

# THE UNENDING RAINFALL OF ARCHITECTURE

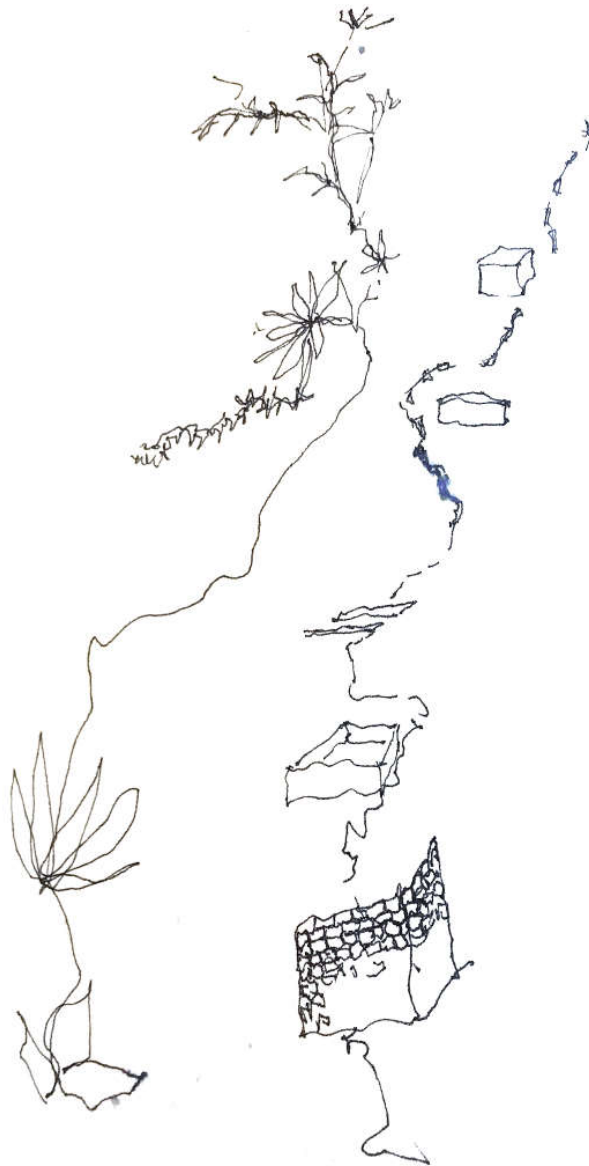
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- FINDING THE AUTOGENETIC WITHIN THE  
PHENOMENOLOGICAL -



FIG. 1 :TO DWELL





## I ACKNOWLEDGMENTS

‘

I can do all things through He who gives me strength.’ ~Philippians 4:1

To Kenny and Karin, without whom I never would have dared to climb this mountain. To you I owe an unending amount of thanks, I am forever grateful for your support.



FIG. 2 :THE LINE OF ARCHITECTURAL THINKING (AUTHOR, 2018)

## II PREAMBLE

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”

We find ourselves,  
within the provocation of thought,  
and reckoning of space  
and the intuitive glance towards the shape,  
that the building cuts from the sky.  
We most definitely find ourselves,  
if only for two beats of footsteps,  
along a path of dirt or gravel or concrete.  
We are somewhere and we are thinking.  
Something...

This self is not self  
or found  
without nature.  
without somewhere to be.

We reflect within the spaces  
that which we are ourselves without, and within.  
We toast to our conscious lack of experience  
To the lack of not knowing there is a lack.

Is this the architecture wherein we live?  
And do and feel and think and sleep.  
Is the architect the creator of that which we subconsciously lack  
within nature?  
Does the architect attempt to create this experience of that,  
which lies forgotten by the consciousness.

When we get back to the party that nature has thrown,  
where materials are as immaterial as they are material,  
and where the droplets of champagne that we spill on the floor,  
as we perform our lives,  
are considered spilled for only a second, until they too disappear.  
As we ourselves do, as the nature upon which we intrude so enthusiastically,  
does.

It is only that which we leave behind  
that which becomes memory,  
that remains for this landscape  
(of man).

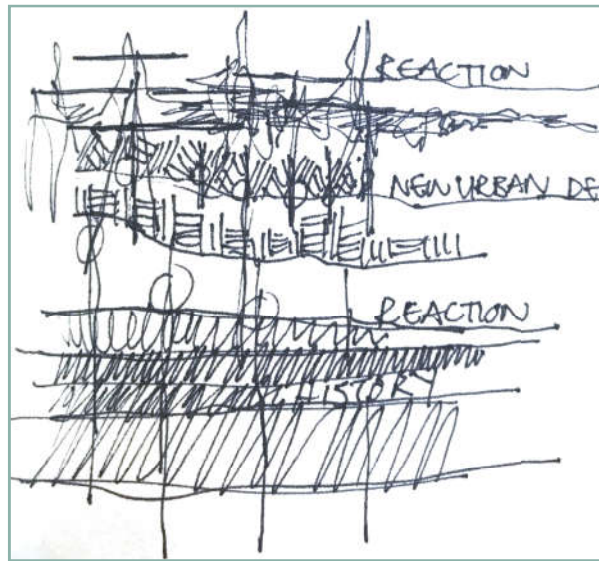


FIG. 3 :PALIMPEST ACTION &  
REACTION

By Author, 2018

III ABSTRACT

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A didactic response through architecture is secure through the re-establishment of the importance of knowledge, education and culturally appropriate debate through sound. This introduces the program of the local MamsFM radio station, onto a natural landscape next to the Pienaars River. As the water runs northwards into the Magalies and onwards, so the architectural intent lends itself to this trajectory of movement and spatial discourse.

As the presence of the river is never broken, only dried out or sunken, so architectural structure seeks to simulate a practice of solid presence and eluding fragility. The spatial constraints of the intrusion onto the landscape is guided by the natural topographic recourse of the site, aiming towards sensitive but deliberate environmental intervention.

The challenge of these buildings will be iterated in the balance between the consumption of the building by the landscape, and vice versa.

The exploration of the argument becomes crucial in the concept of experience in terms of the human and environmental scale. These contentions will be framed under principles of phenomenology and the encouragement of space-making.

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Theoretical conclusions within the framework of phenomenology predict patterns of importance relating to scale, form, light and texture that is subjectively experienced throughout architecture. Regenerative theory advances environmental and wellbeing strategies, focusing architecture towards sustainability within societal wellbeing. These objective and subjective guidelines are explored as an architectural whole that relies on the efficiency of all its parts.

THE UNENDING  
RAINFALL  
OF ARCHITECTURE

CINDI JANSE VAN VUUREN

UNIVERSITY OF PRETORIA  
2018

SITE :

Magaliesberg Mountain,  
Penaars River:  
North-Western Mamelodi  
25°41'59.76"S  
28°21'24.79"E

PROGRAM :

Didactic Radio-Station  
& Public Homestead

FIELD :

Heritage and Cultural Landscapes

CLIENT :

Primedia, Project of Government  
Stimulus package

THEORETICAL PREMISE :

Phenomenology

KEYWORDS:

Didactic, Regenerative, Haptic,  
Auto-genetic, Reflection

STUDY LEADER :

Dr. Nico Botes

STUDIO LEADER :

Prof. Arthur Barker



Autogenetic adjective  
au-to-genetic  
Definition of autogenetic  
1: SELF-GENERATED  
2: of or relating to autogenesis  
3geology : determined by or developed under strictly local conditions

Phenomenology noun  
phe-nom-e-nol-o-gy  
plural phenomenologies  
Definition of phenomenology  
1: the study of the development of human consciousness and self-awareness as a preface to or a part of philosophy  
2a(1): a philosophical movement that describes the formal structure of the objects of awareness and of awareness itself in abstraction from any claims concerning existence  
(2): the typological classification of a class of phenomena the phenomenology of religion  
b: an analysis produced by phenomenological investigation

Haptic adjective  
hap-tic  
Definition of haptic  
1: relating to or based on the sense of touch  
2: characterized by a predilection for the sense of touch a haptic person

Regenerative design  
a process-oriented systems theory based approach to design. The term “regenerative” describes processes that restore, renew or revitalize their own sources of energy and materials, creating sustainable systems that integrate the needs of society with the integrity of nature.

Permaculture noun  
per-ma-cul-ture  
Definition of permaculture : an agricultural system or method that seeks to integrate human activity with natural surroundings so as to create highly efficient self-sustaining ecosystems

Techne noun  
tech-ne  
Definition of techne : ART, Skill-especially : the principles or methods employed in making something or attaining an objective

Tabula Rasa noun  
ta-bu-la ra-sa |  
Definition of tabula rasa  
1: the mind in its hypothetical primary blank or empty state before receiving outside impressions  
2: something existing in its original pristine state

Pluvial adjective  
plu-vi-al  
Definition of pluvial  
1a: of or relating to rain  
b: characterized by abundant rain  
2of a geologic change : resulting from the action of rain

## IV TERMINOLOGY

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AS DEFINED BY THE MERRIAM  
WEBSTER DICTIONARY

## AT THE WATERS EDGE

### KEYWORDS

didactic  
reflection  
reclamation  
reckoning  
phenomenology



FIG. 4 :THE DISTURBANCE OF PLACE AND THE EXPERIENCE OF RECKONING (AUTHOR, 2018).

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III Preamble  
IV Terminology

V Structuring

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‘ GREAT THINGS ARE DONE  
BY  
A  
SERIES  
OF  
SMALL  
THINGS  
BROUGHT TOGETHER.

-VINCENT VAN GOGH



# CHAPTER 01

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## INTRODUCTION

- 1.1 Site of choice
- 1.2 Preface
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of tabula rasa
  
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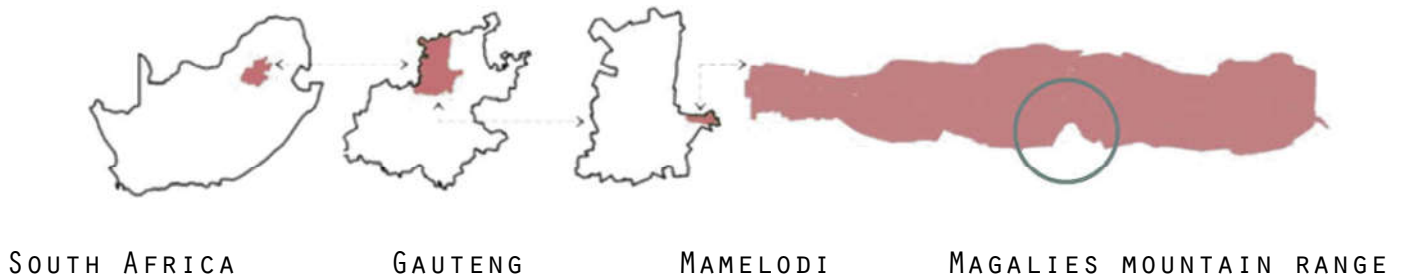


FIG. 5 :DIAGRAM OF LARGER SITE LOCATION (AUTHOR, 2018)

### 1.1 SITE OF CHOICE

The site choice originates from the authors normative position regarding the concept of non-place exploration, through the catalysing potential of water. Mamelodi was chosen for its precarious and interesting position within the spatial legacy in the South African context, and the implication of ownership and place. This dissertation aims to investigate the contentions within nature itself, as well as the reflection of the spatial legacy on the landscape of nature and man.

The primary site of interest is the ridge in the Magaliesberg Mountain where the Pienaars River enters the urban condition of Mamelodi West, near Moretele Park. Historical investigation reveals how the river has played a crucial part in the urban sprawl of the greater Mamelodi, where the single-use residential typology has promoted social and economic fragmentation (Steyn, 2005).

## 1.2 PREFACE

'Every new work of architecture intervenes in a specific historical situation. It's essential to the quality of the intervention that the new building should embrace qualities that can enter into a meaningful dialogue with the existing situation. For if the intervention is to stand its place, it makes us see what already exists in a new light. We throw a stone into the water: sand swirls up and settles again. The stir is necessary. The stone has found its place, but the pond is no longer the same.'

PETER ZUMTHOR  
(THINKING ARCHITECTURE, 2006:86)



FIG. 6 :INTUITIVE VS  
CRITICAL (AUTHOR, 2018)

### 1.3 IN THE ABSENCE OF TABULA RASA (INTRODUCTION)

#### GESTURES AND INVESTIGATIONS:

This project aims to address the distance between architecture that is omniscient of human and natural experience, as well as sensitive to emerging strategies of regenerative place-making. This theoretical stance therefore suggests strong input from phenomenological as well as regenerative thoughts and typologies. The essential goal for this investigation is to arrive at a place where rational and slightly ridiculous anomalies of architectural understanding meet. This incision into theoretical understanding aims to place itself within a contextual background that is relevant to current South African developments of thinking and building.

The application of this academic attempt is not in the interest of arguing certain typologies of theories, but rather in the exploration of certain ways of thinking and how these are applicable to the creation of architecture that speaks of an individual dream, whilst caressing a universal regenerative intent.

#### THE CONTEXTUAL:

At the Northern boundary of Mamelodi, the Pienaars River enters the Eastern periphery of the Pretoria Magalies Mountain range. This river, a tributary of the Crocodile River, flows northwards through Mamelodi and proceeds into the Roodeplaat Dam. The focus of the context lies within the careful extrapolation of the spatial legacy of the natural and urban landscape, its condition of non-place/place, and the potential of architecture as a stimulant of place through the lens of water as a catalyst.

The intention of architecture as stimulant, is not without strong limitation and deliberation of program. The architectural intention should eventually guide the natural condition through a process of reflection and reclamation, as well as respond enthusiastically towards the cultural and social audience. This is the search for an autogenetic function that supports the ambiguity of function and form, in a temporal and ephemeral sense.

The community of Mamelodi is historically viewed as a contested area due to social and physical planning skills, which has led to the concentration of a socially marginalized population. As a result, one finds poor urban connections between economic nodes and the formidably established township (GAPP, 2010:19)

GENERAL

The absence of 'sense of place and ownership' between the east of Pretoria, the CBD, and Mamelodi, is what drives this investigation. The transport between 'place'(residence) and other 'places'(CBD) crosses a large barrier of non-place that I wish to address by using architecture as a tool for connection and enablement. Obvious and basic need fulfilment, political junctures as well as past legacies are blatant and fruitful factors to influence an already complex site (GAPP, 2010). The introduction of a social and economically viable meeting point, serves to eliminate the marginalization, and repair the deviation that was created as the industry of residency and business grew, in some cases too close, and some cases too far, from one another. The interest of the author is to marry the natural contentions of the chosen site to the contextual social environment in a way that allows points of reflection and reclamation.

The search for an auto-genetic function that supports haptic experience, propels the dissertation into investigations of phenomenological theory.

URBAN

The motive is to harness the presence of the river as a force of reckoning and shape as a tool for social reclamation. This aims to address both a phenomenological and pragmatic issue that reclaims environmental potential as well as nourishes the spirit and legacy of the natural and social opportunity of space. As water is a life-sustaining resource but also an important source of social recreational activities; the marriage of the auto-genetic and ephemeral become apparent within the conceptual context of this investigation. The ephemerality of water is self-expressed. In its ability to always find the easiest path, to move and change with the seasons, and to sustain and restore life. These qualities of the river are discussed in order to create way-finding between the experiential purpose of water and the experiential intentions of the possible architectural intervention.



The memory or origin of the place has to meet the potential of what it could be - and that we can only assess in the present. This is where the main concept of reflection as a journey through reclamation and reckoning comes into play. The interest of water as a tool for place making and a vessel for reflection, generates the primary architectural issue. This stems from a theory of architecture that can overcome all spheres of the liminal and subliminal need, to be closely constructed with contextual principles that relate to the program, atmosphere and audience. Thoroughly investigating the potential for the site throughout the periphery of Mamelodi as place, and then that which wanders off onto its own into the Magaliesberg to the North, Sammy Marks to the West and the consequential suburbia of the South-Eastern boundary: aim to lead to findings that supports the need of an architectural intervention that could satisfy the reflective narrative of the architectural intent.

The eventual aim is to determine the type of intervention that could be beneficial to the environment (noting the environmental sensitivity of the Magaliesberg Mountain area, and further disregard for riverbank maintenance and general vagrancy) as well as the spirit of the audience. This addresses the in-between space where human and environmental needs are equally met and sustained.

Fundamentally attempting to ground epistemology in the human consciousness of the present moment found within nature (Husserl, Dummett and Moran, 2008:70).

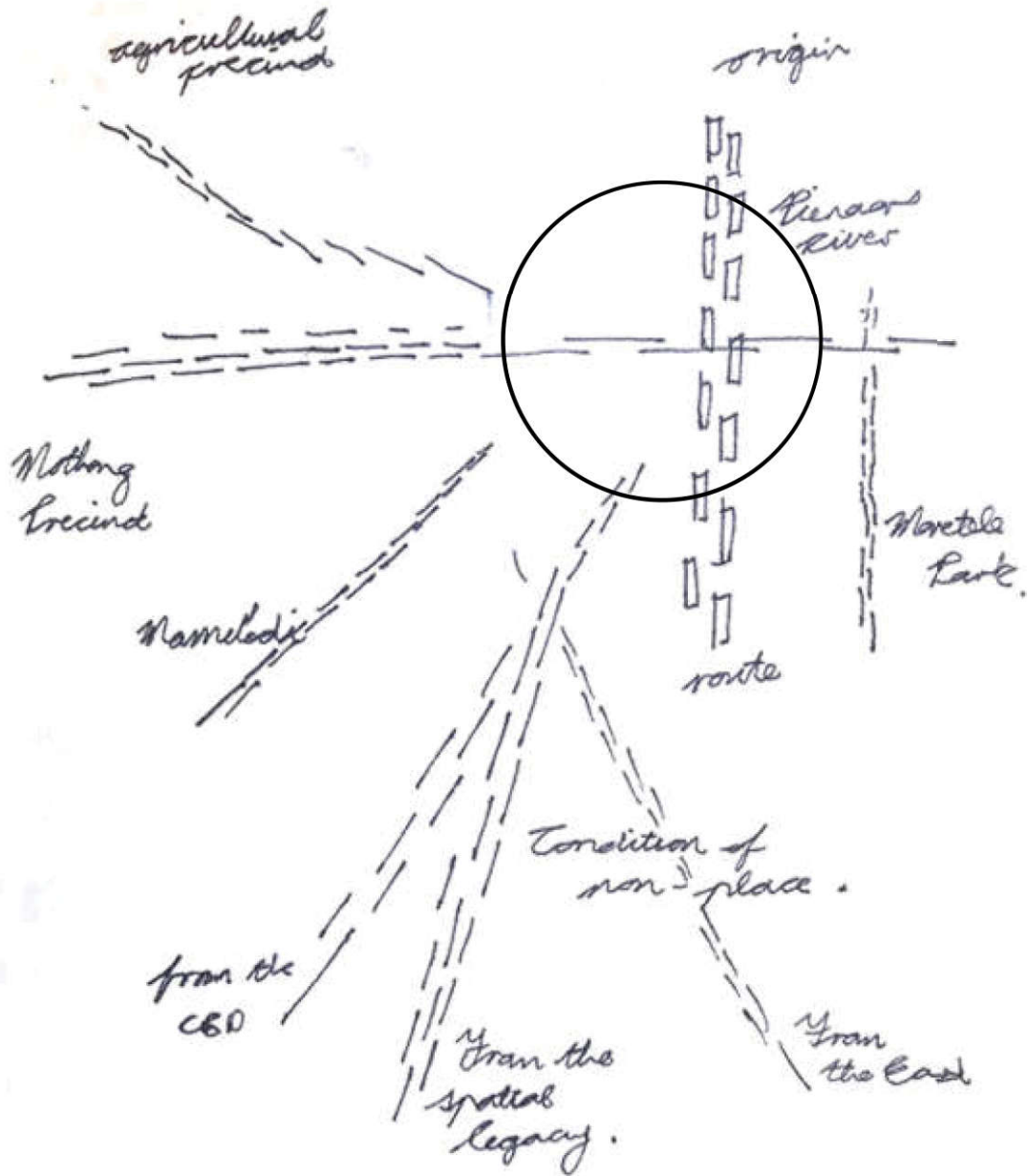


FIG. 7 :DIAGRAM EXPLAINING THE AUTHORS INTENTION TO DISTINGUISH INFLUENCING DRIVERS THAT CONTRIBUTE TO THE CONDITION OF 'NON-PLACE (AUTHOR, 2018)



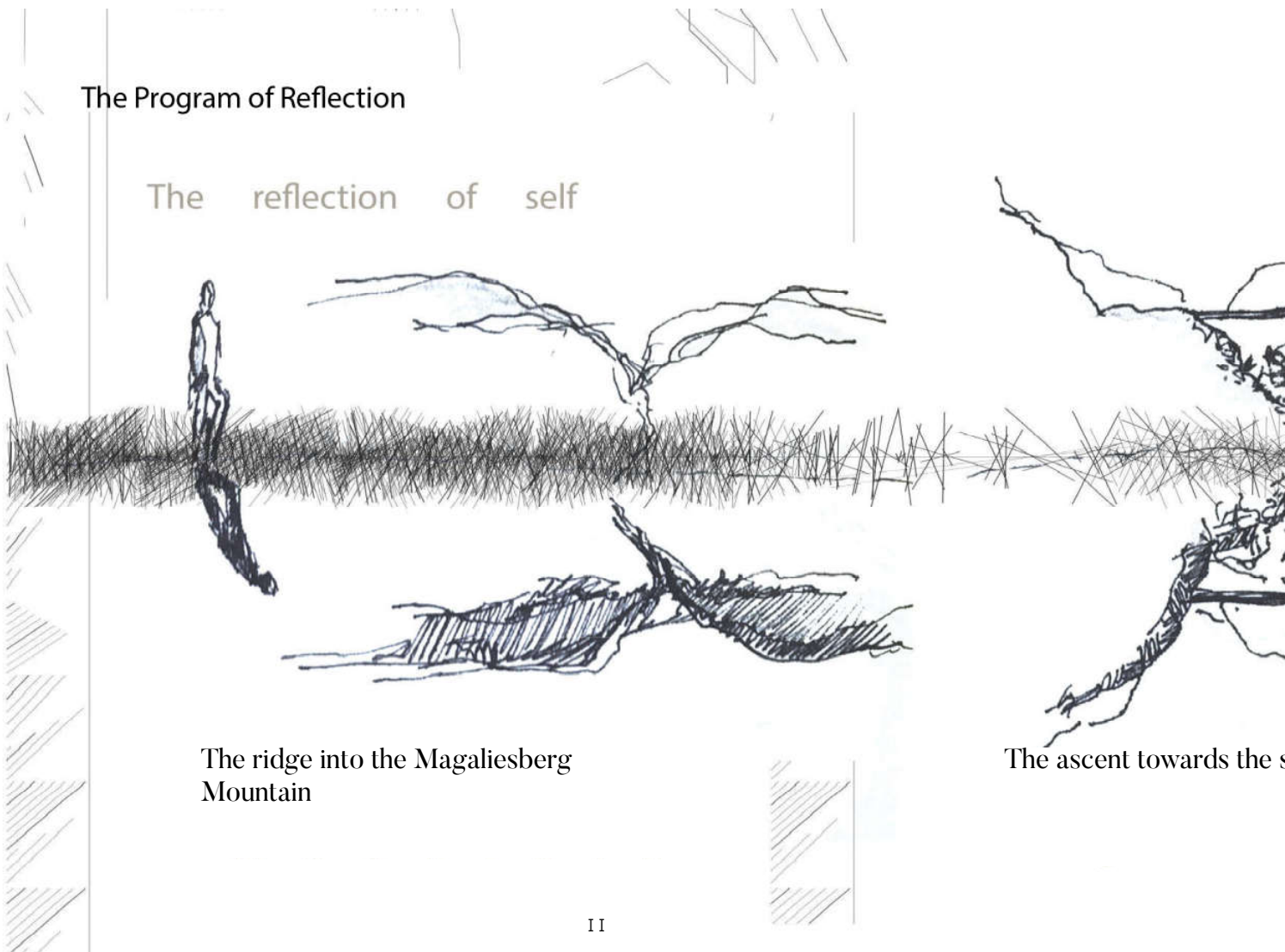
*FIG. 8* :PHOTO COLLAGE OF  
CONTEXTUAL EXPERIENCE WITH RIVER  
AND SURROUNDS (AUTHOR, 2018)

ARCHITECTURAL  
INTENT

The intention of the author is to create a destination that allows water to stimulate 'place' of social and recreational worth as well as a place of economical facilitation. The concept around an active social gathering space draws into the apotheosis of the animation and ambition of the social and individual spirit. The established global water management crisis offers a myriad of interesting architectural and programmatic solutions and challenges, considering the environment and human-relationship sensitivity. The idea around the physical architecture of structures, around and throughout the body of water, is to house a cultural economic program. This requires sensitive deliberation around the input and output of what such industry could be, especially pertaining to existing local trade and market/infrastructural gaps in the precinct.

The Program of Reflection

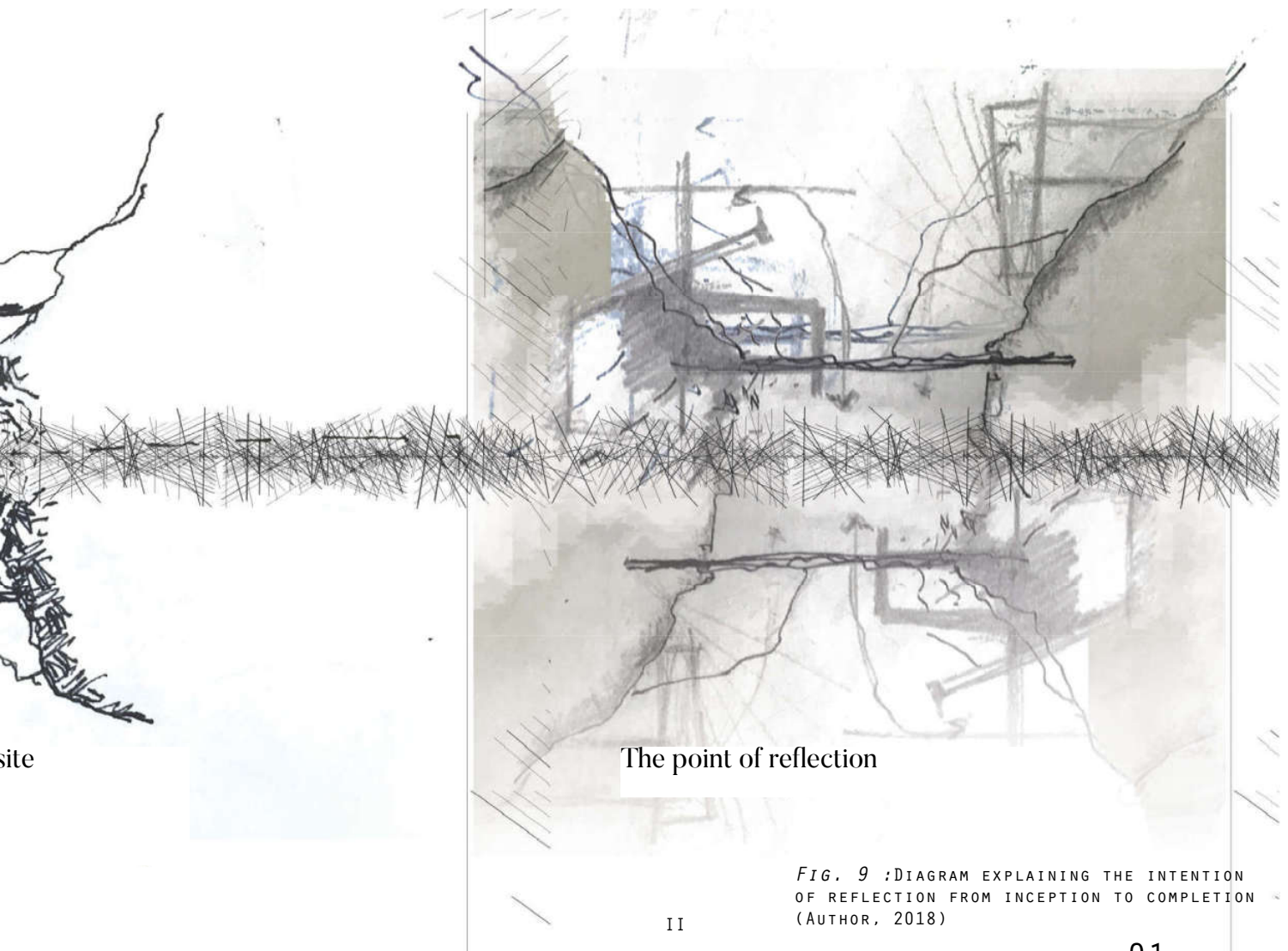
The reflection of self



The ridge into the Magaliesberg  
Mountain

The ascent towards the s...

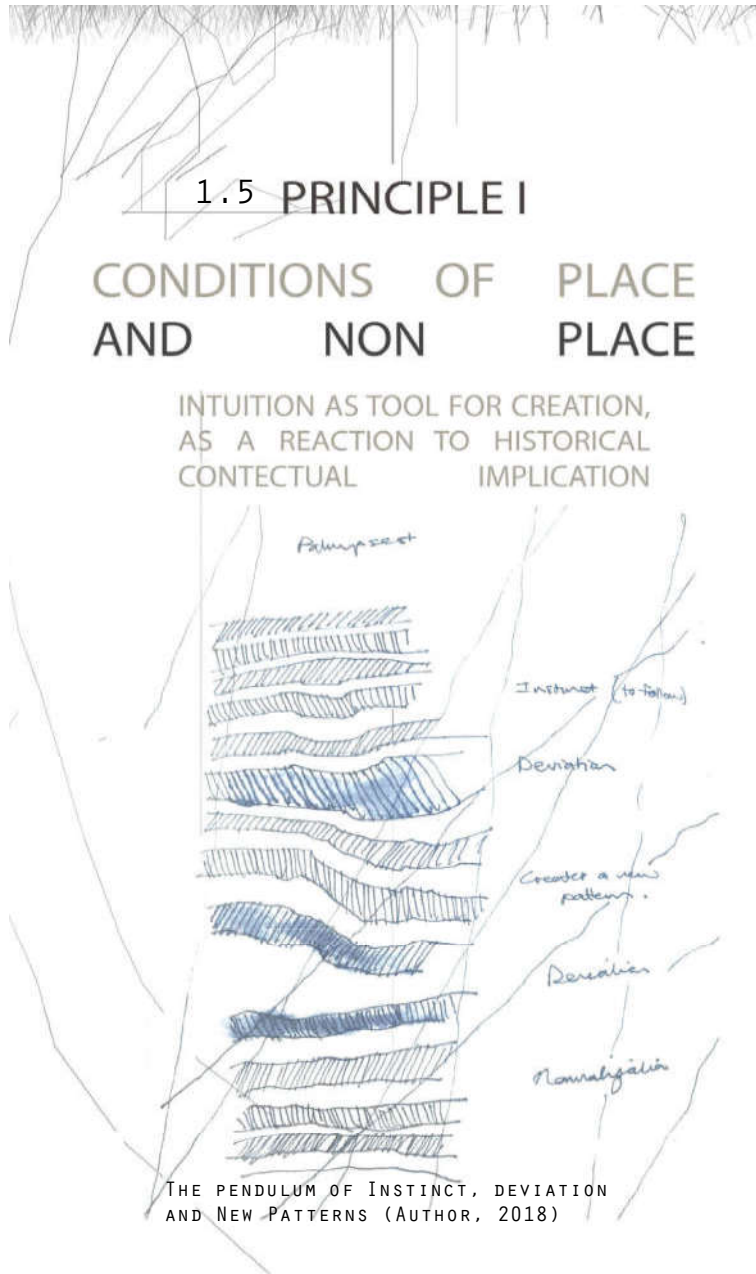
1.4 CONCEPT The language of a social water-body and communal-industry orientated intent, is to grow naturally from within a landscape that is peripheral to Mamelodi and the more formalized movement to the West. It is suggested that current models of development merely satisfy economical and technical needs, where the approach of architecture needs to find itself in conforming and supporting more social economic programmes(Van Rensburg & Da Costa, 2008).).



The point of reflection

FIG. 9 :DIAGRAM EXPLAINING THE INTENTION OF REFLECTION FROM INCEPTION TO COMPLETION (AUTHOR, 2018)

II



THE INTENTION OF THE AUTHOR IS TO  
EXTRAPOLATE THE JOURNEY OF  
REFLECTION FROM THE SELF, OUTWARDS  
TO THE FINAL ARCHITECTURAL  
I N T E R V E N T I O N

The idea that place entails unending descriptions of 'processes that shape existential and aesthetic cultural experience' (Rewers 2004: 161). The 'place' in question is a study of not only geographical location but human behaviour and environment.

## 1.6 PRINCIPLE II

UNDERSTANDING OF CONNECTION  
BETWEEN WATER BODY AND  
SOCIAL CONDITIONS AND  
INFLUENCES IN THE SURROUNDING  
A R E A  
TO DWELL



*The way in which you see the way, the manner in which humans are on earth is dwelling.*

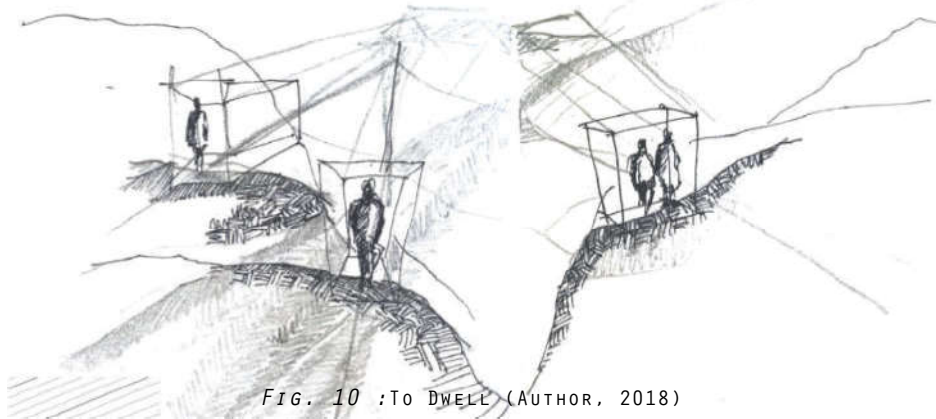


FIG. 10 :TO DWELL (AUTHOR, 2018)

The lens of the 'ordinary' or daily life becomes important when viewing this disconnect between modern life's disregard for nature and the lack of dialogue between man and nature on a regular basis. This contributes to the authors argument pertaining to principles that facilitate 'non-place', as well as suggest a solution through design as a mediator.

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## 1.7 STUDY DELIMITATIONS

The author acknowledges that she is not a landscape architect and will only provide concepts and guidelines for landscape design.

- The author acknowledges that she is not a specialist in geological or aquatic ecology and will only aim to implement general ecologically sound principles in the architecturally relevant field in order to inform design decisions
- The author acknowledges that she is not a civil or mechanical engineer and will calculate basic flood and runoff volumes relevant to the Pienaars river, concluded from available and most recent information.

### ASSUMPTIONS

- 1.8
- The Tshwane Open Space Framework (TOSF), (TOSF Vol 2, 2005: 4) is to be investigated and responded to
  - Pienaars River Rehabilitation Framework & Moretele Park Redevelopment to be assumed as implemented
  - All Erfs and Erf portions that are considered will be available to be purchased at market related prices by willing sellers
  - Implementations of the Open Space Framework is to be assumed as realised
  - Architecture on the site will be assumed to achieve an appropriate Green Star SA rating



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## 1.9 RESEARCH METHODOLOGY

The basis for this intention is to well enough establish how certain strong leaders in these fields have successfully contributed to the harnessing of future developmental typologies.

This precedes investigation of precedent and theory, as well as the authors own experience and discretion in the placement and value of certain paradoxes. The interest of phenomenology and regenerative theory does not stand alone and is accompanied by a wider variety of theory regarding space, place and form. Placing the palimpsest of history underneath this investigation also renders a more complete contextual response and allows the reader to inflict his/her own understanding upon the discussion. Establishing the research methodology, its outcomes and vocal focus points becomes a feeding circle of problem solving and does not result in a list of problems to solve and a list of problems to ignore (Lorenzo, 2017). Human and natural phenomenological application here is to be seen as the underlying golden thread; engaging with society's cultural, educational and basic need-fulfilment.

This intention is to be realised through study of quantitative information available of the site and surrounds, as well a qualitative strategy to guide deeper and more complex issues of the site:

The author considers four critical elements of investigation, as suggested by Groat) (Groat & Wang, 2002:176-7):

- 1: A strong disposition towards the natural landscape of the scene. This is to understand and encapsulate primary observations present within the setting, observed multiple times on different times and days of the week. This investigation involves qualitative inspection about the place and the people, their issues and their opinions.
2. The next step is the interpretation of the data into diagrams and appropriate analytical responses that reacts compositely to the conditions and characters.
3. Pattern and observations of important nodes are to be mapped in order comprehend the complexity of the site, and how the spaces and landscapes are currently used and interpreted by the local community.
4. Putting the puzzle pieces together by means of conceptual sketching, mapping and a coherent integration of all existing infrastructures and anomalies of the surrounds. This is to be further incorporated with the authors understanding of phenomenological and regenerative aspects and possibilities. This leads to eventual design iterations of an appropriate nature to the context of Mamelodi.



# CHAPTER 02

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## CONTEXT

2.1 Lenses for mapping:

2.2 Continuum of Architectural  
Reflection

2.3 Through History

2.4 Primary Observations

2.5 The Urban and the River

2.6 Environmental Observations

2.7 The Observed Present

2.7.1 Urban Framework

## 2.1 LENSES FOR MAPPING:



### MAPPING

Statistical data of Interest pertaining to the surrounding area

URBAN VALUES- modes of representation to confront an impermanent urban ground;

- Politically/Economically/Formally/Historically/Spatially Rehabilitating Landscapes in the Surrounding Area
- Active Social Nodes in the Surrounding Area
- Relevant Institutions in the Surrounding Area
- Bioclimatic Conditions of the Pienaars River
- Main Water Sources in the Surrounding Area
- Fauna & Flora Species in the Surrounding Area

GENIUS LOCI – The prevailing character or atmosphere of a place. The multi-valence within the urban landscape.

- Narrative
- Factual & Empirical Data
- Agricultural Farms in The Surrounding Area
- Recreational Activities in Surrounding Area
- Activities in The Magaliesberg and Surrounds

FIG. 11 :LENSES FOR MAPPING

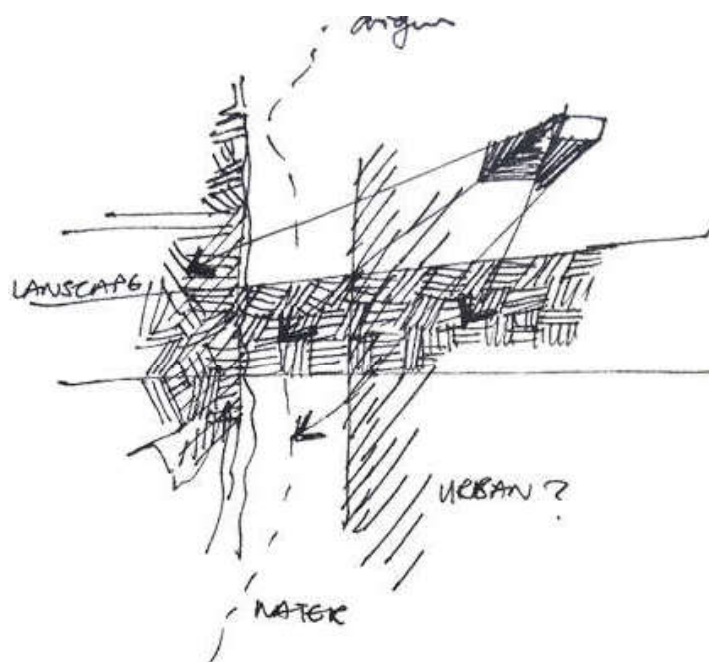


FIG. 12 :THE PLACEMENT OF THE INTERVENTION UPON THE NATURAL LANDSCAPE (AUTHOR, 2018)

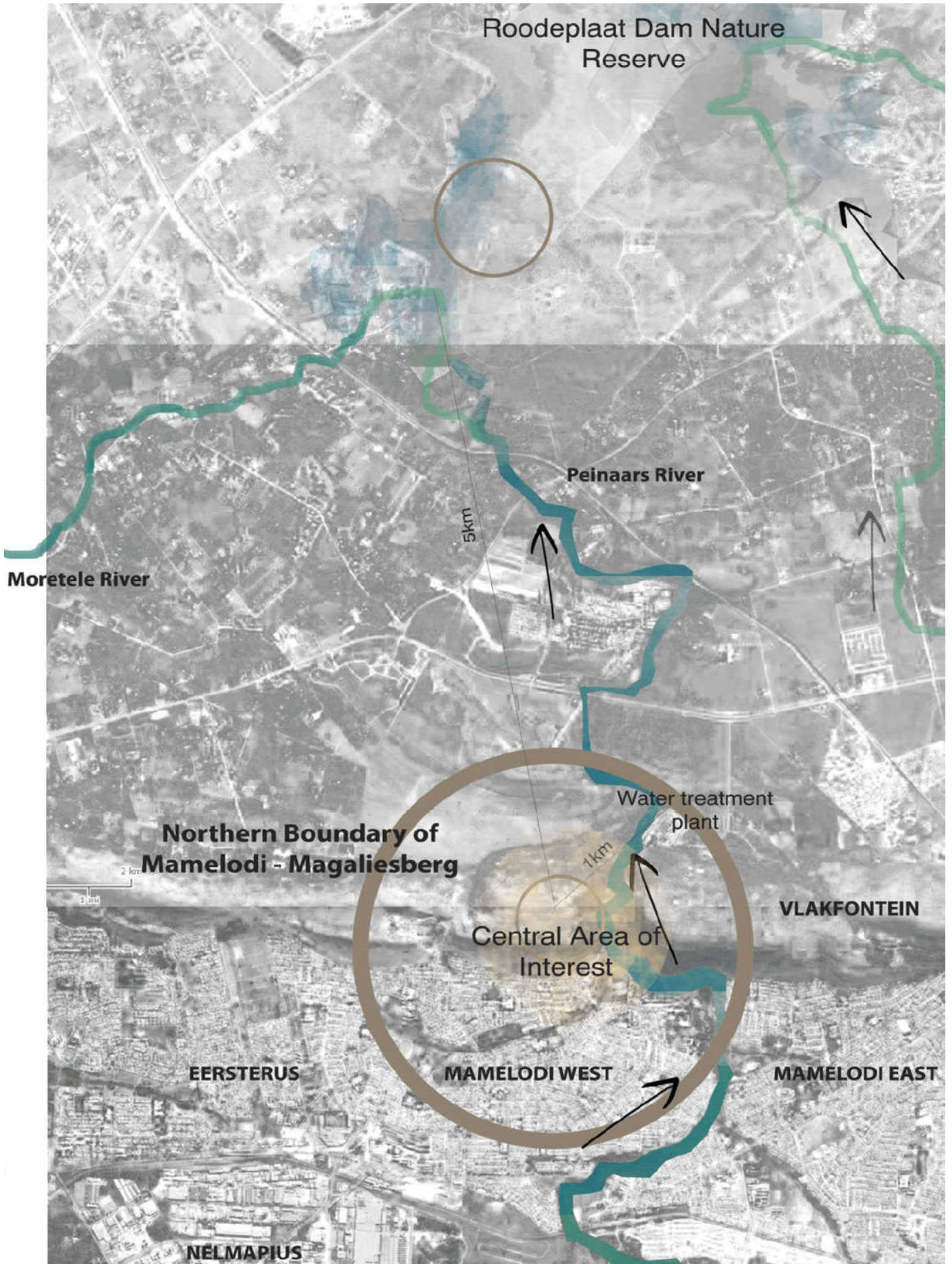


FIG. 13 :GEOGRAPHICAL ELEMENTS OF IMPORTANCE TO MAPPING (AUTHOR, 2018)



FIG. 14 :PHENOMENOLOGICAL  
TEXTURED APPROACH SKETCH  
(AUTHOR, 2018)

Our history and our inevitable progression  
Our blind repetition  
Layers of icons migrate,  
Stagnate, and dictate  
Standing guard against ambiguous plains.  
Conductors and Spectators  
Bleak skies and collapsing horizons  
Adding and subtracting,  
Concealing and revealing,  
Reflecting and repeating,  
Attempting to root oneself  
in that which is not solid  
(Curlowe et. al. 2017)

## 2. 2 HISTORY AND ITS IDEALS CONTINUUM OF ARCHITECTURAL REFLECTION:

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'If the universal demand for landscape is therefore so different from the past, what do we gain from a study of history? (Jellicoe & Jellicoe, 1995)'.  
The Landscape of Man suggests that there are three reasons that amplify the importance of the landscape and its constant development as our world's most important entity of the arts. The first is the existing balanced order of the delicate biosphere and its disturbance by the activities of man, whereby man is the only fixate of the issue. Secondly, these exertions of man atop nature is a basic return to an 'efficient animal state of sustained existence'. The third point being to the author of most importance, stating that man's destiny to rise above the animal state, he creates around him an environment that is a projection into nature of his abstract ideas (Jellicoe & Jellicoe, 1995)'.  
In the challenge of studying history within its entirety of man's intervention with nature, is the interpretation of this information and how it is treatable today that becomes imperative. This categorises the continuum into the academic and the ephemeral. In its most basic capacity, this allows us to understand man's response to certain tranquillity and assurances that are found in geometrical forms (squares and circles), and how these are manifested differently according to society, philosophy, morals, geography and economics. These are the informants of a local and transitory nature that come to play in our practise and imaginations.  
This raises the following subquestion: What is the local and transitory, and how does the universal continuum of architectural development influence current positions? The author responds by way of recognising our five sense themselves as the mechanisms that we observe and create with. 'Within their distortions and peculiarities, these mechanisms have scarcely changes since prehistory and through which all perceptions still pass to simulate emotions and reactions (Jellicoe & Jellicoe, 1995)'. Does it then stand that we can measure all levels of history through the lenses of our human senses, and then further dilute into scale, light, material and shadow?

2.3 THROUGH HISTORY

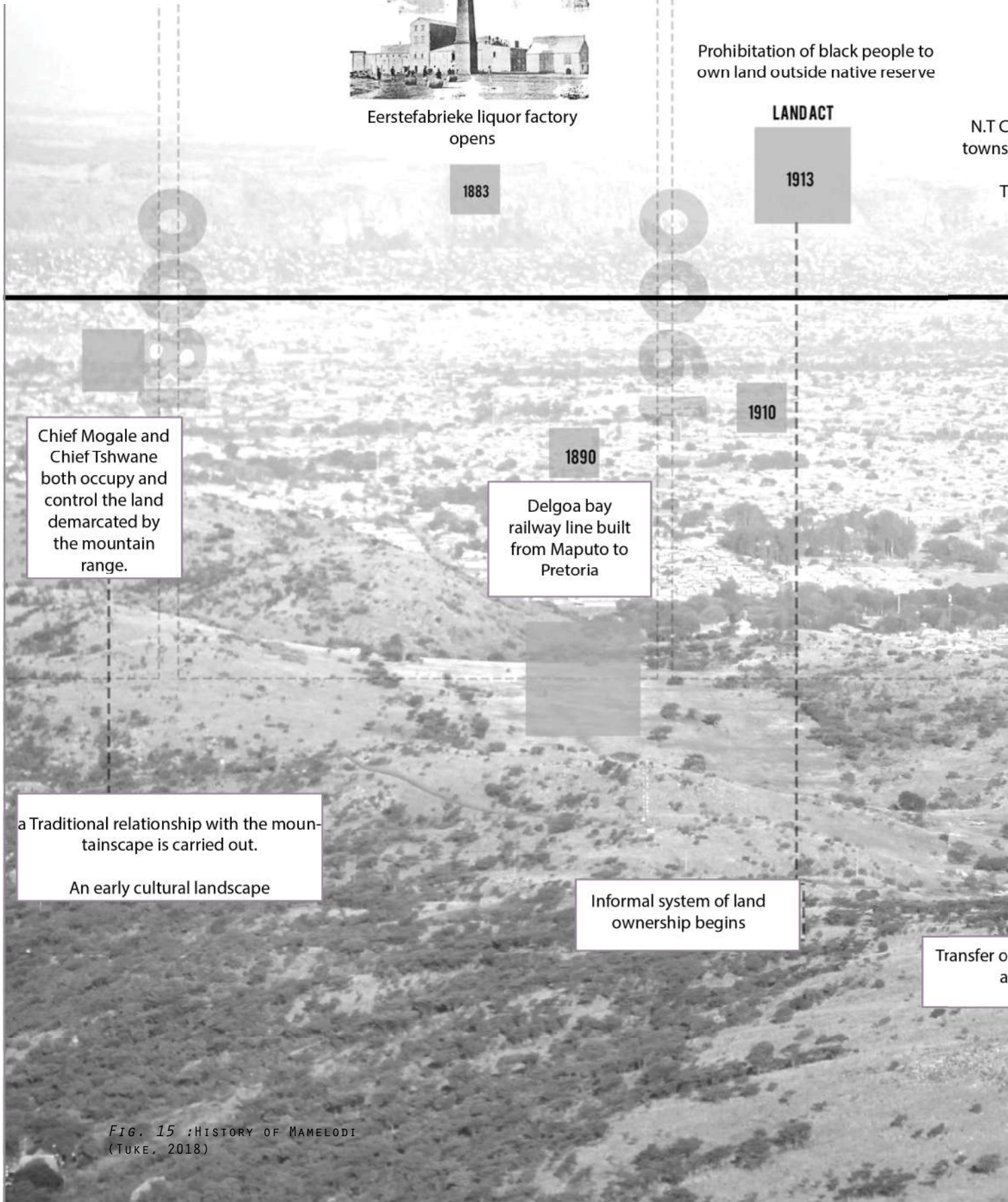


FIG. 15 : HISTORY OF MAMELODI (TUKU, 2018)



APARTHEIDREGIME

DEMOCRATIC GOVERNANCE



Botswana Rondavels architecture typology introduced as housing for natives

First democratic elections

Residents strike:

1947

Post-war job seeking lead to more people into Mamelodi. The west became crowded and population extended over Pienaars river to East.

