UNIVERSITEIT VAN PRETORIA
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ENCROACHMENT, ARCHITECTURE & IMPAIRED ECOLOGY

DESIGN INTERVENTIONS ON THE EDGE OF WILDERNESS

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2013

Submitted as part of the fulfilment in the requirements for the degree of Magister of Architecture, MArch(Prof), to the faculty of Engineering, Built Environment and Information Technology.

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by Naas du Plessis

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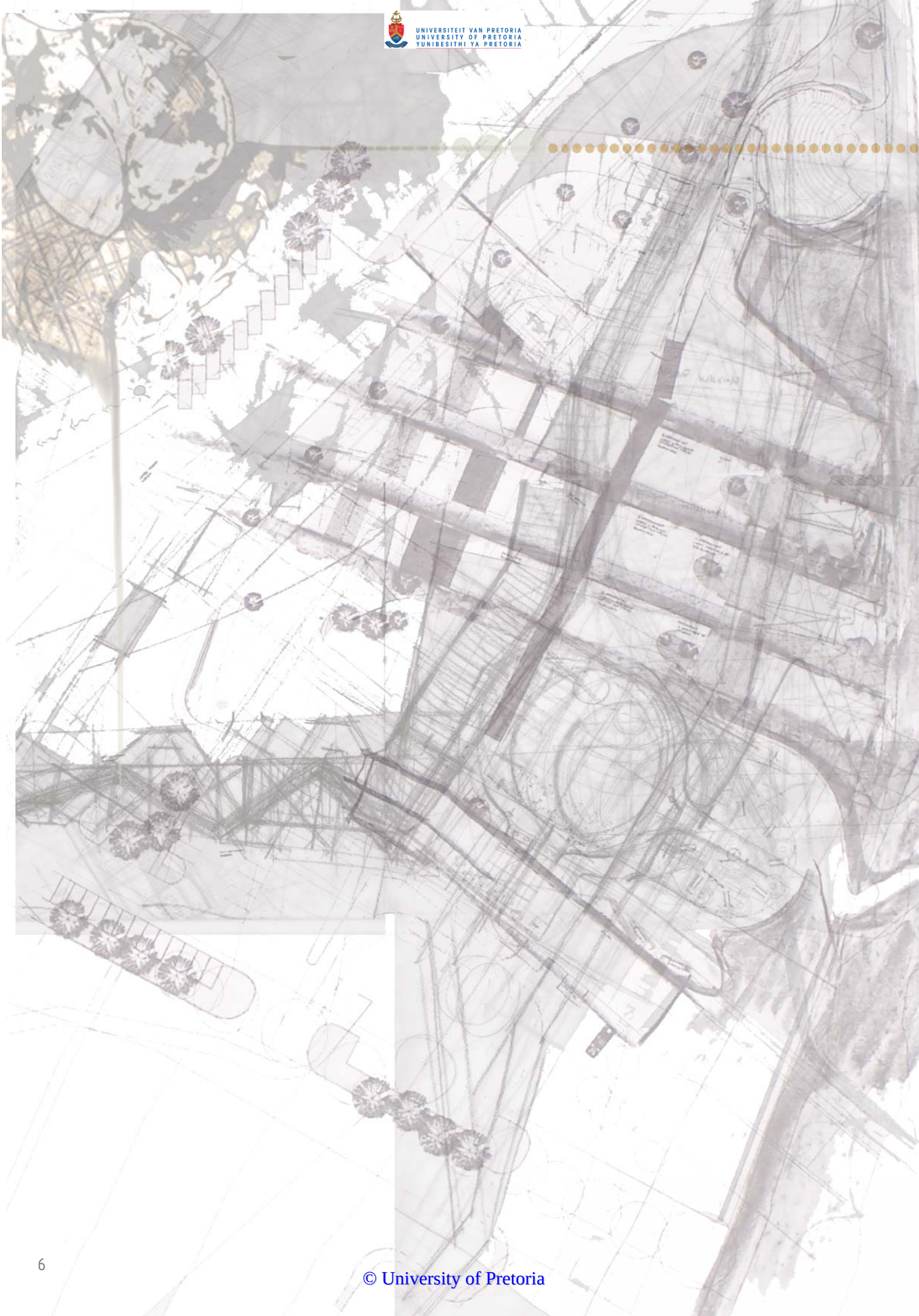

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ABSTRACT:

In the contemporary built-environment the focus is very much on environmentally conscious design or so-called 'sustainable' design- or even the generic labelled 'green' architecture. Despite this popular and supposedly informed preoccupation with the importance of the role of ecology in architecture, 'green' architecture is usually fixated on energy efficiency within the envelope of an individual building. This dissertation questions this limited, and often artificial and technologically driven, relationship between man and ecology. Fundamentally it questions the role of architecture as negotiator in this relationship. The author proposes an alternative way of viewing ecologically conscious architecture, where the intent of the architectural intervention is to respond directly to a given environmental issue and where its existential impact relates to its surrounding situation and the tension between man and ecology existing within the landscape, instead of turning its focus inwards to achieve isolated 'environmental' efficiency. Examples of such a specific issue, context and program with a collective goal of achieving these aims are hence forth elaborated on in the content of this dissertation.

OORSIG:

In die huidige bou omgewing lê die oorwegende fokus op omgewings verantwoordelike ontwerp of nuutgevonde terme soos 'volhoubare' ontwerp en sogenaamde 'groen' argitektuur. Ten spyte van hierdie populêre en oorwegend ingeligte toepassings met toewyding tot ekologiese sensitiwiteit, is 'groen' argitektuur meestal daarmee vermoei om energie besparing na te streef en te bewerkstellig in die limiete van 'n individuele gebou. Hierdie verhandeling bevraagteken dié gebrekkige en soms onnatuurlike wisselwerking tessun mens en ekologie, waar bogenoemde toepassings dikwels slegs deur tegnologiese prosesse gedreif word. Die skrywer stel 'n alterniewe manier om ekologiese ontwerp te benader voor, waar die argitektuur optree as antwoord op 'n gegewe ongewings kwessie en waar die impakte daarvan verband hou met die omliggende situasie van wrywing tessun mens en natuur, gegrond in die landskap, instede daarvan om die fokus na binne te keer en sodoende geïsoleerde omgewings effektiwiteit na te streef. Die spesifieke voorbeeld van so 'n kwessie, die konteks waar binne dit plaasvind en die argitektoniese program wat hierdie gesamentlike doel versinnebeeld word meer breedvoering verduidelik in die inhoud van hierdie verhandeling.

PROJECT SUMMARY:

PROGRAMME: Tourism and Environmental Education Centre based on the utilisation of veld-fruit

SITE DESCRIPTION: Vacant site on Rust de Winter Road North before entrance to Dinokeng Nature Reserve

SITE LOCATION: Eastern Edge of Kekana Gardens-and Skierlik Townships as part of the larger Hammanskraal Township and Western boundary of Dinokeng Nature Reserve, Tshwane, Gauteng Pretoria.

ADRESS: Erf 26 Klipdrift 90-JR, City of Tshwana Region 2, Gauteng South Africa

RESEARCH FIELD: Environmental Potential

CLIENT Gauteng Tourism

KEY WORDS:
- Encroachment
- Architecture
- Ecology
- Interventions
- Wilderness

-THRESHOLD

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(Author's note: All images/figures produced by author)

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PREFACE:

"Before there were humans, the world was in a state of wilderness. Now we have spread out and multiplied, our works have gotten out everywhere... For the entire Twentieth Century we have relied on politics to shape the world. We have thought that social planning would make us a new landscape, but we never reckoned on the power of the machines to make landscapes we didn't anticipate... The point of dwelling on landscape now, at the end of the century when the question asked right at the beginning-what is appropriate?-is still unanswered, is to re-perceive the ratio of wilderness to cultivation and research the strategies...The point is to replace the guttering candles of the neoclassical world with something less destructive than the furnaces of the nineteenth century or the fluorescent tubes of the twentieth" (Shepheard,P. 1997)

This excerpt from P. Shepheard'd book: The Cultivated Wilderness: Or, What is landscape? signifies the dilemma of humanity's parochial perception of his existence in relation to the natural world. A world view that have identified the manner in which he conducted himself particularly in the recent past, and the negative effects these actions have had through all man's disciplines including the built environment.

It speaks fundamentally of an evolutionary threshold breached by humanity approximately 10000 years ago with the advent of agriculture, at the moment where he acquired the knowledge and means to break loose from the shackles that he's ecologically pristine condition have limited him to for millions of years.

After this turning point humanity itself became able to demarcate and incarcerate the very environment that once contained him, ultimately establishing new thresholds. A striking example of such a realm created by this newly evolved human condition is the ecological threshold between the 'human environment' and the 'natural environment': the new order versus the old order if you will. It's an ever shifting threshold becoming ever-more visible as the 'human domain' increases and the pockets of remaining wilderness continuously dwindle in size.

This dissertation deals directly and indirectly with the various conditions of thresholds and the reality put in place by this situation. It takes a region within the Tshwane environ exhibiting the attributes of 'in between' civilization and wilderness both in a physically literal and metaphoric sense.

It will also explore the intangible thresholds that were crossed in cultural history of the region and reflect on the possible effects that these events might have had on the environment. The objective is also to touch base with the current way in which humanity operate within this threshold from an architectural point of view.

There's currently a clear hostility between the two contrasting environments in question and the scheme asks the question of how architecture can be suggested within this kind of context that would create a better relationship with both human-and natural environments as a result.

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PREFACE

1 INTRODUCTION

Fig.1.3: Kruger National Park as epitome for nature conservation and wilderness under threat from urban/ human encroachment due to compromised conservation efforts. (Author 2013)

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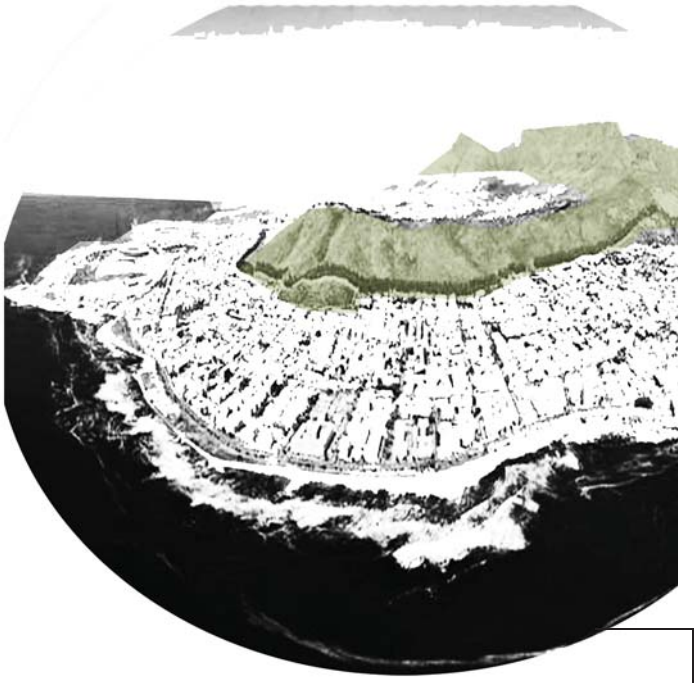

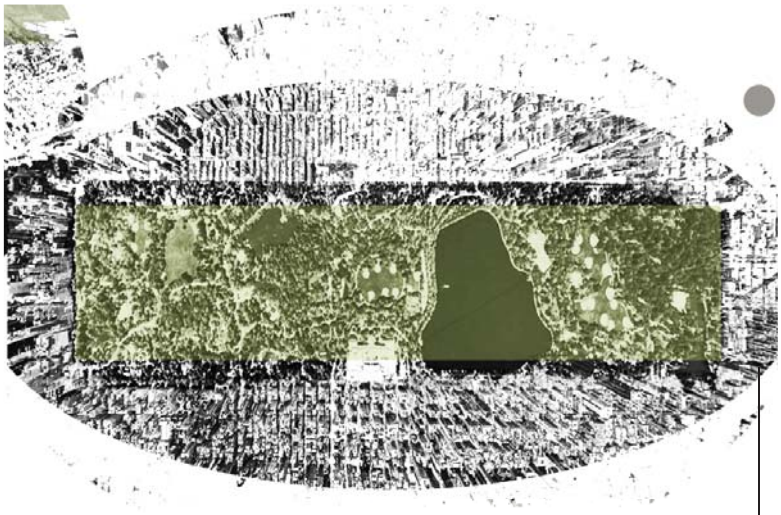

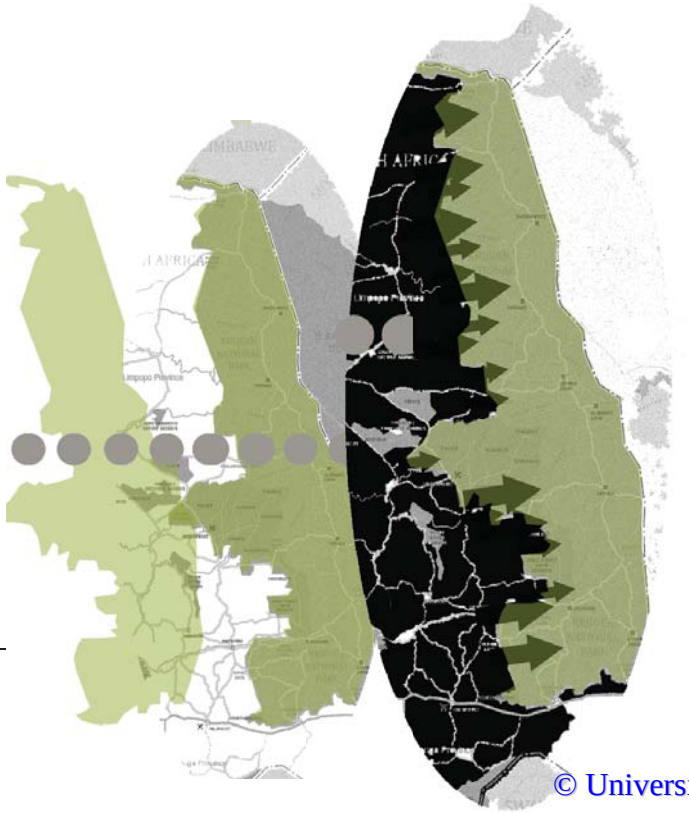

We live in a time where environmental issues are at the forefront of discussion. Virtually every person nowadays realises the threat that global warming and the resultant climate change pose, not only on our way of life but on the future of humanity as a whole, and within the built environment architects and other professionals are committed to produce energy efficient buildings. This however, poses a problem in itself. For when the word sustainability is used in architectural language or discussion, it usually only refers to energy efficiency which expresses an ecological ignorance.

The author therefore grapples with the question of what is being done about the other major 'green' issues such as biodiversity loss and environmental degradation within significant ecologies.

In our urban centres we increase the amount of greenery within public places and we even let plants grow up our buildings, all in an attempt to rejuvenate our cities to something more closely in tune with nature. The fact however remains that these places have severely been altered by human activity and its capacity to remain part of the ecological engine or heart that drives the planet's various life forces has been diminished significantly. And so humanity still dominates, cultivate and ultimately incarcerate these places.

Thus the question remains: What is being done from an architectural perspective in relatively pristine environments where the ecological value is still intact to the extent of being salvageable or places portraying eco-systemic and bio-diverse significance?-Places we like to call wildernesses.

Arguably the best example of such a place in South Africa is the Kruger National Park, where its entire western border is under siege from ever increasing contiguous communities fighting for scarce resources and where the latest antagonism is coming from the east (referring to the eastern border with Mozambique and further afield to Asiatic countries) in the form of rhino poaching. Case in point is the Ndumo Nature Reserve in northern Kwazulu-Natal: In 2005 adjoining community members from bordering Mozambique broke down fences and invaded the reserve when their grievances of not benefiting enough from the reserve's resources reached a boiling point. Ultimately they re-appropriated the land to suit their needs by converting pristine and ecologically sensitive riverine forest into agricultural land.

And that is where the area of investigation for this dissertation enters the picture: The site is located in between the Dinokeng Game Reserve and the eastern edge of Hammanskraal Township, rendering it with similar contextual dilemmas as those mentioned with Kruger and Ndumo. Even though Dinokeng can hardly be perceived as a pristine, untouched wilderness, it represents the idea of wilderness within South Africa's most developed and populated province and will be perceived in that perspective for the purposes of this scheme, and holds significance in that regard since being proclaimed as Gauteng's only nature reserve boasting with the so-called 'big-5' of wildlife (buffalo, elephant, leopard, lion and rhinoceros). This site will be discussed in further detail in the chapter dealing with context.

Fig.1.1: Table Mountain Capetown as incarcerated wilderness
(edited by author from online source: http://www.airpano.com/ files/Cape-Town-Tour-South-Africa/photos/picture3big.jpg)

Fig.1.2: Central Park as ecological island, yet artificial/natural refuge amongst a sea of concrete and steel
(edited by author from online source: https://www.google.co.za/www.glogster.com)

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PREFACE
1 INTRODUCTION
2 THEME

2 THE THEME

This chapter gives a brief synopsis of key words and concepts around which the dissertation is based and structured. It states in summary the departure point and intentional conclusion to provide a compressed vision or perspective about the stance of the author towards certain issues and how its pertinence to architectural discourse can be realised as main outcome.

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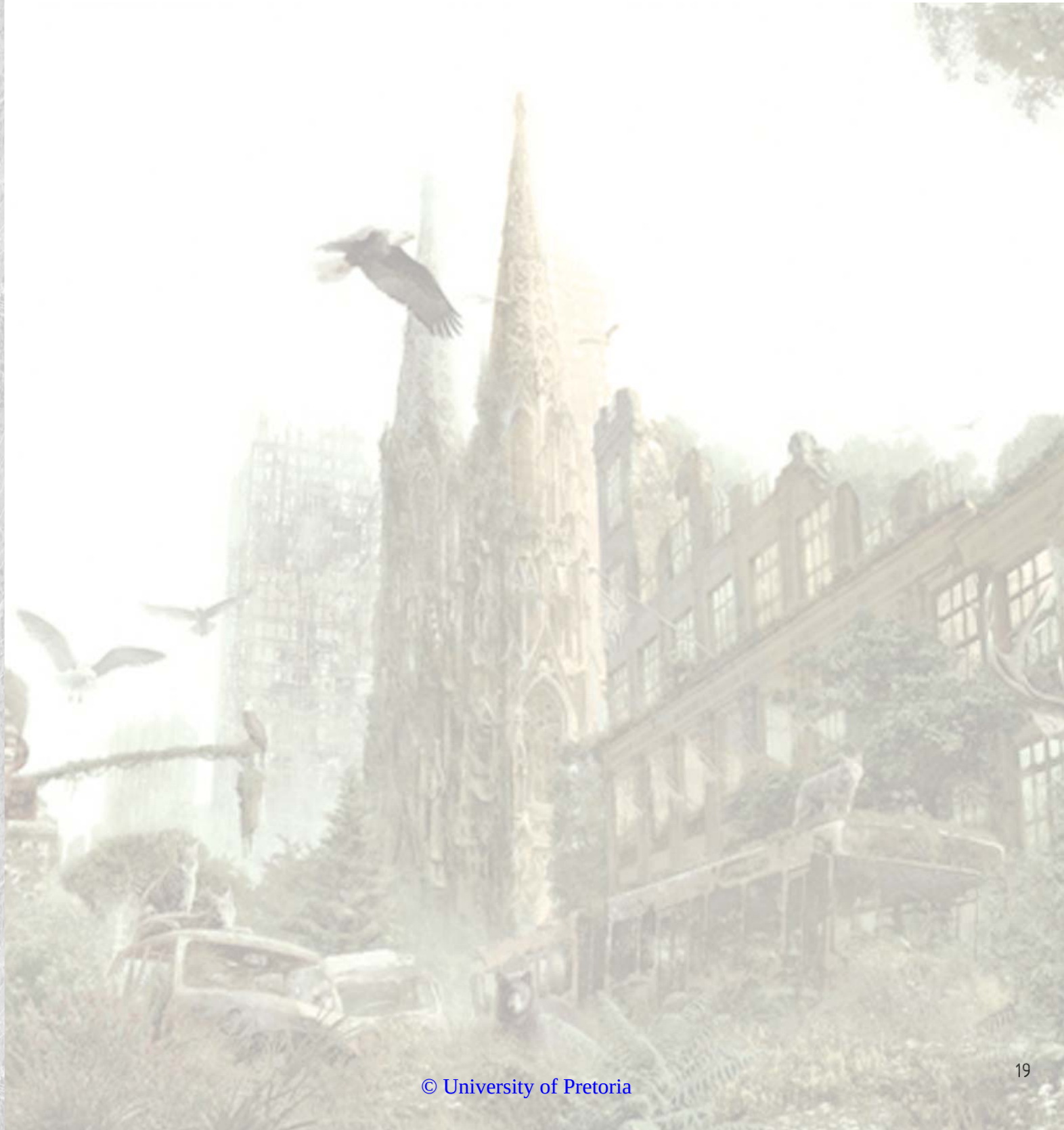

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Fig 2.1

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Fig.2.1 & 2.2: Imitations of nature misconstrued as natural ecology

Fig. 2.2

2_1 ELABORATION ON KEYWORDS AND CONCEPTS:

Main title:
-Encroachment (refers to both the issue and the intent)
-Architecture (context and response): Refers not only to the physical discipline within the built environment as responsive intervention within the existing state of the project setting but also to the biological memory, structure and make-up of the natural context in which the project functions.
-Ecology (context): Referring first and foremost to the natural setting and context on one end of the spectrum. The inclusion of the descriptive word 'impaired' stresses the fact that the state of health of this ecology is being compromised by a negative influence, preventing it, or which have deprived it, from being unspoiled any longer. It therefore suggests a status quo which is far from perfect and that would have to change in order for the affected ecology to return towards a state of health.

Sub-title:
-Intervention (response): Suggests the need for an intermediating response to a problematic status quo.
-Wilderness (context): Refers primarily to the natural setting as a more detailed description of the word 'ecology' found in the main title. A more detailed elaboration on the implicated meaning of wilderness is given in the following chapter.

2_2 PROBLEM STATEMENT:

It is the author's view that the highly problematic and pathologically distorted relationship between man and nature is still being perpetuated despite current efforts of intervention within the intermediary realm between 'developed' environments and ecologically significant environments. The related issue therefore refers to the environmental issue of biodiversity loss and the destruction of life sustaining habitats.

2_3 THE ISSUE: (PRIMARY INFORMANT)

·With the introduction chapter and problem statement as acting background the overarching issue can therefore be defined as the problematic manner in which 'human environments' at large, and the built environment in specific, relate and integrate with pristine 'wilderness' areas.

· Focusing in on a human scale or on the scale of an identified region, or even on a specific site within such a region, the symptomatic issue can be abridged as the encroachment of the 'human environment' onto the 'ecological environment'.

Fig.2.1: Urban parks as an atemp for ecologically rejuvinating cities.
(Online source: http://www.google.co.za/imgres?imgurl=http://www.inhabitat.com/wp-content/uploads/highline_opening-sundance8.jpg&imgrefur)

Fig.2.2: An example of a 'Green Facade' as an atemp to reconnect with nature and ecology.
(Online source: http://www.google.co.za/imgres?imgurl=http://i16.)

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2_4 HYPOTHESIS:

The author argues that:
there is a case to be made for better integration and reconciliation between wilderness and society and particularly architecture's role as negotiator in this reconciliation process. It is the view of the author that the context of wilderness and its peripheral condition will in all probability become a vital milieu in the not-so-distant future seeing that these places have always been and will continue to be the determining supports for life on earth. In the modern movement the urban, technological advanced and 'developed' landscape was seen as the setting in which to find answers for society's future problems. It is however the state of health of our preserved natural landscapes that will determine the fate of the next generation. The reality however exists that wherever people dwell and spread out the need for architectural endeavours follow suit, with the subsequent need for interventions arising in order to address problems related to humanity's existential impacts. In this case the problem created by the human presence transcends the social-cultural dilemma into the ecological imperative. The time is therefore ripe to start debating this intermediate environment as architectural laboratory for investigation.

2_5 RESEARCH QUESTIONS:

·What should the role of architecture be on the threshold between the 'human'-and ecological environments?

·What is an appropriate response in terms of an architectural program that would sufficiently deal with the problems associated with the identified environmental issue?

·How can architecture be utilised as an extension of nature conservation?

2_6 INTENTION FROM POINT OF INITIATION:

The aim of this scheme/project is to propose an intervention set within the relevant milieu, addressing the relevant issues and research questions, as a collective clarification of the pertinent concept, through articulated programming, spatiality, material choice, construction methods and correspondence with other contextual matters.

Fig.2.4: Abstract presentation of the project's locality issue: human encroachment from Hammanskraal onto the ecological environment of Dinokeng Game Reserve
(Author, 2013)

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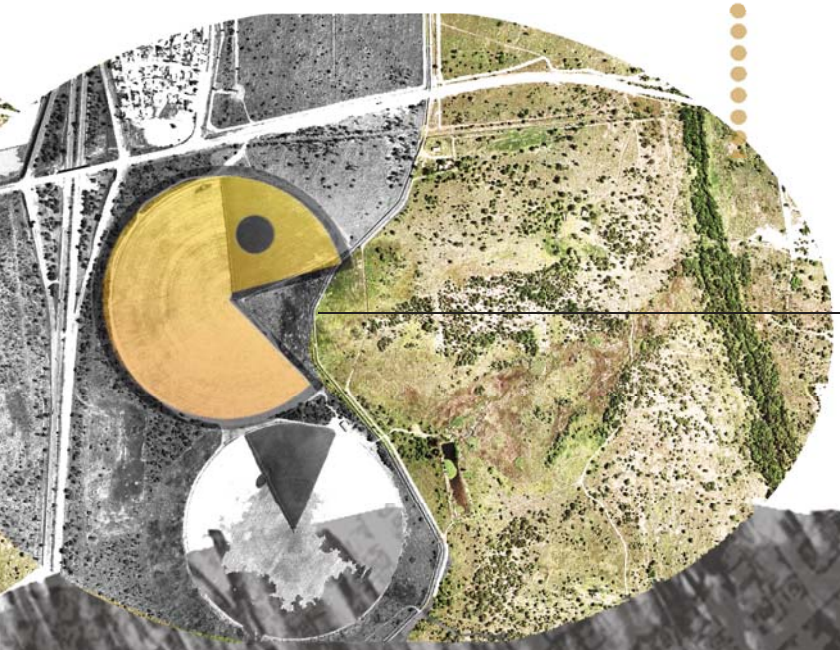

Fig.2.3: The contrasts in 'green'-perceived and actual natural landscapes. [Contrast between destructiveness of 'developed' world practices-commercial agriculture-versus natural ecology (Author, 2013)

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PREFACE
1 INTRODUCTION
2 THEME
3 THE CONTEXT

3 THE CONTEXT

In this chapter the various levels of contexts having relevance to the scheme are discussed by starting with the esoteric and theoretical, yet overarching-metaphysical context, as basis, and moving towards the more tangible ecological and physical contexts.

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Fig.3.1: A depiction of nature reclaiming the human environment
(online source: http://cracpreservation.files.wordpress.com/2011/03/2007_06_world5th2.jpg&imgrefurl

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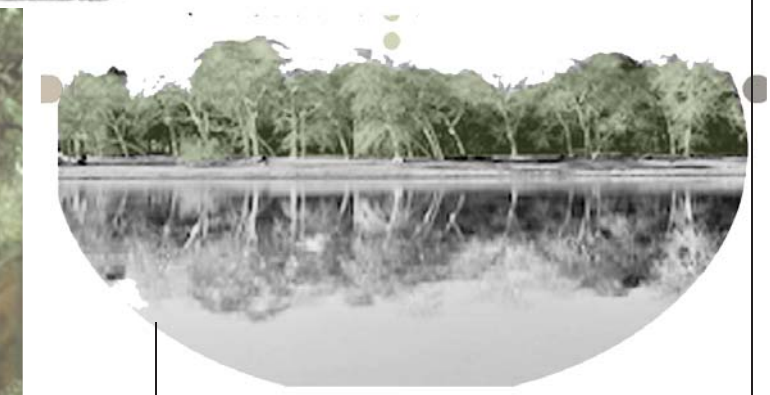

Fig.3.2

The metaphore of 'wilderness' as natural place where wild ecology, instead of human activity, dominate the landscape

Fig.3.3

Fig.3.2: Pafuri forest Kruger National Park (online source: http://www.google.co.za/imgres?imgurl=http://www.outdoorphoto.co.za/gallery/data/518/pafuri_fevertree_)

Fig.3.3: Ndumo Nature Reserve (online source https://www.google.co.za/search?sa=G&q=ndumo+game+reserve&tbm=isch&tbs)

3_1 METAPHYSICAL CONTEXT: (1st subsidiary informant basis)

3_1_1 CONSTRUING THE MEANING OF WILDERNESS:

"In wilderness is the preservation of the world." Henry David Thoreau

The 'civilized' human being has always had an affinity with the wilderness idea. From ancient emperor-conquerors like Alexander the great and ocean farers such as Columbus who wanted to embrace the thrill of searching for mysterious places unknown to the developed, 'modern' man of the time, to Idealist-naturalists such as Thoreau were all drawn by specific notions of wilderness. It resonates with a primordial part of the human psyche that seeks to reconnect to a distant past where the prehistoric human animal stood helpless against the powers of his surrounding landscape and had to summon extraordinary intellectual development in order to overcome this subsidiarity and conquer the metaphorical beast in wilderness. As times have changed the idea developed as one can witness in artistic depictions that include the wilderness epitome as subject. Especially neoclassical and renaissance paintings with biblical themes show it in an adverse light as a hostile place of damnation and abandonment.

In recent times modern man's fascination with the wilderness idea has taken on a new face and is currently playing out in a deadly dance with ecology while a striking irony stares him in the face. It's indicative of the point that we have intellectually evolved into a state where we've gained the ability to alter our physical environment but regressed in the ability to make wise decisions surrounding our metaphysical and existential wellbeing.

In an article published in Notes 2012 the authors investigates two studies that examines the role of 'wildness' or '(freedom from intentional human control)' within wilderness that is associated to the experiential significance within wilderness with regards to 'Phenomenology of Spiritual Experiences in Wilderness'.

The American Wilderness Act of 1964 states that: "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. "(Sec. 2. (c))"
In contrast to this view Howard Zahniser however says: "We are a part of the wildness of the universe. That is our nature. Our noblest, happiest character develops with the influence of wildness. Away from it we degenerate into the squalor of slums or the frustration of clinical couches. With the wilderness we are at home" (Zahniser. 1992b. (p. 65)).

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Fig.3.3: *'Twilight in the wilderness'* painting by Frederick Church 1860
(online source: http://www.google.co.za/imgres?imgurl=http://www.fredericedwinchurch.org/Twilight-in-the-Wilderness.jpg&imgrefurl)

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If one would then again share Roderick Nash's point of view who states that "Civilization created wilderness," and "Appreciation of wilderness began in the cities" the viewpoint of society's antagonistic stance towards wilderness preservation might seem contradictory and hypocritical seeing that the idea of wilderness itself is a product of the western way of thinking: "The urban centres of Western civilization are the centres of imperial power and global domination and oppression. Whatever comes from them, including classic liberalism, is therefore likely to be tainted by the values, ideology, and practices of imperialism, as the mainstream white man (and his emulators) seeks to discharge (impose) his "white man's burden," the burden of his 'enlightenment,' on all the others, of all sorts, on this planet." The author of the same article titled: "The incarceration of wildness" in which Nash's statement appeared continues to say:

"Unless we Westerners see and acknowledge the shortcomings of this gesture (of wilderness preservation) we will languish in self-congratulatory bad faith. …the bad faith that taints our mainstream justifications for wilderness preservation and to sting us out of it toward a more ethical relationship with wild nature, with wildness itself, and thereby with one another."(Birch,H. ?)

It is also distinctly possible that the feature of the wilderness idea which proved to be so alluring to the early explorers still remains in our modern day fascination therewith, and that is the mystery or contrast factor is has with the normal 'human environment': "…A certain humility of unknowing and an openness to experience may be important… there is a deliberate setting apart of wilderness from the forces of change that are associated with modern, technological society. … Wilderness is symbolic of restraint and reserve, suggesting the importance of lightening the burden of humanity on nature and upon the experience of nature" (Borrie 2004)

The irony alluded to earlier, lies in the aspect that even though the contemporary human have come to realise the importance of preserving so-called wilderness areas, the methods in which man attempt to do so echoes his instinctive yearning to divide and conquer the wild, by placing it in isolated, fenced down pockets completely severed from its natural state of interconnected networks.

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In addition, the frenzied, unrestrained explosion of human population and hopelessly inadequate urban-spatial planning surrounding the wild, albeit impaired, places of ecological sanctuary exacerbates the absurdity. It creates even yet another reality in parallel, though contradictory to, the aims of wilderness preservation. This reality is but another form of mankind's predictable and relentless oppression on ecology. It attests to the problematic relationship with wilderness spoken of earlier and which manifests itself here in the form of urban sprawl. In the context of this dissertation the Dinokeng Game Reserve is representational of wilderness while the encroaching Hammaskraal as well as the surrounding commercial agriculture embodies the irrational relationship between man and nature.

The word wilderness therefore has several meanings of relevance in this context. It is not limited to the literal depiction referring to proclaimed nature reserves, for it also suggests symbolically the natural ecology as place of ancient refuge. It can also refer on an abstract level to the ecological wilderness or spiritual desert we as twenty-first century people currently find ourselves in as a result of our disconnectedness from nature.

'NEBUCHADNEZZAR IN THE WILDERNESS'
-WILLIAM BLAKE-1795
Fig.3.4

'ELIJAH IN THE WILDERNESS'-FREDERICK LEIFGHTON-1878
Fig.3.5

'THE WANDERER ABOVE THE SEA OF FOG' -CASPER FRIEDRICH-1818
Fig.3.6

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'WILDERNESS'-KASPER KANG-2010
Fig.3.7

'THE LANGOLOIERS' OR 'INEVITABLE ENTROPY'-NEOSURREALISM ART
Fig.3.8

'TWILIGHT IN THE WILDERNESS' -FREDERICK CHURCH 1860
Fig.3.9

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3_1_2 THE EDGE OF WILDERNESS: AS THRESHOLDS BETWEEN MAN (HUMAN SOCIETY) AND HEALTHY ECOLOGY

[threshold n. point of entry or beginning; a level or point at which something starts or ceases to happen or come into effect; the level at which one starts to feel or react to something.]

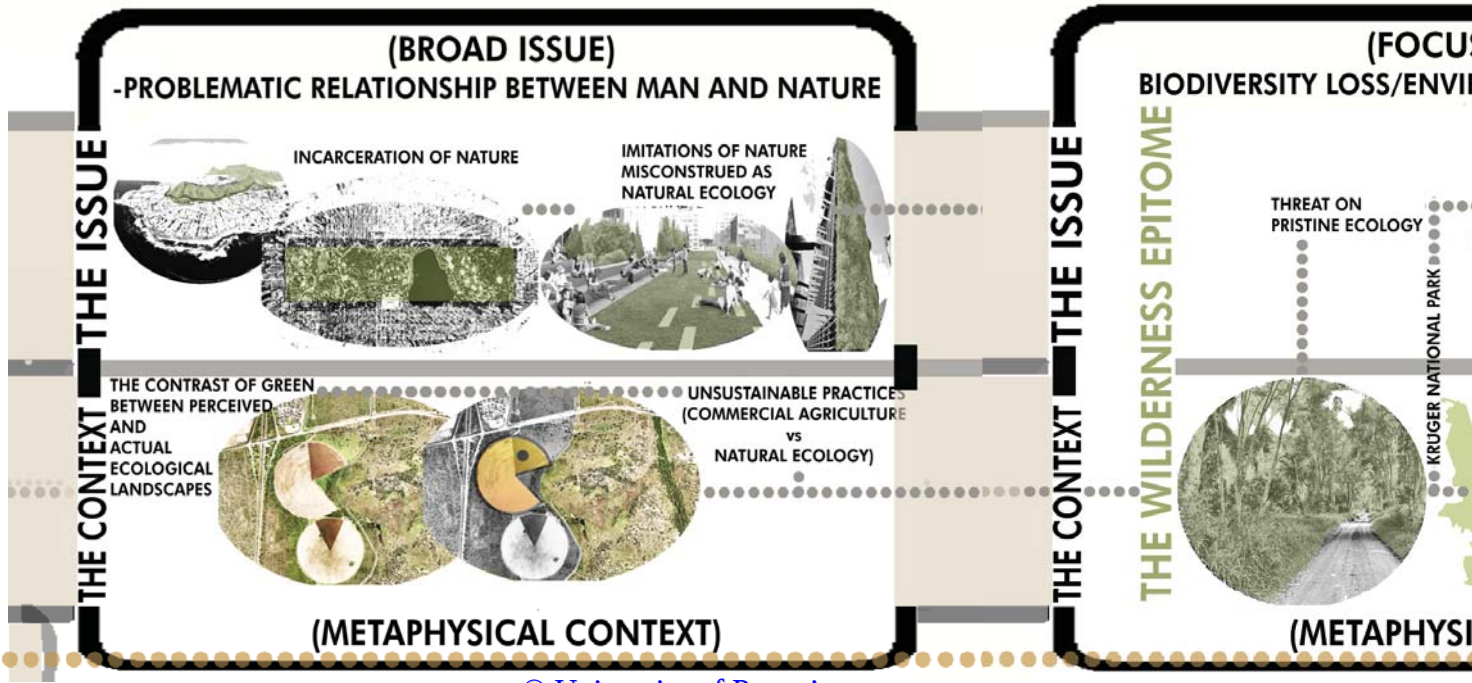
As we've seen there are numerous ways in which the concept of wilderness can be interpreted. When one speaks of the threshold through which to move in transition towards the given state of wilderness as end destination, the understandings there-off would naturally also be multiple.

As an in-between realm it holds potential as facilitator for emphasizing contrast between different worlds and an architectural mediation in such a realm has the potential to spatially communicate what Henry David Thoreau tried to do in written form in his literary masterpiece Walden. As explained in its Introductory chapter, the author juxtaposes concepts present in the study of an ecological context such as '*society versus solitude, complexity versus simplicity, matter versus spirit, nature versus God...* and suggests that*...man cannot achieve his high aims of perfection by rejecting one of these concepts and leaping into the other but must work his way up through the jungle of the world towards that very perfection he seeks.*' Whichever way one perceives this denotation, it collectively suggests an 'in-between' state serving as an entrance to and exit from different realms. From a rigidly literal sense the edge of wilderness within the bounds of this dissertation refers to the site of intervention as identified between Dinokeng and Hammanskraal, as will be shown in the section on the physical context.

3_1_3 THE CONTRASTS OF GREEN: RECOGNIZING THE VARIANCE BETWEEN ACTUAL AND IMITATED ECOLOGY AS WELL AS HEALTHY AND DISTORTED NATURE

As alluded to in the introductory chapter, there seems to be a misconception within the contemporary understanding around what constitutes as nature or ecology. This dissertation is however not concerned with engaging in debates such as whether an urban park has the same emotional or experiential relevance than an untouched wilderness has. The author however finds it worth noting that there seems to be alarmingly little differentiation around the ecological authenticity between ecologically significant places and mere imitations of ecology such as urban parks. An example is the popular yet misunderstood notion of a disturbed and trampled plot or urban land, overgrown and infested by pioneer weeds being misrepresented as 'nature reclaiming land'. In actual fact such a piece of land have been damaged so much that it will take ages before healthy ecological systems, that is efficiently reconnected with global ecological networks, will start to flourish in a natural manner.
An equally common misinterpretation exists with regards to agricultural land. Most people mistake this for nature while in actual fact it is one of the main threats to ecological environments. The reason for raising this point is that these misconceptions surrounding our understanding of real ecology hinder us in responding appropriately towards ecological problems. For it is only when one understands the essential workings of a system that one can begin with the process of solving the problems related to such a system.

Fig.3.10: Project order of logic showing transition between contexts (Author 2013)



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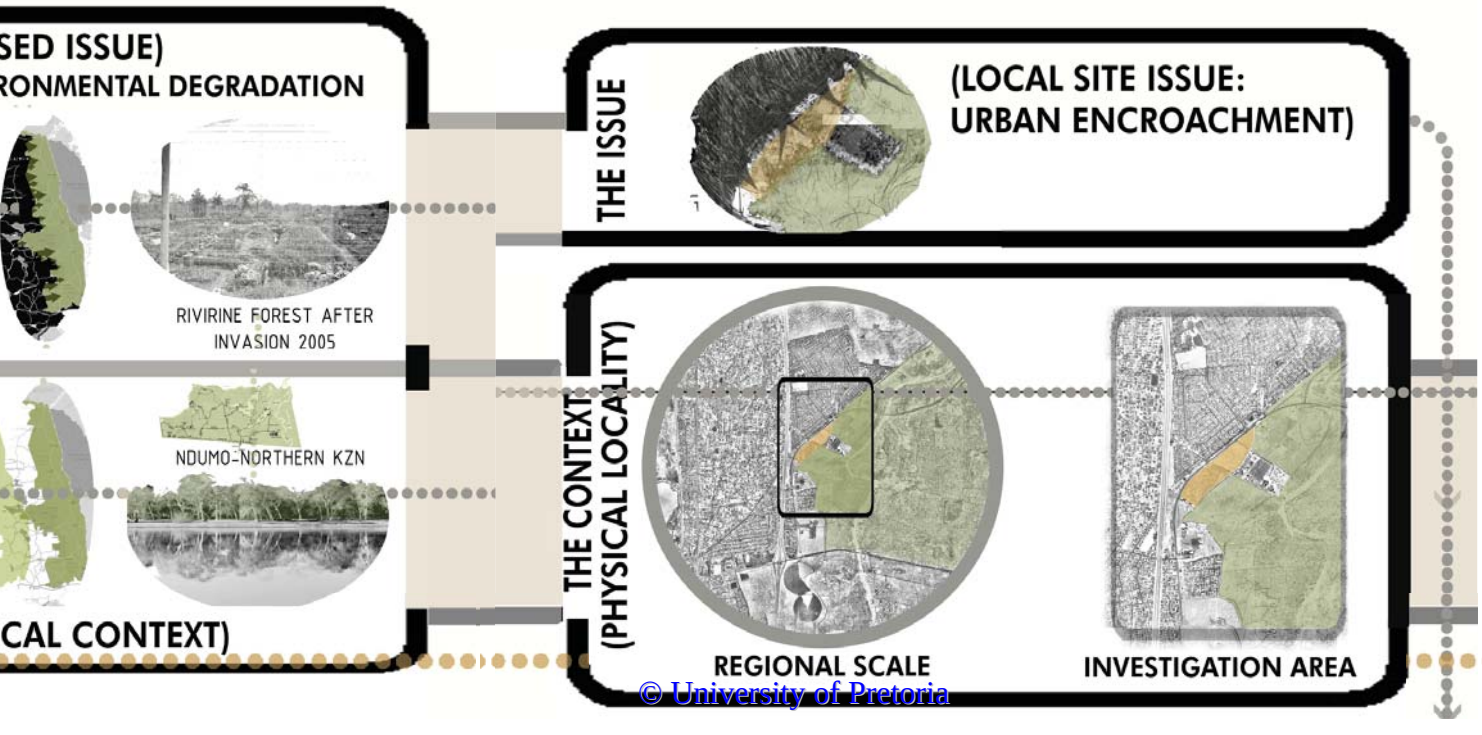
The Urban/Non Urban Spatial landscape:

"Clearly, if the relationship between urban development and non-urban landscapes is to be enhanced, the permanent maintenance of defined urban-rural edges must be considered an abiding principle of development. By definition, if the dominant form of growth is sprawl, (as it is the case with the site at hand) urban dwellers who previously had easy access to the opportunities of the city as well as the countryside, find increasingly that contact with nature is becoming further and further removed, as the city grows. It is precisely in this situation that a remedial substitute such as parks or other forms of artificial open spaces becomes necessary. Conversely, dwellers who seek contact with nature move to the outskirts and as the city continues to sprawl they ultimately find themselves removed from nature as well as access to urban activities and facilities." (Dewar,D.,Uytenbogaardt,R.S. 1991:40)



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3_2 PHYSICAL CONTEXT:

The area under investigation is located on the western border of the Dinokeng Game Reserve and the eastern edge of Hammanskraal Township. It lies in the far north eastern corner of the larger Tshwane area and is about 50km north of Pretoria CBD where Gauteng, Limpopo and Mpumalanga meet provincial borders.

Reasons for choice of site include:

a) Dinokeng is Gauteng's only game reserve that boasts with the 'Big 5' (buffalo, elephant leopard, lion and rhino). It therefore represents the idea of wilderness within South Africa's most populated province, and the reserve can as result expect a substantial influx of tourists in the foreseeable future.

b) The reserve is closely bordered by Hammanskraal which is ever expanding its bounds and might also potentially pose a threat to the reserve in maintaining the effectiveness of its conservation aims.

Intermediately to the two main identified environments, where Dinokeng represents the 'ecological environment' and Hammanskraal represents the 'human environment', a number of private properties and a portion of no-man's land are located. The author has identified this as the threshold between the two contrasting environments. The immediate region surrounding this threshold forms the study area for the project.

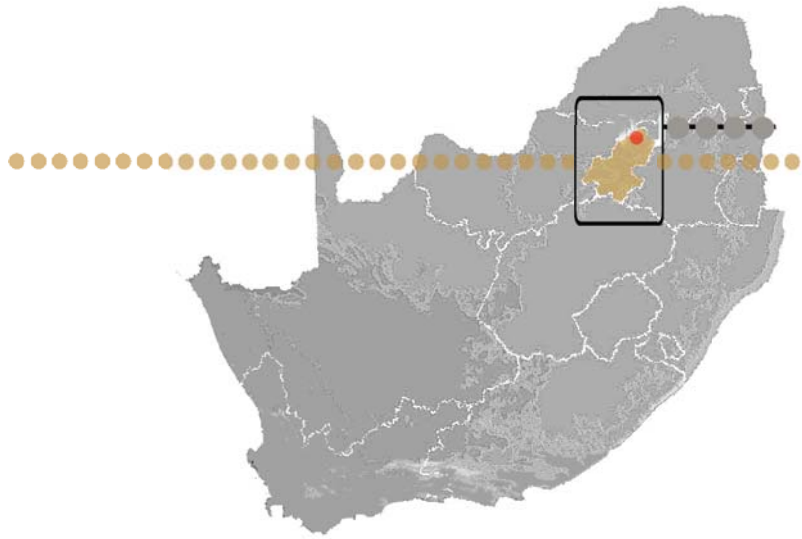

Fig.3.11:
Aerial photo showing relationship between Hammanskraal and Dinokeng Nature Reserve (edited by Author 2013 from UP Department of Geography)

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PHYSICAL CONTEXT:
MESO SCALE

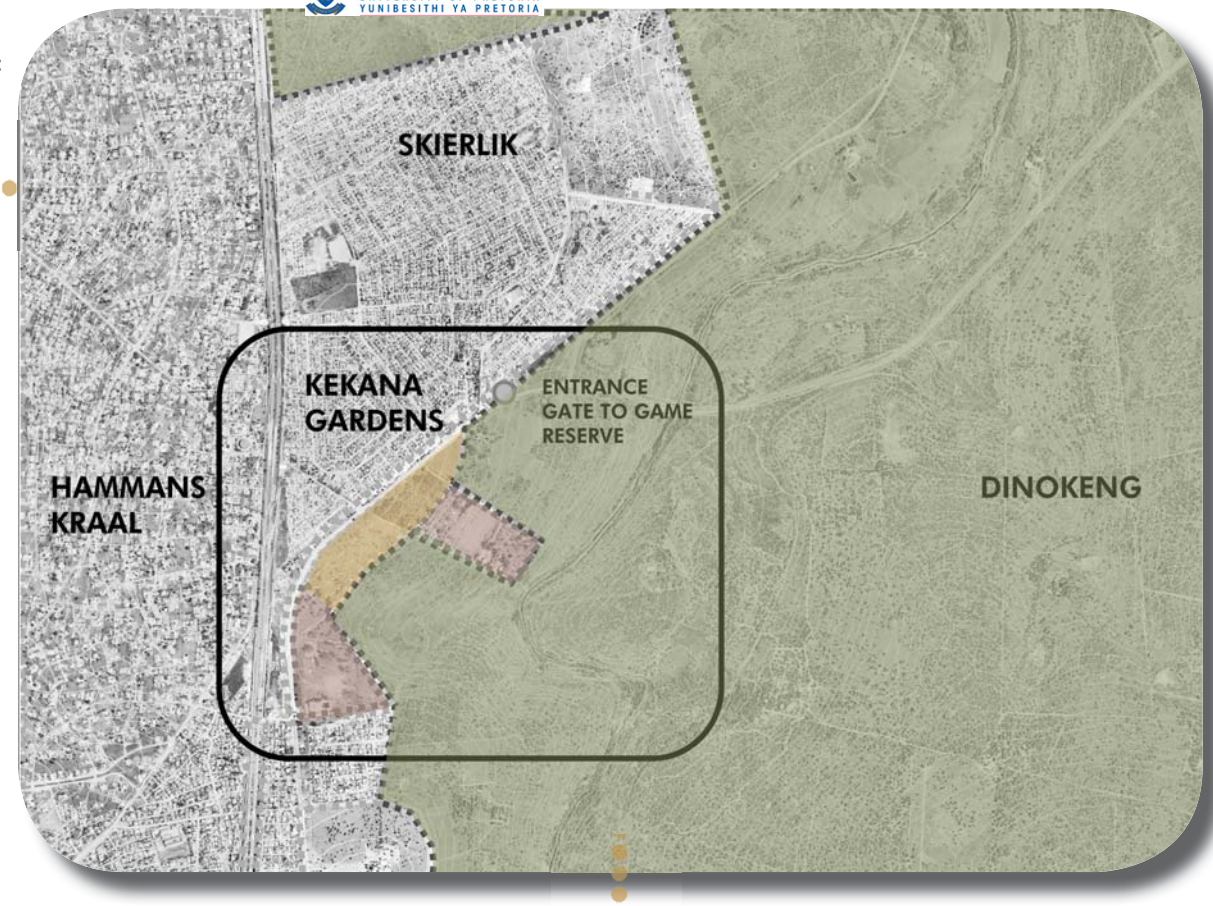

Fig.3.12: KEKANA GARDENS SELLTEMENT & DINOKENG NATURE RESERVE: BOUNDARIES AND ORIENTATIONAL ELEMENTS (Author, 2013)

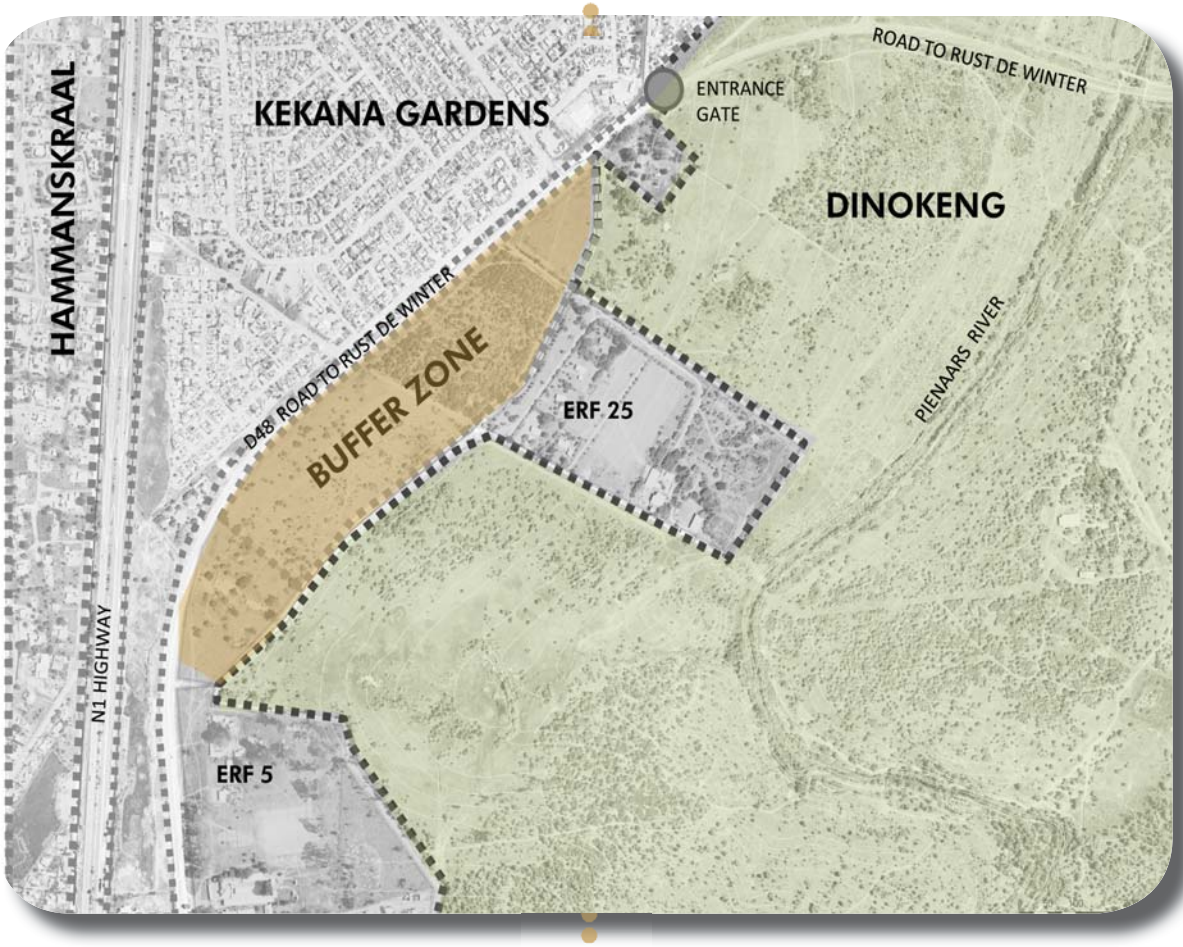

Fig.3.13: Identified threshold between Hammanskraal and Dinokeng (Author,2013)

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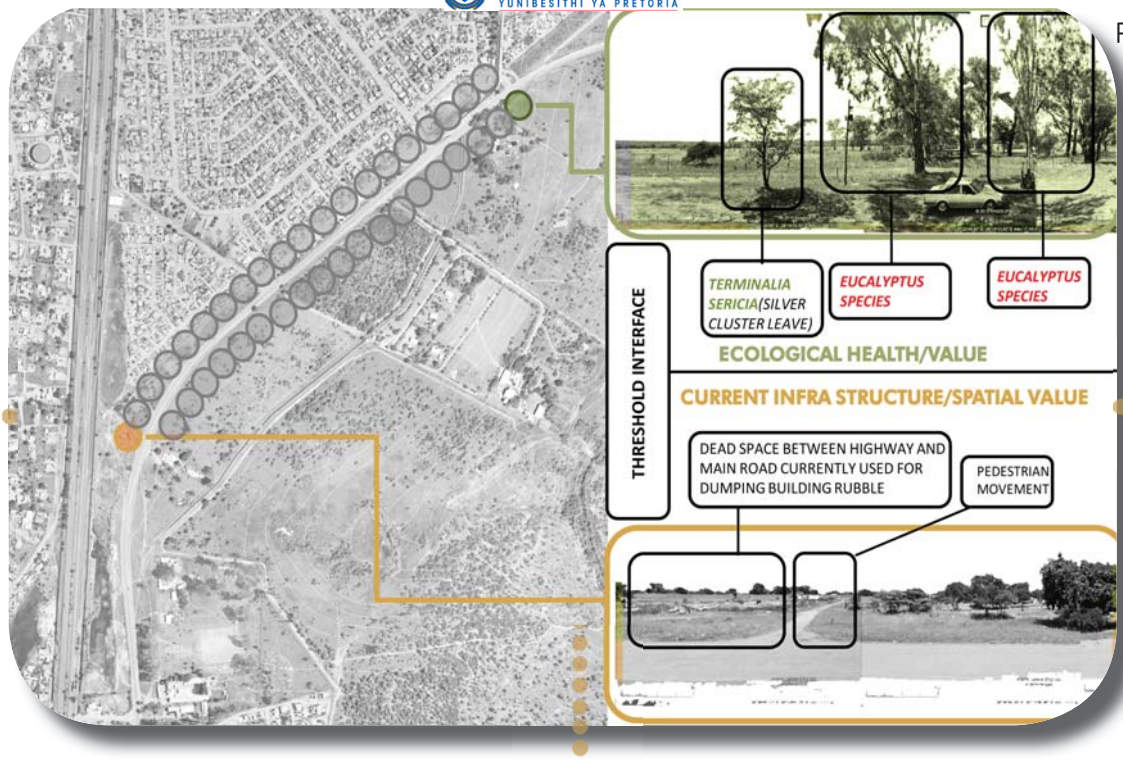

Fig.3.14:
Site Edge Condition investigation
(Author 2013)

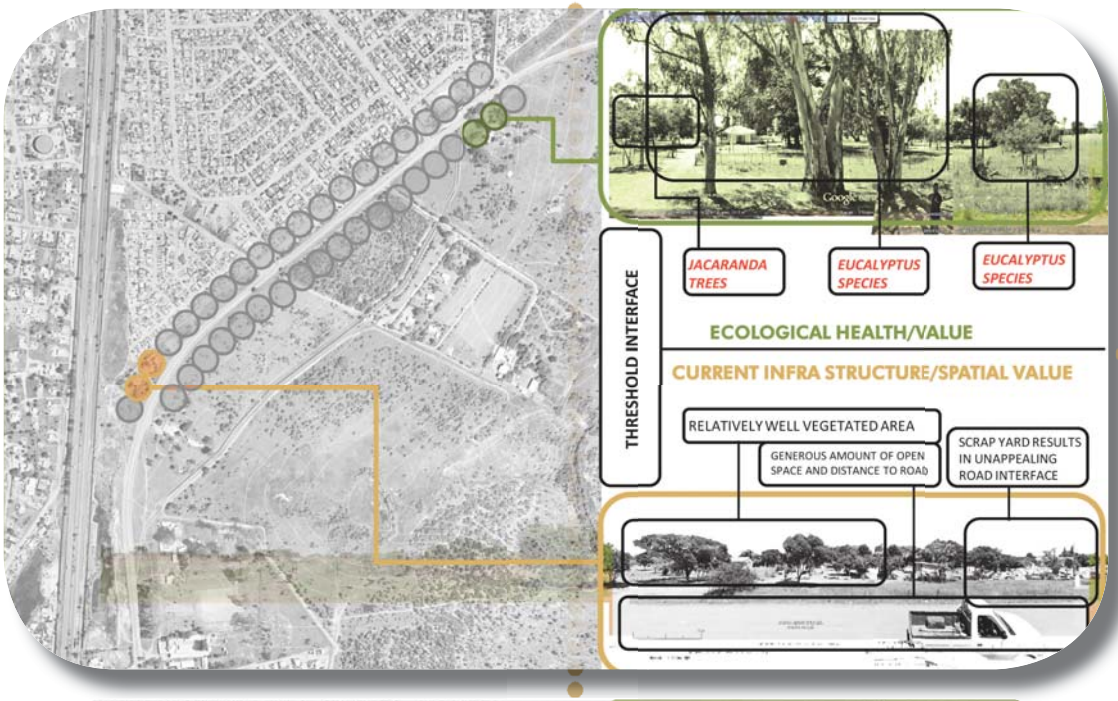

Fig.3.15:
Site Edge Condition investigation
(Author 2013)

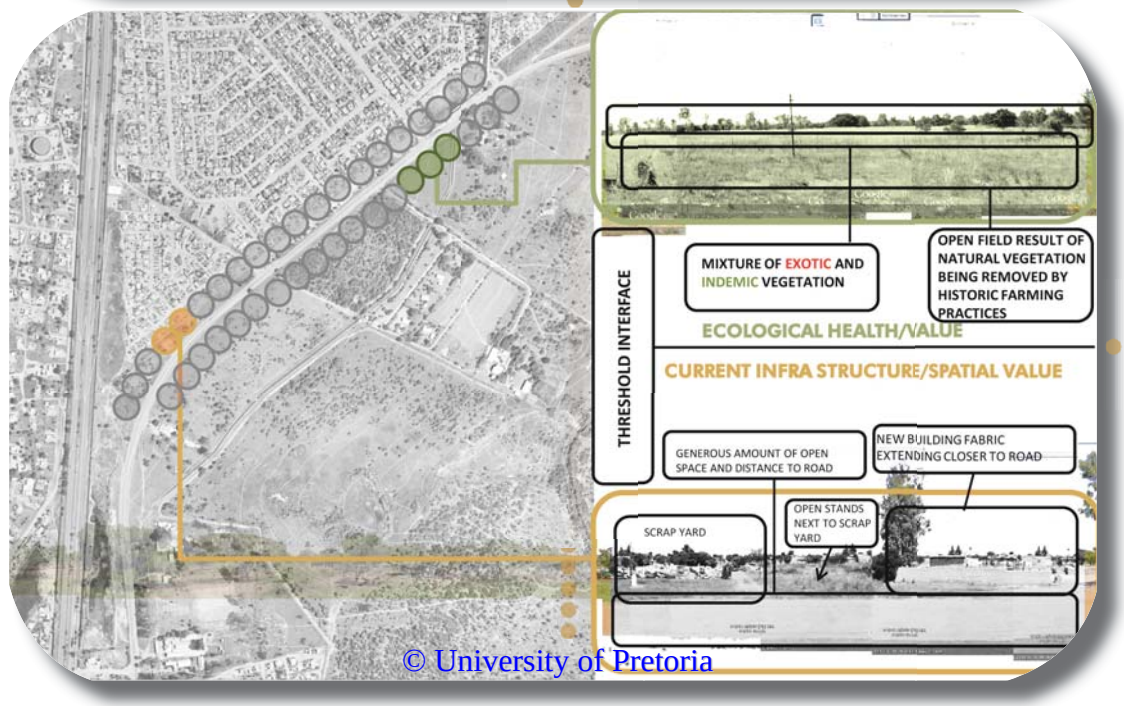

Fig.3.16:
Site Edge Condition investigation
(Author 2013)

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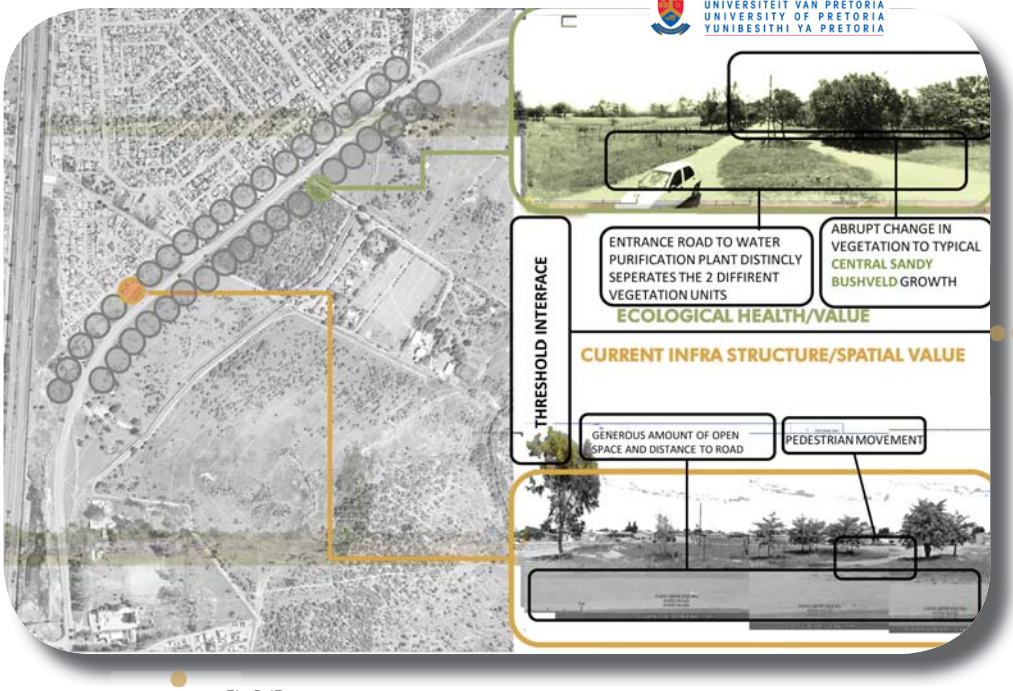