1994

Shack eradication-stance undertaken by government

2008

Cooper designs a planned township on American planning system. Township established:

1945

Nema EIA regulation

3 July 2006 New Environmental Legislation came to pass

2006

1954

Site and services scheme introduced to the township

1960

Political Activists seek refuge. Rise of the people-park, where activists spoke in public settings. Activists and community leaders on the run find shelter in the mountain-scape.

1985

Mothong medicinal facility established by Dr.Mabena

2001

1953

Six houses built for natives on the Vlakfontein farm

1950

Group areas act: Expansion of the land act to segregate all South African residents living conditions

1967

Nelson Mandela village: first squatter camps

of various traditional, sacred and social activities

Became refuge for activists, community leaders and residents seeking asylum from police.

Evolution of the cultural landscape...

Restricted cultural landscape residents have grown accustomed to littering

Conservative efforts by AIKS (african indigenous knowledge systems) Evolution of cultural landscape...

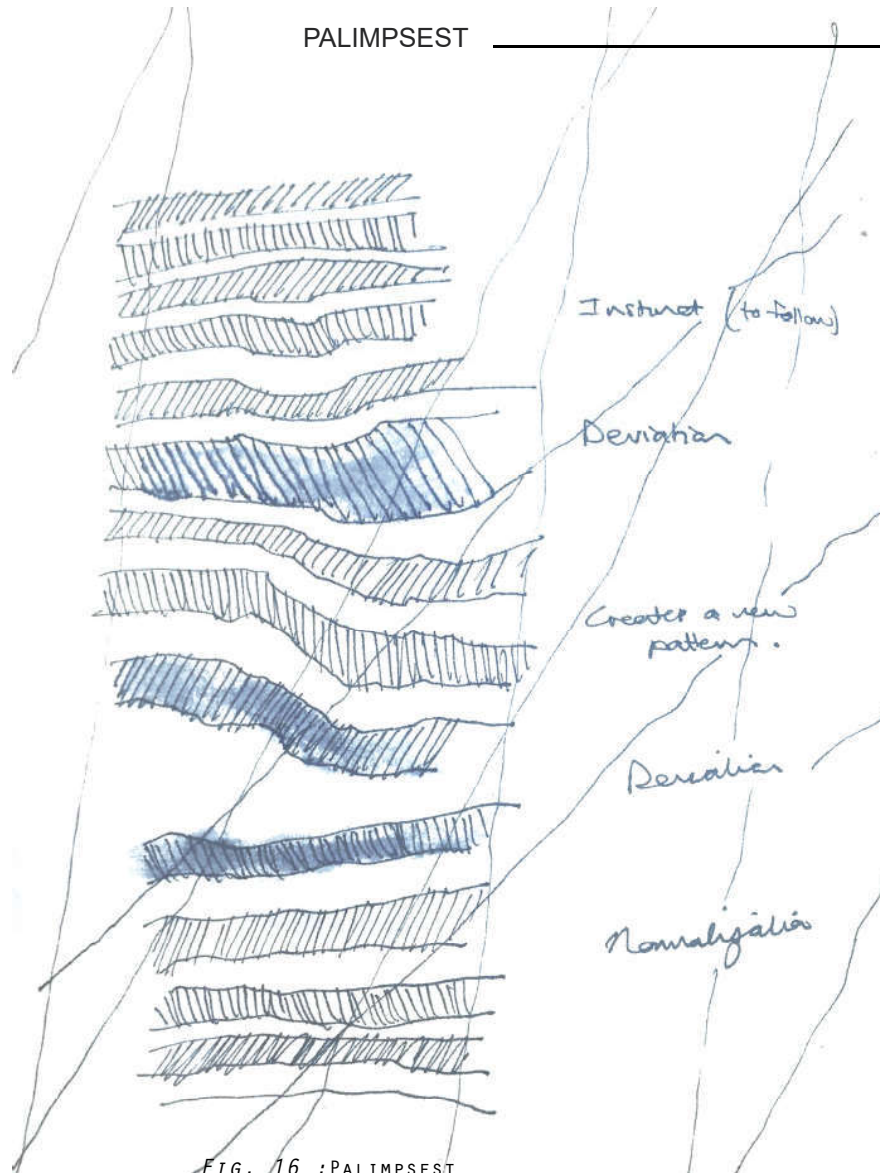


FIG. 16 :PALIMPSEST  
PHENOMENOLOGICAL SKETCH  
(AUTHOR, 2018)

IT IS NECESSARY TO REMEMBER, WRITES ALLAN RICHARD PRED (1984: 279, IN CRESSWELL, 2004:35), THAT PLACES ARE NOT SHOES OR CARS WHICH REMAIN IN FACTORIES AS FINISHED PRODUCTS STATING THAT PLACES ARE NEVER FINISHED BUT ALWAYS BECOMING.

Each architectural ideal (Classicism, Eclecticism, Modernism) started off as an aspiration to an architectural dreamland that harmonises its true form through contrast with the natural world. The authors insight into the next paradigm suggests that the ideals of emerging architectural practise is aligning more closely with form that harmonises within and throughout nature (both human and environmental). Historically architecture, as we understand it, embedded within all its controversies and theories, wasn't the main appeal for the ritual of construction, but rather grew out of initial and contextual need. It was shelter, fortification, safe and solid and watered with reason. It was more concerned with providing walls, floors roofs and experience than with the reasoning behind each how and how much.

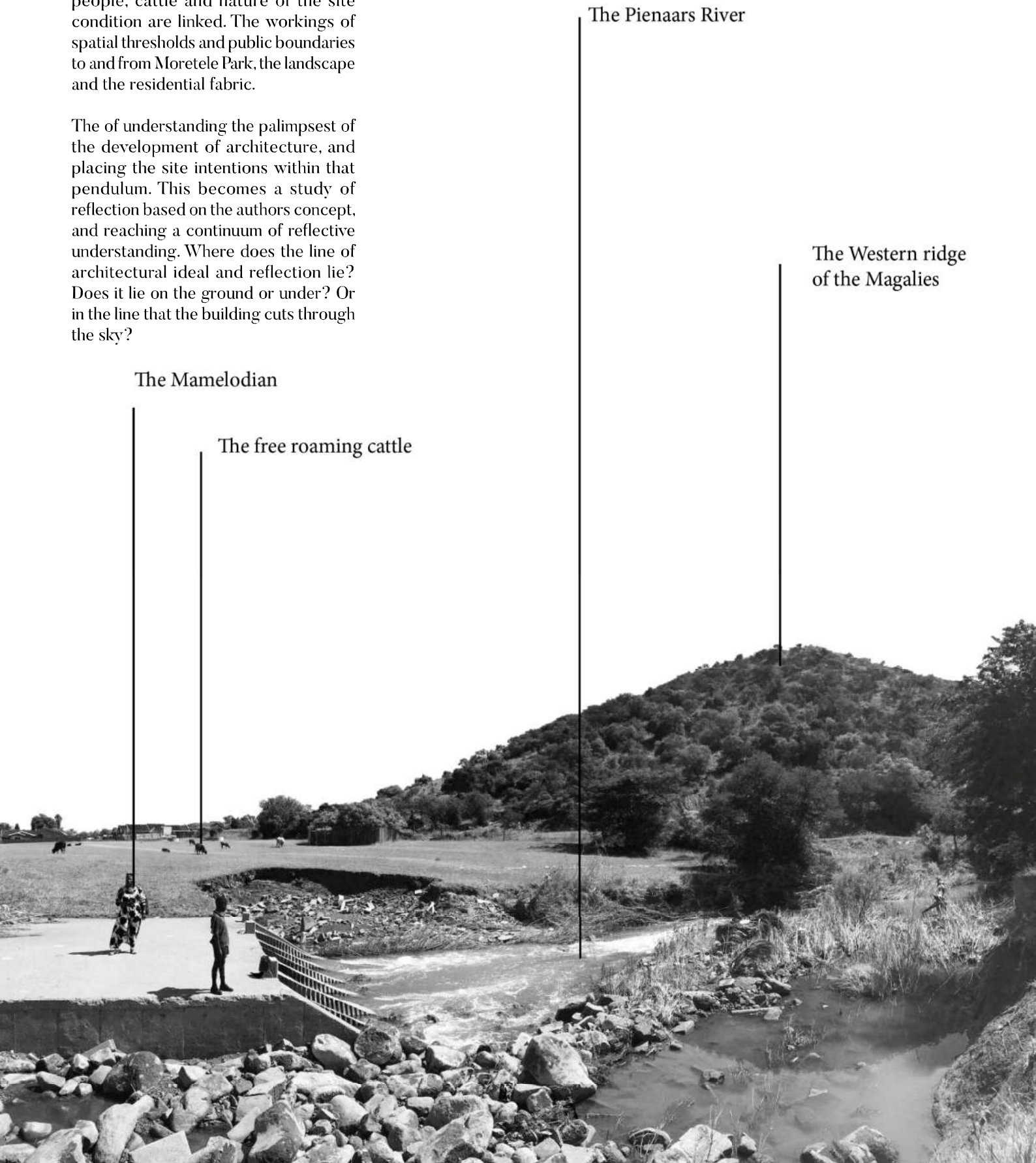
Necessity has perhaps taken the back-seat to ecosystem and economic drive. Which is a contextual response and perhaps neither bad or good, but observed by the author none the less. In all of our respective architectural palimpsest of triumphs and trials, it is the insisted plasticity of the ever changing spectator and their backgrounds that constantly lead us to believe in an architectural dreamland (Prak, 1968).

The processes wherein we as society expand and contract allows our architecture to therefore shape itself around this convulsion and maximise its incoherence. It is therefore pertinent that this dreamland does not exist, as our buildings should find their roots rather within the bedding of current condition, with respect and acknowledgement for future appropriation, than blanket on an entire existence of shape, space and form. The intention of the author is to create a destination that allows water to stimulate place of social and recreational worth as well as a place of economical facilitation. The concept around an active social gathering space, draws into the apotheosis of the animation and ambition of the social and individual spirit. The established global water management crisis offers a myriad of interesting architectural and programmatic solutions and challenges, considering the environment and human-relationship sensitivity.

## 2.4 PRIMARY OBSERVATIONS

Understanding the current conditions of the site, how the experience of the people, cattle and nature of the site condition are linked. The workings of spatial thresholds and public boundaries to and from Moretele Park, the landscape and the residential fabric.

The of understanding the palimpsest of the development of architecture, and placing the site intentions within that pendulum. This becomes a study of reflection based on the authors concept, and reaching a continuum of reflective understanding. Where does the line of architectural ideal and reflection lie? Does it lie on the ground or under? Or in the line that the building cuts through the sky?



The Mamelodian

The free roaming cattle

The Pienaars River

The Western ridge  
of the Magalies

FIG. 17 :PRIMARY  
OBSERVATIONS (AUTHOR,  
2018)



The existing concrete bridge

The approach from Moretele Park pedestrian bridge

The Eastern ridge of the Magalies

“ The art of the eye has certainly produced imposing and thought provoking structures, but it has not facilitated human rootedness in the world (Pallasmaa, 2009:9).’

(To another conscious...)

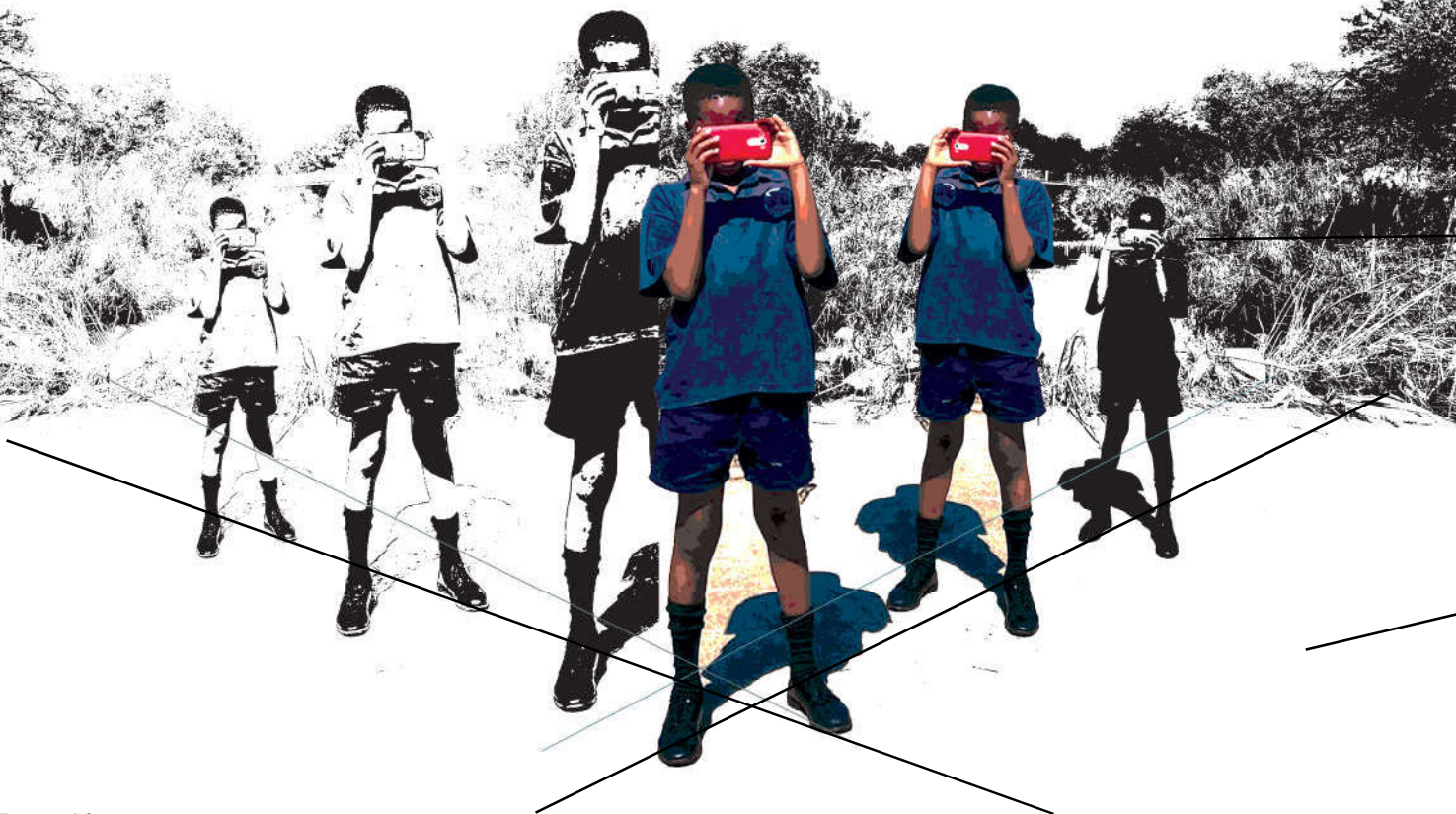


FIG. 18 :THE NATURE OF THE INDIVIDUAL  
WITHIN THE SITE (AUTHOR, 2018)

THE EASTERN RIDGE

THE MAMELODIAN

THE WESTERN RIDGE

THE RIVER

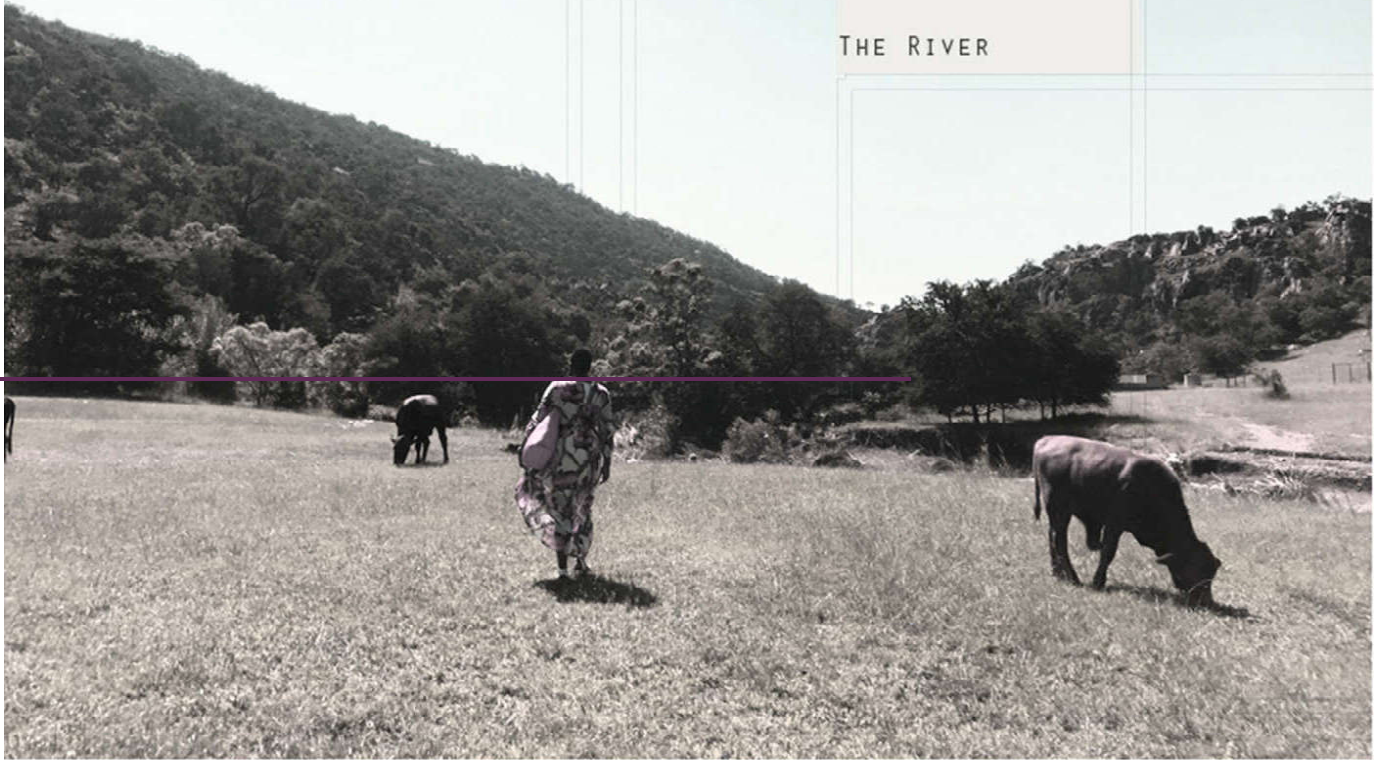


FIG. 19 :OBSERVATIONS ON THE EASTERN RIDGE (AUTHOR, 2019)

In the quest for achieving a modern civilization, the interconnected relationship between nature and humankind has changed to one of disconnect. This disconnection does not only compromise the natural environment but also underpins most concerns about the health and well-being of people. The Magliesberg Mountain range which borders Mamelodi, Ersterust, and Baviaanspoort is a shared natural resource with benefits currently undervalued.

MORETELE  
PEDESTRIAN BRIDGE

RIVER-BANK DEPLETION



THE RIVER

FIG. 20 :MORETELE PARK PEDESTRIAN BRIDGE ON EASTERN RIDGE (AUTHOR, 2019)

RUBBLE BANK

NORTHWARDS  
FLOWING RIVER



EASTERN RIDGE

FIG. 21 :RIVER CONDITIONS (AUTHOR, 2018)



UNHEALTHY WEIR  
AND RIVER BANK

WESTERN RIDGE

OBSTRUCTED WEIR  
UNDER VEHICULAR  
BRIDGE



FIG. 22 :RIVER BANK AND WEIR  
OBSERVATIONS AT SITE APPROACH  
(AUTHOR, 2018)

OBSTRUCTED FLOW

EASTERN RIDGE

STAGNATING POOL  
DUE TO POOR BANK  
CONSTRUCTION/-  
MAINTENANCR

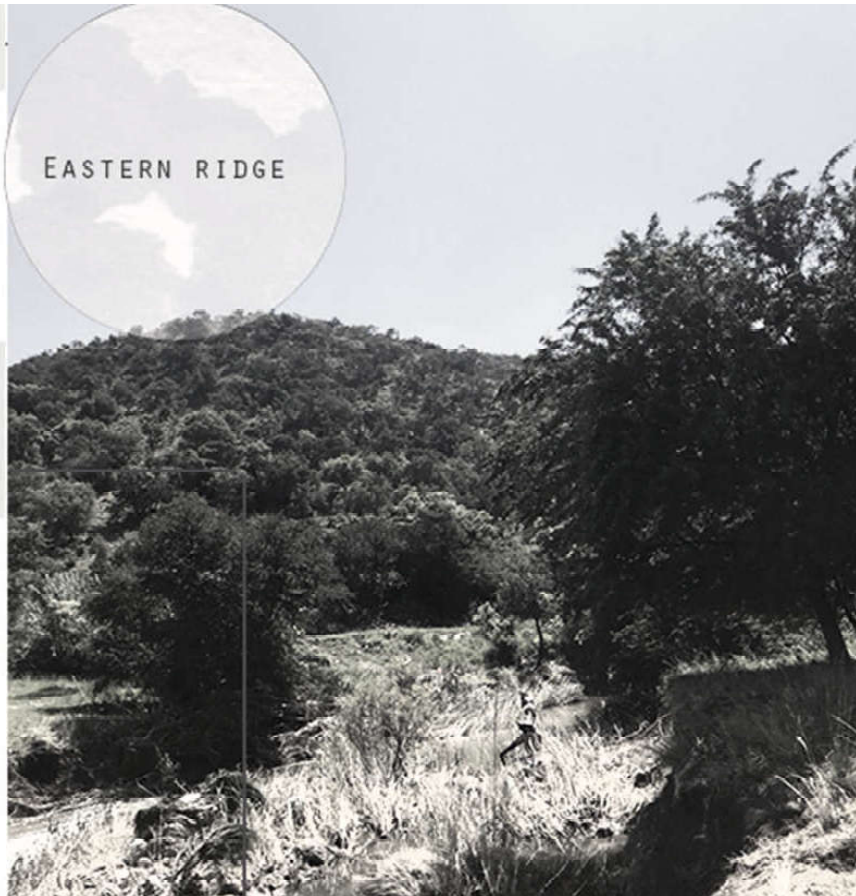


FIG. 23 :EASTERN RIDGE  
(AUTHOR, 2018)

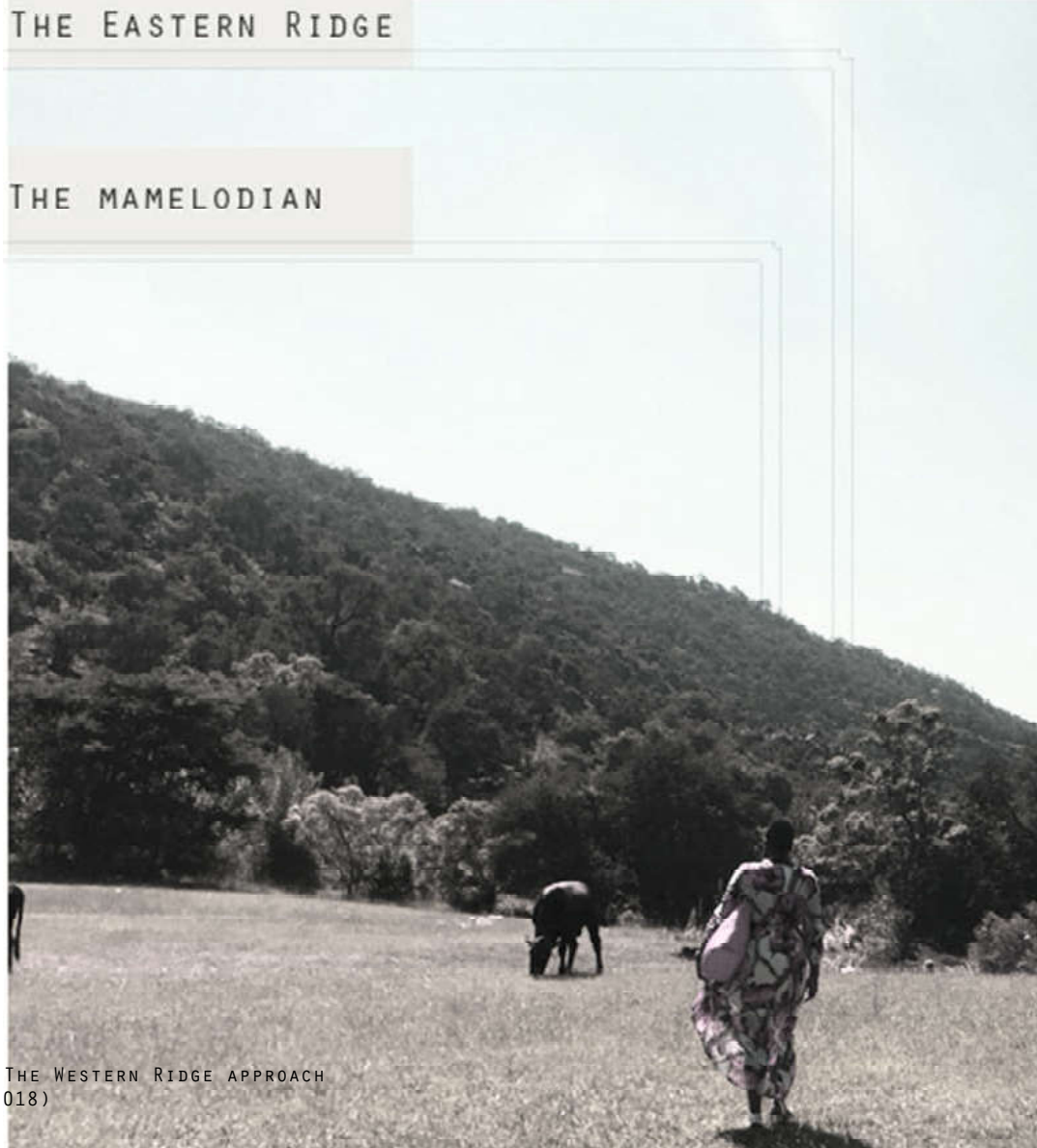


FIG. 24 :THE WESTERN RIDGE APPROACH  
(AUTHOR, 2018)

Water, even in its absence, is vital:

## 2.5 THE URBAN AND THE RIVER

**Principle I: Understanding Connection Between Water-Body, Social Conditions and other Influences In The Surrounding Area:**

The idea that place entails unending descriptions of ‘processes that shape existential and aesthetic cultural experience’ (Rewers, 2004: 161). The ‘place’ in question is a study of not only geographical location but human behaviour and environment.

Historically the Pienaar’s River acted as an important authority to the township as well as the agricultural holdings. “Laundry was done in the river and dried on large flat stones which are still there. Once the washing was completed, one often washed oneself as well.

Water for the house was also taken from the river” (Walker & Van Der Waal, 1991: 15). According to Darkey (2000: 9), “the Pienaar’s River and flood plain including the smaller tributary which joins the system, still performs an important physical and ecological function. Among others, it provides an environment of food resource for birds, frogs and insects, thus making the area an ideal future urban open space conservation area.

These primary and secondary acts of provision by the river created a sense of ownership and involvement by the community that nurtured ownership. This connection has now been lost, as the river is no longer nurturing in a natural way due to the avid pollution inflicted up it by the community, and its lack of basic infrastructural management.



FIG. 25 :OBTAINED FOR AERIAL UNDERSTANDING OF MAMELODI DEVELOPMENT OVER PIENAARS RIVER (HISTORICAL INVESTIGATION, 1997)



FIG. 26 :OBTAINED FOR AERIAL UNDERSTANDING OF MAMELODI DEVELOPMENT OVER PIENAARS RIVER (HISTORICAL INVESTIGATION, 1997)



FIG. 27 :OBTAINED FOR AERIAL UNDERSTANDING OF MAMELODI DEVELOPMENT OVER PIENAARS RIVER (HISTORICAL INVESTIGATION, 1997)



PRE 1960'S RIVER  
RELATION TO SOCIETAL  
CONDITION



CURRENT RIVER RELATION  
TO SOCIETAL CONDITION

FIG. 28 :SKETCH INTERPRETATION OF URBAN RELATIONSHIP WITH RIVER (AUTHOR, 2018)

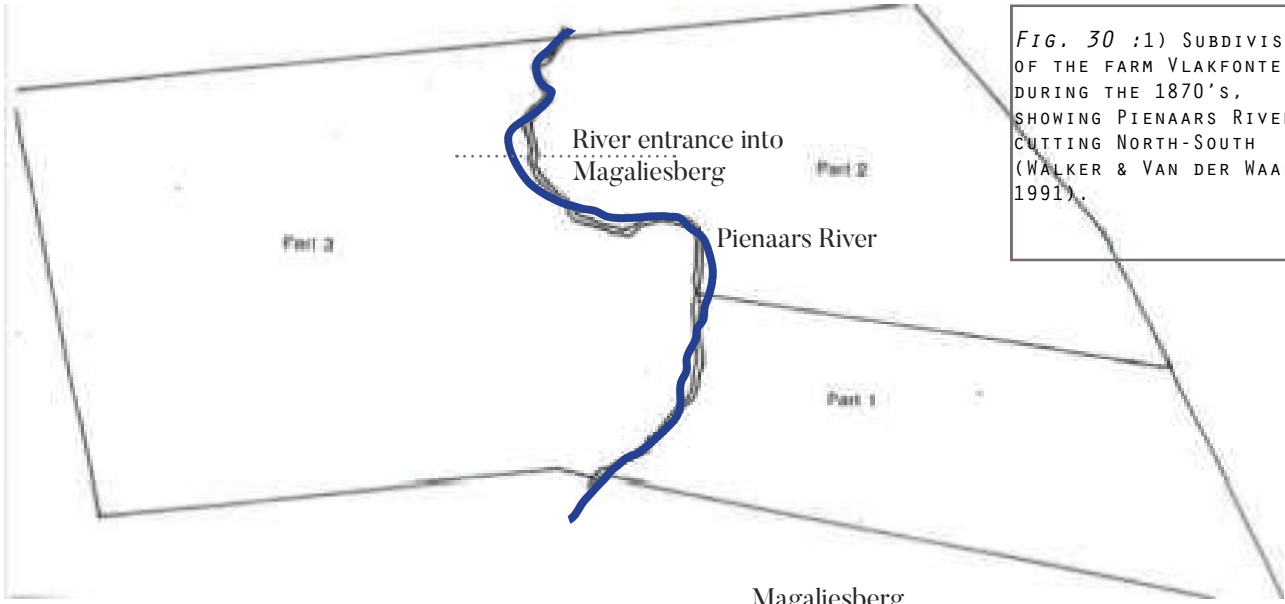


FIG. 30 :1) SUBDIVISION OF THE FARM VLAKFONTEIN DURING THE 1870'S, SHOWING PIENAARS RIVER CUTTING NORTH-SOUTH (WALKER & VAN DER WAAL, 1991).

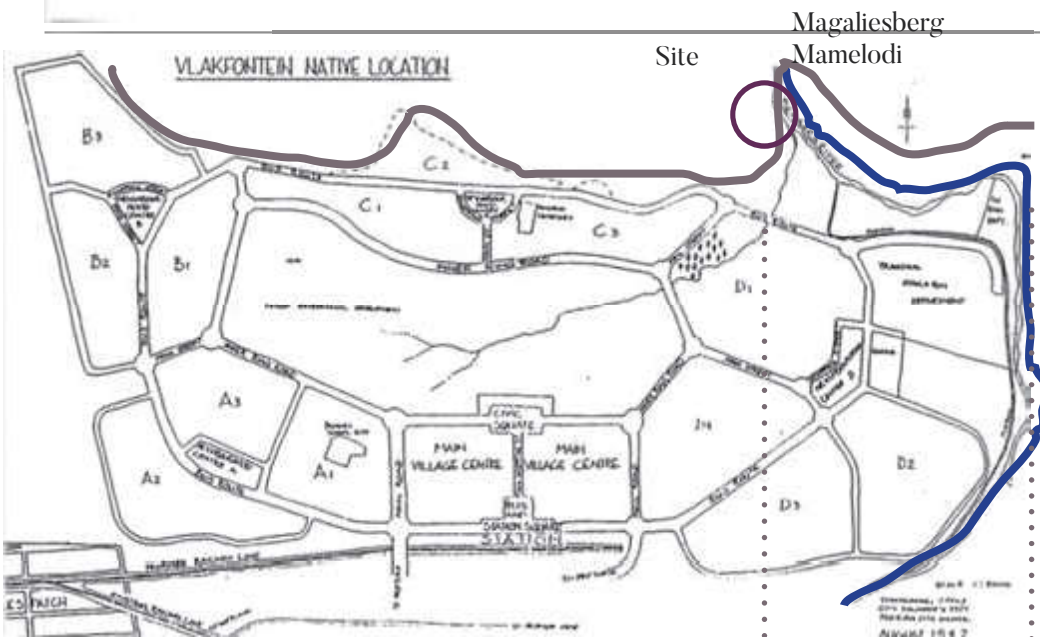


FIG. 31 :2) LAYOUT IN 1947 SHOWING PIENAARS RIVER AS THE EASTERN BOUNDARY FOR MAMELODI (WALKER & VAN DER WAAL, 1991).

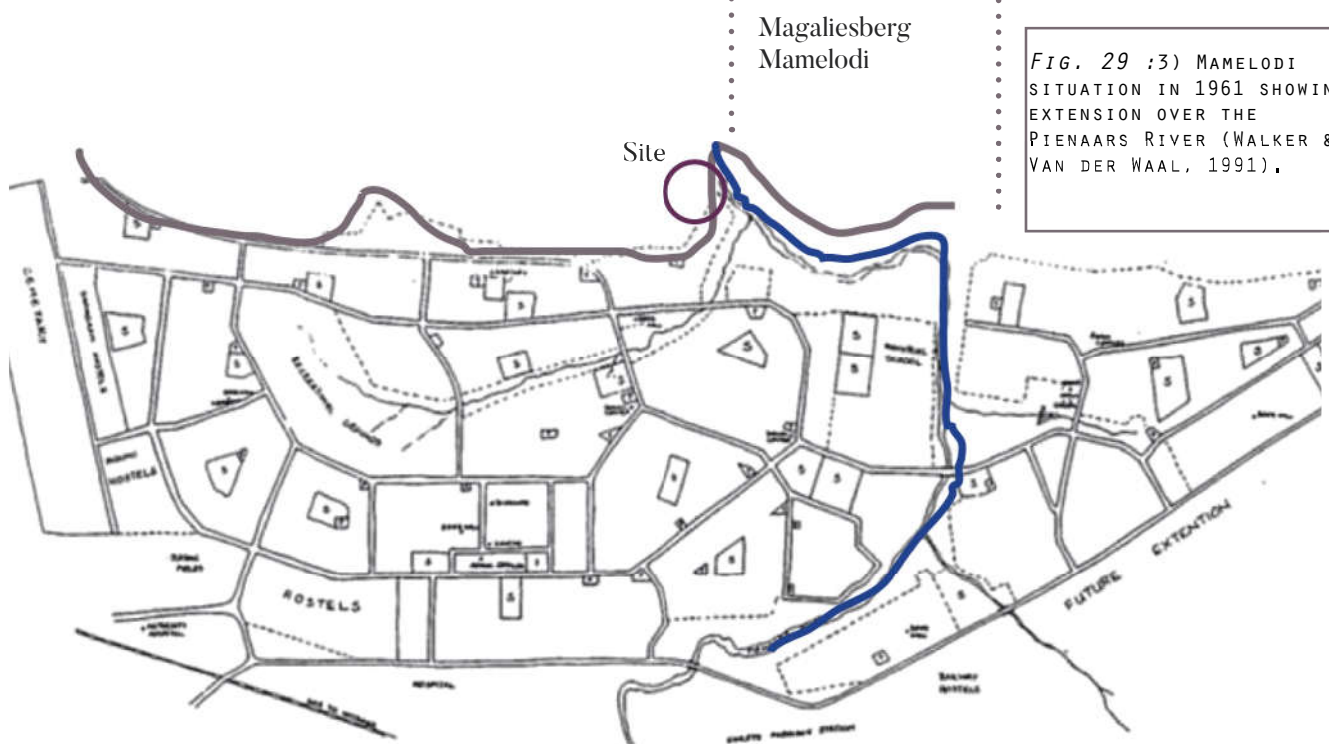


FIG. 29 :3) MAMELODI SITUATION IN 1961 SHOWING EXTENSION OVER THE PIENAARS RIVER (WALKER & VAN DER WAAL, 1991).

HISTORICAL  
DEVELOPMENTS AROUND  
THE MAGALIES RIDGE  
AND PIENAARS RIVER,  
LEADING TO THE  
ESTABLISHMENT OF THE  
CURRENT MAMELODI  
CONDITIONS :

---

1600's : Occupation of the Magaliesberg valley by the Southern Ndebele and Tswana speaking natives who occupied the river valley.

1650 : The arrival of the Kwenya tribe in the valley named the mountains Kwashane/Cashan mountains which would later then be renamed to the Magaliesberg, after chief Mohale.

1800 : eKwenya Mmatau facilitated the construction of stone settlements along the southern slopes of the Magaliesberg, later to become Mamelodi.

1860 : Establishment of Pretoria's water furrow system.

1930 : Rivers channelized in order to respond to dangerous flooding.

1986 : Due to the continual debilitation of the water quality from the Rietvlei Dam, it was decided to appoint consulting engineers to investigate causes and solutions in cooperation with the national institute of water research at the CSIR. This led to the overall purification and upgrading that commenced in 1986.

1996 : Pretoria eventually operates four wastewater treatment plants, namely Daspoort (45ml/day), Baviaanspoort (36ml/day), Zeekoegat (30ml/day), and Rooiwal (210ml/day)

The Baviaanspoort waste water treatment is situated 1,8km from the designated site.

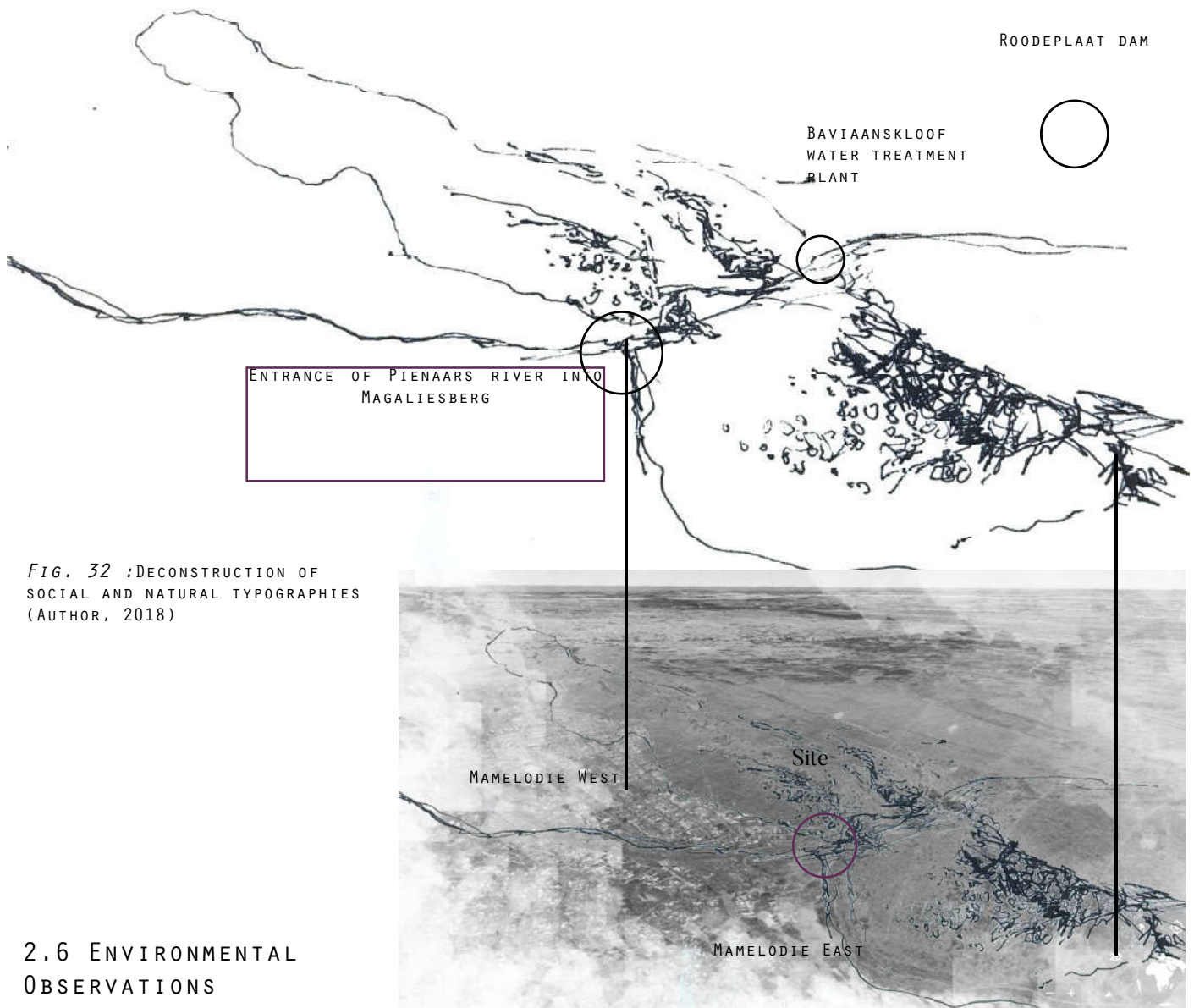


FIG. 32 :DECONSTRUCTION OF SOCIAL AND NATURAL TYPOGRAPHIES (AUTHOR, 2018)

## 2.6 ENVIRONMENTAL OBSERVATIONS

50% of South Africa's annual rainfall is dam stored. We have 550 government dams with a supply volume of 37000million m<sup>3</sup>. A growing problem for South Africa's rivers is a lack of water. Reduction in river flow, due to removal and storage, has negatively impacted our rivers. We live in a country where few natural lakes exist, and therefore rely predominantly on rivers, dams and groundwater. South African water usage, according to the 2016 Water Framework, is 60% Agricultural, 18% environmental, 11,5% urban and 10,5% industrially divided. Pretoria itself uses 800million litres of water a day, that is predominantly supplied by springs situated at Groenkloof nature Reserve and Rietvlei Dam. These springs flow to Rietvlei Dam, Bon Accord Dam, Hartebeespoort Dam and Roodeplaat Dam (water source relevant to Mamelodi framework).

### CURRENT IDENTIFIED ISSUES WITH PIENAARS RIVER:

- 1) Waste management
  - This relates back to poor infrastructural management. Could be resolved with waste transfer stations, recycling centres, and preventing vehicular access thereby formalising pedestrian open spaces along the banks.
- 2) Storm water design and position
  - Storm water discharges directly into the tributaries and river without erosion protection or siltation. Ideally these outlets should be moved out of the floodline and the flow should be reduced by means of wetlands or retention ponds.
- 3) The disruption of healthy in-stream conditions
  - This is elevated by the lack of proper river bank structure like gabion bank reinforcement, and lack of wetlands to capture silt.
- 4) Lack of community ownership
  - The lack of social infrastructure (lighting, benches, facilities) around the rivers.
- 5) Lack of vegetation around the river

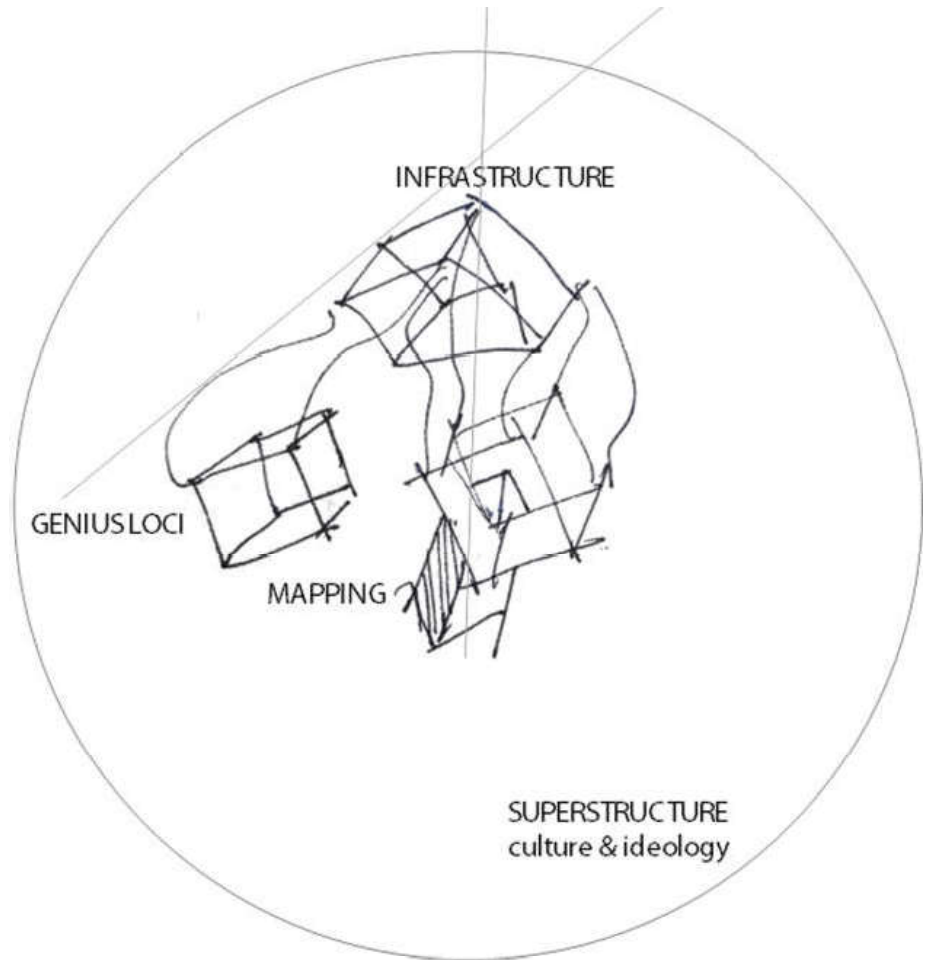


FIG. 33 :MAPPING APPROACH TAKEN INTO SITE EXPLORATION (AUTHOR, 2018)

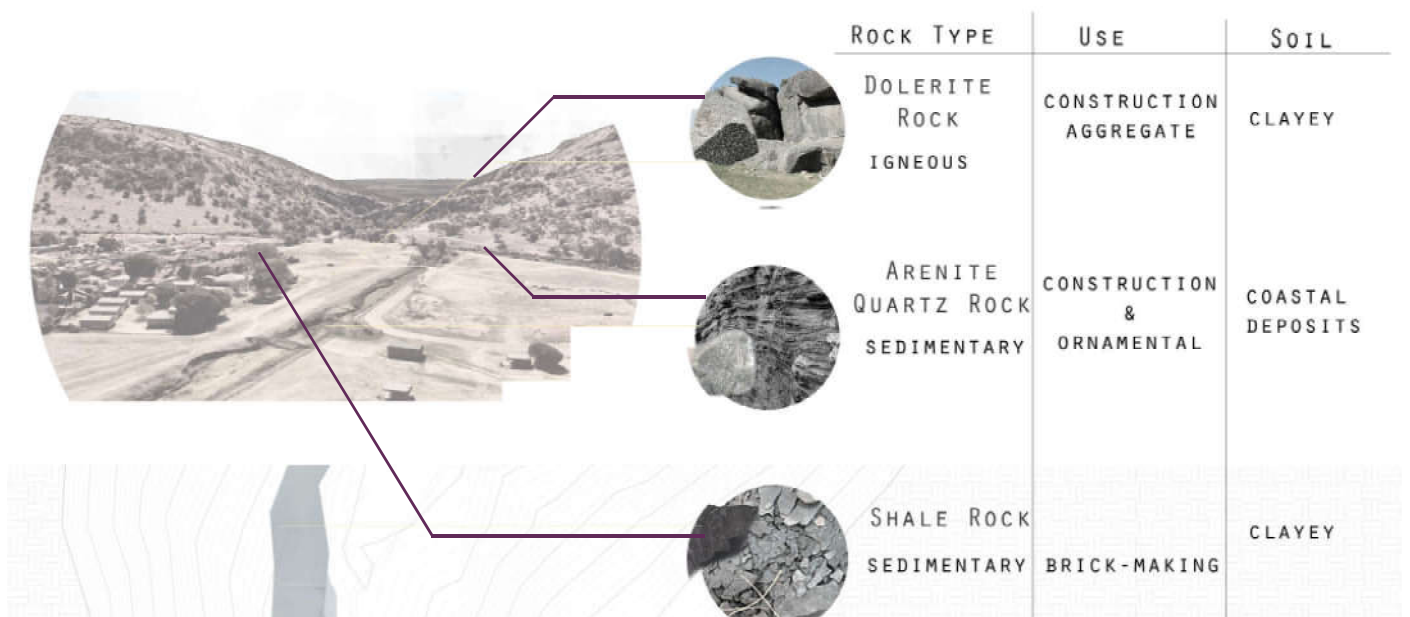


FIG. 34 :GEOLOGICAL ELEMENTS ON SITE (AUTHOR, 2018)



**FLORA THE MAGALIESBERG**  
**VEGETATION, HERBS & MEDICINAL PLANTS**

**HERBS & MEDICINAL PLANTS**



**VEGETATION**



Marikana Thornveld (SVcb 6)

Rand Highveld Grassland (Gm 11)

Id Reef Mountain Bushveld (SVcb 9)

**VEGETATION: RIVER-BOUND**

**HARTEBESPRUIT**  
Alien Species: Bluegum & Pine  
**MORELETASPRUIT**  
Indigenous & Alien Species  
Woody Species (*Combretum erythrophyllum*, *Rhus Pyroides* and Common Karee *Lancea*) & Lucerne (*Pepper Tree*, *Privet* and *Syringa*) around banks.