Fig.3.17:
Site Edge Condition investigation (Author 2013)

Fig.3.18:
Site Edge Condition investigation (Author 2013)

Fig.3.21:
Site Edge Condition investigation (Author 2013)

Fig.3.22:
Site Edge Condition investigation (Author 2013)

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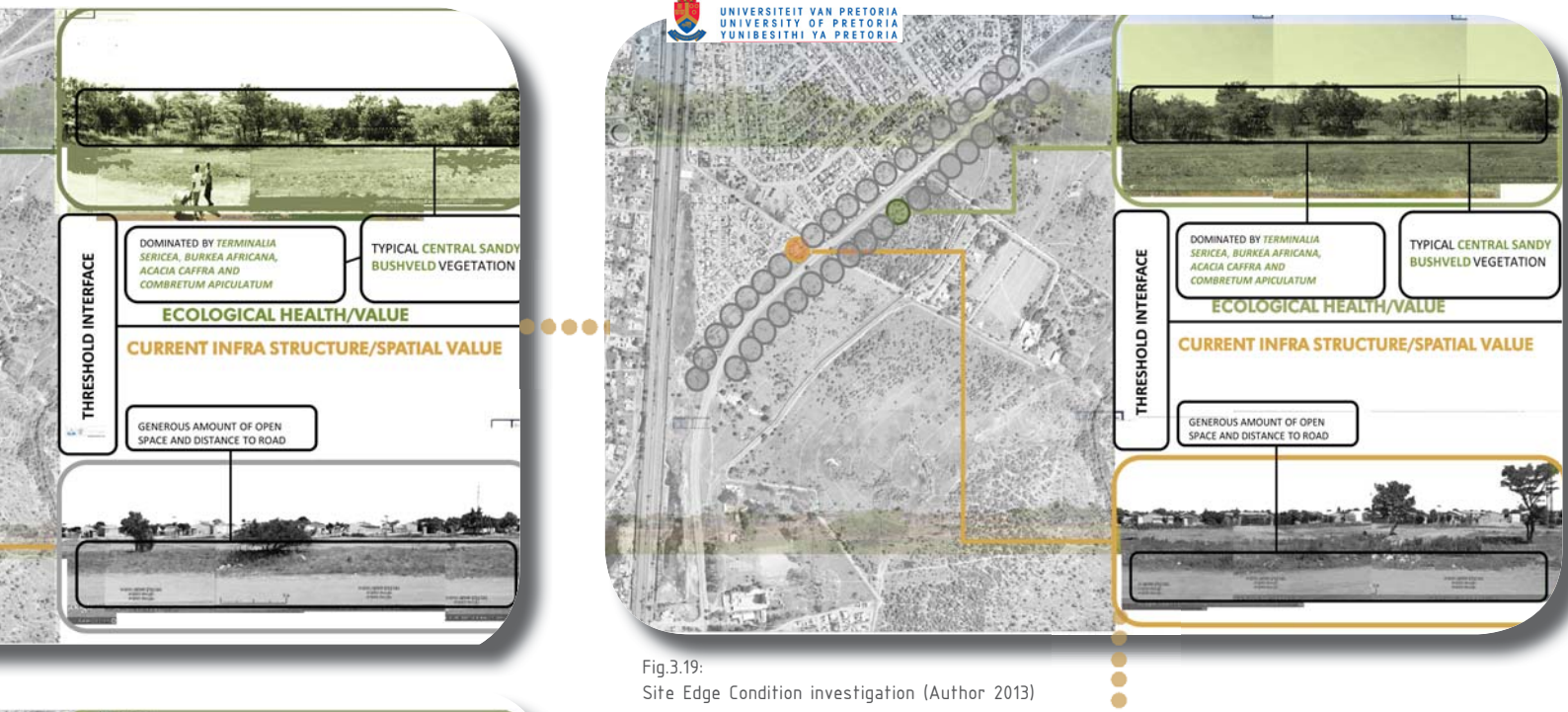

Fig.3.19:
Site Edge Condition investigation (Author 2013)

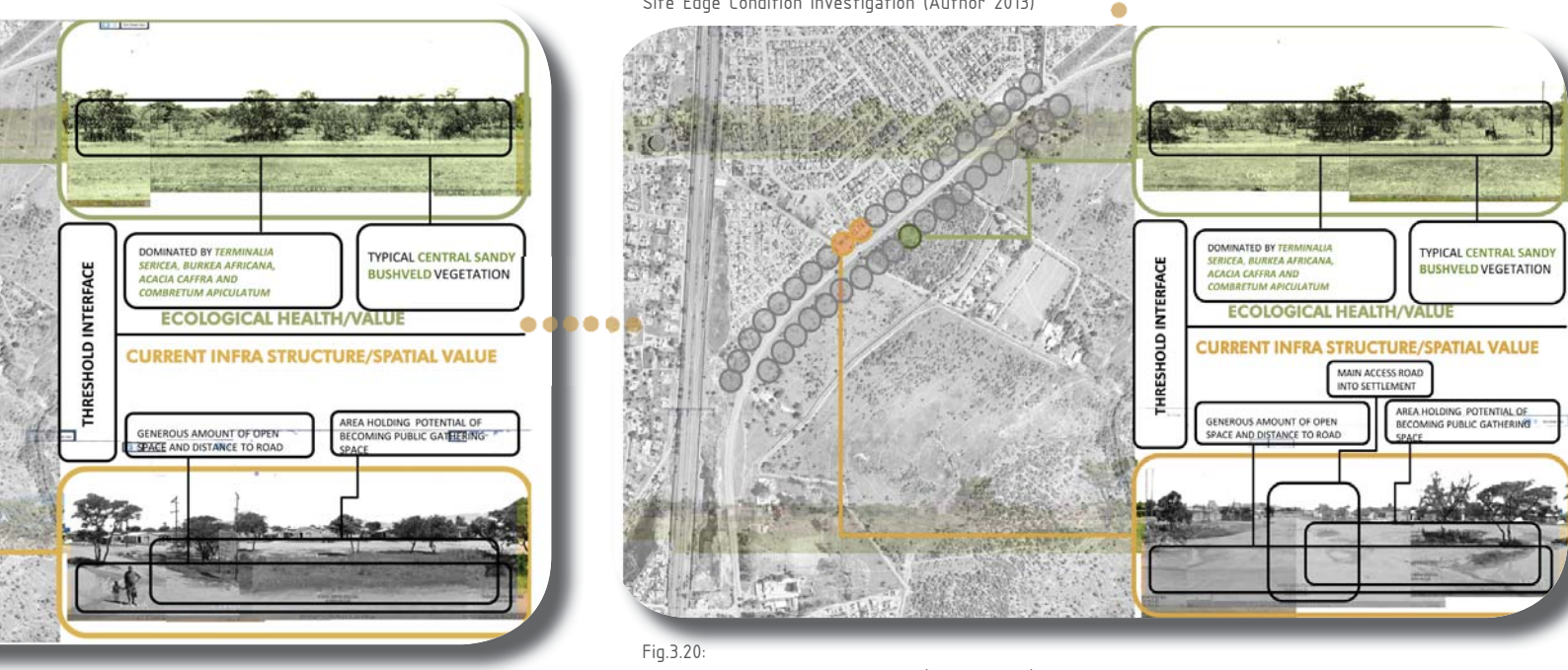

Fig.3.20:
Site Edge Condition investigation (Author 2013)

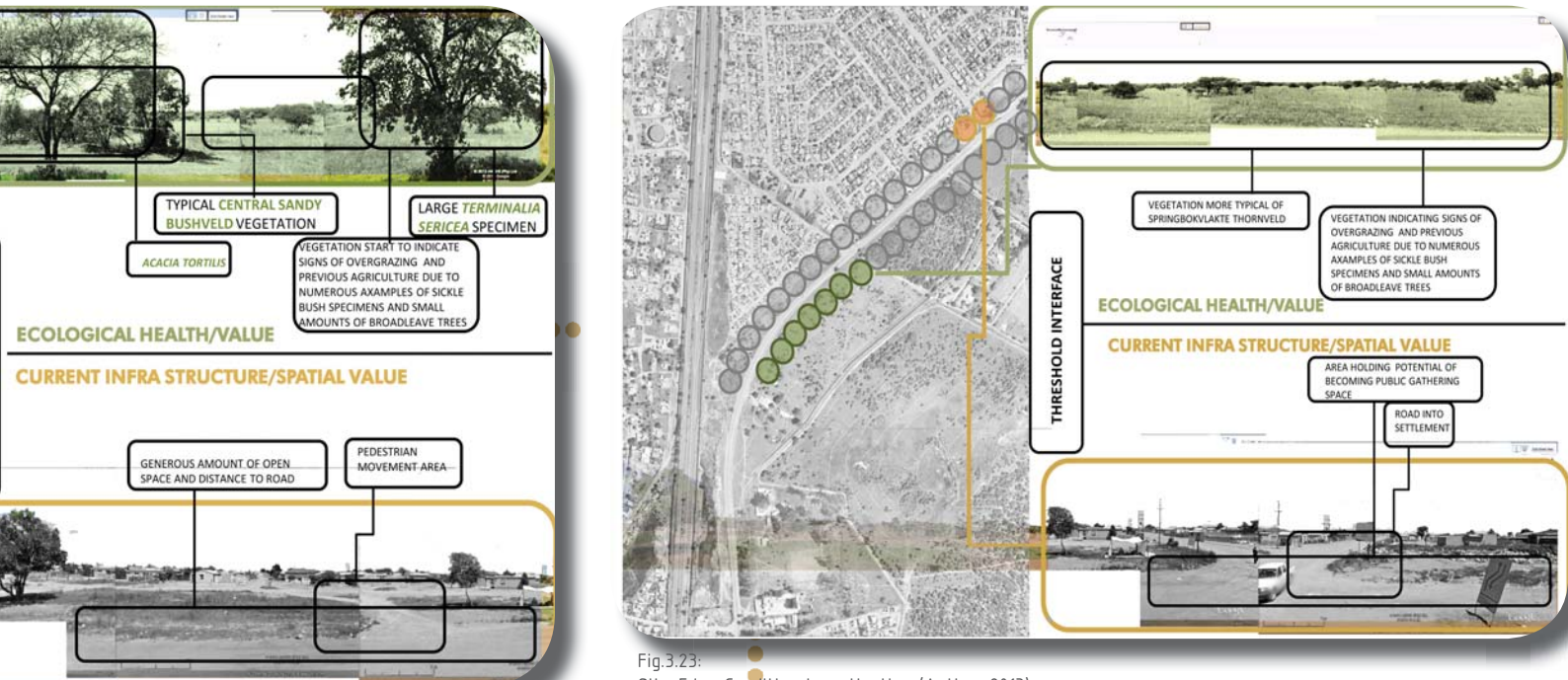

Fig.3.23:
Site Edge Condition investigation (Author 2013)

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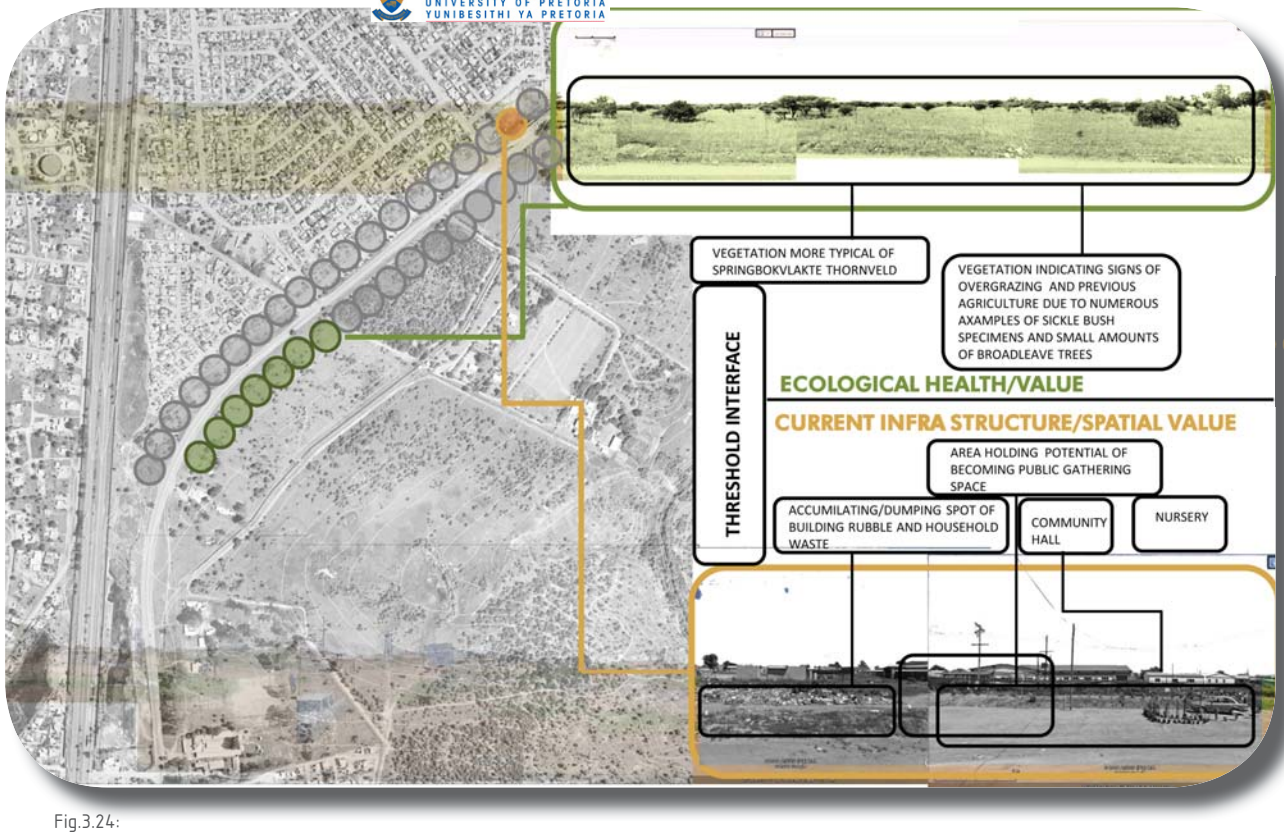

Fig.3.24:
Site Edge Condition investigation (Author 2013)

Fig.3.26:
Site Edge Condition investigation (Google Streetvie edited by Author 2013)

Fig.3.27:
Section through site (Author 2013)

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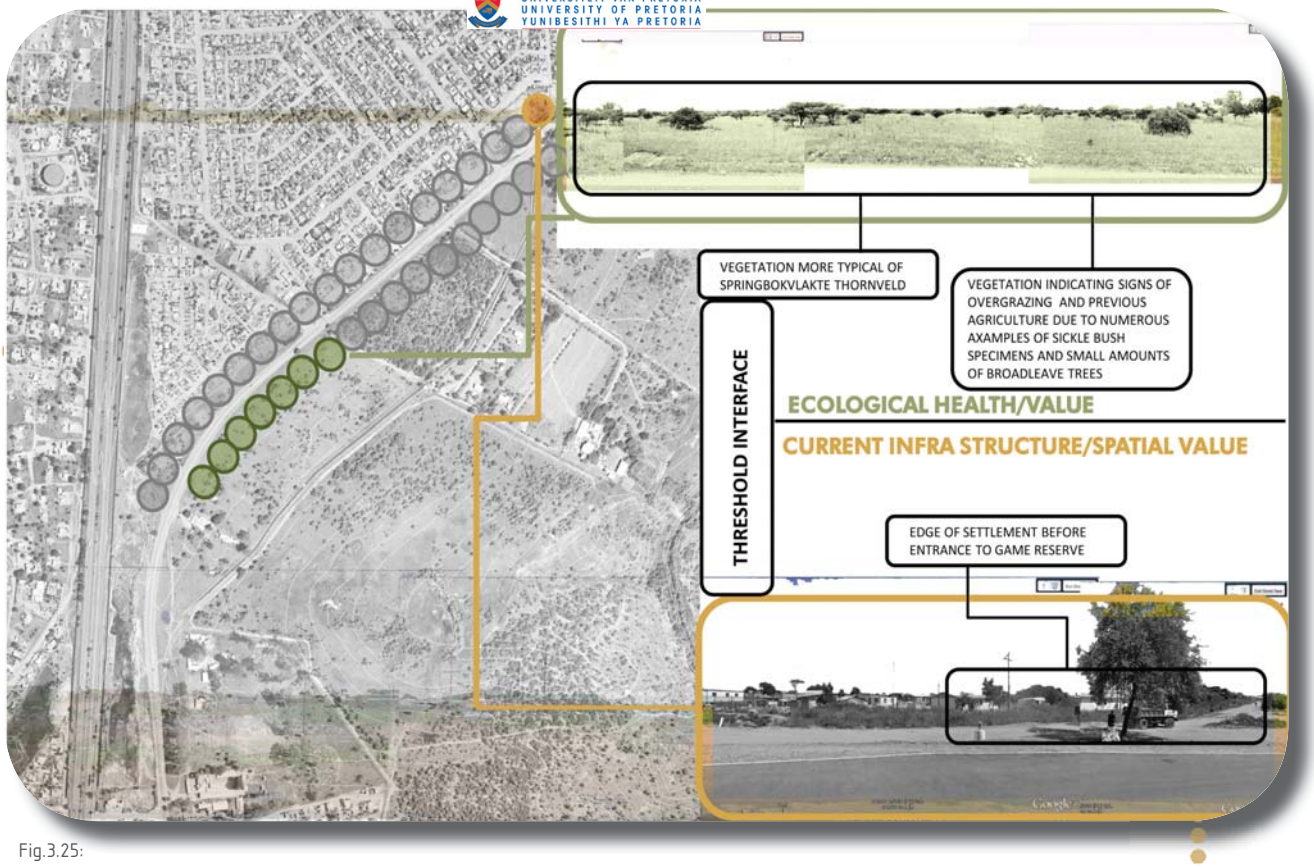
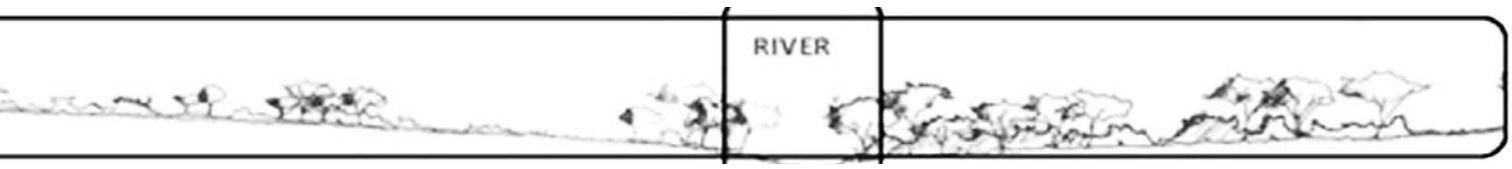


Fig.3.25:
Site Edge Condition investigation (Author 2013)



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3_3 THE ECOLOGICAL CONTEXT IN FOCUS:

Because this project deals with an environmental-and subsequently ecological issue, the decision was made to focus in on the ecological context in search for clues to an appropriate contextual response. When one takes an ecological spectrum and separate the strands that comprises it, namely mammals, reptiles, birds, insects, invertebrates, up to single cell organisms, the strand which will probably tie in best with architecture is the flora (vegetation) for sharing certain attributes: Any building component, assembly of building components, assembled building or assembly of buildings appears to be static entities in the landscape, yet it is part of a constant and dynamic process of adjustment and adaptation brought forth by the forces of change such as impacts induced by its users over time, operational stresses and natural entropy. Similarly any leave, branch, assembly of branches, assembled tree or conglomeration of trees within a vegetation community forms part of a dynamic system influencing-and is influenced by-its surrounding forces, yet appears to be static to the naked eye. This shared feature between architecture and flora lends a connection point at which architecture can merge with ecology. [1]Arhitecture as an extention of ecology versus architecture as parasitic infection which invades ecology. This conception is taken then as basis for exploring the floral ecology of the given region further.

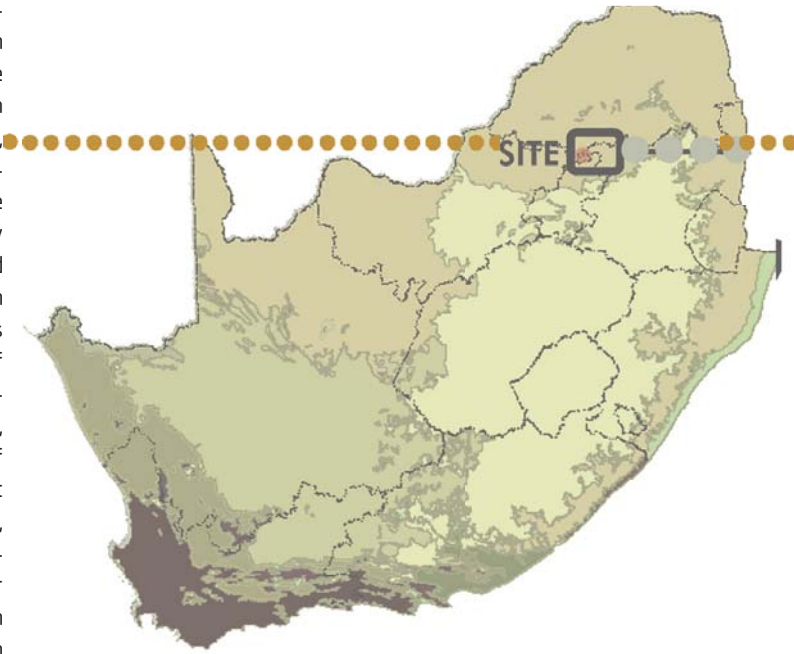

Fig.3.28: BIOMES-NATIONAL SCALE

Looking at the map of South Africa, one will notice that the country is divided into several biomes of which the site under investigation falls within the savannah biome. This biome is further divided into various bioregions and becomes apparent when zooming further into the provincial map of Gauteng. On the site two of these bioregions coincidentally meet, namely the Springbokvlakte Thornveld and the Central Sandy Bushveld (CSB).
This provides the region with substantial biodiversity and a relatively large variety in flora, specifically that of fruit baring trees.
The following page shows an indication with related illustrations of the dominant tree species in these two bioregions. The CSB include amongst other Sclerocarya Birrea subsp.caffra (marula trees) and Englerophytum Magalismontanum (Transvaal Milkplum/ Stamvrug) with excellent fruit producing properties from which an array of products can be manufactured.
List of dominant tree and shrub species present with indication of the edible plants shown in colour on next page:
In the chapter to follow that focuses on the program a more detailed description will be given of the rich heritage that exists in connection with the various products being produced in this ecological context.

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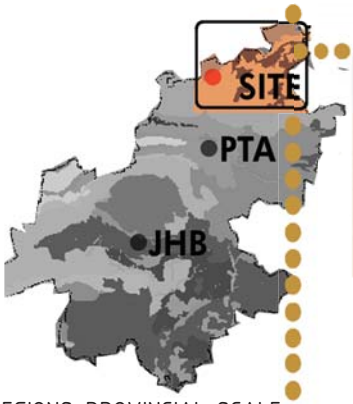
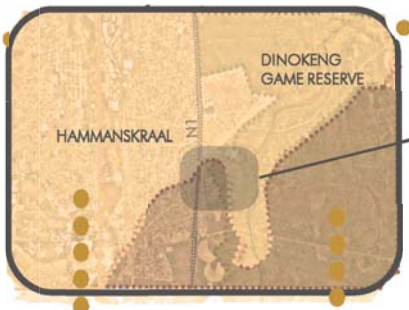
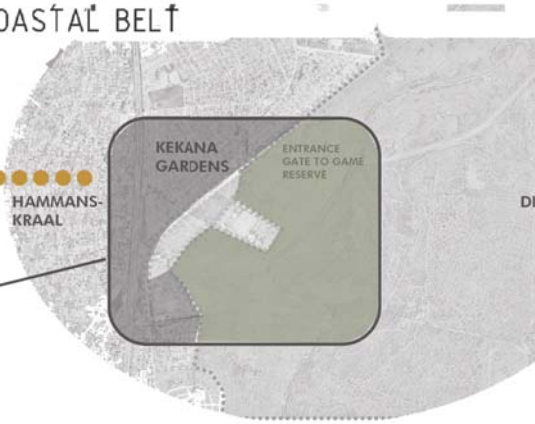
BIOMES LEGEND:

- SAVANNA
- ALBANY THICKET
- DESERTS
- NAMA KAROO
- FORESTS
- SUCCULENT KAROO
- FYNBOS
- GRASSLAND
- INDIAN OCEAN COASTAL BELT

Fig.3.29: BIOMES-PROVINCIAL SCALE (Mucina,L. Rutherford,M.C. 2006)







Springbokvlakte Thornveld

Central Sandy Bushveld

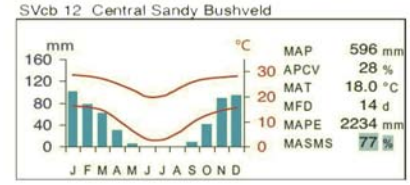
Fig.3.30: BIOREGIONS-PROVINCIAL SCALE (Mucina,L. Rutherford,M.C. 2006)

1.MAIN VEGETATION SPECIES:

- *ACACIA BURKEI(dominant)*
- *ACACIA ROBUSTA*
- *SCLEROCARYA BIRREA SUBSP. CAFFRA (marula)*
- *COMBRETUM APICULATUM(dominant)*
- *CELTIS AFRICANA*
- *COMBRETUM ZEYHERI(dominant)*
- *ENGLEROPHYTUM MAGALISMONTANUM (stamvrug/transvaal milkplum)*

FOR HUMAN USE:
- TREE SAP(*BOOMGOM*) USED TO MAKE CANDY AND ADHESIVES
- DILUTED SAP USED FOR MOUTH WASH PRODUCT

FOR HUMAN USE:
- WOOD EASILY CARVED AND DURABLE-USED FOR MAKING HOUSEHOLD ITEMS SUCH AS SPOONS etc.



FOR HUMAN USE:
- FRUITS USED FOR MAKING A VERY SWEET AND TASTY JAM, JELLY, SYRUP, ROSE WINE AND MAMPOER

Fig.3.31: CENTRAL SANDY BUSHVELD VEGETATION (VENTER, F.,VENTER,J. 1998/2002:98,146)

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List of dominant tree and shrub species present with indication of the edible plants shown in colour:

1. *Acacia burkei*
2. *Acacia robusta*
3. *Sclerocarya birrea subsp. caffra- (marula)*
4. *Burkea Africana*
5. *Combretum Apiculatum*
6. *Combretum Zeyheri*
7. *Terminalia Sericea*
8. *Ochna Pulchra*
9. *Peltophorum africanum*
10. *Rhus leptodictya*
11. *Combretum hereroense*
12. *Grewia bicolor*
13. *Grewia monticola*
14. *Strychnos pungens*
15. *Agathisantherum bojeri*
16. *Indigofera filipes*
17. *Felicia fascicularis*
18. *Gnidia sericocephala*
19. *Acacia Karoo*
20. *Acacia luederitzii var retinens*
21. *Acacia mellifera subsp. detinens*
22. *Acacia nicolita*
23. *Ziziphus mucronata*

(Venter, F.,VENTER,J. 1998/2002)

(Fox, F.W., Norwood Young, M.E. 1982:352)

(Fox, F.W., Norwood Young, M.E. 1982:355)

(Fox, F.W., Norwood Young, M.E. 1982:201)

(Fox, F.W., Norwood Young, M.E. 1982:352)

(Fox, F.W., Norwood Young, M.E. 1982)

(Fox, F.W., Norwood Young, M.E. 1982:157)

(Fox, F.W., Norwood Young, M.E. 1982:279)

(Fox, F.W., Norwood Young, M.E. 1982:315)

(Fox, F.W., Norwood Young, M.E. 1982:80)

Fig.3.32:
Author's sketches of indigenous plants based on sketches from *Food from the veld: Edible Wild plants of Southern Africa* (Fox, F.W., Norwood Young, M.E. 1982)

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1.VEGETATION & LANDSCAPE FEATURES:
OPEN, LOW THORN SAVANNA DOMINATED BY ACACIA SPECIES OR SHRUBBY GRASSLAND.

2.CLIMATE:
SUMMER RAINFALL WITH VERY DRY WINTERS. *AVERAGE RAINFALL:* 500-650mm
FROST FAIRLY INFREQUENT IN WINTER.
AVERAGE TEMPERATURES:
MAX 35.2°, MIN -2.0°

3.MAIN VEGETATION SPECIES:

- *ACACIA KARROO (dominant)*
- *ACACIA LUEDERITZII VAR. RETINENS (dominant)*
- *ACACIA MELLIFERA SUBSP. DETINENS (dominant)*
- *ACACIA NILOTICA (dominant)*
- *ZIZIPHUS MUCRONATA (dominant)*
- *ACACIA TORTILIS SUBSP. HETERACANTHA*
- *BOSCIA FOETIDA SUBSP. REHMANNIANA*
- *EUCLEA UNDULATA (dominant)*
- *RHUS ENGLERI (dominant)*
- *DICHROSTACHYS CINEREA*
- *DIOSPYROS LYCIOIDES SUBSP. LYCIOIDES*
- *GREWIA FLAVA*
- *TARCHONANTHUS PLICATUM*

FOR HUMAN USE:
- TREE SAP(*BOOMGOM*) USED TO MAKE CANDY AND ADHESIVES
- DILUTED SAP USED FOR MOUTH WASH PRODUCT

FOR HUMAN USE:
- FRUIT EDABLE
- SEEDS GRINDED TO FINE COFFEE POWDER
- LEAVES EATEN AS SPINACH REPLACEMENT

FOR HUMAN USE:
- MAKING OF BEER AND MAMPOER FROM FRUIT
- DRIED FRUIT CAN BE GRINDED TO MAKE *PAP*(MEAL)

SPRINGBOKVLAKTE THORNVELD

Fig.3.33:
Springbokvlakte thornveld vegetation ·
(VENTER, F.,VENTER,J. 1998/2002)

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3_4 THE CULTURAL CONTEXT:

"Bits of songs and broken drums are all he could recall,
so he spoke to me in a bastard tongue
carried on the silence of the guns.
It's been a long, long time since they first came
and marched through our village-
they taught us to forget our past
and live the future in their image.
They said: 'You should learn to speak a little bit of English.
-Don't be scared of a suit and tie.
-Learn to walk in the dreams of the foreigner'
- I am a third world child.

The outworld's dreams are the currency
that grips the city streets.
I live them out but I have my own
hidden somewhere deep inside of me.
In between my father's fields
and the citadels of the rule,
lies a no-man's land which I must cross
to find my stolen jewel.."
(Extract from 'Third World Child'-Johnny Clegg, Savuka)

3_4_1 THE HISTORICAL CONTEXT OF TSWANA ARCHITECTURE

Southern Africa has an intriguing history with regards to a diversity of peoples throughout the region. It is rich in accounts of aboriginal cultures and tribes such as the nomadic Khoi and San who lived off the land in hunter-gatherer lifestyles that tied directly into, and formed part of, the surrounding ecology. Later on these ancient cultures were replaced by Bantu-speaking peoples from the north, and the area where Dinokeng is situated today came to be dominated by the Tswana. Even though these cultures made use of small scale agricultural practices and livestock farming, they still maintained an existence in relative symbioses with the natural environment. It was only with the arrival of colonist/settlers from Europe that the ominous signs of a dramatic break from ecological wisdom started to become apparent. Subsistence farming was replaced by commercial agriculture, traditional knowledge on plants became defenceless against western science and vernacular identity was made to be perceived as a pagan-or inferior to- the Eurocentric-worldview. It was at this stage where the threshold from ecological intelligence was breached into a realm of unsustainability and egocentricity. This rift between man and nature led to the origination of spatial planning, political-economic policies and even conservation strategies that led to issues such as urban encroachment and biodiversity loss as experienced today.

Fig.3.33: Traditional Tswana village
(online source:http://aatpm.com/MUSC%2520308%2520Music%2520of%2520Sou

Fig.3.34: Traditional Tswana homestead
(online source: http://www.thuto.org/ubh/afhist/elnegro/)tsw19c2.jpg&imgrefur

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thern%2520Africa/

Fig.3.35: Present day Hammanskraal houses(Author 2013)

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The following section refers to an article on vernacular Tshwana settlements as a glimpse into the mentioned past, which might act as possible key towards more ecologically minded and contextually appropriate urban frameworks to be followed:

"Contemporary authors on African urbanism regularly repeat reports by early European travellers of large Tswana settlements with populations of approximately 20,000, apparently the same size as Cape Town at that time. These settlements, called agro-towns, unlike Mapungubwe and Great Zimbabwe, are mostly described in academic publications, while very few architects know what they really looked like. This article applies quantitative analysis to the plans of the ruins of certain distinctive Tswana stone-walled homesteads and villages by exploring the physical attributes such as size, shape, geometries, spatial patterns and land-use intensities. Sizes are subsequently compared with those of pertinent frontier towns of that period, as well as those of Great Zimbabwe, which are widely recognised and undisputed as urban entities.."

In the concluding paragraph Steyn states that: *"Even a superficial scrutiny of Molokwane (precedent Tshwana settlement) confirm that Tswana spatial patterns were codified and responded to immutable farming and social practices, as well as ways of inhabiting territory on all scales that dictated geometry, spatial relationships and distribution of functions and families. In other words: There was an economic, social and ecological logic applied to the patterns. Not only are the hierarchy of spaces from public to semi-public to semi-private and private areas and the system of paths that connect them apparently particularly enduring, but also, the relative locality of elements, whether an entrance gateway, a cattle kraal, the chief's hut, the kgotla, the ceremonial courtyard, individual dwellings or the women's cooking areas. The hierarchy of space regulates not only movement, but also the relationship between the constituent components in the settlement."* (Steyn,G. 2011)

Even though the proposed architectural intervention of this scheme differs greatly from a typical Tshwana settlement in the fact that it is not archetypally an urban or social housing-related project, a lot can be learned from its sensible approach towards spatial hierarchy, movement circulation and mentioned relationship between components within a complex as well as its economic, social and ecological logic on all levels of scale.

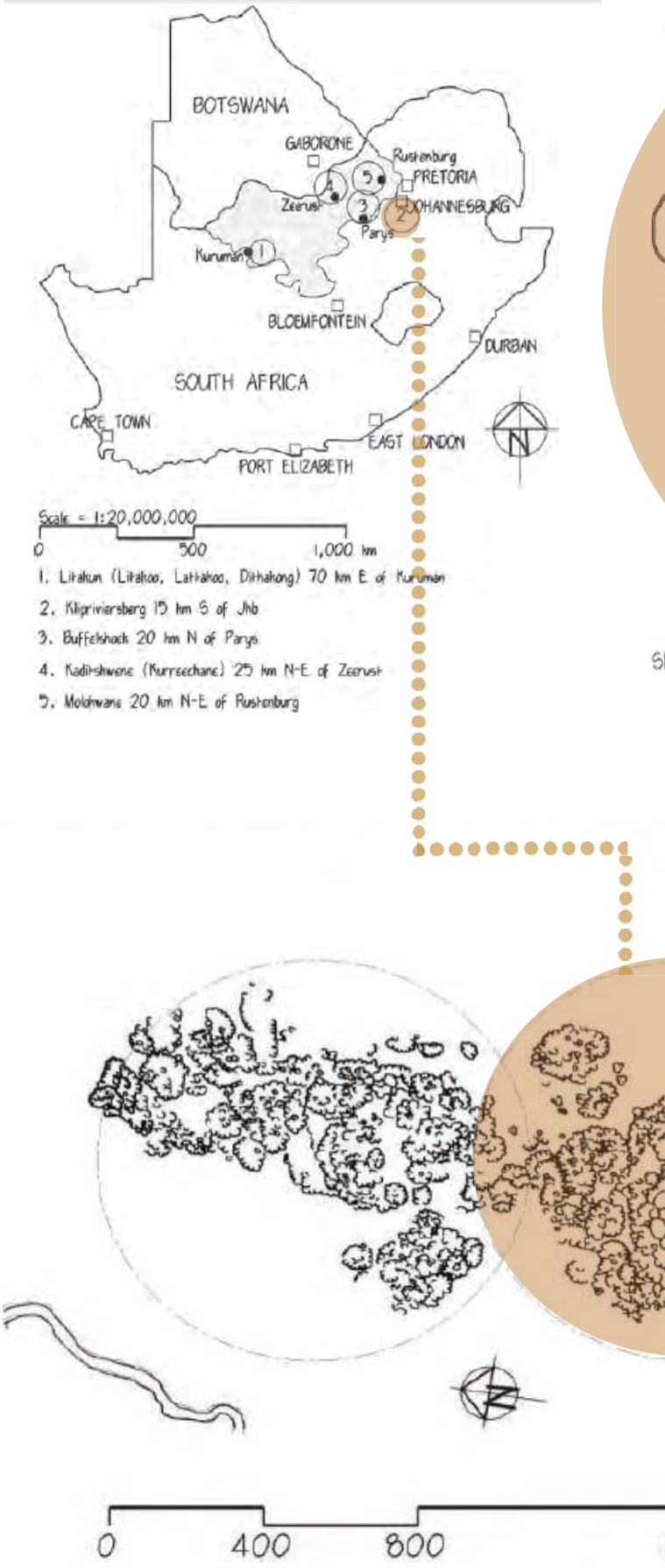

Fig.3.37: Molokwane as example of traditional Tswana settlement as entity of urban significance
(plan derived by Steyn,G. from Pistorius 1992:5)

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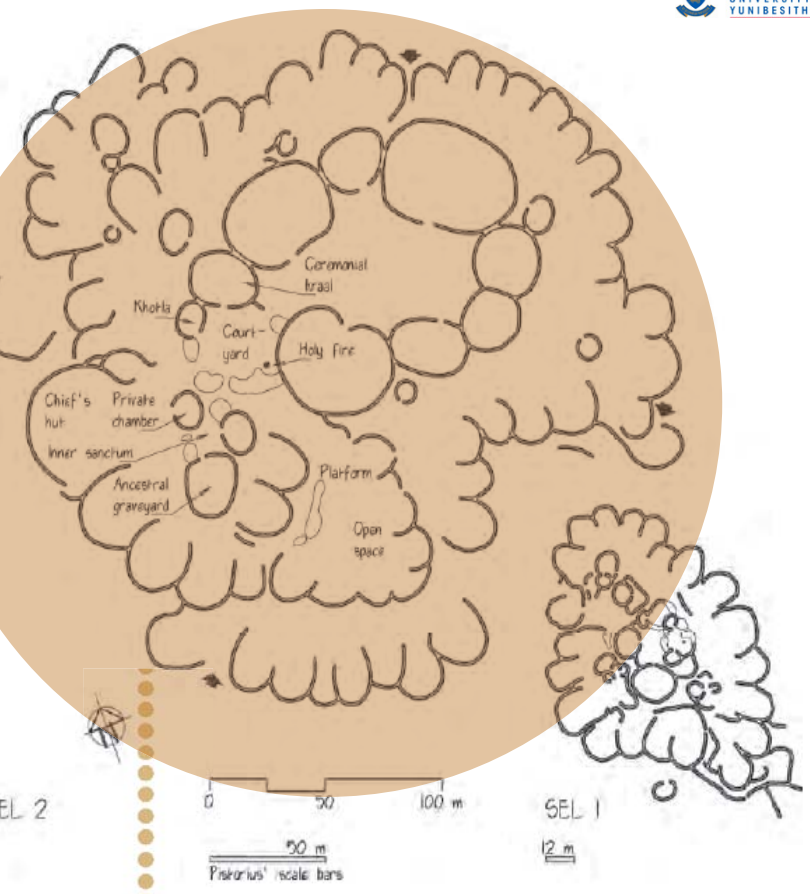

Fig.3.36: Molokwane as example of traditional Tswana settlement as entity of urban significance
(drawing of SEL 2 by Philip Lourens for Gerald Steyn after Pistorius 1996:146)

3_4_1_2 SPATIAL CONCEPTS

Even though both the following two concepts refers to the domestic or residential typology, it emphasizes the significance of threshold establishment and 'hierarchical differentiation' within traditional Tswana spatial order and can be incorporated accordingly into a public building in an appropriate relation to its given functions.

a:The Concept of Front and Back: *"Once the built environment breaks up into individual homesteads which tend to follow a linear pattern along contour lines, a trend in Tswana settlement which has accelerated in more recent times, then it will be seen that the traditional centre-perimeter apposition will become translated into one based upon the concept of front and back. In the context of the individual traditional Tswana household, the opposition has always been one between "front" and "back" where the dwelling of the parents is located in the fore court or lobe of the homestead whilst the areas of privacy, of cooking and of children's residence have been located to the rear."*

b:The Concept of Left and right: *"This is based upon the hierarchical relationship perceived to exist between the "first" and subsequent wives of a polygamous marriage. The interpretation of which hand is assumed to be ascendant varies from group to group and is the subject of numerous historical anecdotes or myths. Generally speaking it may be said that those groups who hold "right" to be superior to "left" explain this by means of a metaphor which reflects an old rural belief that a warrior wields his spear with his right hand and his shield with his left. The right is therefore assumed to have an ascendance over the left being "active" and "aggressive" whilst the left is "passive" and "defensive". The Tswana are known to have built their settlement in a roughly circular shape with a large space, being the men's area and cattle byre, located at its centre. …. Today, although it has been found that the circular fan pattern has fallen largely into disuse and individual homesteads tend to follow a linear form along the lines of land contour, the same considerations of left and right have prevailed and are still being maintained by succeeding generations."* view-source:http://www.francof-rescura.co.za/indiginous-tswana-architecture.html:

The reason for mentioning these intricacies of the vernacular Tswana built-environment is to shed some light on how such spatial arrangements can inform contemporary reinterpretations of architecture practised in the same geographical milieu, even though pertaining to different building typologies. The relevance of these traditional applications will be shown in the chapter dealing with design development.

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PREFACE
1 INTRODUCTION
2 THEME
3 THE CONTEXT
4 ARCHITECTURE AND ECOLOGY

[DESIGN TYPOLOGIES IN THE REALM OF ECOTOURISM]

This chapter will look at the type of achitecture that is implemented in ecologically significant and underdeveloped areas and see how and why it has evolved over time. It will also explore how this can suggest a possible path towards finding an appropriate type of architecture for the peripheries of such areas in relation to human communities and with regards to programs beyond accommodation design.

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Fig.4.1:
Early days of utilising tents as shelter during bush vacations and safaris
(online source:http://blog.africageographic.com/safari-blog/files/2013/03/LETABA-TENTS-ERECTED-DURING-WINTER-%25E2%2580%2593-JULY-1954-%25C2%25A9-SANparks-archives.jpg&imgrefurl)

Fig.4.2: (Fraser,C. Alexander,R. 2007:96)

Fig.4.3: (online source: http://cdn-imglib-01.go2africa.com/img/20120622_0743_4_1.jpg&imgrefurl)

Fig.4.2&4.3: Contemporary interpretations of the tent-based structure in the eco-tourism typology

4_1 THE EVOLUTION OF ECO-TOURISM ARCHITECTURE

The history of consciously 'dwelling in ecology' or which can otherwise be described as wilderness experienced-architecture stretches back before the introduction of the term 'ecotourism' and its related mindset towards ecology took hold. In Southern Africa the period of the pioneer explorers and pilgrim prospectors in search for mineral wealth in the lowveld in the late nineteenth century, can arguably be recognised as the starting point. This was the earliest time when people were consciously aware of being outsiders coming from a human environment into an ecologically dominated or 'wilderness' environment. Up until the time and even after the Kruger National Park was established people were also dwelling in this landscape as outsiders but with a different purpose. Yet this purpose was still not one of ecology-based tourism or 'ecotourism' but rather a one with a colonial attitude of taming wild nature and in the process exploiting its resources, even if ignorantly so.

The architecture that followed naturally served the various basic functions related to these practices.

To continue with Kruger as an example, the early rest-camps established were spatially laid out in patterns with the same Colonial mind-set and point of reference. Pieces of land were identified and chosen based on factors which had less to do with ecological sense of place or considerations for developmental impacts but rather with practicality such as ease of access. These portions of land were then fenced off, stripped considerably of wild vegetation and replanted again by human hands in ordered composition of choice. Layouts of accommodation units and their physical appearance often ironically and somewhat derogatorily reflected and referred to the circularly grouped, thatched rondawels as seen in traditional villages respectively. The motivation for this was therefore to achieve or produce order from and within the chaotic wilderness.

Since then a lot has changed and the objective of designs in this setting have shifted quite dramatically. When lodges are laid out these days the focus is placed on keeping fences down where possible, removing as little vegetation as possible and creating architectural space and form that attempts to blend into its natural landscape. The size in footprint in these lodges is usually also limited in size these days.

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The focus here is adversely to celebrate the genius loci and let the spirit of place be the main design informant. It is a shift from form which followed colonial function towards form inspired by and following an ecological context. It is a shift from creating new and object-related spaces towards celebrating an existing primordial place through architectural space. Regardless of the previous or contemporary departure points, all of the above are driven by mind-sets associated with surrounding ecology.

The evolution of the ecotourism typology can therefore be seen in direct relation to a shift in man's perception of wild places and he's place in it.

Fig.4.4: The early years of infrastructure establishment in Kruger National Park's ol
(online source: http://www.wildcard.co.za/userdocs/image/aoldkruger/image%25206%2

Fig.4.6: Singita Lebombo Lodge, Kruger National Park as example of contemporary ecotourism typology

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dest rest camp-Pretoriuskop
520(6).jpg&imgrefurl)

Fig.4.5: Existing Rondawels in Pretoriuskop rest camp from the bygone colonial era exhibiting visual references towards traditional/vernacular architecture (online source:http://www.safarinow.com/db/id/227176/g122866.jpg&imgrefurl)

4__2 SUPPOSITION:

While it is widely acknowledged that practices such as densification and adaptive reuse is the sustainable way in which to deal with developed urban environments, yet relatively little attention is given to assess an appropriate architectural response in humanised areas on the periphery of protected wilderness areas.

Parallel to this, the design sub-culture within ecotourism, which largely operates in the same context, has evolved a unique typology and has even been branded in a recent publication as 'the new safari' style. This movement has managed, in many instances, to integrate relatively well, and with minimum impact, with its surrounding ecology. Unfortunately this design idiom is largely limited to exclusive tourist lodges completely isolated from adjoining communities. Of course it should correspondingly be recognized that the function of eco-tourism accommodation is precisely meant to do just that-to provide sanctuary and refuge from bustling society.

The challenge therefore is to extend this ecology-based-architecture into human environments alongside wilderness areas, towards an ultimate model of integrating these settlements holistically with the natural heritage it feeds from. Because of the specific context, such designs would have to be environmentally driven yet within human frameworks of departure.
Of course one should realise that there's a distinct difference between accommodation units nestling privately into the middle of an ecological setting on a small scale to a public building sitting on the edge of an ecological setting and operating at a larger contextual scale. It is however the approach of celebrating the natural context as design idiom where the attention ought to begin and end.

And that is the poetic nature of eco-tourism building the author find most inspiring-architecture as space created to frame or emphasize an already existing place instead of architecture creating place anew. This concept and intent ties in with the theory of ecological phenomenology as discussed in the following chapter.

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Now-if one were to extend this design philosophy to the given context: In a striking natural landscape with well-defined topographical differentiation or densely vegetated biota the appropriate way for bringing architecture to such an environment would be to simply allow the building to blend into the landscape and only define the features already existing. But, in this case where the given site is mostly flat and without any substantial features to draw from the approach will be done differently. Here the methodology would be to use the building as defining interface and threshold between the ecologically substantiated environment to the back of it and the urban/human environment at its front or entrance. The philosophy of emphasizing the ecological setting as done in ecotourism design is still carried through yet in a way of using the building more as a viewing box and connection towards that ecologically significant environment. This extends even further the phenomenological approach as will be explained in the chapter to follow.

However-to take it even a step further-rather than designing for an existing context the purpose in this case should be to design for a future context with a site exhibiting a healthier ecological reality than is currently the case. This can be envisioned by allowing the site to be transformed by the ecological encroachment catalysed through the intervention on site.

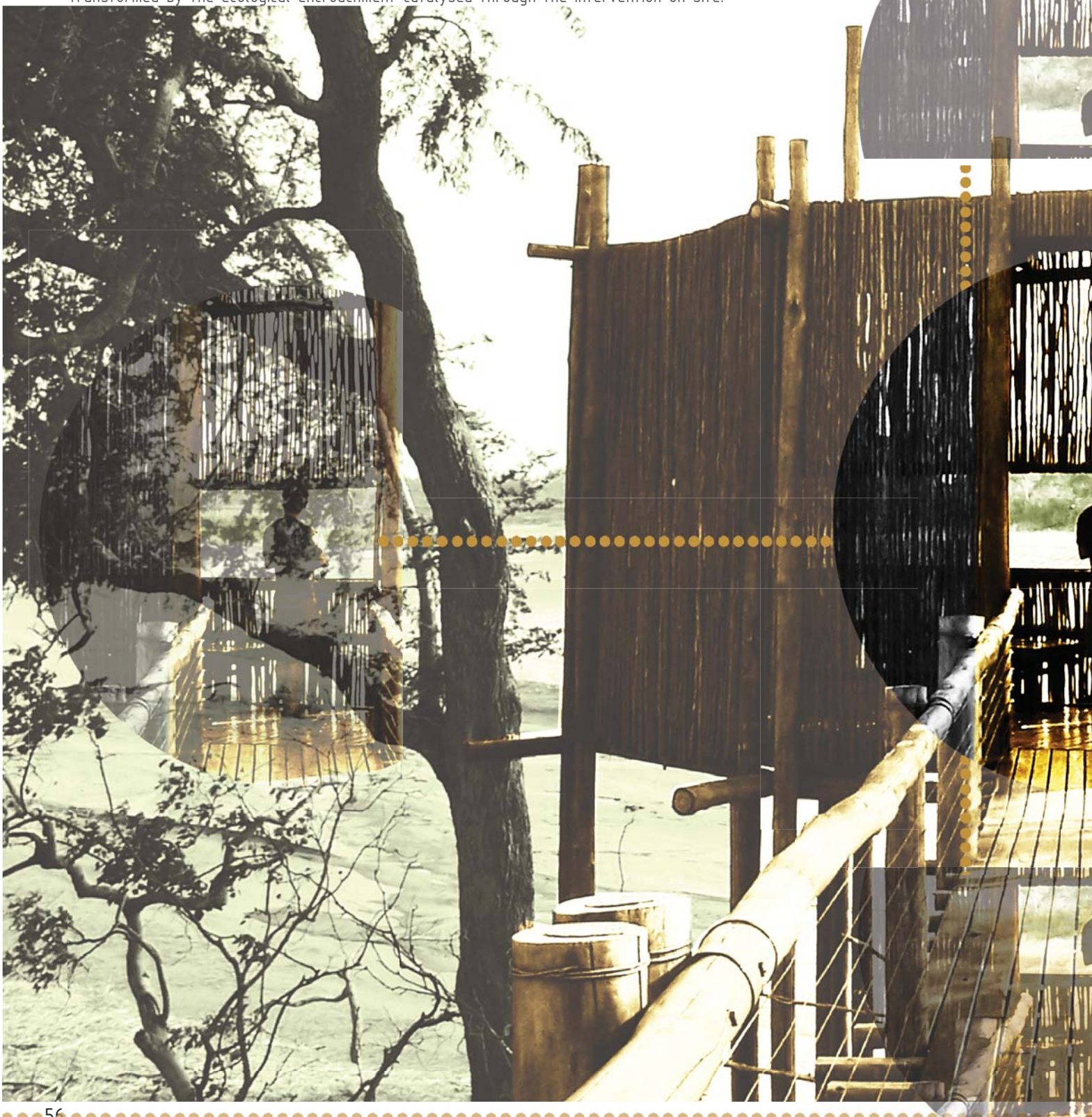

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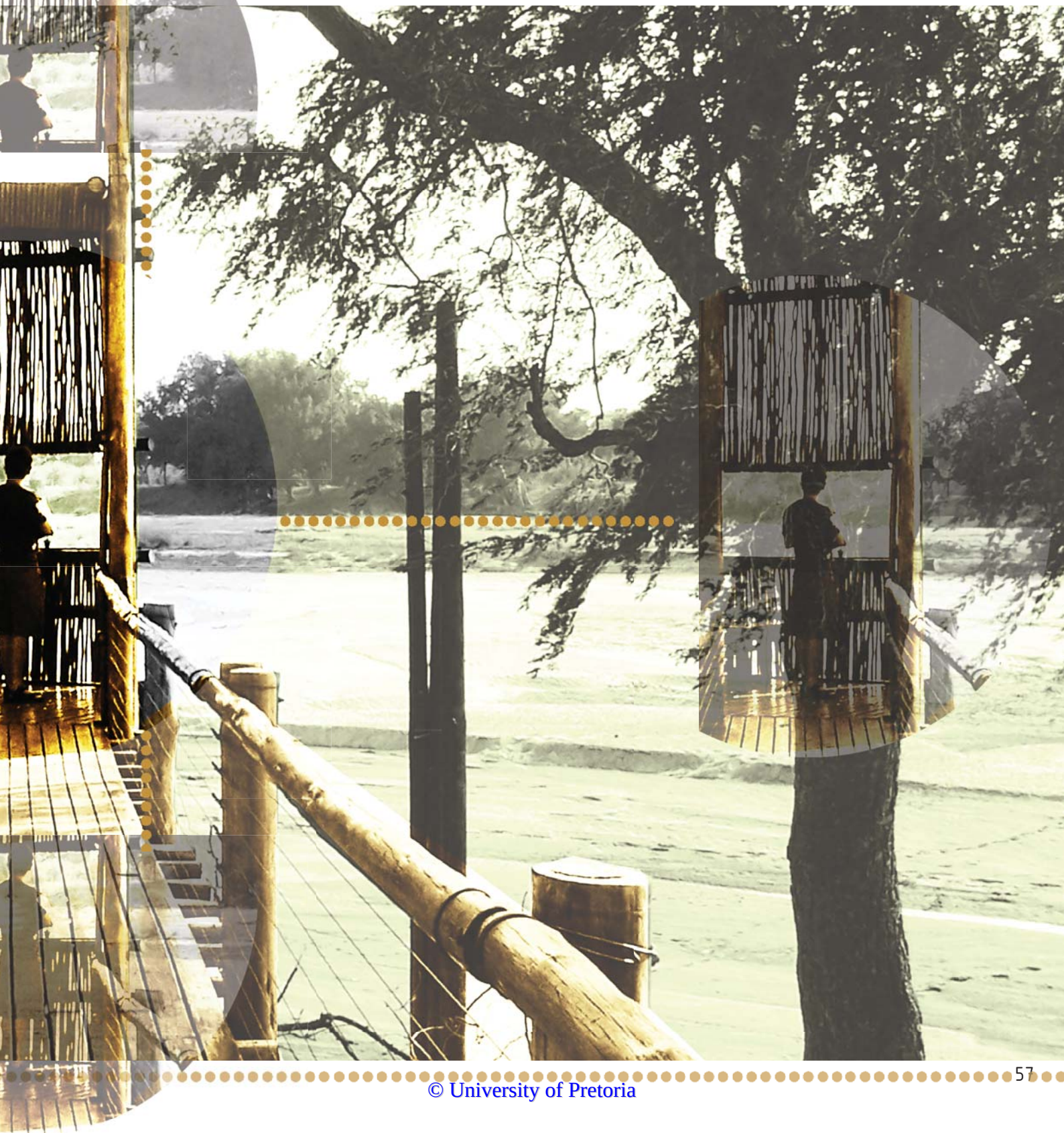
Fig.4.7: Outlook over the Limpopo River, framing the view out onto the ecological setting-Mapungubwe National Park (Author, 2013)



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5 THEORETICAL DIALOGUE

5 THEORETICAL DIALOGUE

In this chapter an indication is given of the theory behind the design, being steered by the identified environmental issue as prime driver.

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When God said to Adam: "You shall be a fugitive and wanderer on the Earth"; he put man in front of his most basic problem; to cross the threshold and regain the lost place. (Christian Norberg-Schultz)

While a multitude of material can be drawn upon that has bearing on the topic of the relationship between man and nature, and which in itself can fill this document, the author decided to limit the exploration thereof to a number of theoretical ideas showing close relevance to the topic at hand and the intent of the design to follow.

5_1 THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS:

It's a notion possibly first expressed in documented history by Aristotle and which has bearing on disciplines transcending the architectural realm. In any holistic approach this idea would be common knowledge and will not be seen as a foreign concept. In this instance it particularly rings true when considering that the intended intervention will, as a probable public building with a multi-disciplinary nature, conceivably consist of separate components that will concurrently have a collective role and intent. The separate components can therefore not function independently nor will the building cluster have the same impact with one of these components missing.

Fig.5.1: Aristotle
(online source: http://gakuran.com/eng/wp-content/uploads/2008/05/aristotle-200x240.jpg&imgrefurl)

Fig.5.2: Ingrid Stevanovich
(online source:http://www.philosophy.utoronto.ca/wp-content/uploads/2012/12/IngridStefanovic.jpeg&imgrefur)

5_2 ECOLOGICAL PHENOMENOLOGY

The author believes that the relevance of phenomenology on this study lies in the fact that it allows or encourages a new way of looking at nature or ecology and humanity's place in, and/or relationship with it. It's unique way of approaching the environmental dilemma, which has become the source for the popular environmental movement at present, is quit refreshing:"*...[we] must approach nature anew, undertaking no less than a phenomenology of nature as the counterpart of our moral humanity" (Kohak,E. 1984)*
An appealing aspect of this theoretical methodology is the reduction of entities and concepts to their essential meaning. This unorthodox notion on man's dwelling in the landscape naturally has great potential for application in architectural experimentation. An example of a well-elaborated depiction on ecological phenomenology is the academic paper by Amy Lavender Harris which includes Ingrid Leman Stefanovic's methodological account of phenomenological enquiry. The following is an excerpt from that paper: *"..a phenomenological approach represents more than an alternative: it is a required response to the western preoccupation with technology, to reductively quantitative accounts of nature, and to utility-based valuations of the natural world. "* (Stefanovich, I.L.)

Fig.5.3:Kohak
(online source:https://www.google.co.za/search?sa=G&q=erazim+kohák&tbm)

Fig.5.4:Christian Norberg Schultz
(online source: https://www.google.co.za/search?sa=G&q=christian+norberg+schulz+genius+loci&tbm)

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Of the significant, yet early and somewhat differing, works done in this school of thought is Martin Heidegger's ontological phenomenology: "...rooted in the question of the meaning of Being: Heidegger's path into phenomenological enquiry is: "to let that which shows itself be seen from itself in the very way in which it shows itself" (Stefanovic, 2000: 9-10; from Heidegger, 1962: 58).

She continues to state:

"Phenomenology aims to supplement conventional approaches to the study of the relation between human understanding and the lived world, with a more holistic and comprehensive description of taken-for-granted foundations of such relation." (1994: 71) or "shedding light on the taken-for-granted, pre-predictive origins upon which explicit theoretical reflection and scientific understanding are grounded" (2000: 10). One of [phenomenology's] primary tasks is to articulate essential meanings as they appear to human understanding... to discern underlying patterns of meaning that may not be self-evident but that permeate our efforts to interpret the world in which we find ourselves [, and] ... to crystallize some essential truths in their historical and cultural rootedness." (11)

She quotes Thomas Nenon by describing phenomenology being about *"the possibility of certain kinds of experiences which any reader should be able to recreate imaginatively on his or her own and thereby see that the possibility for such an experience is universal, even if the reality is not.."*

If this is drawn through to architectural space making one can see how space can be employed to create experiences able in influencing the onlooker's thoughts and mind-set surrounding ecological knowledge and issues.-*"[Phenomenology] exhibits possibilities that any human being could undergo" (11).*

In other words-phenomenology has the ability to speak to anyone by simplifying complicated concepts or intricate knowledge and facts by translating it for instance into built form or spatial and/or light manipulation.

The article suggests that Stefanovic proposes "'originative' thinking (after Heidegger's notion of meditative thinking)" It goes on to explain that: "Originative thinking is creative and open; its call to holism (a notion that the whole, a referential whole, not a totalizing paradigm - is greater than the sum of its parts) is not intended to be thought of as emotional or "wildly intuitive", but rather to evoke an awareness of meaningful connections and interrelationships between and among humans and their environments" (51-52; 56).

Fig.5.5: Martin Heidegger
(online source: http://www.philosophybasics.com/photos/heidegger.jpg&imgrefur)

Fig.5.6: Peter Zumpthor
(online source:http://static.dezeen.com/uploads/2009/04/peter_zumthor.jpg&imgrefurl)

Fig.5.7: Steven Holl
(online source:http://hamsunsenteret.no/images/stories/author/page/Innhold_steven-holl_hamsunsenteret.jpg&imgrefurl)

Fig.5.8: Herman Hertzberger
(online source: https://www.google.co.za/search?tbm=isch&sa=1&q=herman+hertzberger&oq=herman+hertzberger&gs_l)

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"In (ecological) phenomenology, the 'phenomena' available for enquiry include not only 'real'/material entities, but also 'ideal' phenomena, including images, percepts, moods, arithmetical phenomena" (Ihde, 1977: 23), and in particular, the relations among these types of phenomena within structures of intentionality."

In this article it is also stressed that while phenomenology has the ability to create an appreciation for spiritual experience or the atmosphere of place and thus having philosophical significance, it is important to remain grounded in tangible or concrete experiences of the user (the person experiencing the space) and his/her relation to the message conveyed through the space.

In other words if ecological phenomenology is utilised as theoretical informant in architectural design it should: *"exemplify or illuminate the experience of being in the world and the understanding or valuing of nature."*

"...It is as though a lens might be focused and refocused on objects in a room, exposing to light not only various aspects of their existence and their relatedness to one another, but illuminating our own primordial Being amid them."

...Turning to ecological questions in particular, phenomenology offers both theoretical and practical possibilities. Phenomenology, for example, is useful in exposing and contributing to the "rethinking of hidden assumptions" and the foundations of human attitudes themselves (Stefanovic, 2000: 13; 15). By doing so, phenomenological insights may contribute to better decisions on environmental matters, ranging from policies and laws to the design of the environments we dwell and work in. Stefanovic suggests also that phenomenological perspectives may provide a middle way between anthropocentric and ecocentric viewpoints, in which the world is perceived as something to be neither controlled nor revered (43)..."

"Beyond this still, phenomenology may help us regain a sense of the "grace of nature", in which we emerge from and return to a "self-emerging" natural world (76)." (http://ivorytunnel.blogspot.com/2004/05/what-is-ecological-phenomenology.html 20130318)

In the respect of this scheme it has potential to be employed in the architectural intervention stretching between the Hammanskraal settlement and Dinokeng Nature Reserve and the emphasis that might be placed on the inner struggle between the opposing forces protruding from both where the human environment wants to control the ecological environment and the ecological environment in turn wants to be revered due to its conserved nature.