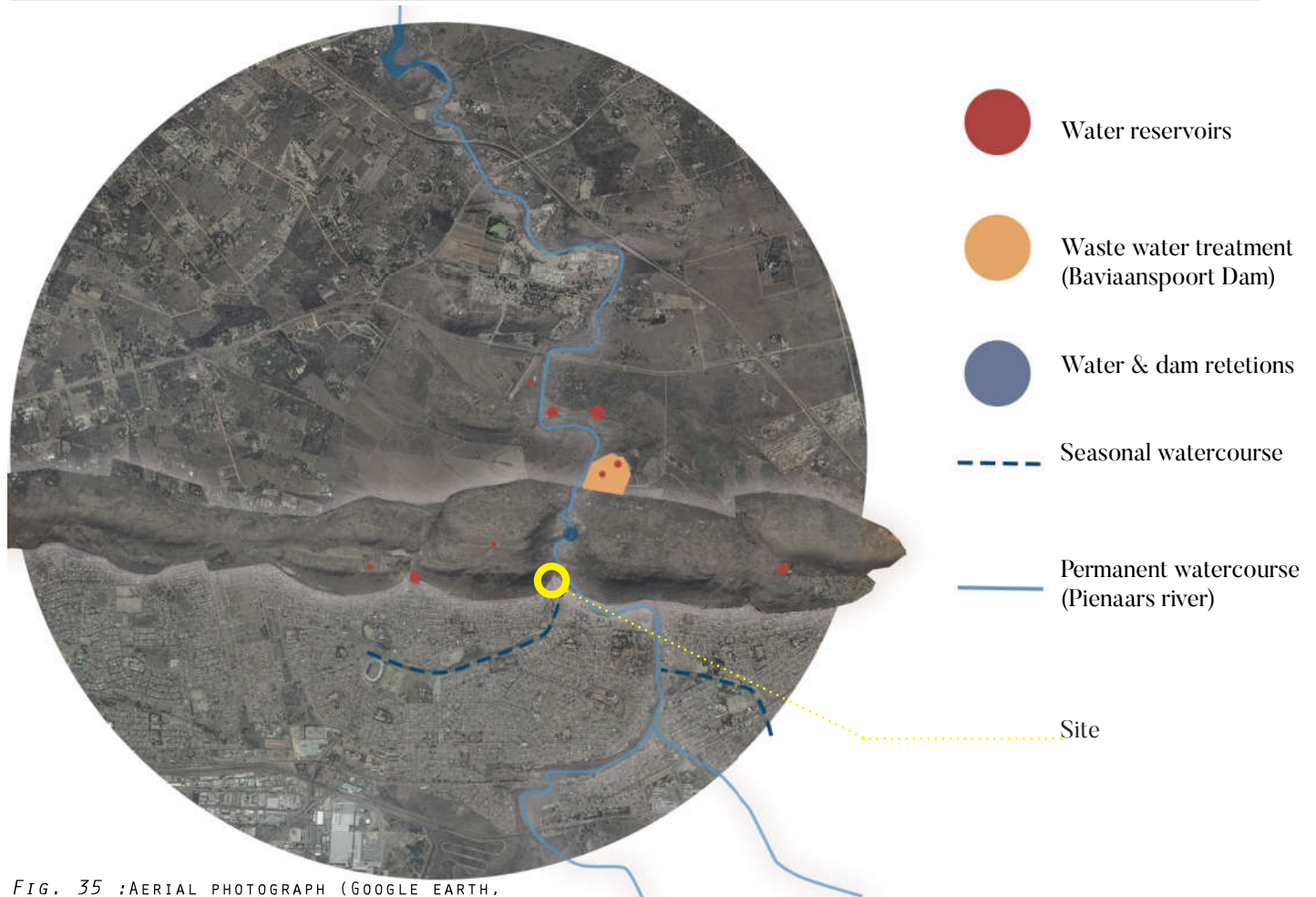


FIG. 35 :AERIAL PHOTOGRAPH (GOOGLE EARTH, 2018)



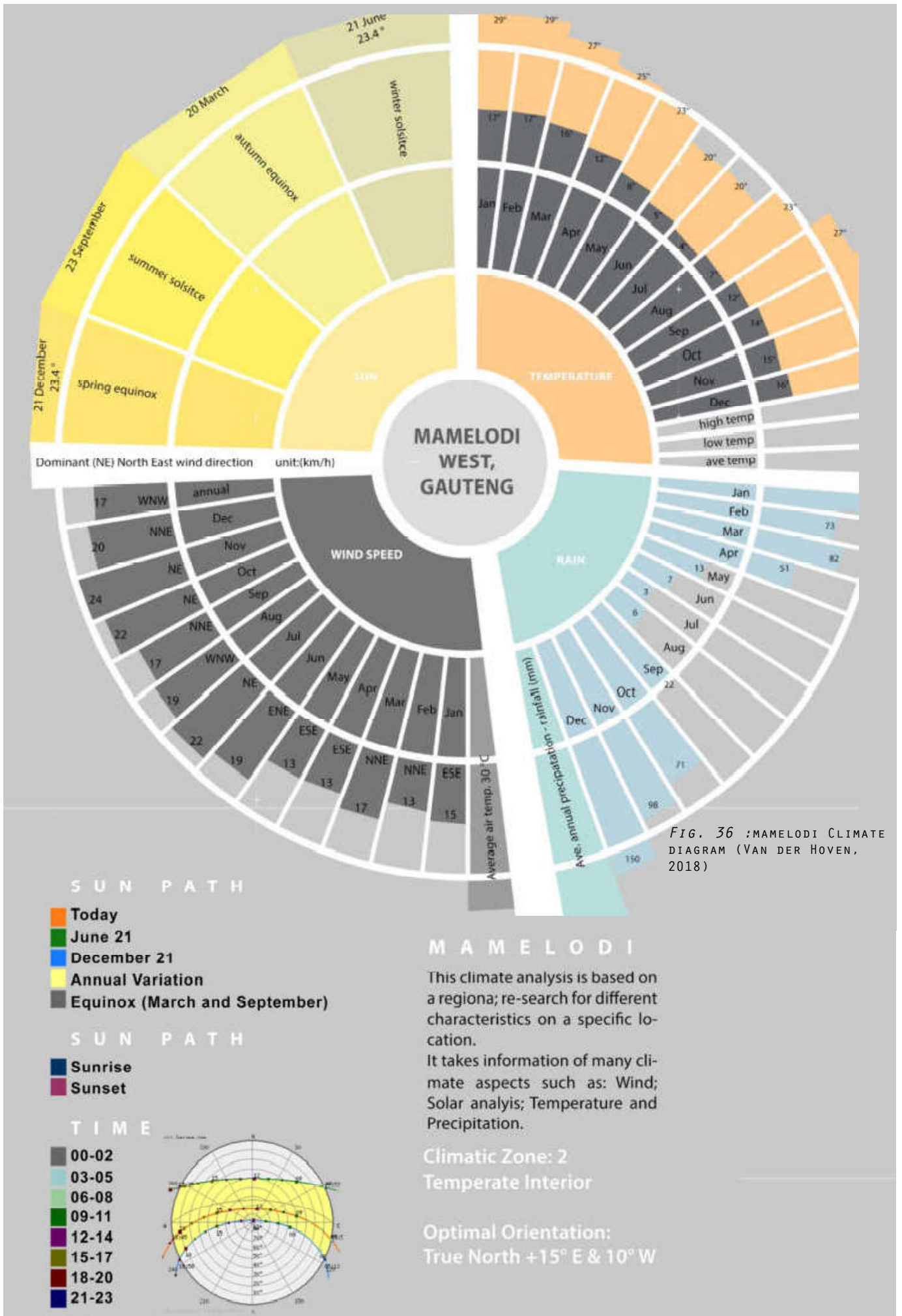
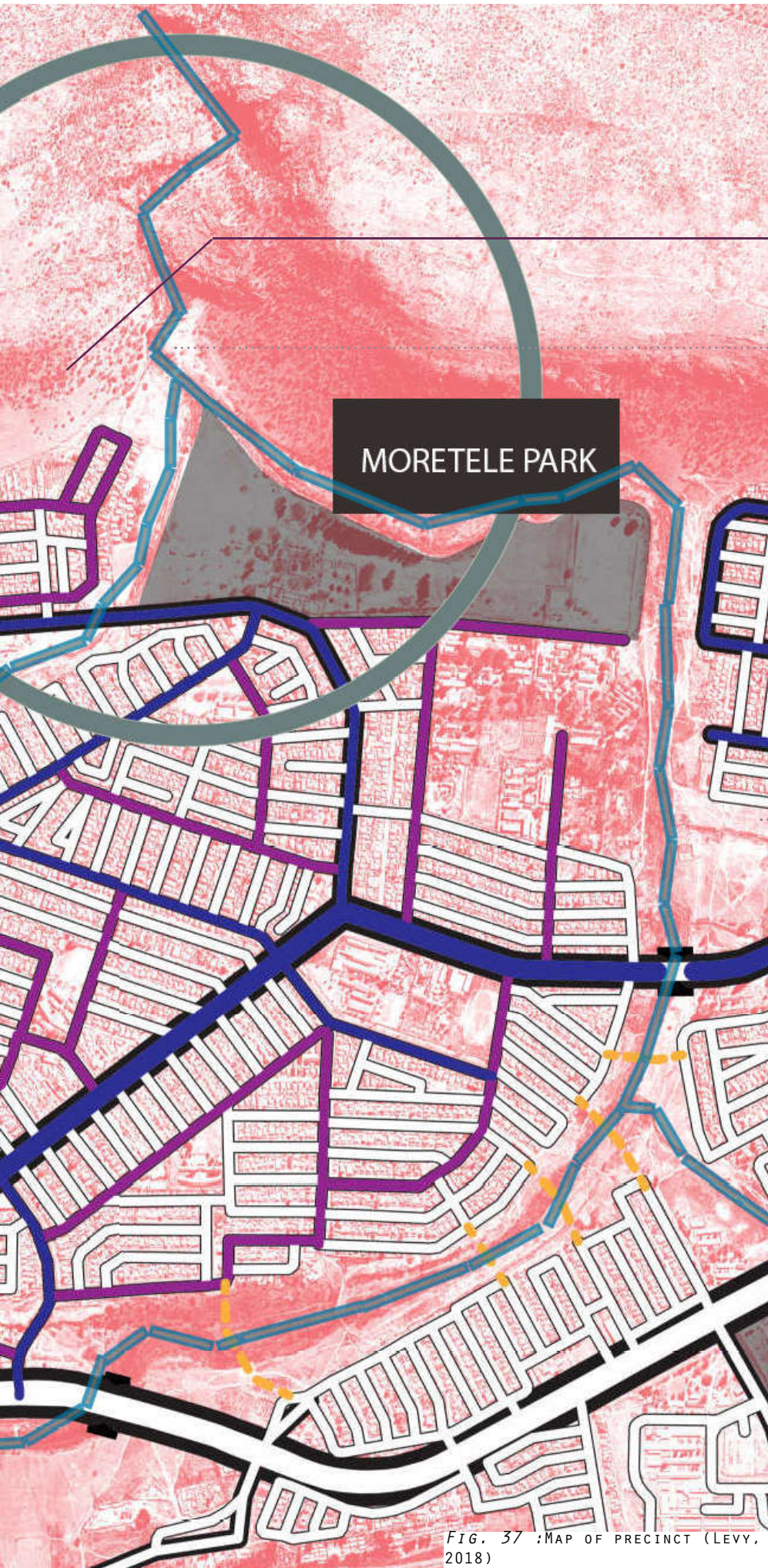


FIG. 36 :MAMELODI CLIMATE DIAGRAM (VAN DER HOVEN, 2018)



MOTHONG  
PRECINCT



SITE: 2.7 THE OBSERVED PRESENT

‘

The contemporary conceptualization of place in urban planning and architecture refer to the face of the city on the road, in motion. They go beyond an imaging of place as an isolated and static are. Places are defined rather as points situated in proximity to the paths of urban circulation. The transformation they undergo is today a matter of the merger of places with transit places, and the inscription of them in a broader process of the erasure of divisions between the inner and the outer, the part and the whole

’

(Hillier, 1996 quoted in Nyka, 2006).

FIG. 37 :MAP OF PRECINCT (LEVY, 2018)

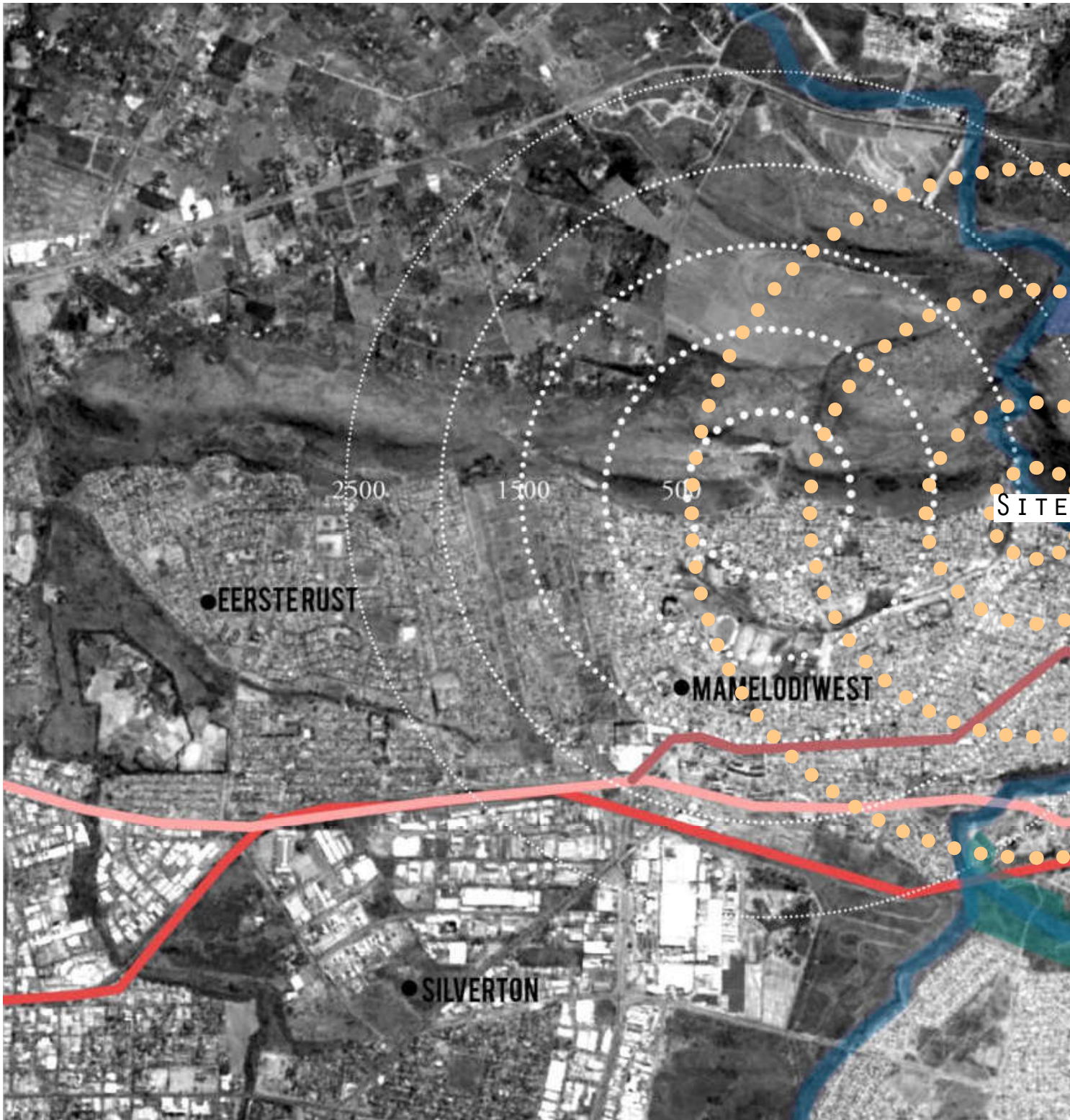
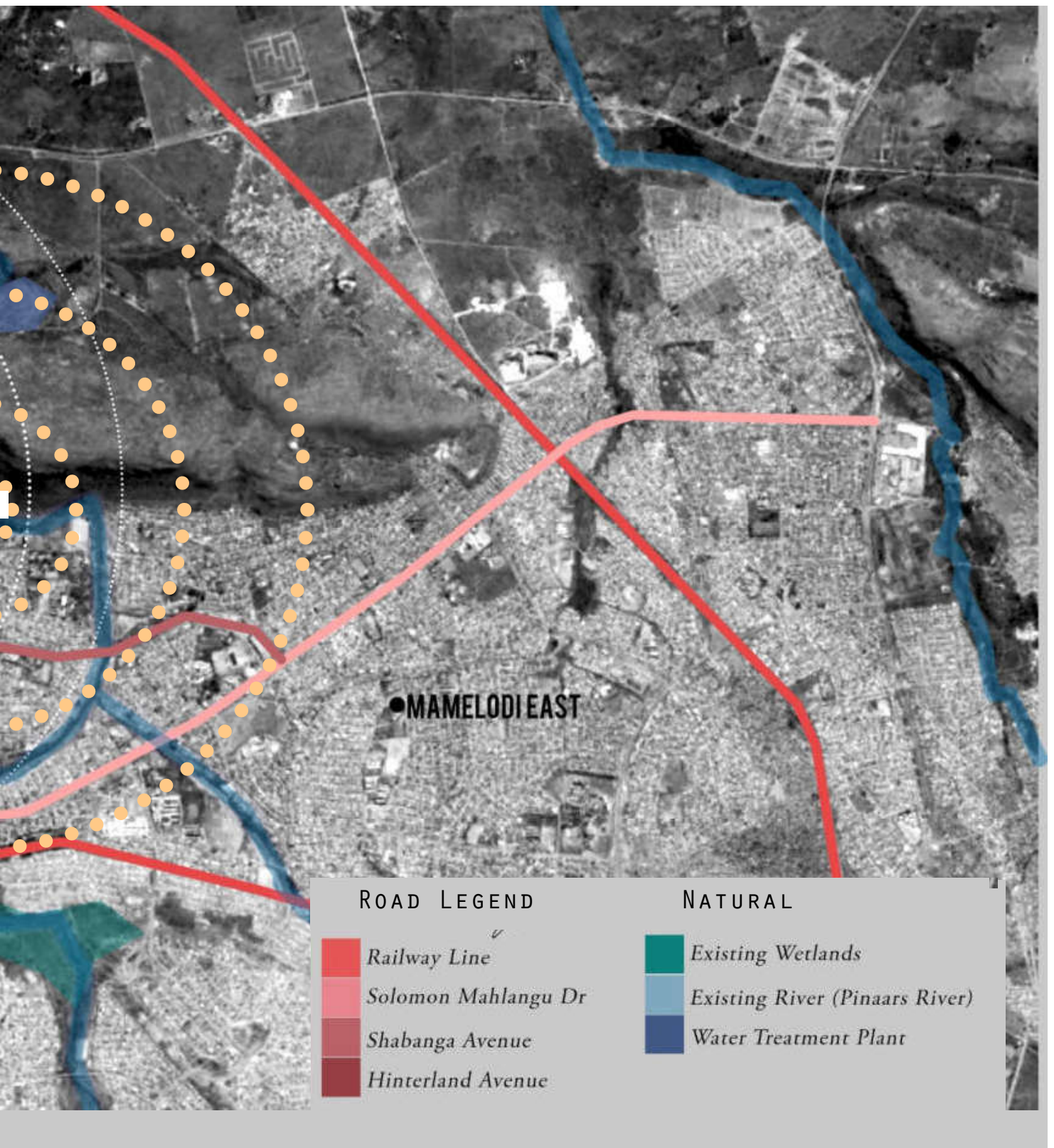


FIG. 38 :MAIN ARTERIES IN AND OUT OF MAMELODI(AUTHOR, 2018)



ACCESS NODES



FIG. 39 :ACCESS NODES TO SITE  
(VAN DER HOVEN, 2018)

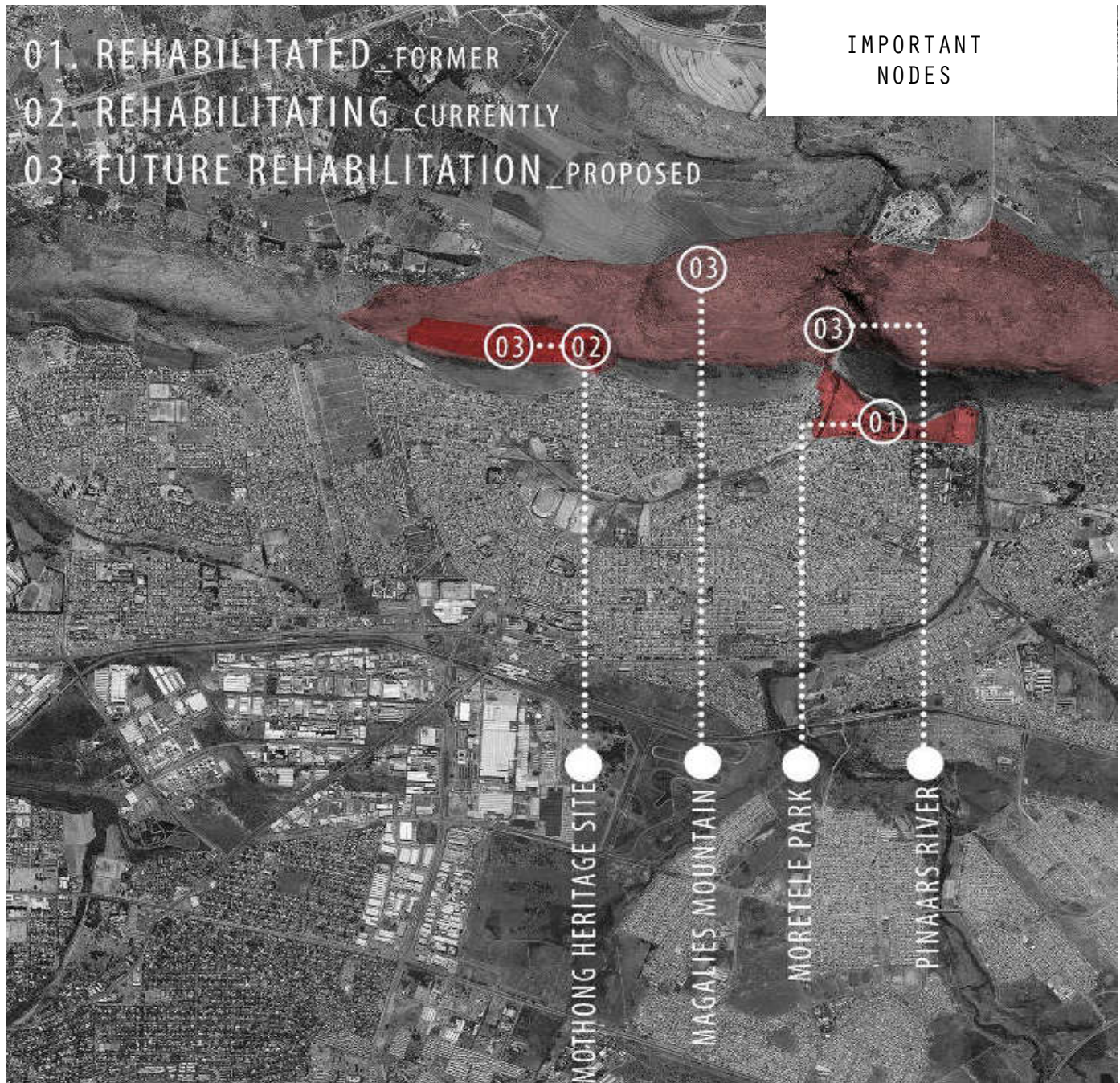


FIG. 40 :REHABILITATING, REHABILITATED AND FUTURE REHABILITATING NODES OF IMPORTANCE (AUTHOR, 2018)

### 2.7.1 URBAN FRAMEWORK

This is to be read in conjunction with the GAPP and Tswane Open Space framework.

Certain spaces are designated for pure heritage and rehabilitation, such as the Mothong Precinct, which is responsible for the harnessing of culturally significant and medicinal plant species. This precinct is also didactic and receives funding from TUT-The department of Science and DST Plant Health Product from the IRS. The Pinaars river zone, dedicated to future rehabilitation, includes the authors site of interest.

An important aspect mentioned by the rehabilitation framework is community farming which if explored can effectively contribute to the socio-economic upliftment of the people of Mamelodi (GAPP, 2010: 43).

## EXISTING STAKEHOLDERS

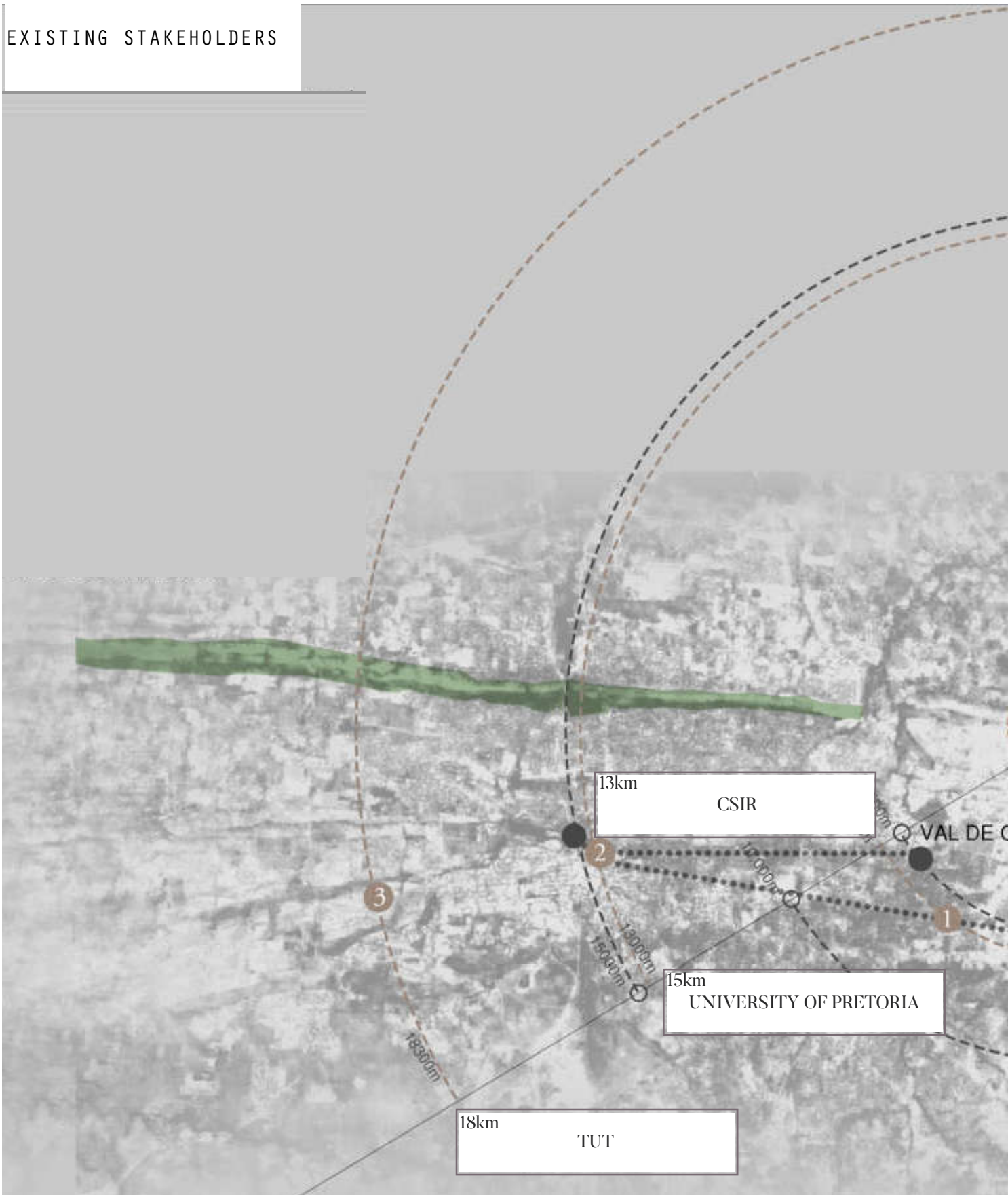
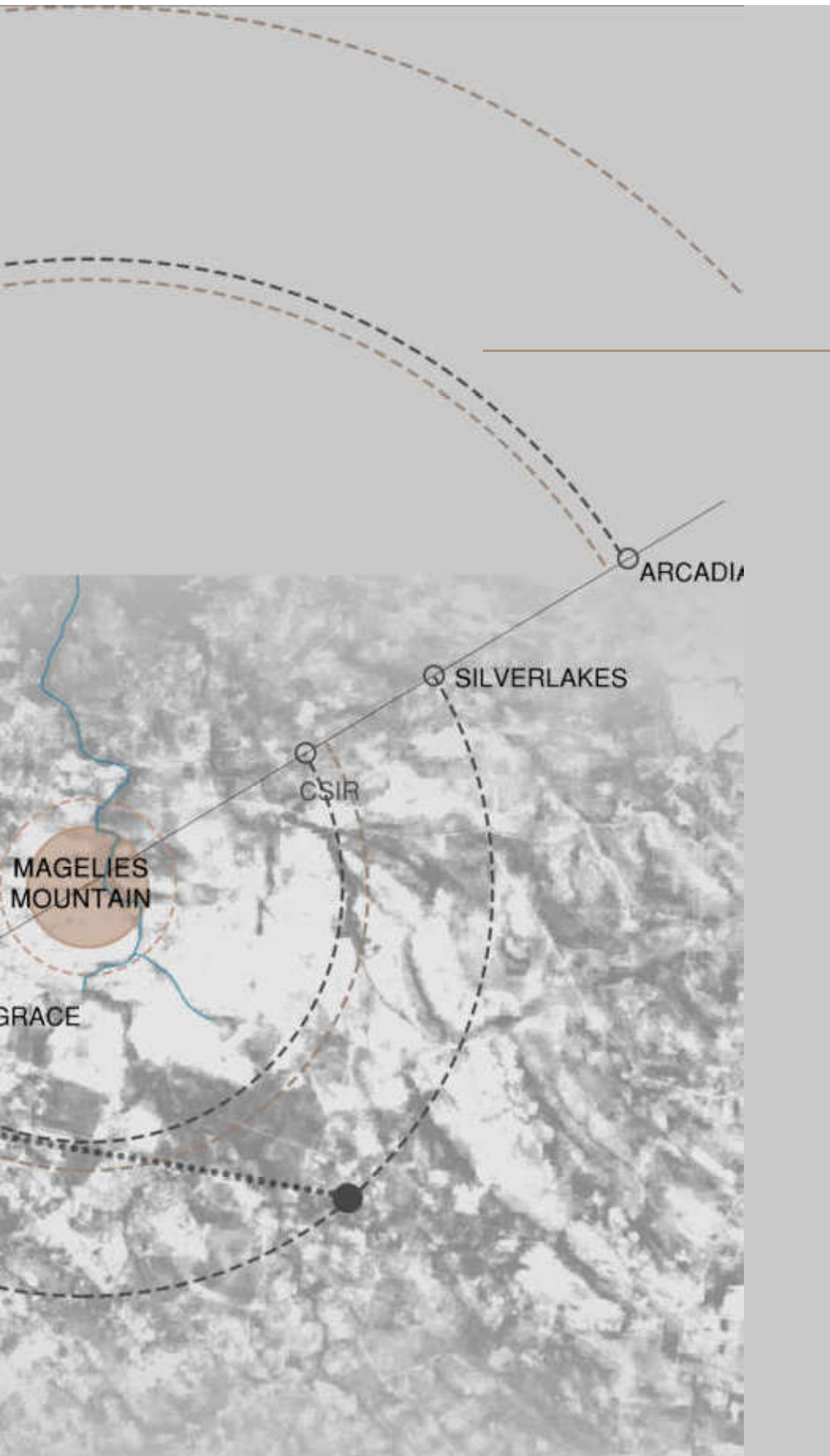


FIG. 41 :EXISTING STAKEHOLDERS AND RELEVANT INSTITUTIONS (AUTHOR, 2018)





CSIR (Council for Scientific and Industrial Research): The Built Environment and Natural Environment Departments are currently involved with strategies for development to the Mothong Heritage Site (which is peripheral to the left of the chosen site).

UP : Department of Plant and Soil Sciences is involved with providing a Process Plant in the near future to the Mothong Site. This is for the honing and responsible extrication of the valuable plants in the Mothong Precinct on the Magaliesberg Mountain.

-Specific involvement: NRF/DST Chair: Plant health Products from the IRS. Plant Science Section: Medicinal Plant Science

TUT (Tswane University of Technology): Department of Sciences is involved in research pertaining the properties of the medicinal plants and products that are currently extricated by Dr.Mabena on the Mothong site.

PERIPHERAL ACTIVITIES

The initiation of design strategies start with a search for a need, or gap, in the current setup of infrastructures. As per the authors conceptual exploration, the eventual aim is to resolve an issue of autogenetic function, within a form of temporal and ephemeral language (that supports phenomenological theories).

The combination of these attributes needs grounding in relevant contextual facilities and elements. These institutions are explored in the map to the left, as practical and programmable informants to possible new developments. These local explorations of space are concerned with geographical proximity, as well as the target market created by such institutions.

Thereby, creating the foundation for programme that is relevant to the social and natural landscape, as well as adherent to the conceptual and theoretical approach of the author.

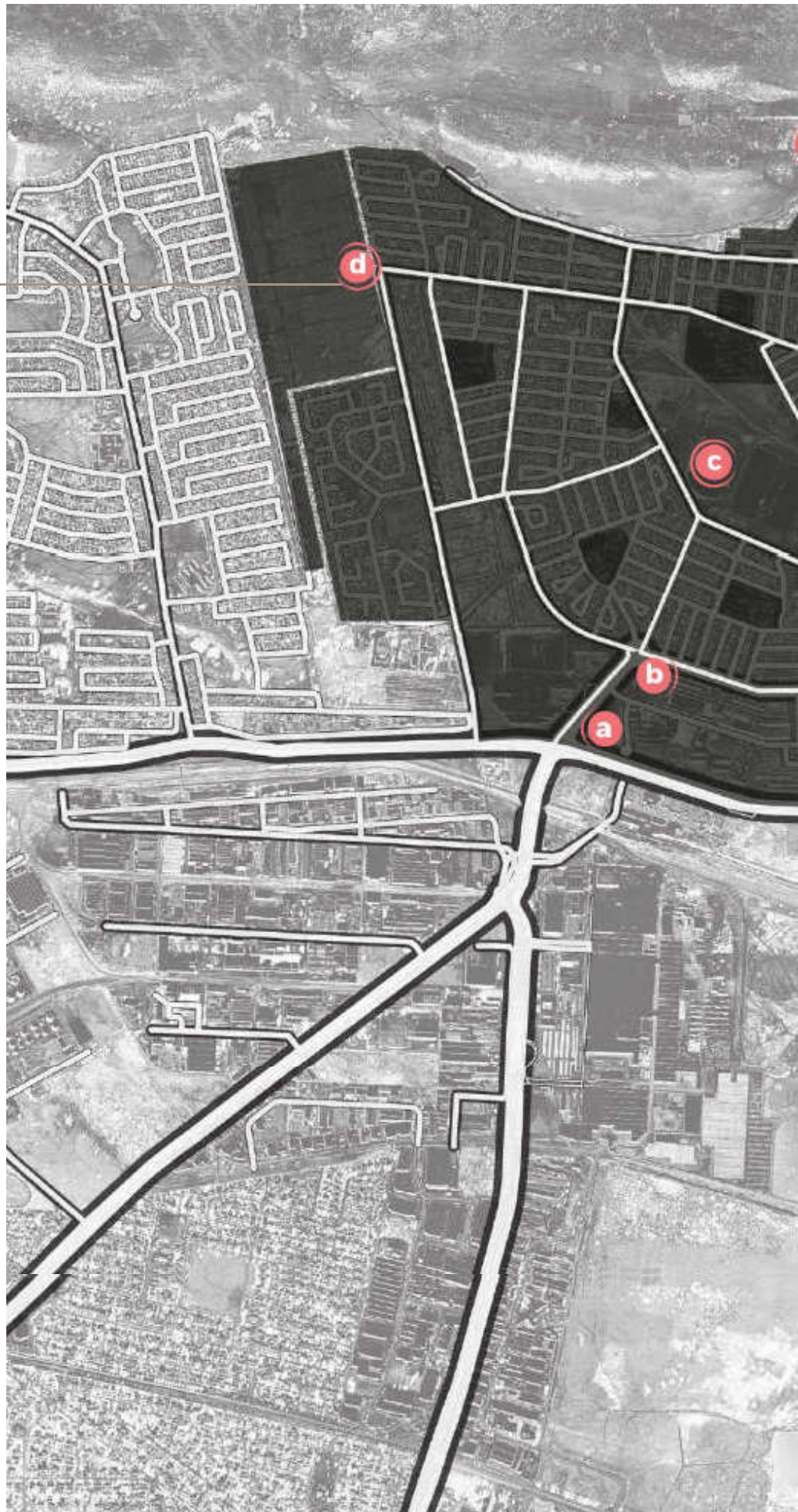
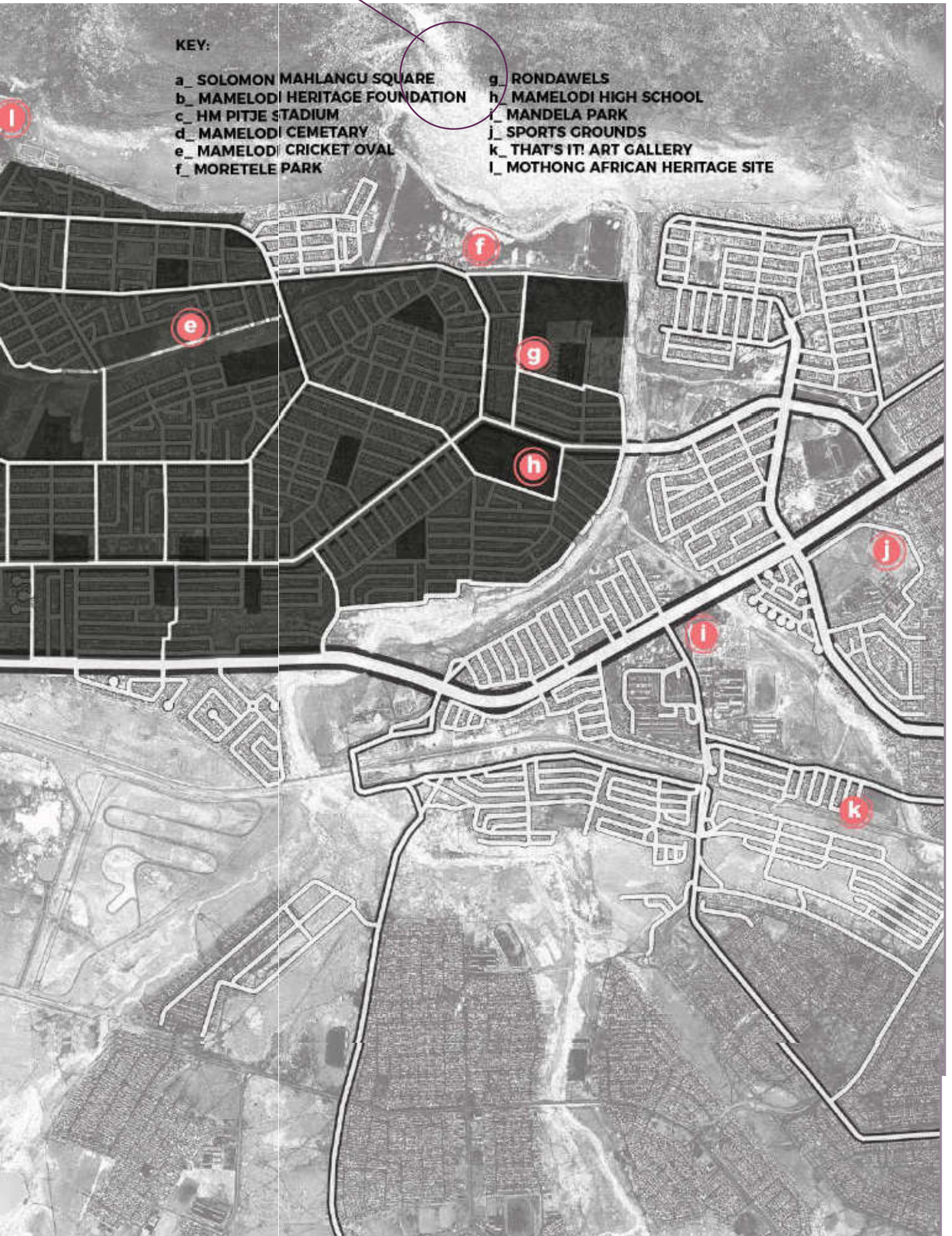


FIG. 42 :ACTIVITIES AND RELEVANT INSTITUTIONS ON SITE (AUTHOR, 2018)



EDUCATIONAL ACTIVITIES

As an introduction to possible didactic programs on site, a study of location concerning existing educational facilities in the precinct is carried out. It is evident that there are numerous primary and secondary schooling institution present, making the choice of site an excellent incubation point for these facilities to pour into.



FIG. 43 :EDUCATIONAL ACTIVITIES ON SITE (AUTHOR, 2018)





CHAPTER **03**

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THEORY AND  
CONCEPT

3.1 Concept

3.2 The architectural  
paradox

3.3 Amalgamation of Theory.

3.4 Space, Place & Non-place

3.5 Manipulation of phenomena  
& Systems

3.6 The exposition of  
Phenomenology

### 3.1 CONCEPT:

---

FIG. 44 :TEXTURED APPROACH INTO MOUNTAIN (AUTHOR, 2018)

'Instead of participating in the process of further speeding up the experience of the world, architecture has to slow down experience, halt time, defend the natural slowness and diversity of experience. Architecture must defend us against excessive exposure, noise and communication (Pallasmaa, 2009:19).

The 'unending rainfall of images', a phrase coined by Italian writer Italo Calvino, refers to the phantasmagorical eruption of unimportant and disruptive patterns of image/information overload of our current era. 'Much of this cloud of visual images fades at once, like the dreams that leave no trace in the memory, but what does not fade is a feeling of alienation and discomfort.'

Maybe this lack of substance is not to be found in images or in language alone, but in the world itself (Calvino, 1985)'. The paradoxical interpretation of this phrase refers to the possibility of abandoning the alienation and the reach of an architectural dream, but for the continuation of an experience that is rooted in context and rationally emitted by the practise or object of architectural intent.

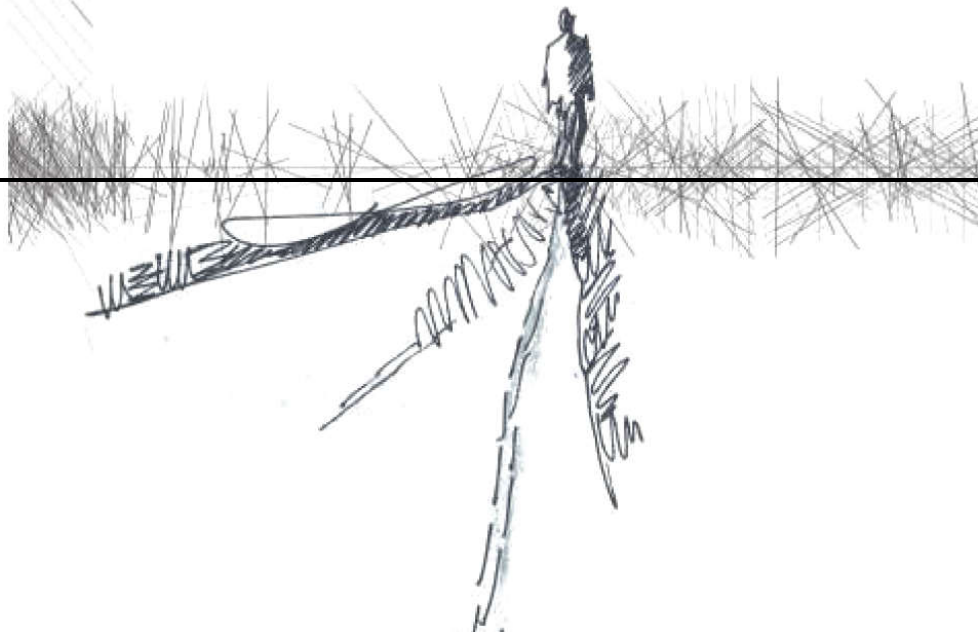
In a way the architecture here aims to deduce the 'rubble' of modern world excess, into simplified amounts of didacticism. The architectural intent is to absorb the economic and environmental squander and succinctly deduce it into a convalescing public and private experience.



The pluvial part of the title refers to the body of water and its contribution to theoretical and architectural investigation. The place-making possibilities of water is crucial to the dissertation and therefore forms a valuable part of this article as a primary informant.

The omniscient possibilities of architecture are here to be seen as mentioned above, as an absorber and observant of life. This negates it to also possess qualities that encompass an understanding of the life that happens beneath, beside and within it, but also form spaces that dictate function with wisdom and care. The context therefore becomes a source of great transcription when piecing together a possible theoretical or practical outcome.

*The disturbance of place and the  
experience of reckoning. ]*



### 3.2 THE ARCHITECTURAL PARADOX :

Socrates challenged the mind of the world when he husked away the conventional customs of living and interaction with sobering realism and core truths. This bottom up way of thinking encourages self-evaluation and does not adhere to any customary rule of society; but rather refers back to our own ethical compass. This compass marked the beginnings of what we now understand, means to live well.

The connection to this new ethical challenge and the built environment was synthesized with Winston Churchill's (1949) insight when he gave a speech concerning the rebuilding of the House of Commons. He referred to architecture as the physical tool for culture, as he states that the built environment conditions our existence. With this argument, architecture plays a phenomenal responsibility in harvesting our human behaviour and experience.

As architects, builders, developers and ultimately users of our built environment: we seek to improve upon our worldly circumstances and cast upon the world a certain

pursuit which becomes inseparable from our charge as individuals, and are essentially grounded in our ethical beliefs. The first premise for an architect is to be a designer, a creator of something that was previously unrealized. If we take into account that the architect knows how he/she is to go about designing the structure, then we can focus on what the designer will achieve with his/her intervention.

The initial designing phase follows the briefings from the client and after this has been established, the documentation has been completed and the contractor has completed the building works; the conventional process of building has been completed. What we are left with, is a structure that will either enforce and keep memory and experience that grows and changes with time, or a bland repetition of an idea that is uncomfortable in its context, and will thereby be assumed not to advance perpetual and ephemeral experience.

The insertion of these theories into an architectural suggestion in a specific context, is crucial to discussion of this dissertation.

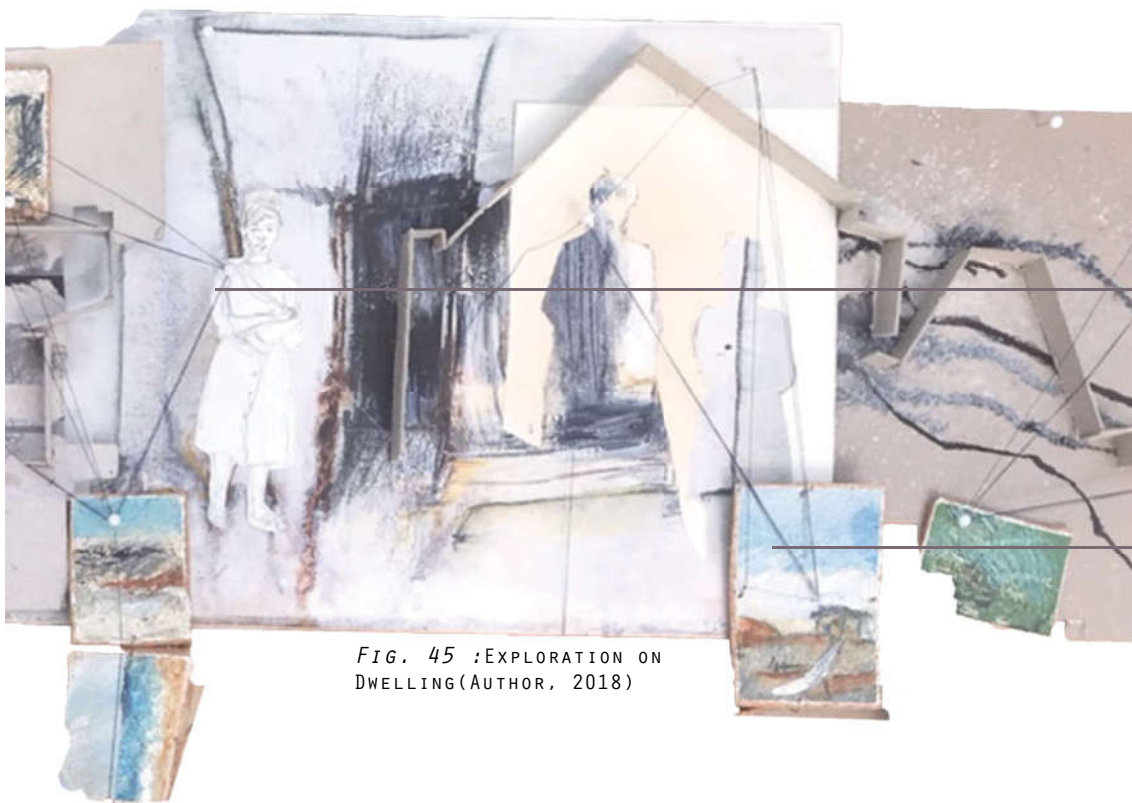


FIG. 45 :EXPLORATION ON DWELLING (AUTHOR, 2018)

### 3.3 AMALGAMATION OF THEORY

**An Argument for Regeneration through Experience:** Historically the natural landscape has been adapted for man largely into homogeneous landscapes that consume a lot of resources and deplete the natural integrity of the site (Kellert, 2005). The relationship of man with nature has unfortunately become disconnected and resulted in landscapes that only propagate the wellbeing of man, and not the nurturing of the two as sustainable entities. 'The prevailing paradigm of urban development is neither necessary nor sustainable and constitutes more a design deficiency that an intrinsic and inevitable flaw of modern life (Kellert, 2005)'. The experience of the 'ordinary' or daily life becomes important when viewing this disconnect between modern life's disregard for nature and the lack of dialogue between man and nature on a regular basis (refer to Principle I :pg 31).

This contributes to the authors argument pertaining to principles that facilitate 'non-place', as well as suggest a solution through design as a mediator. Places are, as per Hudson are thought of as complex entities, ensembles of material objects, people, and systems of social relationships embodying distinct cultures and multiple meanings, identities and practices. 'As such, places are contested and continually in the process of becoming, rather than fixed, open and a variety of flows in and out rather than closed and hermetically sealed (Hudson , 2001:Chapter 8)'.



FIG. 46 :ARCHITECTURE AS A TOOL FOR SUSTAINABILITY, EXPERIENCE & LANDSCAPE(AUTHOR, 2017)

### 3.4 SPACE, PLACE AND NON-PLACE:

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The author of “The Language of Architecture: A Contribution to Architectural Theory” suggest three realms of space to be taken into consideration; the physical, the conceptual and the behavioural (Prak, 1968). It is through these three lenses that space will be explored and further extrapolated within the dissertation.

The author recognizes the duality of space as a constant continuum and a stagnant entity that has become so by human influence. It is here where the tension of past, present and future is borne. We recognise the existence of the past space as its nature 1, and understand the continuum of change, to be finalized through the experience of architecture, that will guide it into nature 2 (Laurent, 2014:15).

Universal aspects of place refer to principles that allow a place to stay ‘universal’ and constant. The presence of boundaries such as streets, monumental type structures, centres and symbolism are some of these principles that allow places to ‘be’, in a sense (Jordaan, 1989).

The settlements and cities that are therewith created serve to exist and sustain for following generations, but will struggle to do so if the principles that have shaped the settlement as it now lays, are not understood. As put by Dewar and Uytendogaardt (1977:145) ‘...successful urban environments have a timeless quality when they are able to withstand the changes brought about by time, since they satisfy fundamental human requirements’.

Is it therefore concluded that cultural observations and practises within Mamelodi are bound to the choices made and appropriated by that culture? It is universally understood that the model of a city is grown from a model of choice based on the ideology of that civilisation (Jordaan, 1989). The truth of that is seen in both ancient and modern civilisations, but is it true for the borne culture of Mamelodi?

The dawn of Mamelodi finds itself a casualty of the ‘dominant’ political culture of the 1950’s and therefore is born a settlement watered with political strife. The layout of Mamelodi as a distant entity to the east of the CBD is therefore a choice not inherent to the audience of the settlement, and cannot be viewed as a result of cultural ‘choice’. The interest of place appropriation then becomes how these spaces were ‘reclaimed’ by the settlers, and how Mamelodi identity found itself a new cultural identity through the contentions of being a place of outlaws.

The culture is then formed within the given boundaries of the site and how the spaces are observed and used. Many of these limitations are results of climate, topography, natural location boundaries (Mills, 1982). The context that results is what is investigated as the culture of Mamelodi.

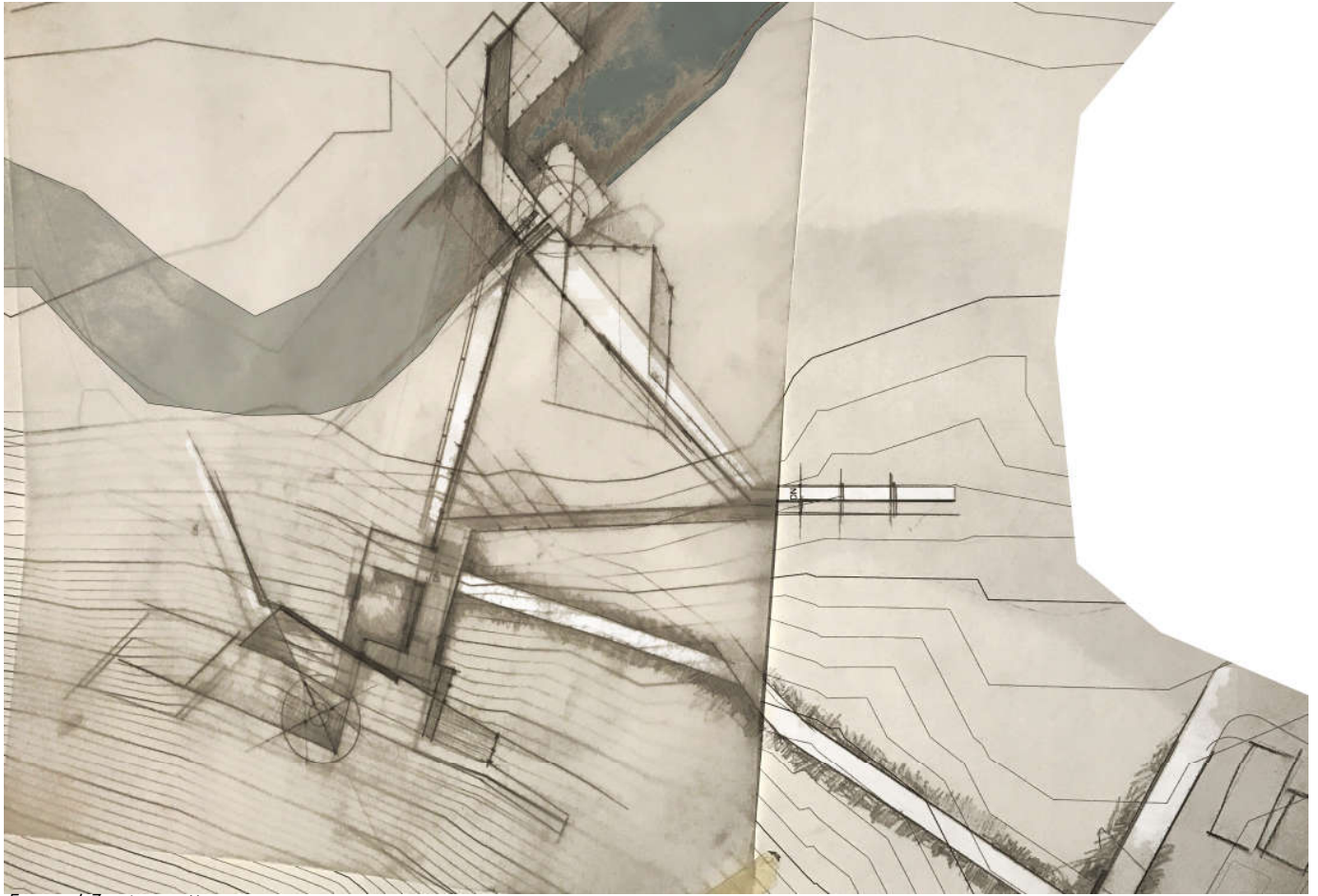


FIG. 47 :LEFT;WHEN THE SITE SPEAKS (AUTHOR, 2018)

### 3.5 MANIPULATION OF PHENOMENA & SYSTEMS:

Merely designing for the benefit of 'green' systems are disputed to be inefficient to solve the complicated circuit of the human interaction within the natural sphere. This approach seems to downplay the role of human activities and aspirations within the constant evolution of natural systems (Mang & Reed, 2012). This solution suggests the complete alignment of human processes within the limitations of nature, and neither preserves nor restores the ecosystem, but rather contributes to the continual evolution of culture.

"A structure in the landscape, like a frame or a concrete acoustic mirror, can help to mediate between ourselves and nature simply by standing in between. Creating a very personal resonance. Like a magic key that unlocks our memories, reminding us that we are part of it all and not separate from nature (Titman, 2013:117)'.

Titman reveals the poetics of the architectural construct through the manipulation of materials. He uses the simple effect of weathering that occurs naturally, to showcase the immense complexity and possibility of nature within the sensory and functional reach of a building. Steven Holl declares, "While sensations and impressions quietly engage us in the physical phenomena of architecture, the generative force lies in the intentions behind it (Steven Holl Architects, 2018)". As with the collective work of Steven Holl, the intricacies of the sensory concept is masterfully intertwined with the user experience. The use of light and texture is manipulated to create space that is not only inherent to its program but positively enforces a user experience that is unique and contextual.

The Herning centre of the Arts, by Holl, combines these tactics of phenomenology with practical function. For instance, all practical services and considerations are concealed with the use of a site build-up of grass mounds and 'reflection' pools that generate a special relationship between the landscape, user and building. The architects' simple conviction of an active landscape generated an innovative concept that combines a visual art and music theme throughout indoor and outdoor spaces. Form stimulates another important reference for design when it comes to this execution of phenomenological design. Simple sketch designs and ideas generated from context is part the complete process that gives the final form to architecture.

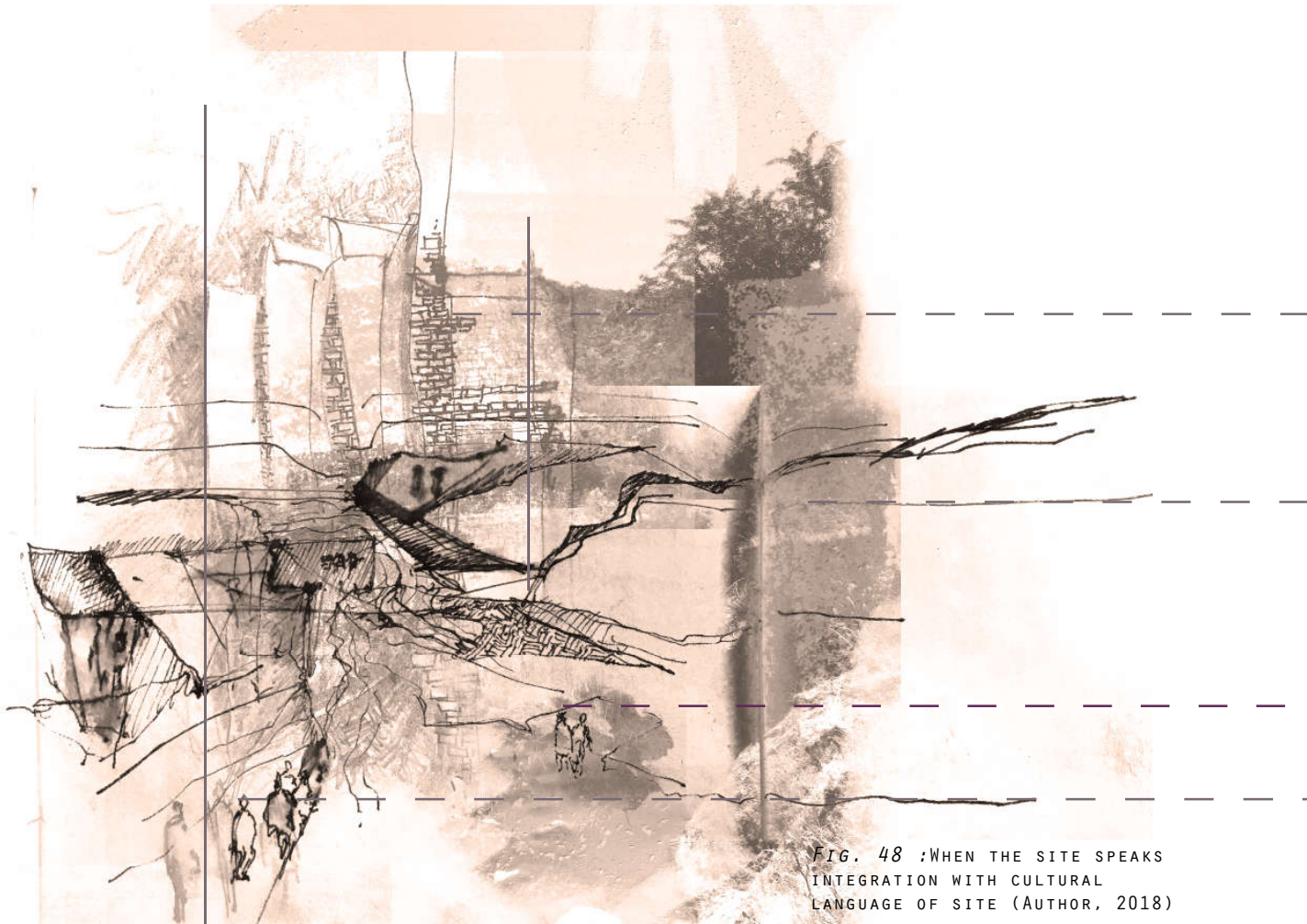


FIG. 48 ;WHEN THE SITE SPEAKS  
INTEGRATION WITH CULTURAL  
LANGUAGE OF SITE (AUTHOR, 2018)

### 3.6 THE EXPOSITION OF PHENOMENOLOGY :

“With life also began individuality, for evolution dictates that no two forms can be exactly alike. Life depends upon light and water, and in straining upwards towards the light the plant evolved its own water reservoir and supply system. This enabled it to invade land (Frazer, 1963)”.

The eternal connection of biotic life lies within light, water and surface. These principles overlap with our basic architectural mediums, but also specifically within a phenomenological framework. As these require our mechanical senses to function in order for us to perceive these experiences, it is the human awareness cultivated from the specifics that really come in to phenomenology-play.

One way to understand this phenomenon is to use Rationalism as a counter theory. Rationalism dictates that the truth of experience is not sensory but intellectual and deductive (Bourke p.263).

This delivers our experience to us within deducible layers for scientific understanding, where we can once again measure a building as a fourfold layered entity according to Frank Duffy's (1969:28-29) theory. This investigation aims to delve into a different interpretation of architectural functionality within a phenomenological construct.

Throughout the revolution and growth of architecture as a tool for and by man, waves of human and natural influence on our structures have fluctuated notably. This relationship has fluctuated between being hostile and exploitative or harmonizing and integrated (Nesbitt, 1996:30). Phenomenology argues that architecture is a human construct built within nature to function positively in the evolution of our lives.

Our architecture should arguably therefore stem from individual and communal human gestures that inspire a wellbeing of life. The integration of function within a sensory framework produces the program for the architecture, and should act as an essential bearer to the practice of phenomenology.

‘And if a building is a frozen poem, then the materials used to construct it are the carefully chosen words’. It offers us a way of appreciating the unquantifiable, the unmeasurable and the irrational. But mostly it gives us a poetic way of looking at nature in beautiful contrast with its massive entropic forces (Titman, 2013:117)’.

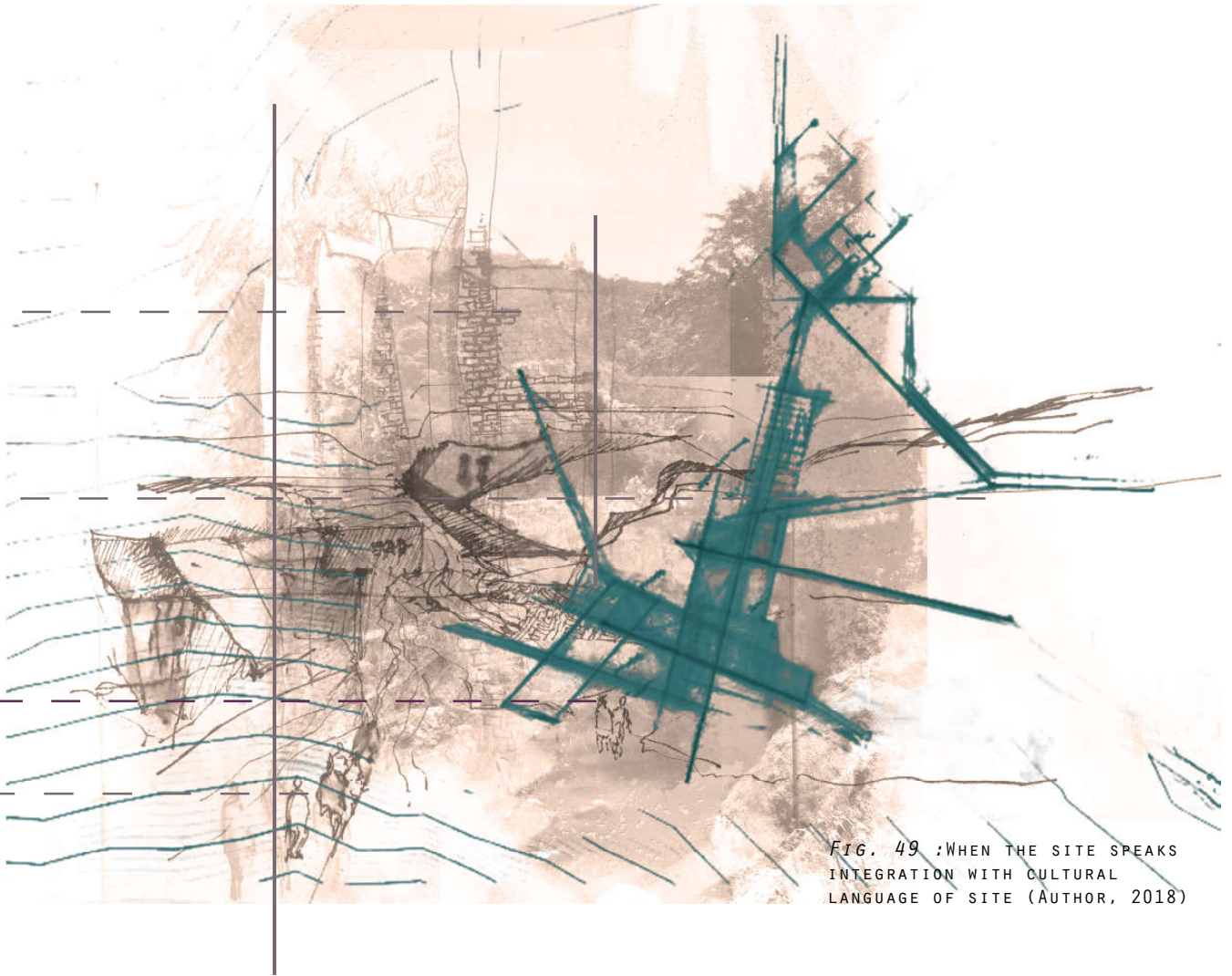


FIG. 49 :WHEN THE SITE SPEAKS  
INTEGRATION WITH CULTURAL  
LANGUAGE OF SITE (AUTHOR, 2018)





# CHAPTER 04

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## PROGRAMS AND DELIMITATIONS

- 4.1 Intro to Program
- 4.2 Touchstone Approach
- 4.3 Composite Constraints and Informants
- 4.4 Local and Larger Lenses
- 4.5 Concept at larger Scale
- 4.6 Economic Adaptability
- 4.7 Land Accessibility
- 4.8 Spatial Dislocation

## 4.1 INTRO TO PROGRAM

If it is impossible to create a visual, tangible, connection that runs through Mamelodi, Eersterus, Waltloo, Silverton, Pretoria CBD, Groenkloof, Menlopark, Garsfontein, Faerie Glen, Wapadrand etc, then does the architecture not need to lend itself to the intangible connection?

### **Reflection: The Relocation and Manifestation of Mamsfm Radio-Station Headquarters To The Magaliesberg-Ridge Working with Nature 2:**

The first possible intervention relates to the program of reflection. This refers to the reflection of self, and the position of community and culture within the self. This is the program of the relocation of the MamsFm radio station (established in 2011). The placement of such a program within the natural condition aims to give ownership and cultural importance to the audience of the site. The transference of knowledge, cultural values, happenings and regional dialogue of value links back to the sub concept of reckoning. The structure of the architecture will aim to bring about a eco-systemic reclamation and interact 'haptically' with its surroundings, whilst being a constant reflection (transmission) of the world happening around it.

### **Reclamation: Productive Landscape to Stimulate Social-Return Working with Nature 1 & 2:**

The second program deals directly with the natural landscape and its historical condition through an approach of social significance. The reclamation of the landscape through agricultural development, such as a waterwheel and aqueduct system, not only restores value to the land but also enriches the economic stability and resource value of such a space.



FIG. 50 :PHOTOGRAPH OF EASTERN MAGALIESBERG RIDGE (AUTHOR, 2018)

Therefore : The primary program deals with the manifestation of Mamelodi FM Radio station. The secondary programs grows from the social return and opportunities that community-based radio stations fund and participate in.



## 4.2 TOUCHSTONE APPROACH

'NATURE 1 AND 2 (Laurent, 2014)

Touch-Stone Response Investigation into The Natural and Topographical Conditions of The Site, and The Imposition of The New.

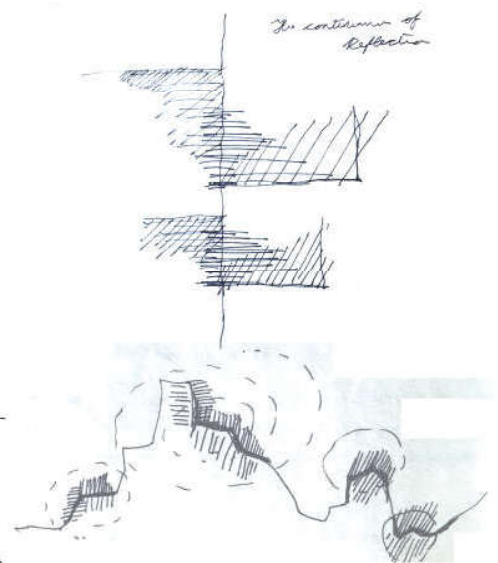
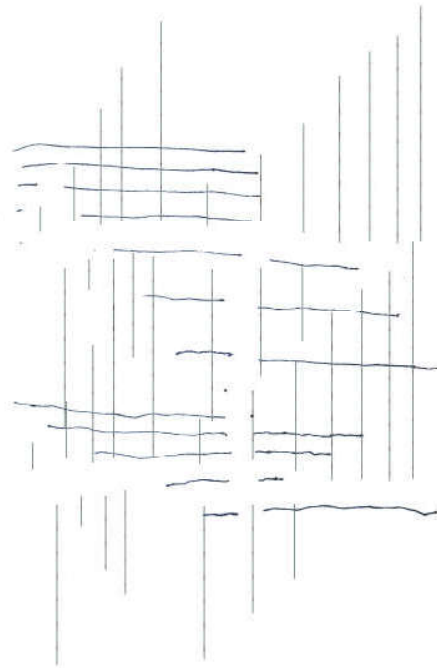
The current condition of nature is seen as nature 1, even though it has been altered by man and has been subject to unnatural change. The infliction of the new architectural program is the second nature of the intended palimpsest. This action is borne intuitively, but strongly rooted into the previous investigations concerning the historical evolution of the natural and social conditions of the site and surrounds.

Where is the line of reaction? Does it lie on the ground or under? Or in line that the building cuts through the sky?

The Pendulum of  
understanding

a Study of  
Reflection

The continuum of  
r e f l e c t i o n



**Where** is the line of reaction?  
Does it lie on the ground or  
under? Or in line that the  
building cuts through the  
s k y ?

FIG. 51 :THE PENDULUM OF  
UNDERSTANDING (AUTHOR, 2018)

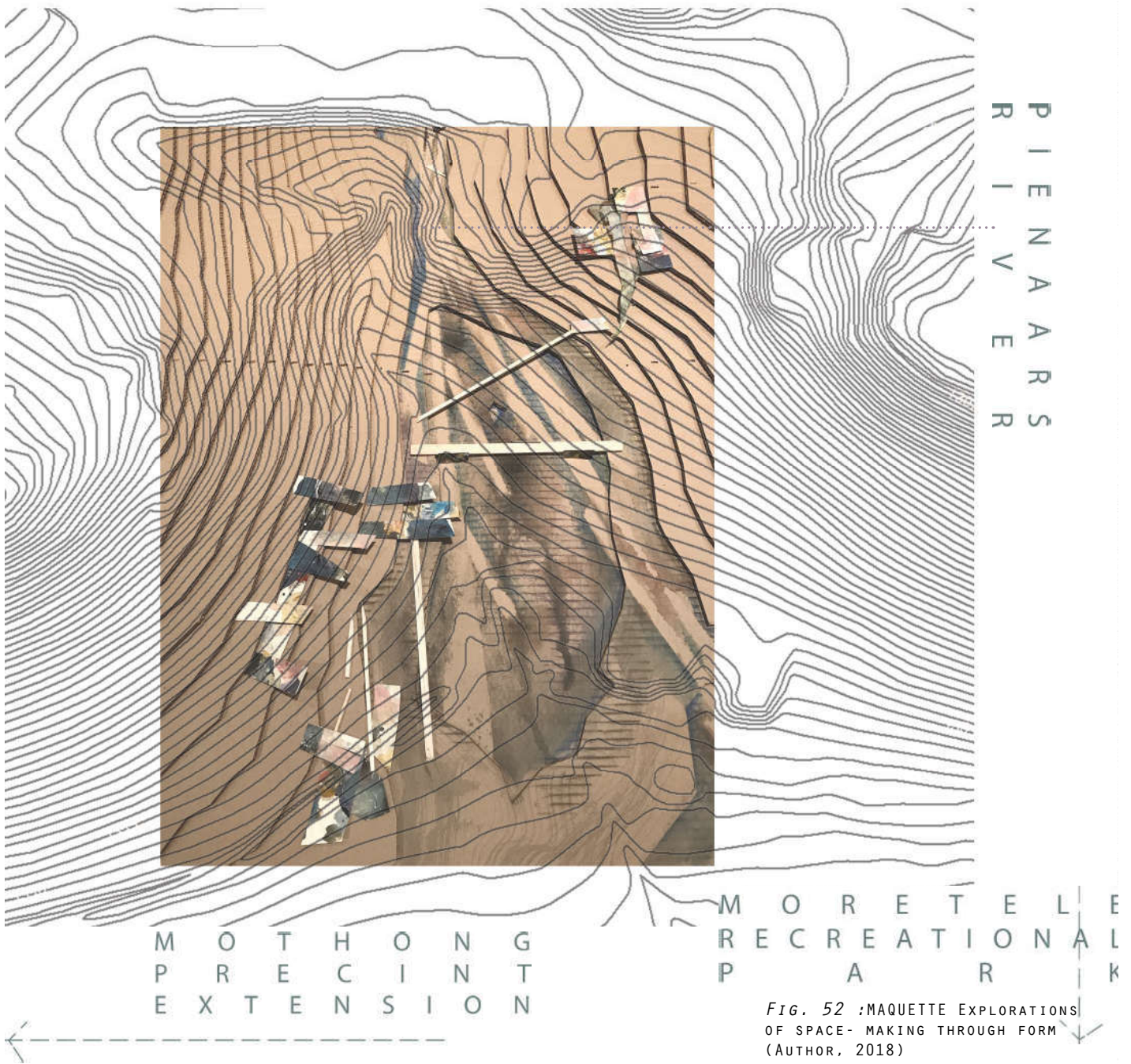


FIG. 52 :MAQUETTE EXPLORATIONS OF SPACE- MAKING THROUGH FORM (AUTHOR, 2018)

MAQUETTE Explorations of space-making through form:  
The extent of site on the Magaliesberg Mountain reaches the entrance of Moretele Park and extents into the east, following the Pienaars river up towards Baviaanskloof Penitentiary.

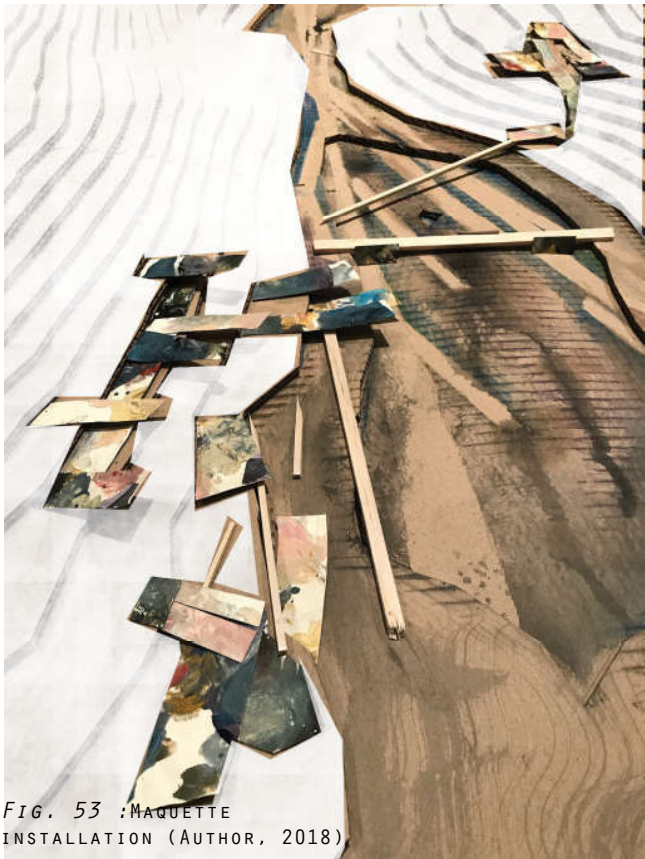
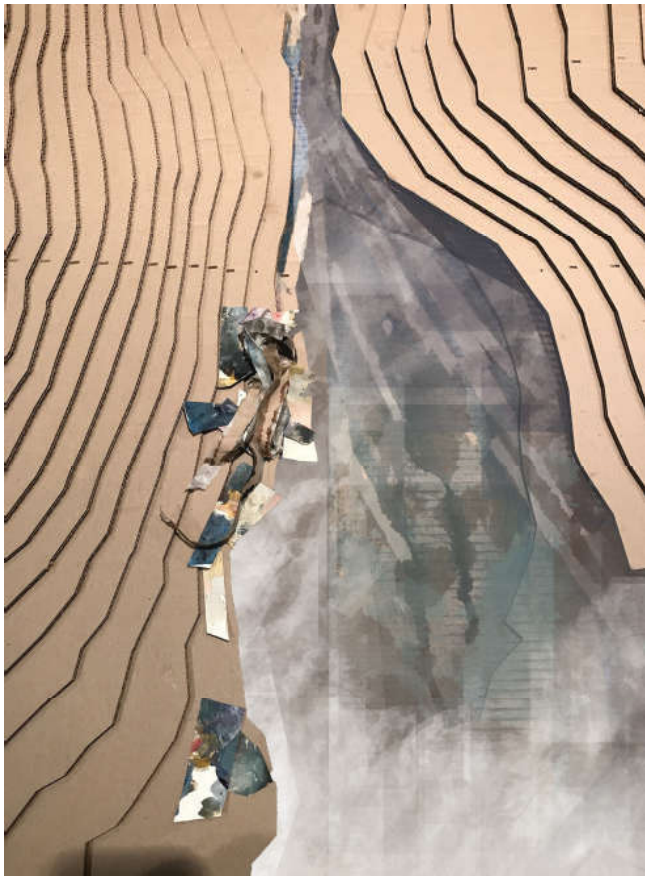


FIG. 53 :MAQUETTE  
INSTALLATION (AUTHOR, 2018)

EXPLORATION INTO THE SUBMERSION OF THE ARCHITECTURE INTO THE FIRST BED OF THE RIVER,



DELIMITATIONS OF THE RIVER Chosen position of the intervention on the western ridge of the Pienaars River. This allows optimal eastern sunlight as the building splays towards to the northern and southern axis of the site and faces predominantly east.



THE TRANSIENT CROSSING OF THE FIRST NATURE WITH THE EXISTING BRIDGE AS A POINT OF RECKONING AND RECLAMATION OF HISTORY. The second nature is born intuitively on the eastern embankment.



*FIG. 54* :MAQUETTE  
INSTALLATION (AUTHOR, 2018)

### 4.3 COMPOSITE CONSTRAINTS AND

## COMPOSITE CONSTRAINTS AND INFORMANTS at the larger scale

The program intention of a communal radio-station infrastructure, integrated permaculture and event space lends itself to:

- Relevant community leaders having a vigilant platform to engage and share issues and ideas with
- Using these gatherings of stories and information to pro actively create awareness and discussions that is relevant to the direct community
- Harnessing the power of corrective journalism within the community, taking control of negative conditions in a conducive way and space.
- Providing spaces that engage listeners to their speakers in a context and scale that is familiar to them
- Facilities that restore cultural appreciation to the surrounding river and mountain-scape
- Giving purpose to environmental resources that restore social value and dialogue with the landscape
- Creating an integrated economical and environmental tool that serves the community of Mamelodi
- Spaces that are relative to sustainable practices within productive economical reason.
- Adaptable and multi-use volumes that re-purpose to the users need of the time.

### THE CONCEPT AT THE LARGER SCALE

THE HOMESTEAD:  
THE RESULT OF EXPERT COMMUNITY  
ENGAEMENT AND THE FOSTERING OF ARCHITECTURE THROUGH NATURE

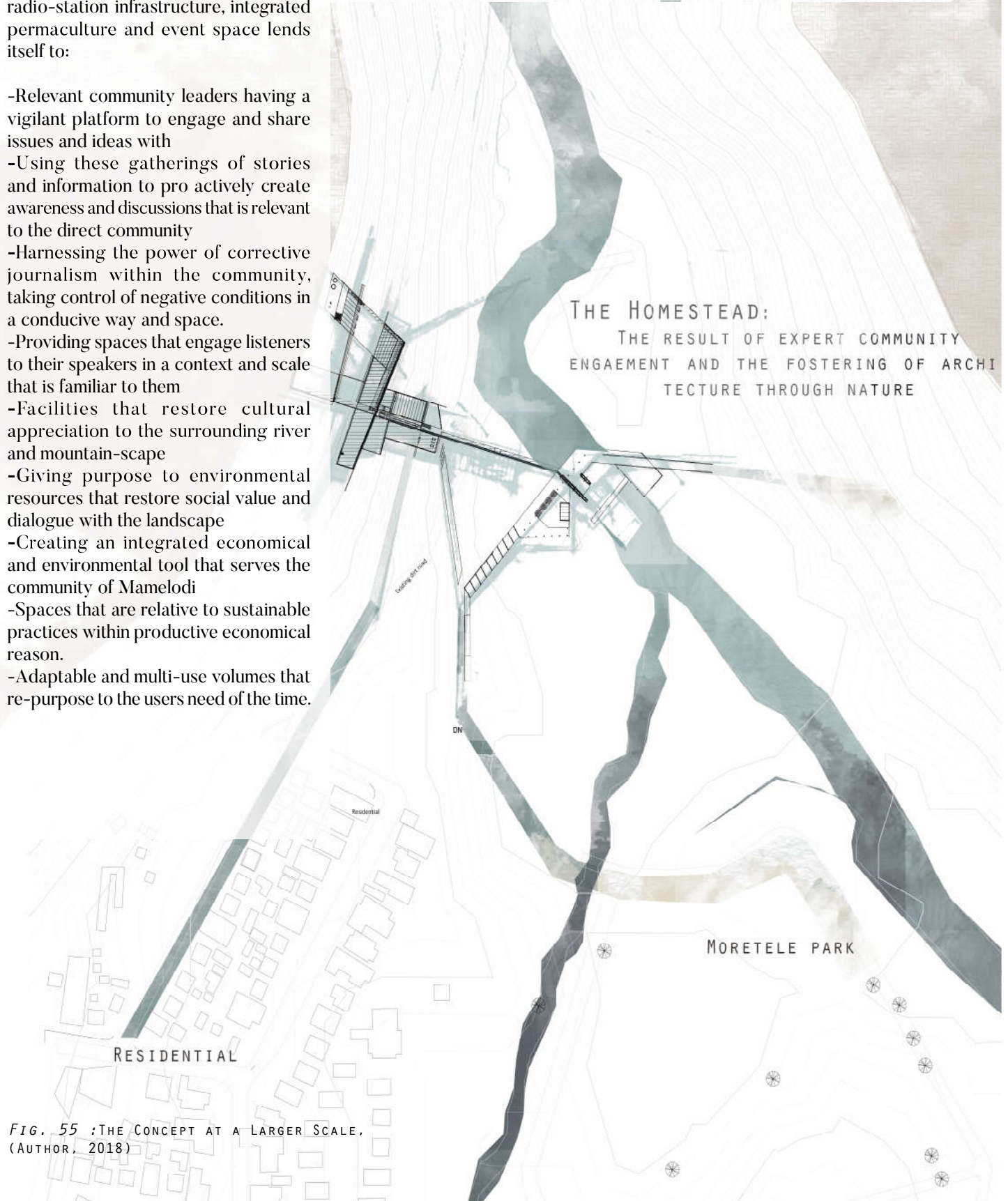


FIG. 55 :THE CONCEPT AT A LARGER SCALE.  
(AUTHOR, 2018)



## SPATIAL DEVELOPMENT FRAMEWORK

### 4.4 LOCAL AND LARGER LENSES:

**Client:**

The clients involved in the sustainment and growth of these programs include Small Business Development Corporations that merge with corporate companies to lend helping financial hands. Current South African leading party policies are proposing tax credits for companies that invest in sustainable job creation. (Mpangane and Fakir, 2018). These policies are also developing a, yet unclear, 'agricultural support package' that aims to address food & water security and procurement, as well as facilitate economic growth. These recent government initiatives are largely linked to our current economic and technical recession, and aims to address sectors of development that will empower local growth.

The site offers a definitive resource to be harnessed in terms of perma-culture (the resource of the river). Lightweight structures of simple construction can be locally implemented to sustain practises of aqua and hydroponics, as well as the procurement of drinking water.

The problem arises when debilitating the management of these implementations. Who will be responsible for managing and honing the skills, resources, availability and distribution of these 'agricultural support packages', as phrased by the ANC Stimulus package (Mpangane and Fakir, 2018). In this theoretical world bound to realistic crimes and expectations, is it unrealistic to imagine an immediate scenario wherein there is no theft, corruption, mismanagement or deception? It is an unfortunate propagated belief that we've been given by the past and present, but should it dictate the response of our future?

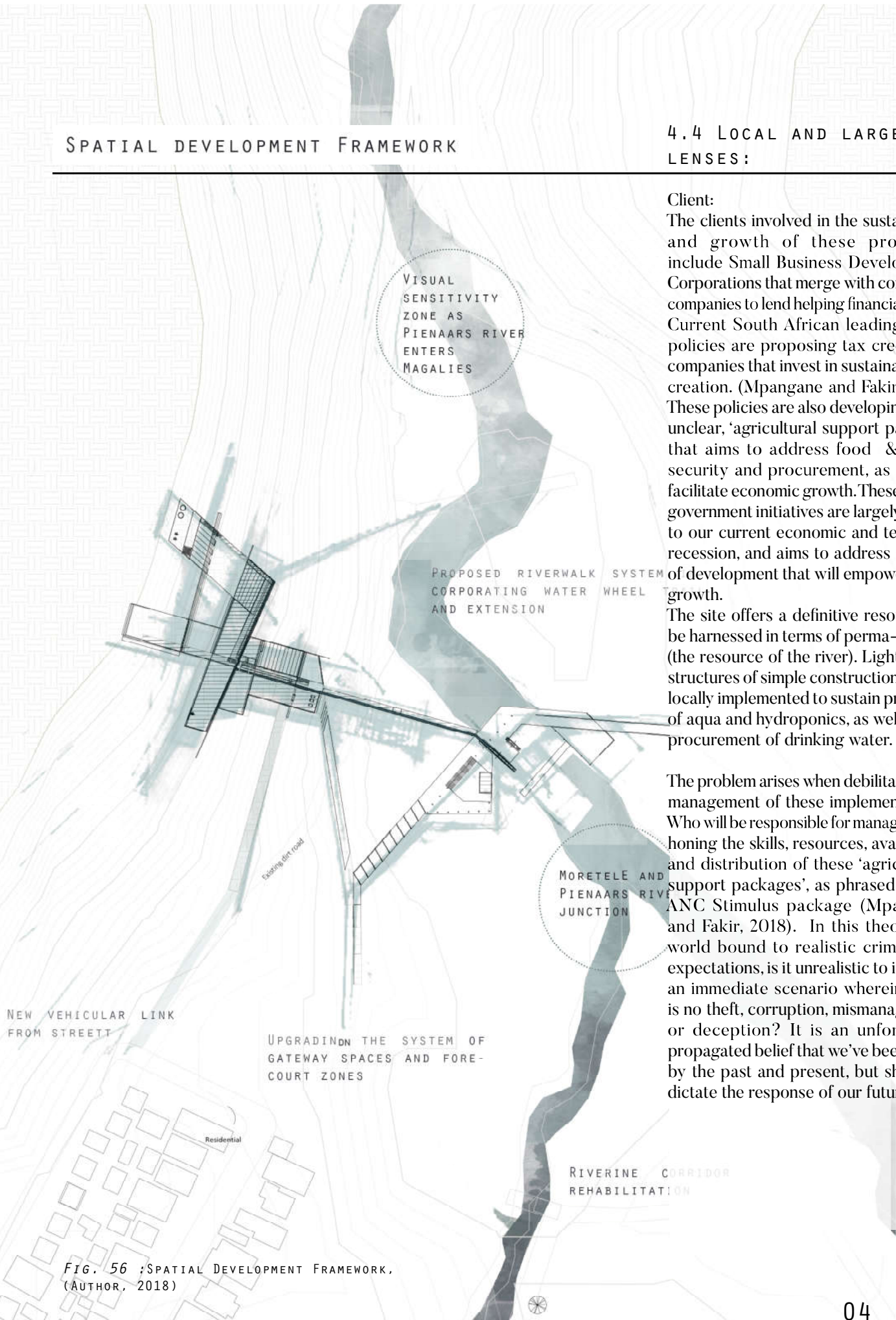


FIG. 56 ;SPATIAL DEVELOPMENT FRAMEWORK.  
(AUTHOR, 2018)

This intervention aims to balance ownership of land and land-use, through sustainable job creation that not only relies on management, but the working and care of the infrastructure and facilities procured.

The first understanding is that ownership belongs firstly to nature itself. Our intervention for gain or re-purpose upon nature is our second ownership, and one that dictates responsibility and management. It is only logical to derive that the earth we work, cannot work for us if we do not sustain and nourish it with respect.

A community cannot wish to gain anything from infrastructural or natural implementations, if these are not valued and respected. This still asks for a certain top-down management approach that is to be implemented from the government side. The further bottom-up management of the actual infrastructural elements such as the waterwheel/aqueducts, wetland system and building maintenance will be orchestrated within the framework of end-users and developers.

Initial funding for these facilities are tripartly funded by a local corporate party of interest such as Agri-growth/Tsebo water/Primedia etc, that will sustain a quarterly gain in this arrangement and thereby continuously invest and encourage further development of the 'stimulus'. Other essential clients include the City of Tshwane and associated governmental implications and initiatives. The following points have been debilitated regarding the Tshwane Open Space Framework (TOSF, 2016):

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The basic goals set out by the TOSF stipulates an international standard implemented within the African context, that inspires local and capital growth and resilience. The sprawl and densification issues identified within these strategies, particularly with regards large established townships like Mamelodi, are to be resolved by establishing areas of ecological importance, employing place-making importance in certain divides, and nourishing social and civic infrastructure. Although these are pure and positive intentions, these policies rarely see the light of day as CoT still fails to implement these nodes in a sustainable way.

The community at large should carry the weight of responsibility and execution as they are the users of these nodes.