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To broaden the understanding of phenomenology and its relevance on architecture the following except is taken from Christian Norberg Schultz's book Genius Loci: Towards a phenomenology of Architecture:

"The basic property of man-made places is concentration and enclosure. They are "insides" in a full sense, which means that they gather what is known. To fulfil this function they have openings which relate to the outside... Finally the man-made environments comprise artefacts of "things", which may serve as internal foci, and emphasize the gathering function of the settlement...Manmade places are related to nature in three basic ways. Firstly, man wants to make the natural structure more precise. That is, he wants to visualize his understanding of nature, "expressing" the existential foothold he has gained. To achieve this, he builds what he sees. Where nature suggests a delimited space he builds an enclosure and where nature indicates a direction he makes a path. Secondly, man has to 'complement' given situation, by adding what it is 'lacking'. Finally, he has to 'symbolise' his understanding of nature, including himself. It implies that an experienced meaning is translated into a building whose properties somewhat make the character manifests... Architecture belongs to poetry, and its purpose is to help man dwell. But architecture is a difficult art. To make practical buildings and towns is not enough. Architecture comes into being when a "total environment is made visible", to quote the definition of Susanne Langer. In general, this means to concretize the genius loci. We have seen that this is done by means of buildings which gather the properties of the place and bring them close to man. The basic art of architecture is therefore to understand the 'vocation' of the place. In this way we protect the earth and become ourselves part of the comprehensive totality. What is here advocated is not some kind of environmental determinism. We only recognize the fact that man is an integral part of the environment, and that it can only lead to human alienation and environmental disruption if he forgets that. To belong to a place means to have an existential foothold, in a concrete everyday sense. When God said to Adam: "You shall be a fugitive and wanderer on the Earth"; he put man in front of his most basic problem; to cross the threshold and regain the lost place. (Norberg-Schultz 1980)

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Fig.5.9: Shedding of light onto the ecological environment from out of the human environment's perspective.

(David Seamon. 2006. Interconnections, Relationships, and Environmental Wholes: A Phenomenological Ecology of Natural and Built Worlds, in Melissa Geib (ed.), To Renew the Face of the Earth: Phenomenology and Ecology (pp. 53-86). Pittsburgh: Simon Silverman Phenomenology Center.)

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5_3 DEEP ECOLOGY , CONSERVATION AND PRESERVATION

As per the previous notion these schools of thought deal with naturalistic worldviews and are ecologically inclined. The word conservation therefore doesn't refer to architectural conservation but to nature conservation as a foundation for asking the question of what role architecture can play in it. As mentioned earlier there exists a divide in environmental circles around what should be the way in which nature conservation ought to be approached and whether ecologically significant places should be left alone as part of its preservation outcome or should it be incorporated into the surrounding human fabric around order to ensure its maintainable existence.
Preservationists say that wild ecology should be left alone at all costs in order to preserve its integrity. It is therefore a moral obligation for humanity to foster a respect and hands-off approach towards it.

In contrast the conservationist view says that since human beings are essentially part of nature, ecological resources are there to be used as long as it's done in a responsible way and that it is intrinsically part of our nature to utilise ecological services for our survival.
Deep ecology believe that the world does not exist as a resource to be freely exploited by humans and should be respected regardless of its 'usefulness' to human needs. It is seen by some as a radical branch of the environmental movement which regards humanity as an uncontrolled infestation upon the earth.
Author's stance: Perhaps there's a midway that can be established between these polar approaches towards ecology.-One where the ecological significant environment receives the protection and conservation it warrants while including adjoining communities in its strategic outcomes.-A new threshold to be established within the perceived threshold...
In 'Sustainable design-ecology, architecture and planning' the author Daniel Williams uses ecology as a model to be implemented in the creation of architectural solutions:
"The deeper lesson of ecology is that nature's form is a direct response to capturing the flow of energy and materials that reside within the bioregion. The form itself, made up of biological processes, maximizes the use and storage of energy and materials for its needs and functions within its ecological and energy location. Ecology is the study of the relationship of plants and animals to their environment. The flow of material and energy between things within their environment is their spatial context-their community." (Williams,D.E.2007)

He continues to say that: *"It is the study of that spatial connectivity between organisms and environment that makes ecology an excellent model for sustainable design. Conceptually, sustainable designs expand the role of the design program, moving the design goal from object to community, and then design the connections, illustrating the relationship between available energy and the natural place..."* (Williams,D.E.2007)

Author's stance: Rather implying that the design intervention will become or pretend to be a new ecosystem or an addition to the ecosystem, the author's aim is to merely tap into the existing ecology-taking queues and inspiration and regard it as a design informant and design model.

5_4 The Environmental imperative in general

The following is an excerpt from *Africa:environment and wildlife magazine* on a speech already delivered in 1996 by WWF-SA Chief Executive Dr John Hanks at the Ecoworld International Congress on the issue we find even more pressing today:
"'The challenge facing the continent is to find appropriate forms of development that will break the vicious cycle of poverty, population growth and renewable resource degradation, and reduce the continent's rapidly increasing environmental debt.' Dr Hanks said that *'conservation programmes which stress the economic value of biodiversity will stand a much better chance of being accepted by disadvantaged communities who all-too-often regard conservation as meaning "hands-off, keep out."*
A pragmatic approach of this nature would view environmental and developmental goals as being inextricably linked."
The author agrees with this notion and envisages the architectural intervention suggested in this scheme to be such a conservation-related programme with an architectural intent that can be abridged by the following citation from Peter Zumpthor's book: 'Thinking Architecture':
"Every new work of architecture intervenes in a specific historical situation. It is essential to the quality of the intervention that the new building should embrace qualities which can enter into a meaningful dialogue with the existing situation. For if the intervention is to find its place, it must make us see what already exists in a new light." (Zumpthor,P. 1998)

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Fig.5.10: Deep Ecology: The rigid and specific viewing of ecological thinking and handling.
(online source: https://www.google.co.za/search?tbm=isch&sa=1&q=deep+ecology&oq=deep+ecology&gs_l)

Fig.5.11: A symbolic representation of the diffirent departure points and their resultant forces present in environmental debate and hints towards the suggestion that only a reconciliatory midway between these diffirent schools of though would lead towards an appropriate and viable management of ecologically significant places. (Author, 2013)

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PREFACE
1__INTRODUCTION
2__THEME
3__THE CONTEXT
4__ARCHITECTURE AND ECOLOGY
5__THEORETICAL DIALOGUE
6__THE PROGRAM

6__THE PROGRAM

(FROM THEORY TO FUNCTION)

In this chapter the reader is referred back to the research question: What is an appropriate response in terms of an architectural program that would sufficiently deal with the problems associated with the environmental issue?
This research question can also be rephrased by asking: Which architectural programs can utilize, as a focus, local ecological services while being sensitive towards the ecology and which can further respond positively to the social/economic condition in the same region? (i.e. a program in cognisance of the Brundtland Commission's sustainable development model of the three spheres of society, economy and environment.)

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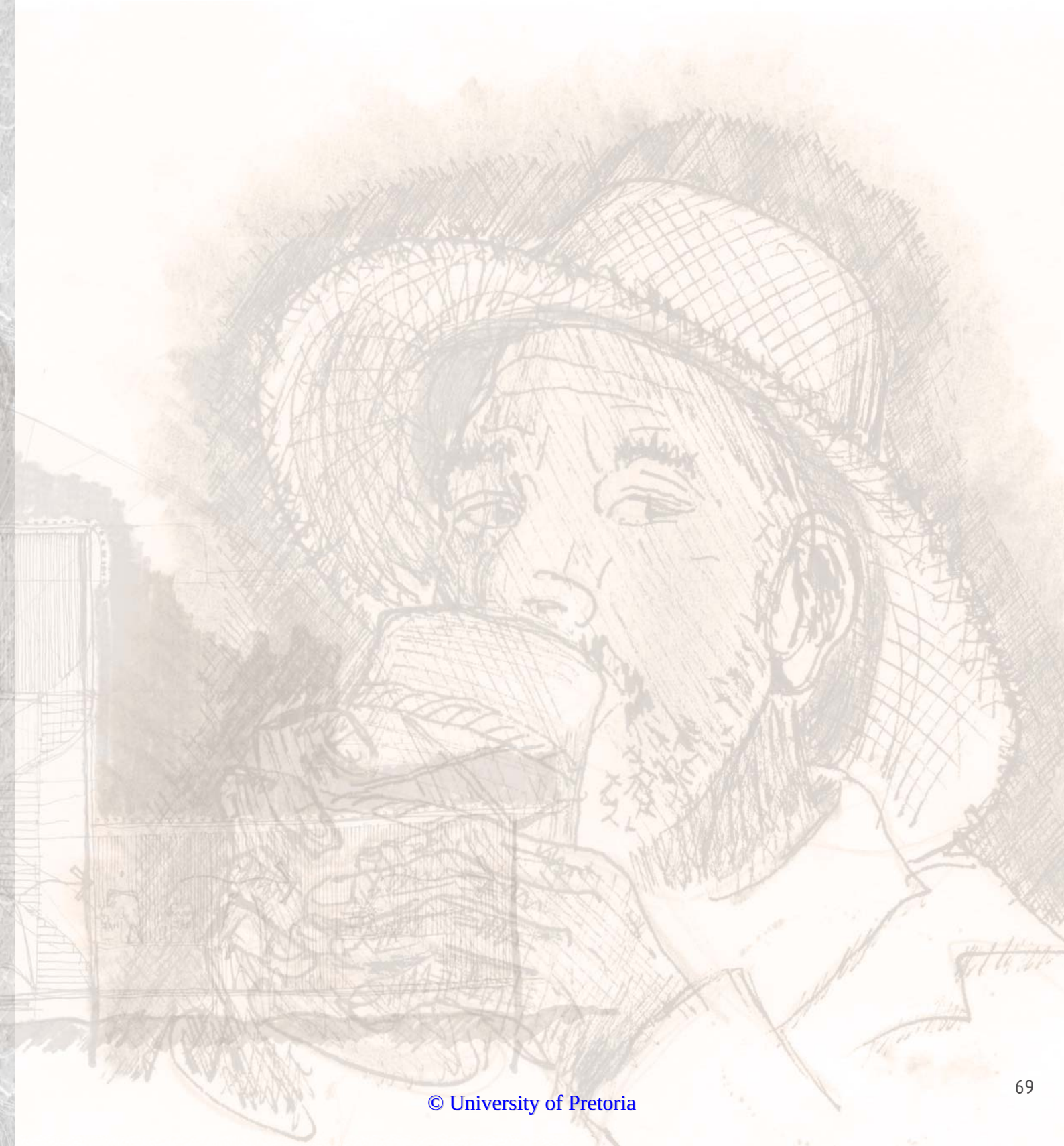

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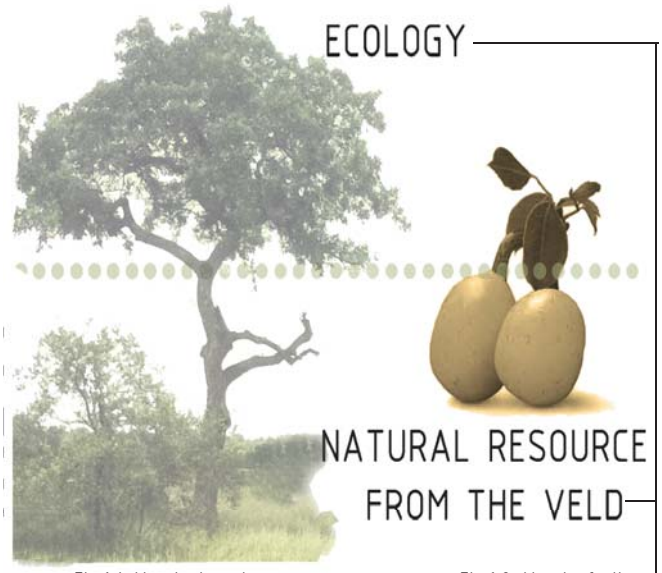
ECOLOGY



NATURAL RESOURCE FROM THE VELD

Fig.6.1: Marula tree in natural condition

Fig.6.2: Marula fruit (online source: www.google.co.za/search?tbm=isch&sa=1&q=marula+fruit&oq=marula&gs_l)

SIGNIFICANCE IN TRADITIONAL/VERNACULAR PRACTICES

Fig.6.3: Women sorting marula fruit before use. (online source: www.google.co.za/search?tbm=isch&oq=people+working+with+marula+fruit+&gs_l)

Fig.6.4: Marula fruit peeled for pulp. (online source: www.blakewoodhams.co.za/images/20110208_amarula_0735.jpg&imgrefurl)

UTILISATION OF NATURAL RESOURCES IN PROCESSED FORM

With an appropriate programme identified the focus can then start to shift towards the actual architecture to be implemented on the interface between the two realms.

6_1 IMMEDIATE AND INDIGENOUS RESOURCES AT DISPOSAL:

As described in *People's Plants: A guide to useful plants of southern Africa:* *"Southern Africa is exceptionally rich in plant diversity with some 30000 species of flowering plants, accounting for almost 10% of the world's trees and shrubs. The region also has great cultural diversity, with many people still using a wide variety of plants in their daily lives for food, water, shelter, fuel, medicine and other necessities of life...In the last few decades however the region has seen great changes in access to modern health care and education, shifts of rural populations to urban areas, changes from subsistence farming to cash-crop production, migrant labour, and unprecedented environmental degradation. These changes in the socio-cultural and environmental landscape have severely eroded the indigenous knowledge base. "*

Out of this citation it is being made apparent that the ecological environment of southern Africa holds great potential within prospective projects of sustainable development. It also alludes to the fact that as a matter of urgency it is highly recommended that the knowledge base associated with it be incorporated, implemented and used as inspiration for such projects. The authors elaborate by stating that: *"The study of the use of local plants, also known as ethno-botany, is still a relatively underdeveloped discipline in southern Africa, and the knowledge of indigenous plant use in the region needs urgent documentation before it is irretrievably lost to future generations, raising the importance of the application and beneficiation of this knowledge as instruments for sustainable development in the region. Innovative mechanisms need to be created to ensure that impoverished rural communities can share directly in the benefits arising from the commercialisation of this profound knowledge base."* (2000: van Wyk B.E, Gericke N.)

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If one were to focus on the flora sector of indigenous ecology as inspiration source or point of departure, there are several different sources with commercial value, some already being employed and others showing potential for commercial utilisation. These sources can roughly be divided into three main components: cereals, nuts and fruits. In People's Plants: A guide to useful plants of southern Africa these various sources and the different forms of products derived from them as well as their various human uses are being elaborated on. Their potential economic importance pertaining to the ecology of the site under investigation is also given.

6_1_1 PRODUCTS FROM THE VELD:

1.Cereals:
"The annual cycle of sowing and harvesting cereals and products derived from cereals has introduced rituals that became an integral part of human existence since ancient times. One of the most ancient forms of cereal use still exists in southern Africa where the seeds of wild grasses harvested and stored by ants are collected and boiled into a nutritious porridge. Cereals belong to the grass family, the 'Poaceeae' or 'Gramineae'. What is usually called the grass grain or grass seed is actually a one-seeded dry fruit (caryopsis)

Sorghum, finger millet and pearl millet are examples of indigenous grains that have remained in common use in southern Africa. ...."

Grains from Grass species found in Dinokeng include: Fingergrass millet (Digitaria eriantha), Kalahari Sand Quick (Schmidtia pappophoroides), Wool Grass (Anthephora pubescens) and various Aristida and Erogrostis species..

"...Apart from their direct use as food, cereal grains are very often converted into malt, which is used mainly to brew beer. ...In rural areas, pearl millet, finger millet and sorghum are now most often grown for beer making, while maize has replaced other cereals as the main staple food. There are however, many traditional dishes in which both the grains and the malt of indigenous cereals are used. ... These crops have been selected for millennia for their vigour, drought resistance and disease-resistance, and have decreased requirements for water, fertilizers and pesticides. Although they generally give lower yields than maize, they provide fundamental food security to remote rural communities in times of drought." (2000: van Wyk B.E, Gericke N.)

2.Seeds and nuts:
"There are some interesting indigenous nuts and seeds that have been used in southern Africa for a very long time...It forms an important part of the human diet and is almost as important as cereal crops...Nuts often have high oil content and are rich in proteins and amino acids...

Fig.6.7: ground up mucronata plant material used as coffee powder (online source: http://www.thebotanicalsource.com/images/Ziziphus%2520mucronata.JPG&imgrefurl)

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Fig.6.5: Fruit on a *Ziziphus Mucronata* Tree (Buffalo thorn) (online source: http://img1.photographersdirect.com/img/12366/wm/)

Fig.6.6: ripe marula fruit on ground (online source: www.google.co.za/search?tbm=isch&sa=1&q=marula+tree&oq=marula+tree&gs_l)

Fig.6.8: Wild raison fruit (online source: http://toptropicals.com/pics/garden/06/5/5438.jpg&imgrefurl)

Fig.6.9: mucronata fruits (http://witbos.co.za/photos/ziziphus-mucronata-8f94c.jpg&imgrefurl)

Fig.6.10: ziziphus fruit (online source: http://www.operationwildflower.org.za/index.php/component/

Fruits & Berries:

p.33: "Rural children in particular snack extensively on a remarkable diversity of wild fruits across the seasons, which provide an important source of vitamins, minerals, amino acids, and trace elements. The contribution that these wild resources make to maintaining health and preventing disease is generally unrecognized, but may well be of survival value among impoverished people subsisting mainly on maize, *and during seasons when other food is scarce. In some cases a single species of fruit is of vital importance for the survival of the local community…Few people realise that there is already a significant trade in wild fruit in South Africa. In Zimbabwe for example wild fruit can be found on most markets.* Some fruits are sold on local markets or by roadside vendors and they are of considerable importance as a source of income for local communities… *There are many southern African fruits with considerable potential as new commercial crops and some progress has already been made towards ennobling the marula.* Marula showed particularly promising results; 12 year old trees flourish despite the desert conditions and saline irrigation water, producing some 500kg of fruit per tree. *In Malawi, a programme is underway to evaluate about 22 different indigenous fruit trees for planting by small-scale farmers. (Maghembe 1994)"* (2000: van Wyk B.E, Gericke N.)

"On the basis of fruit size, palatability, yield, abundance and nutritional value, the following fruits [found in the bioregions of Dinokeng] *have exceptional potential:* marula, sourplum, blue sourplum, Kei-Apple, stamvrug/milkplum, moepel. *(Ackhurst 1996): Analysis of nutritional value of wild fruits (Wehmeyer 1966, 1976; see tables in Fox & Norwoodnm Young 1982 and in Arnold et al. 1995) has shown that many of them have very high vitamin C levels." (2000: van Wyk B.E, Gericke N.)*

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6_1_2 PROCESSED PRODUCTS

Beverages:

p.99: "Southern Africa has a diverse and interesting indigenous tea, wine and beer culture. The terms tea, wine, beer are not accurate and may even be misled by main beverage plants of the modern world. Traditional drinks in southern Africa are often highly nutritious and form an important part of the diet. The diversity of alcoholic and non-alcoholic beverages is highlighted below: One of the most widely used beverages in South Africa is sorghum beer, produced from rural recipes and special ingredients are no longer used except in isolated places. The most important traditional beers "such as pearl millet and marula are no longer as widely used as in former times. ..

Marula and other fruit brews, however, are strictly seasonal, and are used mainly for their alcohol content, to lift the spirit. A glimpse of the diversity can be seen in the study of Quin (1959) who recorded the main traditional beers (bjalwa) of the Pedi culture. With increasing awareness and appreciation for the value of diversity, there will hopefully be a revival of the traditional art of brewing, so that more people will be able to appreciate the diversity of tastes in the future. The traditional malting and brewing methods for bjalwa were recorded in detail by Quin (1959). Lukewarm water is added to the malted meal in a clay pot, the content is stirred well and then covered with a small basket as a lid. After a day of fermentation, the supernatant liquor is transferred to an open cooking pot, brought to boil (to reduce acidity) and the fermented mash, thinned with water, is returned to the liquor, while stirring continuously. After boiling for half an hour, the pot is left to simmer for another hour. The original clay pot is rinsed with cold water and the cooked gruel is transferred back into the pot and stored in a cool place. After 12hours the brew forms a gelatinous mass without any fermentation. More malted meal is added and the whole brew is stirred and left to ferment for 10 hours at room temperature. The brew is now ladled into a grass strainer and the beer is wrung into a clay pot, ready for serving." (2000: van Wyk B.E, Gericke N.)

Fig.6.11: Traditional African beer
(online source: http://m.np.is/delaharpe/s/np00787332.jpg&imgrefurl)

Fig.6.12: 'Modern beer' from western influence
(online source: http://streetscene.co.za/wp-content/uploads/2012/08/Beer-Route.jpg&imgrefurl)

Jams:&Jellies:

Apart from utilizing the fermentation process that these fruits undergo in order to make beverages, another popular use is the making of jams by discouraging the fermentation process. Jam production is an established industry in South Africa, both commercial and traditional, and the idea with this scheme is to incorporate and fuse this as architectural program on a small-intimate yet publicly experienced-scale.

For a more thorough description on jam production practices and recipes the publication by V.G Wiltshire (1932) can be consulted

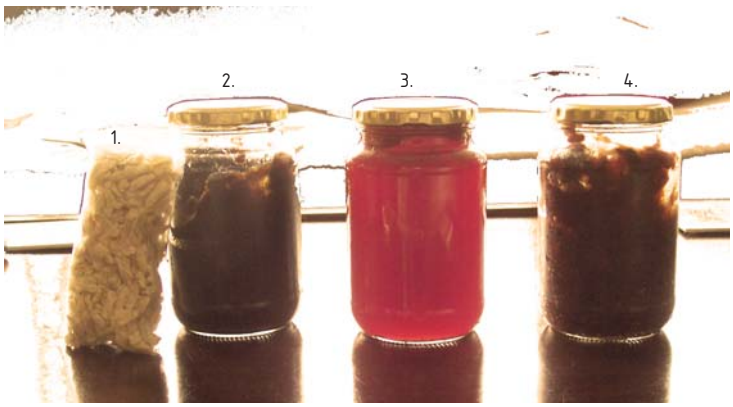

Fig.6.13: An array of products made from indigenous fruit: 1.Marula nuts, 2.Marula chutney, 3.Marula syrup, 4.milkplum jam
(Author,2013)

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The author's stance:

The author believes that the above gives ample insight and sufficient justification for the use of Southern Africa's floral richness as potential for economic generator and informant for projects of sustainable development. The architectural field can be considered an appropriate medium for implementing this indigenous knowledge base, and this type of intervention will benefit the plight of endangered ecologies in terms of nature conservation by preventing communities to ingress into the protected area for these resources in an uncontrolled fashion.

This architectural intervention, fostered in indigenous ecology and related rituals as design informant, will also be a benefactor of social/urban improvement by providing the human community with monetary gain from the sustainable use of their neighbouring ecological resources.

6_2 PROGRAM LAYOUT:

In response to the background and the picture of the ecological context painted the project is therefore programmatically aimed at the design of a facility on the edge and entrance to the Dinokeng Game Reserve that would integrate and incorporate the traditional and contemporary methods of veld-food utilization into a tourist centre. This centre would celebrate the indigenous and/or natural heritage of the region and provide the possibility of accommodating facilities for further research in the local ecology as part of future phases to the project. The architectural intervention will therefore plug in to the natural and cultural context of the site and manifests as a result of those given entities residing in the area. This contextually informed architecture (with focus on the ecological context on the eastern edge of site) will further aim to connect with the social urban condition on the western side of the site and incentivize community members to become part of programmatic operations on site and in doing so aid the ingress of ecological value back into the community. The tourist centre as a whole will be divided into consecutive components of experiential procession.

-COMPONENT A: A nursery for indigenous trees present in the bioregion, connecting with an existing nursery across the road.

-COMPONENT B: A zone in the extended portion of the threshold for planting the nurslings that have reached a considerable size of maturity, as a process of ecological re-establishment on the larger site of intervention. Apart from this zone within the threshold site, community members will be encouraged to plant the trees to be utilised within the facility in their own gardens. By doing this they will re-establish ecological value in their built-environment.

-COMPONENT C: represents the 'recreated ecology' when the trees planted have reached maturity and the ability to produce fruits or other usable products and where the fruit gets harvested.

-COMPONENT D consist of the PRODUCTION/ PROCESSING of fruit into various goods

-COMPONENT E: is the sorting and prepping stage

-COMPONENT F: the selling and/or consumption of products.

-COMPONENT G: Ultimately this cyclical process culminates and starts again by the compost generation from bio-waste generated on site.

These components collectively take on a multi-dimensional program that includes a series of production/exhibition pods:
a: traditional beverage production pod, b: jam production pod c: veld-snack production pod encapsulated by the tourism facility that accommodates these practises.

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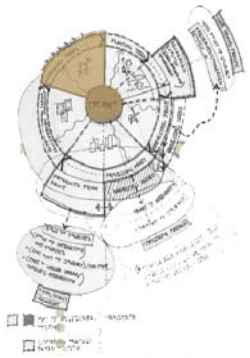
STAGE 1: TREE NURSERY



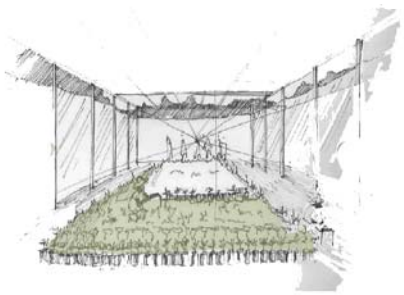


Fig.6.15: Program Stage 1
(Author,2013)

STAGE 2: REPLANTING INDIGENOUS TREES

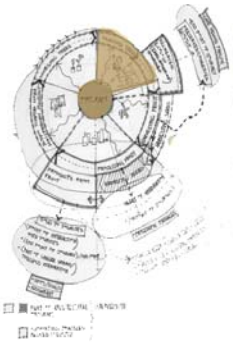


Fig.6.16: Program Stage 2
(online source:http://oi45.tinypic.com/vvtok.jpg&imgrefurl)

STAGE 3: RE-ESTABLISHED ECOLOGY

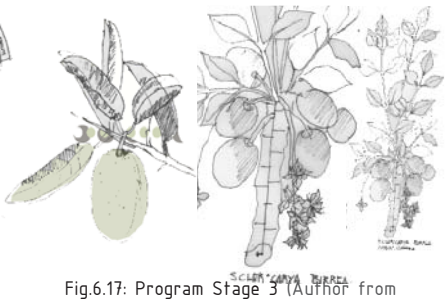


Fig.6.17: Program Stage 3 (Author from Fox, F.W., Norwood Young, M.E. 1982)

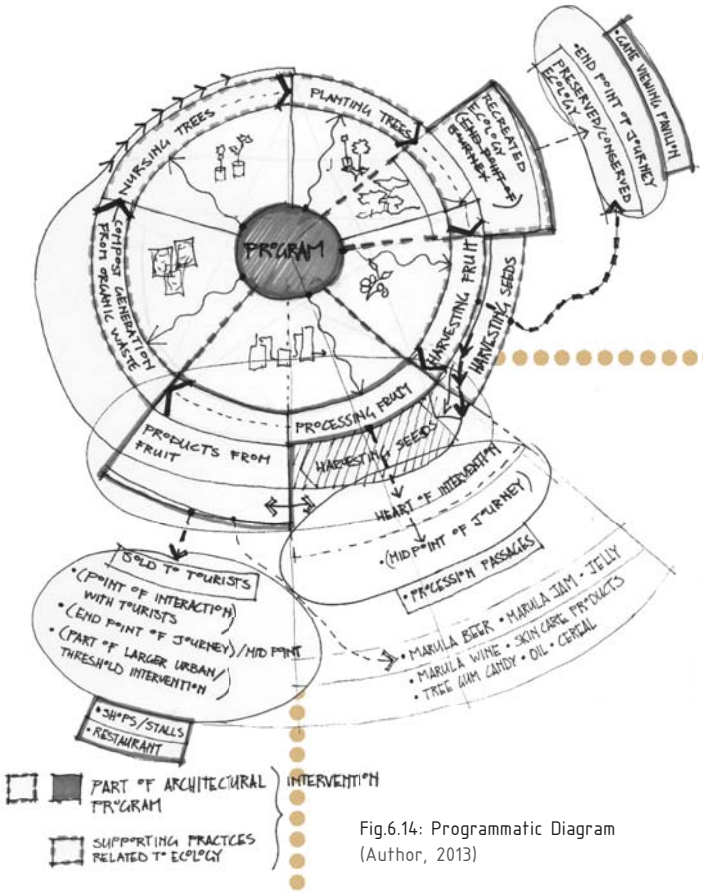


Fig.6.14: Programmatic Diagram
(Author, 2013)

STAGE 4: FRUIT HARVESTING

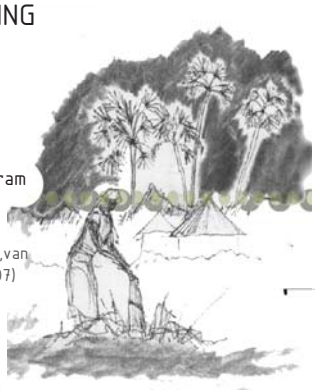


Fig.6.18: Program Stage 4
(Author,2013
from Gericke,N.,van Wyk,B.E..2000:107)

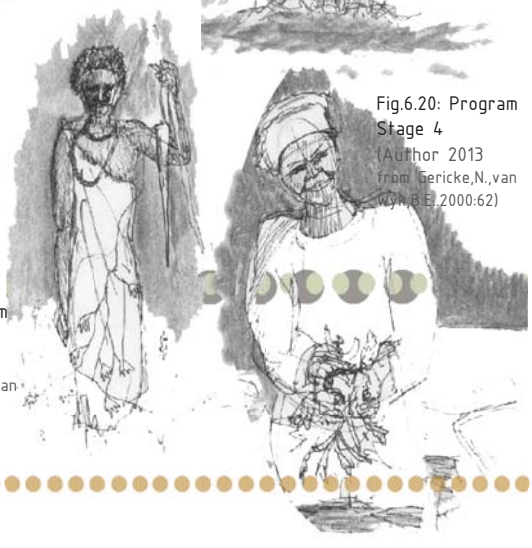


Fig.6.20: Program Stage 4
(Author 2013
from Gericke,N.,van Wyk,B.E.,2000:62)

Fig.6.19: Program Stage 4
(Author,2013
from Gericke,N.,van Wyk,B.E..2000:80)

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STAGE 5: PRODUCTION

Fig.6.21: Program Stage 5 (Author,2013 from Gericke, N., van Wyk,B.E.2000.)

Fig.6.22: Program Stage 5 (Author, 2013)

STAGE 6: CONSUMPTION/SELLING OF PRODUCTS

Fig.6.23: Program Stage 6 (Author,2013 from Gericke, N., van Wyk,B.E.2000:37)

Fig.6.24: Program Stage 6 (Author,2013 from Gericke, N., van Wyk,B.E.2000:98)

Fig.6.27: Program Stage 6 (Author,2013 from Gericke, N., van Wyk,B.E.2000:15)

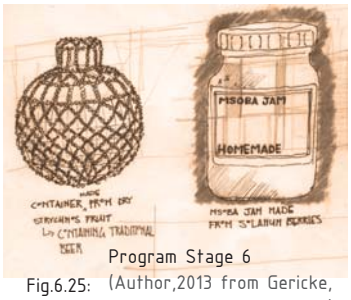

Fig.6.25: Program Stage 6 (Author,2013 from Gericke, N., van Wyk,B.E.2000:57,59)

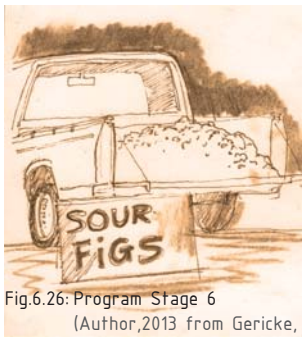

Fig.6.26: Program Stage 6 (Author,2013 from Gericke, N., van Wyk,B.E.2000)

STAGE 7: COMPOST GENERATION

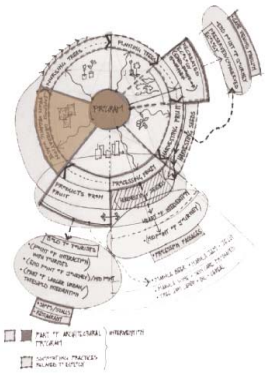

Fig.6.28: Program Stage 7 (online source: http://addorgan-icgardening.com/wp-content/up-loads/2012/09/Finished-Compost.jpg&imgrefurl)&(http://www.thehighline.org/sites/files/images/(for%2520b)

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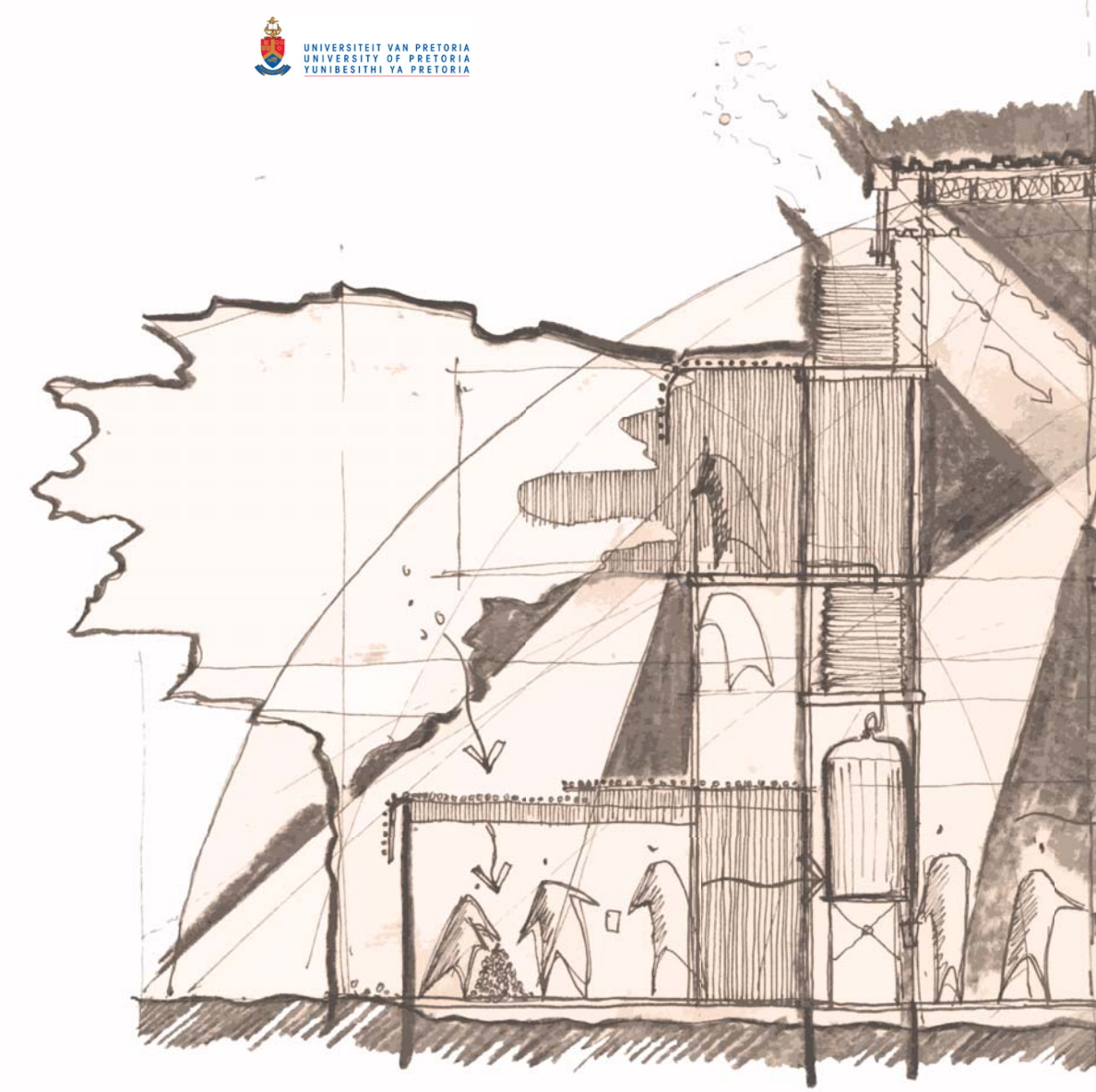

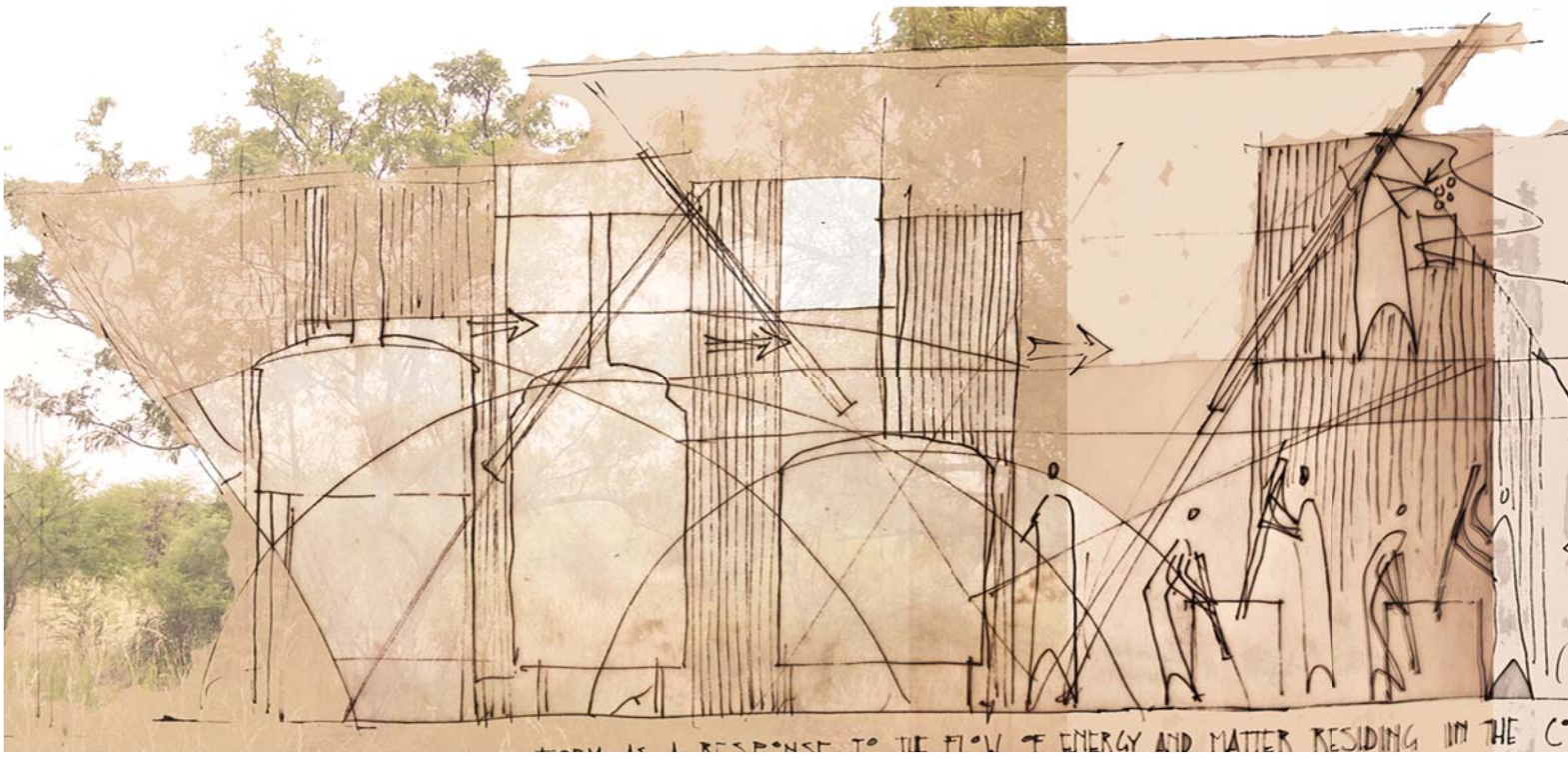

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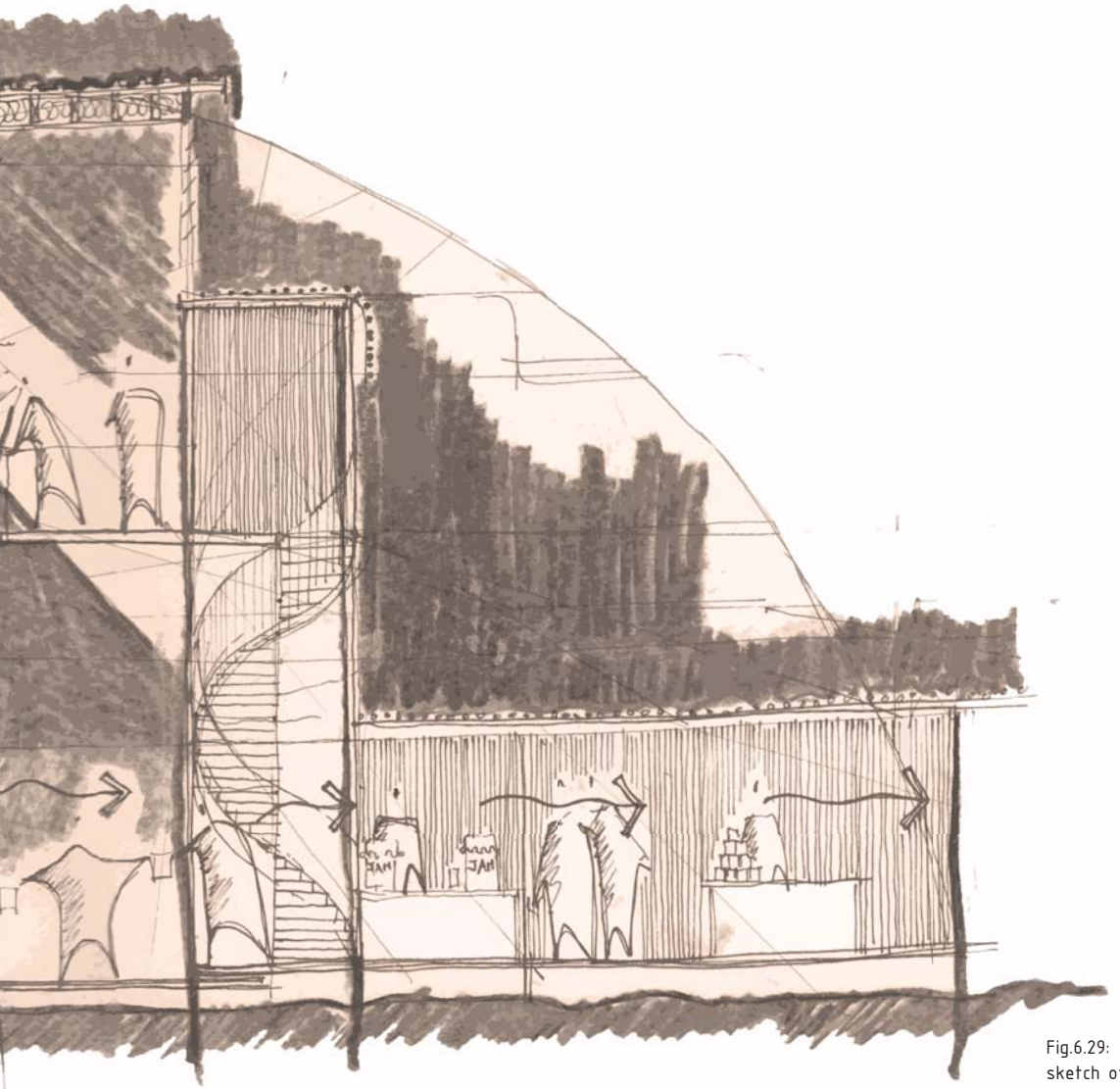

Fig.6.29: A conceptual sketch of Architectural Program (Author 2013)

Fig.6.30: A conceptual sketch of Architectural Program translated into elevational space generation (Author 2013)

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7 CONCEPTUALISATION

In this chapter the combined theoretical discussion is translated into conceptualisation and serves as filtering process thereoff. The theoretical content from previous chapters is sifted through and the remaining matter of substantial relevance is taken further in the process to be moulded into relevant concepts, which is then translated into architectural form and space making.

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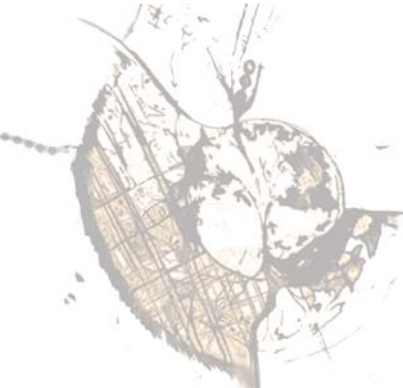
5 THEORETICAL DIALOGUE
6 THE PROGRAM
7 CONCEPTUALISATION



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7_1 DERIVATIVE CONCEPTUAL PHILOSOPHIES AS DESIGN DRIVERS BASED ON THEORETICAL DISCOURSE:

1. CONCEPTION

2 GRAPHIC ABSTRACTION

·A) Architectural intervention as negotiator or reconciliatory between realms

According to Herman Hertzberger there exists a duality within a well-defined threshold as a result of its spatial quality as a platform in its own right-*'a place where two worlds overlap, rather than a sharp demarcation'* (Hertzberger 1991)

Fig.7.1: Ecological retaliation in the face of antagonism and architecture as mediator (Author,2013)

B) An experiential journey through ecological space and time

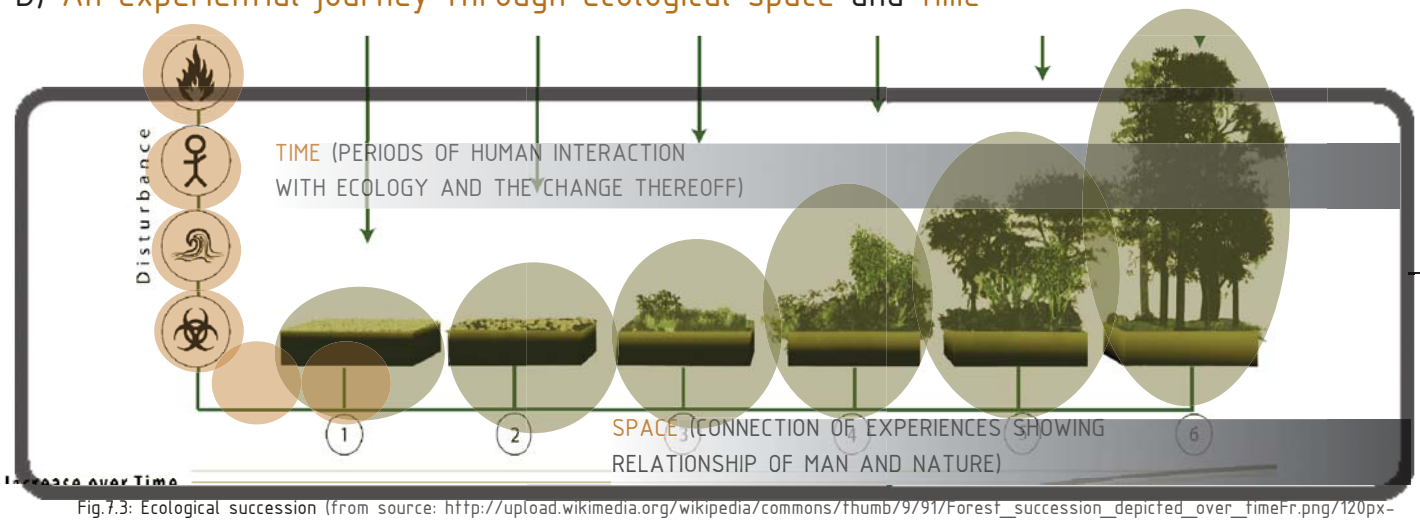

Fig.7.3: Ecological succession (from source: http://upload.wikimedia.org/wikipedia/commons/thumb/9/91/Forest_succession_depicted_over_timeFr.png/120px-Forest_succession_depicted_over_timeFr.png&imgrefurl)

·C) The Flow of energy and matter residing in an ecological setting

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3. DIAGRAMATIC

4. IMPLEMENTATION

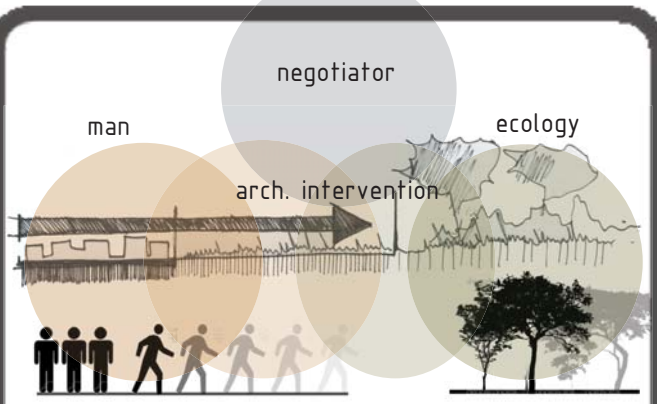

Fig.7.2: Ecological retaliation in the face of antagonism and architecture as mediator (Author,2013)

(TO BE DETERMINED
DURING DESIGN DEVELOPMENT)

Fig.7.4: Journey through ecological space and time (Author,2013)

(TO BE DETERMINED
DURING DESIGN DEVELOPMENT)

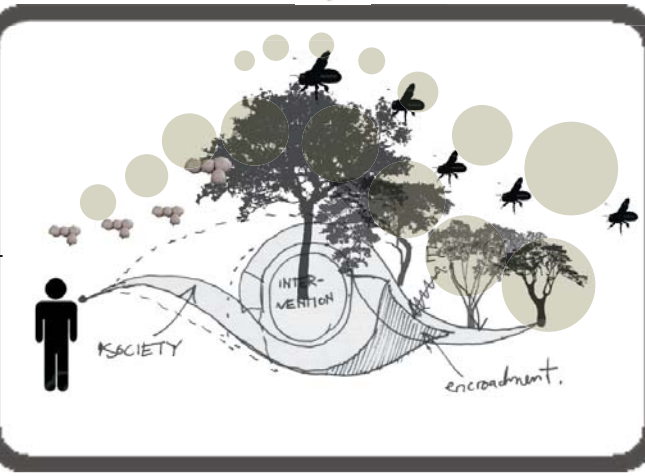

Fig.7.5: Flow of energy and matter in an ecological setting (Author,2013)

(TO BE DETERMINED
DURING DESIGN DEVELOPMENT)

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D) Architecture AS threshold between man and ecology

As a response to the initial question of what the role of architecture should be on the threshold between human and ecological environments, this question is translated into an answer by stating that architecture ITSELF should become the threshold.

-Establishment of spatial hierarchy and appropriate threshold condition

-Facilitating controlled movement through linkage of consecutive, intermediate anchor points

E) Arhitecture as an extention of ecology versus parasitic infection in ecology.

(From Fritjof Capra's systems thinking towards the author's theory of architecture as medium for conservation between man and ecology)

Author's stance:

If one would place the human environment and the ecological environment along one another, one would see that both are in essence vibrant systems comprised of numerous energies and elements. Similarly and for an analogous purpose, architecture and vegetation can be placed along one another as representatives from both these environments as seemingly static, yet dynamic elements within these systems. This shared feature lends a connection point at which architecture can merge with ecology.

To elaborate-Evolutionary, any natural system produces adaptations and develops defence mechanisms to protect it from hostile and invasive forces, but currently the rate at which urban/human encroachment occurs is too rapid for ecological systems to respond. Thus, if architecture is able to tie in with an ecological system, it can be utilised as a human-influenced adaptation in response to the human-created threat on ecology. Hence forth, architecture can become an extension of ecology instead of a parasitic invasion or infection in the ecological DNA.

F) Vernacular Concepts:

Because of the interjecting nature of the project as negotiator between a nature reserve and human settlement, both with historical ties to the Tswana Culture, the design was always going to be confronted by the question of how to respond to the vernacular built environment and its traditional principles regarding architecture in one way or another. One option is to conduct an in-depth study and analysis of the Tswana built-environment and meticulously unravel intricate meanings of a sparsely documented architectural discipline to lend justification to the contemporary design to follow. This would however not be an appropriate response for the purposes of this design because-most recollections of Tswana architecture refer to domestic settlements and the domestic living unit. As this project deals with the design of a tourist centre it wouldn't therefore be typological relevant and applicable. The author rather decided to take a number of key conceptual ideas employed by pre-colonial Tswana builders, and as mentioned in an earlier chapter, to implement it on the relevant design.)

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3. DIAGRAMATIC

4. IMPLEMENTATION

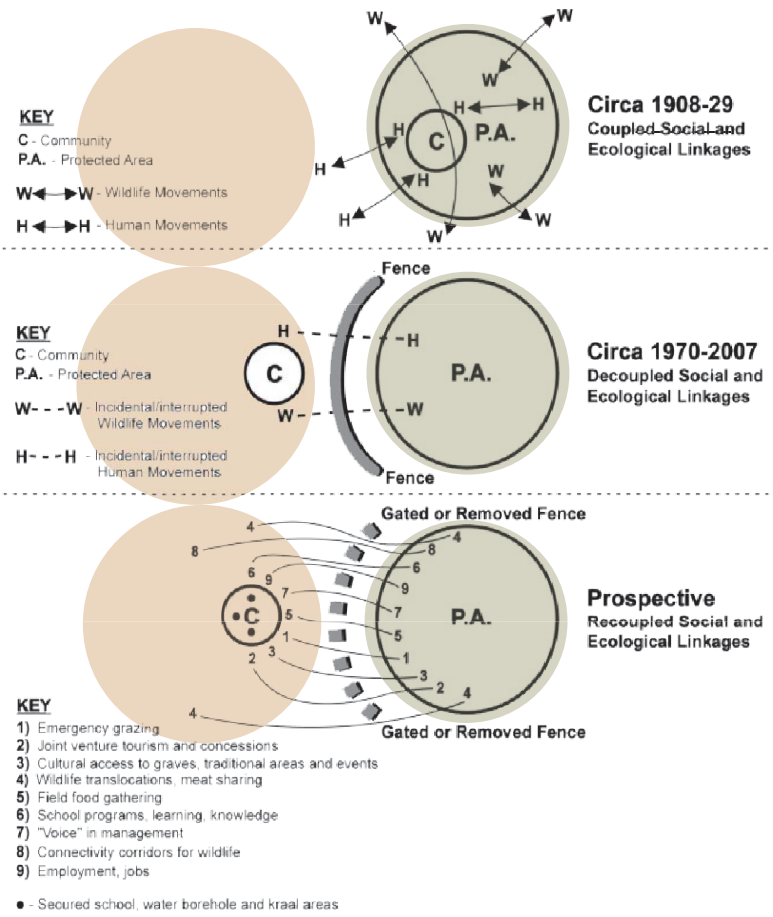

Fig. 7.6: Recoupling social and ecological linkages and systems (online source:https://www.google.co.za/search?sa=G&tbm=isch&tbs)

(TO BE DETERMINED DURING DESIGN DEVELOPMENT)

(TO BE DETERMINED DURING DESIGN DEVELOPMENT)

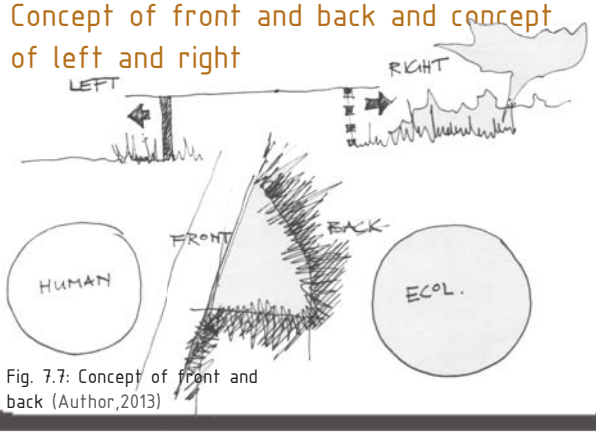

Fig. 7.7: Concept of front and back (Author,2013)

(TO BE DETERMINED DURING DESIGN DEVELOPMENT)

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G: From (the reversal of) urban encroachment to ecological encroachment (the author)

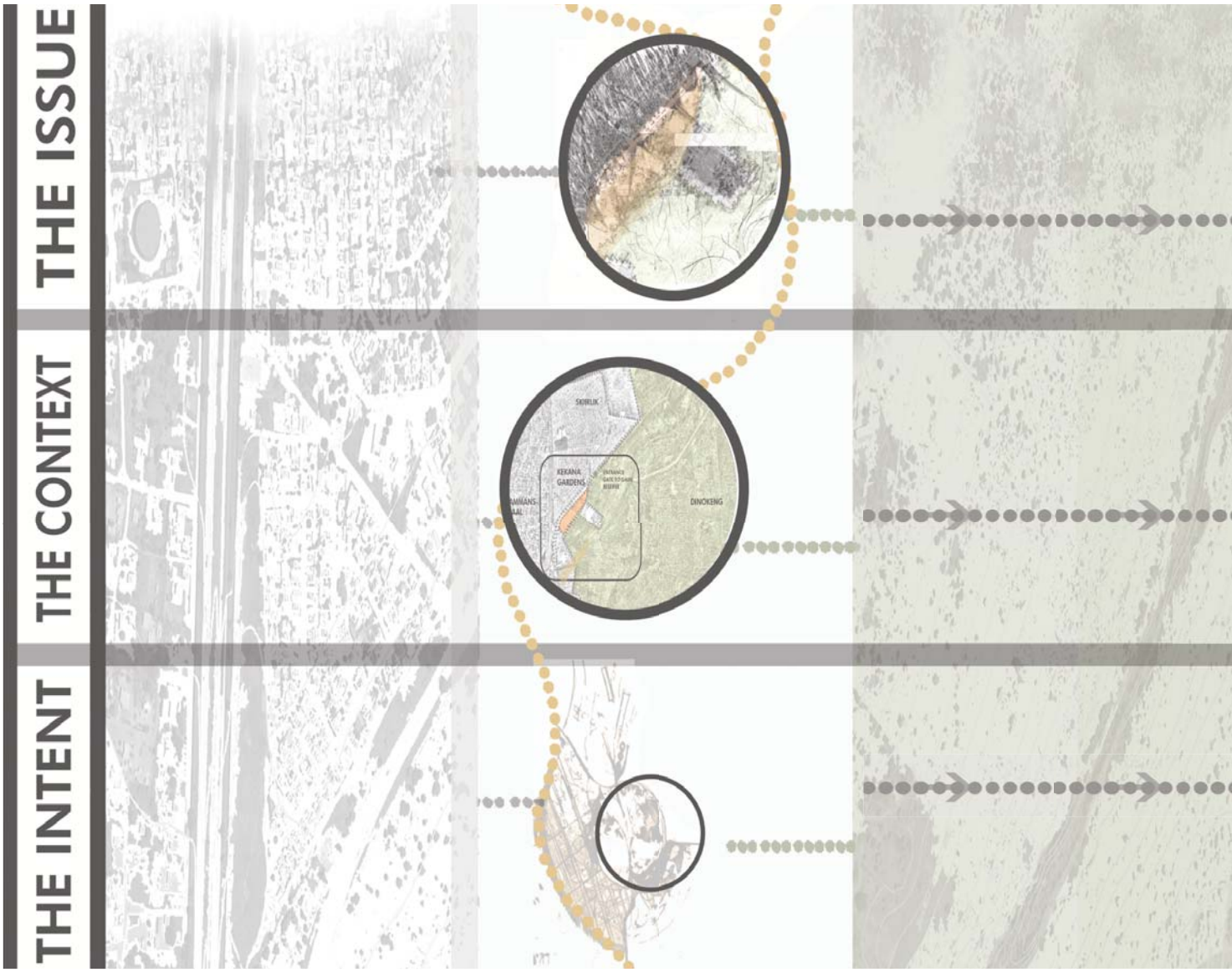
By acknowledging that the threat on ecology in this context can be identified as human encroachment onto ecology it can similarly be acknowledged that an instigated ecological encroachment onto humanity might be the solution to the problem.

G) An exhibition of the relationship between man and nature as expressed through architectural space making and phenomenological place framing.(author)

- Architecture as filtering element for bringing clarity and simplicity -Where buildings frames and illuminates the ecology,

-Architecture channelling ecology-based knowledge into understandable forms on a human scale.

7_2 SUMMARY OF CONCEPTUAL PROJECT DRIVERS:



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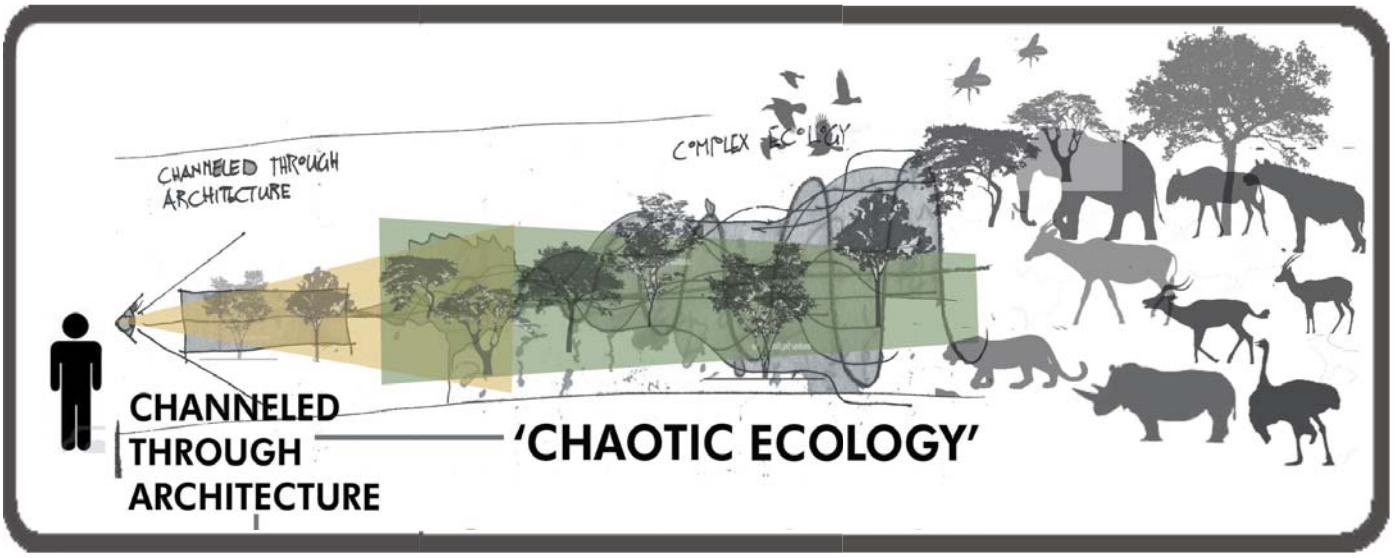

Fig. 7.8: Utilising architecture as filtering element for focusing in on ecology and bringing clarity (Author,2013)

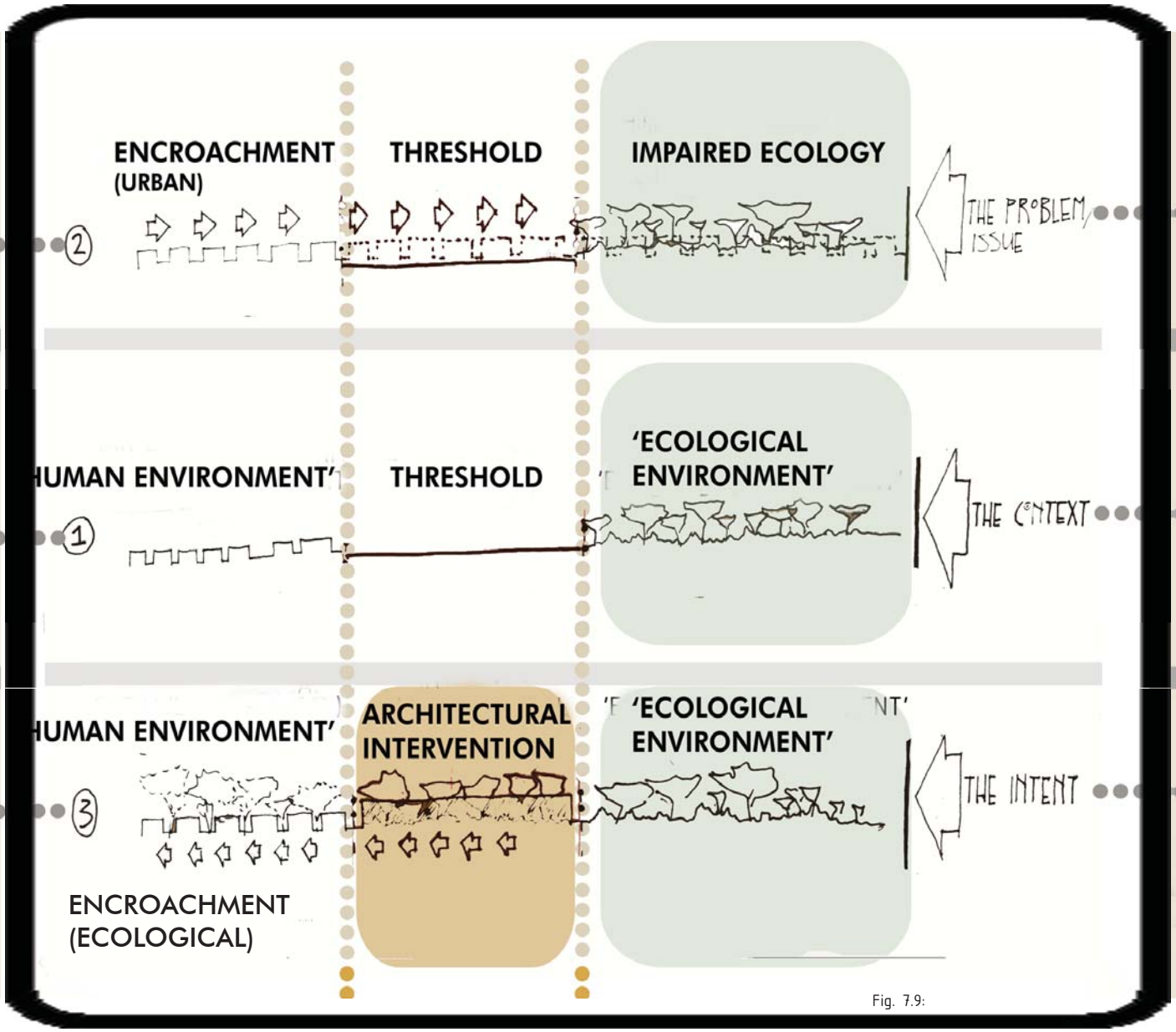

Fig. 7.9:

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8 PRECEDENT STUDIES

In this chapter a selection of case studies is shown that reflects the intents of the design from various points of view that include spatiality and connection of space through ritual movement, buildings as idiom for contextual interpretation and building as dwelling in the natural landscape.
It exemplifies various aspects deemed to be relevant, and are intended to be incorporated by the author.