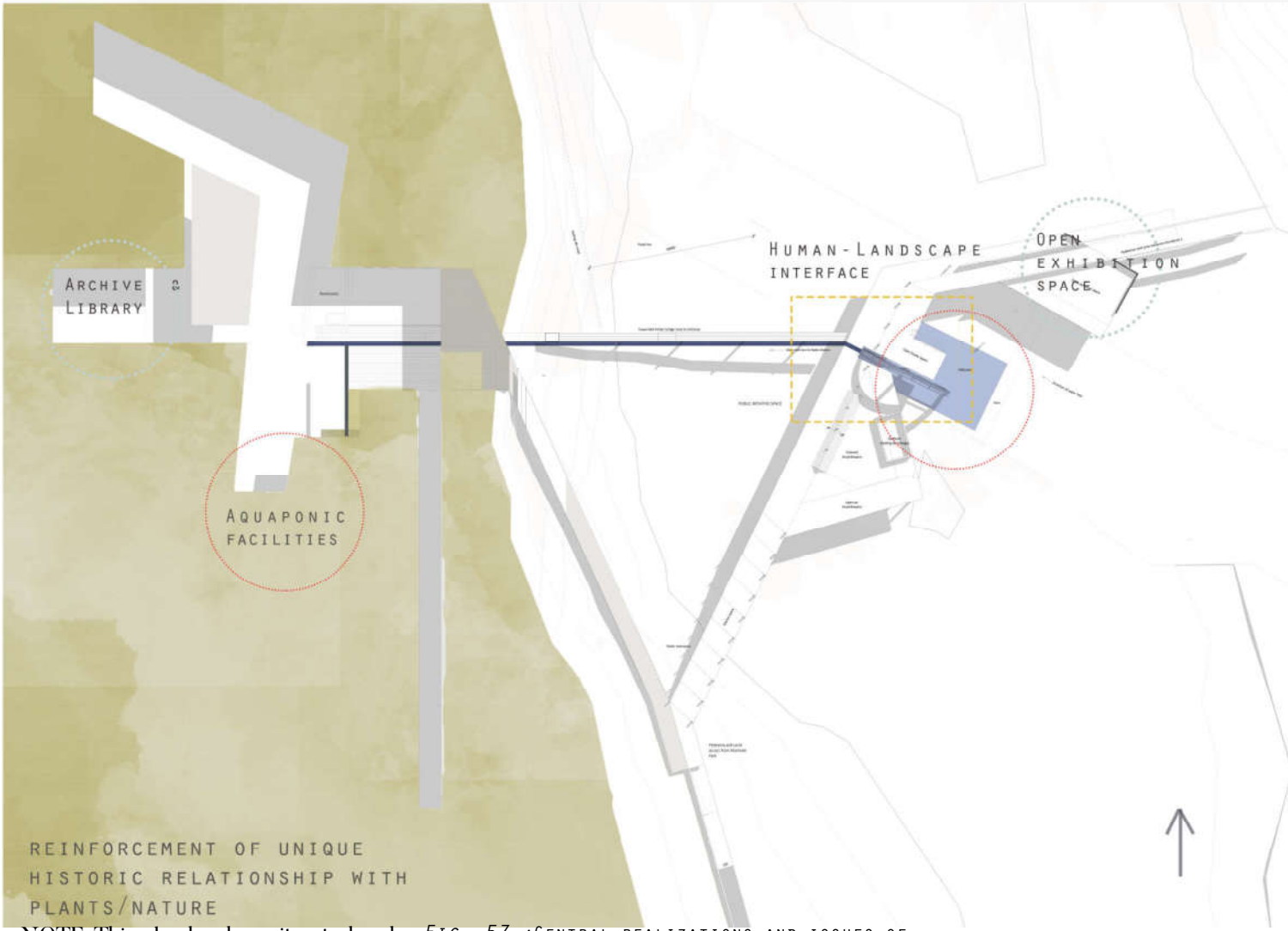
As the framework identifies Moretele Park as a possible catalyst of social and recreational value, the area around this development, i.e. as the authors chosen site, holds many possibilities and opportunities for the promotion of this catalyst. Although there is currently an entrance fee to be paid to Moretele park, the intention of the author is to create a publicly accessible adjacent venture that will eventually feed into the social gain and return of the park itself.

Avoiding a cost implicated to entrance removes the liability of the new buildings becoming disconnected from the surrounding community, but also in turn provides possible safety and access issues. However, the Tshwane open Space Framework is centred around daily life contribution and sustainable wellbeing, and can therefore positively endorse a more peaceful and fruitful future that serves nature as it does its people, without distress of vagrancy (TOSF, 2016). This is a long term goal, but essentially what is aimed for, both by the TOSF and the author.

This does not completely eliminate the need for control and surveillance, but is naturally achieved by the design and 'reclamation and reflection' concept of the author, than forceful boundaries or hard inaccessible edges. Stringent control is however actualized within the private and public division within the building and the function change-over of the spaces. This leaves the open space of the surrounding Magalies mountain and Pienaars river free from access obstruction.

# CENTRAL REALISATIONS AND ISSUES OF RECOGNITION:

PUBLIC INTERFACE ZONES  
NEW EMERGING HERITAGE INTEREST ————  
HUMAN-LANDSCAPE INTERFACE - - - - -



NOTE: This plan has been iterated and should not be counted as the final work.

FIG. 57 :CENTRAL REALIZATIONS AND ISSUES OF RECOGNITION (AUTHOR, 2018)

### 4.5 CONCEPT AT LARGER SCALE

FIG. 58 :PRIMARY SPATIAL PROBLEMS, (AUTHOR, 2018)

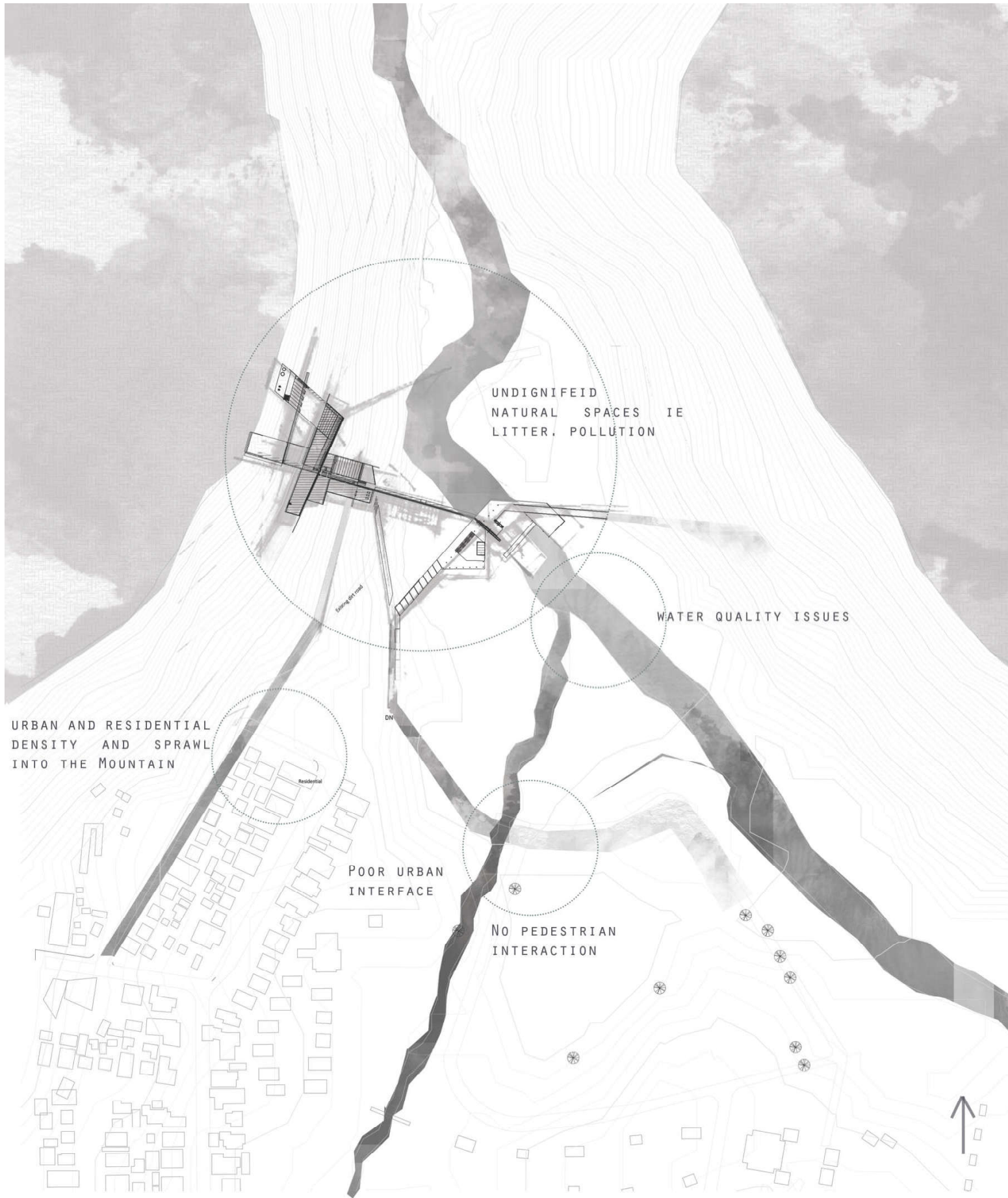
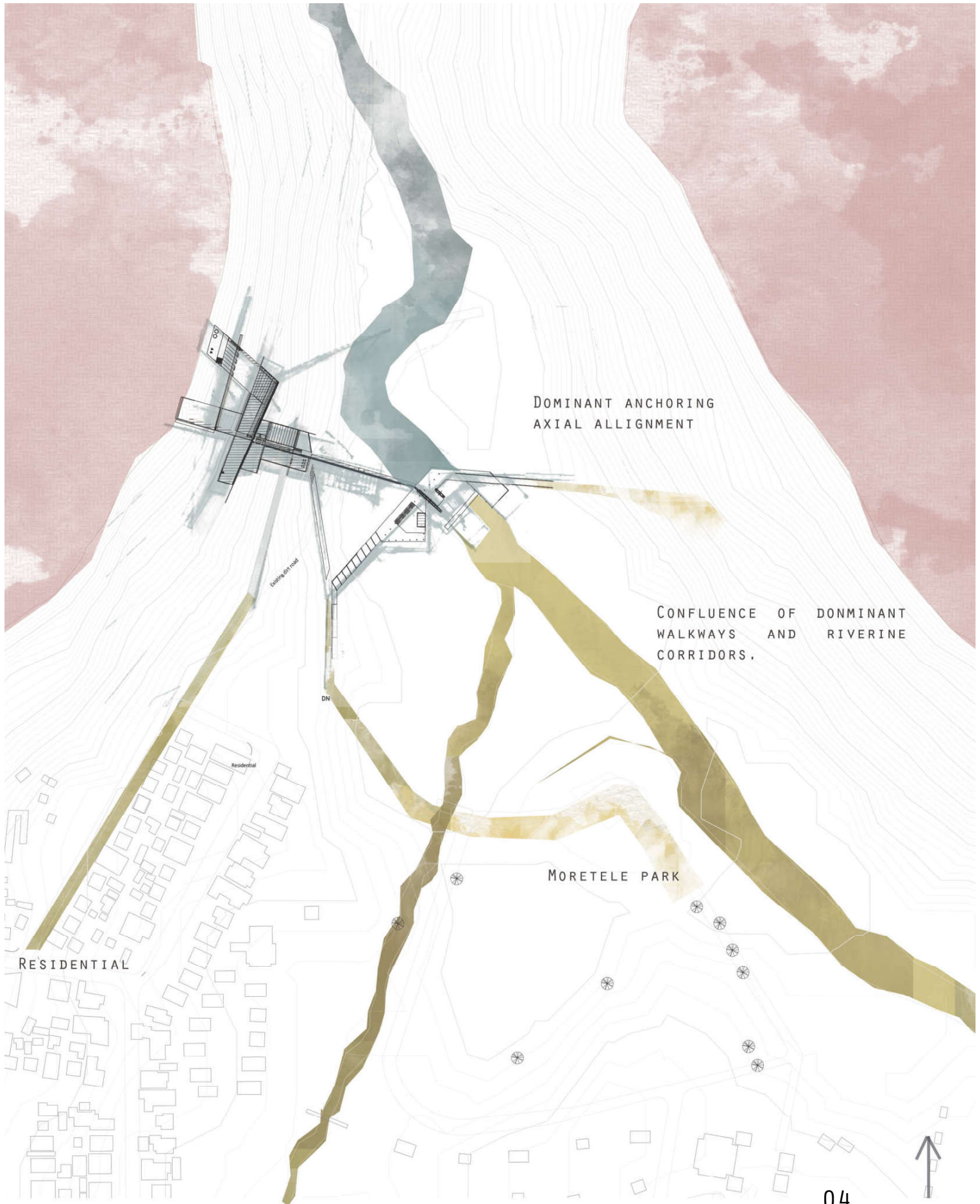


FIG. 59 :STRUCTURAL  
INTERPRETATIONS, (AUTHOR, 2018)



Furthermore, the proposed green and blue nodes of ecological importance (here relevant to the Magaliesridge and the Pienaars River) still separates the daily life of the Mamelodi resident, whether it be east or west, from the workings and resources that the natural landscape has to offer. This is where the author is to implement the strategy and place making phases of working with nature 1, as well as nature 1 and 2 together. This resonates with the importance of zone specifications and place-making established within the policies of the TOSF, but recognizes a need to join the two in certain aspects where it beneficial to both nature and man. The western ridge of the Magalies mountain still retains its conservation and heritage status as the Mothong Heritage precinct, as it stays untouched and preserved, but to its direct east, the radio station and Public water wheel system connects the two in mutualism.

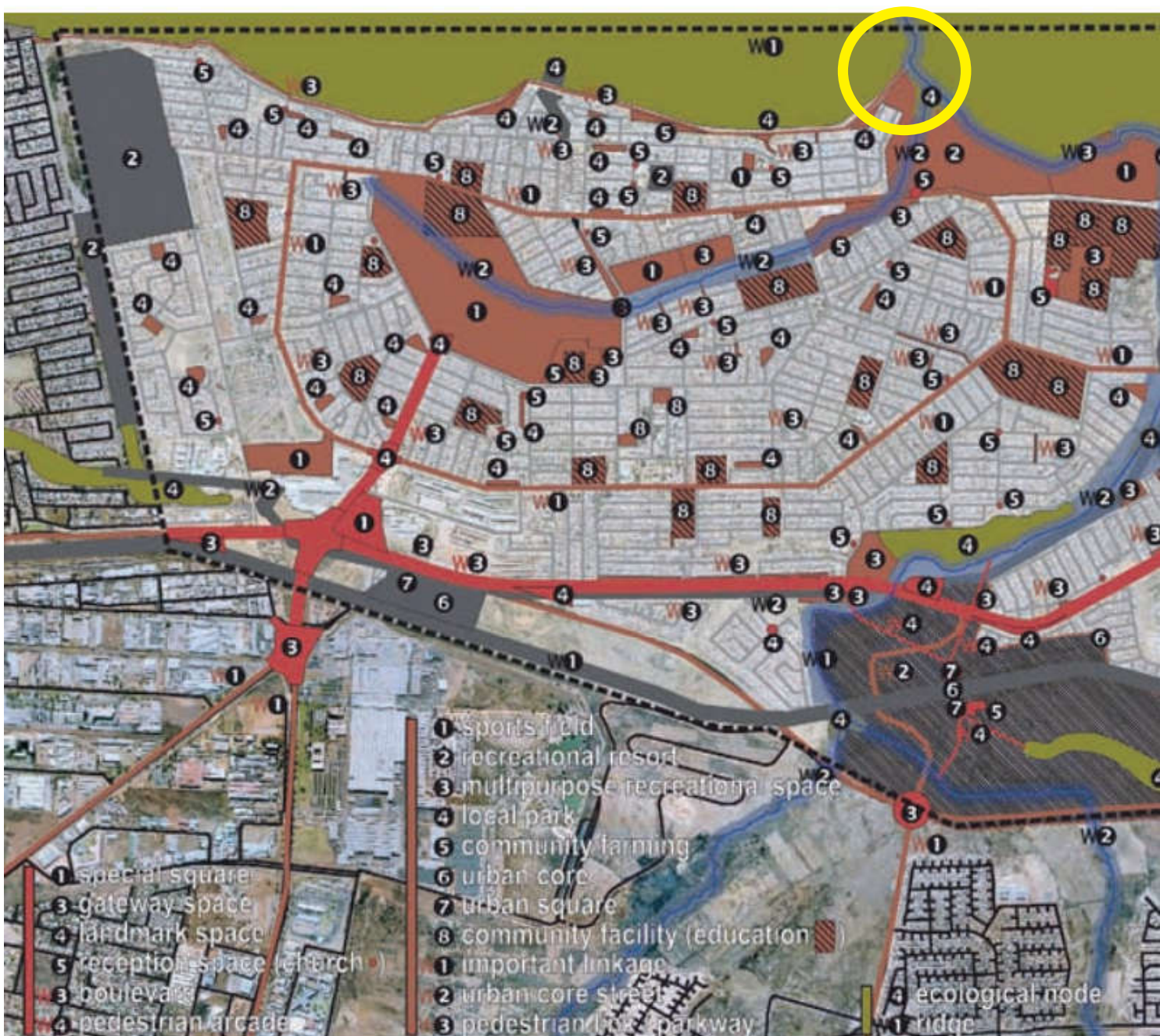


FIG. 60 :CITY OF TSHWANE, FRAMEWORK FOR MORETELE PARK & SURROUNDS, (COT, 2010)

#### 4.6 ECONOMIC ADAPTABILITY:

The buildings have the potential to reinvent themselves, as economical and communal prowess grows and evolves within the community. The destination of the user is an ever-changing, flexible vision that has to be able to change according to current conditions and needs. The current condition of townships in South Africa, according to presidential intentions, should be shifted from primary housing to their own state of infrastructural and economical strongholds. This is to dilute the traffic to and from townships and the CBD areas, and shifting focus into the less developed areas in order to balance the disconnect. ‘Very little attention has been focused on the question of urban land hunger – for housing, public service provision, recreation, culture and most importantly, the stimulation of the township as a site for economic development (Mpangane and Fakir, 2018).’

With this in mind, it is of utmost important to regain and establish a contextual and cultural connect with any new infrastructural/economical implementation, before feelers are put too far outwards from integral community interest. Therefore, the first intention of the project is to connect with a natural resource, that lends itself to the established Moretele Park: a recreational aspect, that connects to an economical pressure point of lack of fresh potable water. The waterwheel intervention thereby serves as recreational establishment, whilst filtering water to a potable level, to provide to the community at a low cost (as a possible phase 3 to the project).



## 4.7 LAND ACCESSIBILITY

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‘Current land distribution patterns in the townships suggest that land is used primarily for housing. In the 24 years since democratisation, there have been intermittently better usage of land for public services in the form of clinics, hospitals, schools, low cost and social housing, as well as limited recreational and cultural facilities (Mpangane and Fakir, 2018).’

Essentially, township enterprises are home-based, and orientated to servicing a local market. Consequently, many township enterprises have an impaired ability and insufficient capacity to serve larger markets that extend beyond their immediate neighbourhoods. In most cases, township entrepreneurs, especially manufacturers, service providers and small retailers are forced to find refuge for their businesses within their own homes due to the fact that it is the only piece of land they can easily access, leading to a decrease in the value of their homes and their overall quality of life. This statement brings to light the juxtaposition of local and contextual entrepreneurial issues, and serving a larger market for sustainable gain and growth.

The author recognizes the cultural aspect of land-use within the Magaliesridge, and aims to marry it into an economic tool that respects and hones the interests of the direct users, but ultimately holds the potential to expand this cultural intention and stronghold into the larger Tshwane precinct. This is not only beneficial to the improvement of the current condition of home-based service and infrastructural providers in the township, but also to the greater platform and voice of the community within the eyes of the CBD and surrounds.

This also gives the opportunity to the local partnerships and business, to grow in their own right, and not remain limited to Mamelodi. This is once again an intangible voice that reaches beyond the Pienaars River or the Magalies mountain, and does not stay hidden on unheard.



#### 4.8 THE ISSUE OF SPATIAL DISLOCATION

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In essence, lack of access to land has forced township entrepreneurs to becoming home-based entrepreneurs, hindering the growth and development of their businesses. They face further obstacles due to their spatial (dis)location from established nodes of trade, commerce, industry and economic activity, and the state of poor infrastructure means that rail, road and other transport connectivity is poor.

These issues as mentioned above are infinitely bound to the spatial divide between the settlement of Mamelodi and the economical hub of the central business district, as discussed in Chapter 1; Urban issues. The hindrance of growth or development in the settlement is to be breached not in a straight line all the way to the CBD, but rather built on its own soil, owned by its own people. Lack of accessible infrastructure and sustainable jobs is what drives this population out of its own context, therefore by addressing these issues directly, by means of the stimulus package, can lead to eventual limited dislocation.



CHAPTER **05**

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DESIGN  
DEVELOPMENT

- 5.0 Preamble
- 5.1 In the search of a language...
- 5.2 Precedent
- 5.3 Waterwheel
- 5.3 Layout and Proportions
- 5.4 Public vs. Private
- 5.5 Ecological deliberations

THE EXPERIENCE OF ITERATING...

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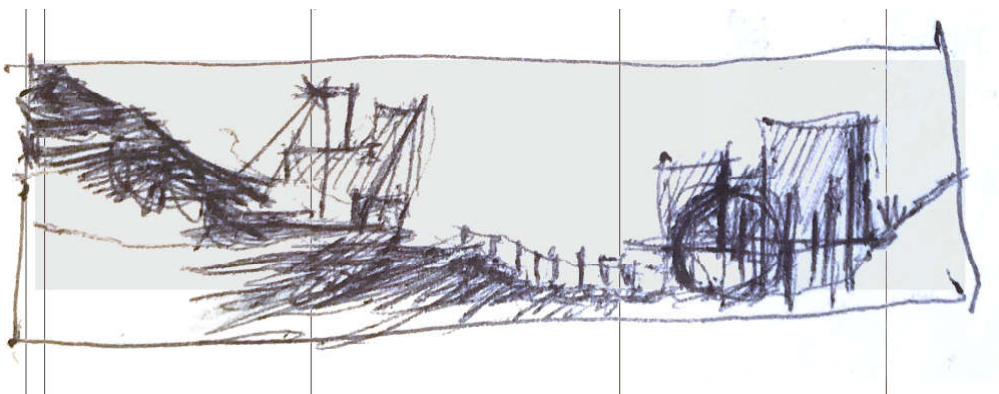


FIG. 61 :Haptic parti sketch (Author, 2018)

## 5.0 PREAMBLE

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This chapter explores the finer differentials within the functional and design iterations of the project. This also includes the intricate mechanisms and workings of program necessity as well as technical and autogenetic decision making factors. The concept of phenomenology and regenerative design is applied within conceptual sketch diagrams that show the authors contextual intentions.

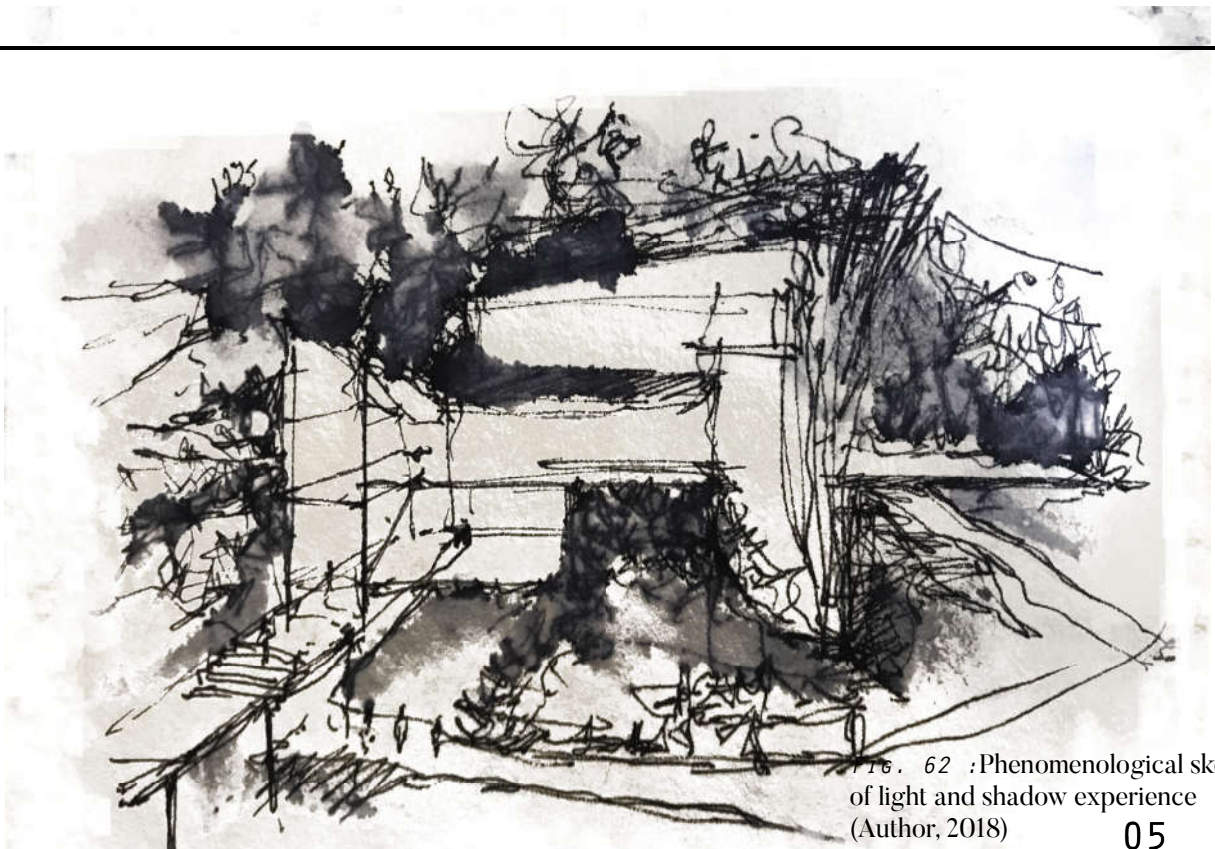
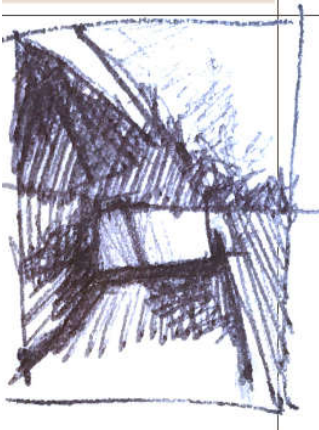


Fig. 62 : Phenomenological sketch of light and shadow experience (Author, 2018)

## 5.1

### IN SEARCH OF A LANGUAGE :



This sentiment is not only extended to the broadcasting languages, but the architectural summit to a vernacular that fits.

#### Absence and opportunity

‘Every new work of architecture intervenes in a specific historical situation. It’s essential to the quality of the intervention that the new building should embrace qualities that can enter into a meaningful dialogue with the existing situation. For if the intervention is to find its place, it makes us see what already exists in a new light. We throw a stone into the water: sand swirls up and settles again. The stir is necessary. The stone has found its place, but the pond is no longer the same (Zumthor, 2006).

Manfred Max-Neef, the Chilean economist, discusses a theory around cities that enable different ‘satisfiers’ of need (Cooke, 2016).

The first being an inhibiting satisfier, and the next a synergic satisfier. An inhibiting satisfier does exactly what it says, it is a form of top-up intervention upon a city that blocks or disables other parts of society to flourish; whether it be identity, culture or creation. The synergic satisfier refers to a bottom up process that directly enables the participants of the space to direct their own needs and wants. This results in energized group or individual that excels towards the future and no longer suffers a wrong of the past (whether it be political, social or spatial). The intention is to extrapolate the journey of this energized reflect from the self, outwards to the final architectural intervention.

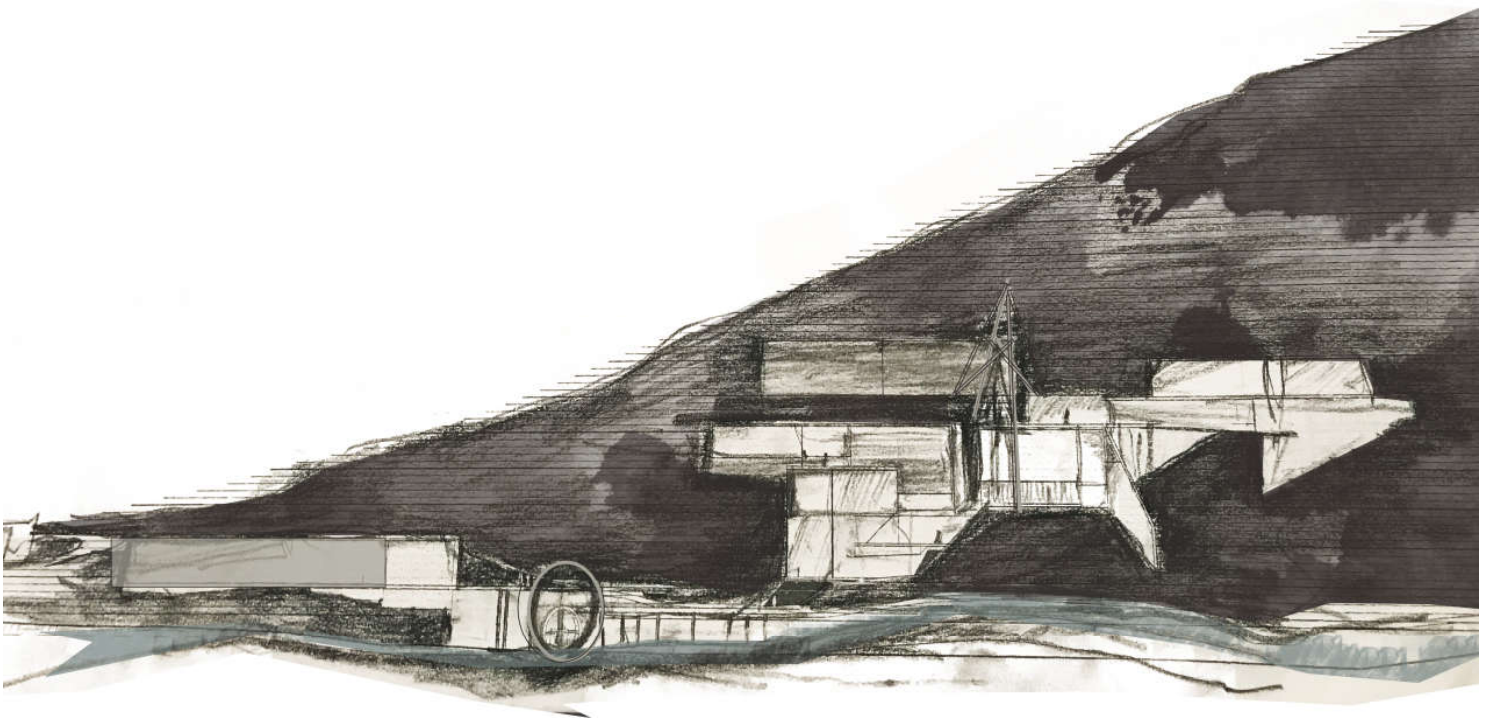


FIG. 63 : POSITION OF ARCHITECTURAL INTERVENTION UPON THE EASTERN MAGALIESBERG (AUTHOR, 2018)

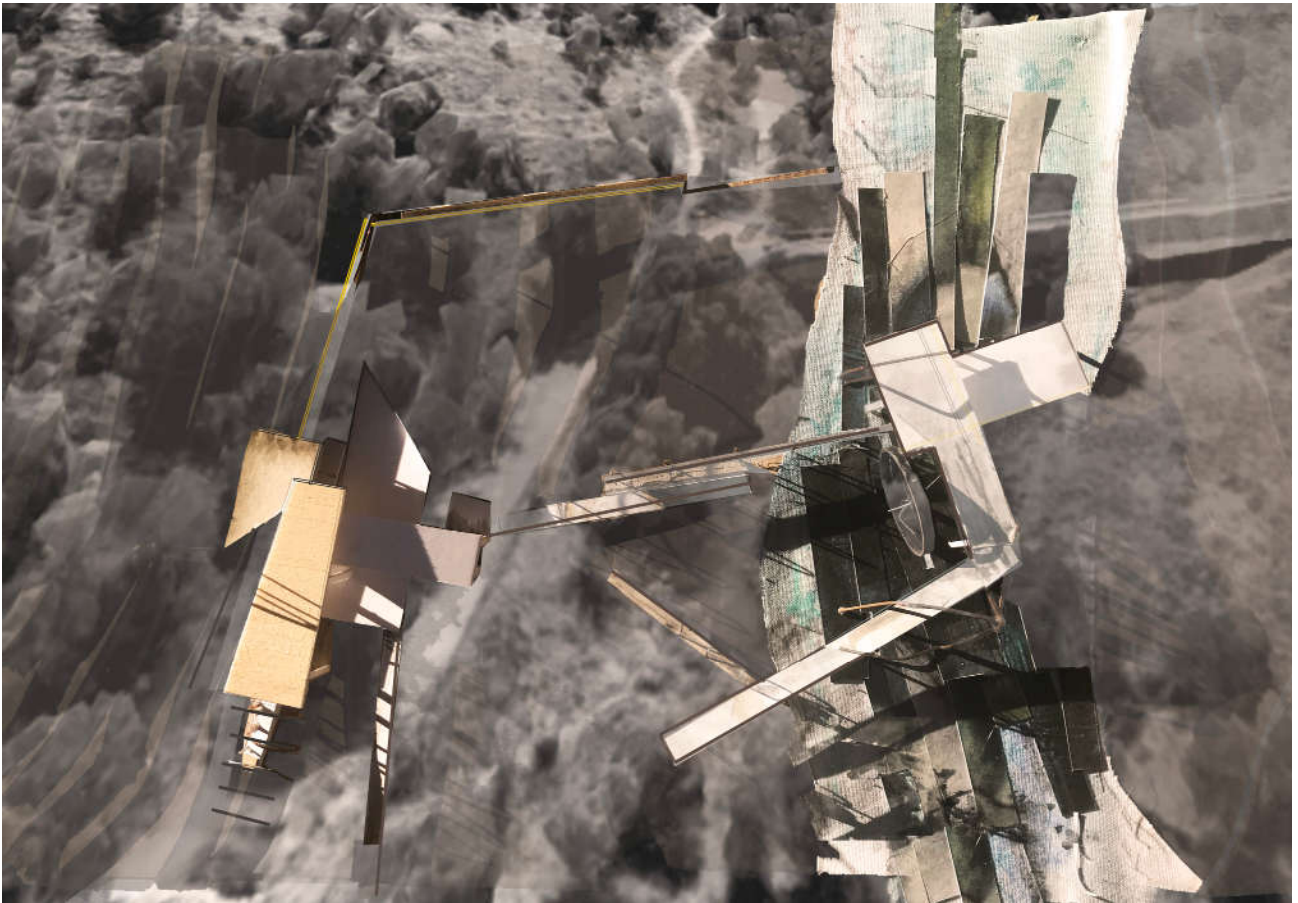


FIG. 64 :CONCEPTUAL ITERATION OF INTERVENTION UPON LANDSCAPE, SHOWING CROSSING OF TECTONIC STRUCTURE OF BRIDGE AND WATERWHEEL OVER PIENNAARS RIVER.

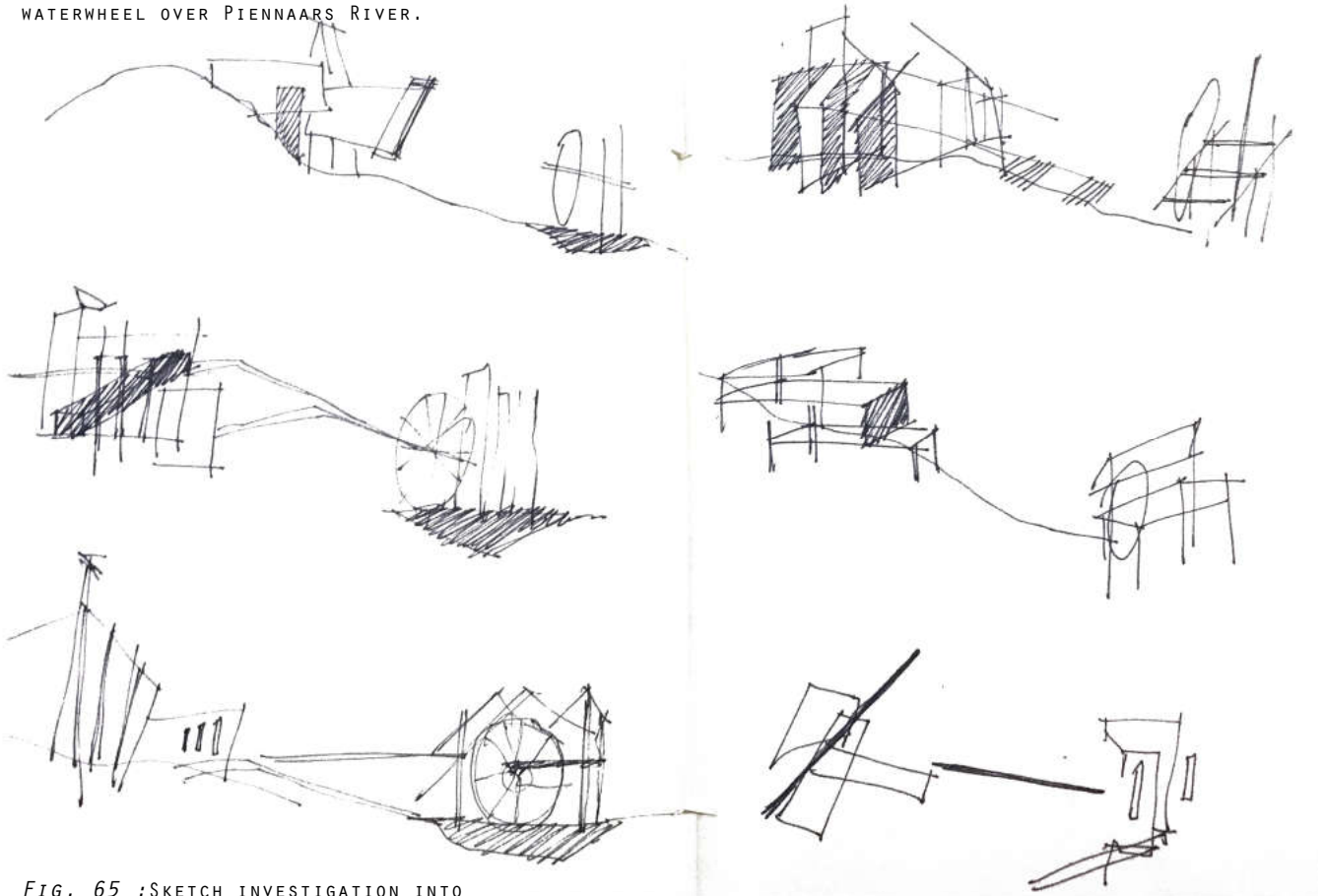


FIG. 65 :SKETCH INVESTIGATION INTO THE PARTI BETWEEN EASTERN AND WESTERN STRUCTURES, VIEWED LOOKING NORTH (FROM URBAN FRAMEWORK)

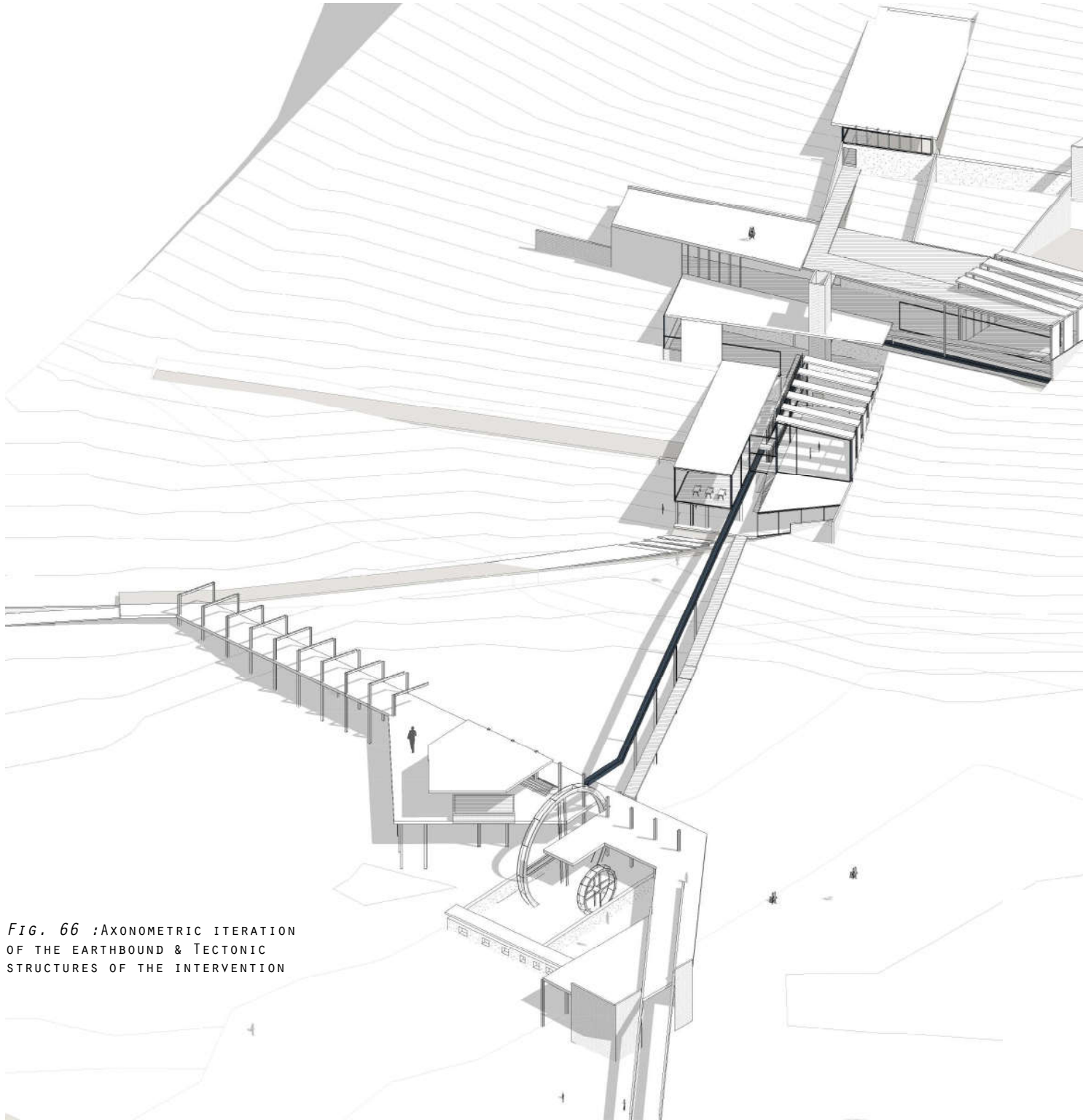


FIG. 66 : AXONOMETRIC ITERATION  
OF THE EARTHBOUND & TECTONIC  
STRUCTURES OF THE INTERVENTION





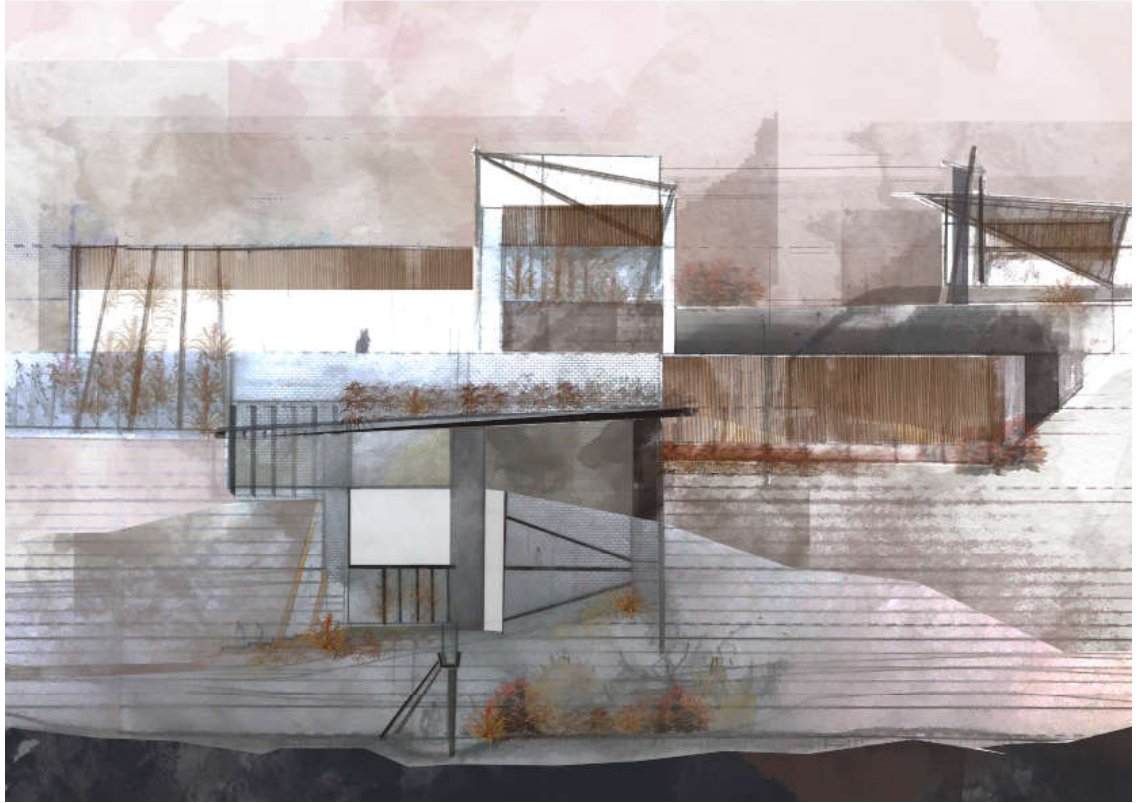
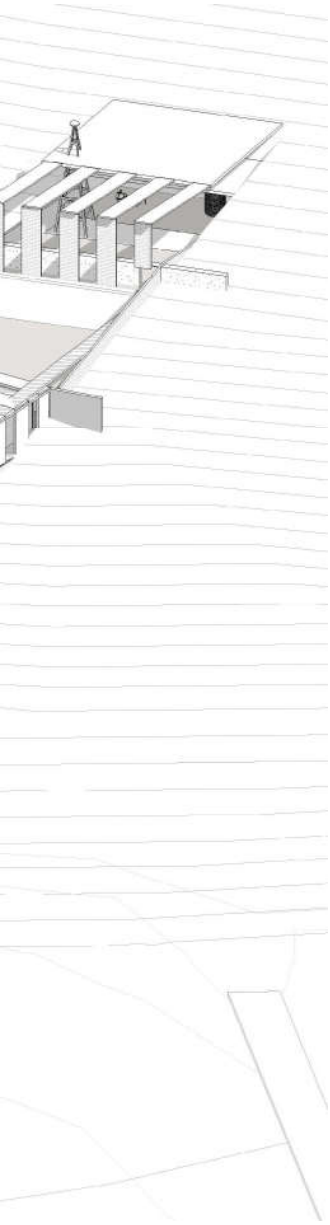


FIG. 67 :EARLY ITERATION OF EASTERN ELEVATION AS SEEN FROM PIENAARS RIVER (AUTHOR, 2018)

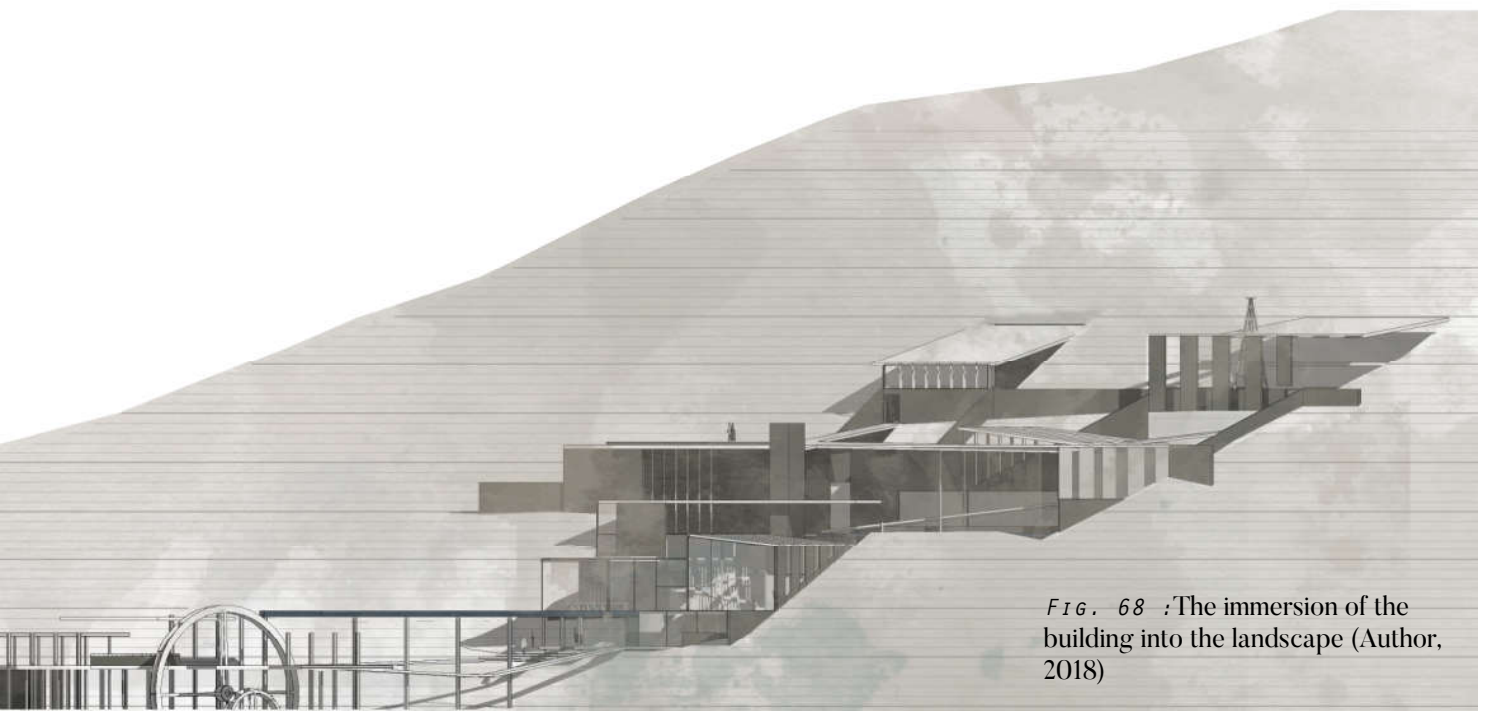


FIG. 68 :The immersion of the building into the landscape (Author, 2018)

## 5.2

### PRECEDENTS :

#### Environmental Precedent:

The Arch at Bandar Rimbayu, Selangor, Malaysia

Architect: Garis Architects sdn bhd, 2012-2014

The idea of place-making; the insertion of humankind onto the presence of a landscape (Garis Architects, 2018). The driving force behind this project was the relation man builds upon nature that supports and establishes community. At the primary level, The Arc provides a direct connection to human needs in terms of shelter, social discourse; so in short, it provides 'commune'. Activities that are embraced within this construct are leisure, sport, and event space provision that enable and promote recreational activities within nature. These elements stem from the intention of the creation of an edifice or spatial identity, that provides a versatile and flexible community to be adapted and changed according to current needs and standards. This intention echoes strongly to the authors contextual intentions on the natural site of the Magaliesberg; to meet a diverse socio-economic need within an environmentally positive construct.

The sustainable construct of this precedent follows a design that is aimed to be constantly growing and evolving, especially within the inconstant climatic conditions of the site. This sparked certain solutions in terms of sunlight, heat and humidity management. The primary solution inspired a large green roof that collects and filters rainwater before discharging into constructed waterways. There is a drip irrigation system that allows for constant moisture to the climbers and creepers that cover the support structure.

The conceptual implication is the continuity of a natural process that is sustained and invigorated by human structure, putting human intervention into the secondary act of a system that was there before interference. The idea of permaculture is strongly explored in the projects' vegetable gardens, prompting healthy community maintenance responsibility and self-reliance. Sustainable living is further iterated in the green terraces, roof gardens, walking and cycling routes, sports fields, local shops and general facilitates that encourage community dynamics into that of wellbeing.

FIG. 69 :PHOTOGRAPH DEPICTING OPEN WALKWAY INTEGRATION (GARIS ARCHITECTS, 2018)



FIG. 70 :PHOTOGRAPH THE ARC MAIN GREEN ROOF PLATFORM EMBEDDED IN WATER-FILTERING SYSTEM, (GARIS ARCHITECTS, 2018)



**Process and Phenomenological Precedent:**

The Herning center of the Arts :  
Steven Holl declares, 'While sensations and impressions quietly engage us in the physical phenomena of architecture, the generative force lies in the intentions behind it (Steven Holl Architects, 2018).' As with the collective work of Steven Holl, the intricacies of the sensory concept are masterfully intertwined with the user experience. The use of light and texture is manipulated to create space that is not only inherent to its program but positively enforces a user experience that is unique and contextual.

The Herning centre of the Arts, by Holl, combines these tactics of phenomenology with practical function. For instance, all practical services and considerations are concealed with the use of a site build-up of grass mounds and 'reflection' pools that generate a special relationship between the landscape, user and building. The architects' simple conviction of an active landscape generated an innovative concept that combines a visual art and music theme throughout indoor and outdoor spaces. Form stimulates another important reference for design when it comes to this execution of phenomenological design. Simple sketch designs and ideas generated from context is part the complete process that gives the final form to architecture.

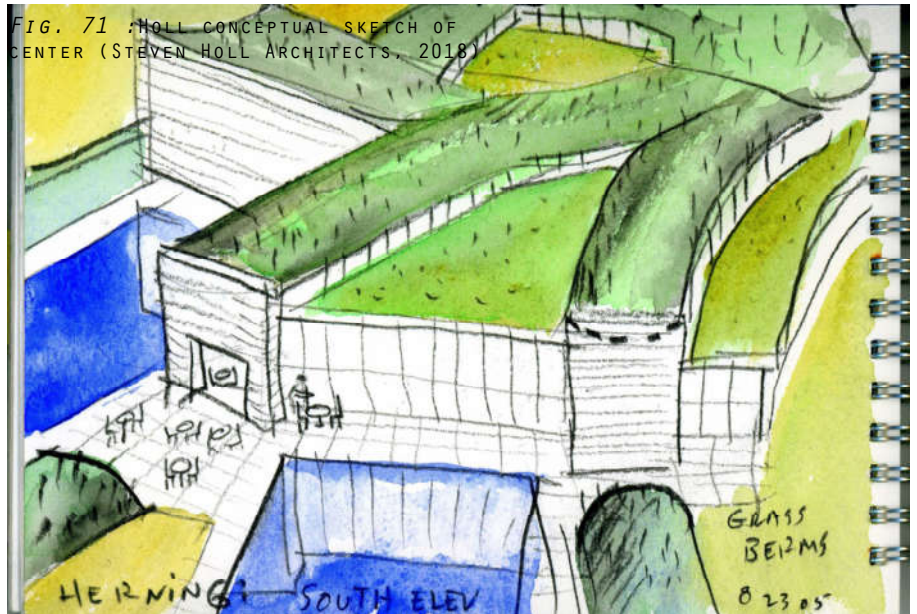


FIG. 71 :HOLL CONCEPTUAL SKETCH OF CENTER (STEVEN HOLL ARCHITECTS, 2018)



FIG. 72 :PHOTOGRAPH THE HERNING CENTER WITHIN CONSTRUCTED LANDSCAPE, (STEVEN HOLL ARCHITECTS, 2018)



FIG. 73 :MODEL OF THE ENTRANCE PAVILLION, (STEVEN HOLL ARCHITECTS, 2018)

Program Precedents:

Department of Radio and Television  
University of Silesia / BAAS Arquitectura  
+ Grupa 5 Architekci + Maleccy Biuro  
Projektowe

This competition project is situated in Katowice, Poland and focuses on an existing building transformation into a contemporary scale sensitive intervention that grows into the existing urban fabric. The existing building is therefore retained, worked around and taken as visual inspiration for certain aspects for the new intervention such as a new facade from the same brickwork style as that of the existing. The result of these lattice brickwork creates a very open and breathable facade that emits and filtrates ample light. This effect is contrasted in atmosphere, with the very unique silence and concentration given to the internal space within the Department of Radio. The relationship between the external and internal is therefore breached and infiltrated, as desired by the nature of a building that is programmed for the external user. The further use of glazing on the entrance facade extends the lobby and the activity therein to the urban street. This main entrance further alludes to vertical and horizontal circulation that is the primary connection to the rest of the structure and its functions.

This clear connection of the indoor and outdoor environments is created by means of (visually) interactive architecture, that alludes and invites different views, scales of light and textures in an engaging and unobtrusive assembly.

The arrangement of spaces within these buildings conglomerate around a central social node, giving the key element of the connection to social activity that happens between studios, lecture rooms and the library. The architects note that the aim was not to design a stand-alone iconic structure, but rather a new fragment of the urban landscape that complements the existing nature of the site (BAAS Arquitectura, 2018). This idea has been translated into the poetics of local architecture, that exudes a programme of international didactic standards and efficiency.



FIG. 74 : PHOTOGRAPH OF THE ENTRANCE FACADE, (BAAS ARQUITECTURA, 2018)

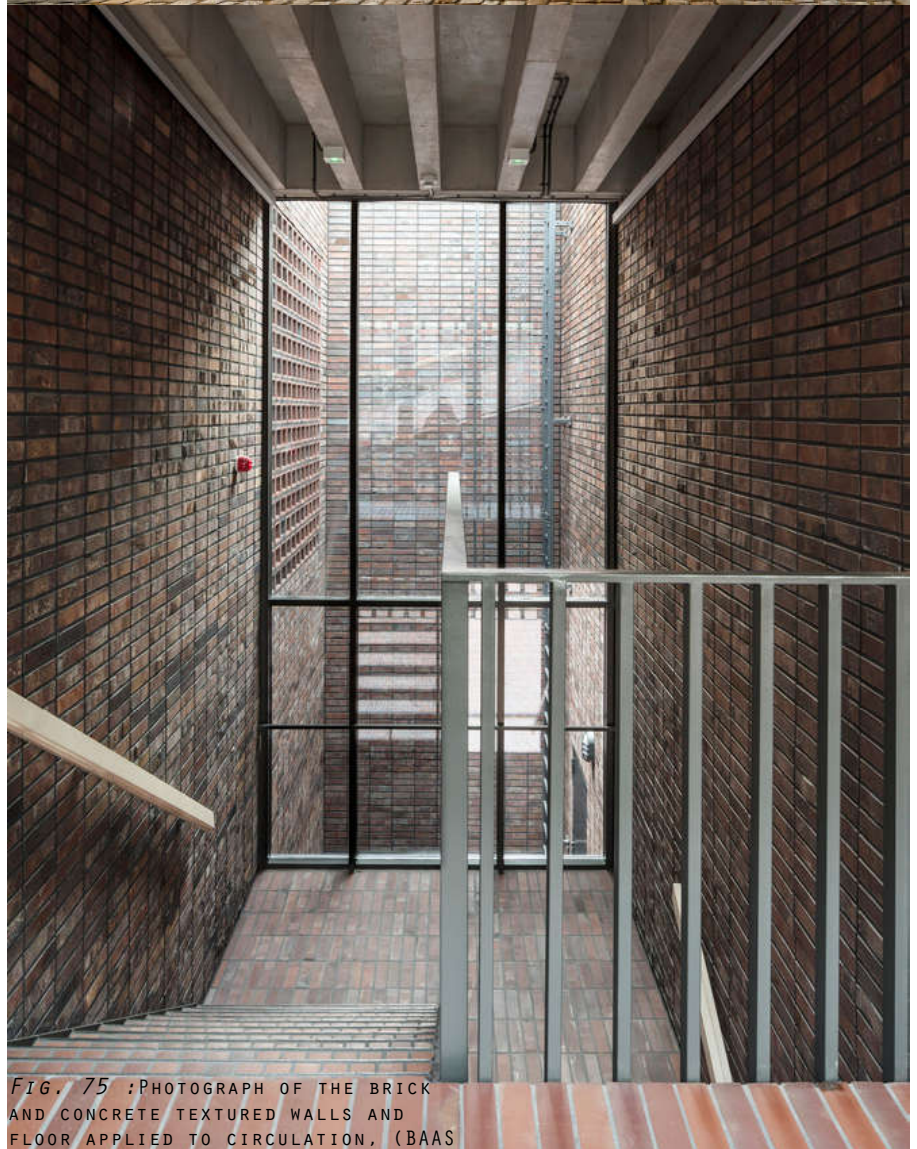


FIG. 75 : PHOTOGRAPH OF THE BRICK AND CONCRETE TEXTURED WALLS AND FLOOR APPLIED TO CIRCULATION, (BAAS ARQUITECTURA, 2018)



FIG. 77 :PHOTOGRAPH OF A LECTURE HALL,  
(BAAS ARQUITECTURA, 2018)

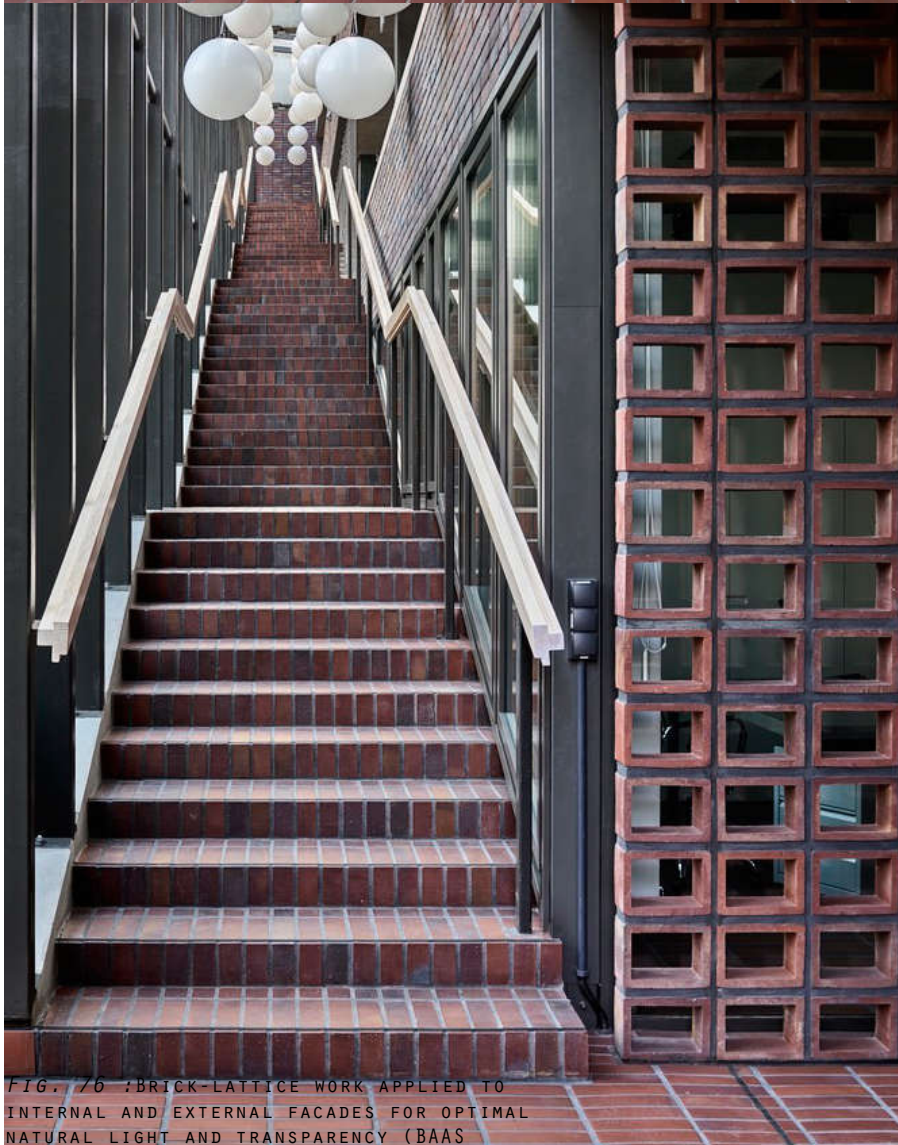


FIG. 76 :BRICK-LATTICE WORK APPLIED TO  
INTERNAL AND EXTERNAL FACADES FOR OPTIMAL  
NATURAL LIGHT AND TRANSPARENCY (BAAS  
ARQUITECTURA, 2018)

### 5.3

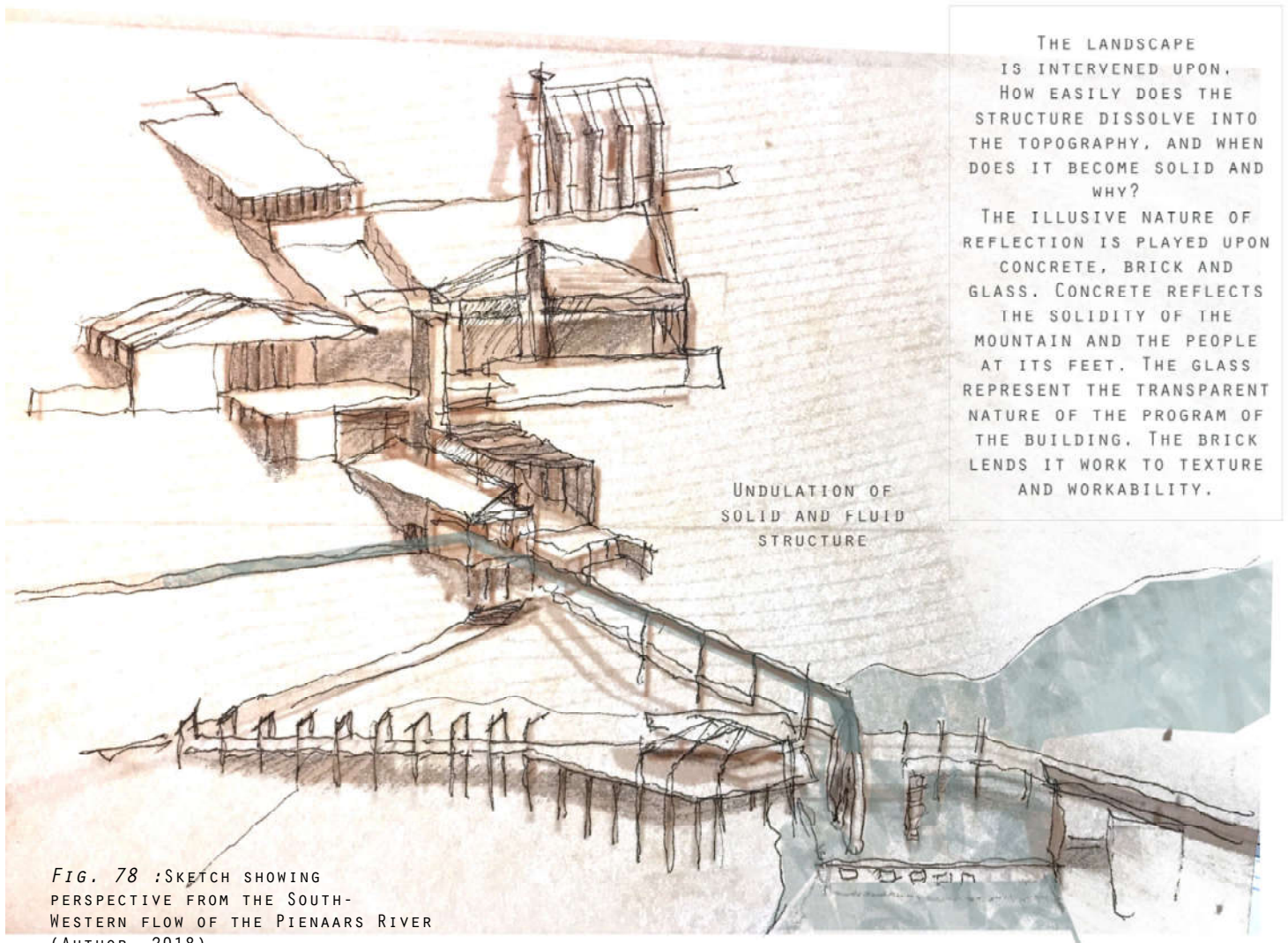
#### WATERWHEEL CONCEPTUAL;

Conceptually, the waterwheel aims to unite the availability of natural resources into a pliable and sustainable tool with which to encourage economic empowerment. The sustainability of this process has been key in the construction of the water-wheel intervention and concept.

It is unwise to suggest an intervention of pure socio-economic gain on a sensitive natural landscape, without proper consideration of environmental balance of inputs and gains. The ability of the waterwheel to provide water to the new infrastructure and its permacultural possibilities, is cemented in archival aqueducts system and without the need much modern technology. The use of such an archaic system is heralded within this project as testimony to man's ability to transform and work with nature, as an artful and experiential installation.

The scale of the intervention in this instance also determines the effect on both river and populace.

Primary investigations suggest firstly an element of great social importance and magnetism. This infrastructure is to be seen as a major drive for social attendance and interaction; serving therefore as a platform for events and linking with the audience of the recreational park next door.



This intervention of structure onto the river is conceptualized to act as force of reckoning to the community of what nature, when harnessed and respected, is capable of giving in return. The limited protection and maintenance surrounding the river banks of the Pienaars River is challenged in this new active creation.

Intrigue is established in the pure size of the waterwheel (16m in height), acting as the first social magnet, and is furthermore directed into the eventful and recreational function of its surrounding and supporting infrastructure.

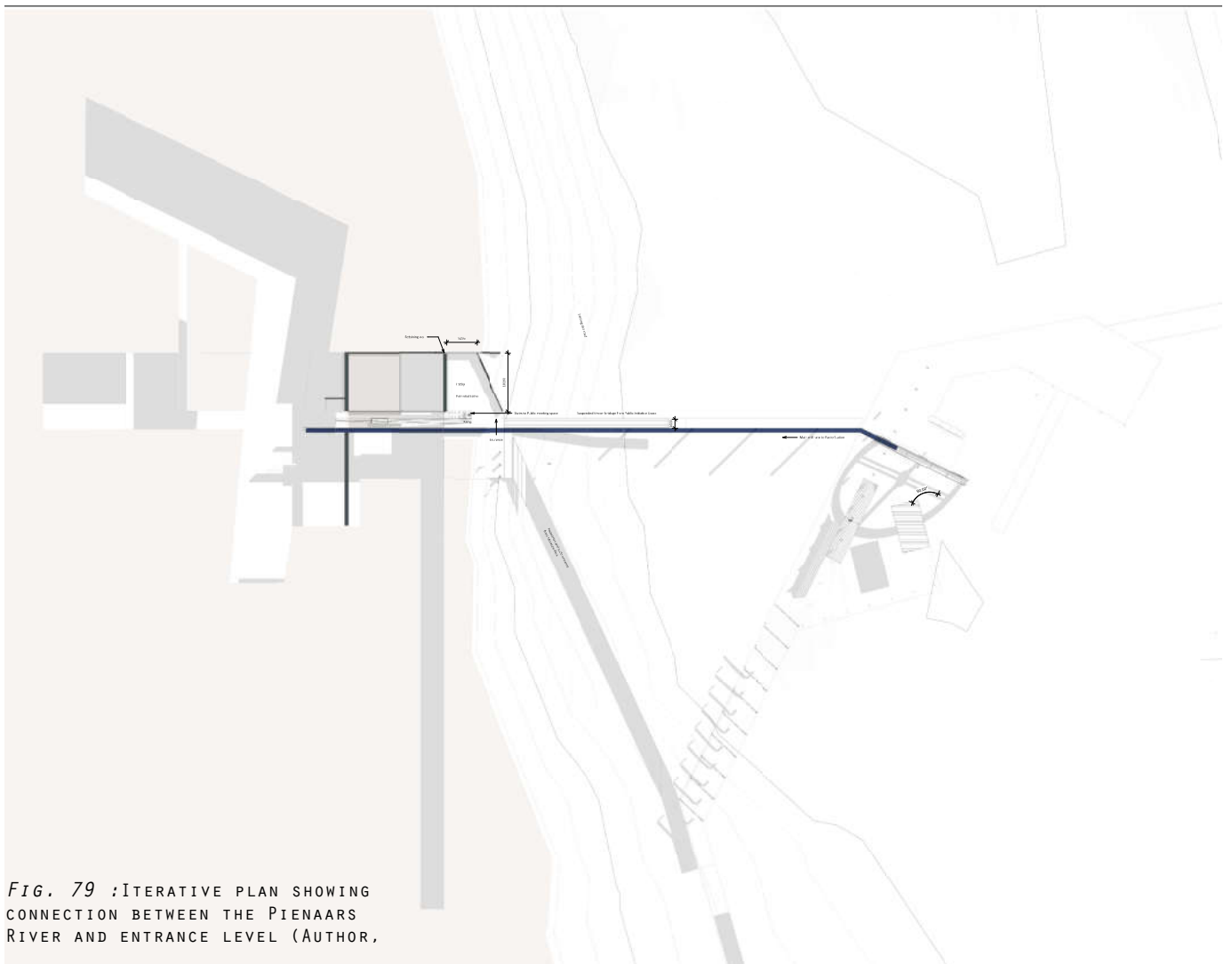


FIG. 79 :ITERATIVE PLAN SHOWING CONNECTION BETWEEN THE PIENAARS RIVER AND ENTRANCE LEVEL (AUTHOR,

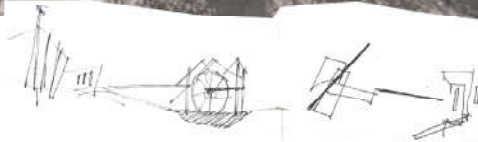
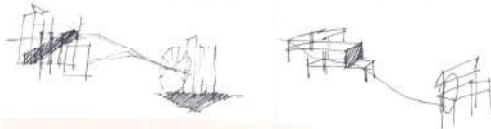
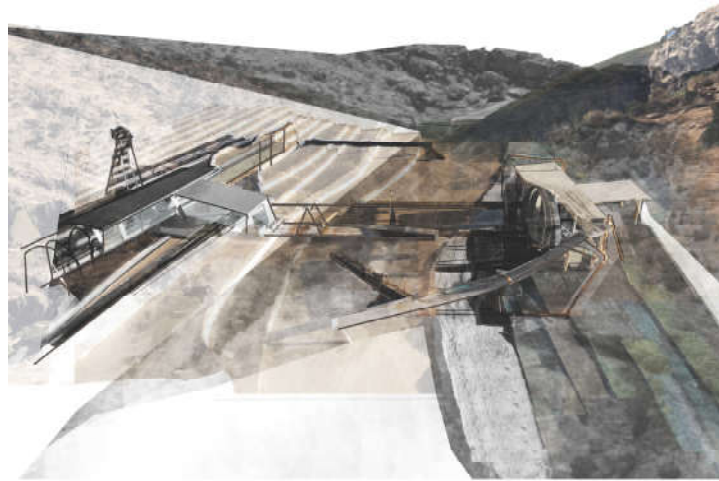


FIG. 80 :PHOTOGRAPHIC COLLAGE  
DEMONSTRATING CONCEPTUAL  
INTUITION MODELS (AUTHOR, 2019)



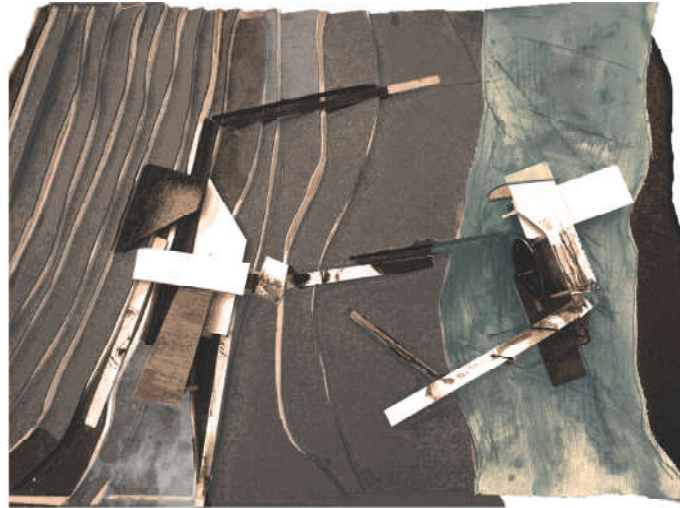
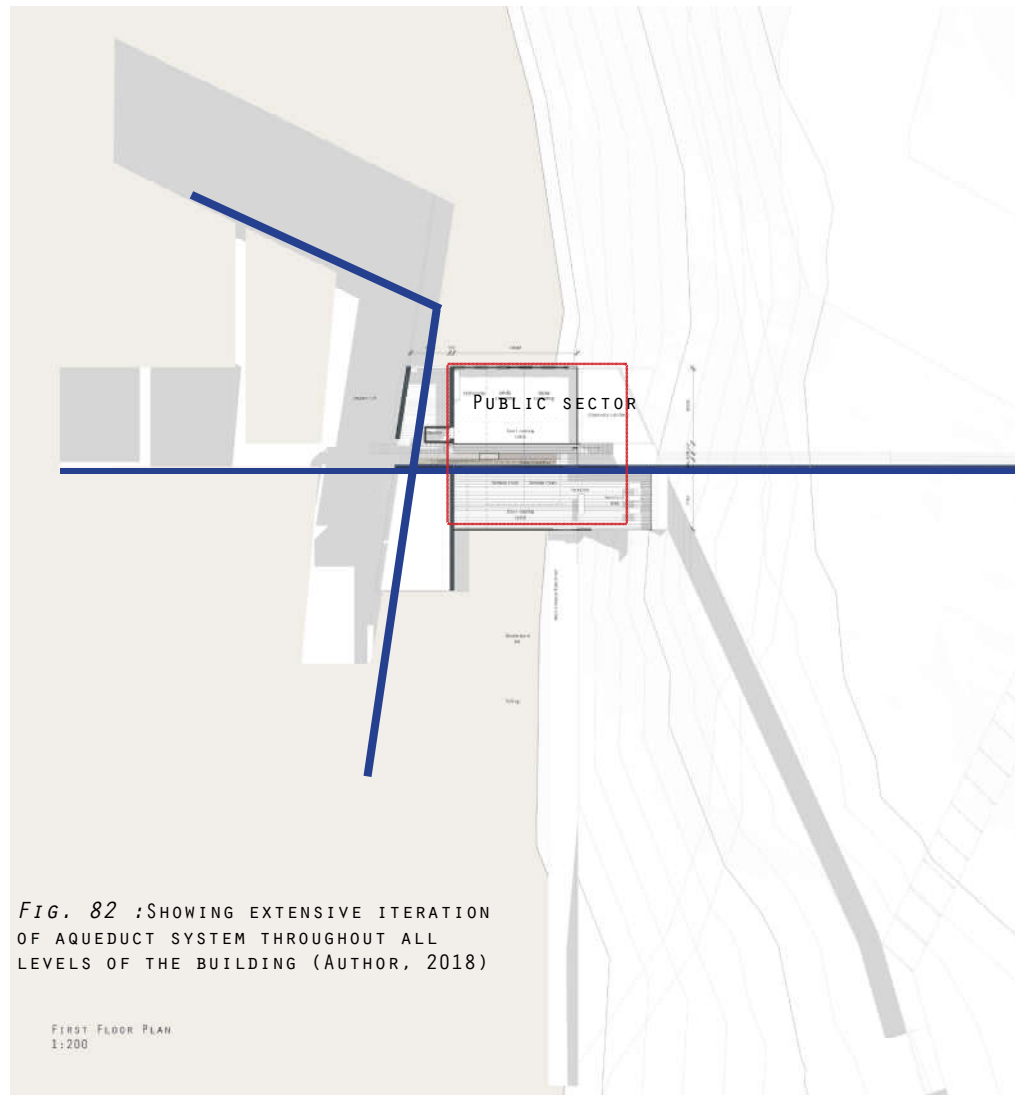


FIG. 81 :PHOTOGRAPHIC COLLAGE  
DEMONSTRATING CONCEPTUAL  
INTUITION MODELS (AUTHOR, 2018)

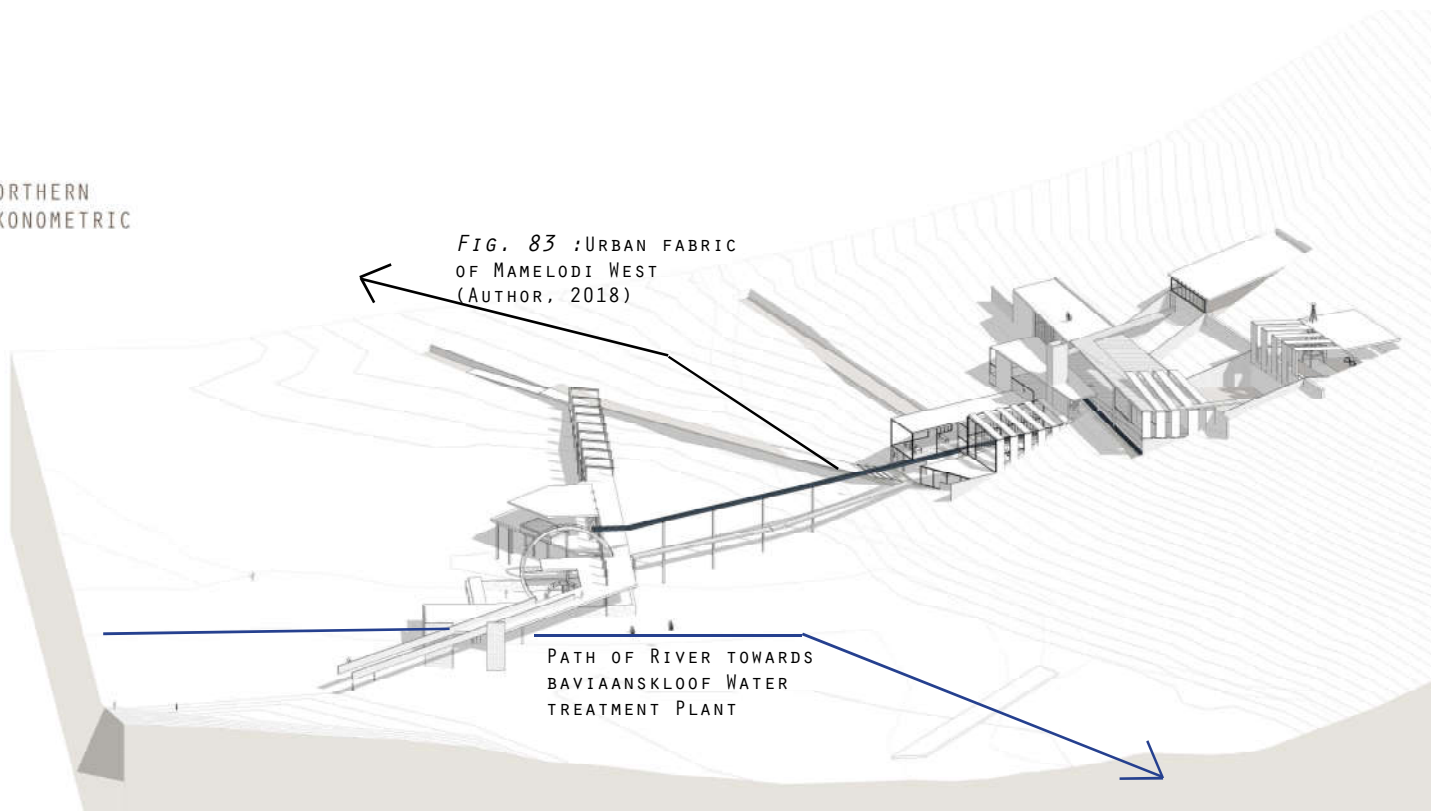
## 5.4 LAYOUT & PROPORTIONS;

The first design plan iterations of the building show an aqueduct system on all levels of the buildings, making itself an integral and prominent feature within the internal and external. As gravity can only take the water as far as the 1st floor without the use of pumps, the later iterations has eliminated this visible galvanized steel aqueduct from then on forwards, as the water after this requires a pump to deliver it to the UV filtration on the 5th level.

The use of an electric solar powered pump, felt dishonest in the further portrayal of an 'aqueduct' system and was thereby initially removed from the design. The water is thereby transported via pipes and ducts to its final point of filtration. It is arguable that this will still be further iterated, as the concept of 'water as a tool for reflection' becomes unfulfilled to the majority of the building spaces.



NORTHERN  
AXONOMETRIC



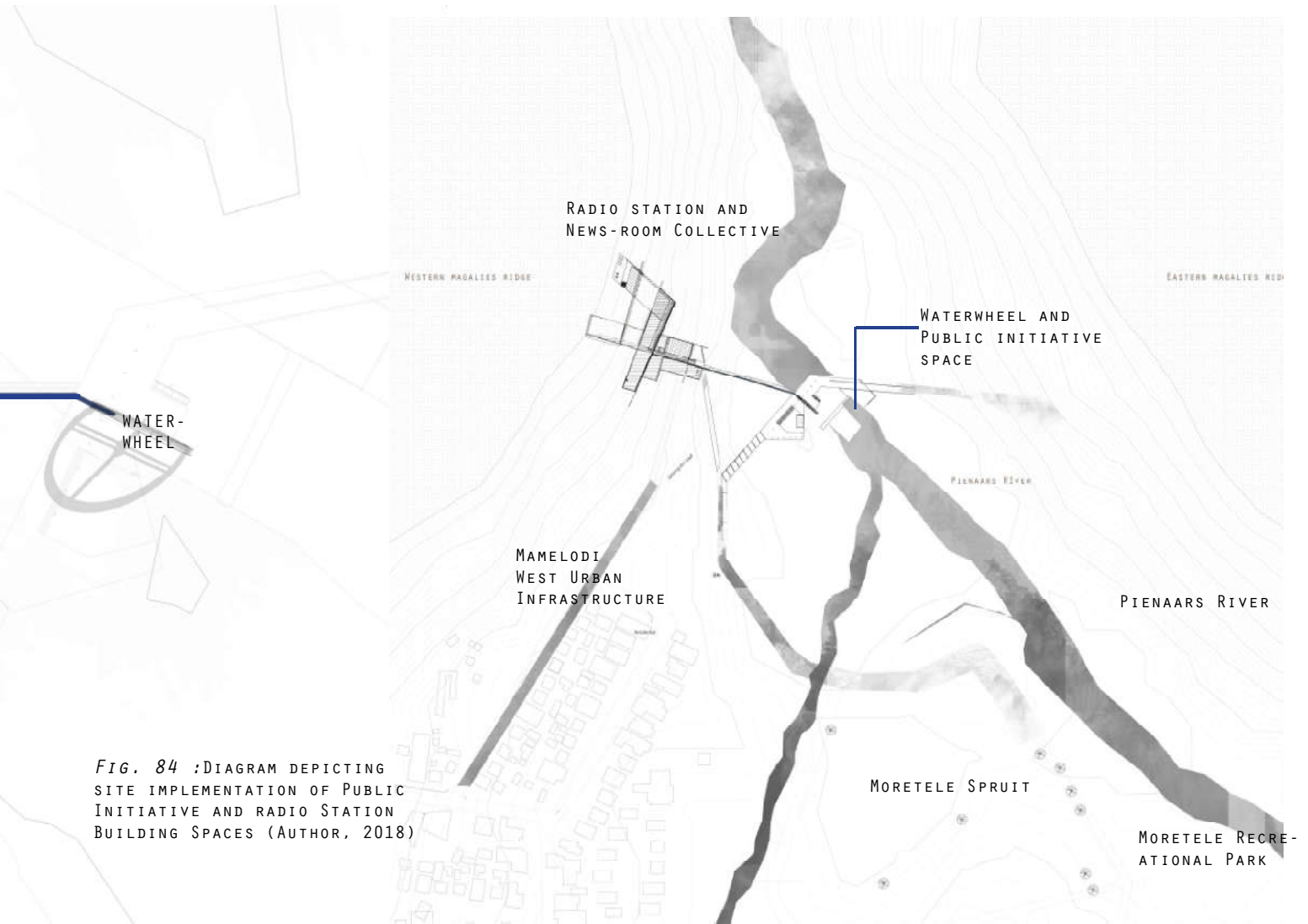


FIG. 84 :DIAGRAM DEPICTING SITE IMPLEMENTATION OF PUBLIC INITIATIVE AND RADIO STATION BUILDING SPACES (AUTHOR, 2018)

The layout of the functions of the building plays an important role in the distribution of the water. The storage and retention dams of the filtered water were not initially visibly accessible or integral enough with the design. This is iterated in the final resolution, as it has been apparent that the process of water cannot be lost in any part of the design process or execution. In earlier iterations it is also apparent that the services of the building regarding water storage, UV filtering and so on was placed too far from the initial entrance of the water, requiring double private and public circulation access. This result of excess of circulation was further reduced by way of grouping programs and their services, relying on each program to maintain its own services, and therewith is granted its own point of access.

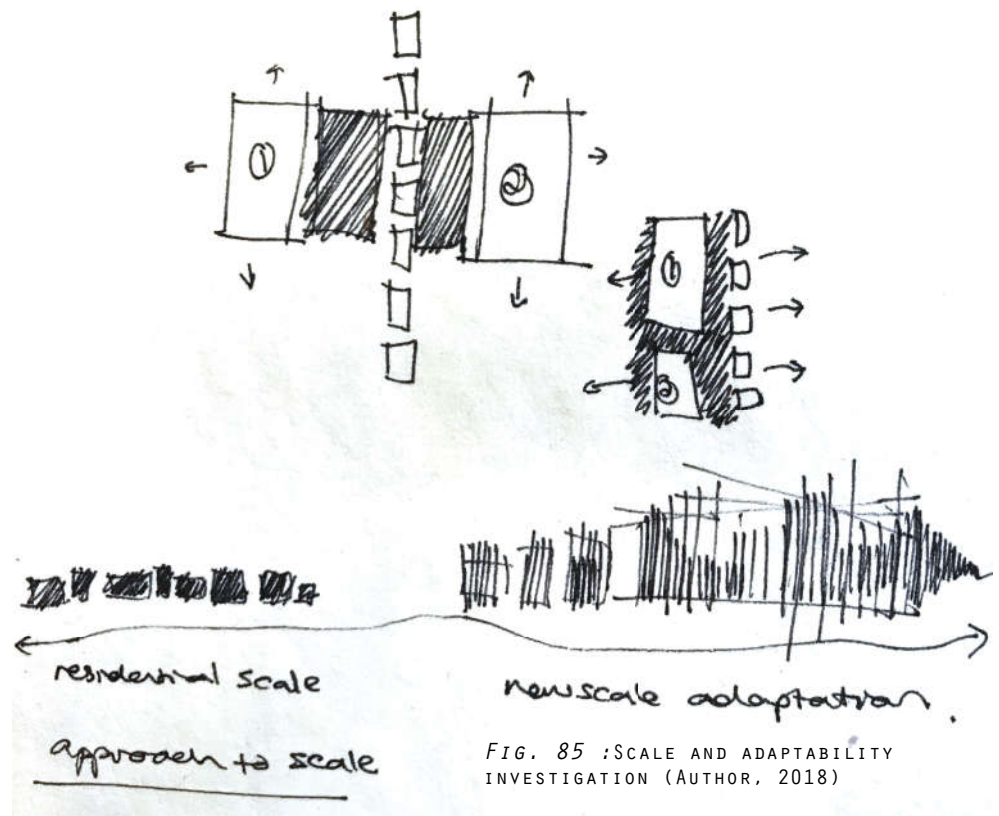


FIG. 85 :SCALE AND ADAPTABILITY INVESTIGATION (AUTHOR, 2018)

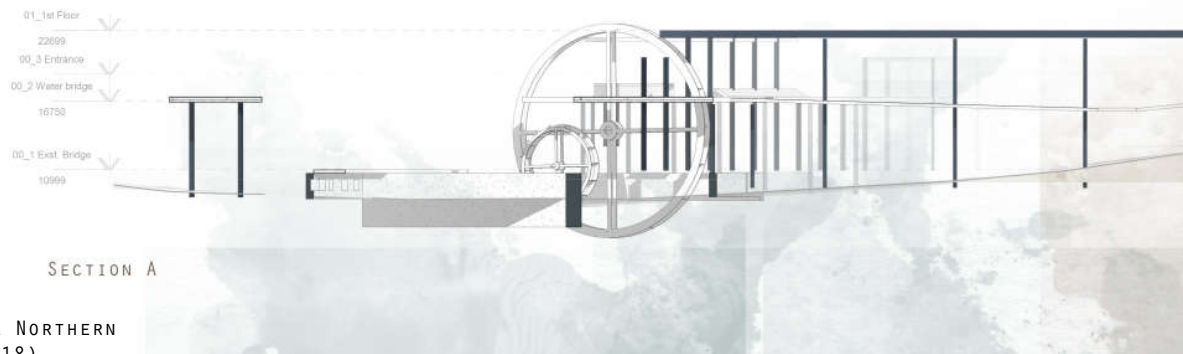


FIG. 88 :CONCEPTUAL NORTHERN SECTION 1(AUTHOR, 2018)

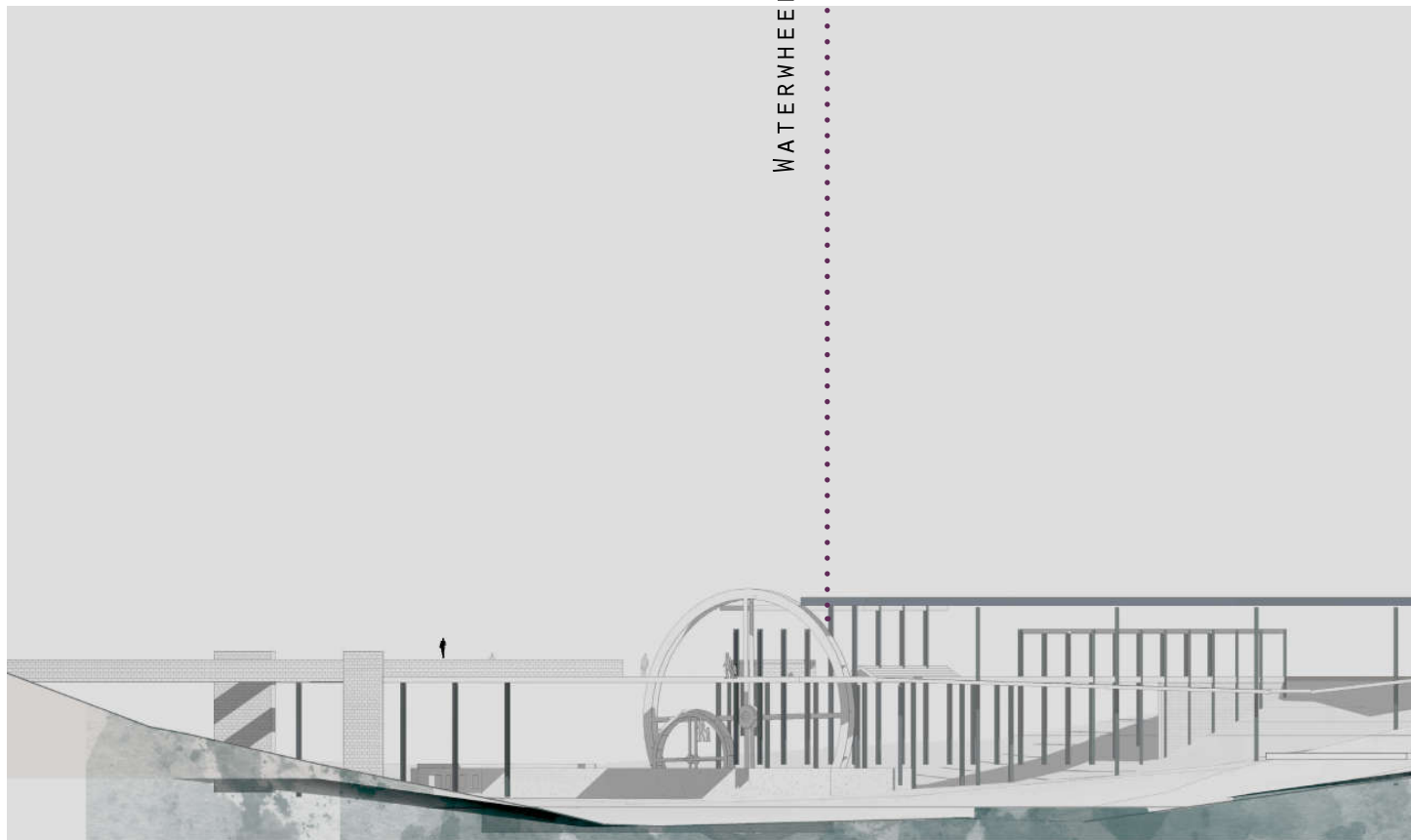


FIG. 86 :ITERATION OF NORTHERN ELEVATION  
FIG. 87 :IN TERMS OF COMPLETE STRUCTURES (AUTHOR, 2018)