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8_1 A THRESHOLD INTO AN ECOLOGICAL ENVIRONMENT

8_1_1 TILLAMOOK FOREST CENTER

Tillamook Oregan USA

by Miller Hull Partnership

The Tillamook Forest Center is located on a site which underwent historical mismanagement of ecological resources, where loggers stripped the landscape and subsequently a number of ecological disasters followed suit. Within the context of a more environmentally conscious timeframe, the design of this centre stands as testimony to the injustices commited on this ecological environment in the past but also symbolises a look into a more responsible future by bridging the gap between the human and ecological environments. It functions as a visitor center that reflects not only by means of narrative accounts on the mentioned past but also uses the architecture itself as an exhibition of the history in connection with the timber landscape through material use and tectonic expression.

"The Tillamook Forest Center tells the story of past human stumbles while embodying a leap into the future"
Randy Gragg

(online source: http://greensource.construction.com/projects/2009/03_Tillamook-Forest-Center.asp)

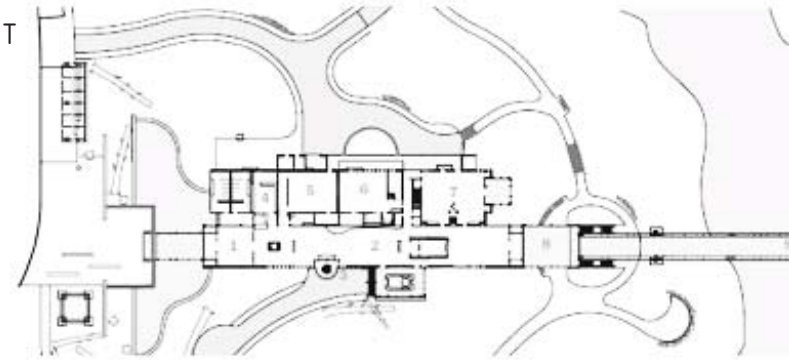


Fig. 8.1: Floor Plan (online source: http://greensource.construction.com/projects/2009/03_Tillamook-Forest-Center/Images/thumb.jpg&imgrefurl)

FLOOR PLAN

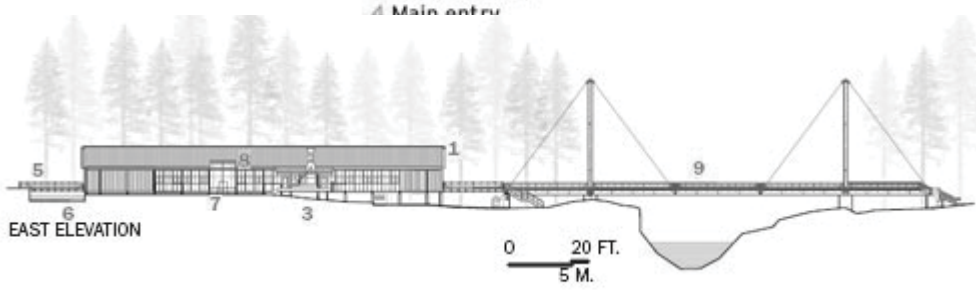
1 Entry lobby
2 Exhibit gallery
3 Nurse stump
4 Gift shop
5 Theater
6 Administrative offices
7 Classrooms
8 Deck
9 Bridge to Wilson River Trail and Jones Creek Campground

NORTH ELEVATION

SOUTH ELEVATION

ELEVATIONS

1 Entry from bridge
2 Classroom
3 Steam donkey
4 Main entry



EAST ELEVATION

ELEVATIONS

1 Entry from bridge
2 Classroom
3 Steam donkey
4 Main entry
5 Entry porch
6 Pond
7 Nurse stump
8 Exhibit gallery
9 Bridge to Wilson River Trail and Jones Creek

Fig. 8.2: Elevations (online source: http://greensource.construction.com/projects/2009/03_Tillamook-Forest-Center/Images/thumb.jpg&imgrefurl)

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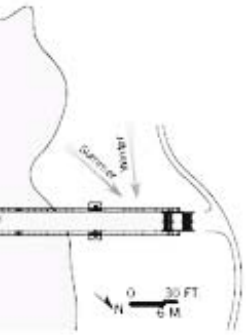

Fig. 8.3: Entrance walkway from bridge (online source: http://www.tillamookforestcenter.com/resources/rental_packet.pdf&h=465&w=310&sz=221&tbnid=dI7V_KkALEAlMM&tbnh=275&tbnw=183&zoom=1&usg=___BzgNzaXWNPDcrGZ0pka8fxsgJt0=)

Fig. 8.4: (online source: http://greensource.construction.com/projects/2009/03_Tillamook-Forest-Center/Images/thumb.jpg&imgrefurl)

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8_2 CENTRE OF EXPERIENTIAL LEARNING AS A JOURNEY THROUGH LANDSCAPE, 'LINKING LEARNING PLATFORMS':

8_2_1 WANGARI MAATHAI INSTITUTE FOR PEACE AND ENVIRONMENTAL STUDIES

"The Wangari Maathai Institute for Peace and Environmental Studies (is) envisaged as a 'green campus'and will be a place of experiential learning, communication and interaction bringing together world leaders, policy makers, academics, students and people from rural communities. As a dynamic educational and practical landscape showcasing and demonstrating sustainable techniques in natural resource management and agriculture production...
Fundamentally, the Institute is to also introduce a new way of 'experiential' learning. This would not only happen within the buildings of the Institute but throughout the working landscape at the innovative learning platforms within the landscape intended to inform the student or visitor about critical issues such as climate change. The WMI is intended to be experienced as a journey winding through the entire site linking the learning platforms, working landscape, natural ecosystems, and the Institute and culminating in the democratic space and memorial to Professor Maathai."

(http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf.2012)

Fig. 8.5: Master Plan (online source: http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf

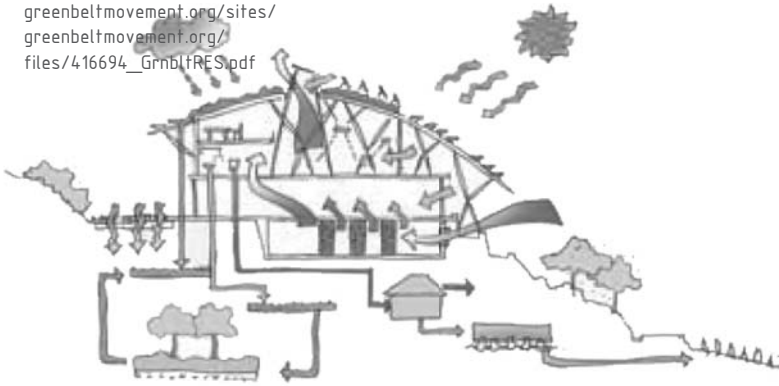

Fig. 8.6: Systems diagram (online source: http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf)

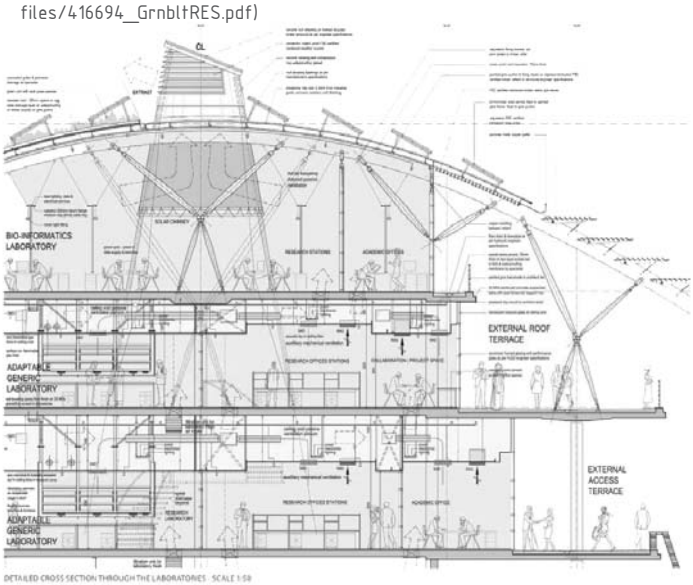

Fig. 8.7: Section ((online source: http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf)

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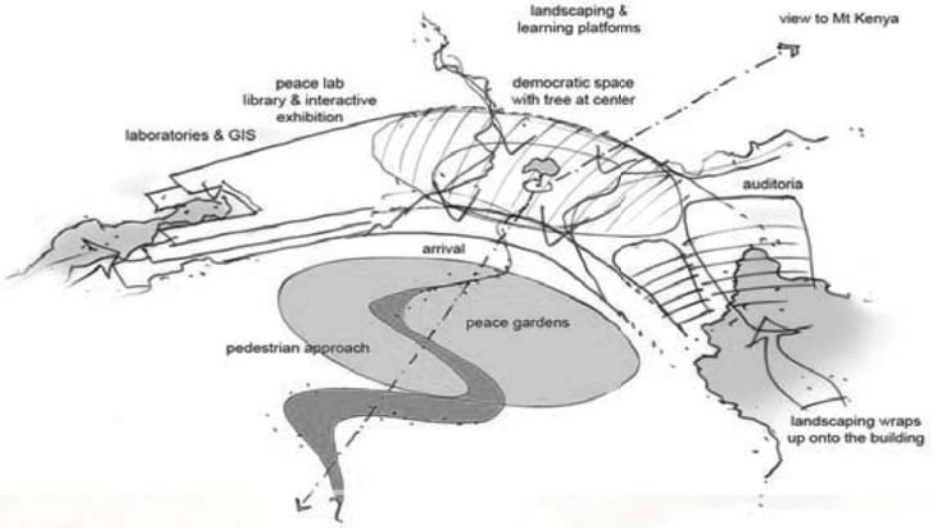

Fig. 8.8: Conceptual sketch (online source: http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf)

Fig. 8.9: perspective Exterior perspective (online source: http://www.greenbeltmovement.org/sites/)greenbeltmovement.org/files/416694_GrnbltRES.pdf

Fig. 8.10: Interior perspective (online source: http://www.greenbeltmovement.org/sites/greenbeltmovement.org/files/416694_GrnbltRES.pdf

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8_3 BUILDING ROOTED IN AN EXISTING-AND INFORMING A FUTURE-NATURAL LANDSCAPE:

8_3_1 COROMANDEL HOUSE: MPUMALANGA SOUTH AFRICA
Marco Zanuso Architect

For the author, the relevance of the Coromandel House in the Lydenburg district Mpumalanga, with the project at hand lies in the fact that it represents an alternative approach of design within the natural landscape. It's an approach with a future context in mind instead of responding necessarily only to an existing context.

If one compares older photos taken of the house with those recently taken by the author it is apparent that indigenous vegetation surrounding the building have since become part of the architectural language and in some instances the vegetation planted on site is difficult to distinguish from the wild veld. Some trees in the courtyard were strategically planted in a way for the building to compellingly accommodate their presence. This ecological encroachment leaves the observer unaware of which came first-the building or the tree. Within this strategy lies a poetic manipulation of the existential relationship between man and nature which lends a unique way of seeing the place of architecture in the natural landscape instead of purely viewing it as an object driven-intervention.

Fig. 8.11: Exterior View (Author,2013)

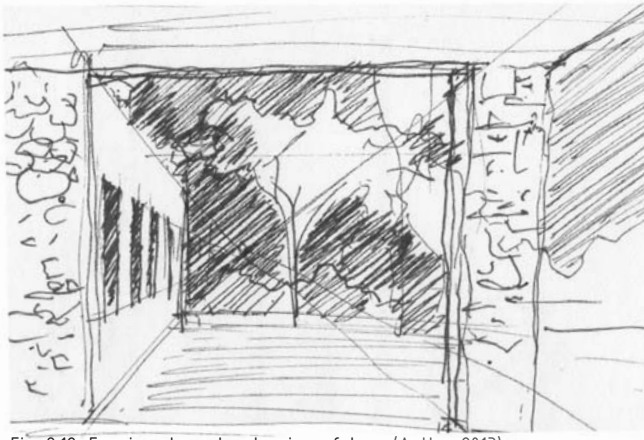

Fig. 8.12: Framing element onto view of tree (Author,2013)

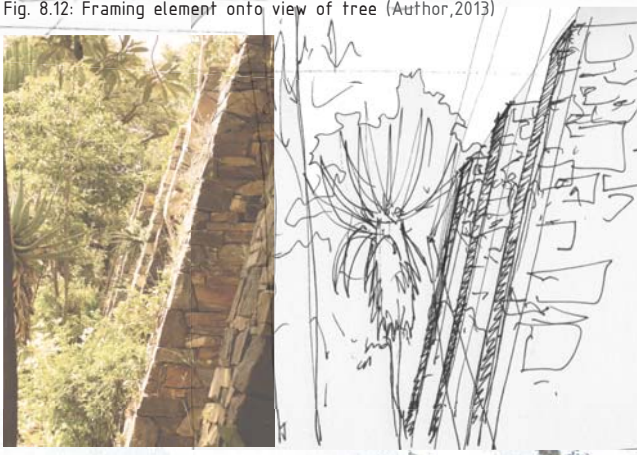

Fig. 8.13: The fusion of ecology with architecture (Author,2013)

Fig. 8.17: View of exterior in 1974 before ecological encroachment onto building took hold (photograph by *Arbitare*[Milan] no.191.1981; Breytenbach,A.;Viljoen,B. from Joubert,O.2009)

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Fig. 8.14: Building as part of the landscape (Author,2013)

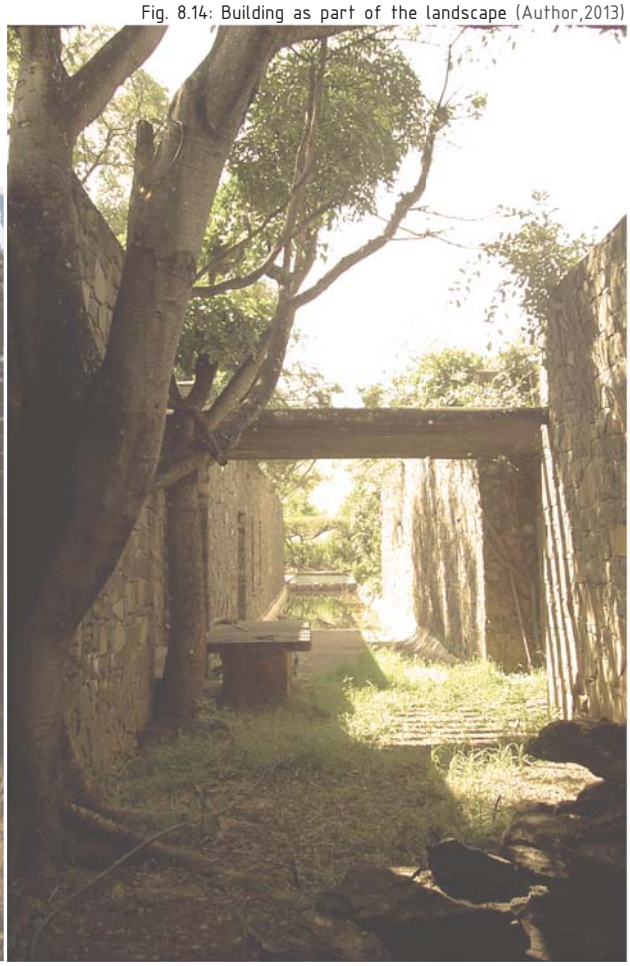

Fig. 8.15: View of interior courtyard (Author,2013)

Fig. 8.16: View of interior courtyard (Author,2013)

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9 DESIGN DEVELOPMENT

9 DESIGN DEVELOPMENT

(FROM CONCEPT TO FORM)

In this chapter the design process and its development is shown from initial sketch drawings up to the design in its latest state before technical finalisation.

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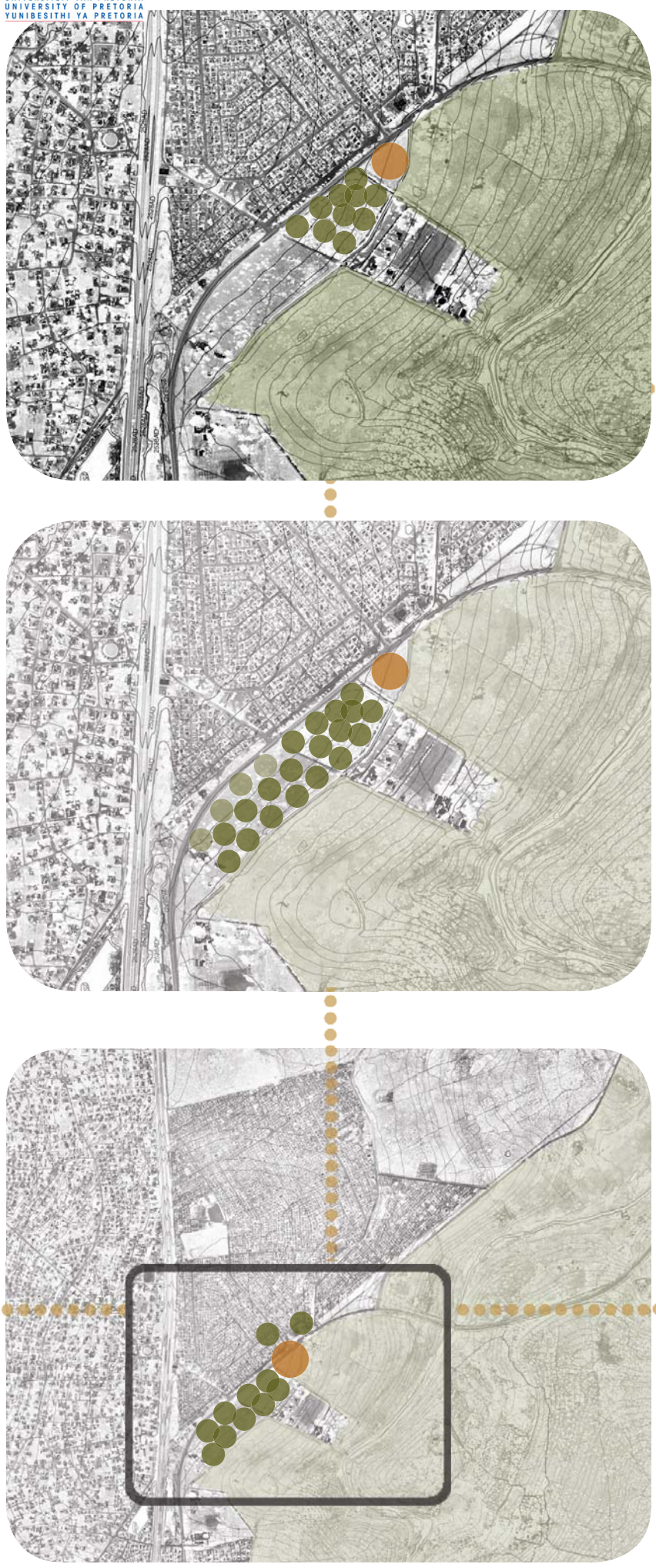
9_1 URBAN VISION:

As mentioned earlier, part of the intention behind the project scheme is to incentivize the local community in becoming part of production processes on site, in order to ultimately establish ecological encroachment back into the humanised township.

The architectural intervention which functions on a small scale is therefore intended to act as a catalyst for spurring ecological growth back into Hammanskraal and therefore influence the region indirectly on a larger urban scale.

This urban cycle thus already starts on the site of intervention where indigenous trees are firstly nursed before being replanted on the threshold site as well as the township. When community members realise the economic possibility that indigenous fruit holds it would spur them in planting these trees in their own gardens. When these trees bare fruit they'll be able to then sell their own fruit to the tourism centre for production. This completion of the cycle between the site of intervention and township gardens therefore spurs an ecological ingress and growth into the so-called 'human environment'



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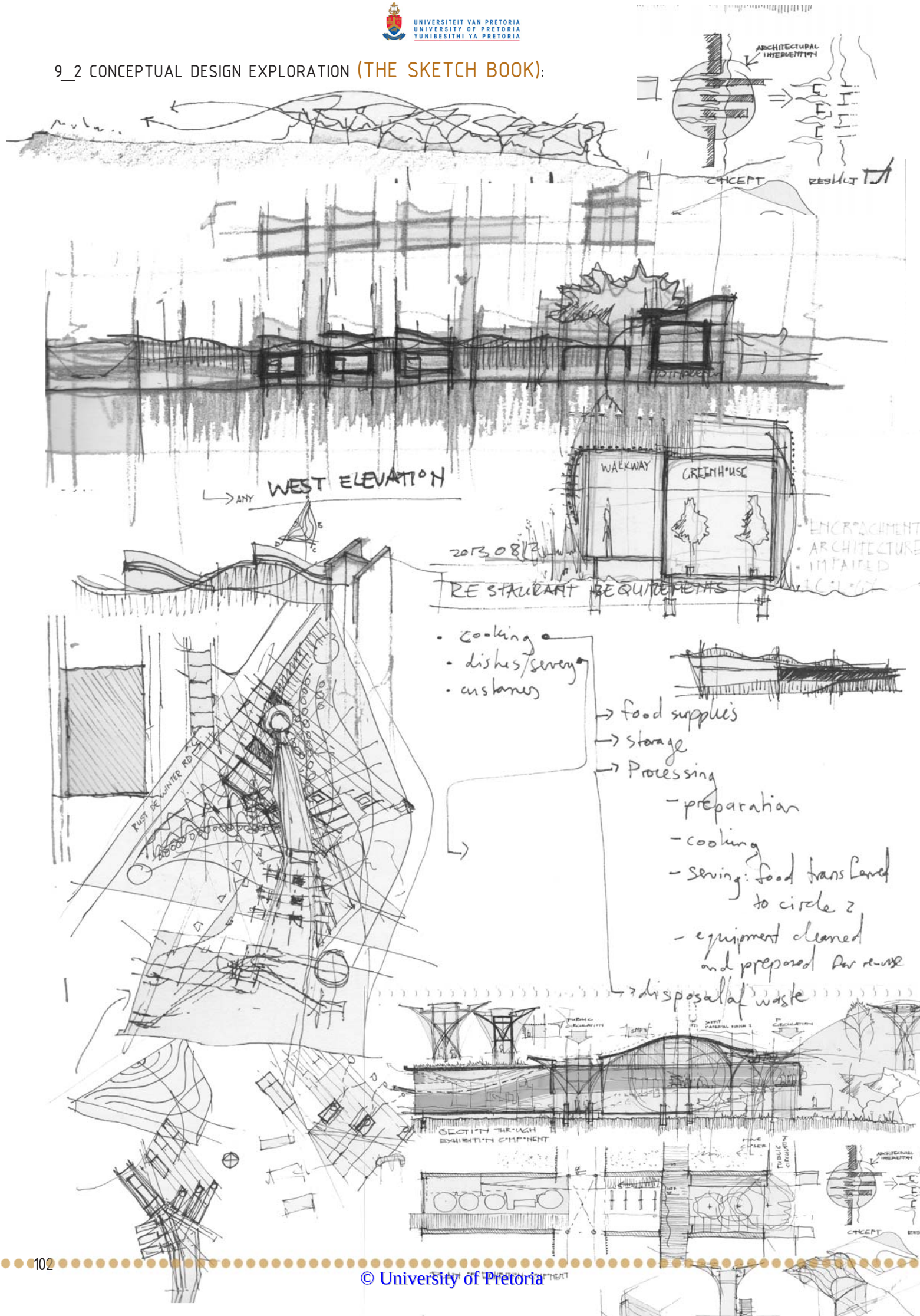
9_2 CONCEPTUAL DESIGN EXPLORATION (THE SKETCH BOOK):



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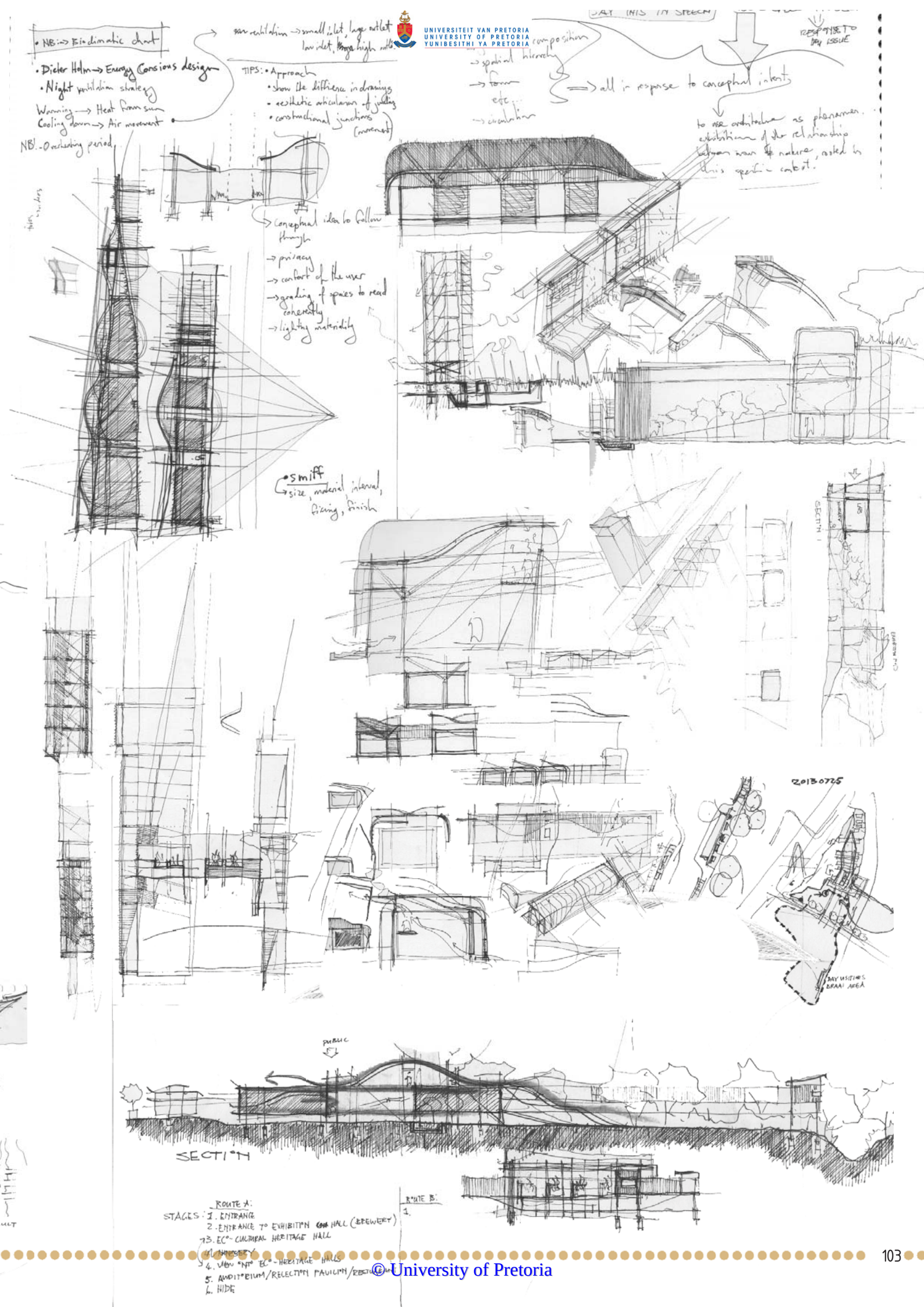

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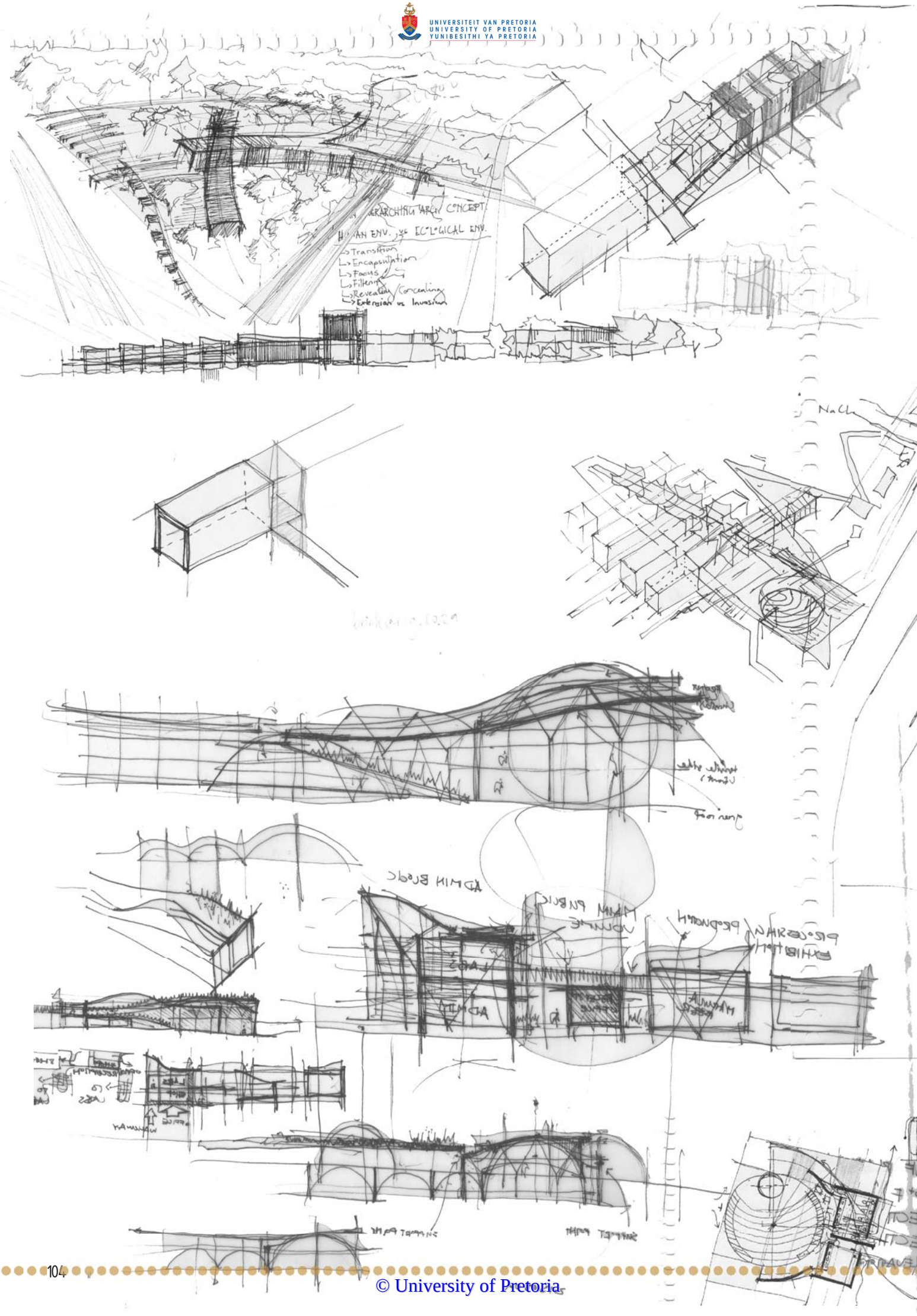

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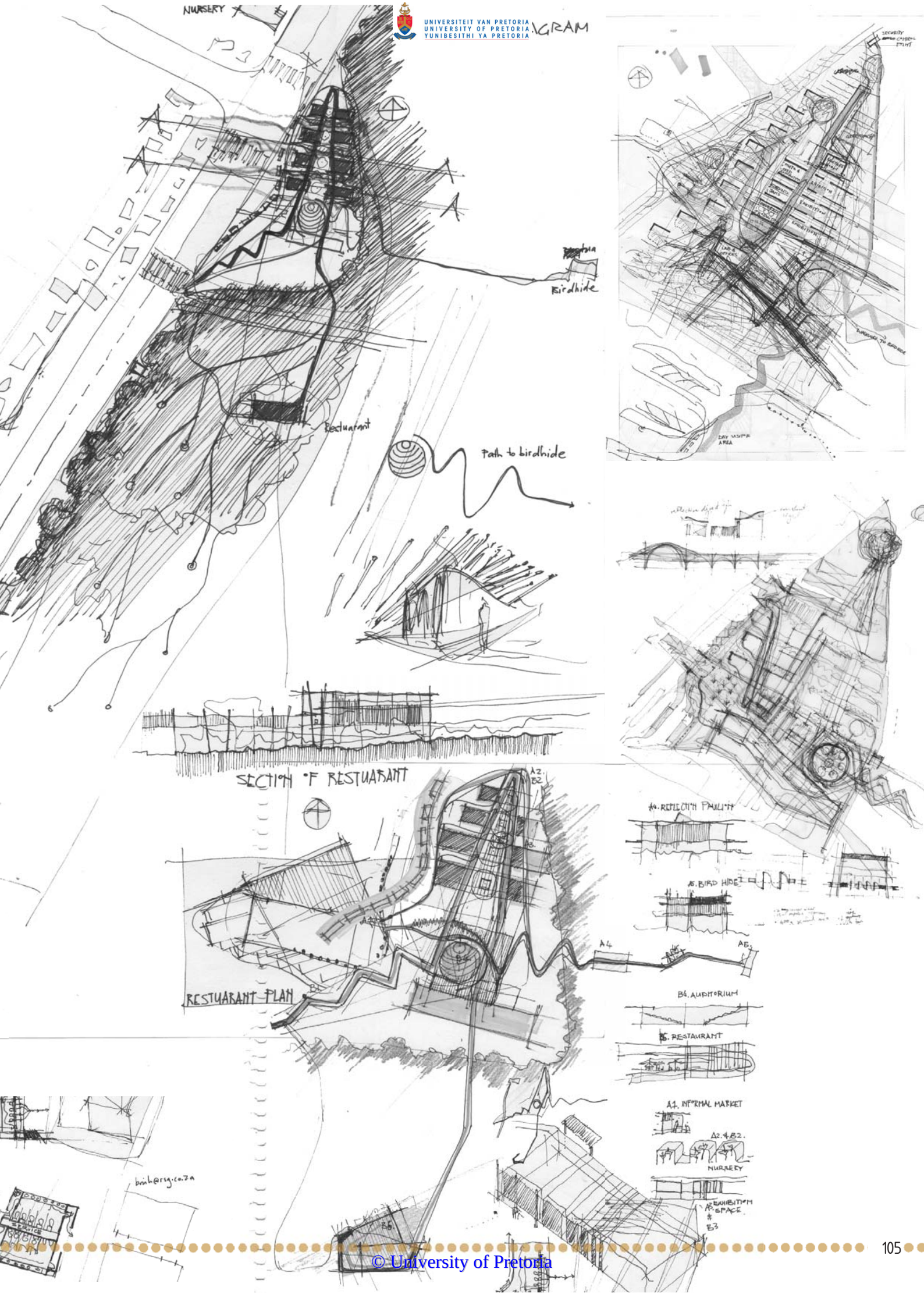

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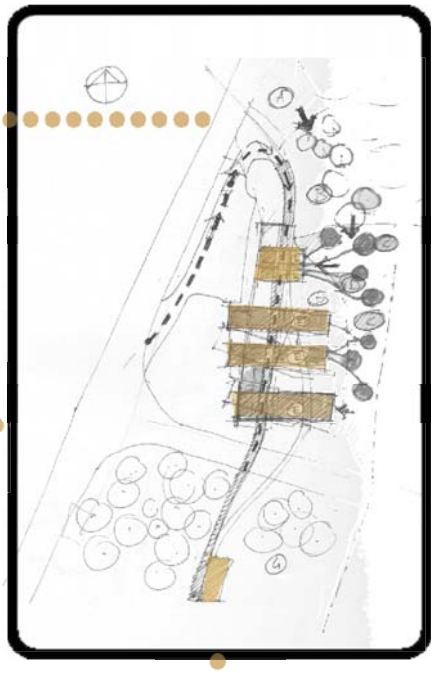
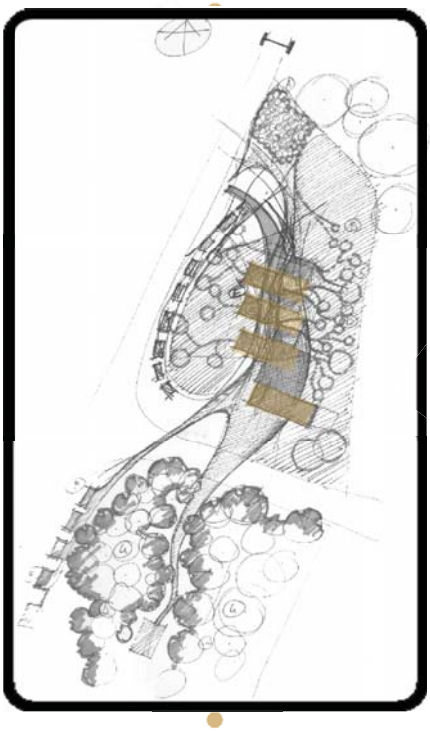
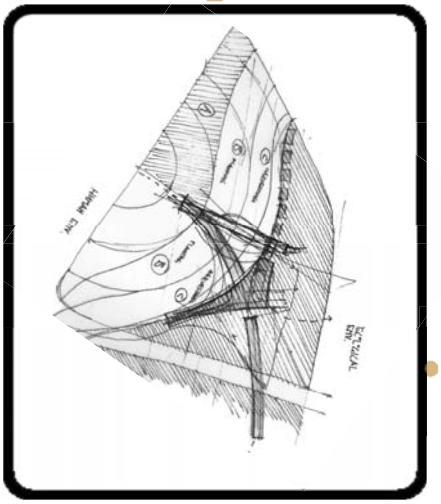
9_2_1 INITIAL SPATIAL: LAYOUT:

Key initial concept:

The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':







Initially the aim of the design was to create movement from the northern portion of the larger identified threshold to the southern portion to emphasize the contrast between the two sites: The northern site almost completely stripped from natural vegetation and the southern site densely vegetated. The problem with this configuration was that it didn't develop the site as an effective threshold between the 'human environment' on the western side of the threshold and the 'ecological environment' on the eastern side of the threshold. The next step was to break down the site to its most essential elements. After this the site allocated for intervention was divided into several layers of transition between the two states, based on the consecutive components of experiential procession, described in the program chapter. A route starting in the developed settlement and culminating in the natural, ecologically protected environment was formed. Still architectural form needed to be added to this route.

A predominantly linear element was placed over the route acting as main funnel for pedestrian movement. The monotony of the main linear element was broken by several perpendicularly intersecting elements, directing the programmatic flow of worker energy and matter. Initially two main circulation routes were formed and split on different levels for pragmatic reasons: The visitor circulation on first floor and the worker circulation on ground floor. This conceptual configuration was also problematic because it became more of an object imposed onto the natural landscape rather than a naturally conceived process of architectural sculpted by-and nestled into-the landscape... Therefore the design had to be rethought in order to resonate with a more contextual response

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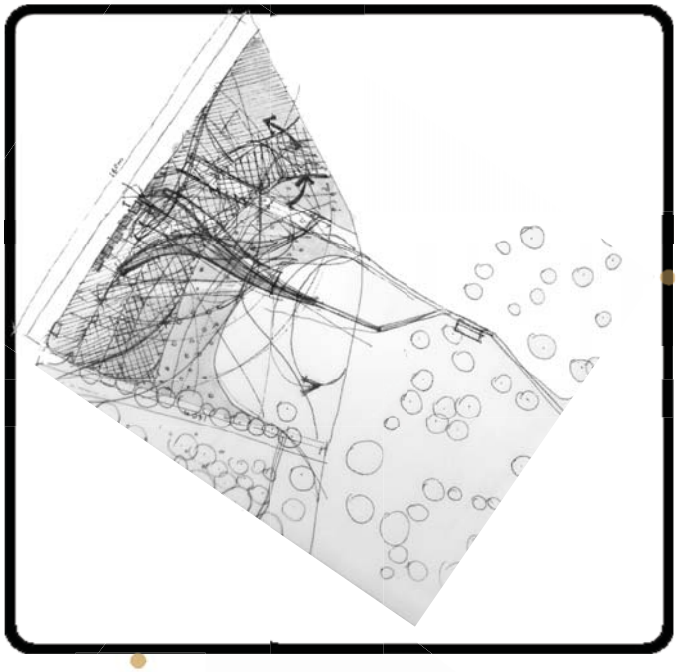

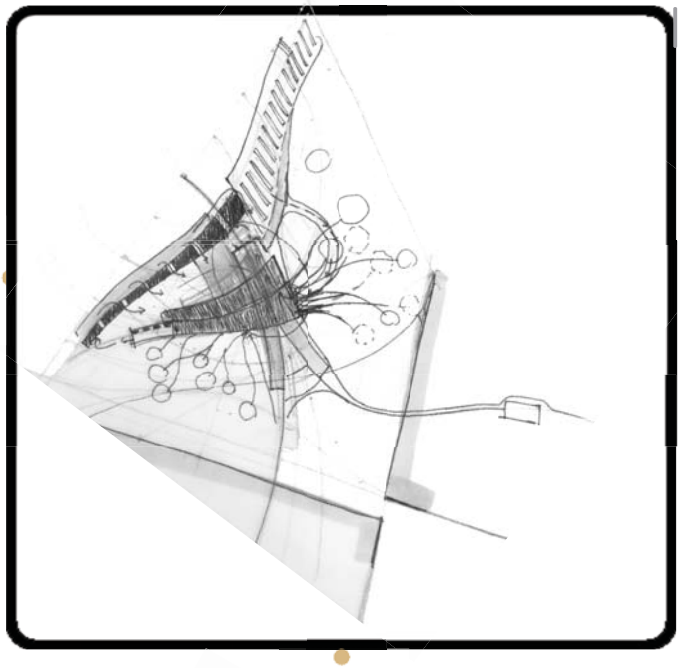

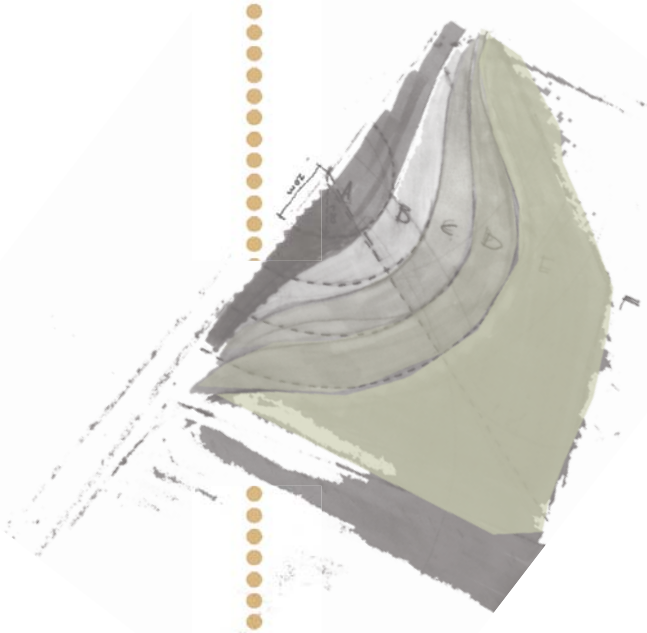

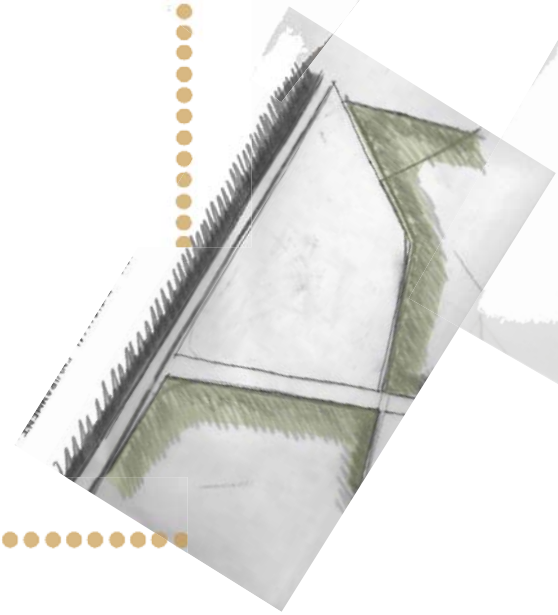

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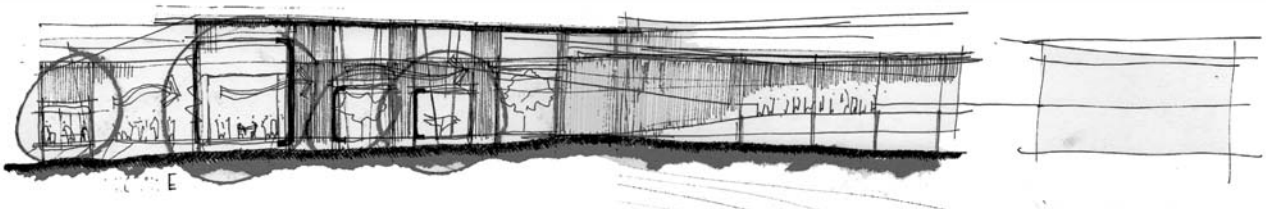

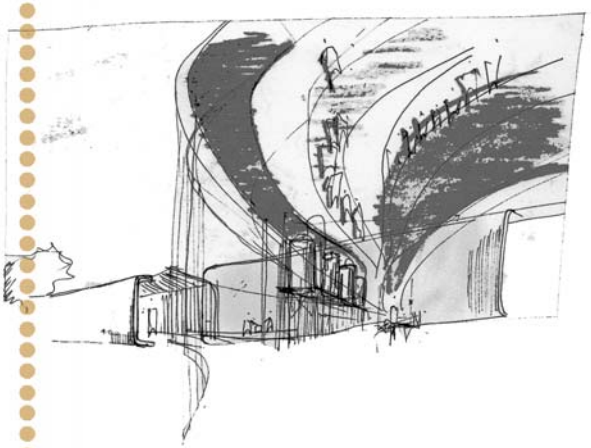

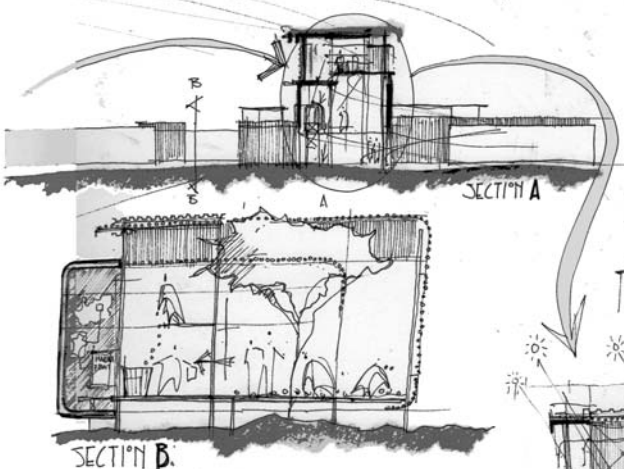

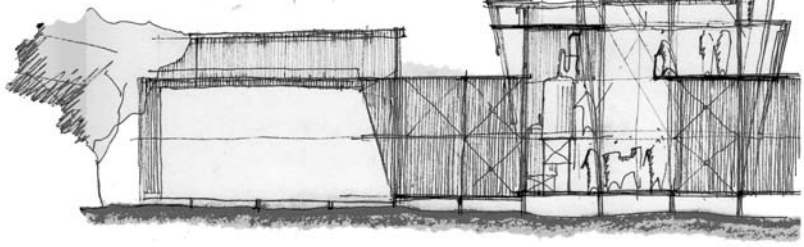

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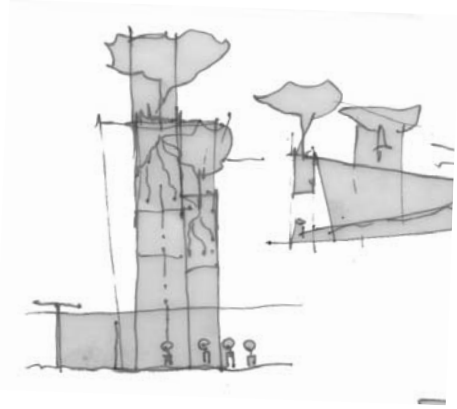

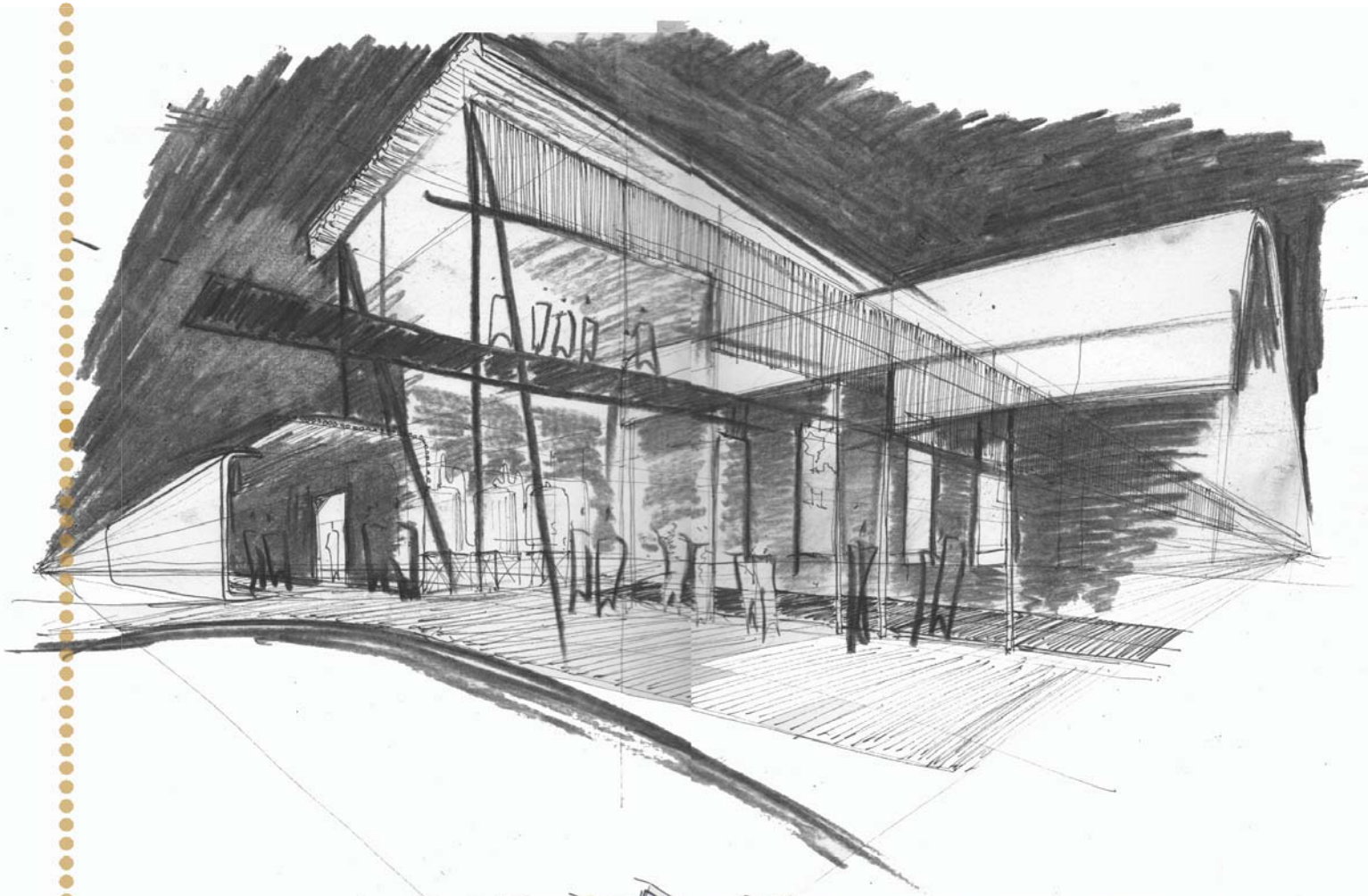

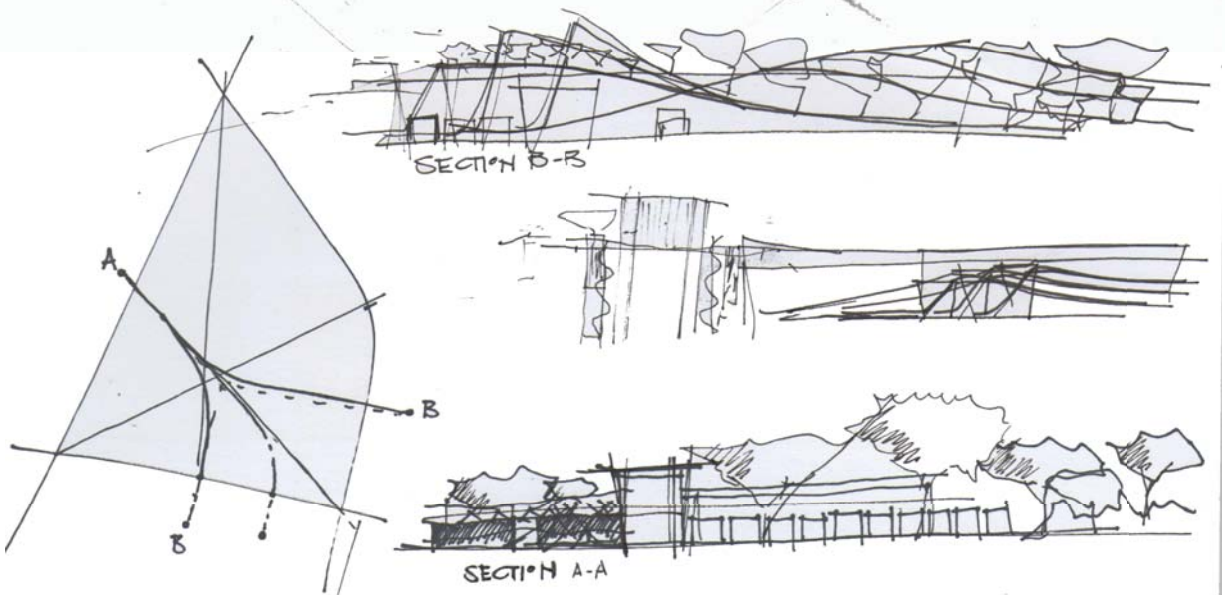

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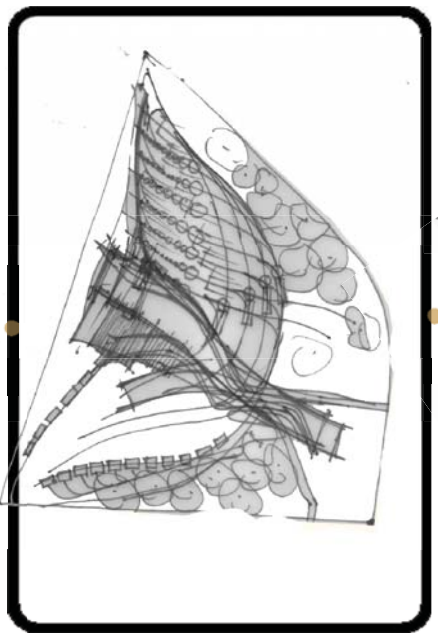