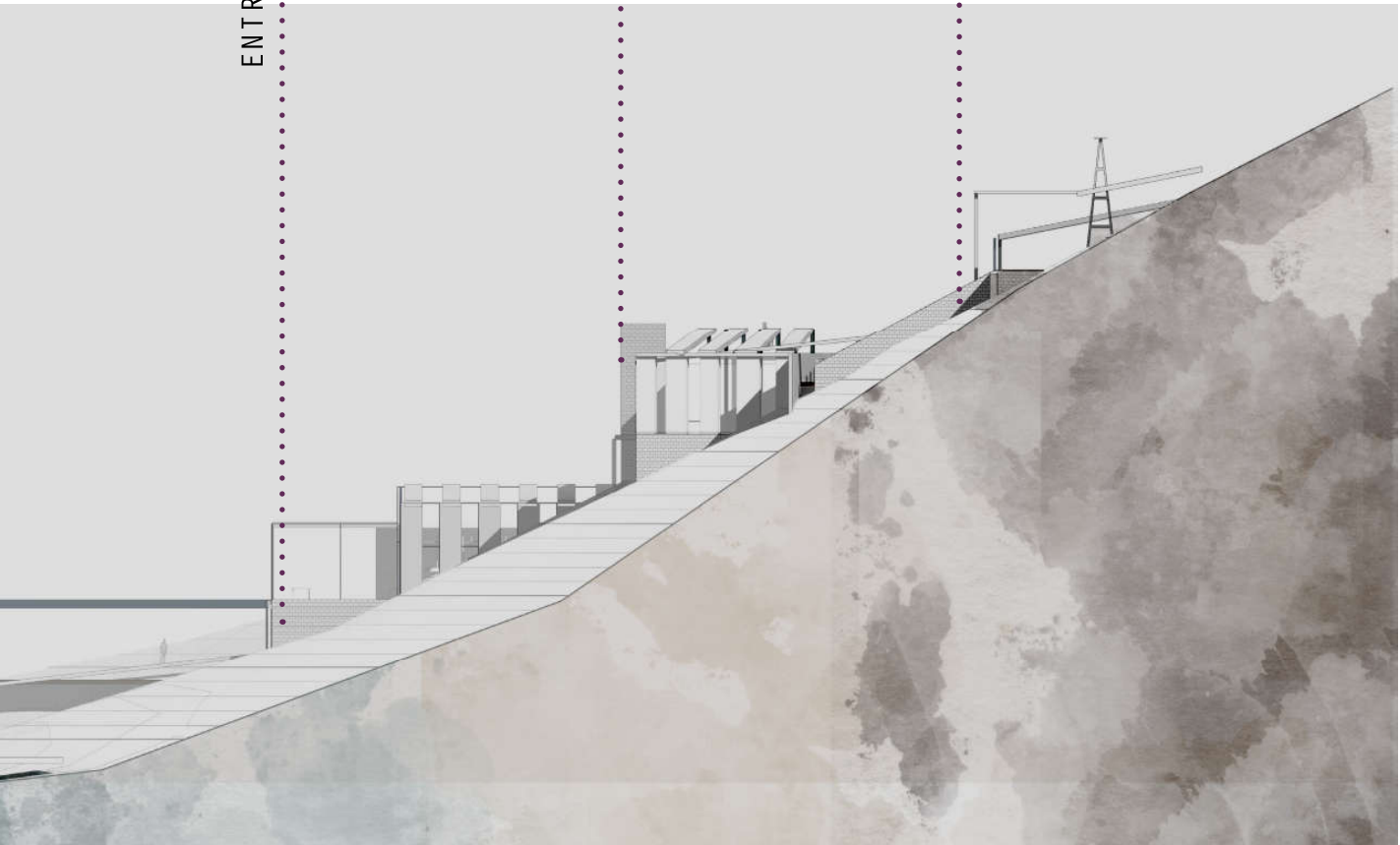
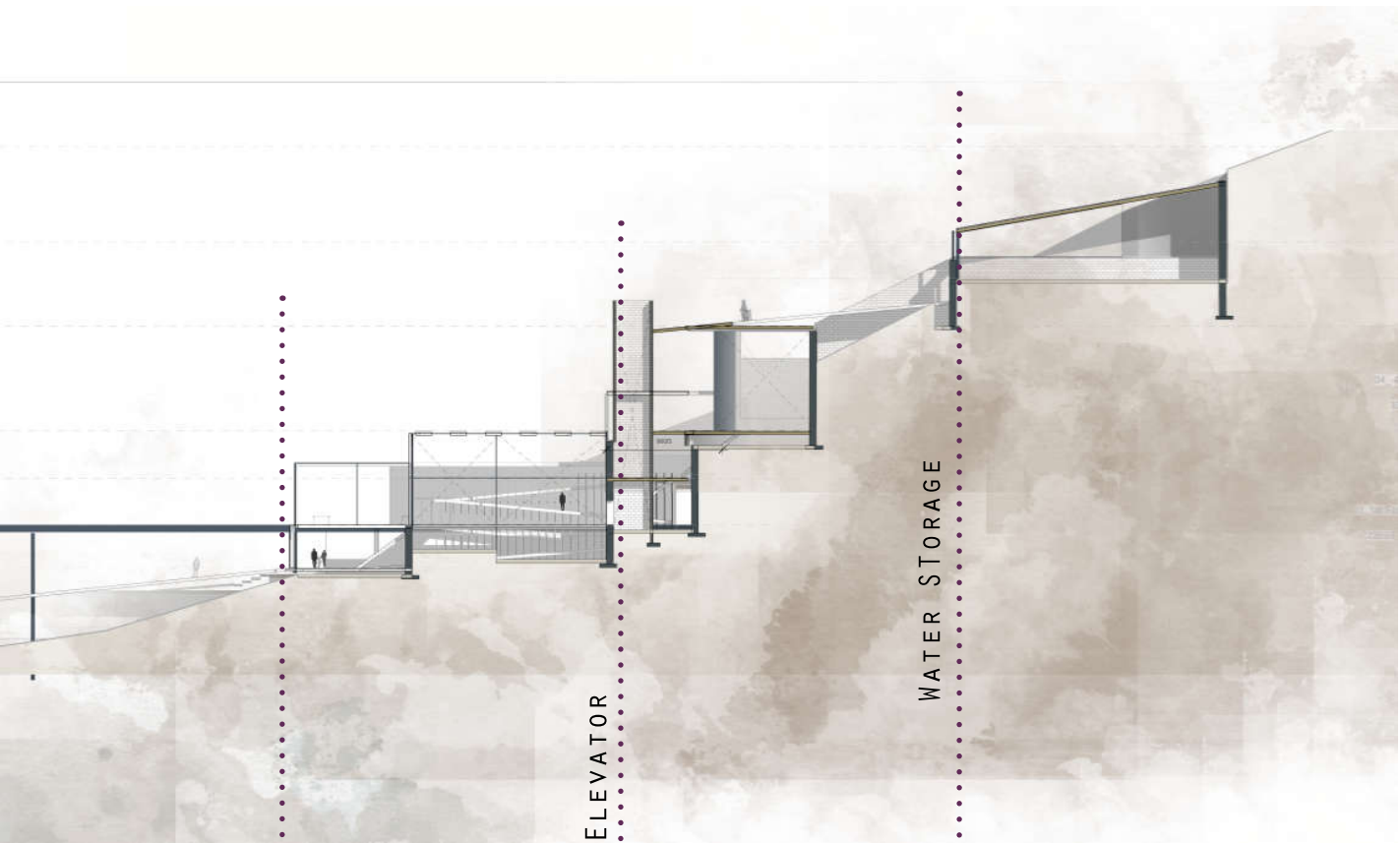




FIG. 89 :CONCEPTUAL NORTHERN ELEVATION 1(AUTHOR, 2018)

1 \_ EXPLORATION OF NORTHERN ELEVATION AS A TOPOGRAPHICALLY INTEGRATED ENTITY



FIG. 90 :CONCEPTUAL NORTHERN ELEVATION 2(AUTHOR, 2018)

2\_ NORTHERN ELEVATION VIEWED THROUGH THE LINE CUT BETWEEN SKY AND GROUND



FIG. 91 :CONCEPTUAL EASTERN ELEVATION 1(AUTHOR, 2018)

2\_ TECTONIC AND STEREOTYPIC ELEMENTS OF THE BUILDING EXPLORED

## 5.5 PUBLIC VS. PRIVATE;

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The architectural language of the building evolves according to use, whether it be private, public, serviceable. The hierarchy of space is given to public domains, as this is seen as the catalyst needed for efficient and sustainable ownership, value and growth within the programs and further development of supporting infrastructure. The appropriate and productive use of the public spaces are the drivers that turn the wheel for the radio-station and journalistic developments.

Clients such as Primedia, who are very invested in public development and the distribution of potent and relevant information that is culturally appropriate, provide bursaries for individuals who wish to further pursue careers in reporting/journalism. These facilities provided by the building are the stepping stone and build-out for individuals who actively want to participate in the field of journalism or reporting.

The development of the building that hosts the radio station has been greatly iterated in terms of public and private access. It has been noted that to separate the two, or create a 'red line' of access, is beneficial to the workings and maintenance of the building, as well to the spatial understandings of functions to the user itself.

The programs of water purification and radio-station platform are to fuse in the first level of the building, as a convolution of public-interface and knowledge transference-space. The aqueduct and wetland system integrates well into the first and entrance level of the building, where it presents itself as a dominant visual and spatial aspect of the design



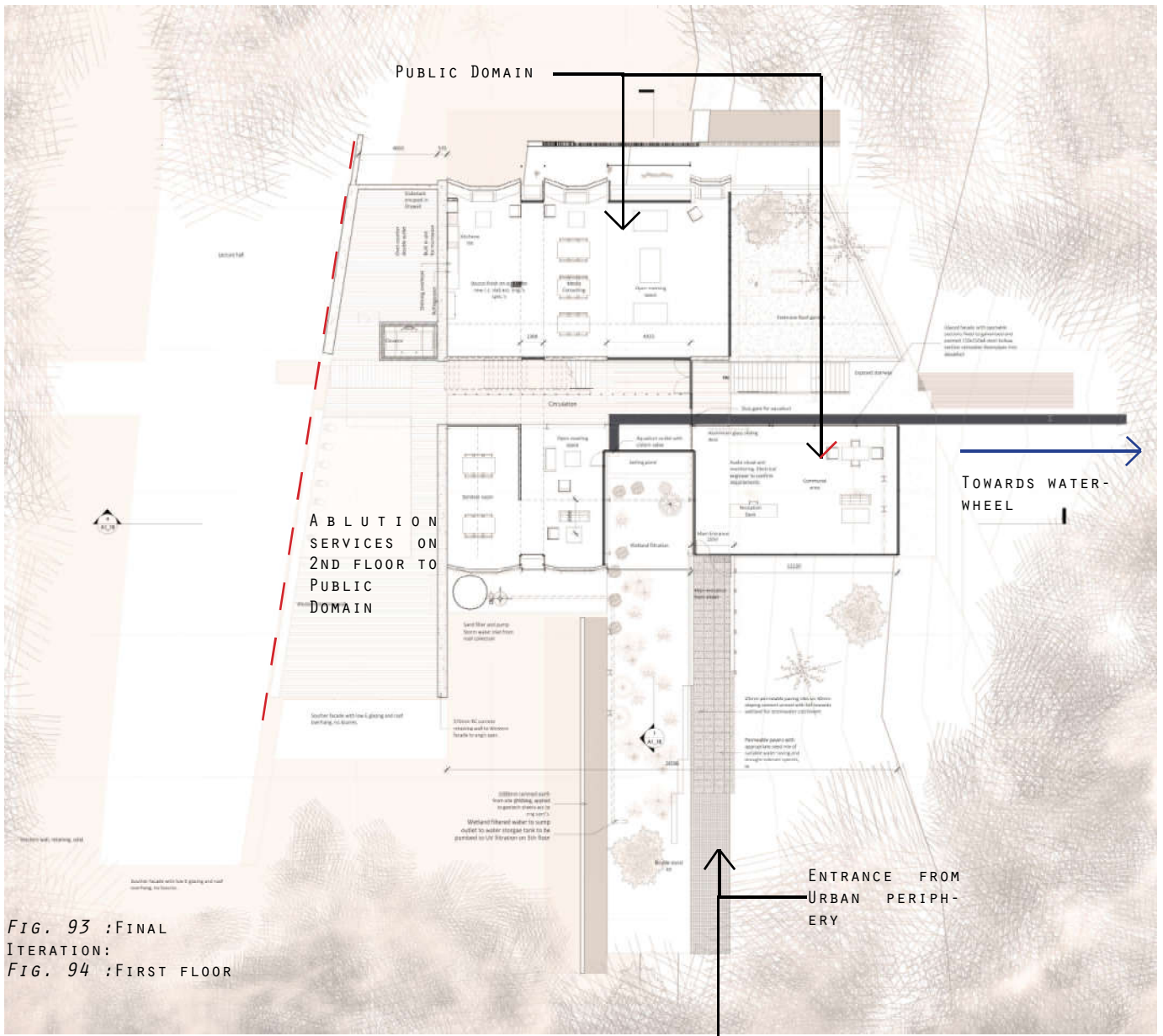
FIG. 92 :SKETCH FIGURES  
SHOWING INDIVIDUAL  
EXPERIENCE OF SPATIAL  
INTERVENTION IN AND  
THROUGHOUT THE PROJECT  
(AUTHOR, 2018)

PERFORMANCE SPACE



MOMENTS OF AN INDIVIDUAL  
NATURE





It is integral to the concept that this system stays important throughout the levels of the design, but has somewhat lost its importance in the later iterations of the project.

The public initiative platforms are therefore seen as the first step to this primal education. The use of these spaces are designated for community leaders, communal strongholds and parties of interest pertaining to the development and well-being of Mamelodi, to congregate their knowledge and expertise.

The leakage of these tales, initiatives, ideas and happenings are then trailed up further towards the recording rooms and studios, where they are relayed to trained radio-disc jockeys.

This is the journey of knowledge and stories, untold crimes and injustices, that find their way into the urban fabric intangibly, made tangible and possible through the provision of architecture that sustains cultural and economic growth. The beginning of a cycle that promotes growth and sustainable positive change, starts with provoking the unjust into truth and light. This simple concept works within the reflection of the present state of affairs and aims to be liberated it into society. This is a catalyst of a public nature, that will navigate truth and knowledge into the greater civic surrounds. This thereby takes the private lives of the community into a public sphere, where it becomes heard, mutable and reactionary.

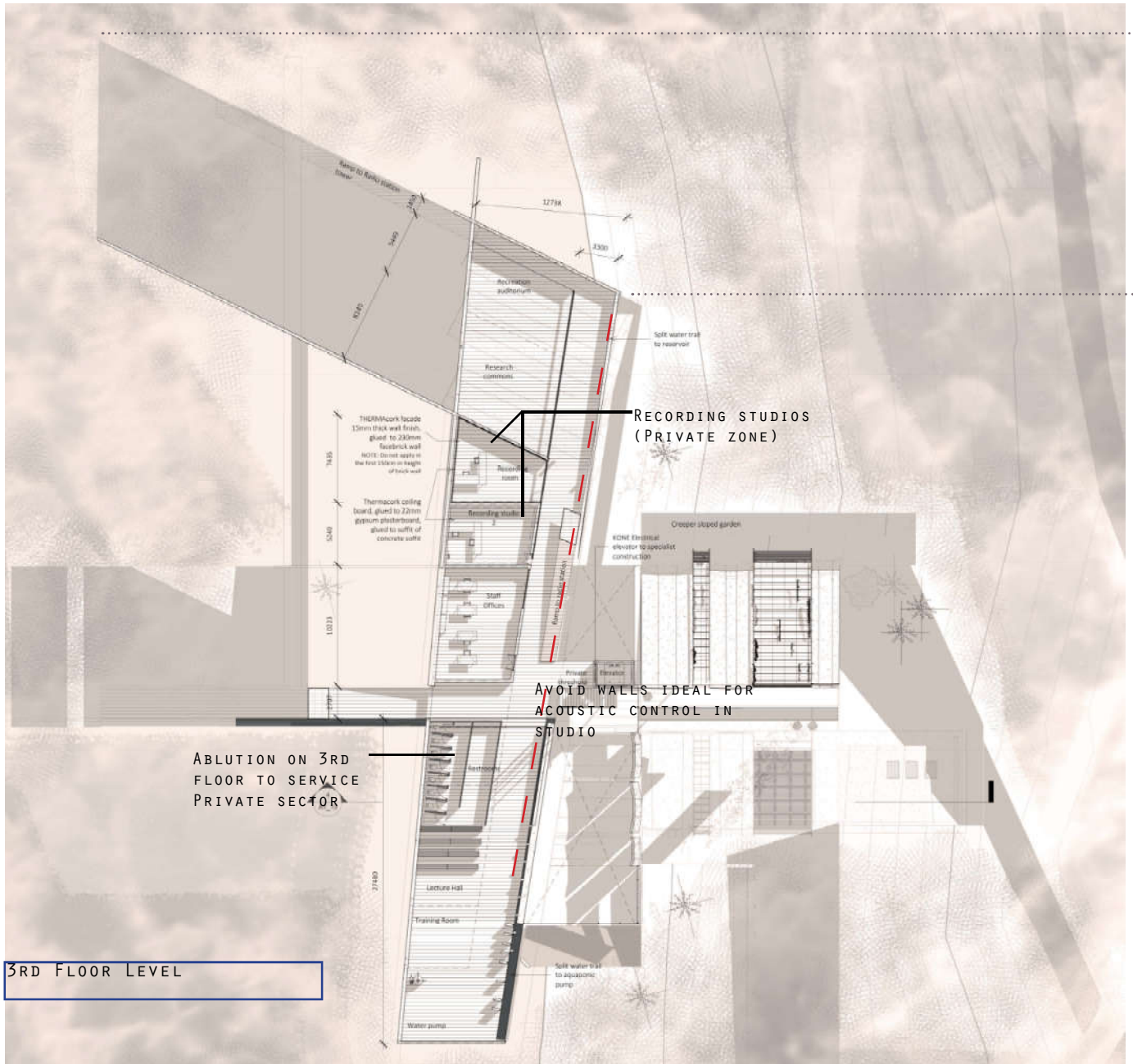


FIG. 95 :SHOWING 3RD FLOOR PLAN

This is a predominantly private zone, dedicated to the functioning of the radio-station program

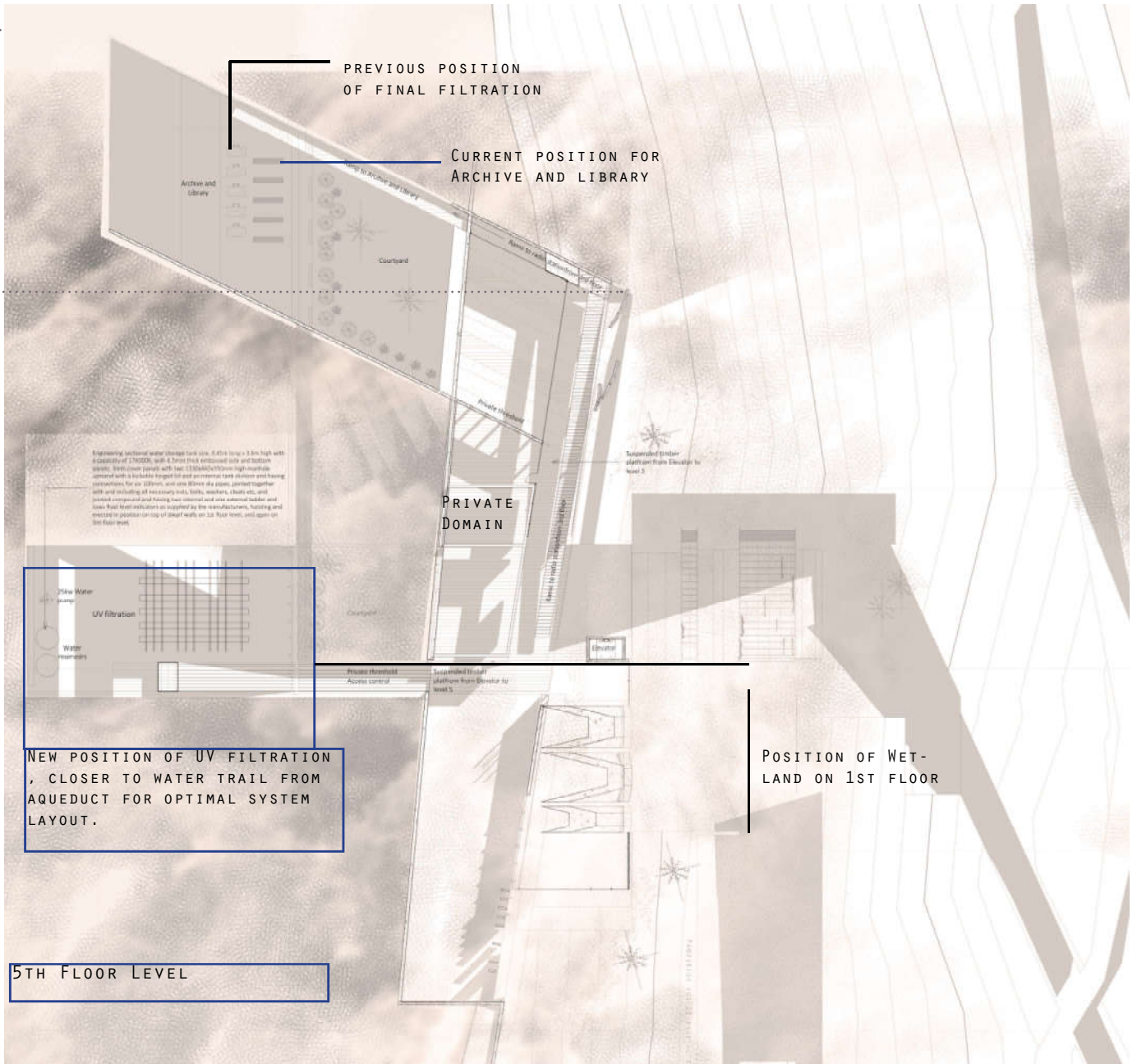


FIG. 96 :SHOWING 5TH LEVEL FLOOR PLAN

This last and highest contoured level of the building is dedicated to the services of the final water-filtration systems

## 5.6 ECOLOGICAL DELIBERATIONS;

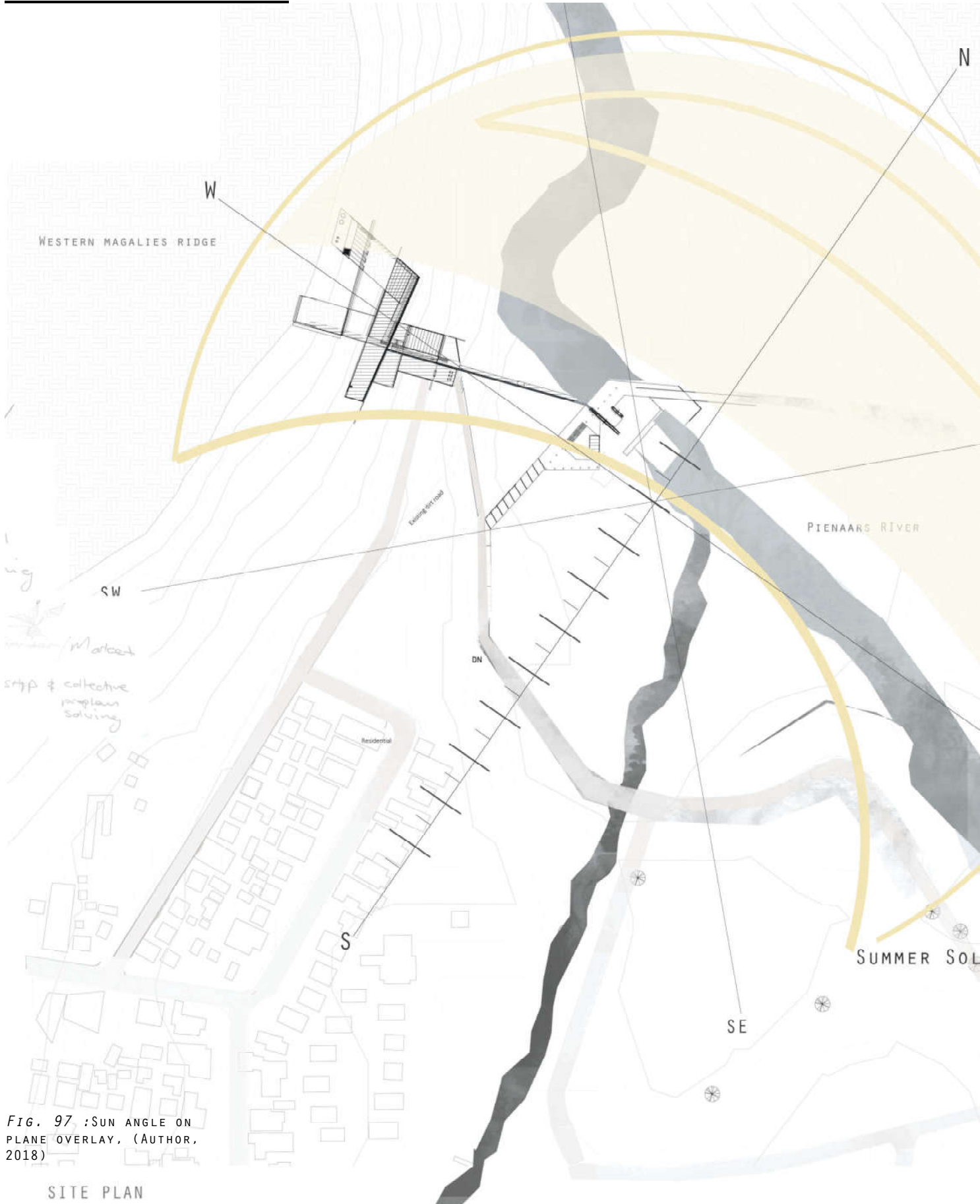


FIG. 97 : SUN ANGLE ON PLANE OVERLAY, (AUTHOR, 2018)

SITE PLAN

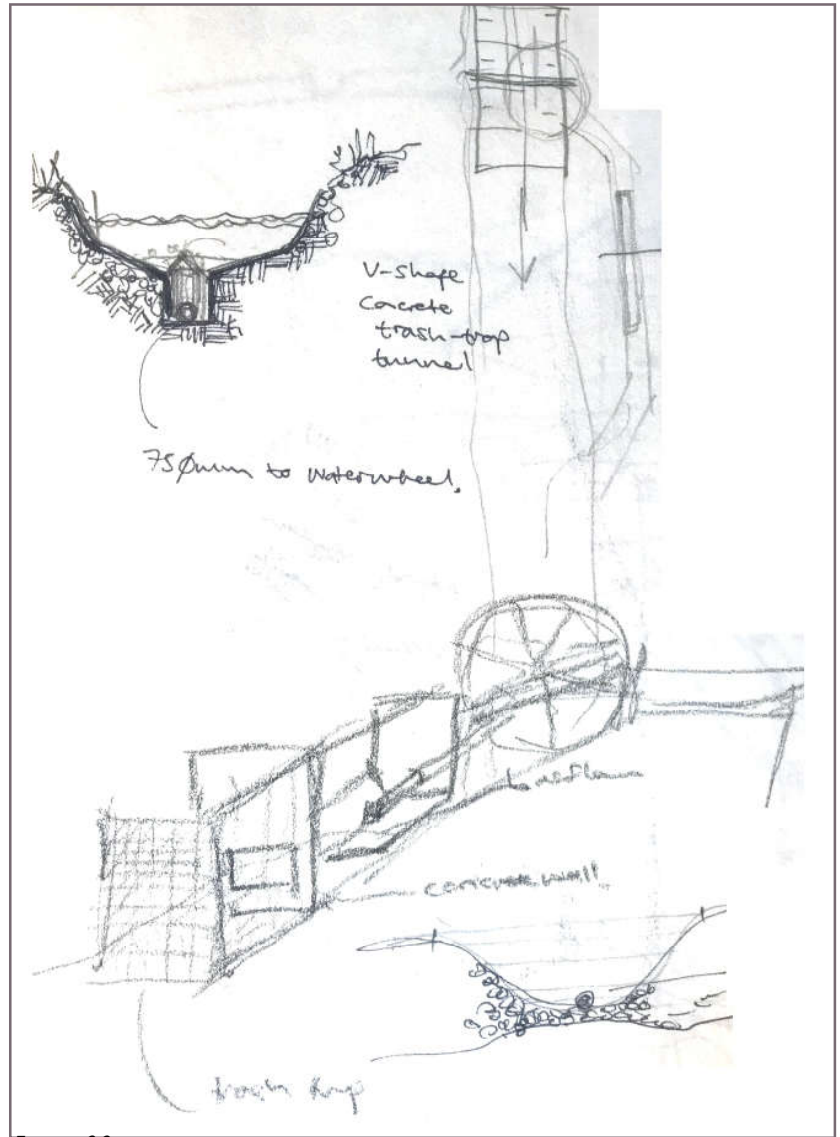
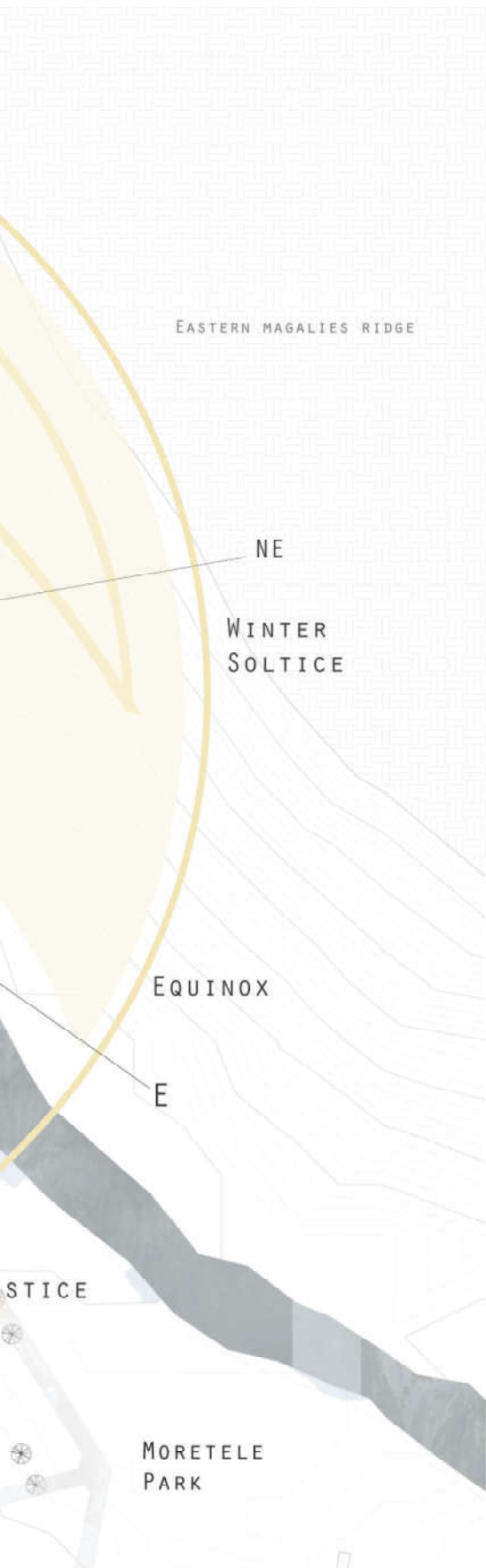


FIG. 98 : WATERWHEEL  
MILLPOND AND TRASH TRAP  
EXPLORATION (AUTHOR,  
2018)

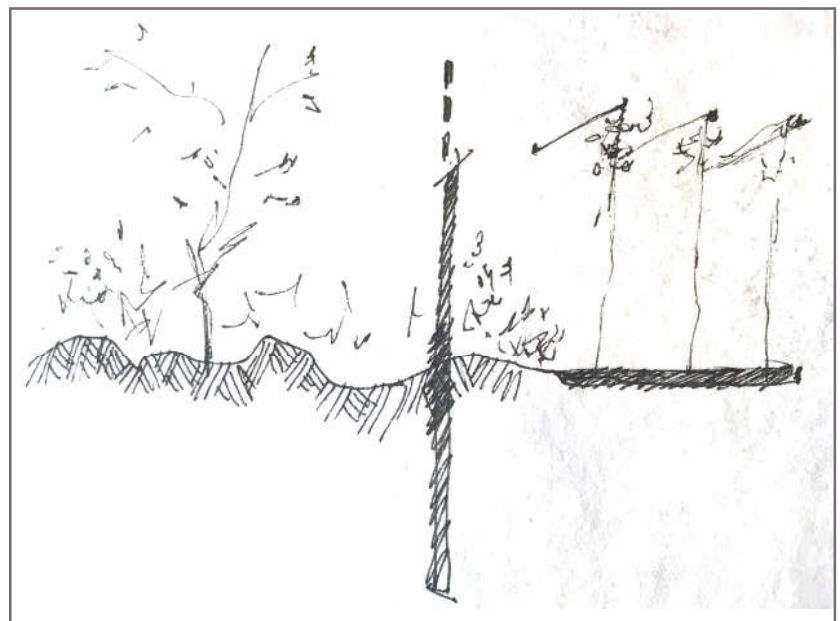


FIG. 99 : EXPOSITION OF  
OUTSIDE VS. INTERNAL SPACES  
AND ENVIRONMENTAL INFLUX  
(AUTHOR, 2018)



# CHAPTER 06

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## TECHNICAL INVESTIGATION

### 01 INSERTION:

- 6.1.1 The supporting, the Core, the Critical
- 6.1.2 Local and Transitory
- 6.1.3 Two & two together

### 02 APPLICATION:

- 6.2.1 Eco-region
- 6.2.2 Water and Waterwheel

### 03 Investigation and Resolution

- 6.3 Ventilation and Thermal Comfort
  - 6.3.1 Passive Elements
  - 6.3.2 Solar Gain
  - 6.3.3 Glazing
  - 6.3.4 Ventilation
  - 6.3.5 Thermal Massing
  - 6.3.6 Cooling & Heating
  - 6.3.7 Geothermal
  - 6.3.8 KONE elevator
  - 6.3.9 Acoustics
  - 6.3.10 Solar Powered System
- 6.4 Final Iterations





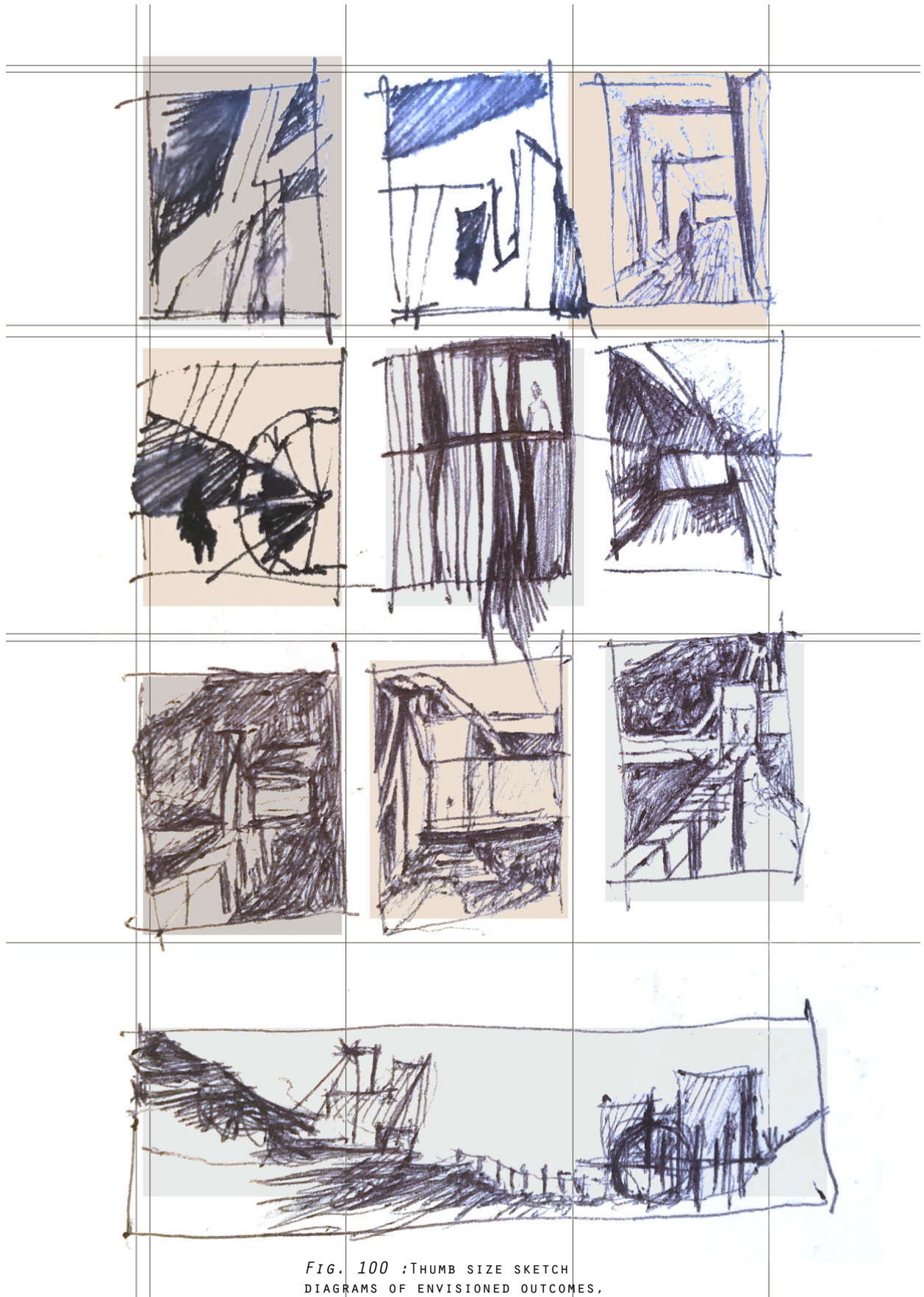


FIG. 100 :THUMB SIZE SKETCH  
DIAGRAMS OF ENVISIONED OUTCOMES,  
TEXTURES AND SPACES.



*FIG. 101* :STRUCTURE &  
LIGHT, (AUTHOR, 2018)

## INSERTION

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### The Technical Story...

Keywords: poetics, water, reflection, reclamation,  
light, balance

### 6.1.1 THE SUPPORTING, THE CORE, THE CRITICAL: (HOW TECHNOLOGY INFORMS ARCHIVAL BRICK ON BRICK)

It is without exception, that all buildings are supported, informed and critically indebted to the pillars and beams on which our floors and roofs rest. Whether our design intentions are pure or not, there are certain elements that rely on structural and technical implications and clear resolution. Without the infliction of logical load bearing techniques and rules, our buildings, beautifully poetic and conceptual as they come, could not stand the test of time. It is within this spectrum of technology and technical resolution, that design is made either trivial or essential.

This dissertation aims to balance the infracting of incidental form into necessary, technically recent and well resolved structure.

This balancing act needs consideration first with regards to the chosen context, availability, typology and function of the form.

### 6.1.2 LOCAL AND TRANSITORY

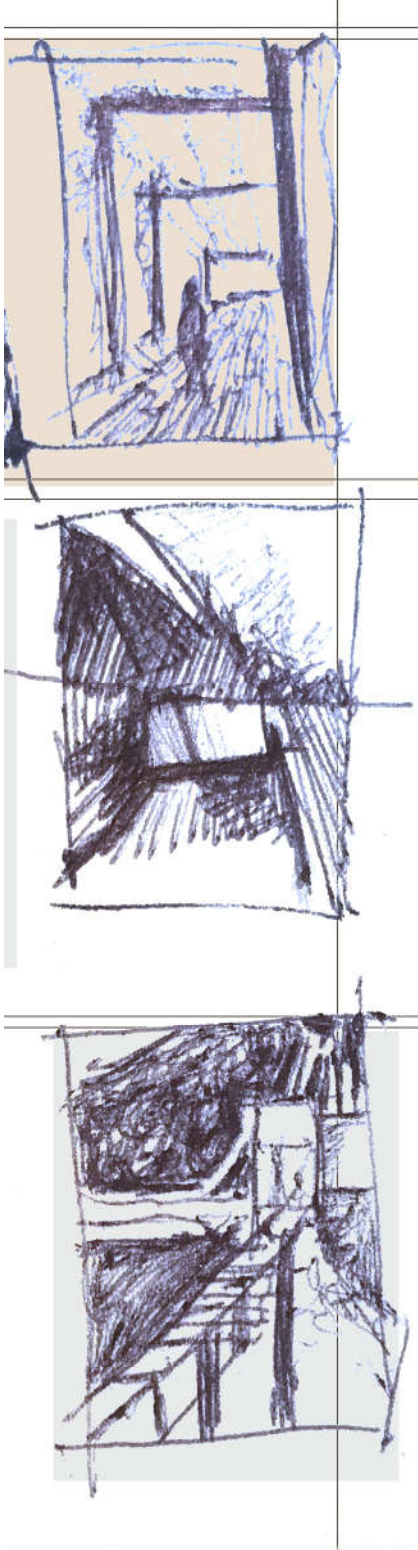


FIG. 102 :TEXTURE,  
 STRUCTURE & LIGHT,  
 (AUTHOR, 2018)

It becomes necessary to discuss the severity of the pending global misconduct of our natural resources to grasp to importance of acting ethically towards the environment in order the maintain wellbeing within the broader scope of humanity. It is observed that architects are only accountable for 2-5% of built structures cliented by wealth, where the rest of the world's informal infrastructure is left unresolved. Of these structures consist most of the world's accidental symbol of global inequities and targets of political regimes.

These constructed environments are also responsible for almost 50 % of the earth's current greenhouse gasses (Fisher, 2016). This issue is also magnified by planning techniques that have resulted in urban sprawl and constitutes another 25 % from the needed transport and dependency on fossil fuels (Fisher, 2016). It is clear that the designed world is a potentially large solution to the problem as it constitutes a large part of the obstacle. The movement towards a more responsible planetary approach is already wide awake in the 'green movement' and shows upon the design communities' awareness and readiness to change.

It is within this regenerative framework of design that we will find the rational guidelines towards a stable, if not very different future. Propagating the sustainable evolution relies on cognitive ethical decisions and strengthens the obligations of regenerative practise. In a more extensive reach, the configuration of balance between human (practical and cultural) and ecological welfare is coined 'Lifescape' by Loures and Panagopoulos (2007:796). This is the propellant for a deep-rooted connection that propagates a natural restoration to biotic systems.

Our insight into the deconstruction of the architectural practise is made clear by Frank Duffy's explanation of the four independent building layers, namely shell, service, scenery and set (Duffy, 1969). He argues that the shell becomes the most prominent creation of the building, as it is the layer that has to provide the least resistance through future appropriation but the most protection of the inner layer, and 'skin' changes, aptly named by Stewart Brand. (Brand 1994:13)

## CONTEXT

This stipulates the geographic location of the site within its environmental biome and implicated dictations of the African sun, weather, water, landscape and population. The appropriate materials are assessed within this construct and withdrawn and appropriated within the typology of the site context. As with the thermal properties of these materials, the economic and environmental possibilities are equally weighed. The position of the intervention within the landscape, at the edge of urban sprawl, further dictates sensitive consideration regarding accessibility within the grid. How far removed do the services need to be?

**FLOOR - STORYTELLER** : The directional and narrative host that guides the user into the purpose and reason of each space. The walkable surface aims to negate function, but also to exemplify the collective culture through the use of 'storytelling' tiles of art and literature, prepared and installed by the community of Mamelodi. This installation aims to marry the ephemeral essence/ individuality of initial experience by the user in the present, with the enduring nature of the communal intention and character of the context and its people.

**WALLS & ROOFS - OBSERVERS** : and the exchangers of the function and program. These elements belong to the spatial quality of space in terms of texture, scale and form, but also to both the earth and the sky separately, and commutatively.

The walls and roofs will be a solid presence, form and material where the most noticeable connection of earth and structure collide within this many-levelled sloped building, supporting the sky and grounding through the earth. The conversation with nature will allow for observance towards the context, extricating the dialogue into the function of the building.

**THE ELEMENT OF WATER** is further extracted from its source, as a very visible and tangible exchange with nature, and made use of to maintain the building and its inhibitors. The system of water purification is a very distinguishable feature that runs from the waterwheel through an aqueduct leading to a wetland feature that permeates into the building itself. This serves a primary structural guide with reference to roof slopes, materials used and rain water harvesting.

**THE ARCHITECTURAL STRUCTURE** will aim to bring about an eco-systemic reclamation and interact 'haptically' with its surroundings, whilst being a constant reflection (transmission) of the world happening around it. These intention is closely linked with the natural conditions of the water-body, and will infuse autogenetic function, such as a waterwheel, and more conceptual function, such as water as a tool for reflection.