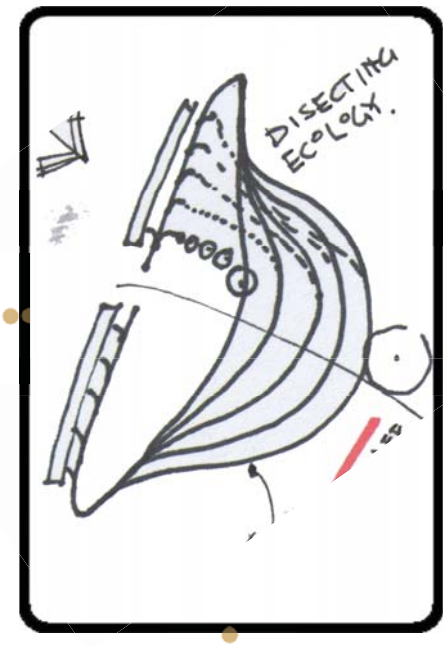

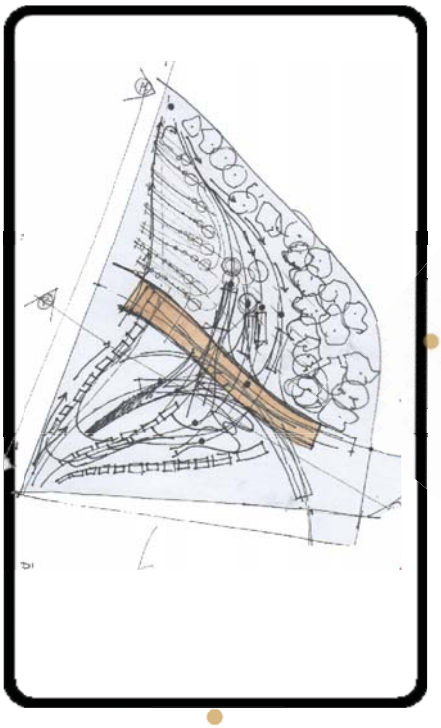

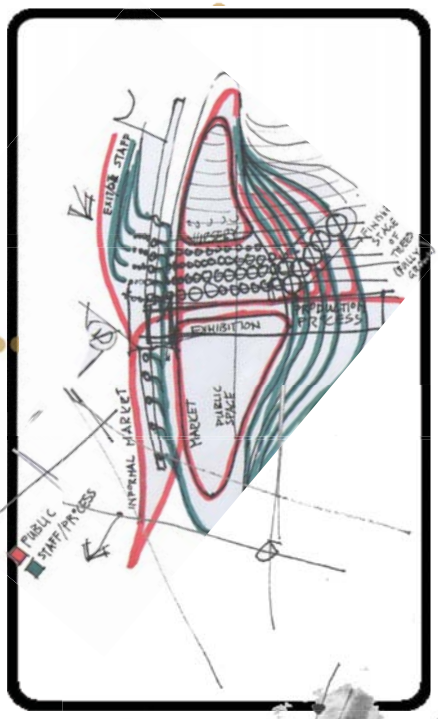

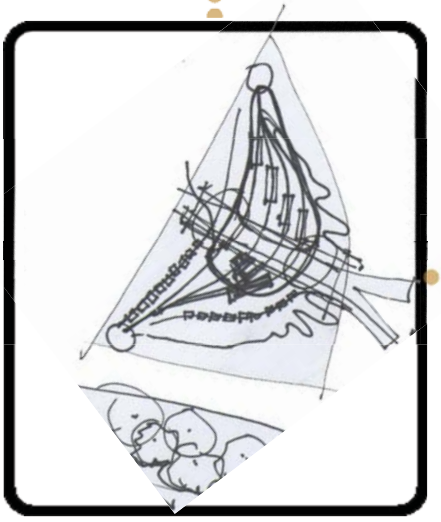

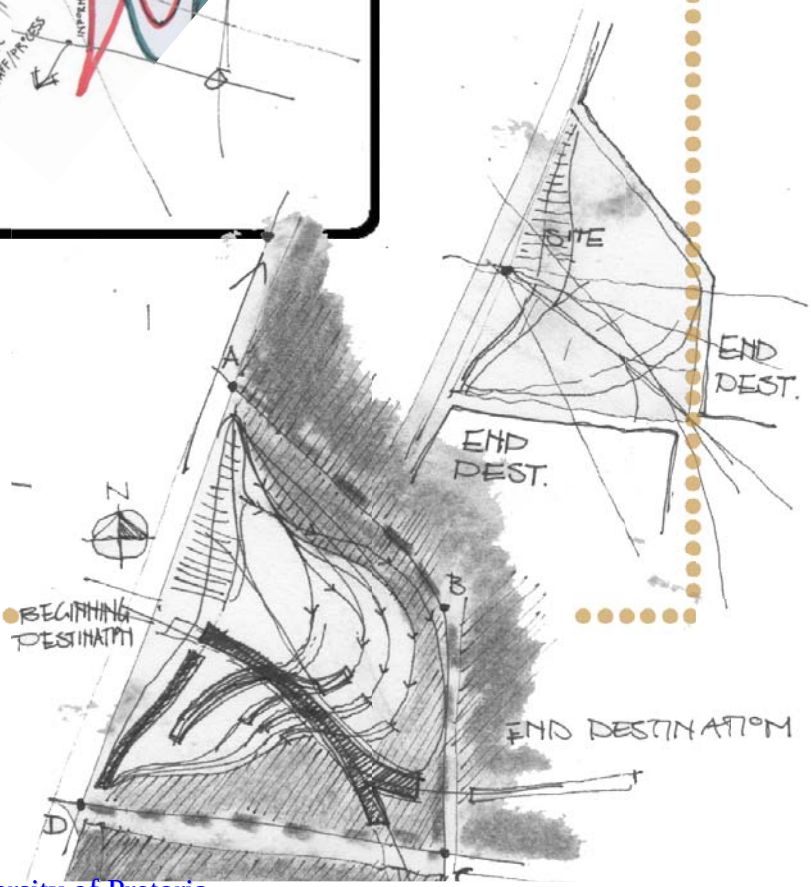

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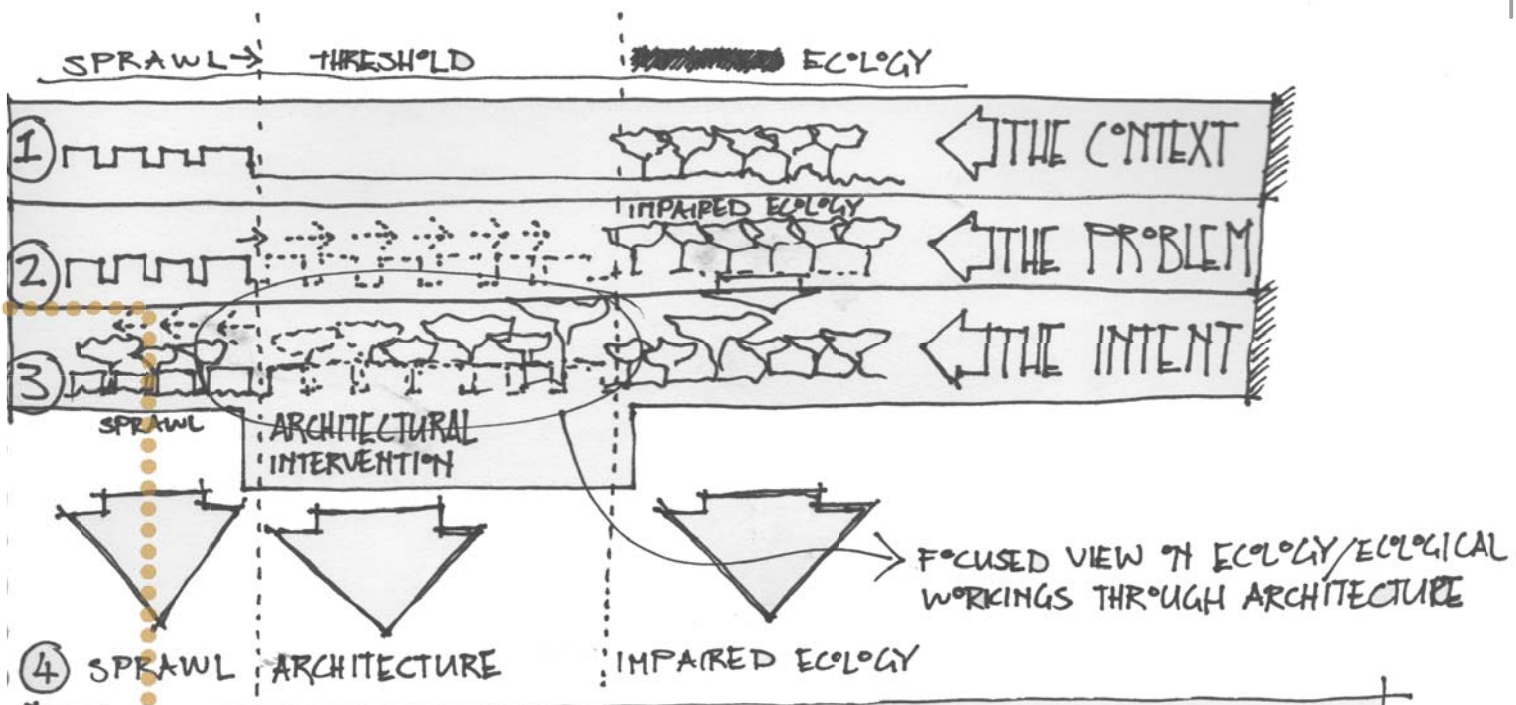
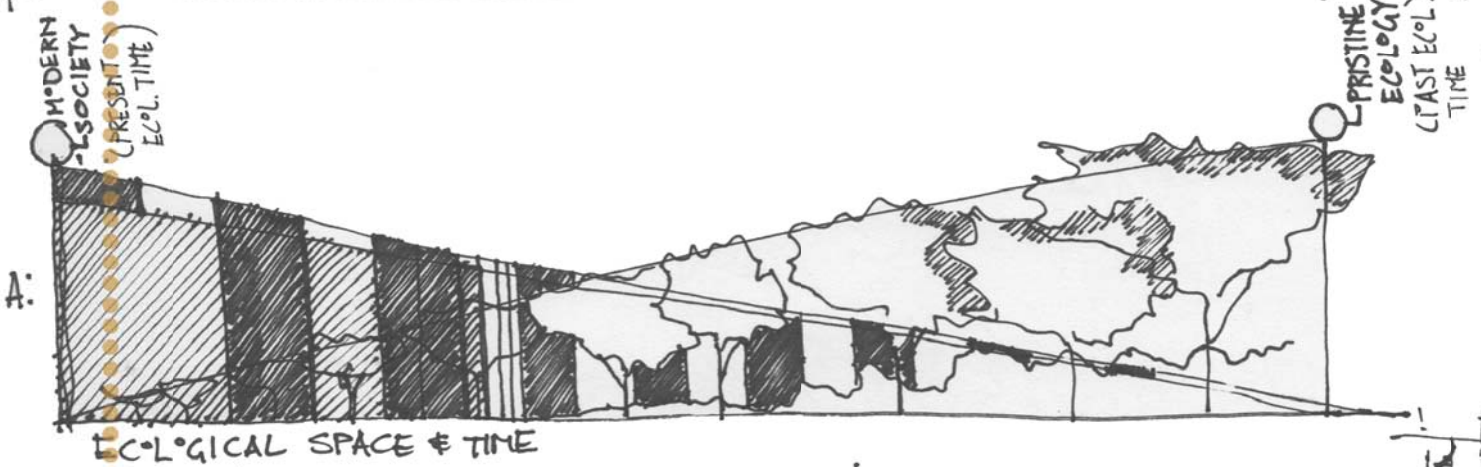
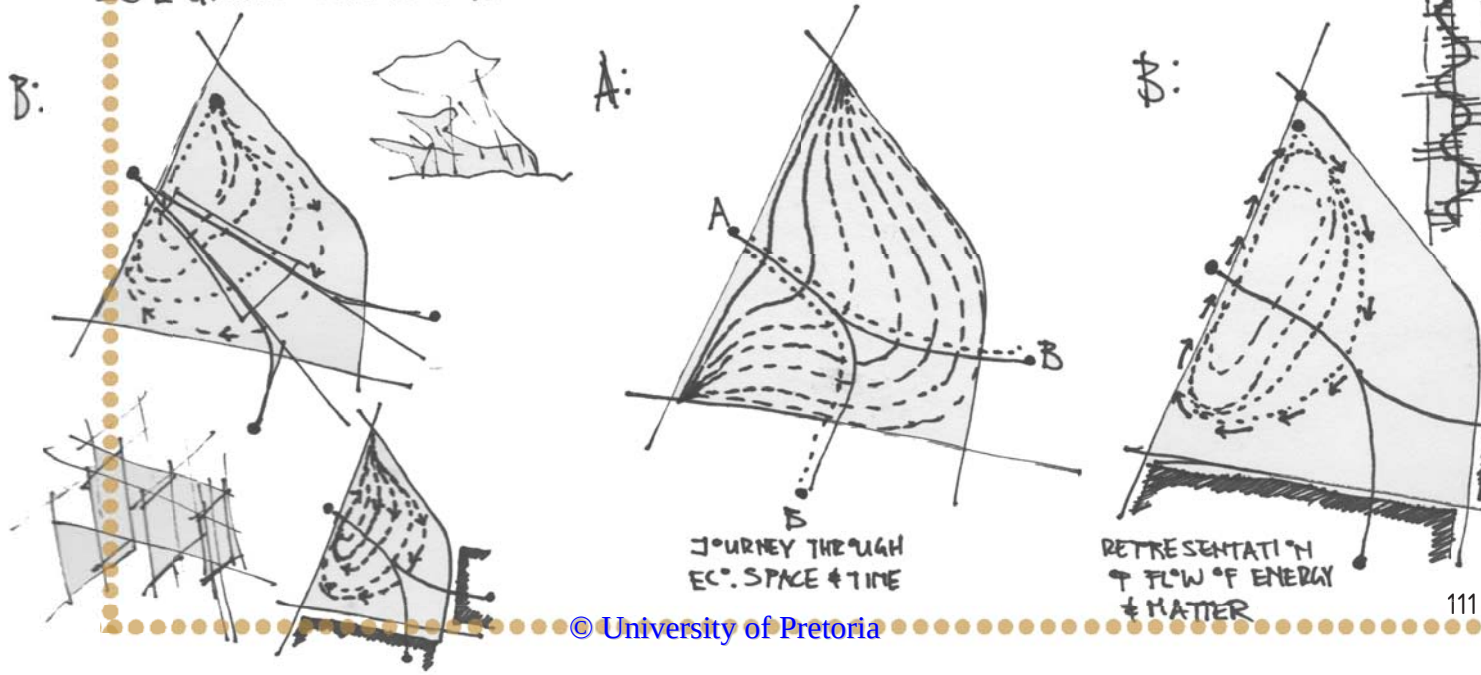


CONCEPT: A: AN EXPERIENTIAL JOURNEY THROUGH ECOLOGICAL SPACE & TIME

AND/OR

B: AN ARCHITECTURAL REPRESENTATION OF THE FLOW OF ENERGY & MATTER EXISTING WITHIN AN ECOLOGICAL SETTING





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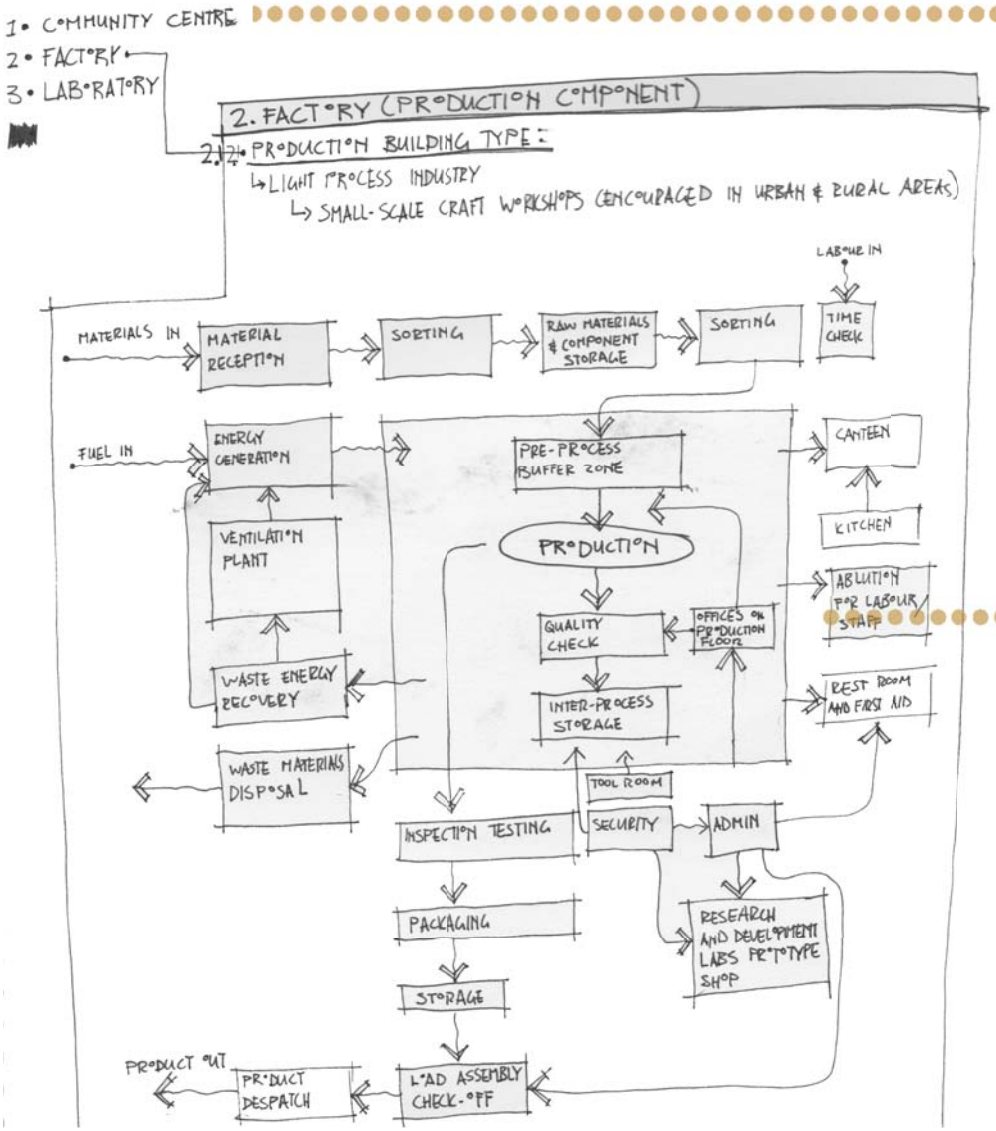
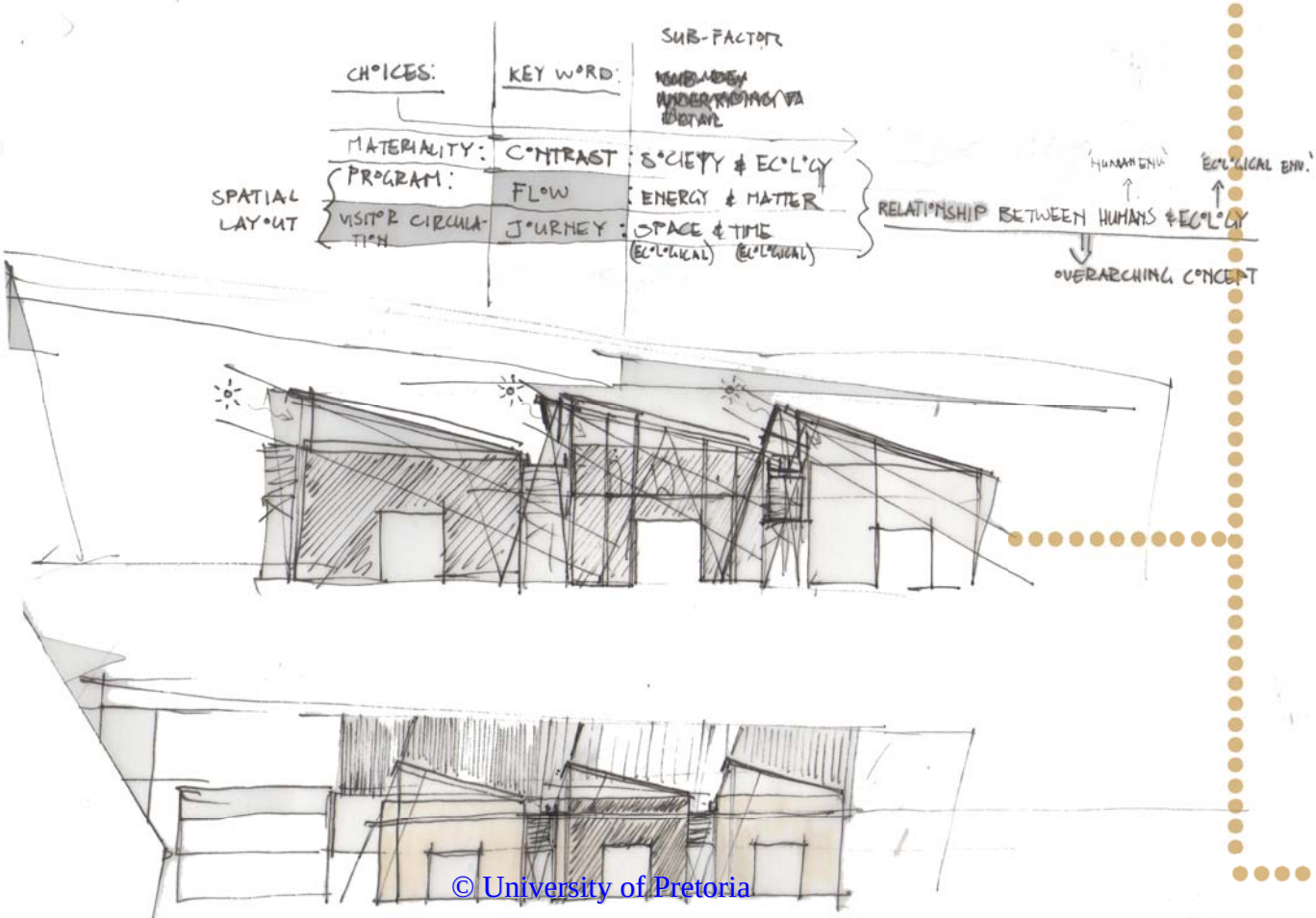
9_2_2
2ND SPATIAL LAYOUT:

Key initial concept:

The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':





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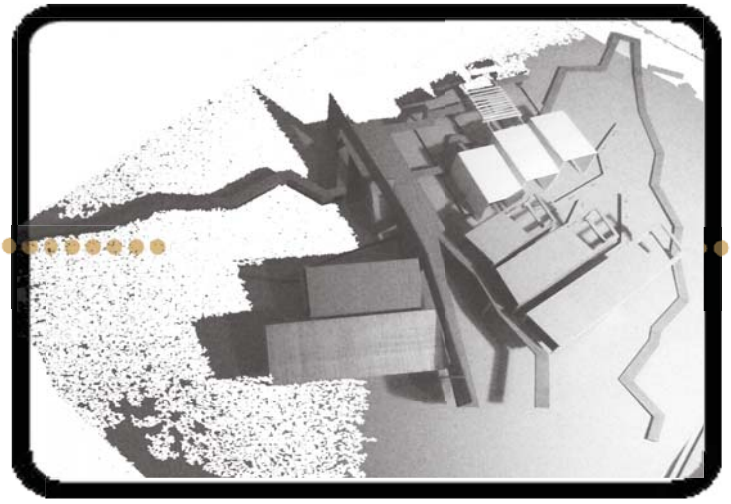

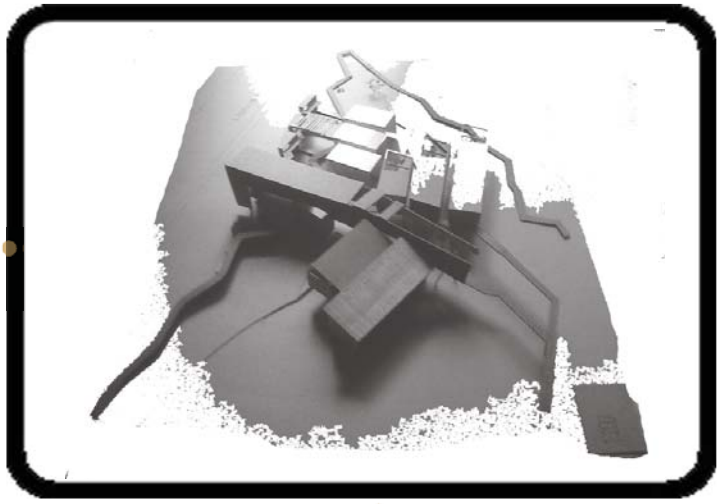

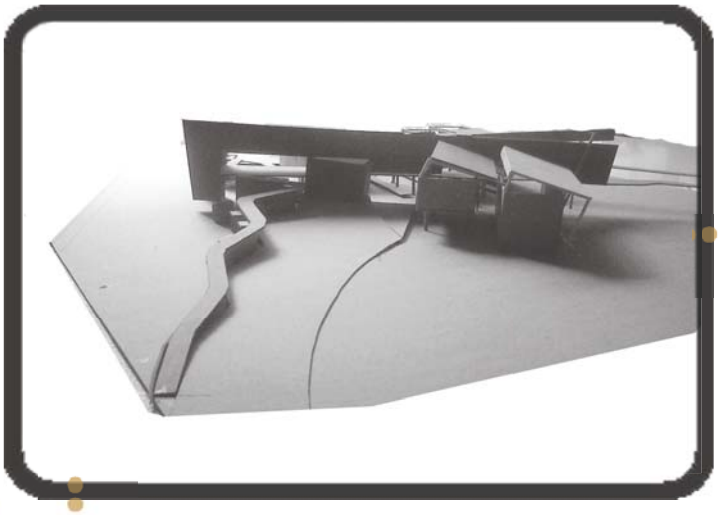

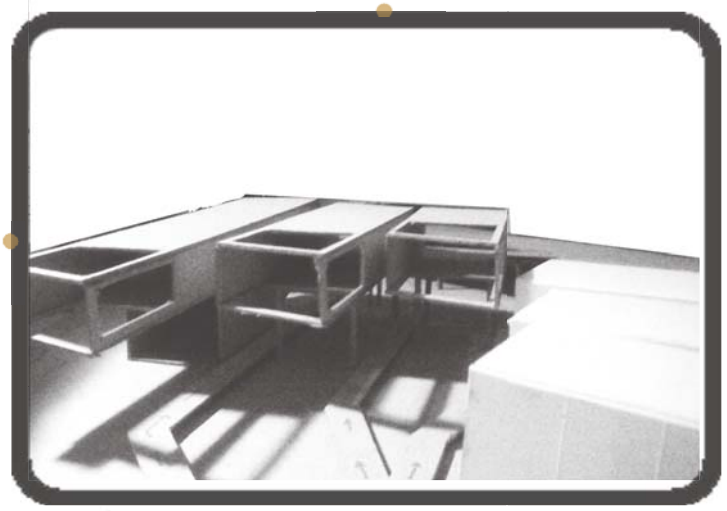

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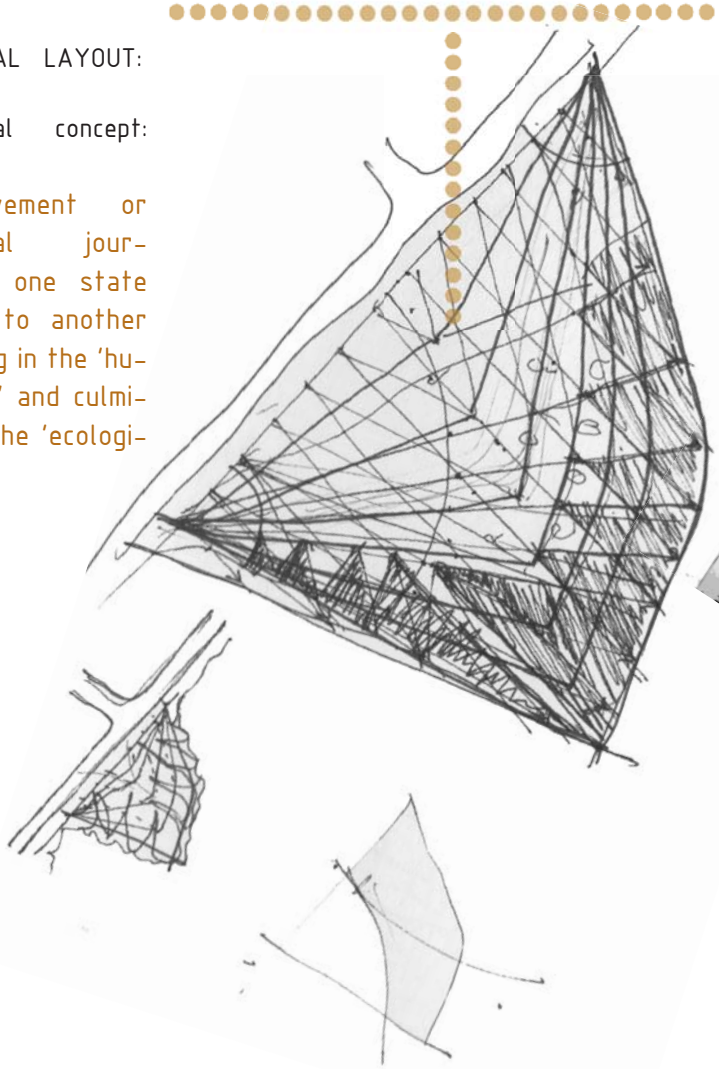
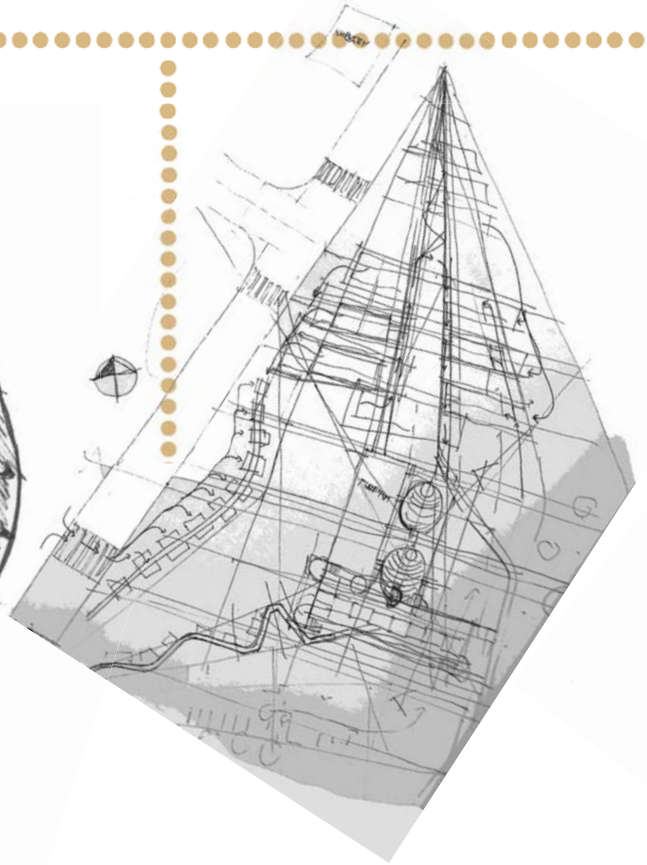
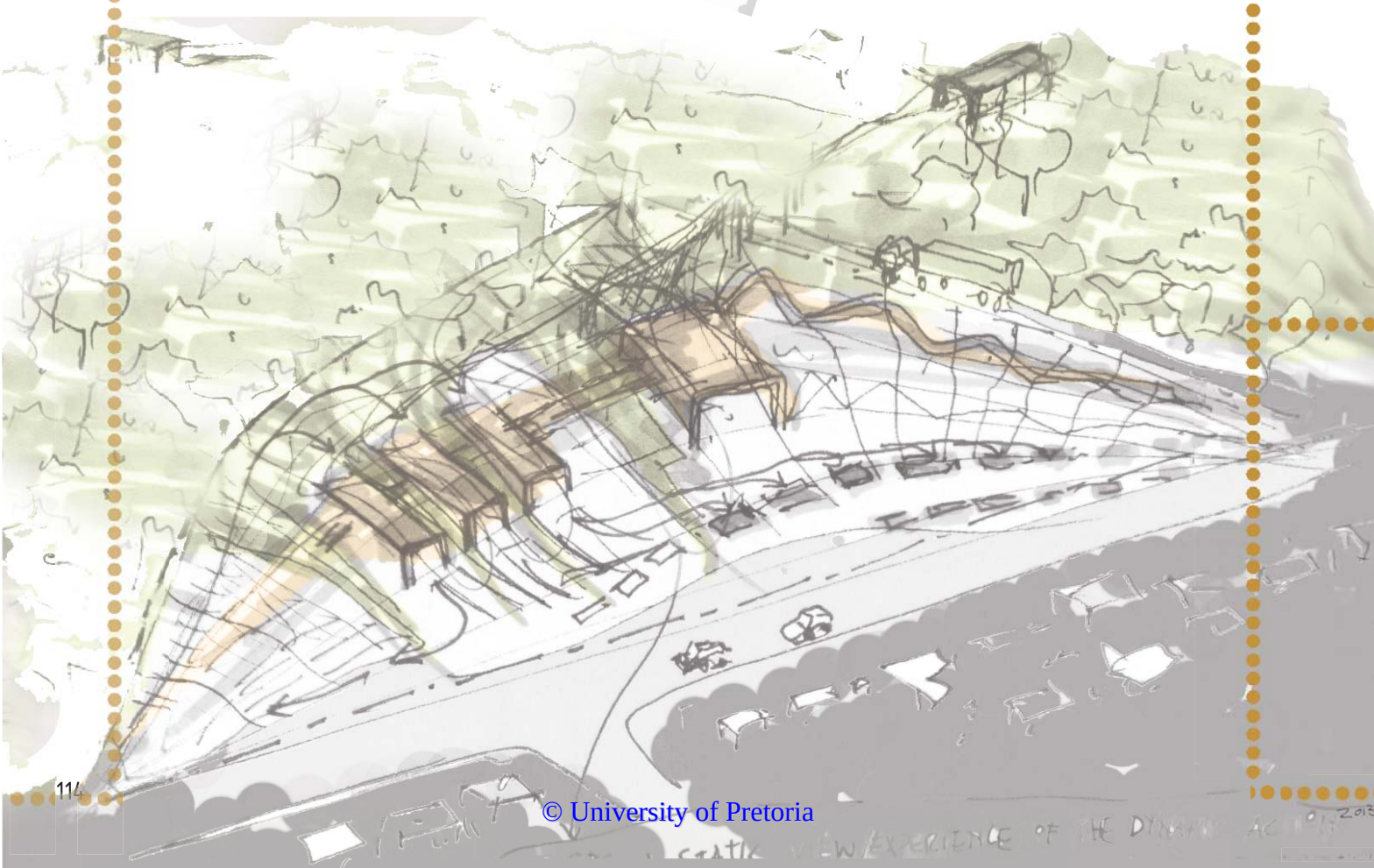
9_2_3
3RD SPATIAL LAYOUT:

Key initial concept:

The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':







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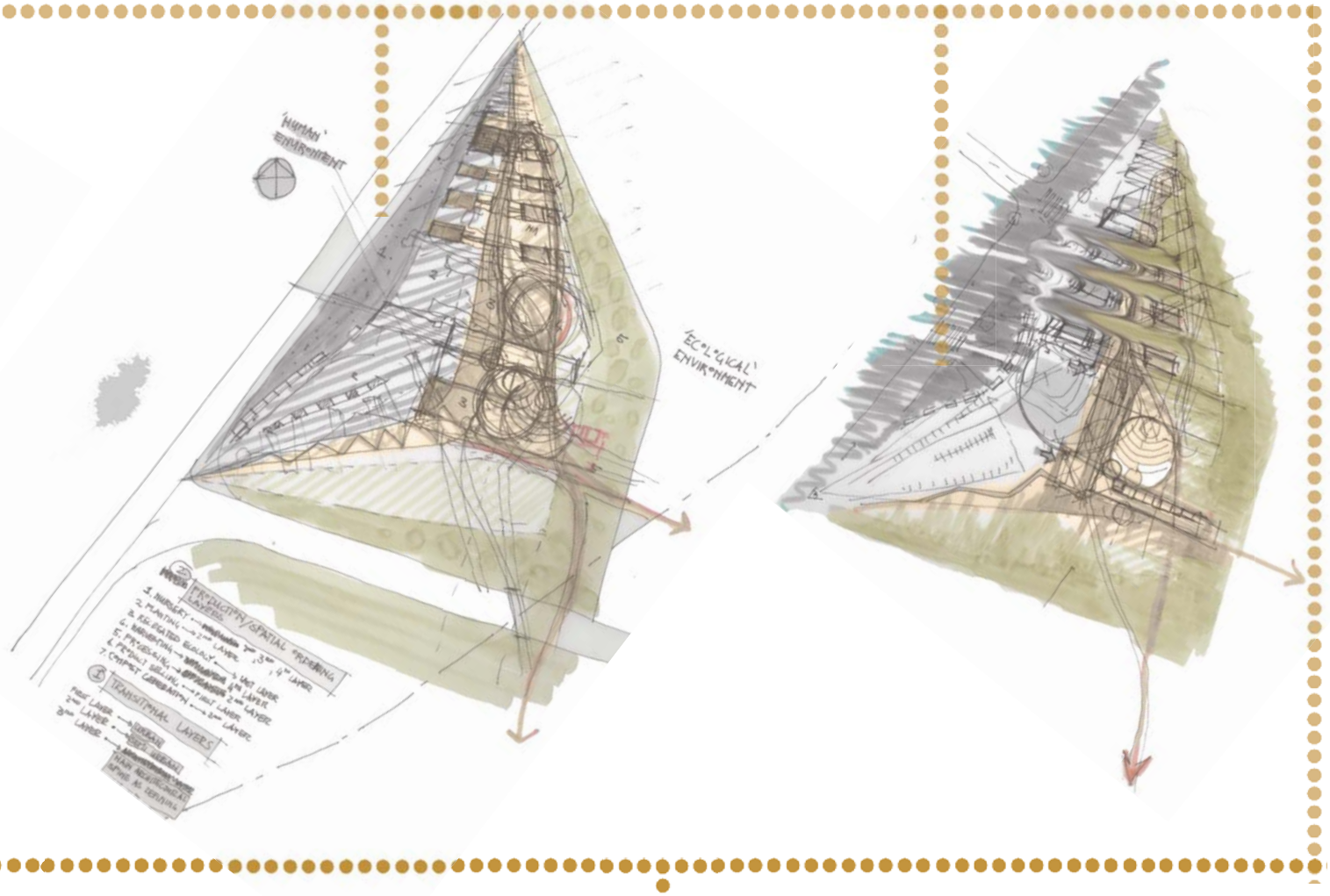

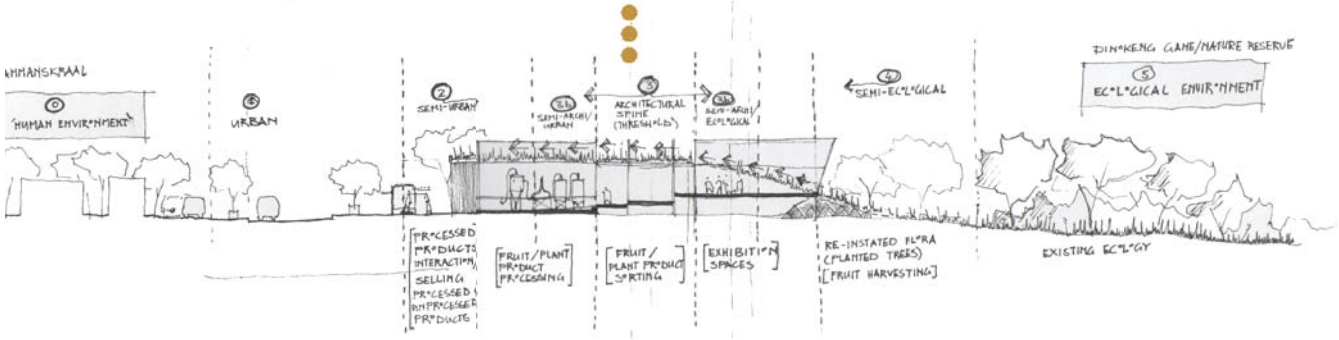

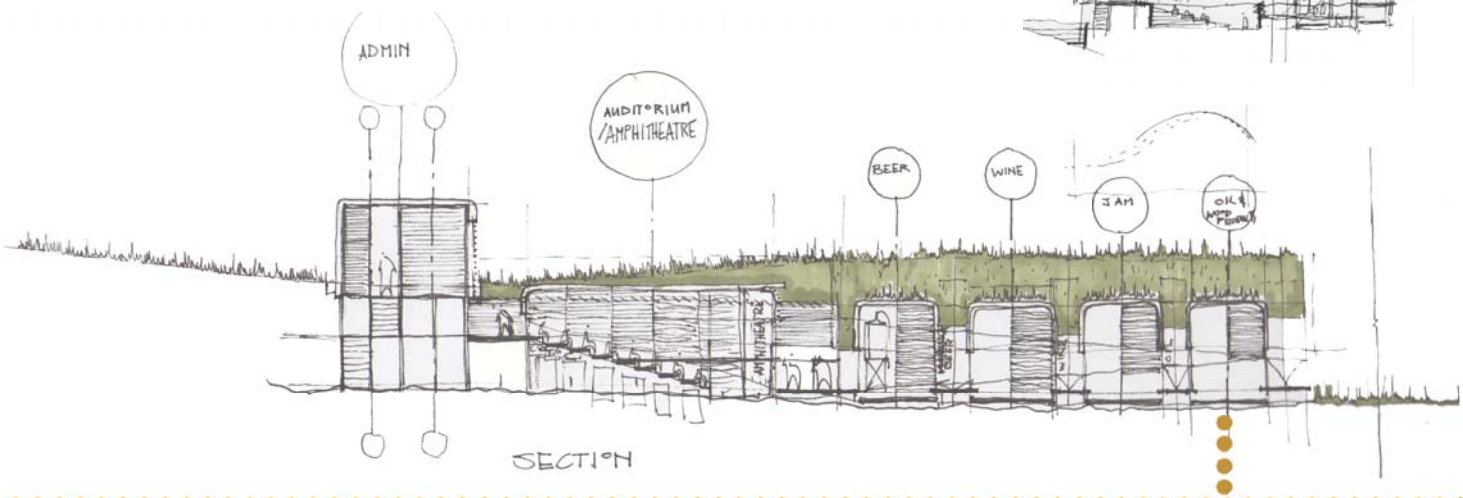

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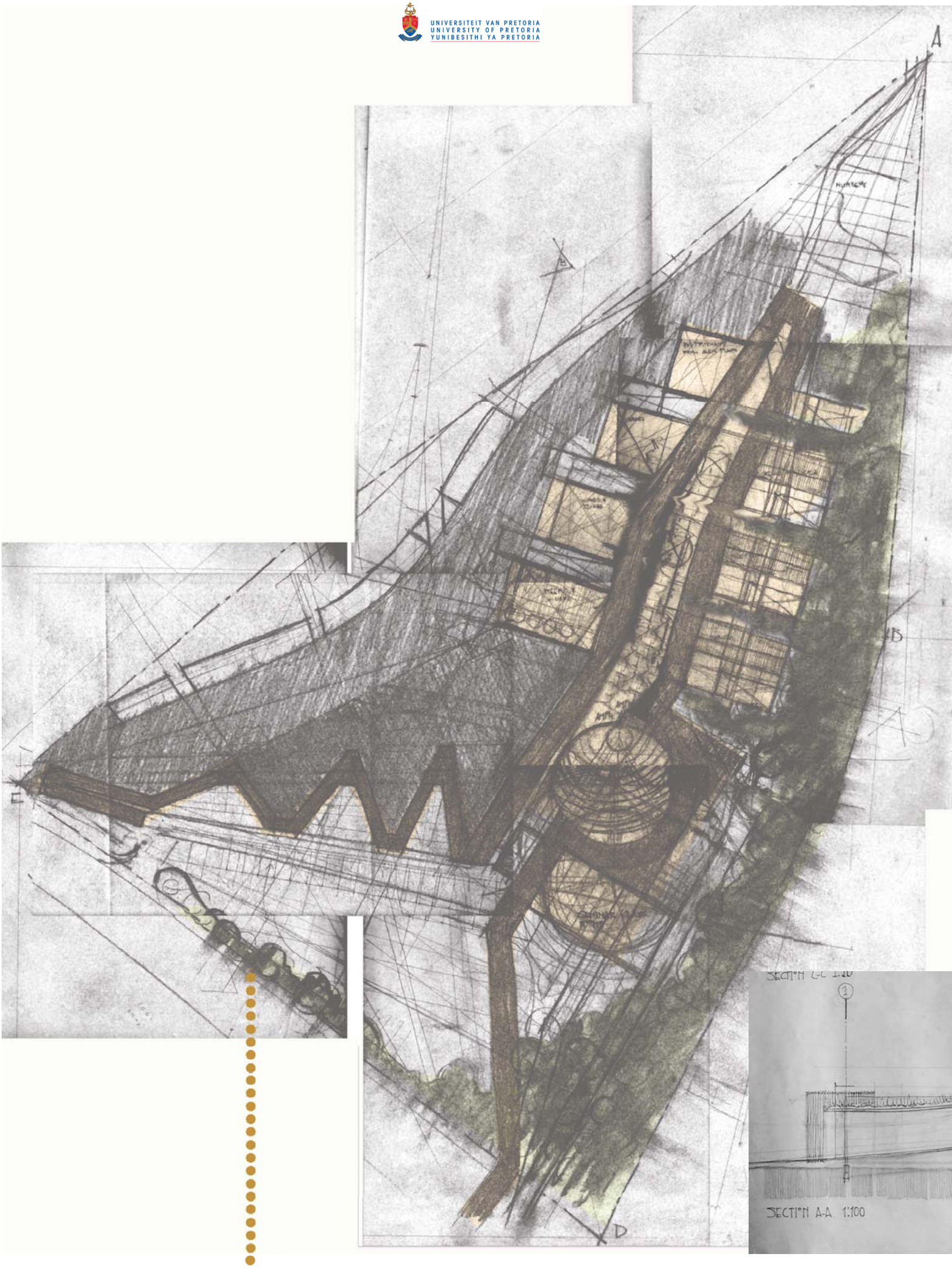

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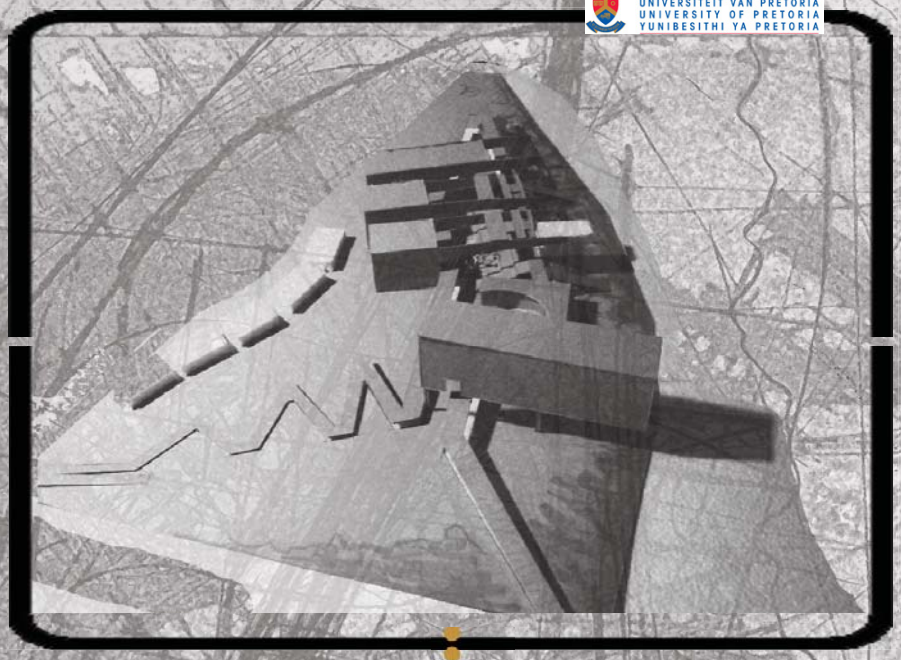

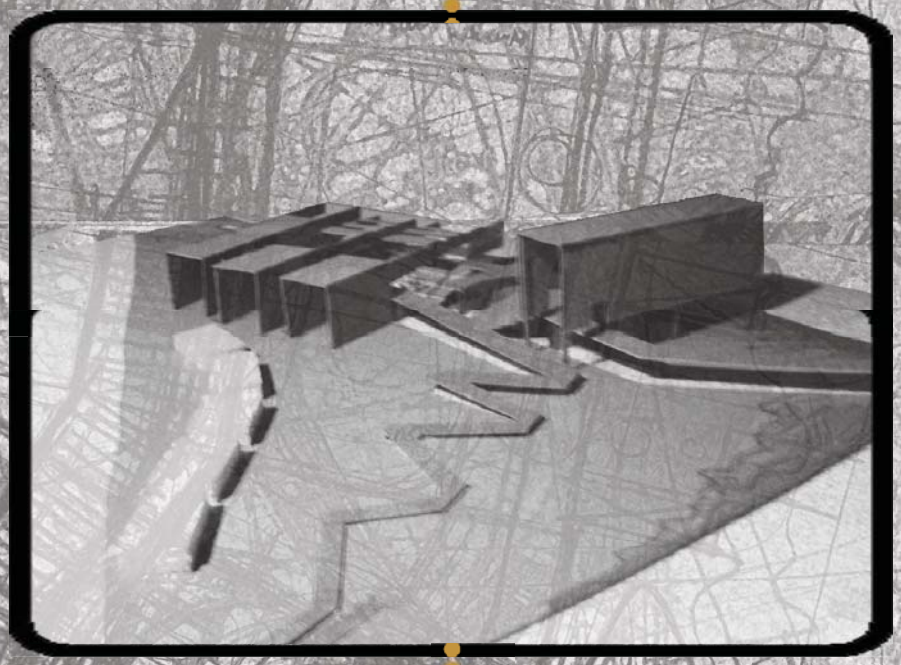

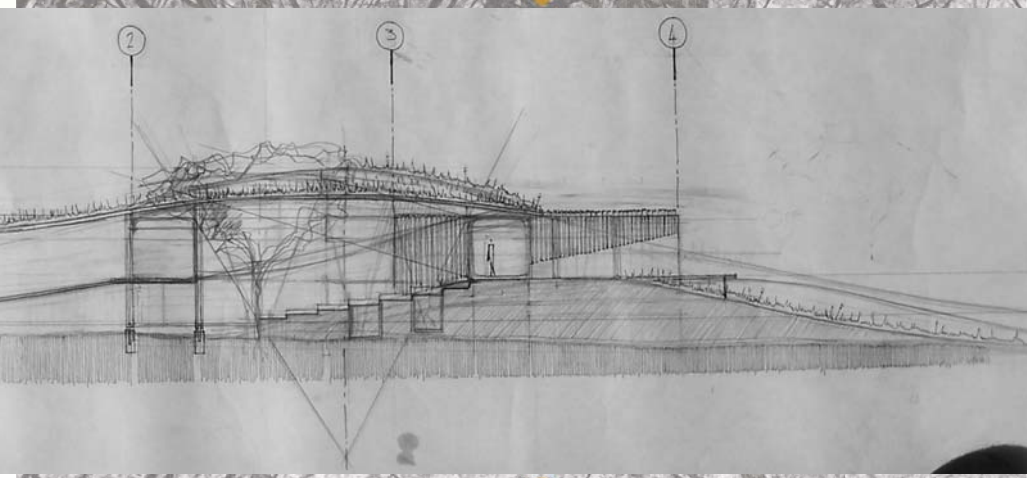

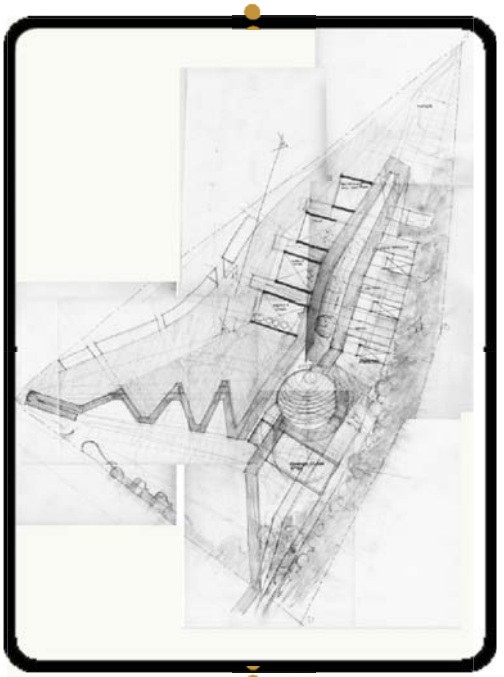

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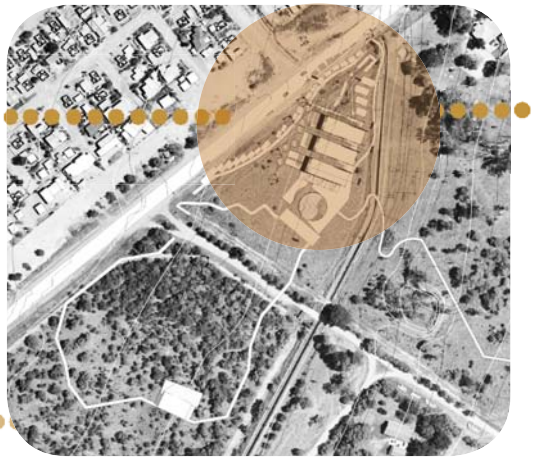
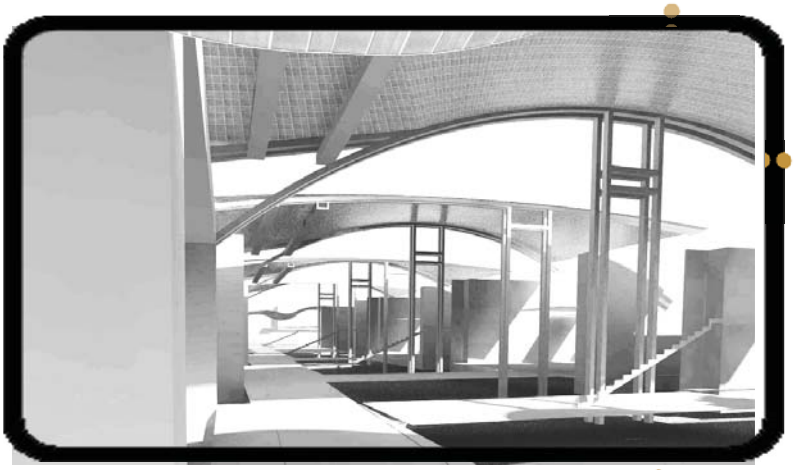
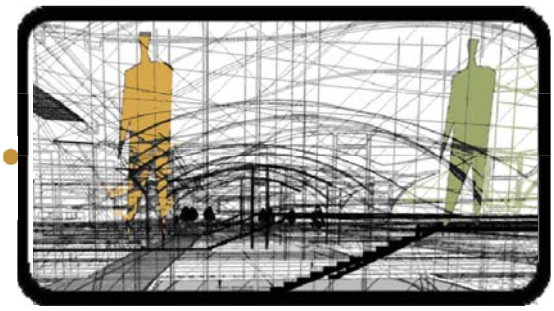
9_2_4 4TH CONFIGURATION:

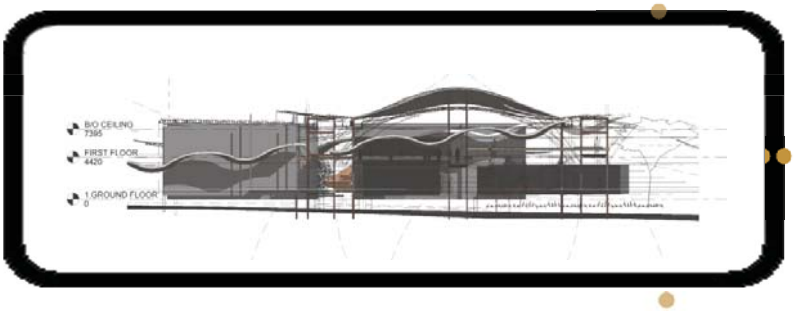
Key initial concept:

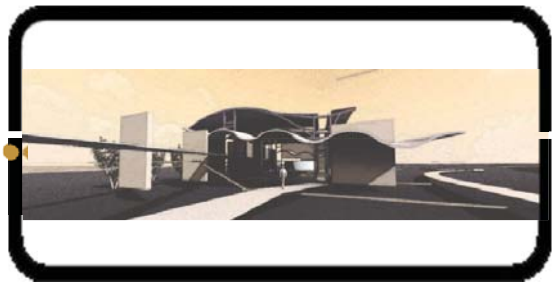
The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':

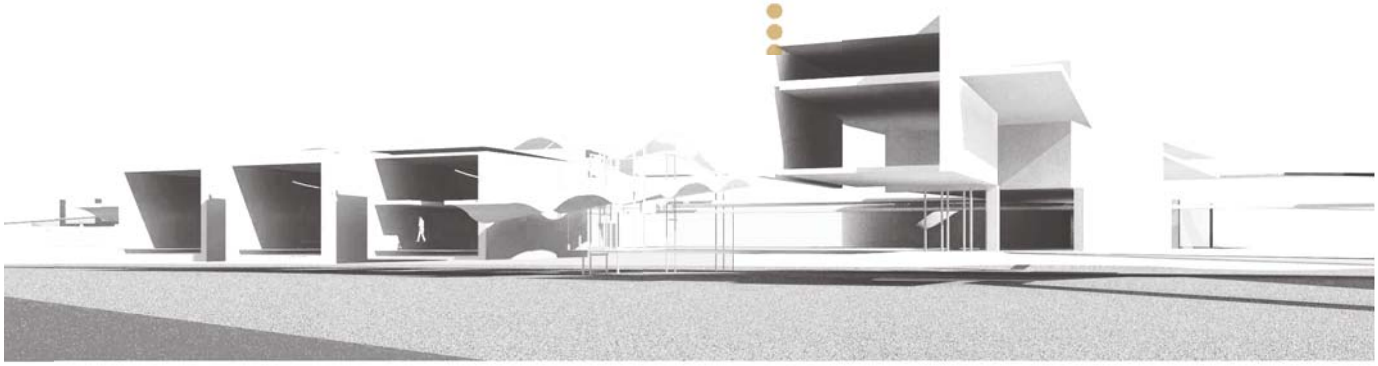












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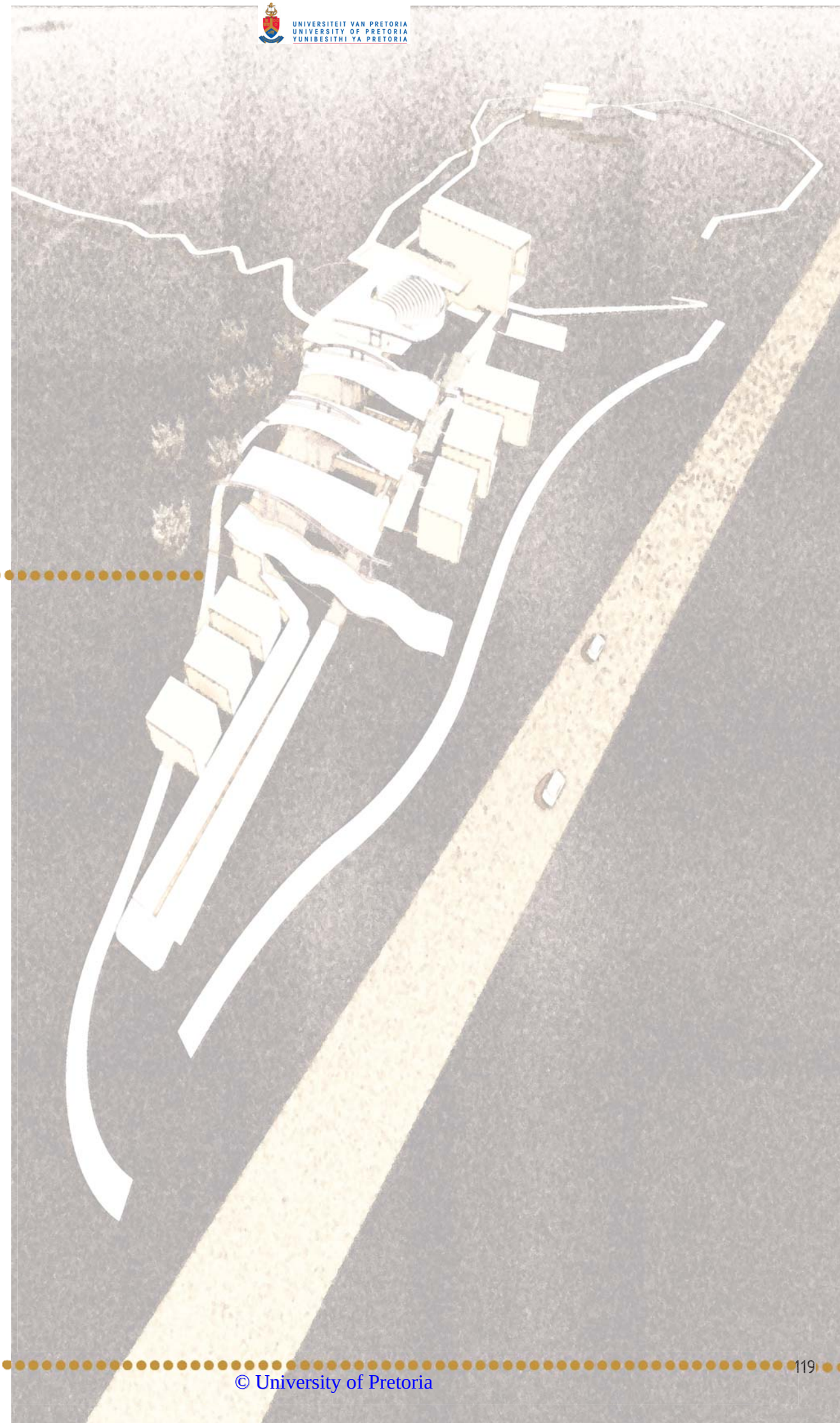

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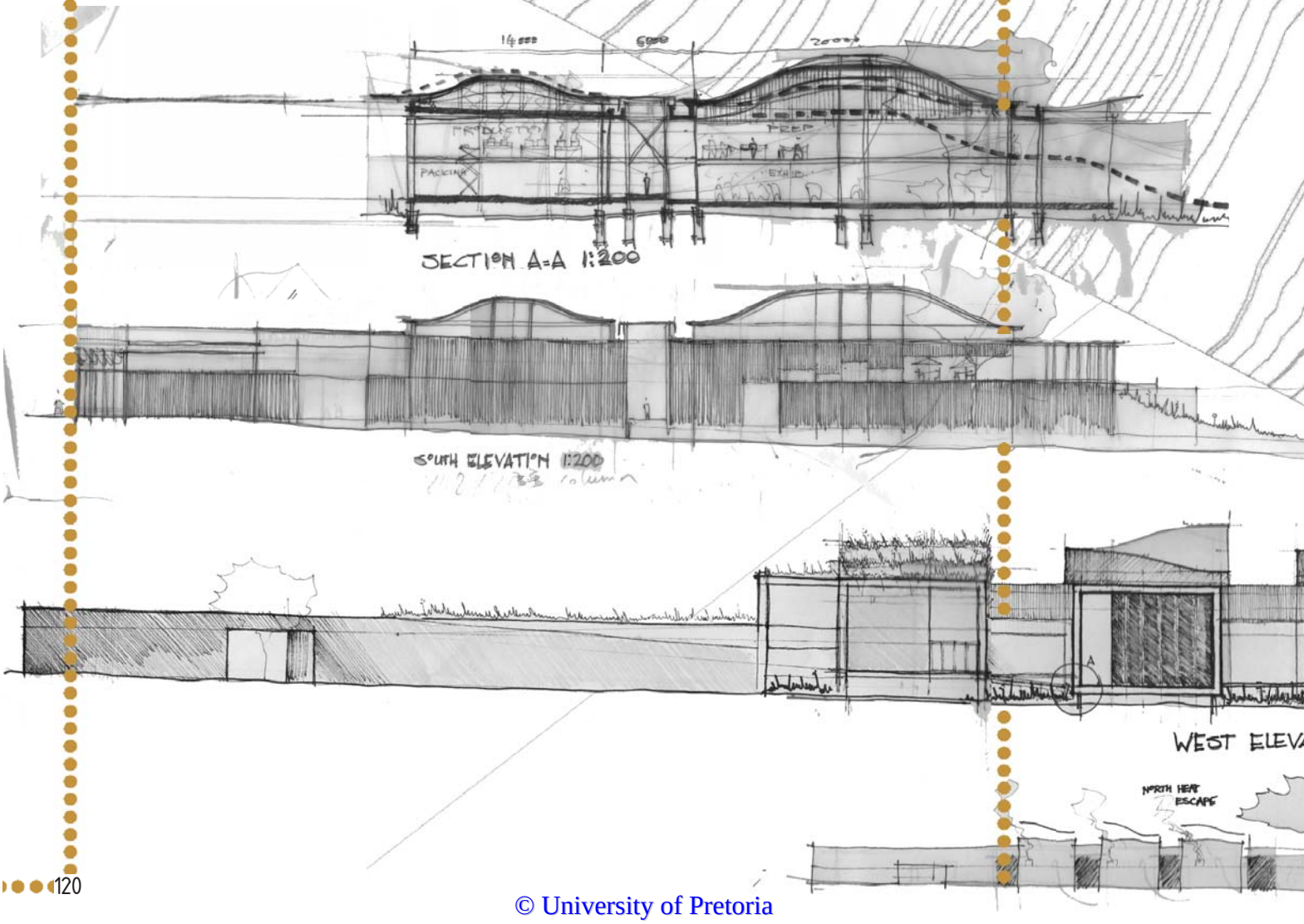
9_2_5 5TH DESIGN CONFIGURATION:

Key initial concept:

The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':



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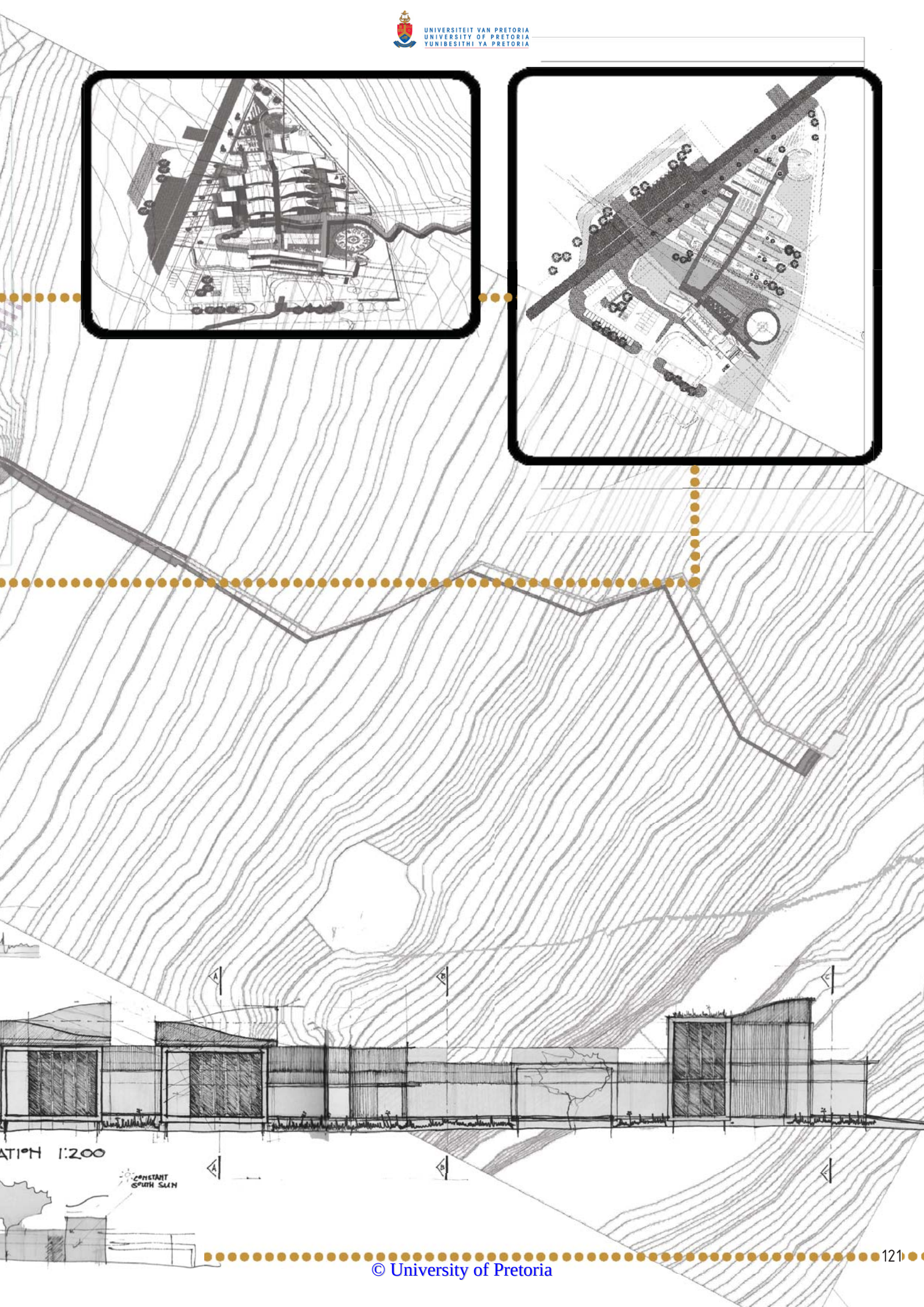

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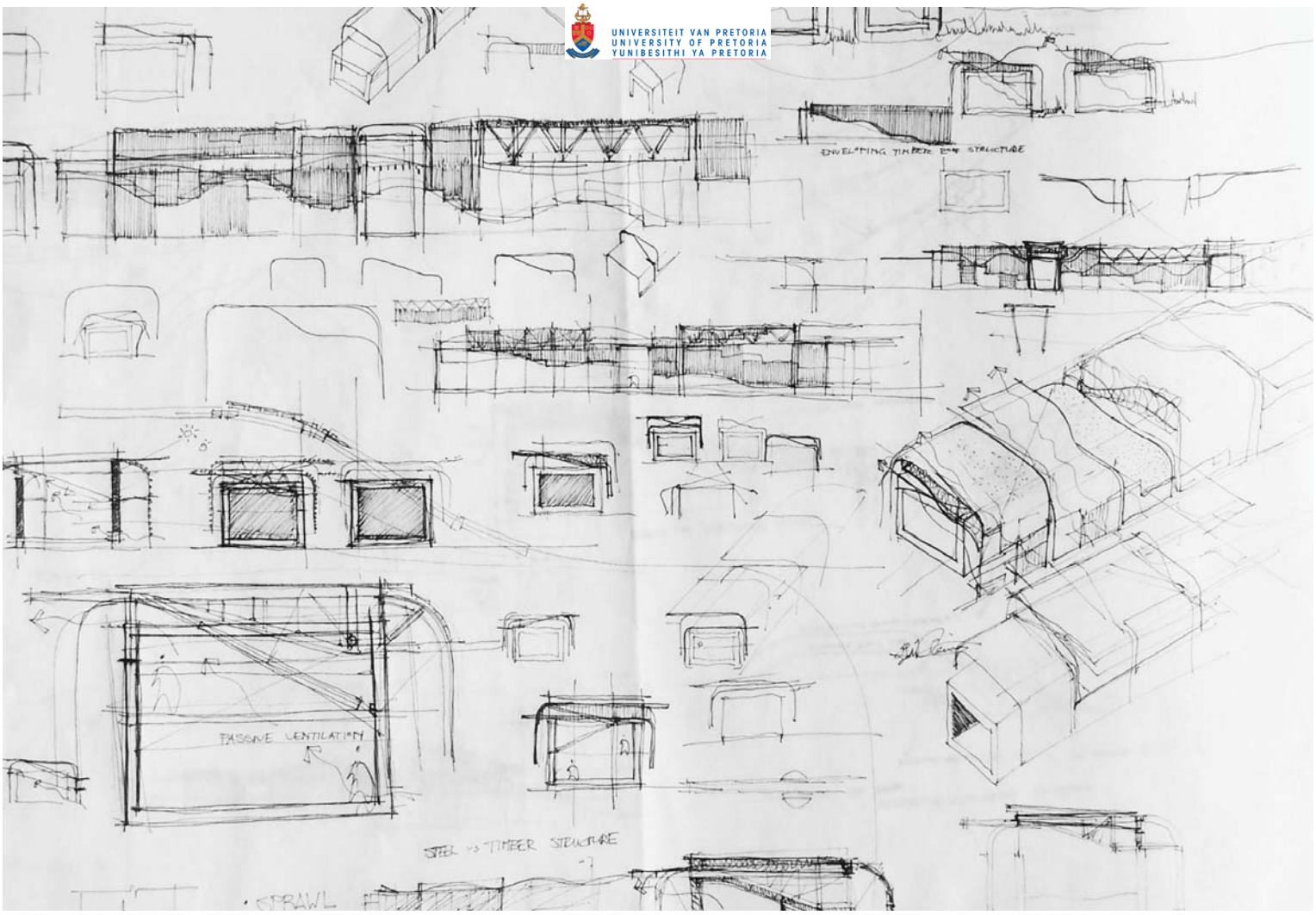

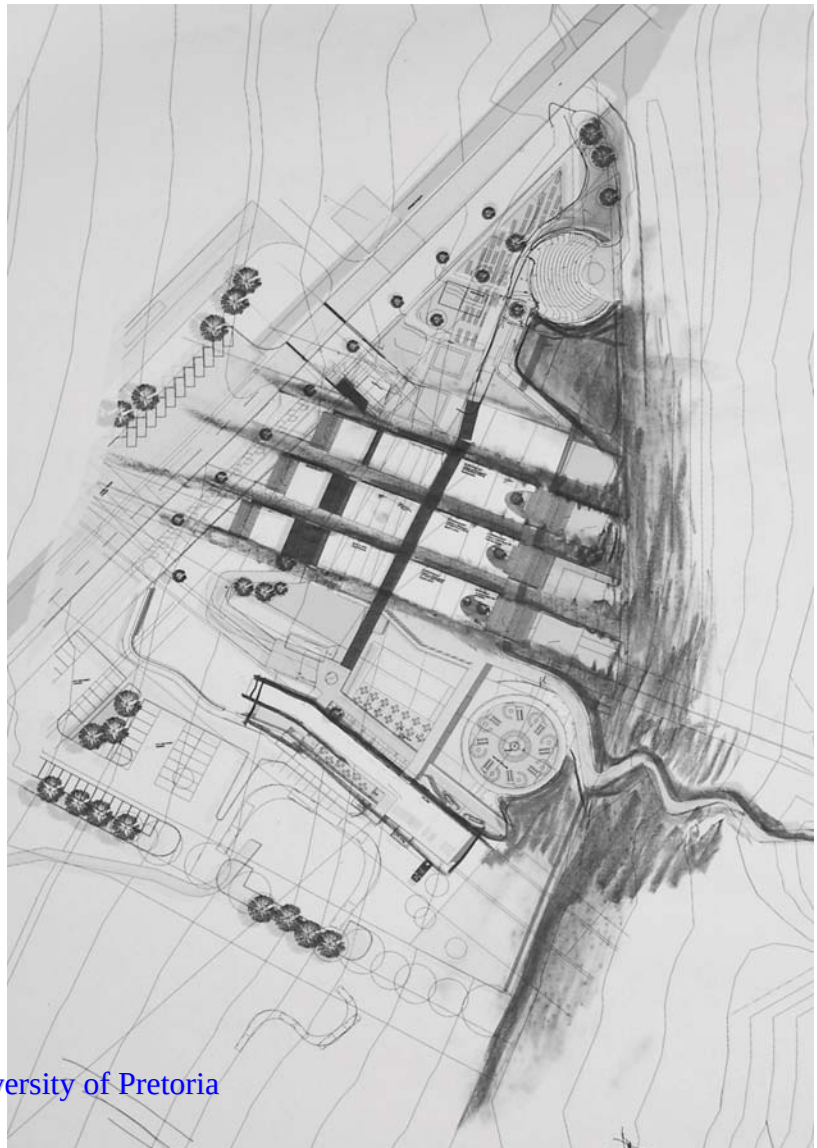

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VIEW ONTO INFORMAL MARKET-OUTBUILDING AND EXHIBITION HALL

FIRST FLOOR PLATFORM CONNECTED TO THE MARULA EXHIBITION HALL

INTERIOR OF EXHIBITION HALL

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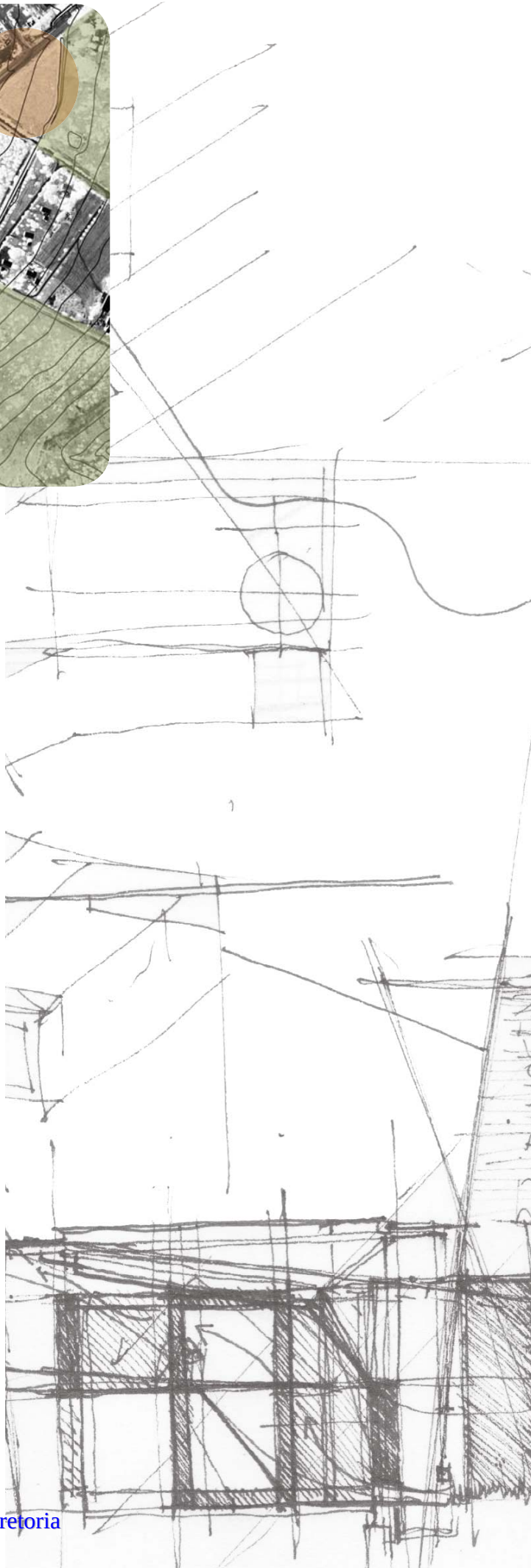
9_2_6 LATEST DESIGN:

Key initial concept:

The movement or experiential journey from one state or realm to another commencing in the 'human realm' and culminating in the 'ecological realm':

9_2_6 LATEST DESIGN:

In response to the latest concept the relating design can be identified as a phenomenological exhibition of the relationship between man and nature as expressed through architecture while the overall intent that encapsulates the general design is for the architecture to exemplify a negotiation between man and ecology. The section of the design which houses the exhibition sector as main program collectively indicates this concept. First, there's the rigid, linear mass protruding from the human environment towards the ecological environment signifying the current tendency of the former to encroach onto the latter. Secondly the more fluid and organic ecology retaliates by wrapping, even flowing over this dominating linearity (indicating its reactionary encroachment) into the human realm. These two opposing forces, expressed in form, are in turn intersected perpendicularly by pedestrian movement entering on ground level while the programmatic functions take place above. The ensemble of buildings on site in its entirety is rhythmically interrupted by slits or slithers of open space that cut through the site and extends from one realm to the other. This communicates the intent of the building to allow the ecological value to protrude back into the community as well as its inclination to momentarily break the dominance of the continuously built-form on the surrounding environment. Simultaneously it also ties in with the phenomenologically based design intent by strategically illuminating views out onto the landscape after momentary lapses of concealed dwelling. The play of light and dark, solid and void and contrast between connection and disconnection therefore come to a head through the implementation of this spatial/formalistic application. The way in which a visitor would experience the created spaces forming the main building and conglomeration of buildings on site is ordered as a journey. A: Entrance: Initial threshold (From Urban Environment) The journey already begins outside the site at the lead up to the building with the approaching visitor experiencing the first glance onto the site either from within a passing vehicle or on foot.



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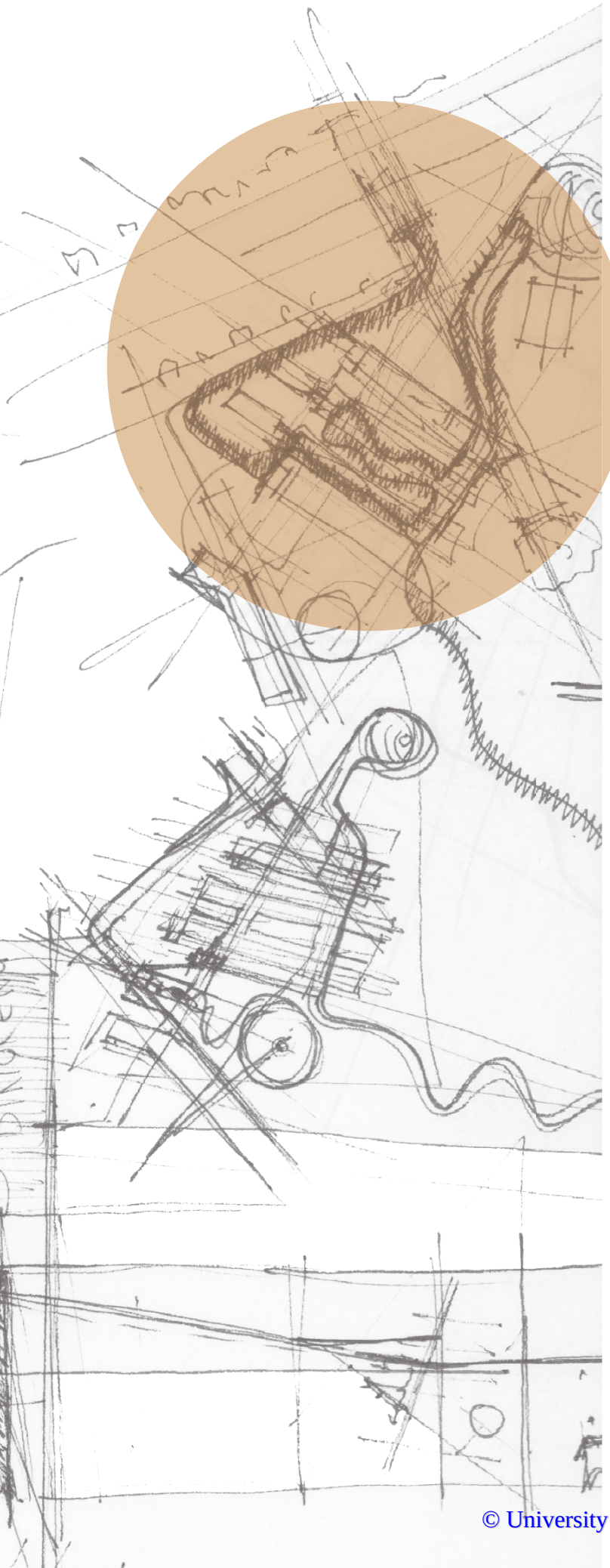

The view drawing the oncoming vehicle-based person into the site and focusing towards the main public gathering space is distinctly different from the one a pedestrian, whose focus would rather converge on the market stalls, would incur. Individual visitors can enter the site either through the main entrance or the restaurant lobby accessed from dedicated parking areas while tour groups will be directed through the main entrance gate. A succession of subsequent thresholds will follow at pivotal points along the journey.
B: Market space: (Semi-Urban E.)
At the first point of entry the visitor is confronted with the veld fruit's final cycle in its most refined and altered phase in the spaces allocated for selling the products produced from the fruit. The visitor is confronted by a choice of staying on ground level where the restaurant and day visitor facilities are located or persuaded towards the upper level by a variety of activities such as the beer tasting café, the zipline launch point or guided walk departure point. By taking the second option the visitor will move through a group of three enclosed exhibition spaces and educational gathering spaces before reaching these roofless destination points.

C: Checkpoint for guided tours through exhibition spaces: Second threshold

D: The exhibition spaces: (Connection between Urban & Ecological E.)
The visitor enters the exhibition areas on ground level and moves from one hall to the next along the central walkway that diverges into the various exhibition spaces on ground floor while all the while the various production processes in relation to veld-fruit takes place on a mezzanine floor above.

The observer is steered in this way to experience the disconnect between man and ecology as he/she enters these spaces. At exit point these two realms, as represented by the observing public and the production activities respectively, are on same level and in between entry and exit the gap continuously narrow as to imply the return of man towards ecological thinking. Each individual exhibition hall is divided into three main segments based on the fruit-related program and the various phases the fruit undergo while moving through these spaces. The western most segments (or left-handed portion at point of initial entry or segment closest to human realm) are allocated for production, the central segments are dedicated to the preparation of the fruit before entering into production and the segment to the far east (or segment closest to the ecological realm) shows the source or the fruit in its natural state (Semi-Ecological E.) the exhibition space works in the following way: exhibition panels plus live demonstration of ecological workings ...physically exhibiting the flow of energy and matter that resides in the ecology outside and In this way the building itself becomes in a way a living organism within the surrounding eco-system. As one approaches the upper exit level from the exhibition chambers the relation of open to closed or void to solid becomes increasingly larger until the destination point of complete openness is reached and a sensation of release from containment is realised.

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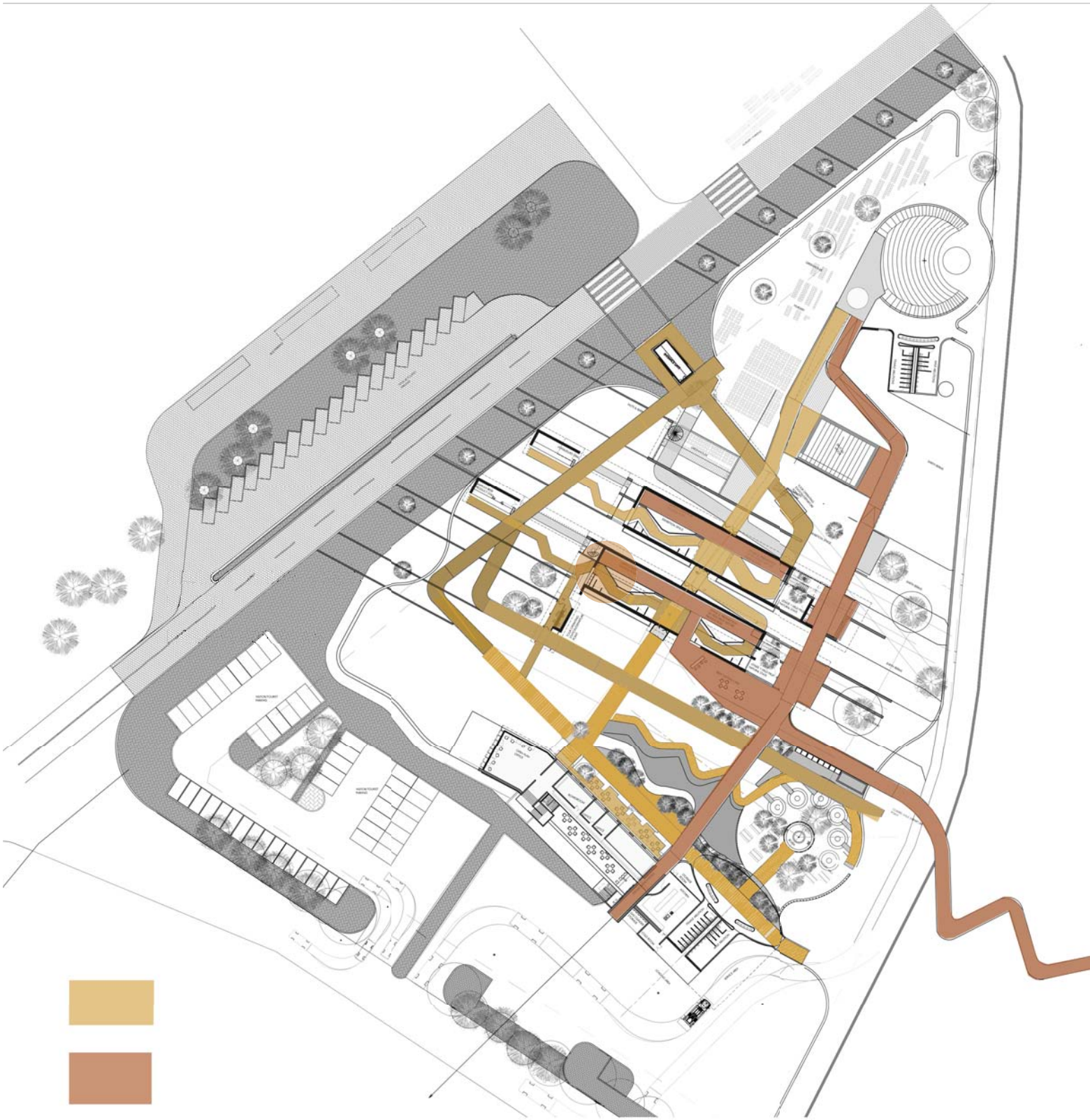

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(The exhibition of the actual production process will only be able to take place for as long as the fruit is available in the veld (summer months) and so the ideal time for tour groups to undertake a demonstrational tour would be in the December summer holiday when tourism activities surrounding Dinokeng would in any case be at a highpoint. Therefore the exhibition/ production spaces were designed to be adaptable for additional uses during off-peak periods.)

E: Lecture Hall & Amphitheatre:
The education component of this complex forms an important part of the overall program and the building is designed in such a way to accommodate a variety of different educational spaces ranging from the permanent lecture Hall and open air amphi-theatre to the spaces in the exhibition/production halls which serve as visual class rooms for student groups on 'veld-school' educational programs during off-season periods of the year when the veld isn't bearing fruit and production of products from fresh fruits isn't possible. (autumn, winter).
The amphitheatre has an additional purpose to serve as a community gathering space during community meetings since this for intervention is earmarked to receive a future community centre in the Tshwane Development Framework Document.

F: The admin block, restaurant and day-visitor centre:
Apart from the series of exhibition halls which forms an ensemble, this grid rhythm along which they're laid out is continued and picked up in the frontage of the administration building after an omission of two solid masses from this composition. This allows the seemingly loose components, separated by an open public courtyard space, to be tied together as a collective building complex.
Apart from administration facilities such as offices and a boardroom on first floor, this block hosts the public relaxation facilities such as the restaurant and day visitor picnic spot where wood from invasive species collected in the reserve can be utilised for braai purposes.

This added public gathering space acts as the secondary anchorpoint in-and finishes off-the building complex tying in with the circular geometry of the amphitheatre in contrast with the predominantly rectilinear geometries of the building esembly at large.

These seperate elements from A. to F. with their educational, experiential, informative and functional programs repectively, forms collectively an ensemble with a common purpose: To become an expression of architecture that ties into an existing ecological reality and responsively produce a subsequent one in return. One which not only serves as the basis for a new urban vision on the periphary of a wilderness context in terms of sociology and economy, but also induses dwelling on the periphary between man and nature with greater conciousness.
I.e. Architecture as a phenomenological expression of the relationship between man and nature.

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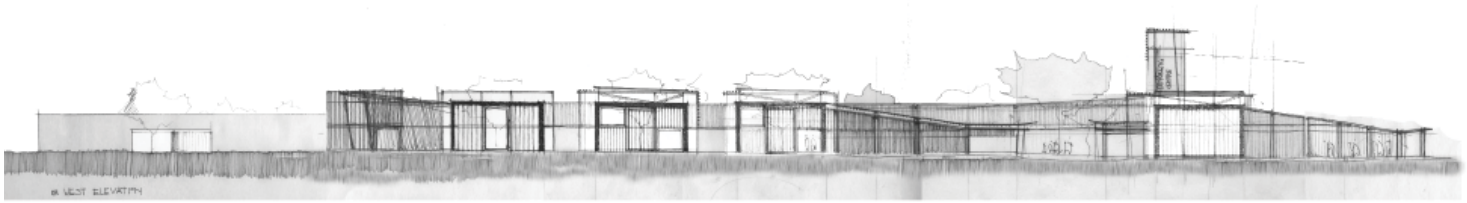
GROUND FLOOR PLAN



WEST ELEVATION

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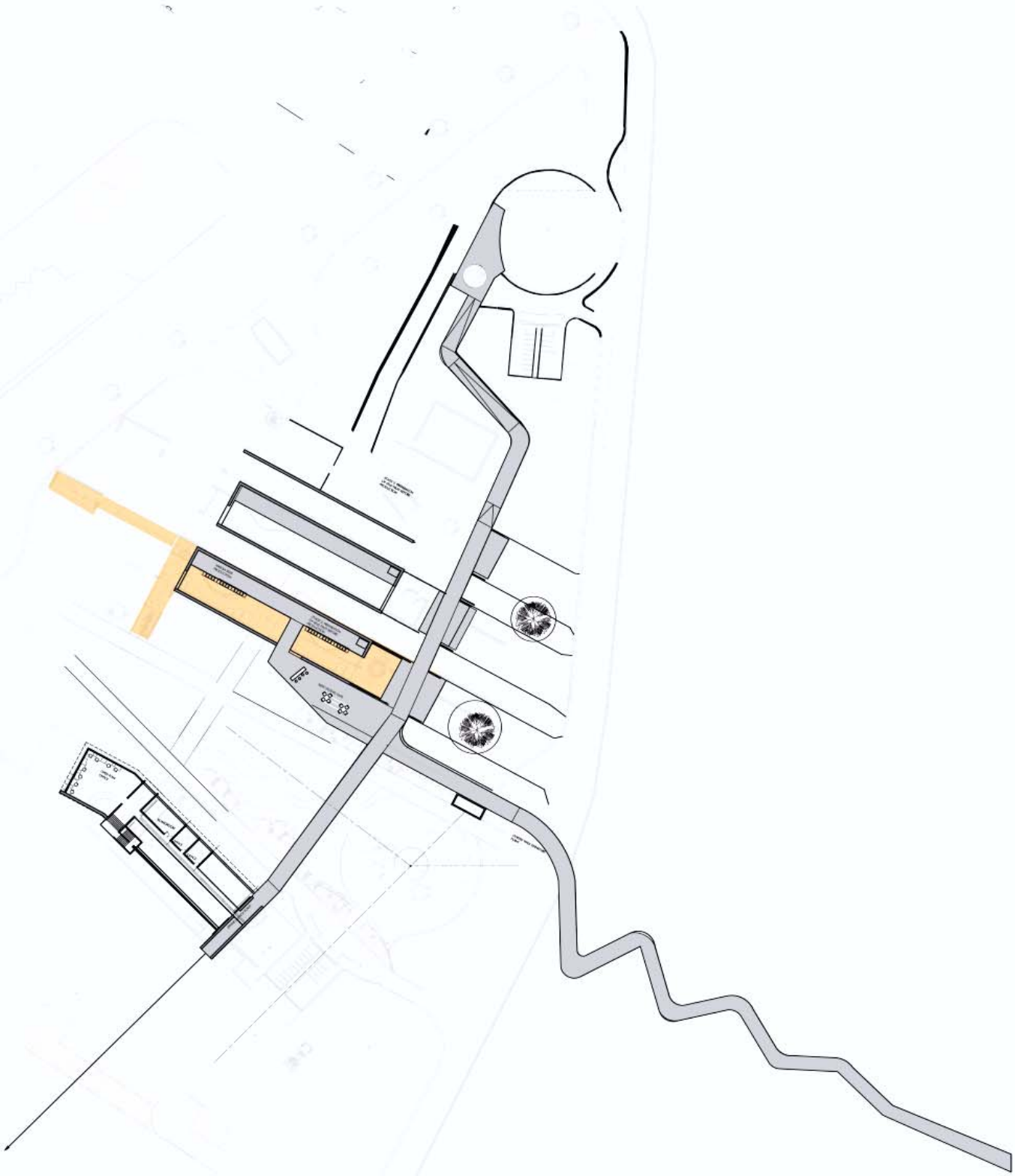

FIRST FLOOR PLAN

SECTION A-A

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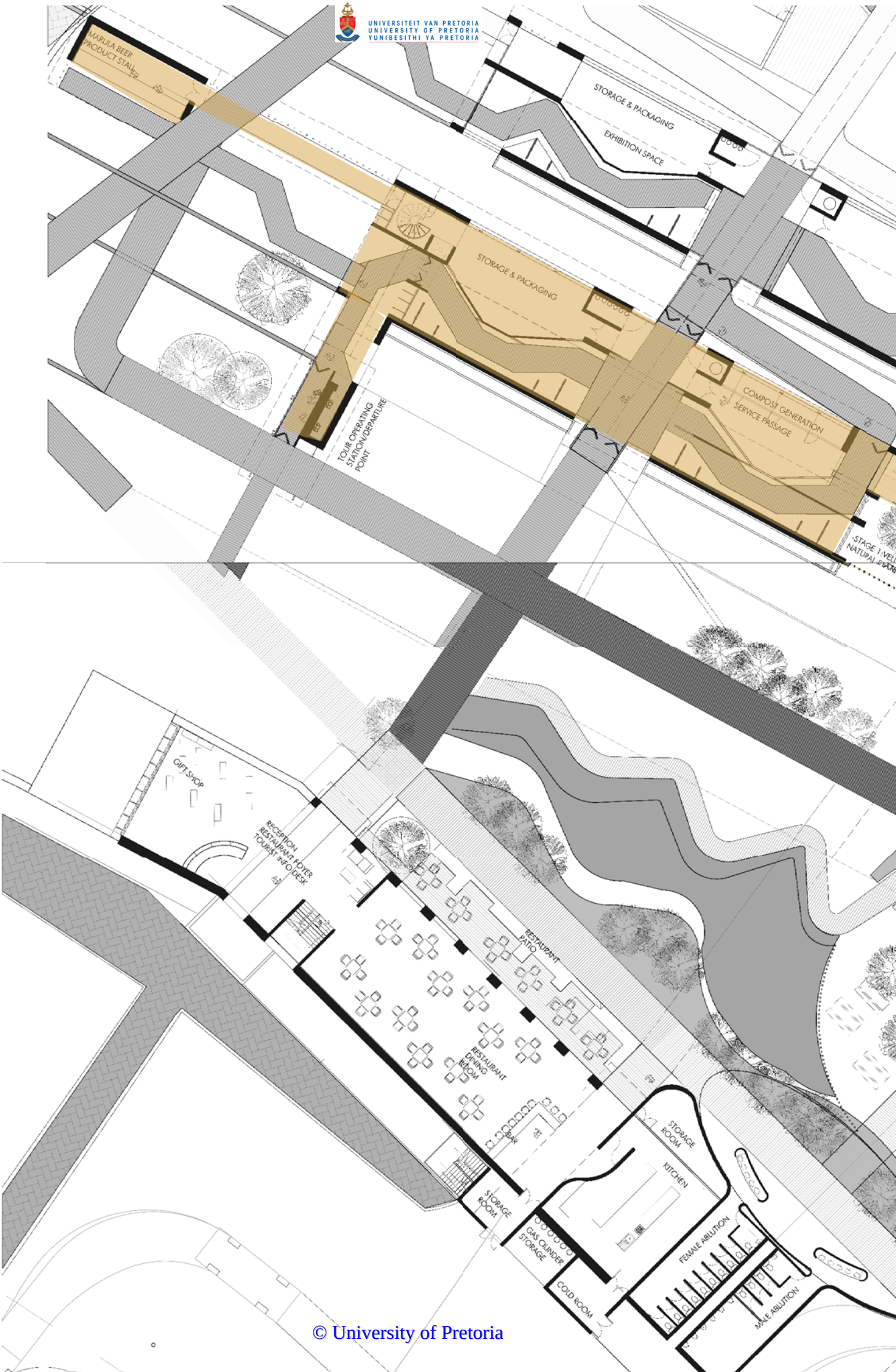

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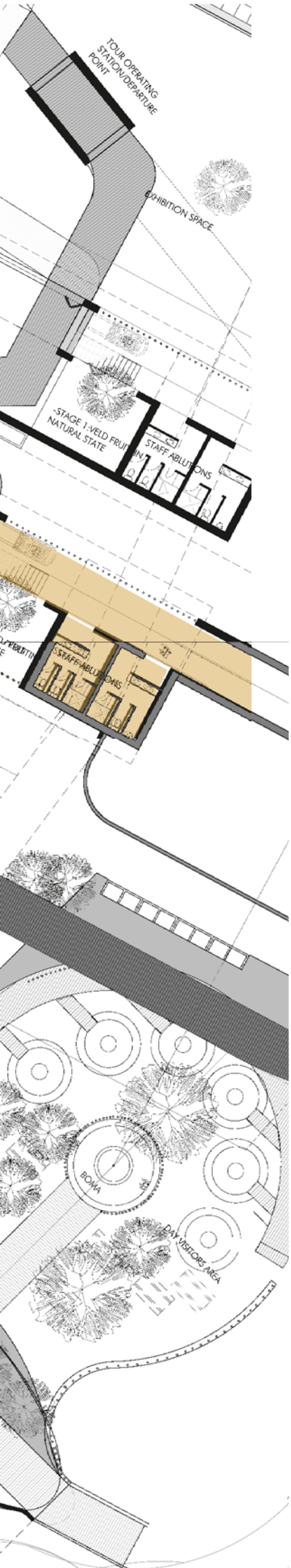

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SITE PLAN WITH INDICATION OF WALKING TRAILS CONNECTING TO BIRD HIDES ON PIENAARS RIVER AS WELL AS ZIPLINE TRACK LAUNCHING FROM 1ST FLOOR VIEWING PLATFORM AND CULMINATING IN VEGETATED PART OF THRESHOLD SITE

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6 THE PROGRAM
7 CONCEPTUALISATION
8 PRECEDENT STUDIES
9 DESIGN DEVELOPMENT
10 LATEST DESIGN DRAWINGS

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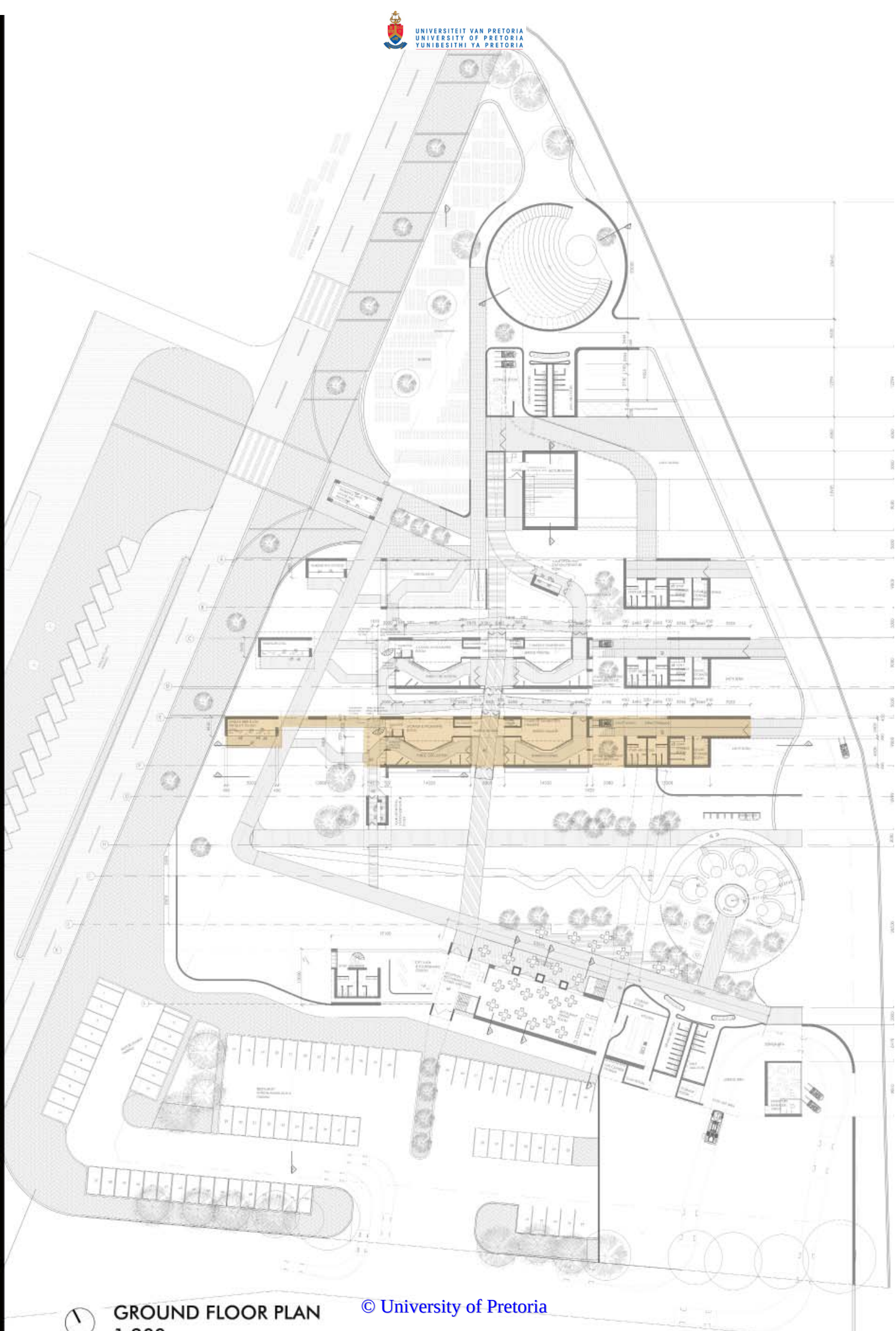
DESIGN RESPONSE



GROUND FLOOR PLAN
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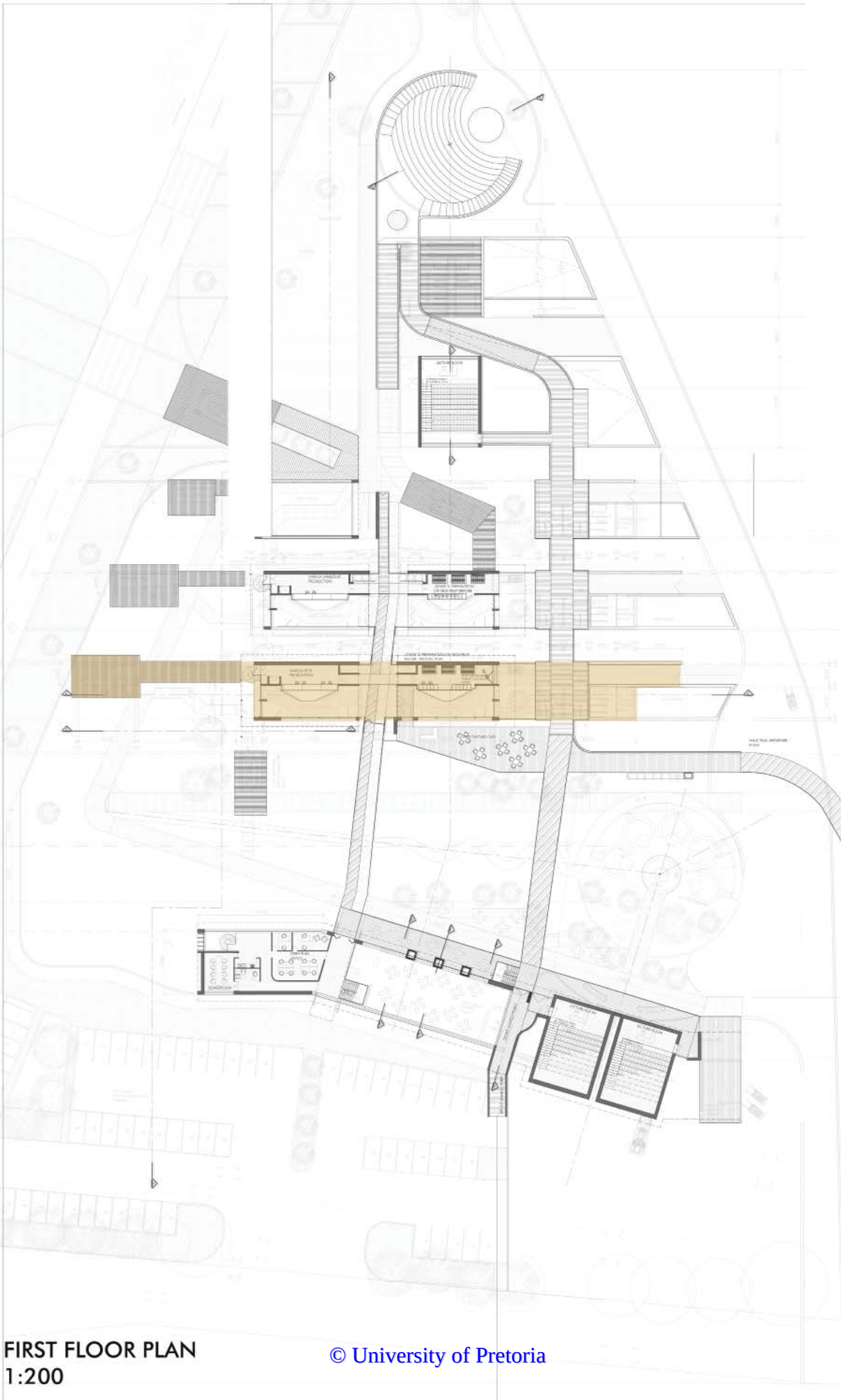

FIRST FLOOR PLAN
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PROGRAM SEQUENCE BASED ON NATURAL RESOURCES (ECOLOGICAL SERVICES)

RESOURCE PHASES:

- SOURCE STATE (TREES)
- HARVESTED STATE (FRUIT)
- BIO-DEGRADING STATE (COMPOST)

PROGRAM PHASES:

1. NURSING PHASE IN GREENHOUSE
2. OUTDOOR NURSING PHASE (NURSERY)
3. PLANTING OF INDIGENOUS TREES & HARVESTING RIPE FRUIT IN HUMAN COMMUNITY(HAMMANSKRAAL) AND EXPERIMENTAL SEMI-ECOLOGICAL BUFFERZONE SITE RESPECTIVELY

3b. DROP-OFF POINT FOR FRUIT HARVESTED IN SETTLEMENT

4a. FRUIT FROM VELD HARVEST UTILISED IN RESTAURANT KITCHEN

4b. WASHING AND PEELING OF FRUIT AND SEPERATING USABLE FROM UNEDIBLE (PRODUCTION/EXHIBITION HALL)

5a. COMPOST GENERATION (PRODUCTION/EXHIBITION HALL GROUND FLOOR)

5b. JAM AND JUICE PRODUCTION (PRODUCTION/EXHIBITION HALL)

6. SELLING/CONSUMING FRUIT PRODUCTS

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INTEGRATION OF SOCIAL AND ECOLOGICAL CONTEXTS

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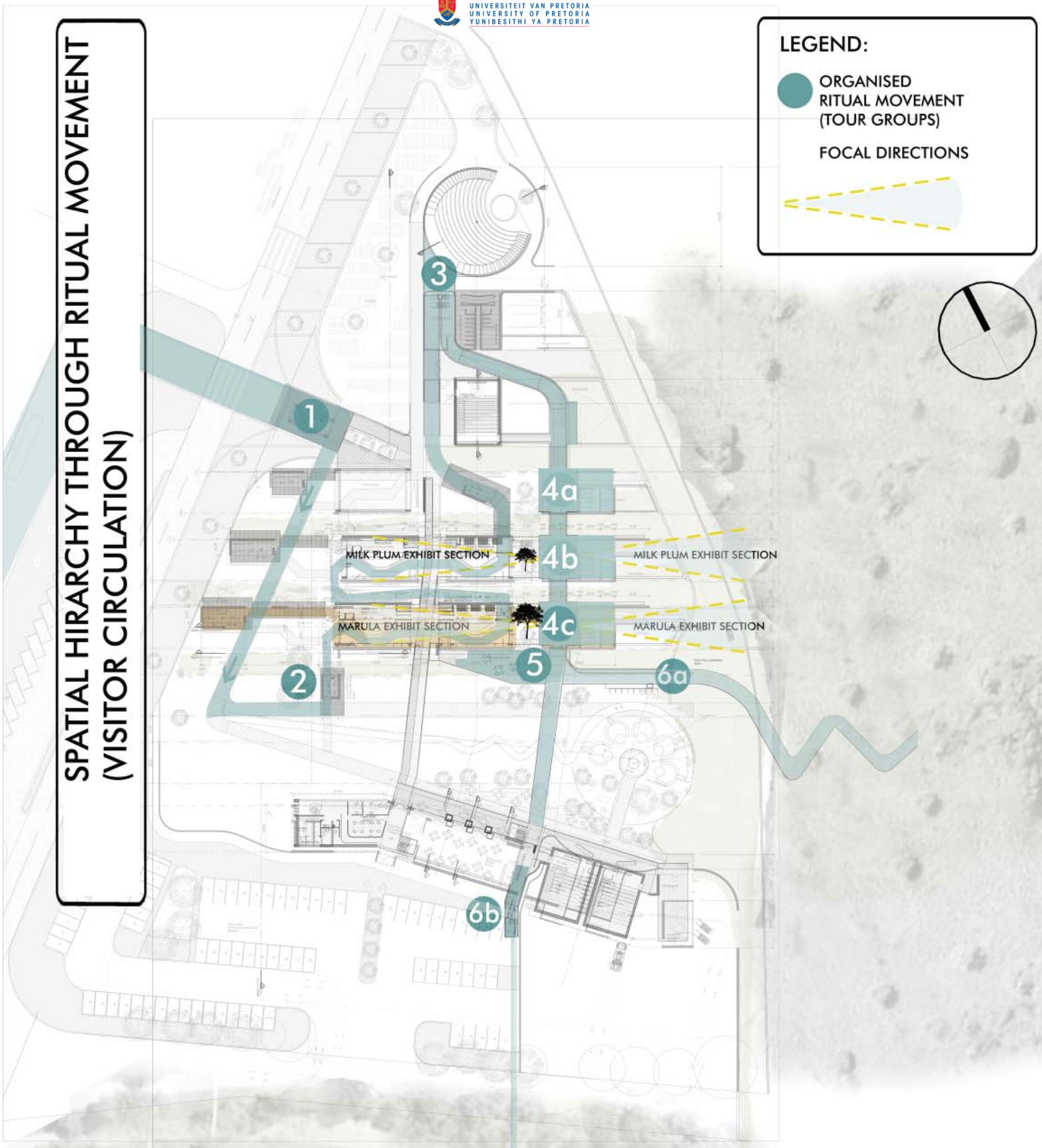
SPATIAL HIRARCHY THROUGH RITUAL MOVEMENT (VISITOR CIRCULATION)



ANCHOR POINTS ALONG JOURNEY

1. ENTRANCE / GATEHOUSE
2. TOUR OPERATION STATION / DEPARTURE POINT
3. REFLECTION PLATFORM ON AMPHITHEATRE LANDING AS PIVOT POINT IN JOURNEY
4. VIEWING PLATFORMS OVERLOOKING THE ECOLOGICAL SETTING TO THE EAST AND LOOKING BACK ONTO HUMAN PROCESSES IN CONNECTION WITH ECOLOGY TO THE WEST
5. RELAXATION POINT:MARULA BEER TASTING PLATFORM
6a. WALKING TRAIL DEPARTURE POINT
6b. ZIPLINE LAUNCH POINT

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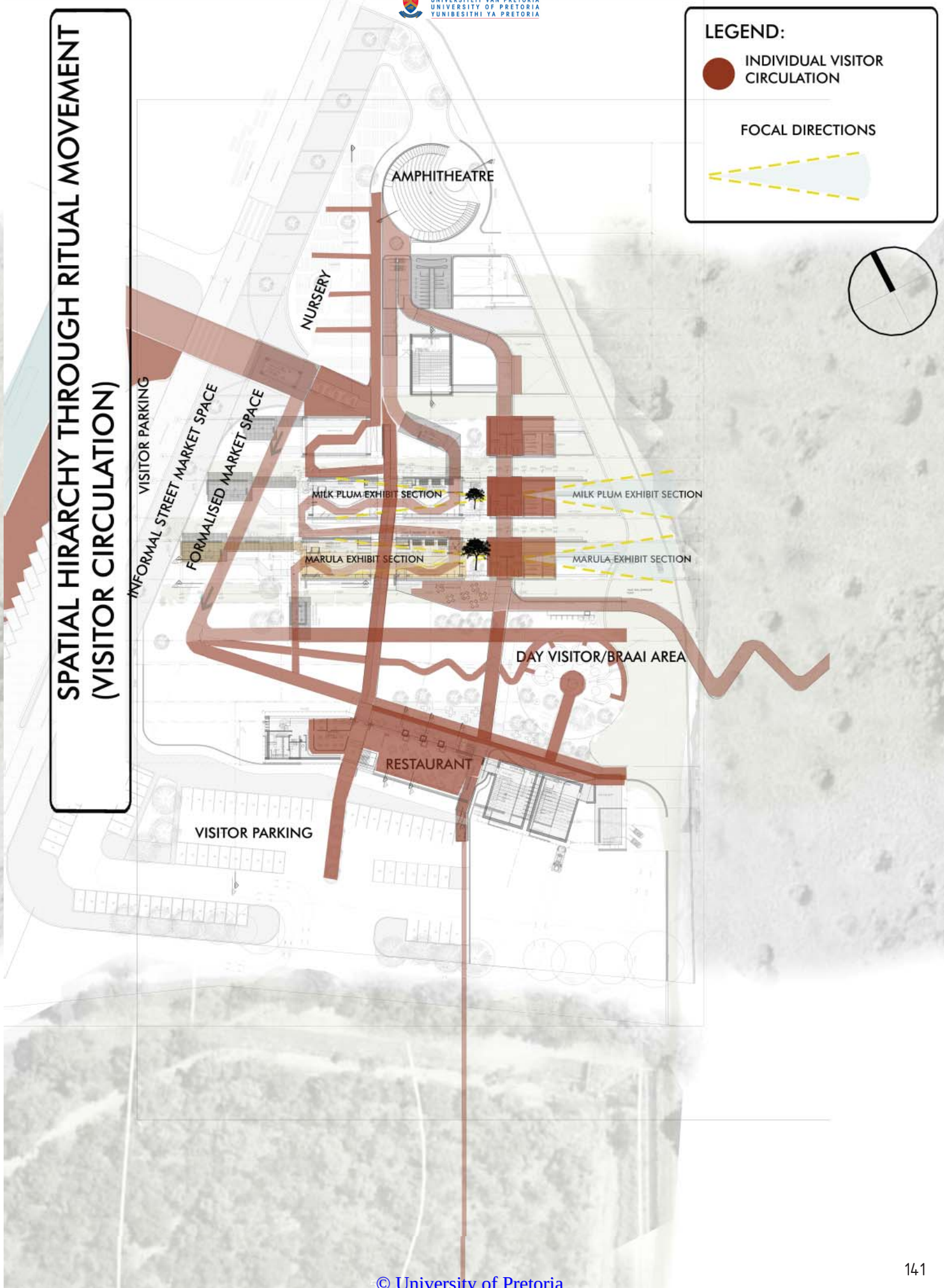
SPATIAL HIRARCHY THROUGH RITUAL MOVEMENT (VISITOR CIRCULATION)



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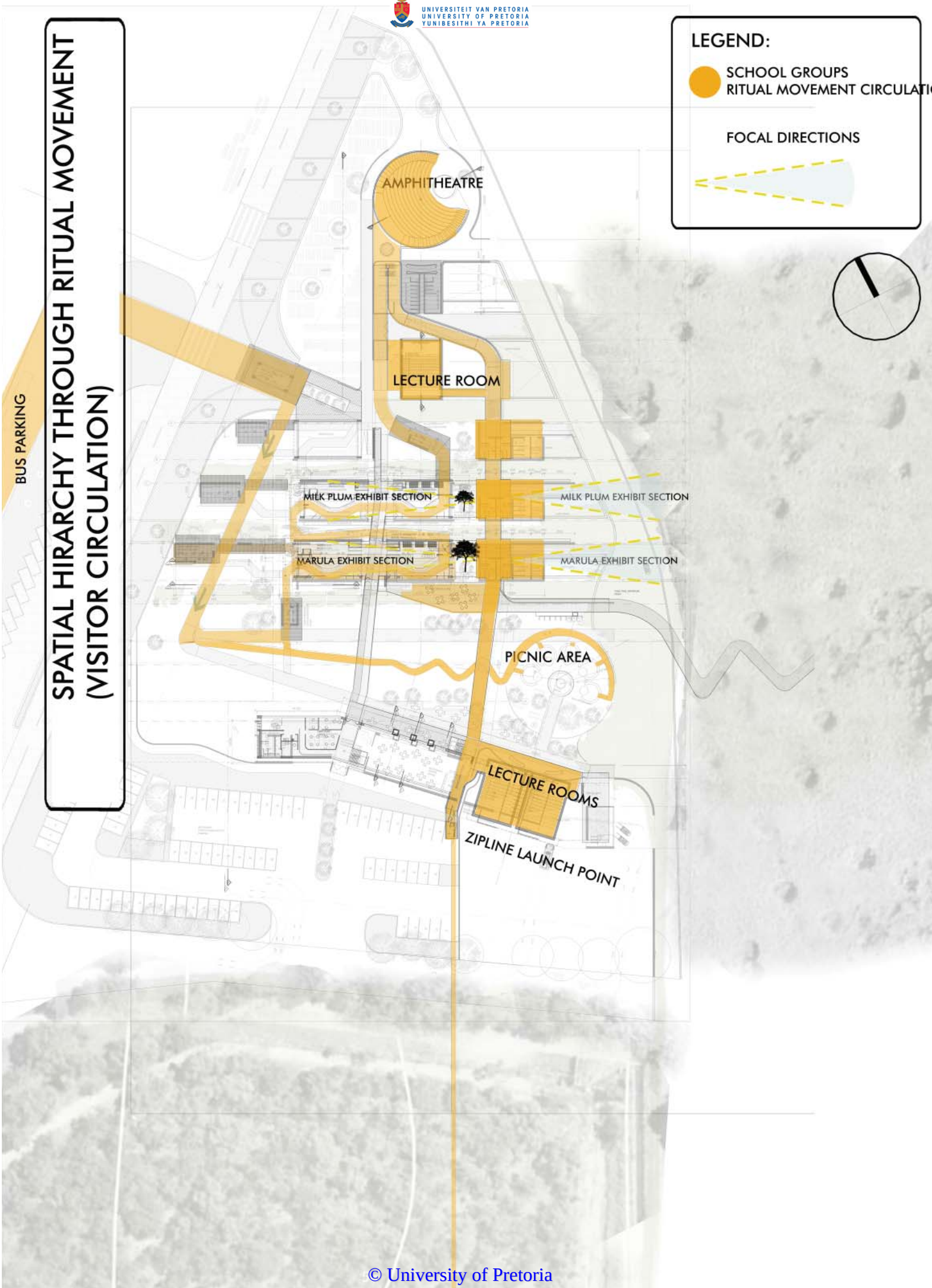
SPATIAL HIRARCHY THROUGH RITUAL MOVEMENT (VISITOR CIRCULATION)



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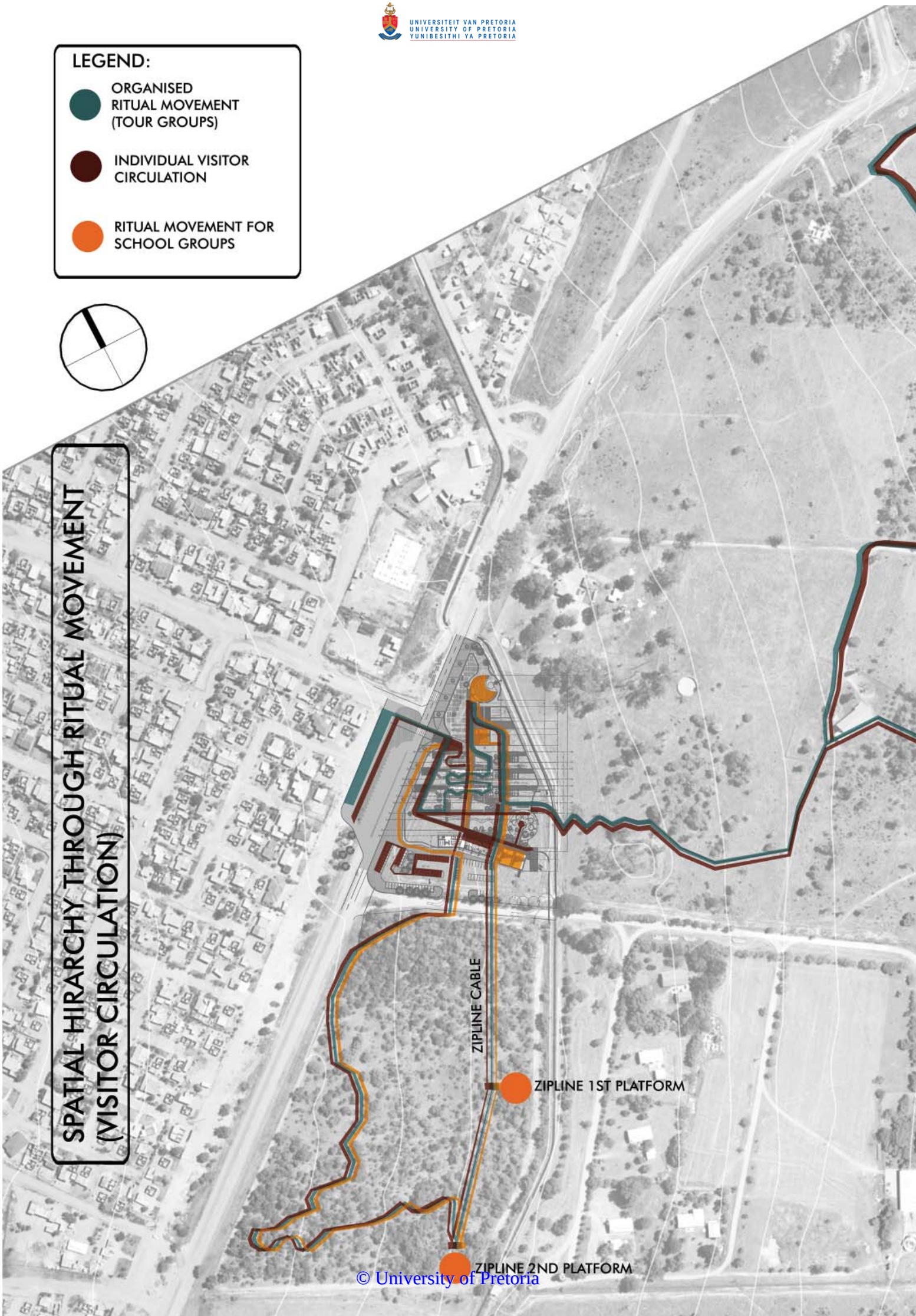

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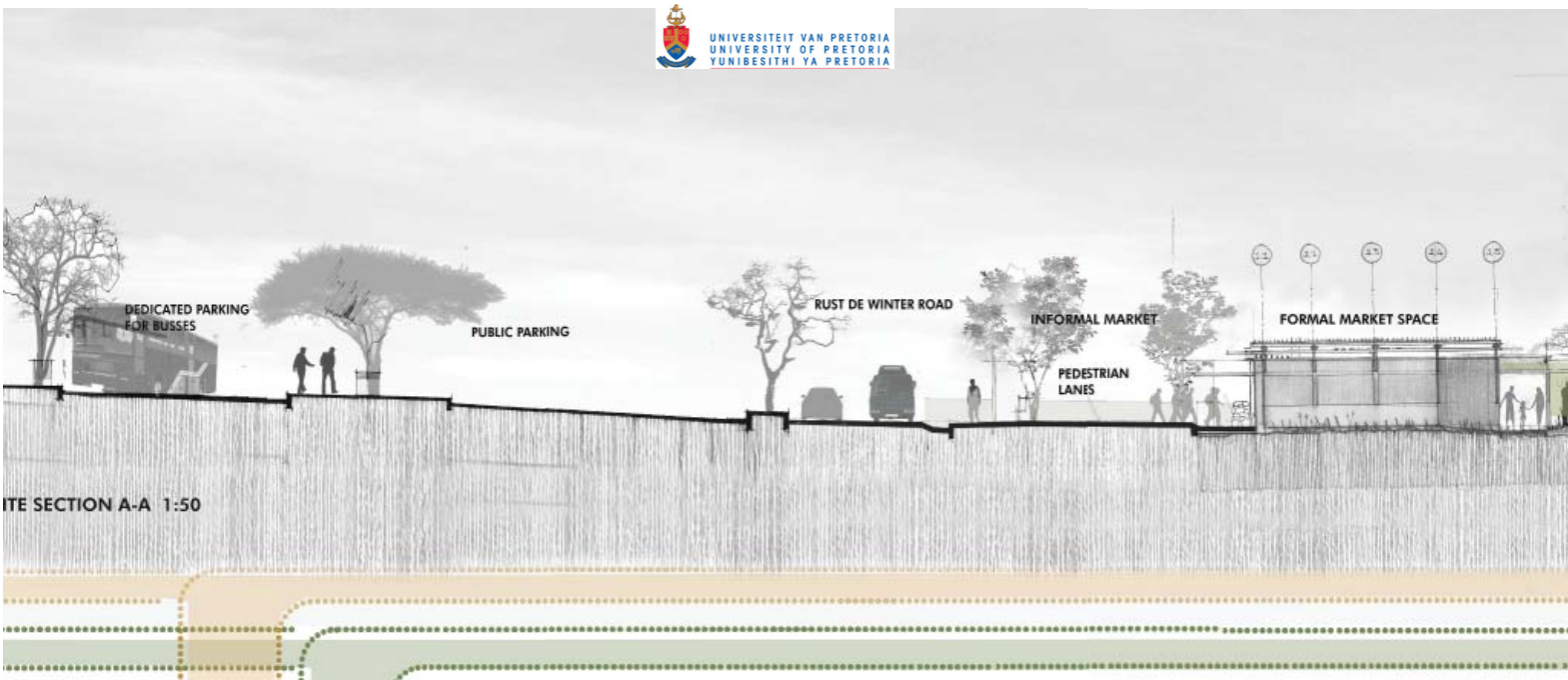

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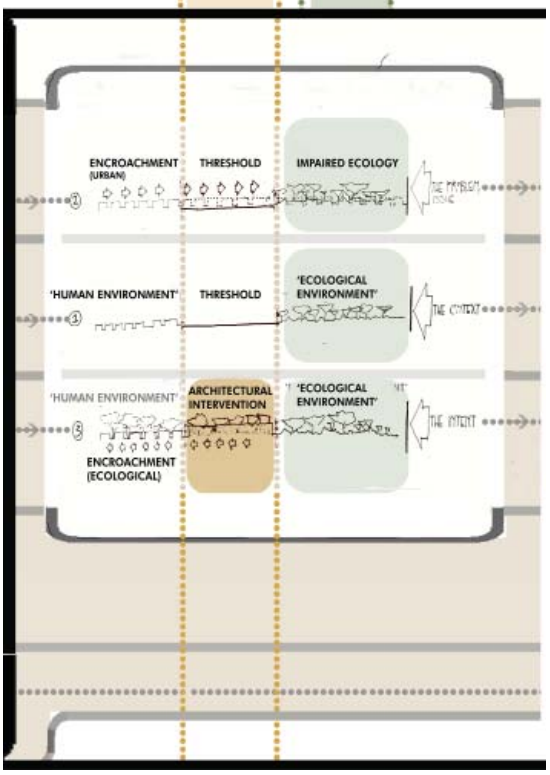

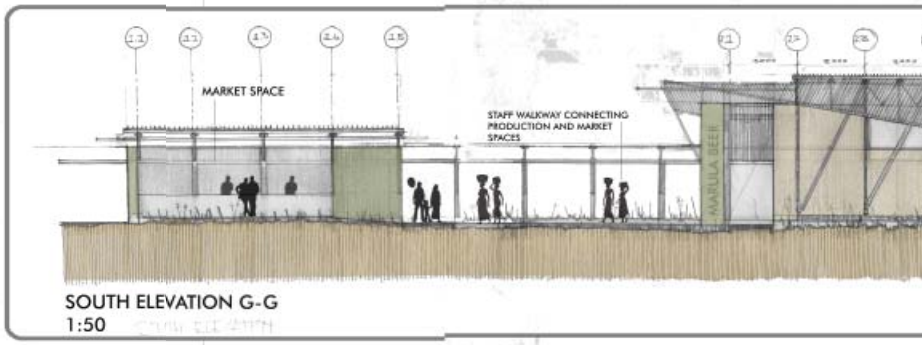

SOUTH ELEVATION G-G
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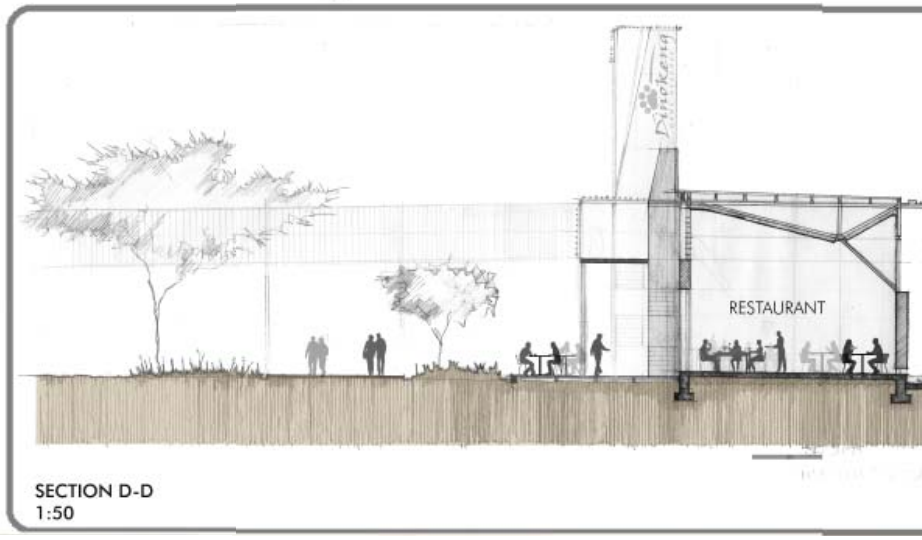

SECTION D-D
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WEST ELEVATION H-H

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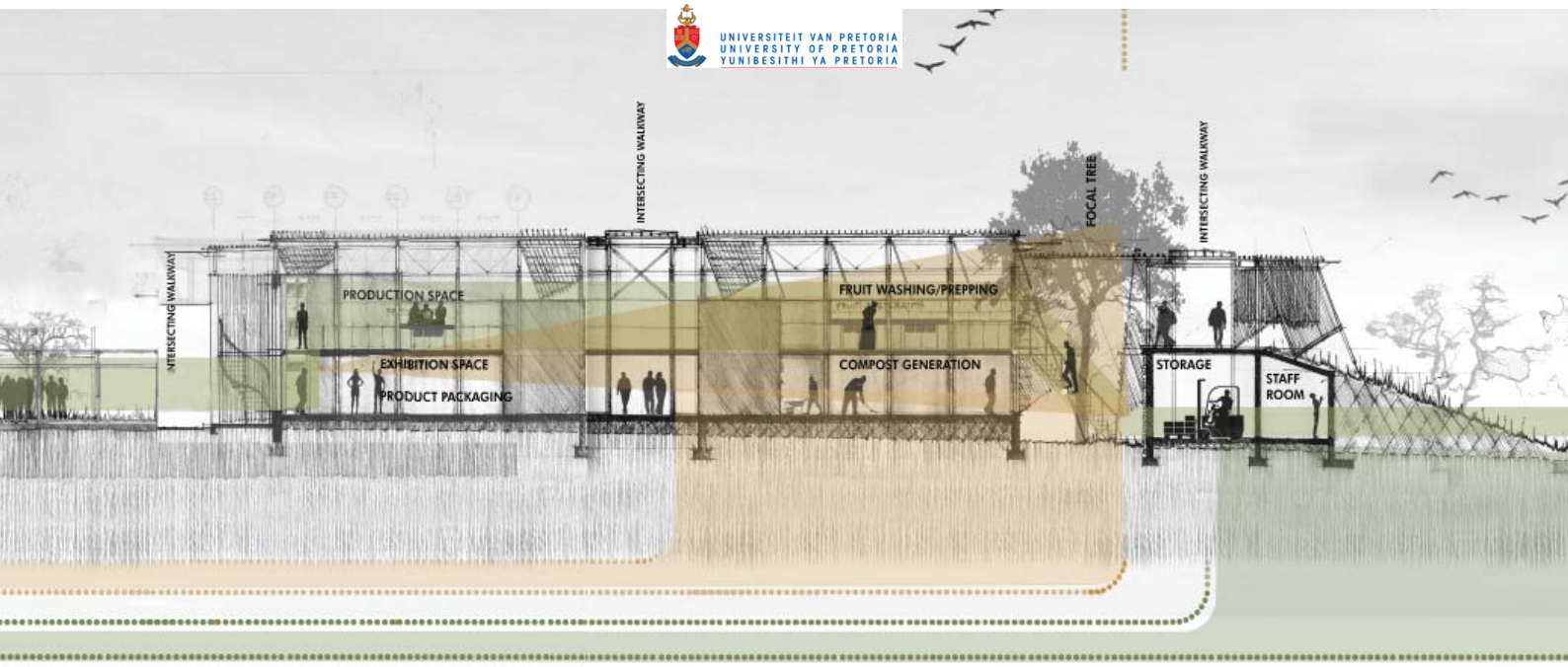
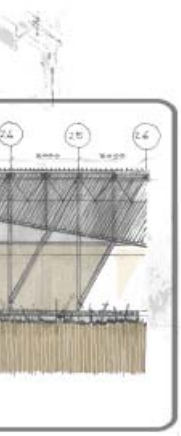
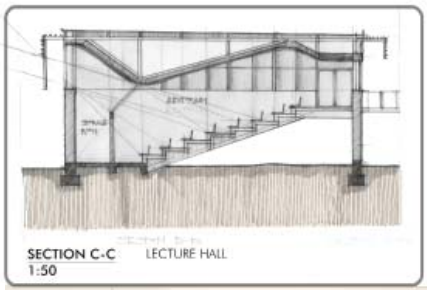




SECTION B-B AMPHITHEATRE



SECTION C-C LECTURE HALL
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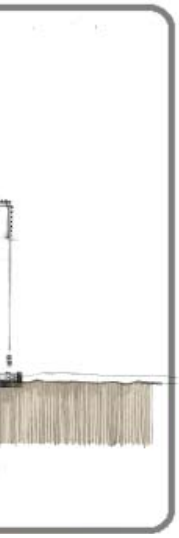

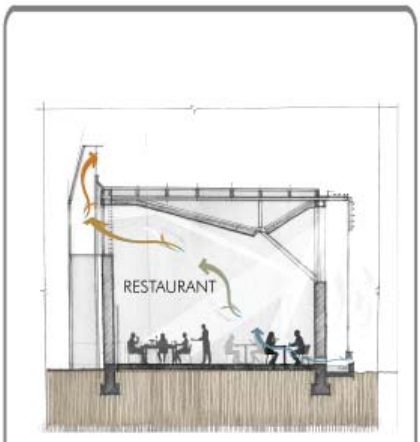

SECTION E-E
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SECTION F-F
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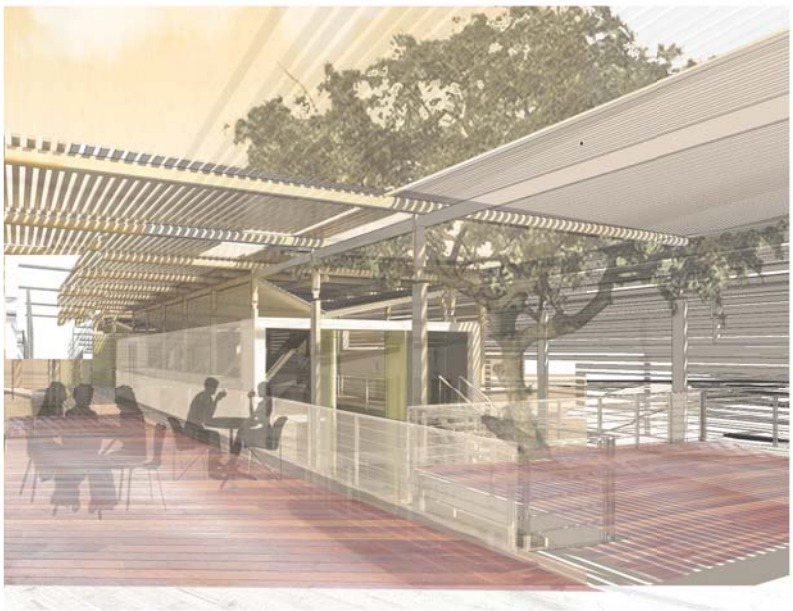

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10 LATEST DESIGN DRAWINGS
11 TECHNICAL RESOLUTION

11 TECHNICAL RESOLUTION

In this chapter the building design with overarching concepts are translated into technical resolution exhibited through environmental strategies, services, material composition and structural layering

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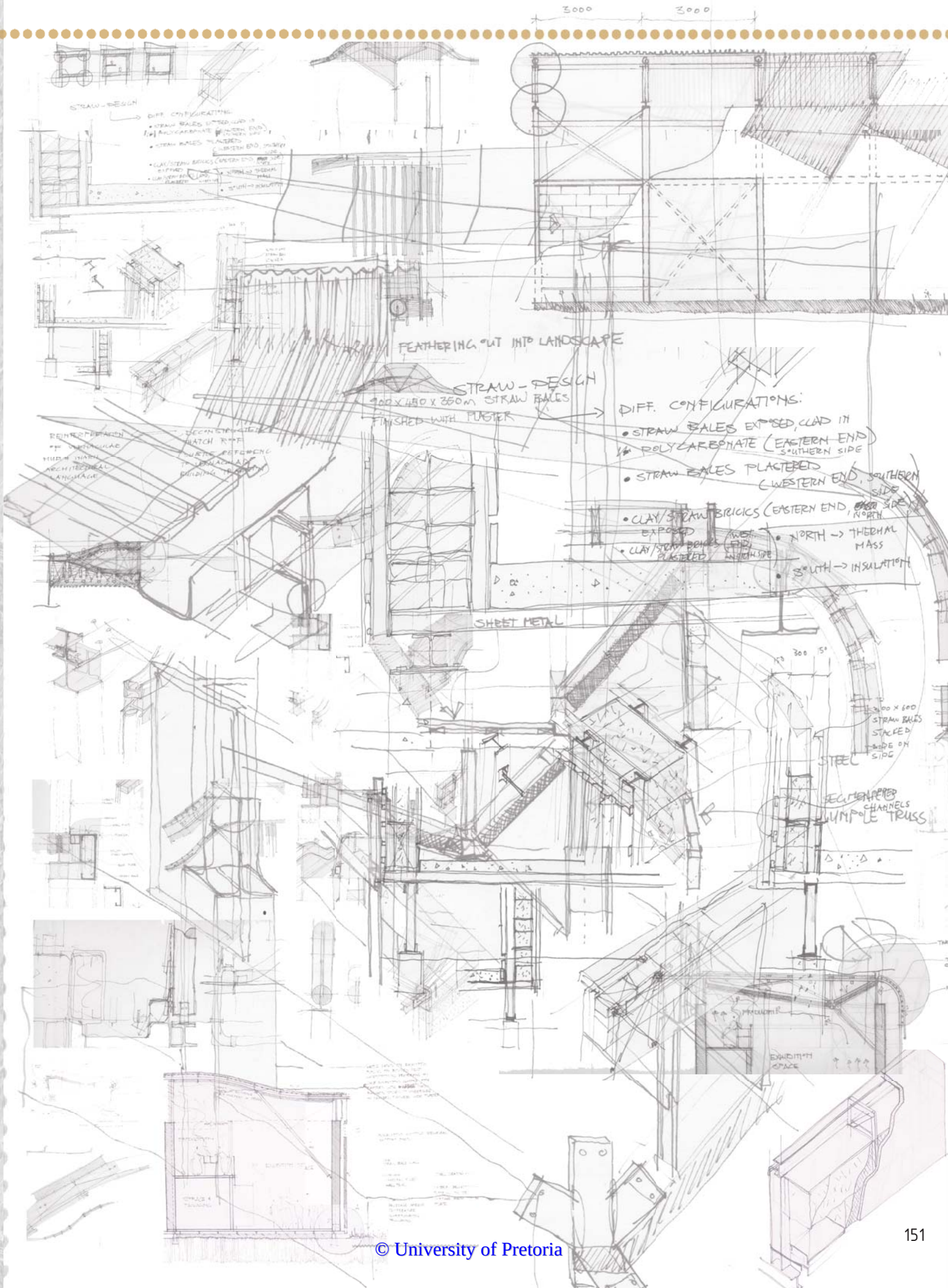

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10_1 OUTLINE

The technical approach ties in with the larger design language and is signified by the steel dominated structure below opposed by the lighter timber structure above. It signifies the juxtaposing influence of ecology on the constraints of conventional geometry and material.

10_2 TECTONIC CONCEPTS:

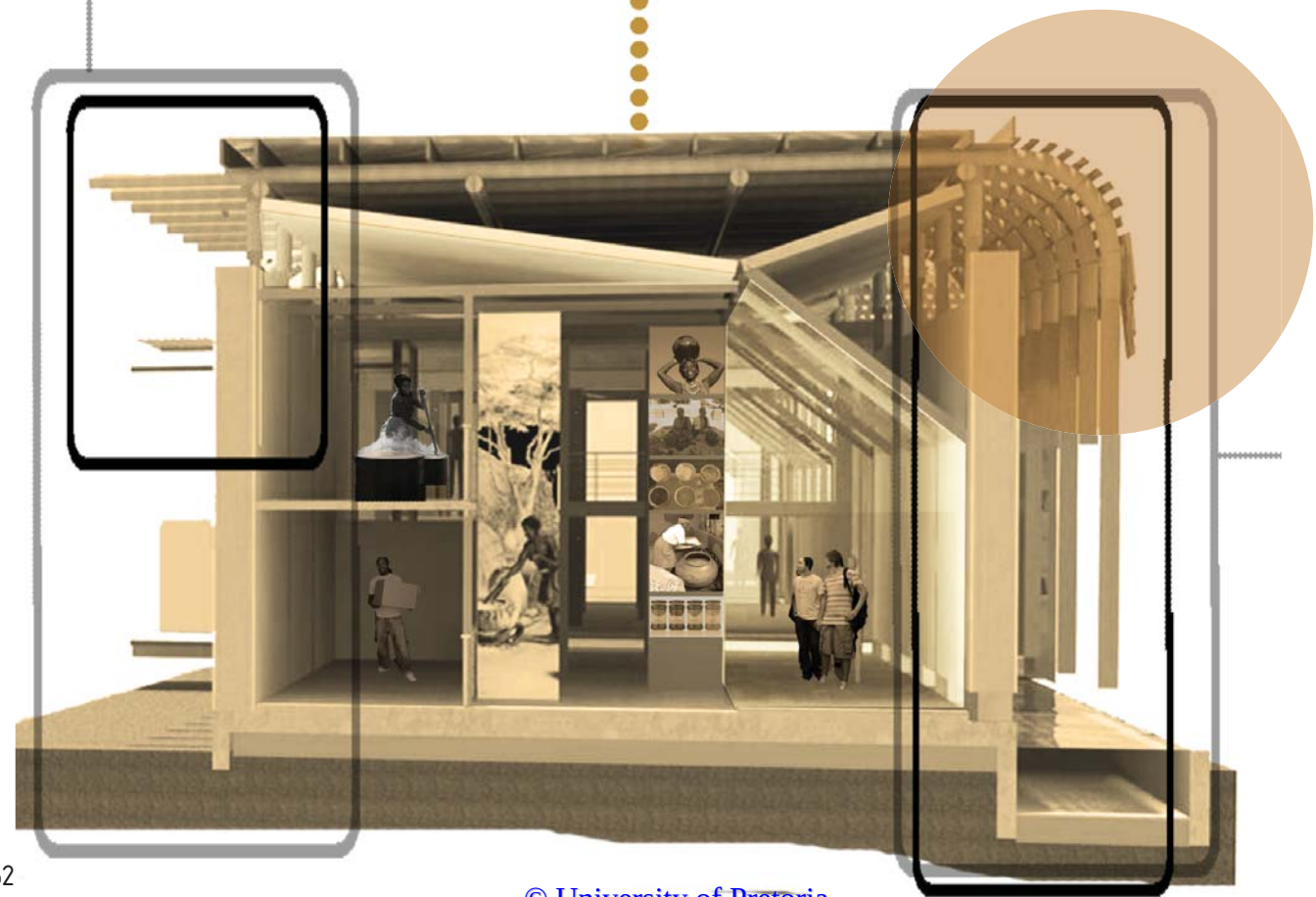
10_2_1-Refined versus Raw

10_2_2-developed versus undeveloped
10_2_3-offensivity versus defensivity
10_2_4-Light versus heavy

10_2_5-flexibility over the constrains of rigid, conventional, Cartesian geometry and logic
(roof structure over lower structure)
-Organic retaliation (roof)

10_2_6-protrusion of human rigidity into organic ecology

OVERARCHING CONCEPT:
THE PHENOMENOLOGICAL RELATIONSHIP BETWEEN MAN AND ECOLOGY AS EXPRESSED THROUGH ARCHITECTURE



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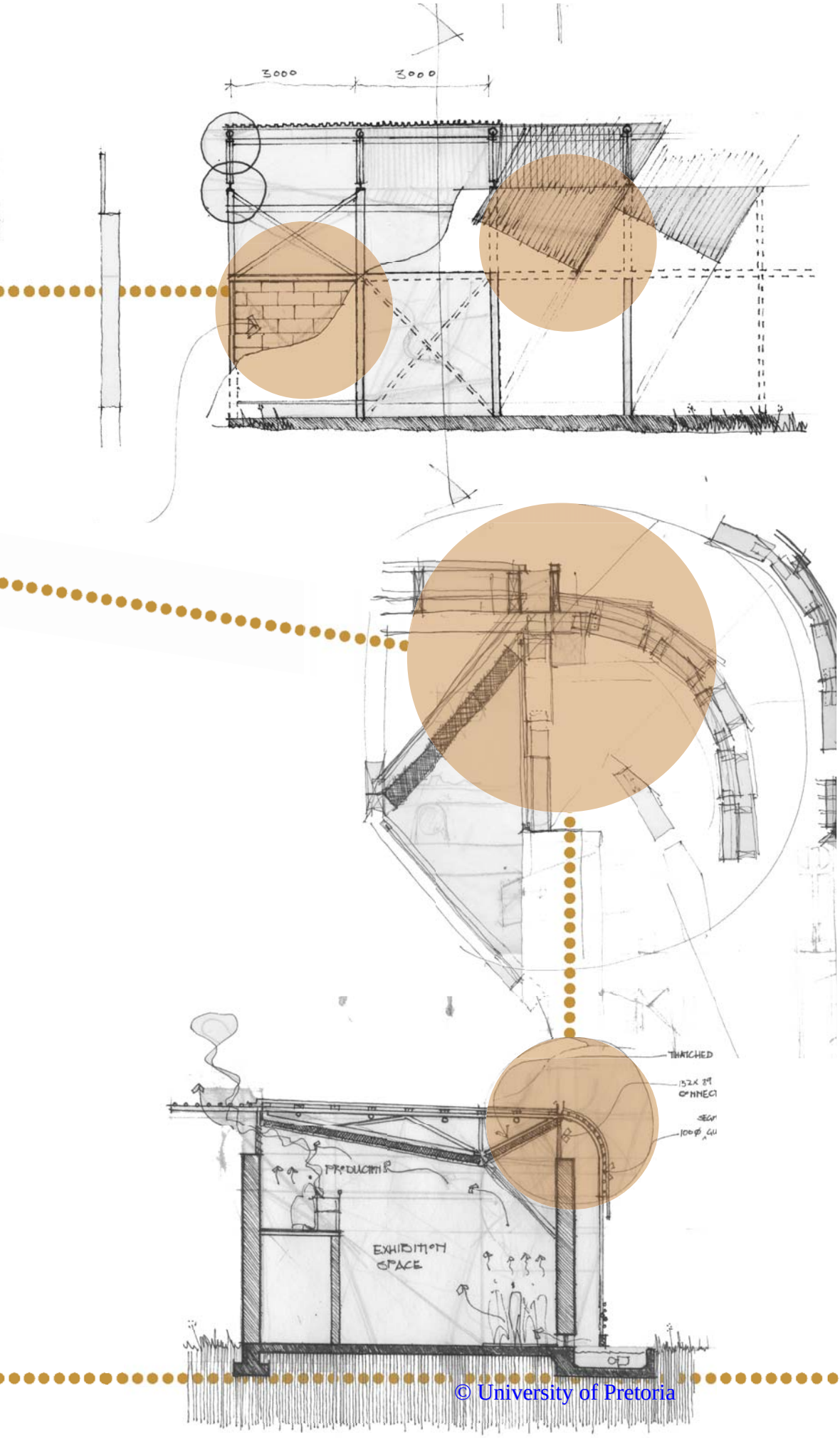

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TECTONIC CONCEPTS

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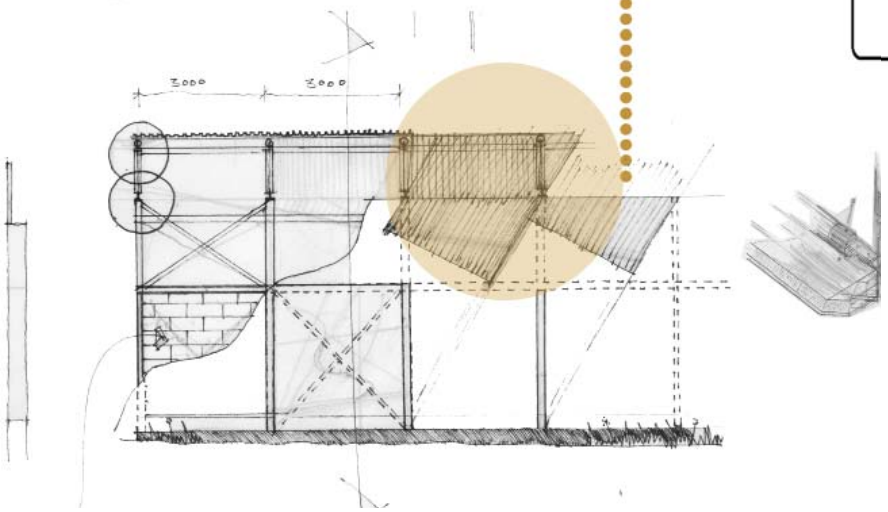
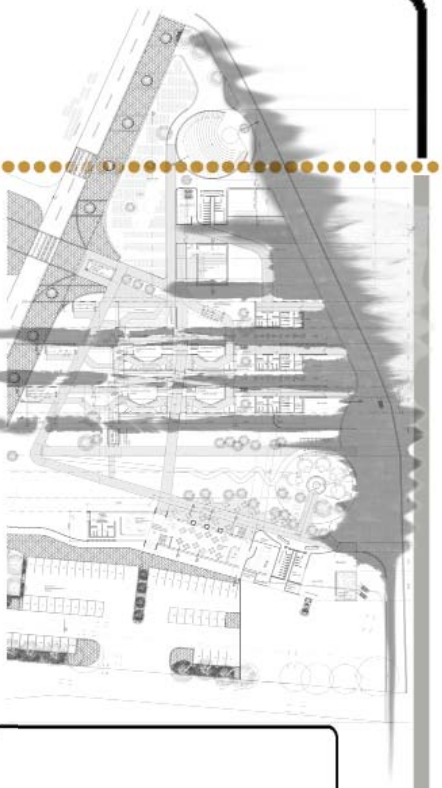
10_2_6-protrusion of human rigidity into organic ecology





WATTLE LATHS

OVERARCHING CONCEPT:
THE PHENOMENOLOGICAL RELATIONSHIP BETWEEN MAN AND ECOLOGY AS EXPRESSED THROUGH ARCHITECTURE

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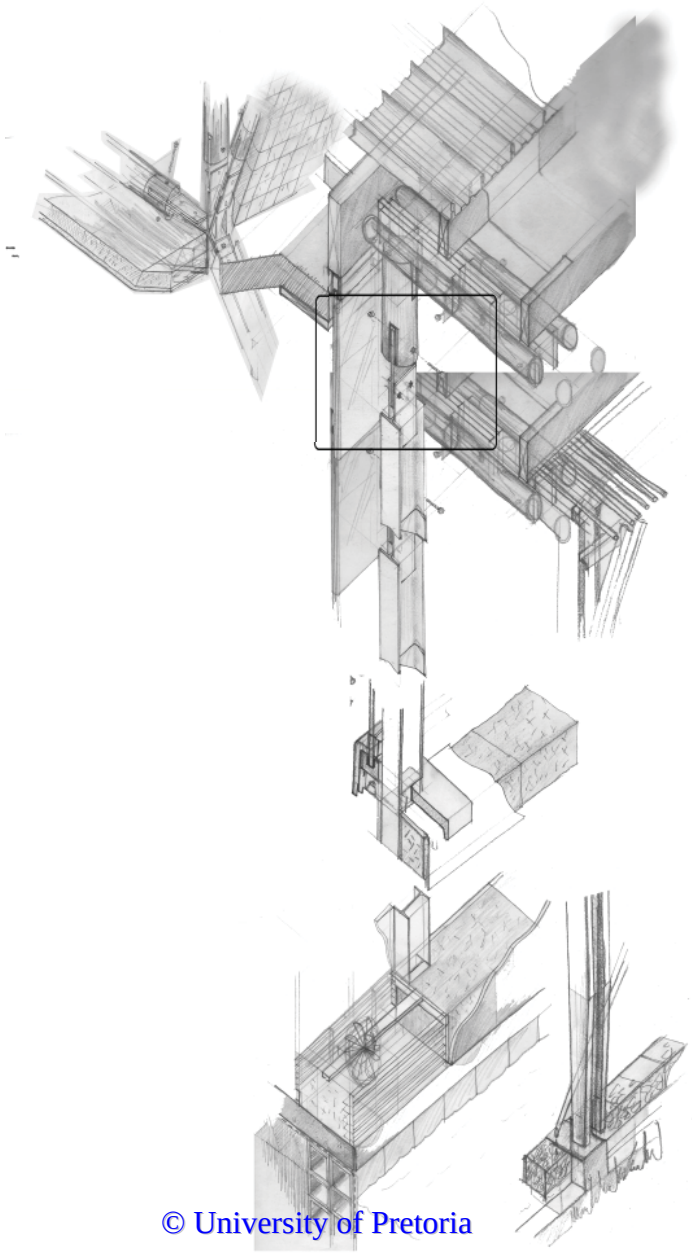

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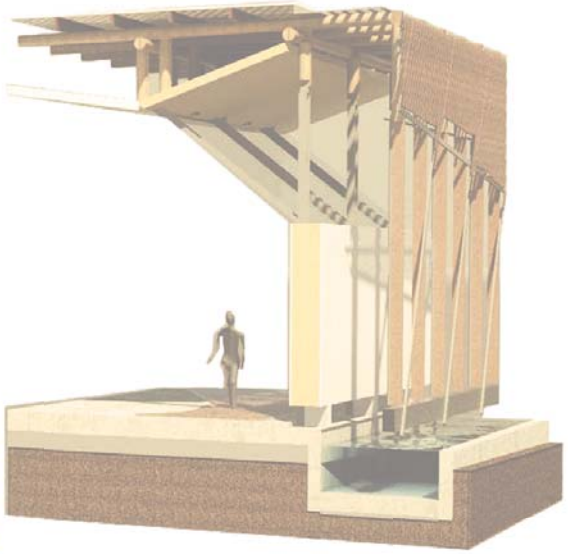
10_3: STRUCTURAL LAYERING



10_2_1 Upper structure/roof structure:
-flexibility over the constrains of rigid, conventional, Cartesian geometry and logic
(roof structure over lower structure)
-Organic retaliation (roof)

10_2_2 Lower superstructure:
-protrusion of human rigidity into organic ecology

-REINTERPRETATION OF TRADITIONAL TSWANA ARCHITECTURE:

a)·The inverted thatch roof
-by inverting the straw/thatch traditionally utilised as roof covering to insulation underneath roof covering, a less steep incline of the exposed straw is achievable since not being exposed to rain/water.
Even though finished with *Brownbuilt Cliplock* steel sheeting (in order to allow the slightest possible slope) it is for all intents and purposes hidden from view and the roof as a collective element is still perceived by the viewer as a wooden structure wrapping over the building and extending selective elements outward as if to suggest its tendency to feather out into the landscape.

·The deconstructed verandah posts/columns
-The wooden post usually supporting the roof and connected to the floor is overturned and instead becomes an extension of the wooden roof structure flowing over the building, yet not connecting with the floor. This creates a visual reading of a roof floating above-and thus contrasted with-the stereotomically grounded walls and floor. The gumpole truss system therefore encompasses the exterior wall line into rafters and ultimately suspended, vertical gumpole posts.

·THE PLASTERED WALL
-Where plastered straw-reinforced mud-bricks were often utilised by vernacular peoples in Southern Africa to build their walls, a practice starting to enjoy gaining popularity in the contemporary built-environment is used as adaptation to the use of veld-grass in wall construction, namely plastered straw bale walls. Even though this practise is hardly a new system, having historical roots in at least Nebraska USA in the 19th Century, it's an appropriate use for the *Hyparrhenia hirta* thatching grass found in abundance throughout the site without incorporating wet-work (apart from its plaster finish) into its construction.

·THE FLOOR
-A floated sand cement screed on concrete surface bed will resemble in tactility or texture the traditional cow-dung polished earth floors as connecting element with the earth.

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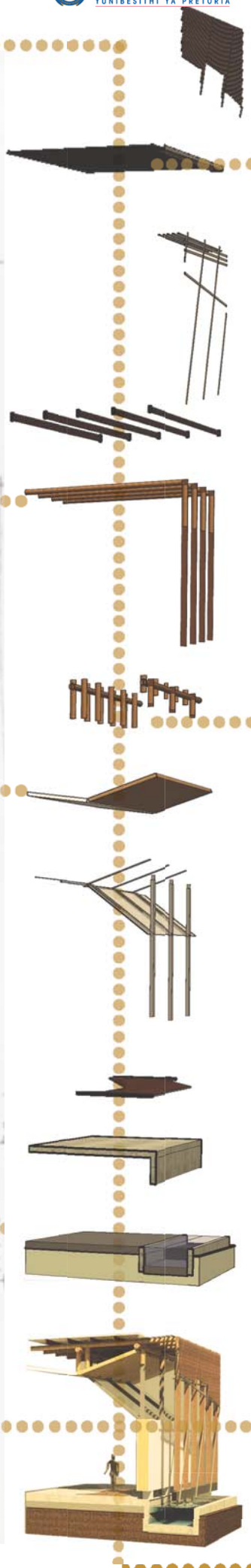

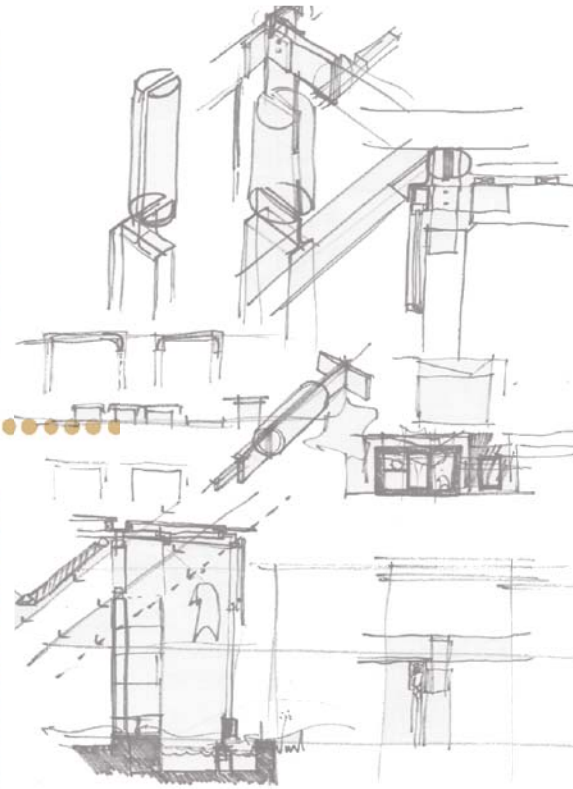

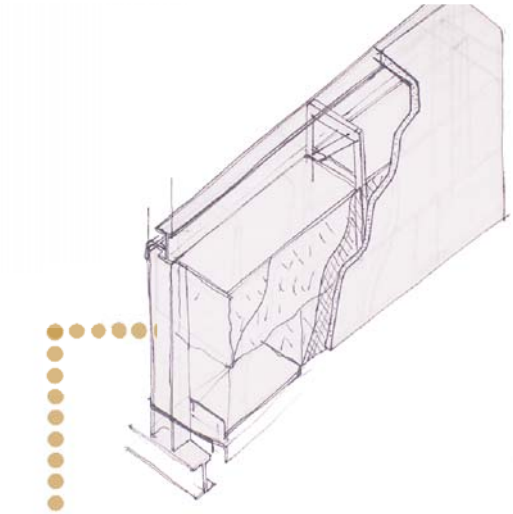

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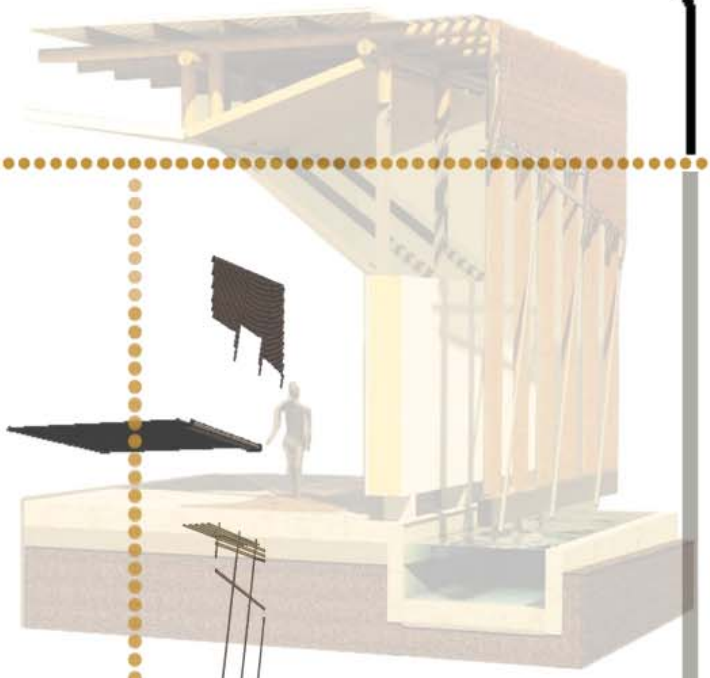
STRUCTURAL LAYERING



1. STRUCTURAL EXPRESSION:

LOWER STRUCTURE:

-CONCEPT: THE PROTRUSION OF HUMAN RIGIDITY ONTO THE ECOLOGICAL ENVIRONMENT.
I.E. HUMAN ENCROACHMENT

UPPER STRUCTURE/ROOF STRUCTURE:

-CONCEPT: FLEXIBILITY OVER THE CONTRAINTS OF CARTESIAN GEOMETRY AND LOGIC:
AN ENCAPSULATION AND ORGANIC RETALIATION

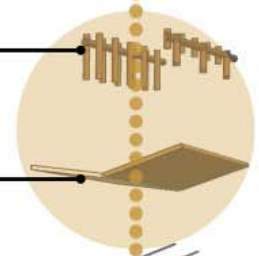
2.REINTERPRETATION OF VERNACULAR ARCHITECTURE:

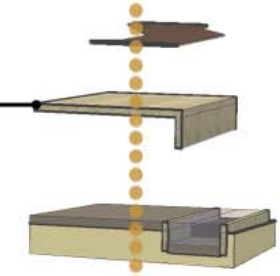
2.1 ELEMENTS- a) THE INVERTED THATCH ROOF

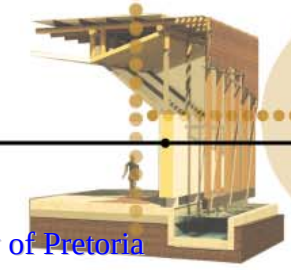
b) THE DECONSTRUCTED VERANDAH POSTS/COLUMNS

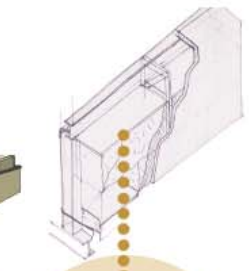
c) THE PLASTERED STRAW WALL

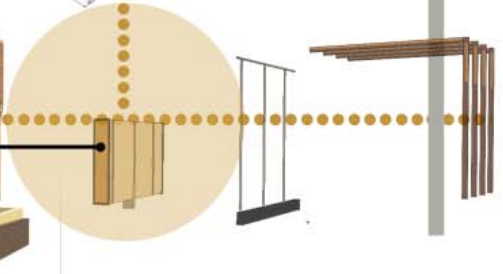
d) THE FLOOR











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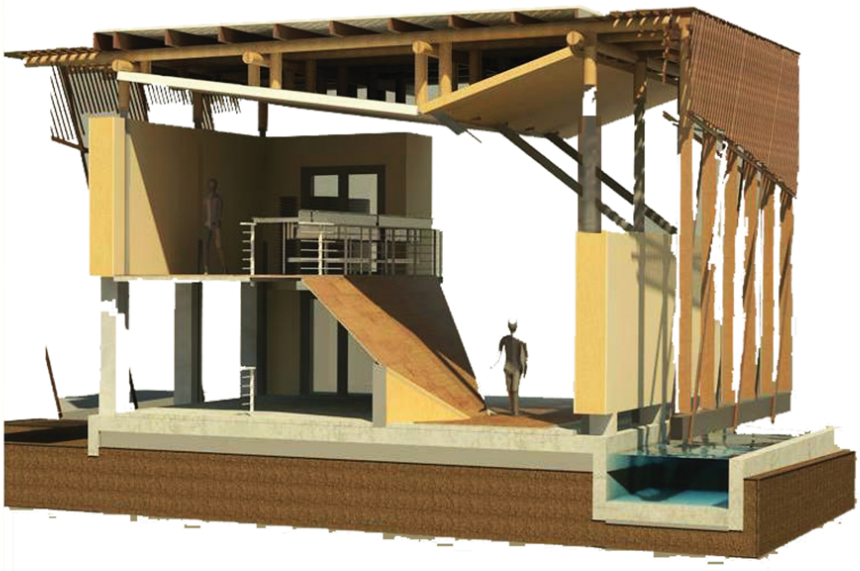

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10_4 MATERIALITY:

10_4_1 Walls as focus:

Stawbale: The reasons for selecting straw as the dominating material for wall construction in this project are the following:

a.The dominance of Grass as common denominator of all the bi-oregions in which Tswana settlements resides/resided and acts therefore as tie between the ecological and cultural context.

b.Material properties:

b.1: Thermal Mass: Because straw bales volumetrically consist of less more than air its thermal mass isn't substantial except if finished with clay plaster which will increasing the thermal mass of the wall.

b.2:Insulation:

Since straw bales display outstanding insulative characteristics and compare favourably with alternative insulation materials it's probably the best reason for choice of wall construction material.

b.3:Sound insulation: (Applicable in lecture rooms and exhibition spaces)

Supposedly according to various sources Straw bales provide the most cost-effective sound insulation available.

b.4:Fire resistance:

"Fire requires oxygen to burn and the density of tightly packed straw-bale walls provide an air-starved environment, so the fire resistance of compacted straw is very good."

b.5:Durability and moisture resistance:

"Provided the straw is reasonably well protected and is not allowed to become in contact with water it can last long with moderate maintenance. It is believed that straw bale walls can last up to 100 years."

g.Toxicity and breathability:

"The natural materials of straw bale construction are safe and biodegradable, unlike conventional construction, 'Straw bale walls have good breathability allowing air to slowly permeate the structure without moisture penetration."

h. Environmental impacts:

-"Straw is a waste product, it cannot be used for feed, like hay, and much of it is burned at the end of the season. Using straw for building reduces air pollution and stores carbon. The straw left over from building can be used as mulch so that, overall, there is minimal waste from using the material.'

-With grasses able to grow on almost any land, and being in abundance in and around Dinokeng, there is a high level of renewable material content in straw bales. They are biodegradable and have a growing cycle of one year."

-"Straw bales are inherently low in embodied energy. A downside usually is that the bales often end up being transported over hundreds of kilometres adding significantly to the amounts of embodied energy to what is a fundamentally low energy material. This negative point will however be eliminated in this project due to the fact that the material can be sustainably harvested on site without any substantial transport."

.

"Using straw for building stores carbon that would otherwise be released. The greenhouse gas emissions associated with straw bales is very low. One tonne of concrete requires more than 50 times the amount of energy in its
manufacture than straw."

i.Buildability, availability and cost

"Straw bale construction rates highly for buildability because it can be very straightforward and is well suited to workshop and volunteer based building programs."

j.Design implimentation

A number of different configurations were implemented in the physical appearance of the straw bale walls ranging from cement or earthen plaster finished Straw bale walls so that the straw is not visible, to clad with translucent polycarbonate sheeting material for textural aesthetic expression.

from source: *(YOUR HOME TECHNICAL MANUAL : Australia's guide to environmentally sustainable homes:5.8:Straw bale use:157) [online] http://www.yourhome.gov.au/technical/*

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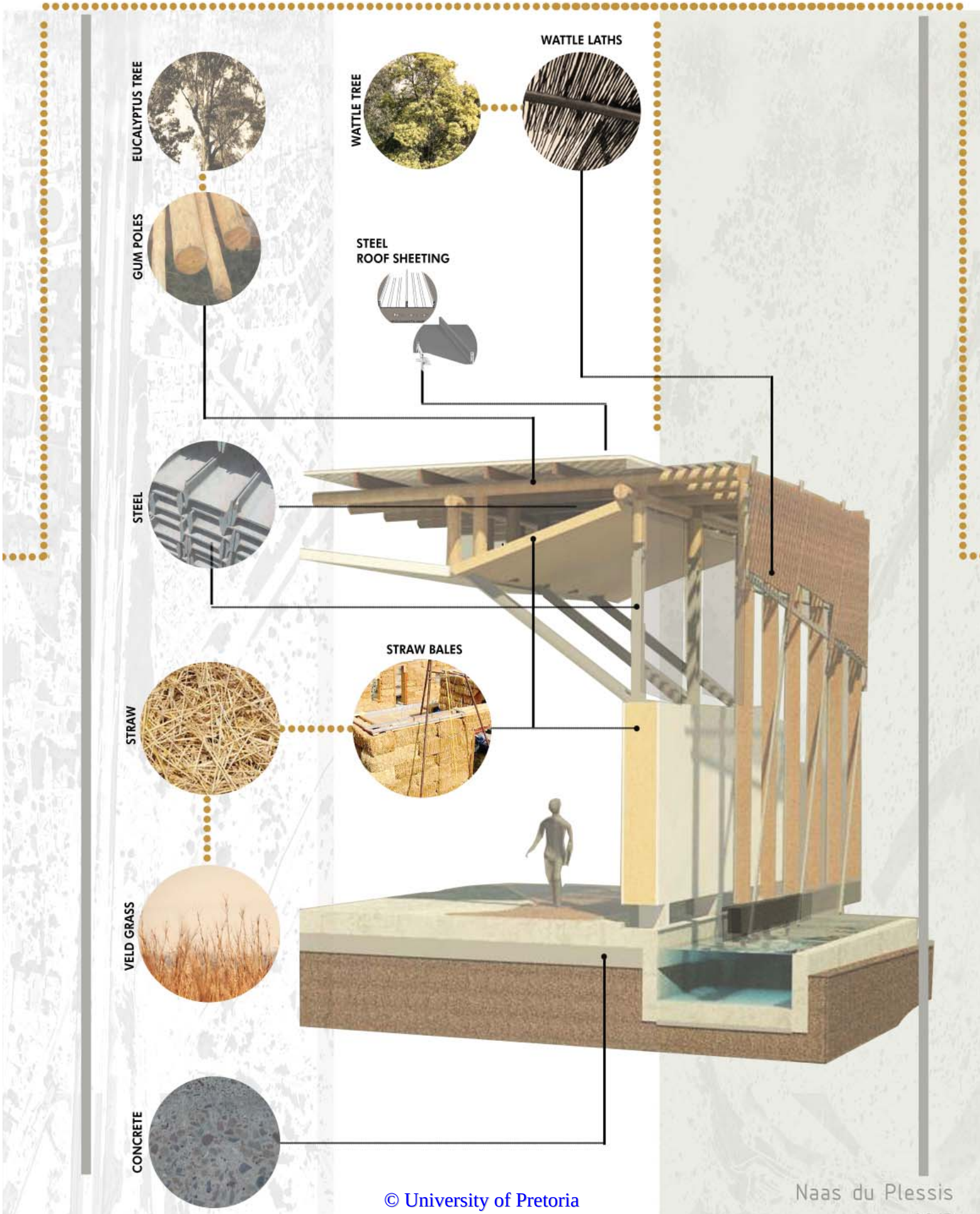
MATERIAL COMPOSITION



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Naas du Plessis
2013

10_5 ENVIRONMENTAL STRATEGIES

10_5_1 NATURAL DAYLIGHT UTILISATION

10_5_2 PASSIVE VENTILATION AIDED BY EVAPORATIVE COOLING:

Seperate water storage tanks will be used for circulating water from the roof to a water collection pond underneath a charcoal filled wall panel at lowest point of the southern facades . The water will be channeled from these storage tanks to perforated pipes at the highest points of these facades. The water will then drip-irrigate the charcoal panels to form a water curtain on the southern facades in order to lower the ambient temperature and create a temperature pressure diffirence between the hot northern and cooled southern facades. After accumilated in the collection ponds the water is pumped back to the collection tanks where the cycle continues. Wind blowing onto-or air moving through-the cooled charcoal panel (acting as a spunge) will create 'coolth'on the lowest southern point of the building where the air will be allowed to enter the interior. Due to heat generated from the cooking pots at the higher, northern end of the interior space the air will equally be allowed to escape the building at the highest northern point of the building and thus creating a ventilative draft through the space.

10_5_3 WATER STORAGE AND PURIFICATION

-Water stored from rainwater harvest is circulated through a biological filter afterwhich it is circulated through a solar distallar before connecting with the potable water outlet points used for jam cooking and traditional beer making.
Seperate water storage tanks not connected to purification system will be used to irrigate nurslings and young trees in thenursery component.

10_5_4 BIODIVERSITY PRESERVATION AND PROMOTION ON SITE

Due to the significance and relevance of nature conservation on the project and the emphasis on biodiversity preservation from the design perspective, care was taken to minimize the amount of vegetation removed from site. In addition the project vision includes the re-establishment of lost ecology in and around the site by reinstating a microclimate of an indigenous vegetation community on an urban scale with the project site as catalyst. The increased amount of vegetation surface as well as incorporating permeable paving products would also substantially decrease the amount of water run-off and subsequent erosion risk associated with a conventional building project.

10_5_5 SERVICES:

a) Biogas generation from organic plant material waste in the stage before production process. The gas generated is stored in cylinders adjoining the production section of the building before being utilised as energy for cooking stoves inside the production section of the building a

b) Biogas generation from human waste, accumilated in the c) composting toilets, then utilised as energy for cooking stoves inside the restaurant.

(Author's note: Elaboration on and finalisation of the services and strategies explained here to be completed before the final technical presentation.)

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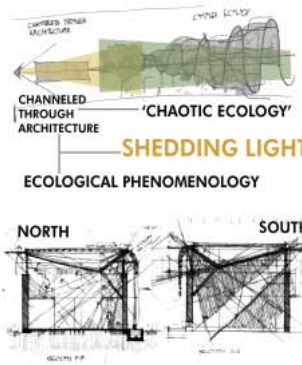
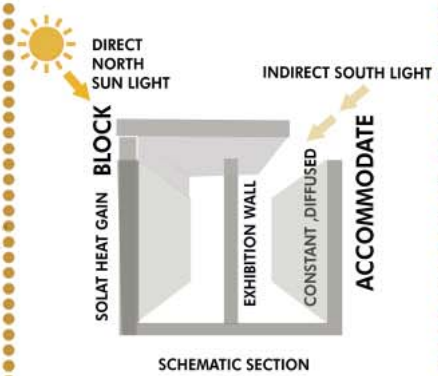
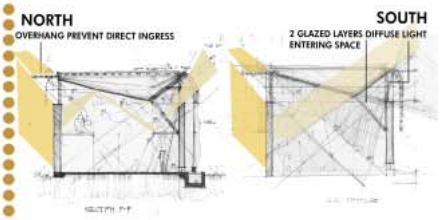
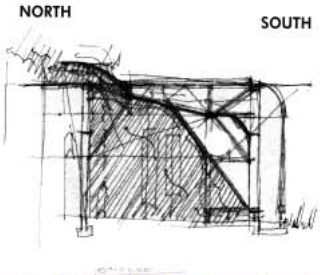
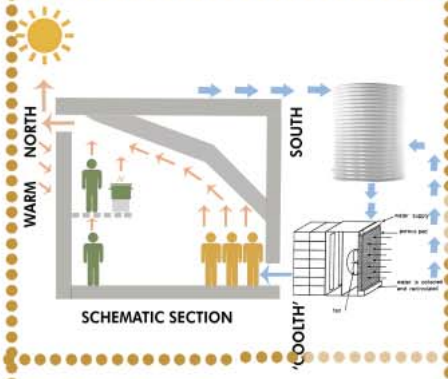
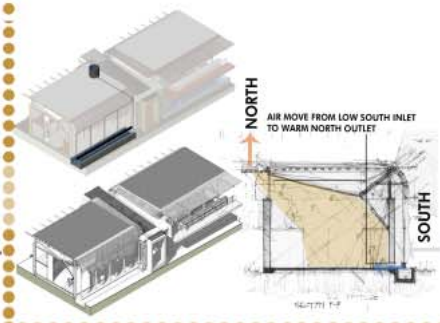
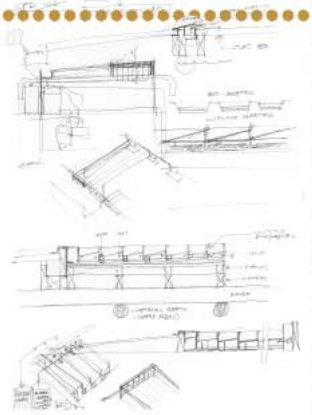
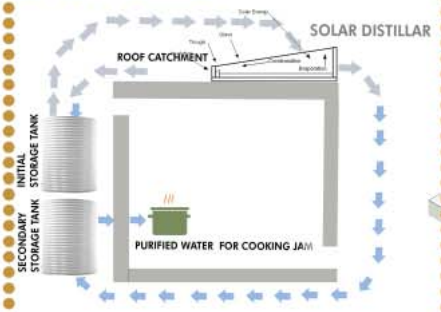
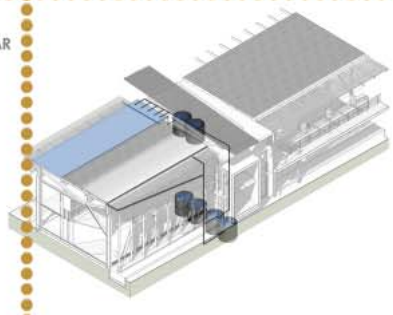
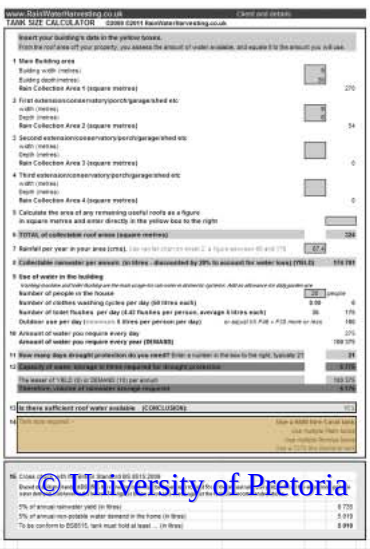
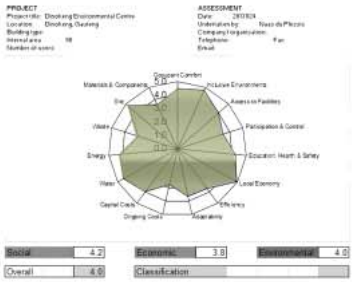
SUSTAINABILITY STRATEGIES

STRATEGY	CONCEPTUAL	DIAGRAMATIC	IMPLIMENTATION
DAYLIGHT UTILISATION			
PASSIVE VENTILATION			
WATER PURIFICATION			

WATER STORAGE CALCULATIONS:



SBAT ANALYSIS:



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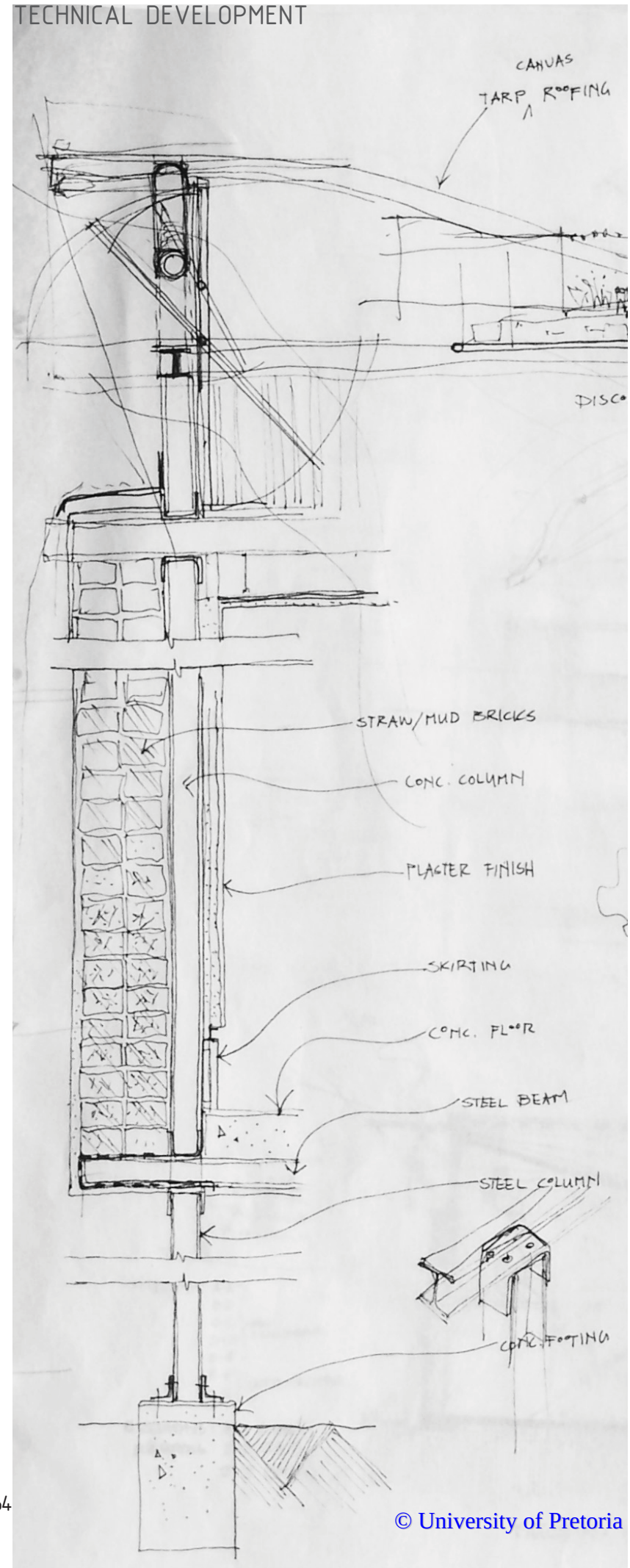
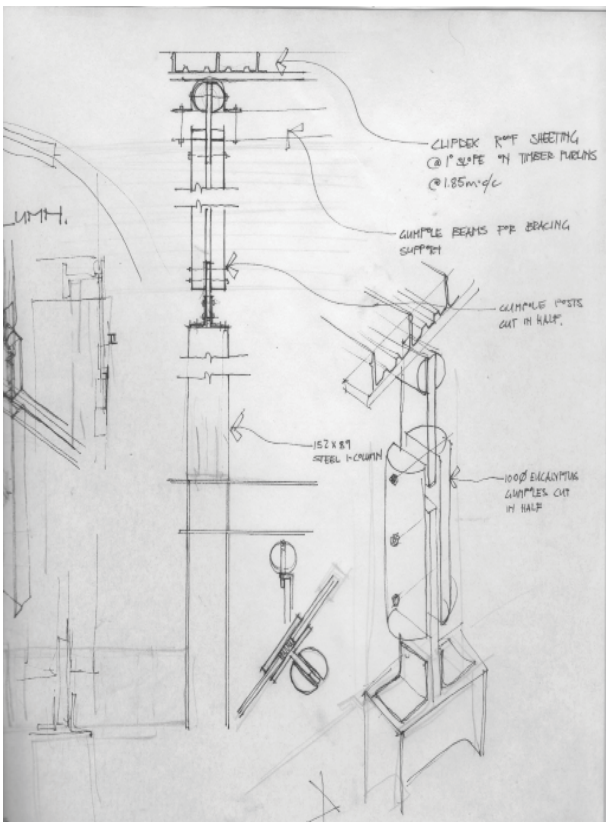
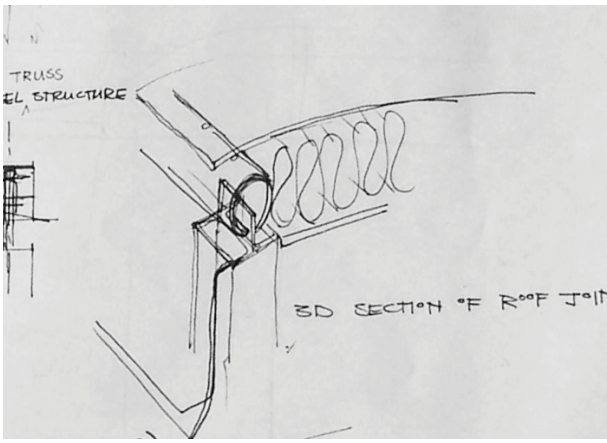
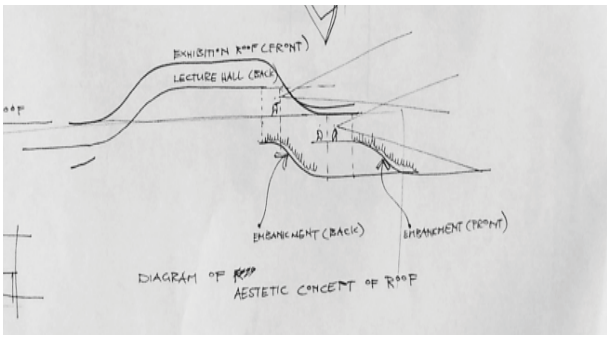
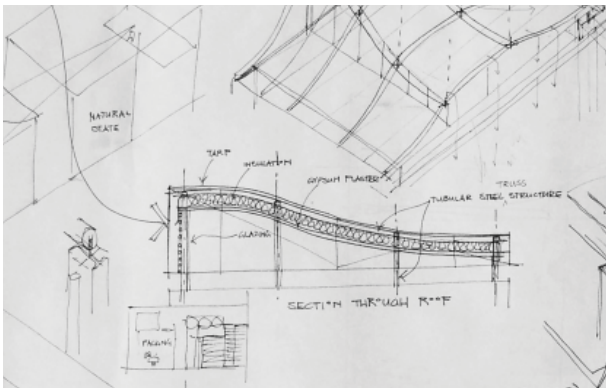
TECHNICAL DEVELOPMENT











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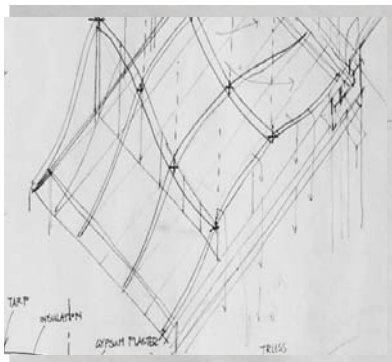


TENSILE CANVAS ROOFING

STEEL TRUSS

GLAZING

SEALANT BETWEEN PLASTER AND STEEL BEAM

STEEL TIMBER LADDER STRUCTURE FOR INTERMEDIATE SUPPORT IN STRAW BALE WALLS, SPACED @ 1200m INTERVALS

STEEL HEAD PLATE

900X450X300 STRAW BALES HELD IN PLACE BY STEEL REINF. ROD

DOWN PIPE

STEEL ROD

INTERIOR

EXTERIOR

STEEL BASE PLATE

LOUVRE

152 X 89 STEEL COLUMN

250 X 50 X 20 STEEL LIPPED CHANNEL

WOODEN DECK FLOORING ON 75 CONC. SURFACE BED ON STEEL PLATE SUPPORTED BY FLOOR BEAMS

PLASTER FINISH ONTO STRAW BALE

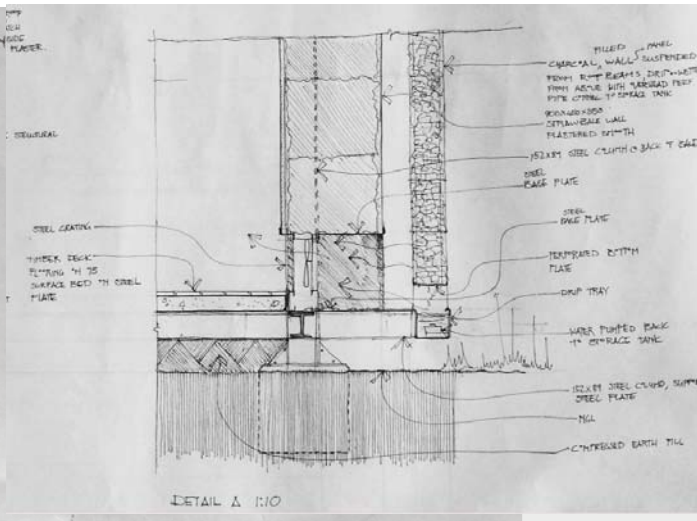
152 X 89 STEEL FLOOR BEAM

MENTIS GRID FOR AIR INLET

150X150 STEEL ANGLE BOLTED ONTO BASE PLATE & COLUMN

CONC. FOOTING

SECTION D-D 1:10



DETAIL A 1:10

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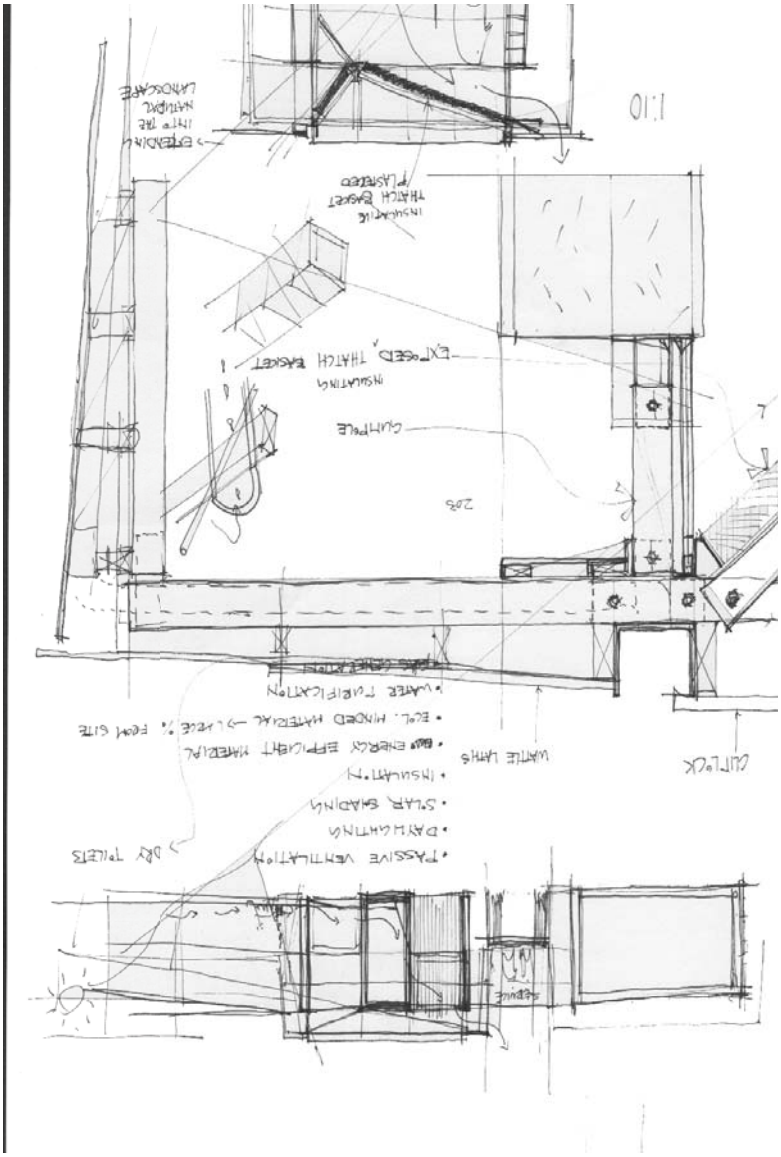

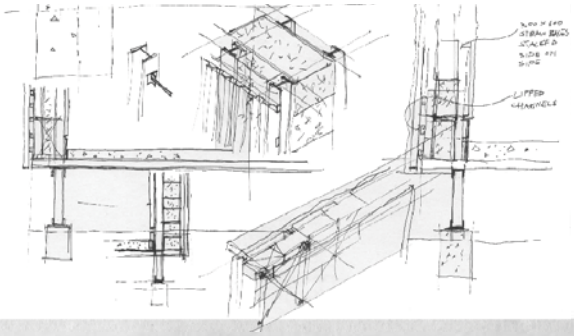

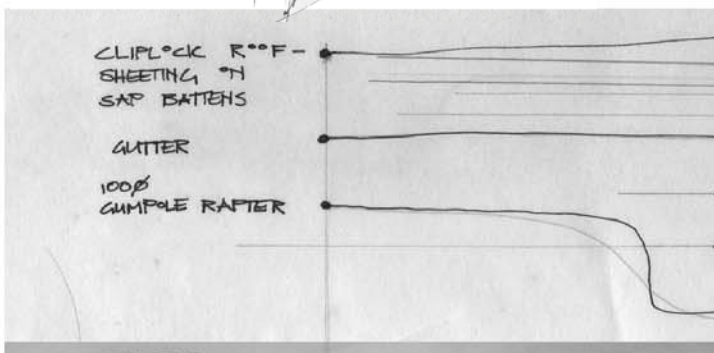

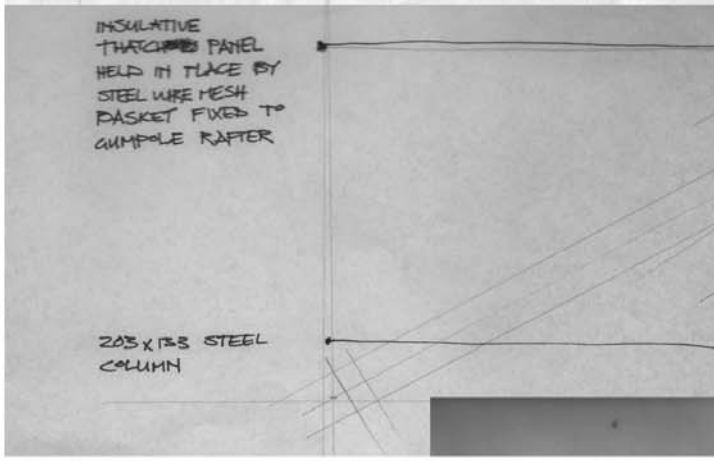

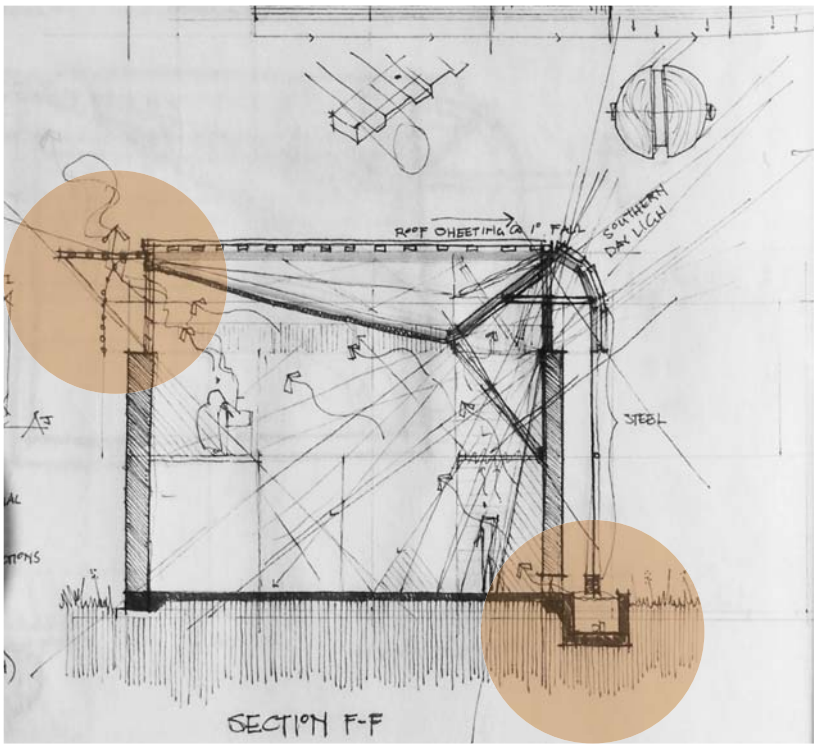

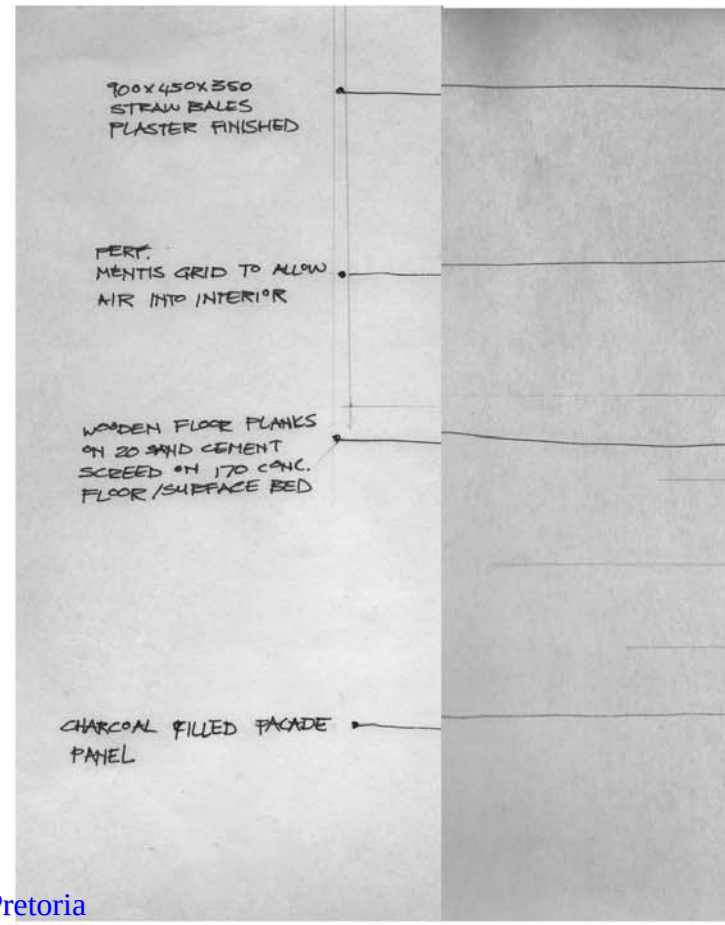

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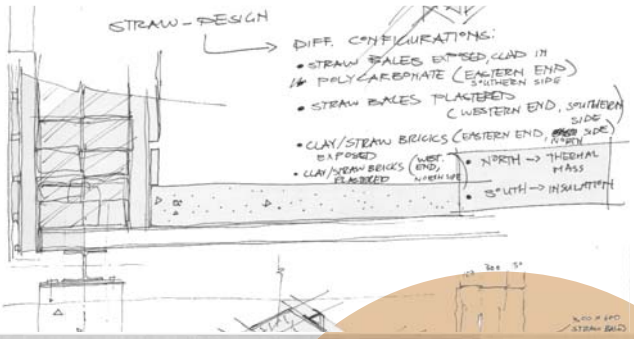

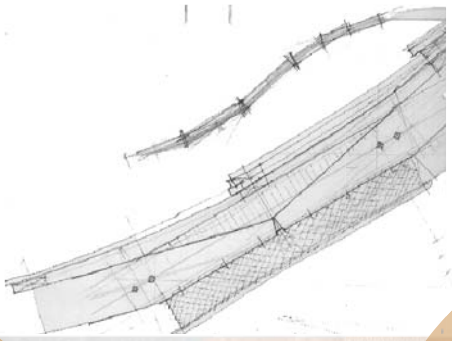

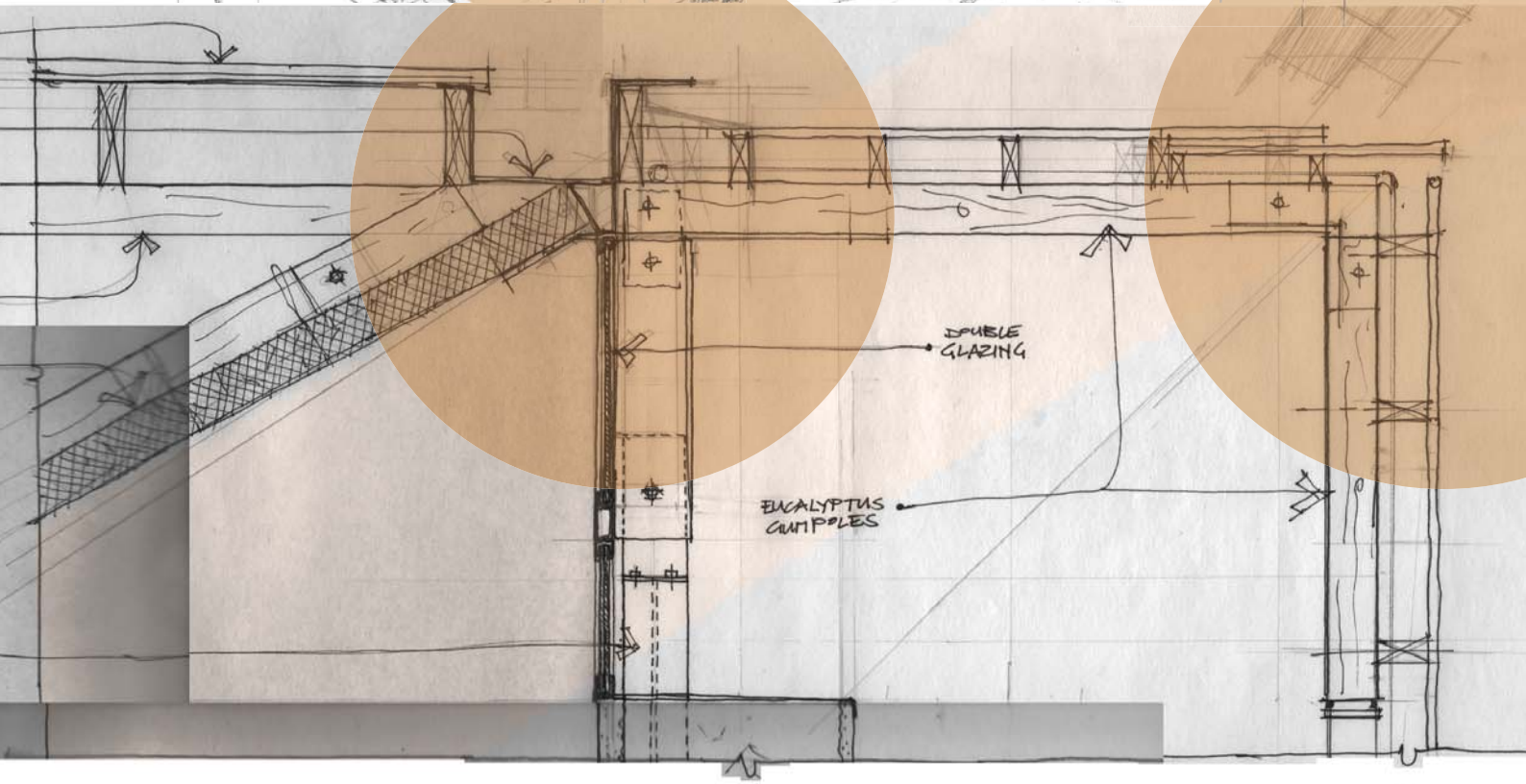

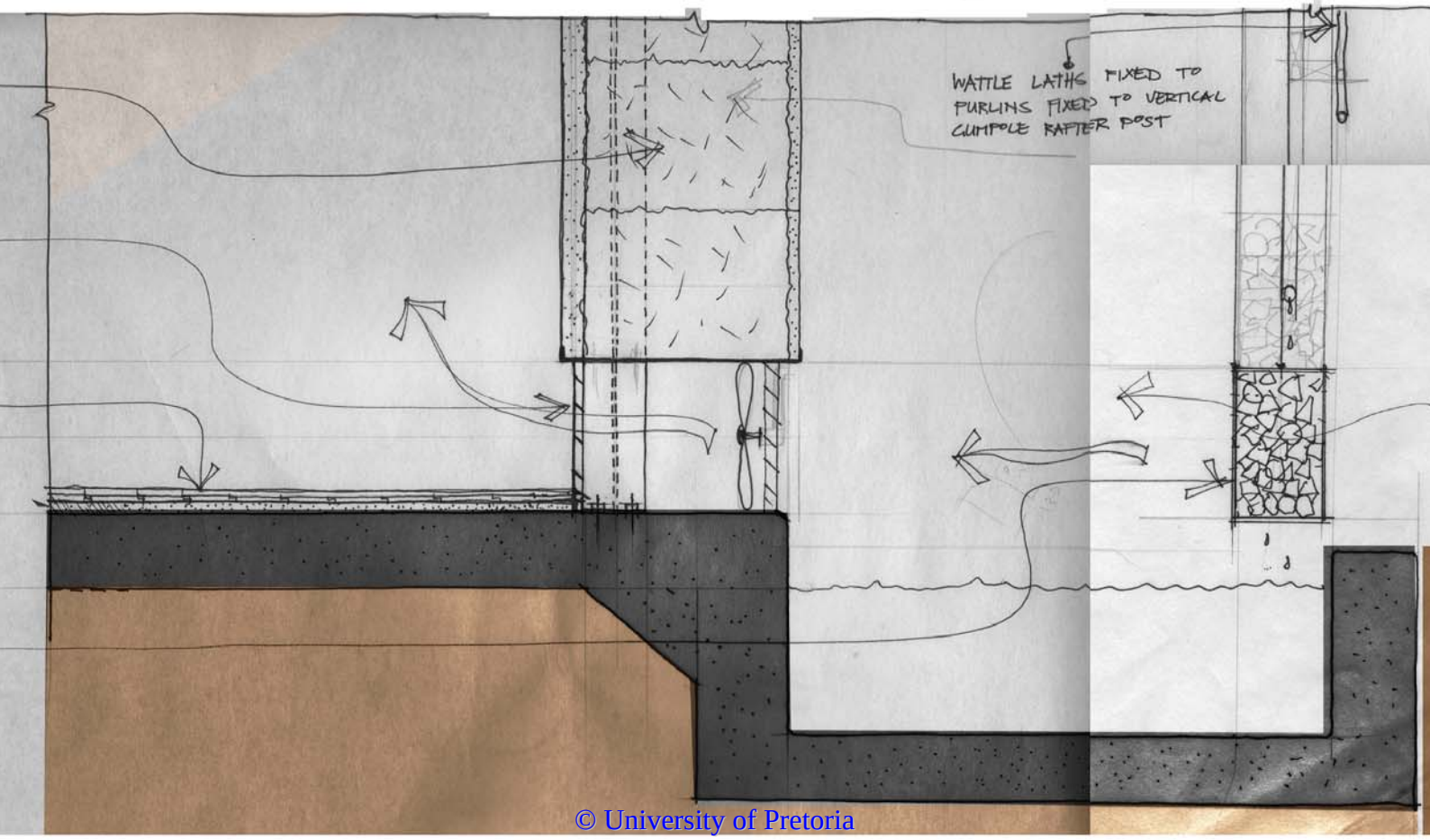

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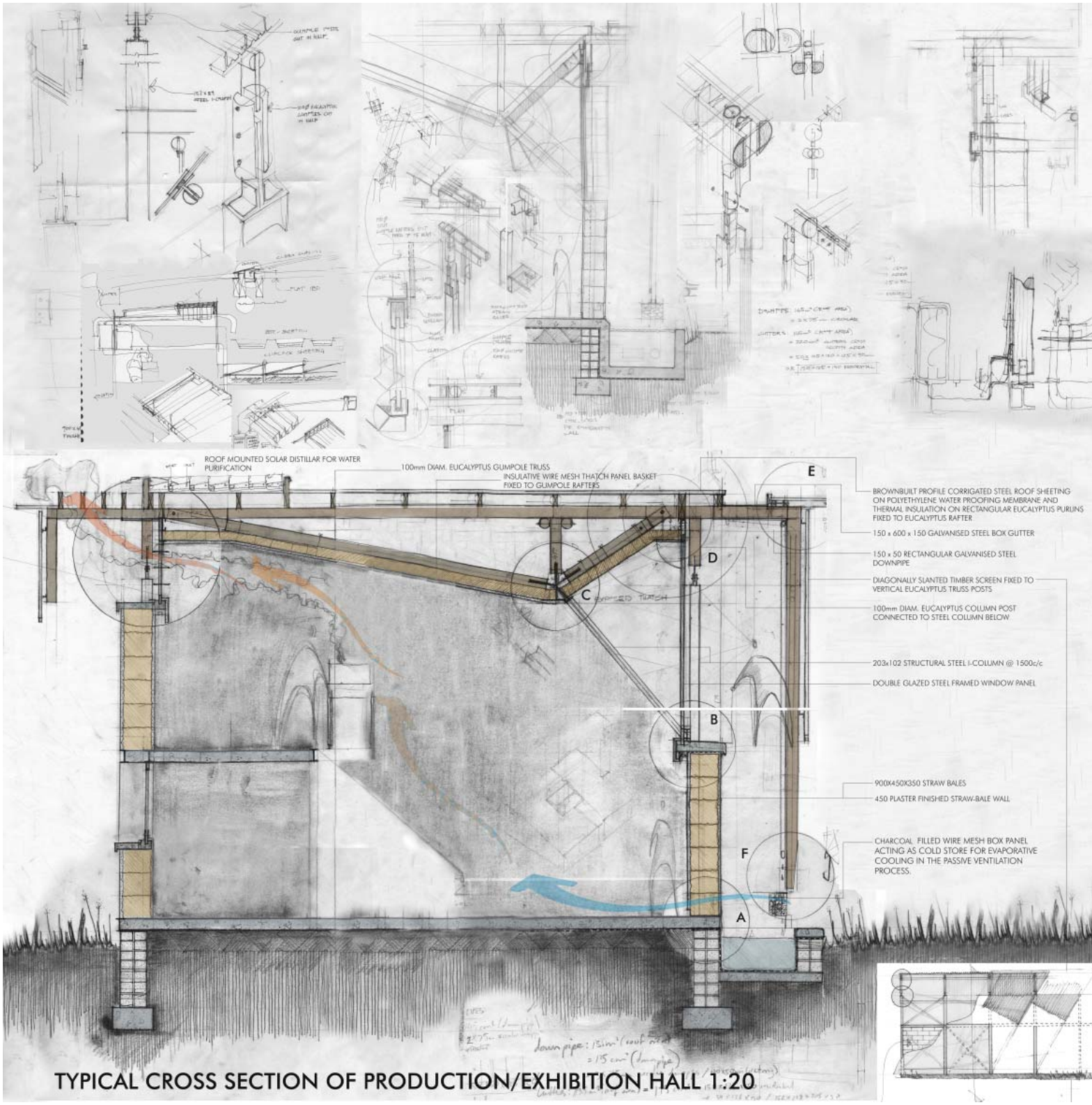

TYPICAL CROSS SECTION OF PRODUCTION/EXHIBITION HALL 1:20

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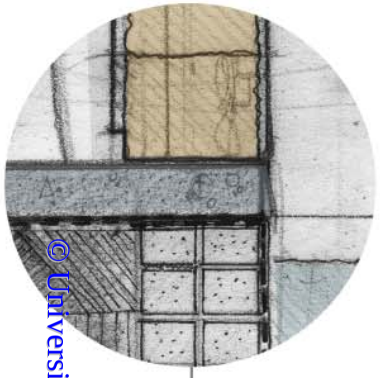
A

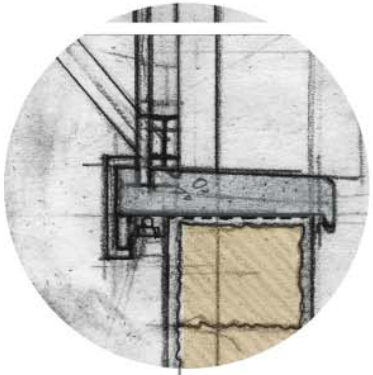
B

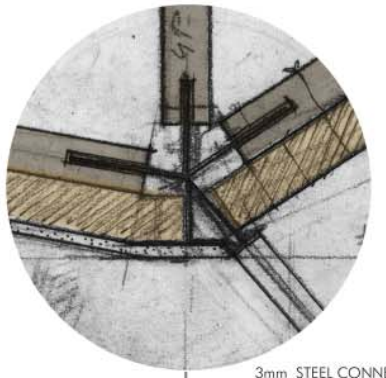
C

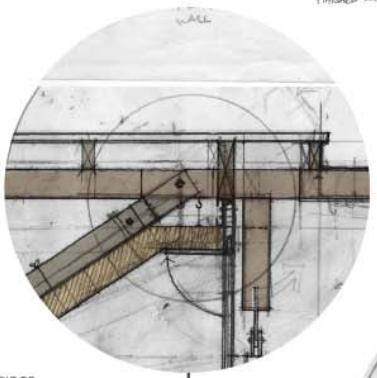
D

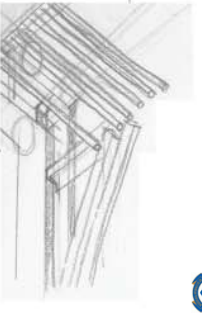
E

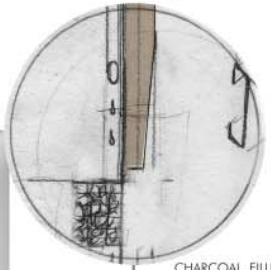




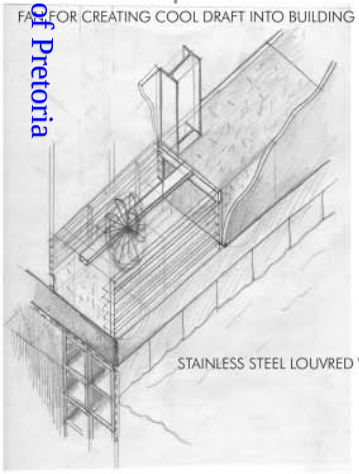




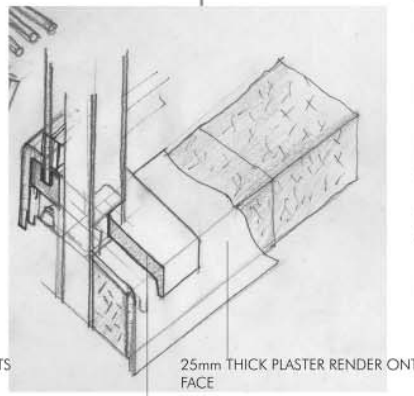




FACE FOR CREATING COOL DRAFT INTO BUILDING



STAINLESS STEEL LOUVRED VENTS

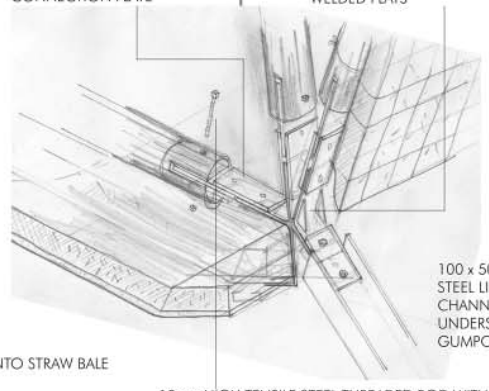


25mm THICK PLASTER RENDER ONTO STRAW BALE FACE

CONCRETE WINDOW SILL CAST ON SITE

3mm FLAT STAINLESS STEEL CONNECTION PLATE

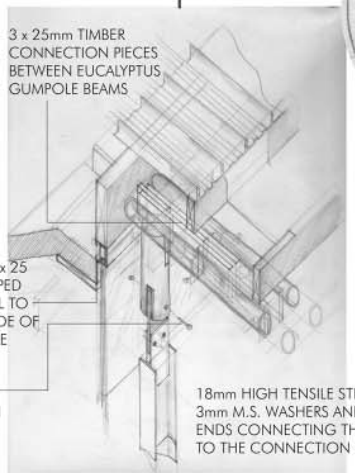
3mm STEEL CONNECTOR PIECE CUSTOM MADE FROM 3mm WELDED FLATS



18mm HIGH TENSILE STEEL THREADED ROD WITH 3mm M.S. WASHERS AND FRICTION NUT ON BOTH ENDS CONNECTING THE EUCALYPTUS GUMPOLE TO THE CONNECTION PLATES.

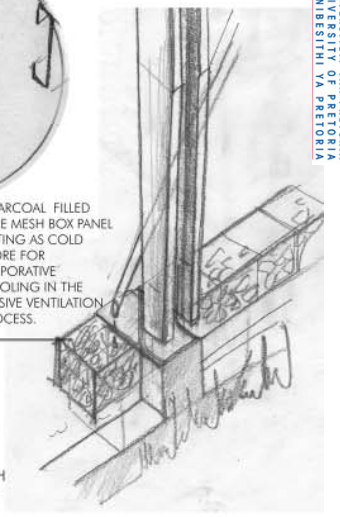
3 x 25mm TIMBER CONNECTION PIECES BETWEEN EUCALYPTUS GUMPOLE BEAMS

100 x 50 x 25 STEEL LIPPED CHANNEL TO UNDERSIDE OF GUMPOLE



18mm HIGH TENSILE STEEL THREADED ROD WITH 3mm M.S. WASHERS AND FRICTION NUT ON BOTH ENDS CONNECTING THE EUCALYPTUS GUMPOLE TO THE CONNECTION PLATES.

E CHARCOAL FILLED WIRE MESH BOX PANEL ACTING AS COLD STORE FOR EVAPORATIVE COOLING IN THE PASSIVE VENTILATION PROCESS.



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PREFACE
1__INTRODUCTION
2__THEME
3__THE CONTEXT
4__ARCHITECTURE AND ECOLOGY
5__THEORETICAL DIALOGUE
6__THE PROGRAM
7__CONCEPTUALISATION
8__PRECEDENT STUDIES
9__DESIGN DEVELOPMENT
10__LATEST DESIGN DRAWINGS
11__TECHNICAL RESOLUTION
12__FINAL PRESENTATION

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ENCROACHMENT, ARCHITECTURE & IMPAIRED ECOLOGY

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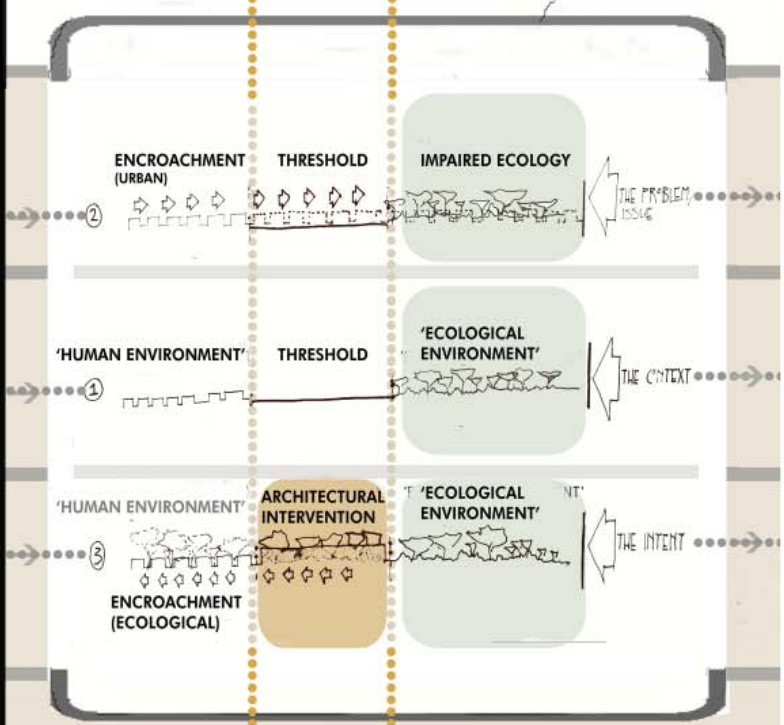
Naas du Plessis
2013

SITE SECTION A-A 1:50



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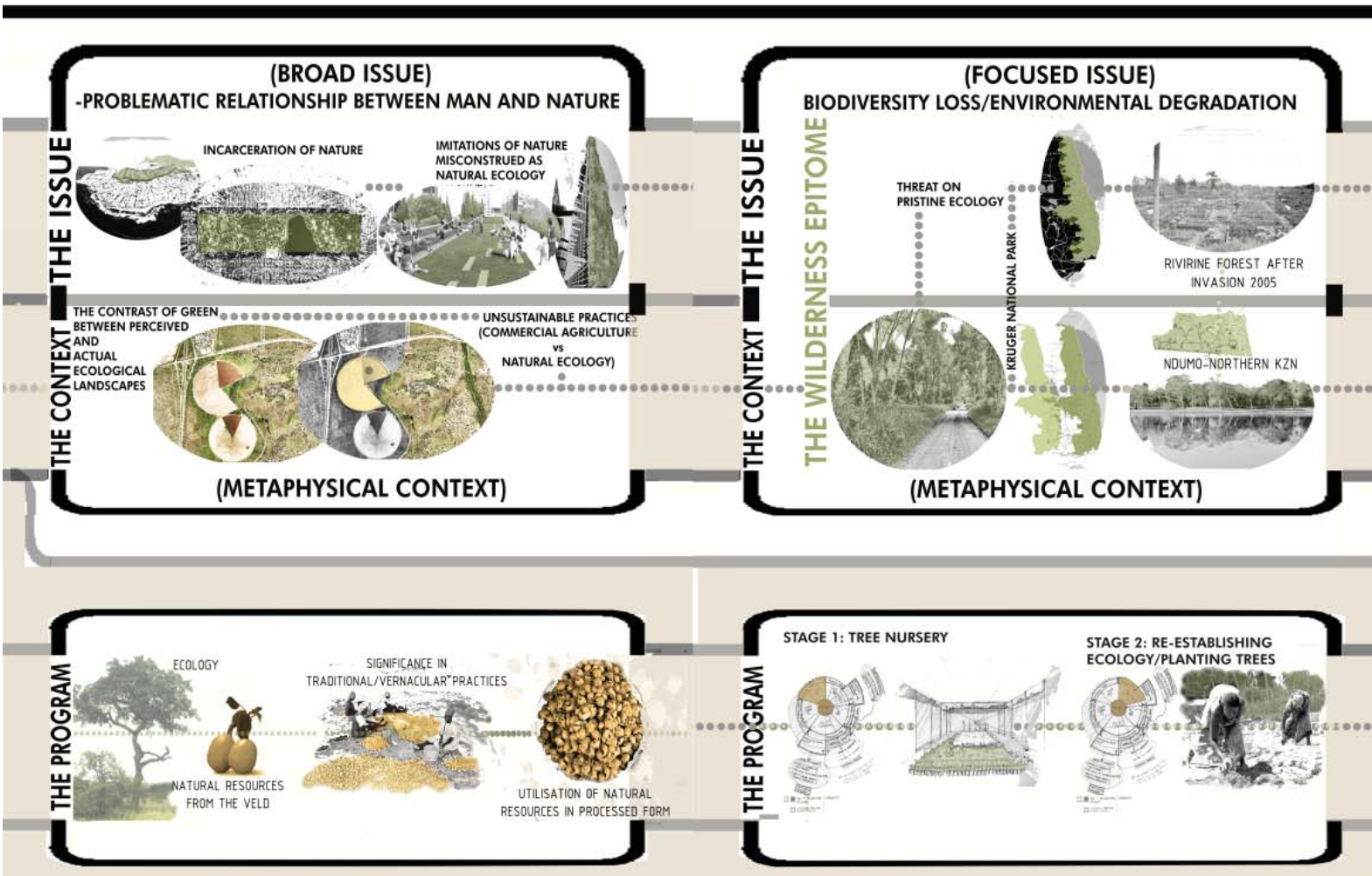

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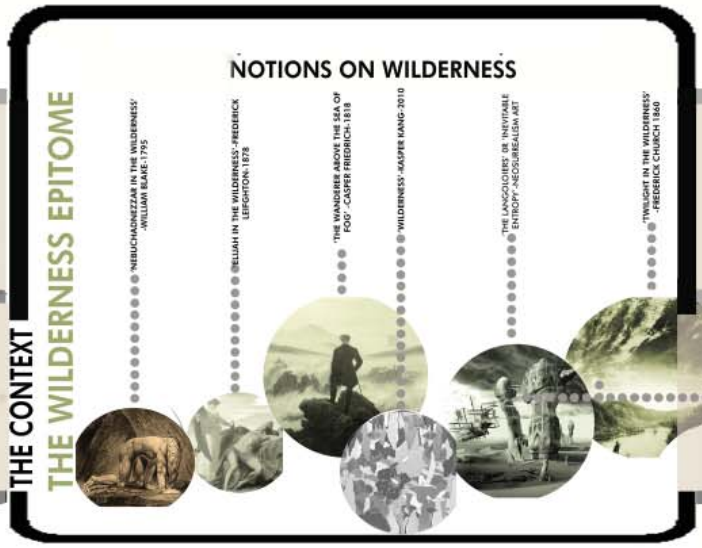

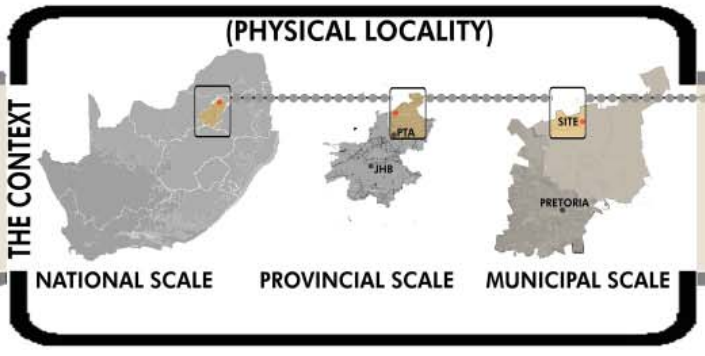

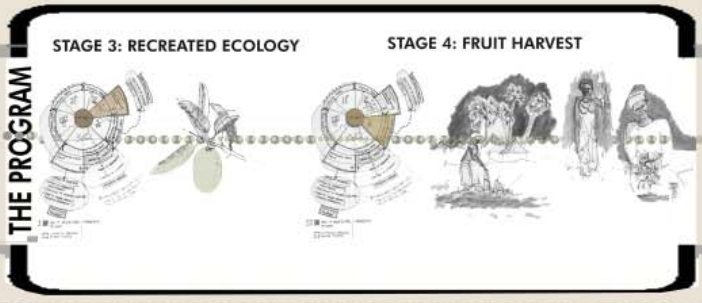

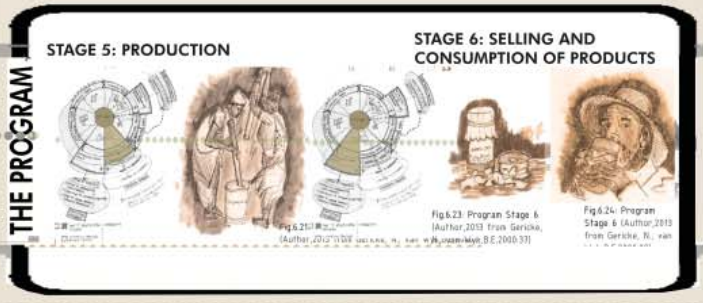

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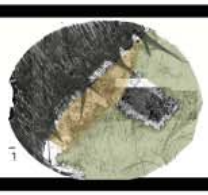
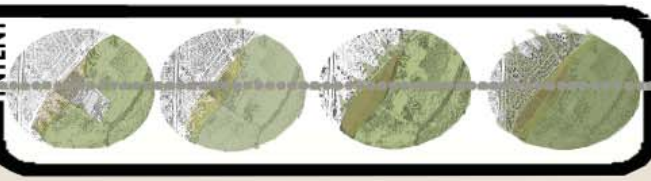
THE ISSUE



(LOCAL SITE ISSUE:
URBAN ENCROACHMENT)

INTENT

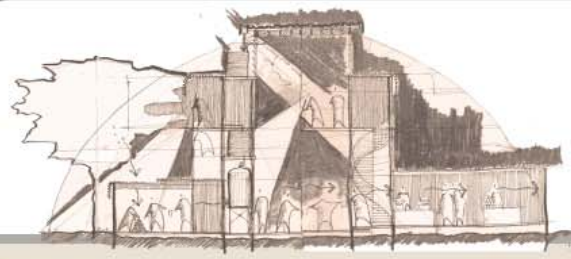


THE CONTEXT
(PHYSICAL LOCALITY)

REGIONAL SCALE

INVESTIGATION AREA

THE PROGRAM



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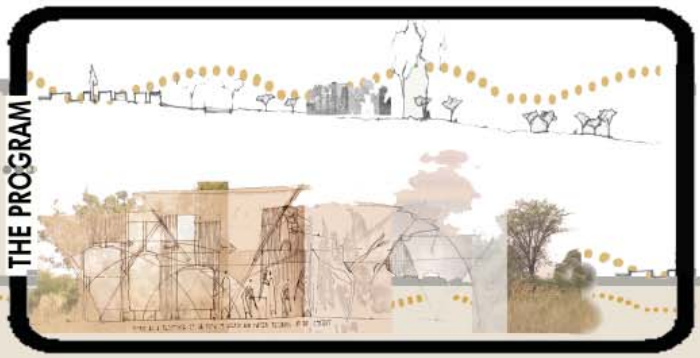
THE CONTEXT

(PHYSICAL LOCALITY)

THRESHOLD CONDITION
& IMPORTANT NODES

IDENTIFICATION OF SITE
FOR INTERVENTION

THE PROGRAM



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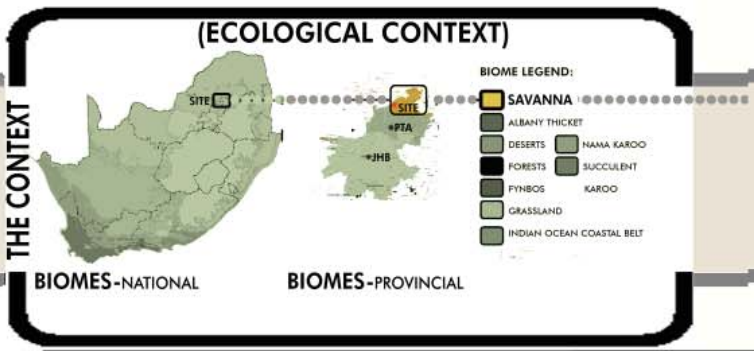

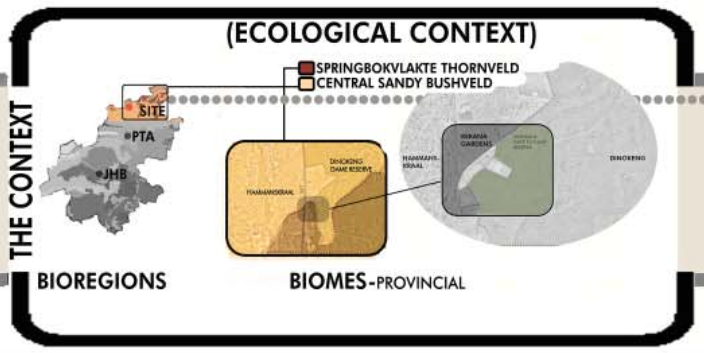

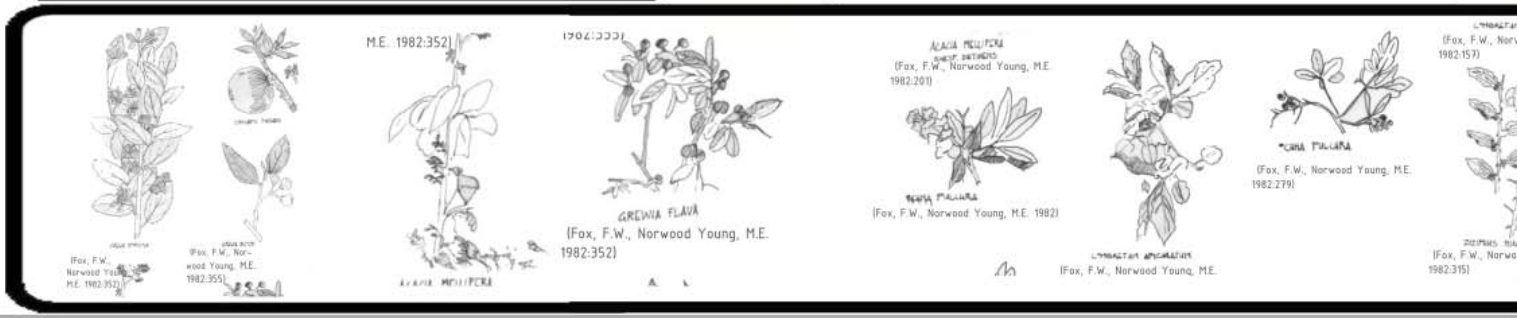

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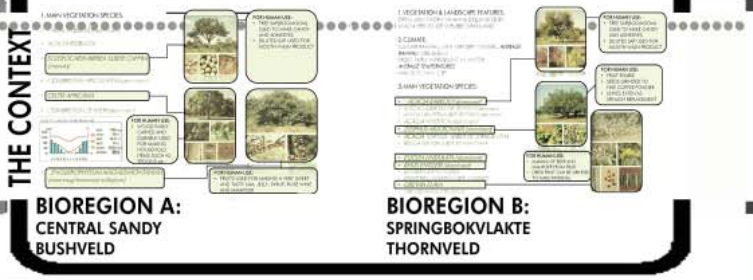
(ECOLOGICAL CONTEXT)

THE CONTEXT



BIOREGION A:
CENTRAL SANDY BUSHVELD

BIOREGION B:
SPRINGBOKVLAKTE THORNVELD

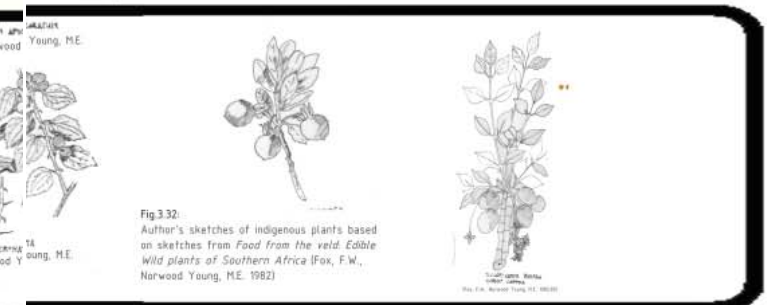


Fig.3.32:
Author's sketches of indigenous plants based on sketches from *Food from the veld. Edible Wild plants of Southern Africa* (Fox, F.W., Norwood Young, M.E. 1982)

List of dominant tree and shrub species present with indication of the edible plants shown in colour:

1. *Acacia burkei*
2. *Acacia robusta*
3. *Sclerocarya birrea subsp. caffra-(marula)*
4. *Burkea Africana*
5. *Combretum Apiculatum*
6. *Combretum Zeyheri*
7. *Terminalia Sericea*
8. *Ochna Pulchra*
9. *Peltophorum africanum*
10. *Rhus leptodictya*
11. *Combretum hereroense*
12. *Grewia bicolor*
13. *Grewia monticola*
14. *Strychnos pungens*
15. *Agathisantherum bojeri*
16. *Indigofera filipes*
17. *Felicia fascicularis*
18. *Gnidia sericocephala*
19. *Acacia Karoo*
20. *Acacia luederitzii var retinens*
21. *Acacia mellifera subsp. detinens*
22. *Acacia nicolita*
23. *Ziziphus mucronata*

(Venter, F.,VENTER,J. 1998/2002)

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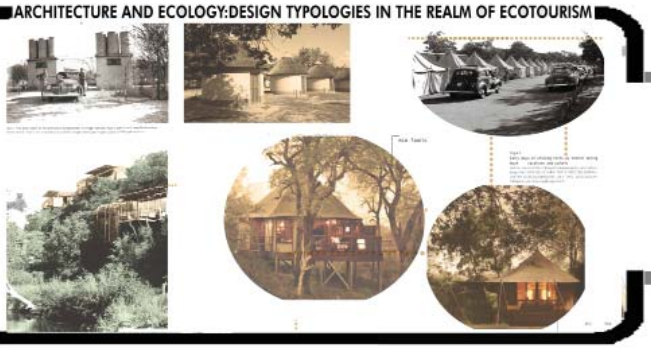
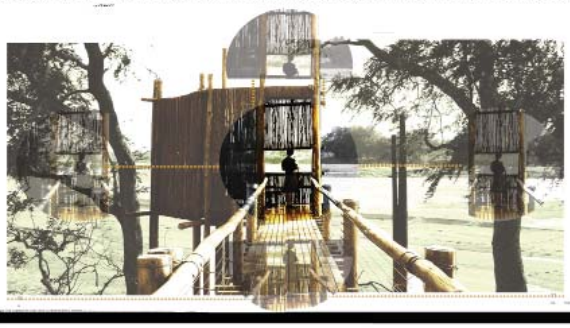
THE CONTEXT

ARCHITECTURE AND ECOLOGY:DESIGN TYPOLOGIES IN THE REALM OF ECOTOURISM

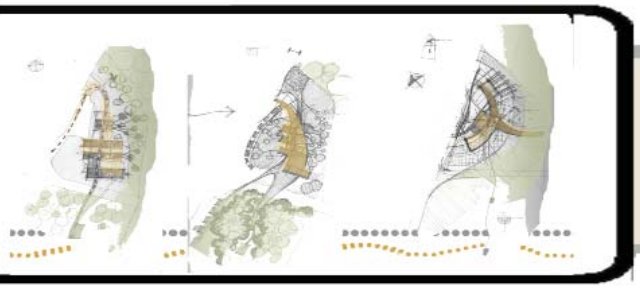


THE CONTEXT

ARCHITECTURE AND ECOLOGY:DESIGN TYPOLOGIES IN THE REALM OF ECOTOURISM



DESIGN DEVELOPMENT



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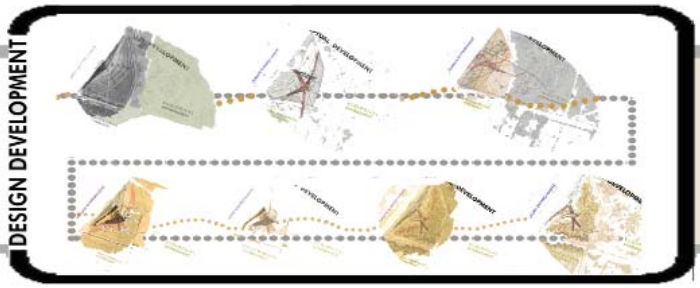
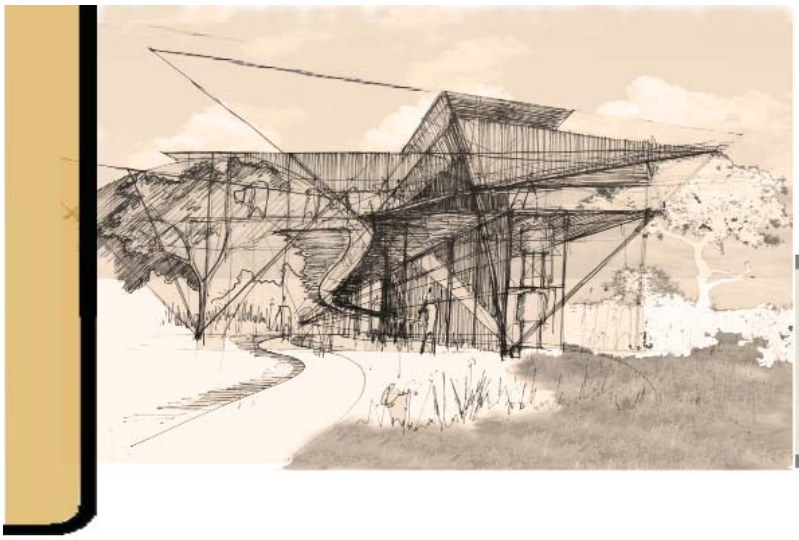
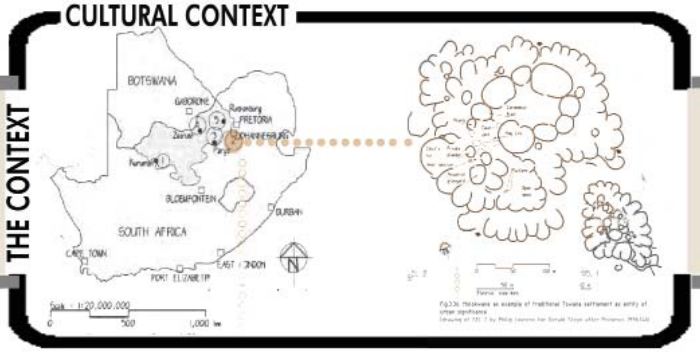
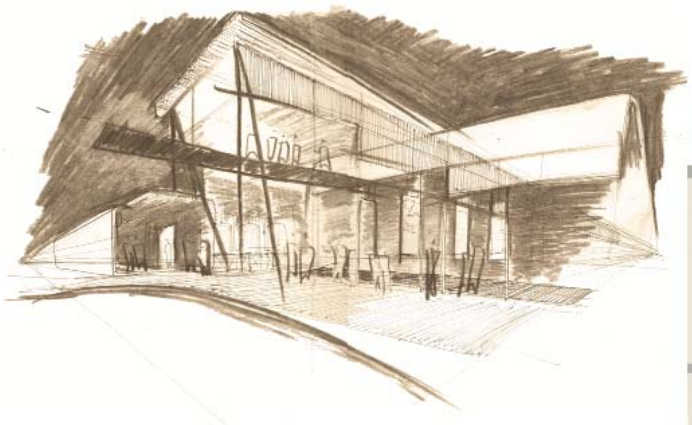




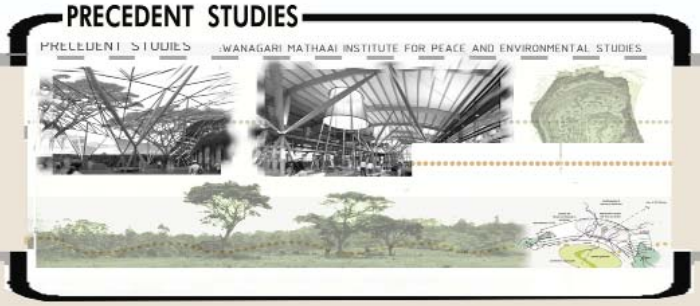
CULTURAL CONTEXT

THE CONTEXT





PRECEDENT STUDIES



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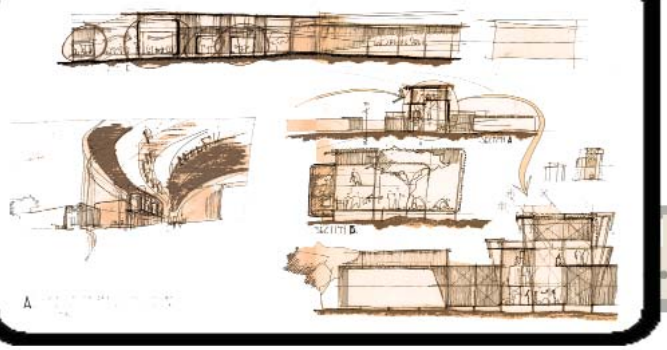
DESIGN DEVELOPMENT



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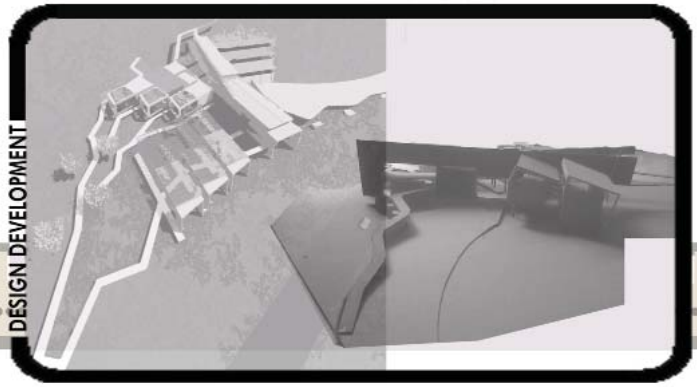


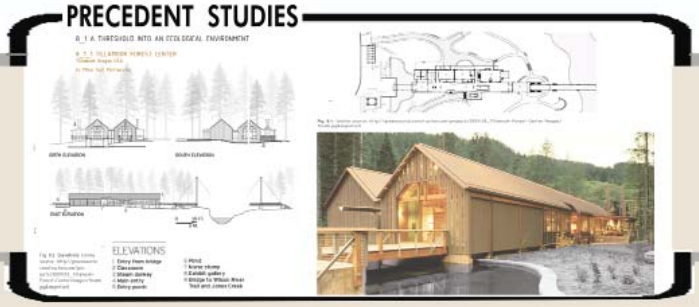
THE CONTEXT

CULTURAL CONTEXT

THE CONTEXT

THEORETICAL DIALOGUE

PRECEDENT STUDIES



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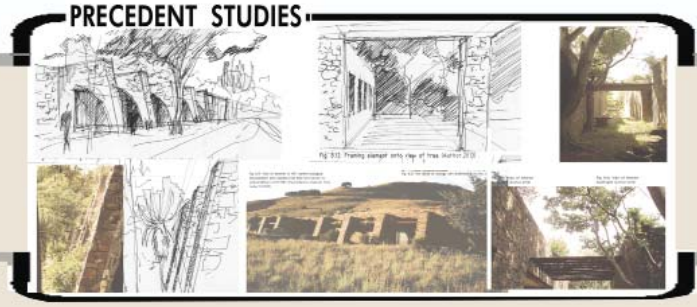

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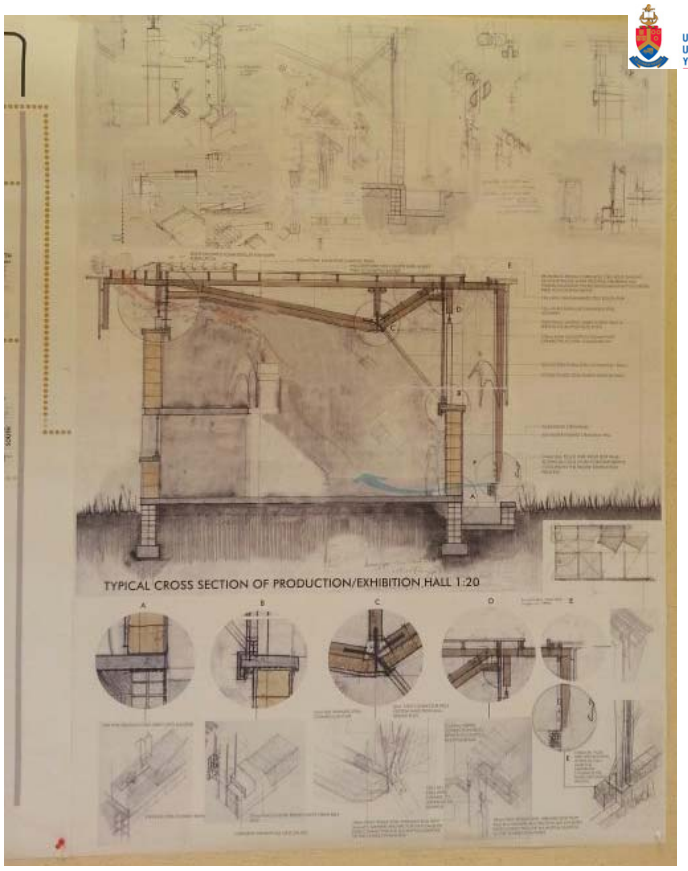

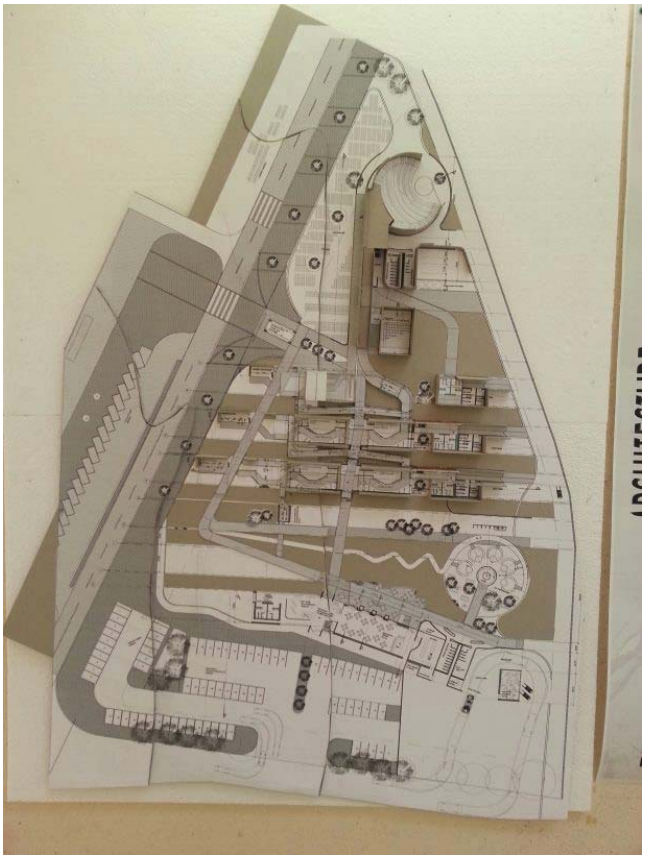

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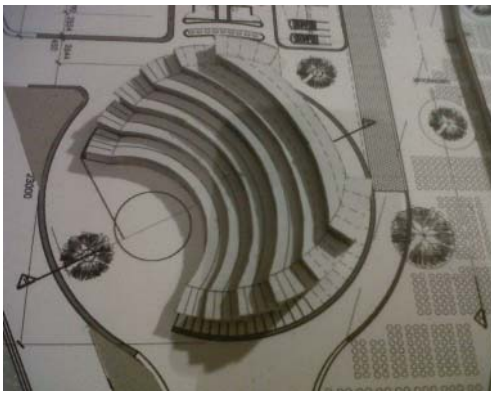

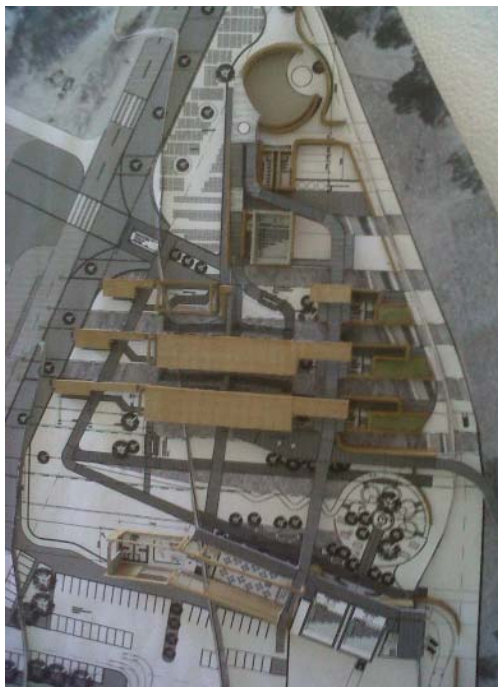

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PREFACE
1_INTRODUCTION
2_THEME
3_THE CONTEXT
4_ARCHITECTURE AND ECOLOGY
5_THEORETICAL DIALOGUE
6_THE PROGRAM
7_CONCEPTUALISATION
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13_CONCLUSION

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This dissertation have explored the relationship between man and nature, but it also suggested the possibilities within the relationship between architecture and ecology- And perhaps a fitting conclusion to this journey would be to answer the initial question by stating that:The point of dwelling on landscape now, at the beginning of the new century when the question asked right at the beginning-what is appropriate, is now better answered. Hence forth we cannot continue to ignore the role that architecture has to play in places where society meets wilderness and must accordingly realise that nature conservation can no longer be limited to exclusive places of sanctuary, safely tucked away in resorts solely flying the eco-tourism flag.

As stated earlier, this scheme encapsulates the idea of threshold: Thresholds between man and nature, thresholds between times of living in symbioses with nature and times of disconnectedness from it: Thresholds that need to be crossed between realms of traditional, indigenous knowledge and unsustainability. Architecture can become the medium or vehicle for shedding light on the imperative role that ecology have played in the past and should play in the future within human communities. It involves the creation of architecture that acts as filtering element for bringing clarity and simplicity to a seemingly disordered and chaotic wilderness as perceived by the novice observer. Where buildings frames and focuses in on dominant aspects within ecology, placing emphasis on these elements and their significance, allowing it to reveal itself as if for the first time.

It is about channelling ecology-based knowledge into understandable forms on a human scale.

-To reintroduce indigenous knowledge to community members living in close proximity to or within ecologically significant settings as well as exposing it to a broader audience of city dwellers.

Ultimately it is about taking any context of impaired ecology, regardless of its geographical position, using architecture as intervention vehicle with the aim of initiating ecological re-encroachment into human environments and thereby creating a new environmental paradigm appropriate for the 21st Century.

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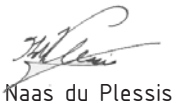
DECLARATION:

In accordance with Regulation 4(e) of the General Regulations [G.57] for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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

I further declare that this dissertation is substantially my own work. Where reference is made to the work 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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