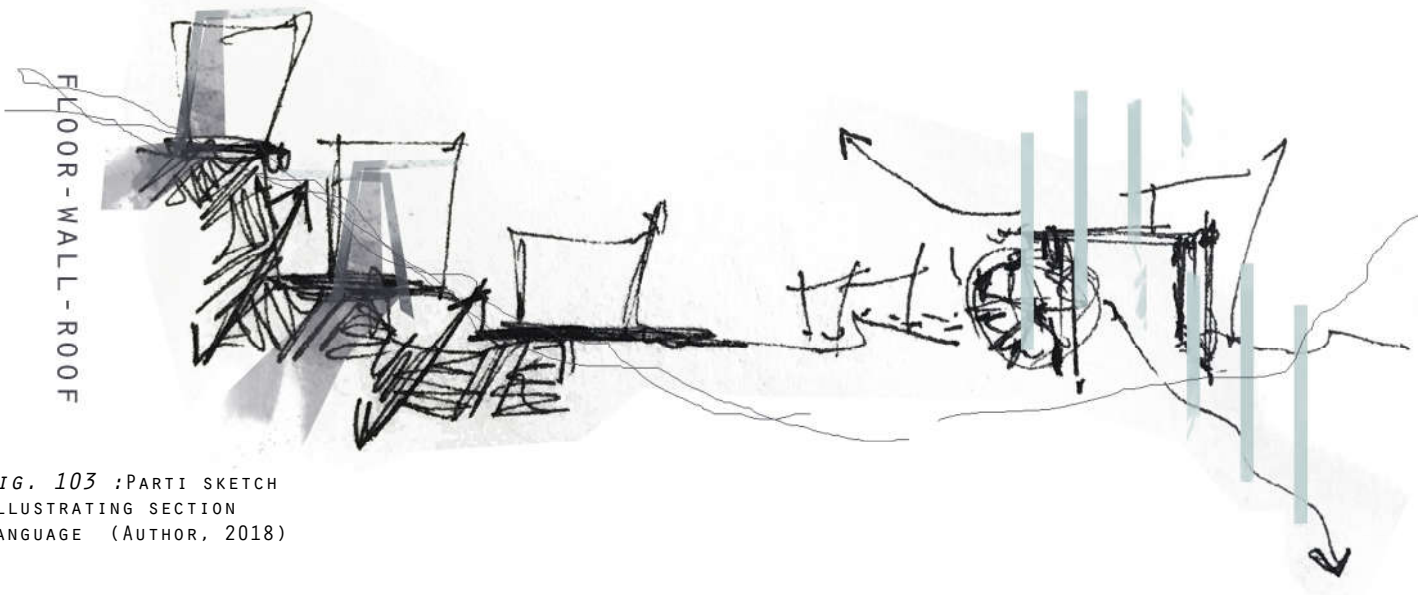


FIG. 103 :PARTI SKETCH  
ILLUSTRATING SECTION  
LANGUAGE (AUTHOR, 2018)

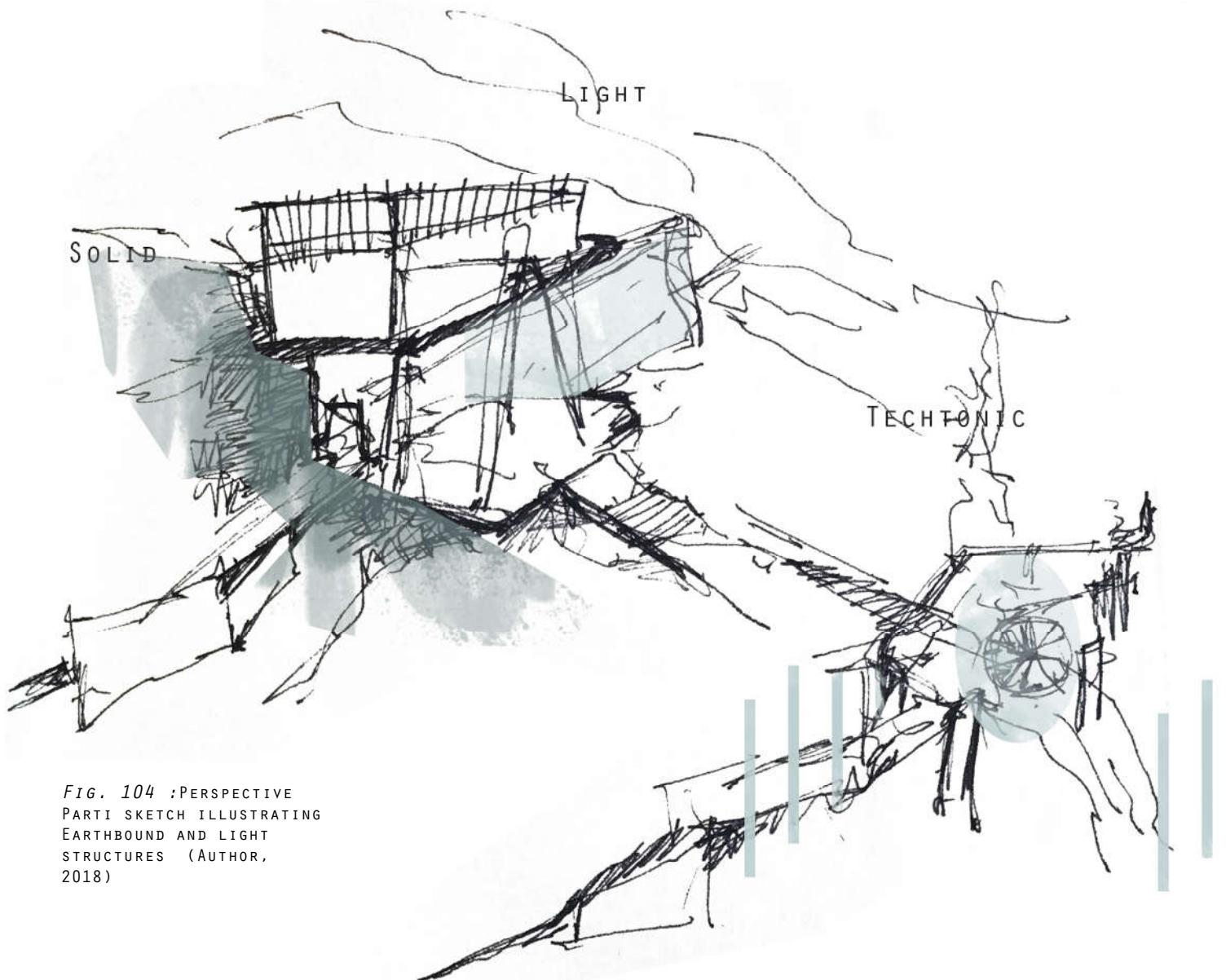


FIG. 104 :PERSPECTIVE  
PARTI SKETCH ILLUSTRATING  
EARTHBOUND AND LIGHT  
STRUCTURES (AUTHOR,  
2018)

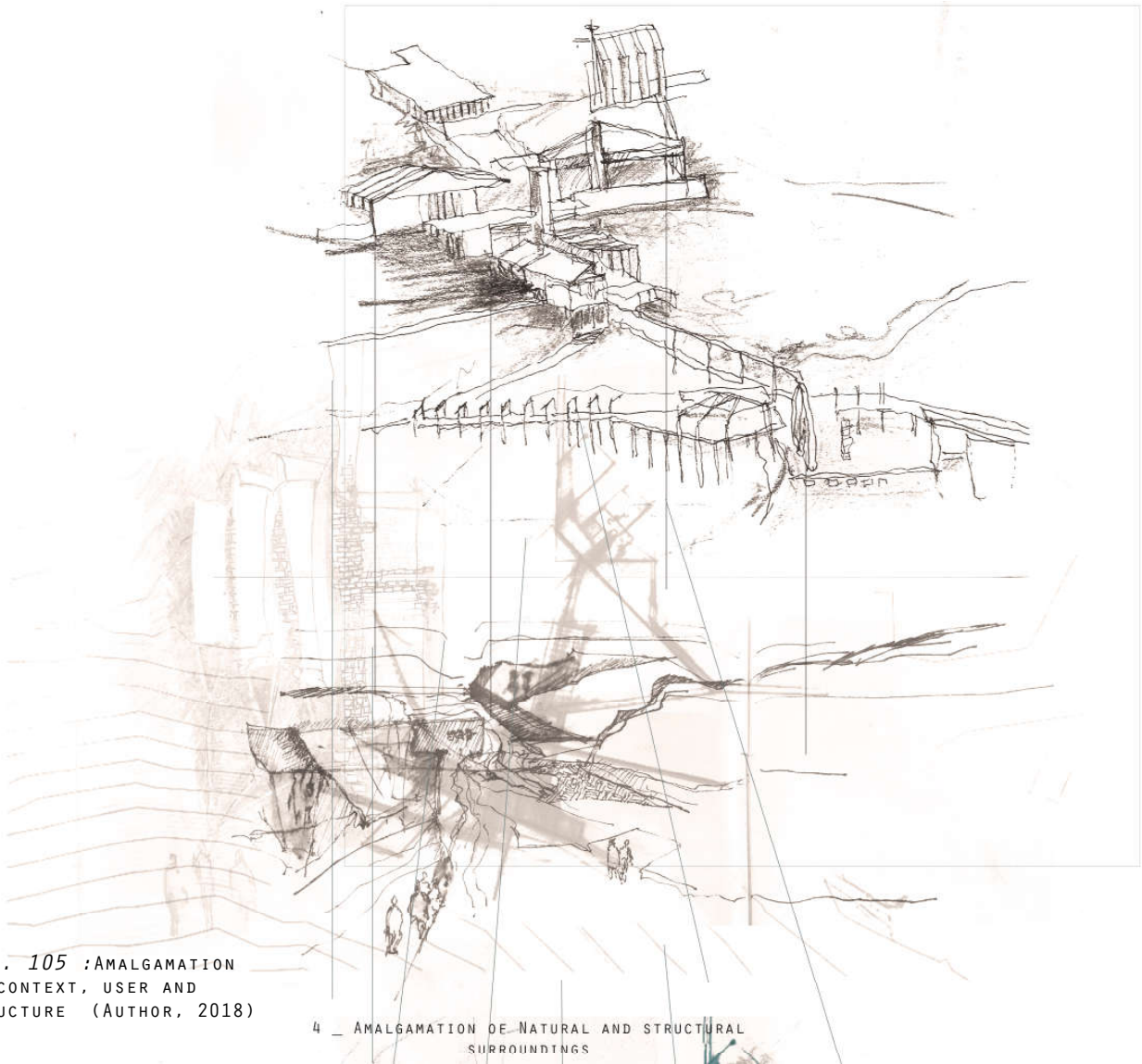


FIG. 105 :AMALGAMATION OF CONTEXT, USER AND STRUCTURE (AUTHOR, 2018)

4 - AMALGAMATION OF NATURAL AND STRUCTURAL SURROUNDINGS

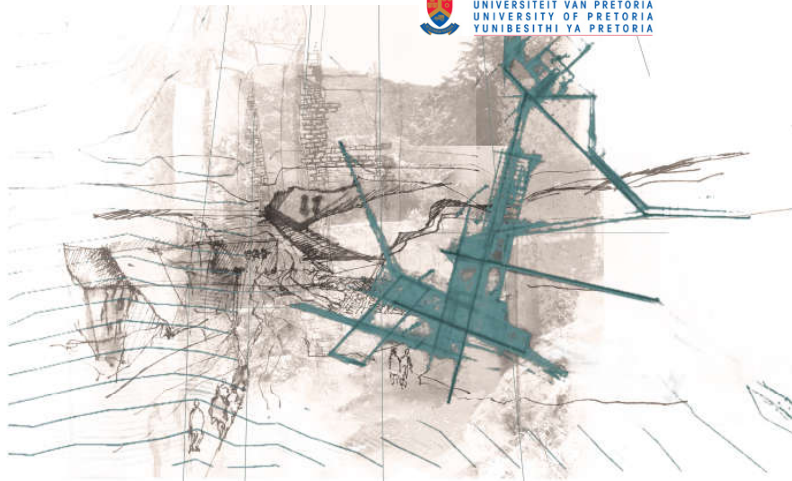
### 6.1.3 TWO AND TWO TOGETHER:

The wellbeing of the human life becomes priority for technological advancement and motivates a coherent public health. This program of thought becomes imperative to the educational aspects of society that are the pillars on which any ecological culture can be built on. The following is an excerpt from, *Architecture for Well-being and Health* (2017), ‘The health and well-being triple bottom line could be summarised as health, comfort and happiness. In order to draw more direct parallels with the built environment, we can refer to Vitruvius and his tripartite model of the three elements required for a well-designed building (Morgan, 1996)

- I “firmitas” or firmness (health)
- II “utilitas” or commodity (comfort)
- III “venustas” or delight (happiness)’

To satisfy sustainable principles, certain elements of architecture is to be investigated through the lenses of experience, space and program – in order to pacify the multiple dimensions of what can constitutes a sustainable/ biophilic design.

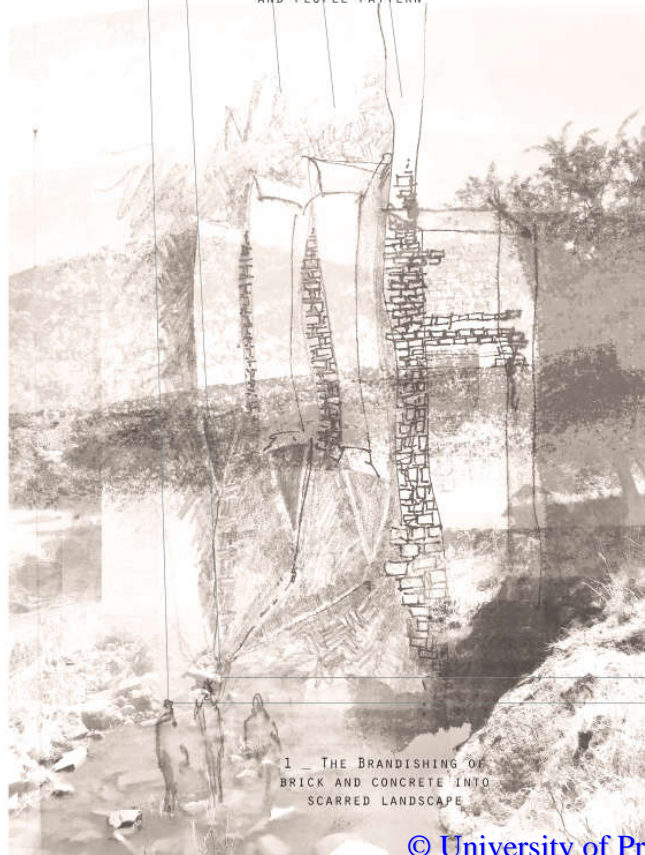
This thereby indicates a need for material, economic and construction specification in terms of quantitative: -availability -workability -skill level needed for construction -thermal comfort -economic viability These materials are also analysed in terms of qualitative: -spatial qualities (height or structural constrictions) -sensory experience (textures & colour) -proportions and scale to user



3 - INVITATION OF PLAN INTO  
HAPTIC INTENTIONS



2 - TOPOGRAPHIC RECOURSE  
AND PEOPLE PATTERN



1 - THE BRANDISHING OF  
BRICK AND CONCRETE INTO  
SCARRED LANDSCAPE

**TECHNICAL HYPOTHESIS:**  
Architecture has the potential to encompass qualities of phenomenology that promotes wellbeing and encourages a didactic approach to sustainability and a holistic regenerative design process

*FIG. 106* ;TRANSITIONAL  
DIAGRAM OF HAPTIC  
ELEMENTS, (AUTHOR, 2018)



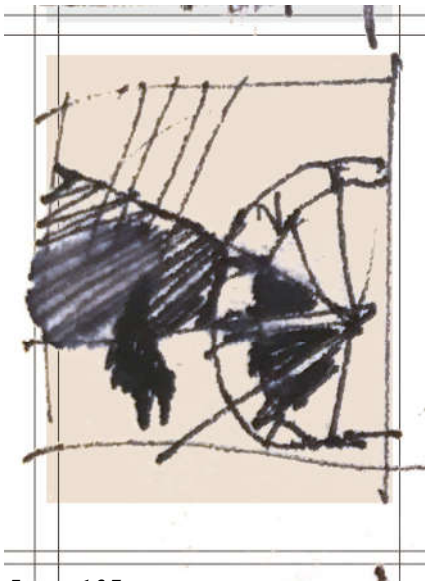


Fig. 107 :WATERWHEEL  
THUMB-SKETCH, (AUTHOR,  
2018)

## 02 APPLICATION

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- 6.2.1 Eco-region and all the facts...
- 6.2.2 Water & the Waterwheel

## RIVER ECOREGION : 6.2.1 ECO-REGION EASTERN BANKENVELD

THE SUMMARIZED DESCRIPTION FOR EACH ECOREGION IS LIMITED TO GENERAL ATTRIBUTES THAT ARE MOSTLY RELATED TO THE RIVERS AND STREAMS OF THE PARTICULAR ECOREGION. THE FOLLOWING ASPECTS ARE COVERED IN THE SECTION:

- TERRAIN MORPHOLOGY,
- MAIN VEGETATION TYPES,
- MEAN ANNUAL PRECIPITATION,
- COEFFICIENT OF VARIATION OF MEAN ANNUAL PRECIPITATION:
- DRAINAGE DENSITY,
- STREAM FREQUENCY,
- SLOPES,
- MEDIAN ANNUAL SIMULATED RUNOFF
- MEAN ANNUAL TEMPERATURE.

### Primary determinants:

Closed hills and mountains with moderate and high relief together with North-eastern Mountain Grassland and Mixed Bushveld are definitive of the region.

General:

Distinctive escarpments occur along the eastern boundary in particular. Large rivers that traverse the area are the Olifants, Elands and Steelpoort with perennial tributaries in the region contributing to

their flow. The Crocodile River (East) has many of its sources in this area.

- Mean annual precipitation: Moderate to moderately high.
- Coefficient of variation of annual precipitation: Low to moderate.
- Drainage density: Predominantly medium.
- Stream frequency: Medium/high but low/medium in limited areas.
- Slopes <5%: <20%, 20-50% in limited areas.
- Median annual simulated runoff: Mostly moderate but moderately high in areas.
- Mean annual temperature: Mostly moderate.

Size = 20098.8 km<sup>2</sup>

TABLE: MAIN ATTRIBUTES OF THE EASTERN BANKENVELD ECOREGION.

| Main Attributes   | Eastern Bankenveld   |
|---|--|
| Terrain Morphology: Broad division (dominant types in bold) (Primary) | Plains; Low Relief; (very limited)<br>Plains; Moderate Relief;<br>Lowlands; Hills and Mountains; Moderate and High Relief; (limited)<br>Open Hills; Lowlands; Mountains; Moderate to High Relief; (limited)<br><b>Closed Hills; Mountains; Moderate and High Relief;</b> |
| Vegetation types (dominant types in bold) (Primary)                   | Sour Lowveld Bushveld; <b>Mixed Bushveld;</b> Clay Thorn Bushveld (limited);<br>Rocky Highveld Grassland; Moist Sandy Highveld Grassland;<br><b>North Eastern Mountain Grassland;</b><br>Patches AfroMontane Forest.   |
| Altitude (m a.m.s.l.) (Modifying)                                     | 500-2300   |
| MAP (mm) (modify)   | 300 to 1000  |
| Coefficient of Variation (% of annual precipitation)                  | <20 to 34  |
| Rainfall concentration index  | 55 to >65  |
| Rainfall seasonality  | Early to mid summer  |
| Mean annual temp. (°C)  | 10 to 22   |
| Mean daily max. temp. (°C): February                                  | 18 to 30   |
| Mean daily max. temp. (°C): July                                      | 12 to 24   |
| Mean daily min. temp. (°C): February                                  | 8 to 20  |
| Mean daily min temp. (°C): July                                       | 0 to 8   |
| Median annual simulated runoff (mm) for quaternary catchment          | 20 to 150; 200 to >250   |

FIG. 108 : ENVIRONMENTAL & SOCIOLOGICAL INTEGRATION OF WATERWHEEL INTENTIONS, (AUTHOR, 2018)

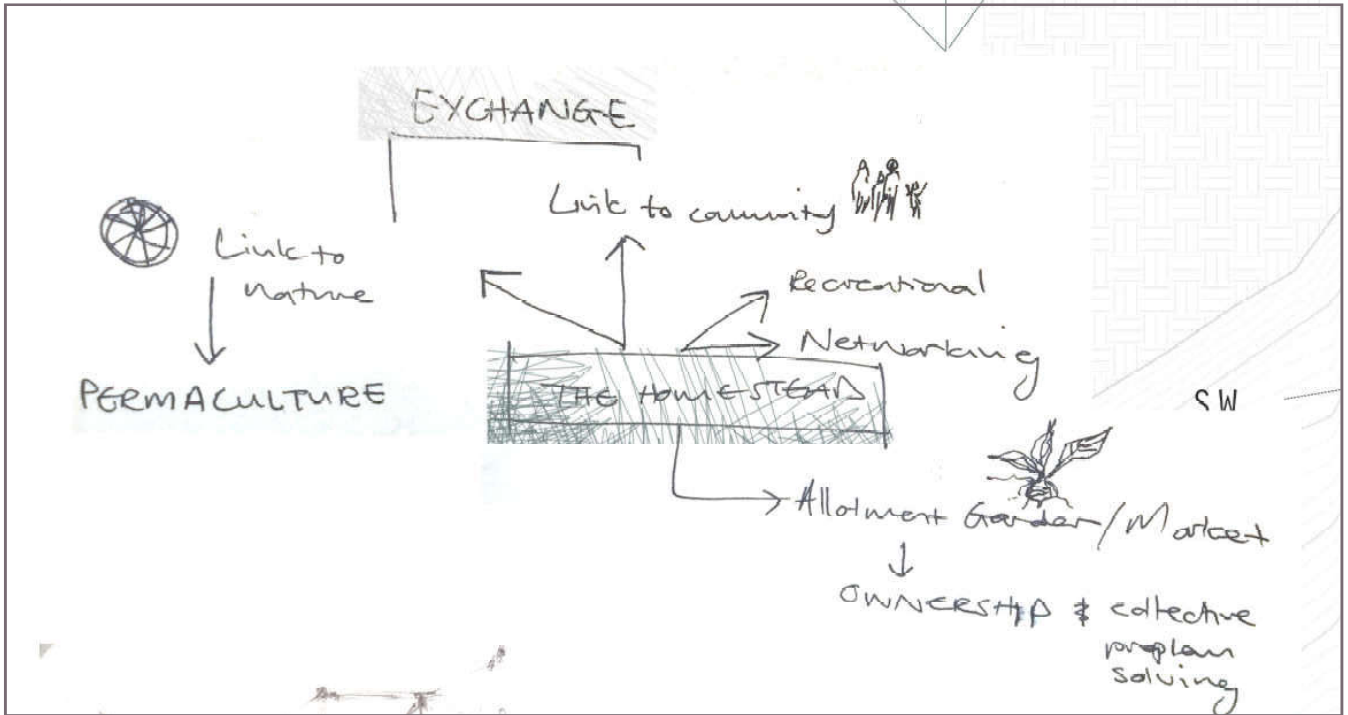


FIG. 109 : HARVESTING EXPERIENCE, (AUTHOR, 2018)



## 6.2.2 THE CONCEPTUAL INTENTION OF THE WATERWHEEL:

Upon further investigation regarding the water filtration system, the need for a wetland became apparent. This intervention seemed most practical on the least sloped level of the building, which meant the 1st floor entrance level on the southern façade, which is also the most visually accessible façade from the residential and urban fabric. Other factors that influenced the placement of the wetland:

-direct access of water from the Pienaars river via aqueducts, without the use of pumps.

-the location of the wetland on lowest point of building intervention allows for ample catchment of rain-water runoff from the building and site that sits above. The wetland filtered water collected from this point on forwards needs to be decisively either stored in tanks/ retention ponds situated on the 1st level for irrigation and hydroponic system usage, as well as pumped further uphill to the storage facilities located at the UV filtration system. This water gets divided according to usage calculated within the building for domestic and potable use, as well as water needed for permaculture purposes.

This extended filtering of water became apparent upon distinguishing the different levels of purification needed for different purposes.

These are established as the following:

-Potable Water needed for drinking purposes within the building, and for possible extension to canned water for distribution for the greater residential area.

- Grey water purification into potable drinking water

- Grey water to be wetland and sand filtered for return to the river

- Trash trap filtered water from the river for irrigation of green roofs (extensive and intensive)

-Wetland filtered water for permaculture purposes such as hydro and aquaponics systems

This divides the water storage capacity of the building and its consumption, as well as collected run-off, into the river, in a way that is balanced and mutualistic to both the river and the economy. What we take out, we replenish with filtered grey water from the building's end-users.

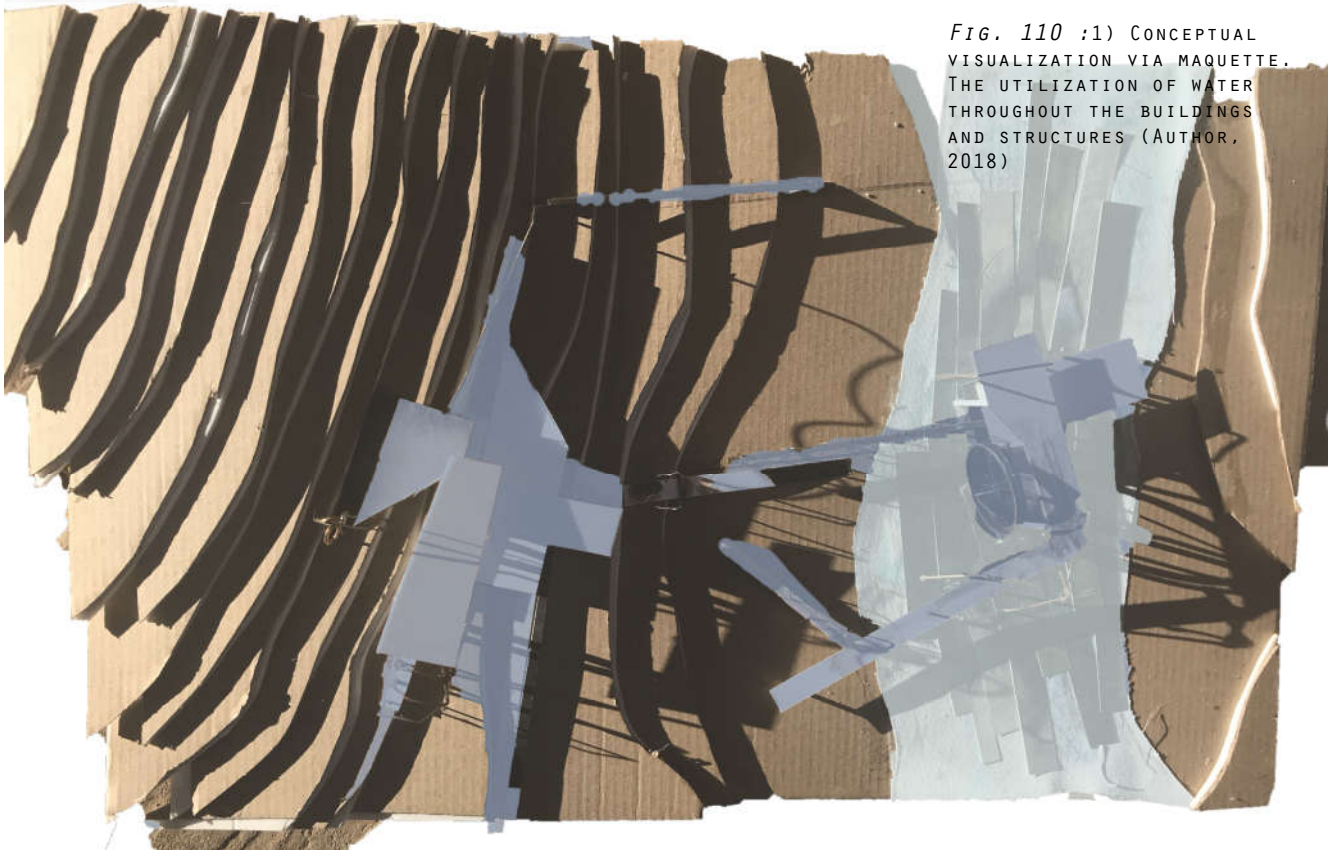


FIG. 110 :1) CONCEPTUAL VISUALIZATION VIA MAQUETTE. THE UTILIZATION OF WATER THROUGHOUT THE BUILDINGS AND STRUCTURES (AUTHOR, 2018)

FIG. 111 :2) DESIGN VISUALIZATION VIA NORTHERN ELEVATION. THE INTEGRATION OF WATERWHEEL AND SYSTEM INTO CONTOURS OF THE BUILDING (AUTHOR, 2018)

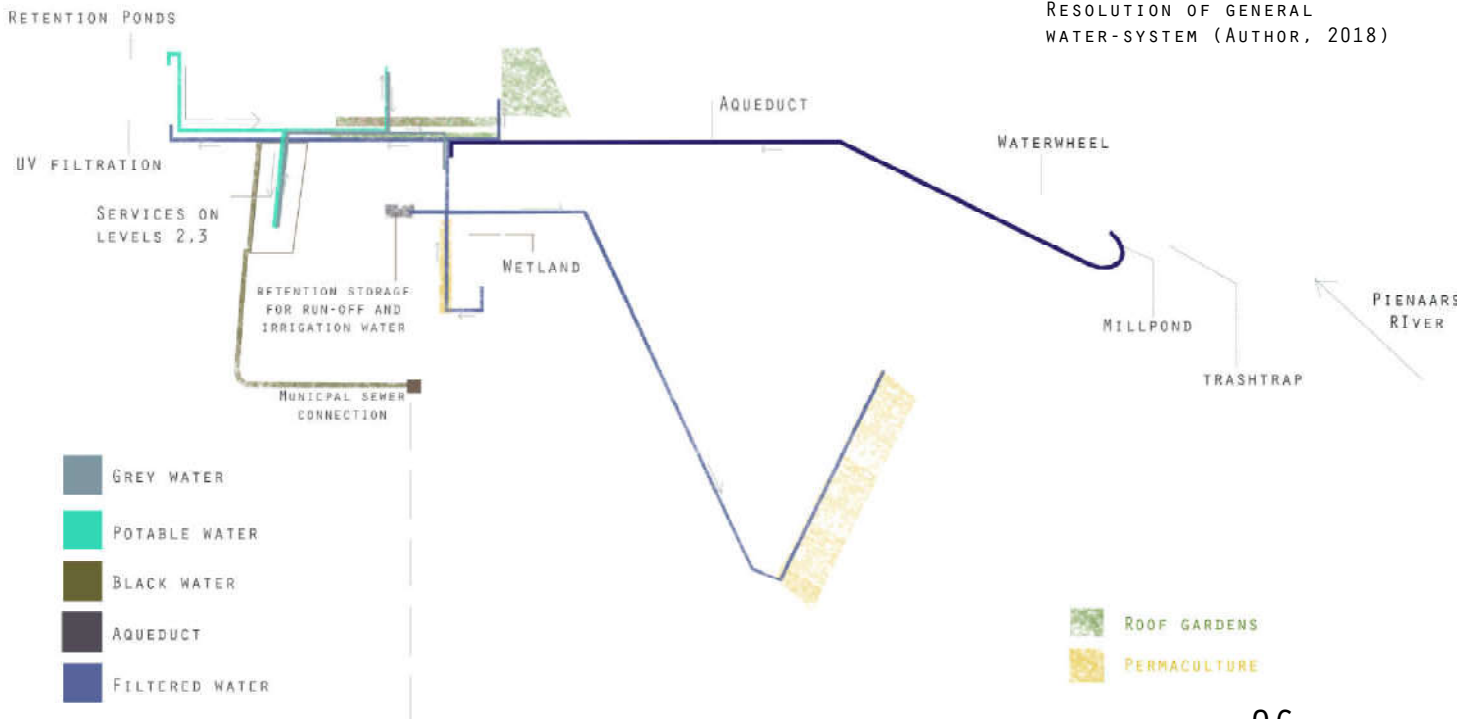
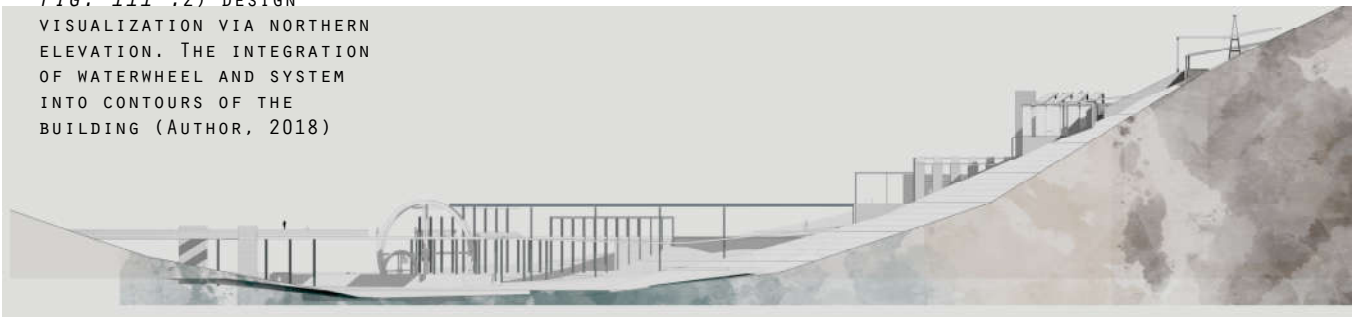
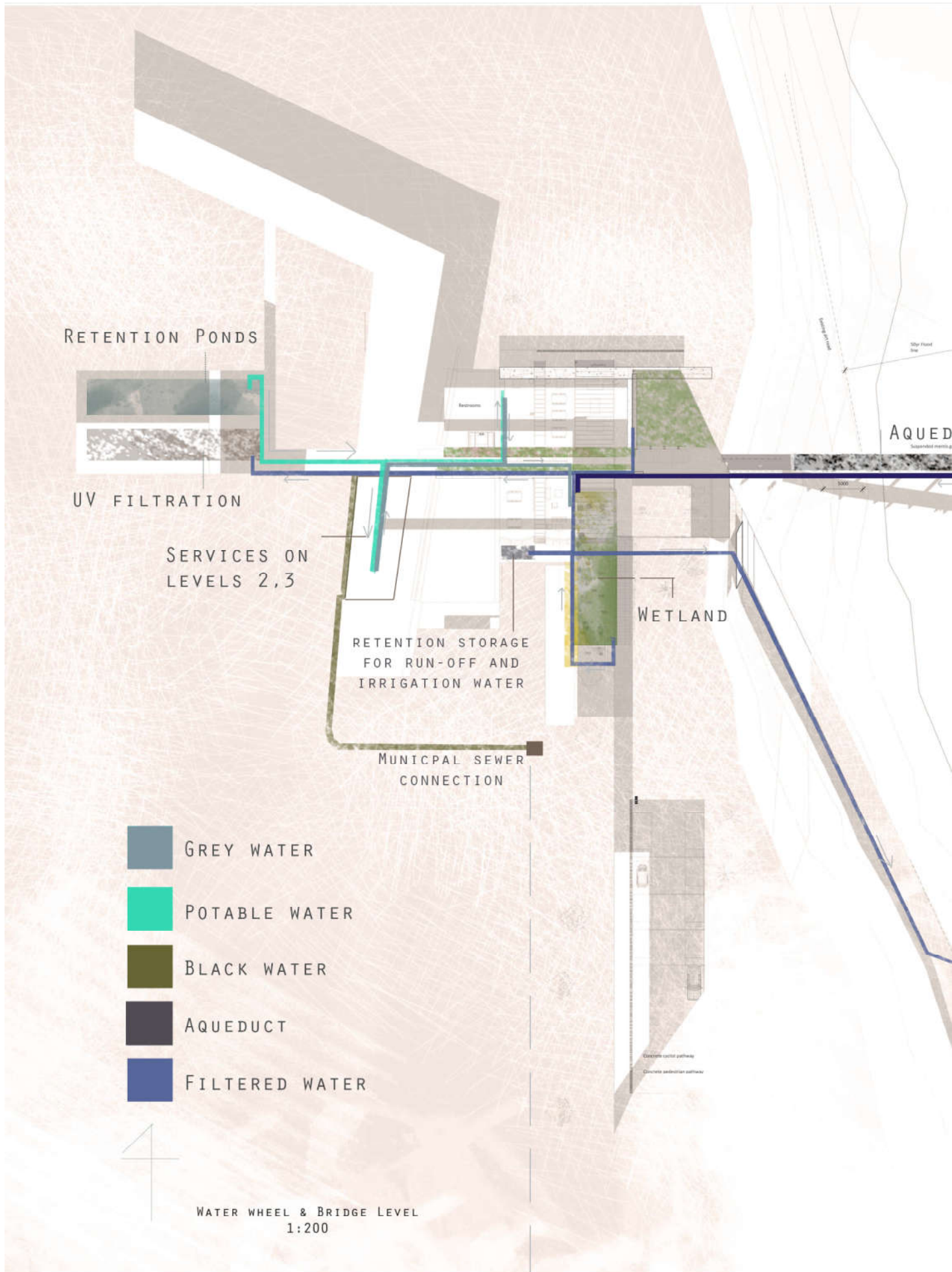


FIG. 112 :3) TECHNICAL RESOLUTION OF GENERAL WATER-SYSTEM (AUTHOR, 2018)



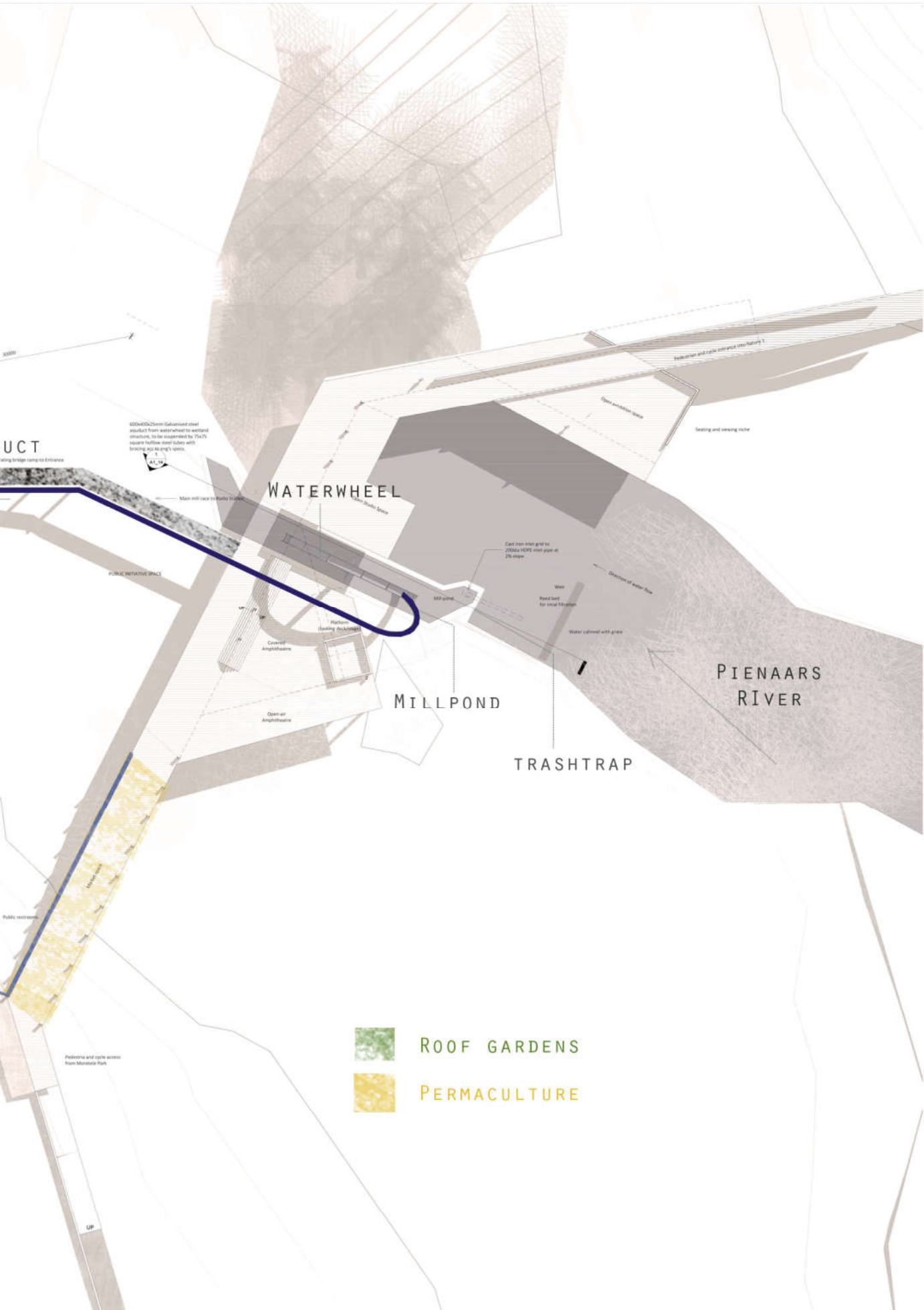


FIG. 114 :FINAL  
WATERWHEEL ELEVATION TO  
THE SOUTH (AUTHOR, 2018)

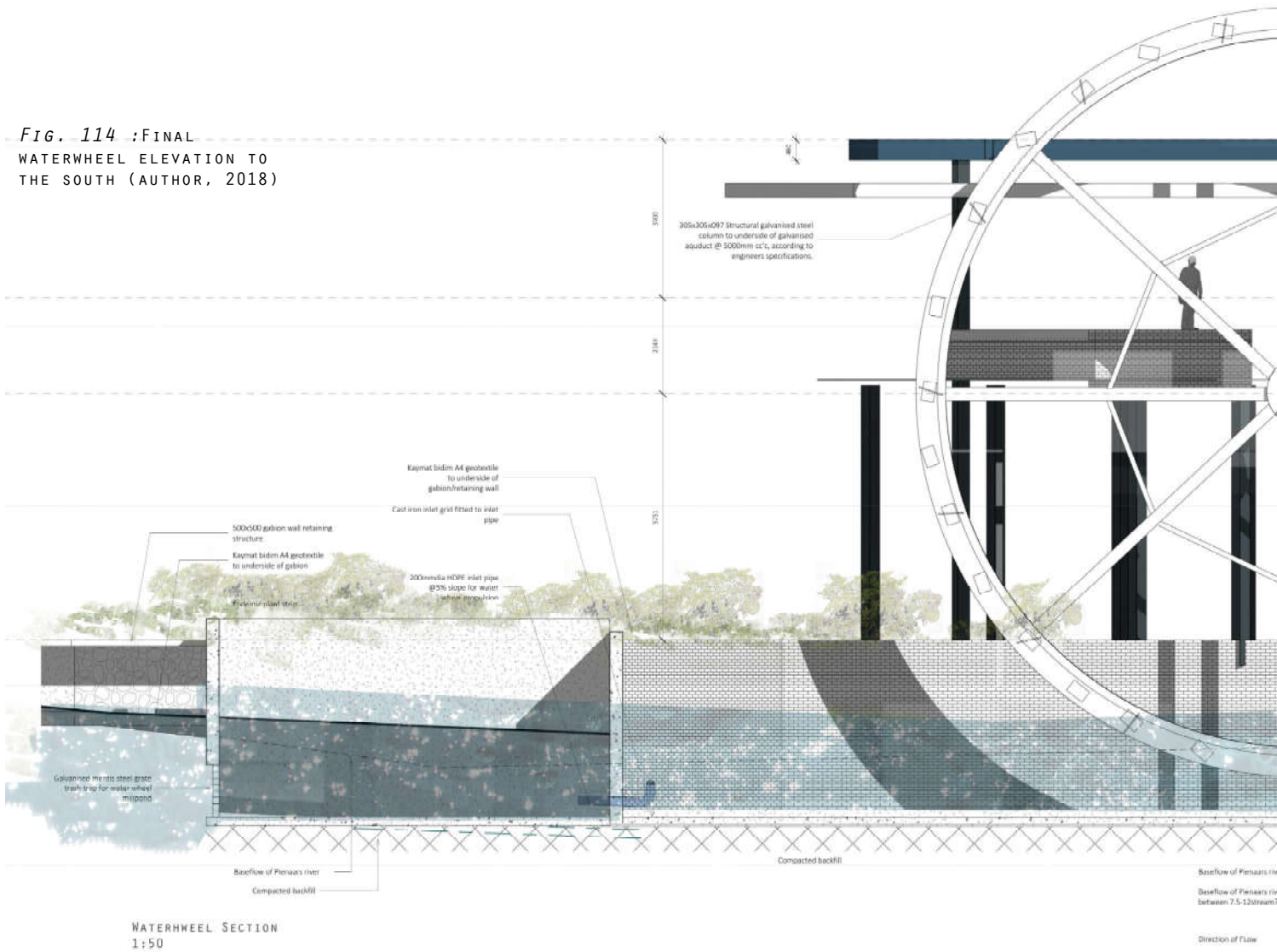
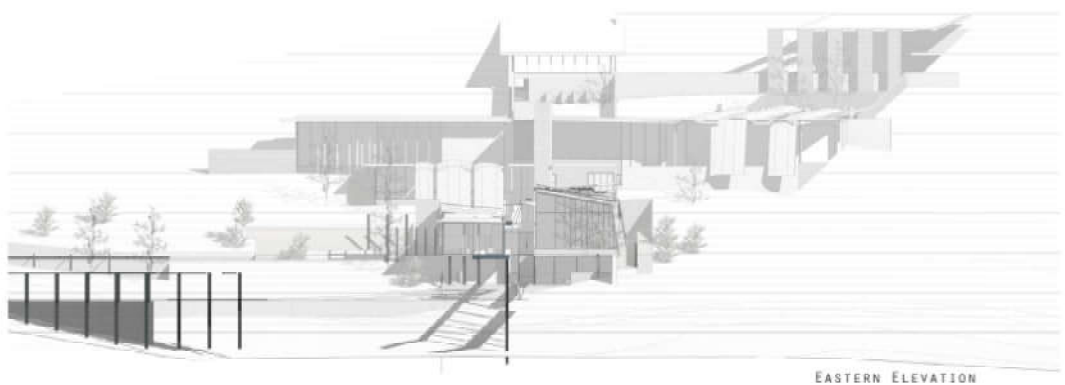
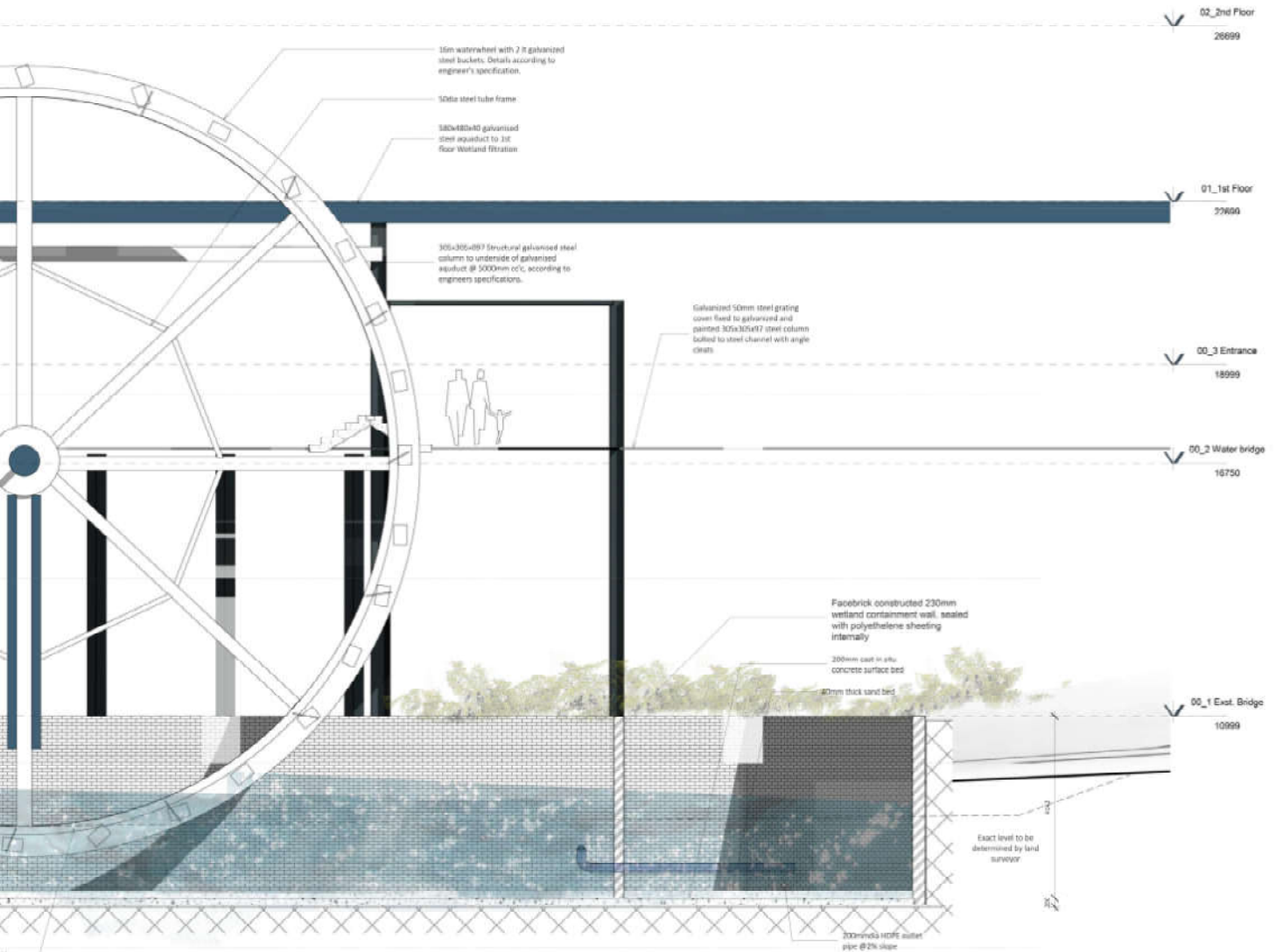


FIG. 115 :SOUTHERN ELEVATION  
FROM URBAN FABRIC SHOWING  
WATERWHEEL INTEGRATION INTO MAIN  
BUILDING (AUTHOR, 2018)







The waterwheel lifts water at a rate of approximately two lts every 2nd second, which will constantly flow through the aqueduct system. This results in 1440lt of water per day, and therefore 43200lt/month. This equals a total of 43m<sup>3</sup>/month water transported from the waterwheel: An annual total of 516m<sup>3</sup>.

Added to the total run-off & rainwater yield of 1840m<sup>3</sup>, is 2356m<sup>3</sup> of water circulated throughout the building annually.

Of this total, 1215m<sup>3</sup> is used for irrigation, grey water, potable water, wetland and UV filtration and black water.

Within the operational phase of year one of the project, the rainfall yield has not yet settled the monthly demand for the buildings water needs, thereby the waterwheel fulfils this need and immediately puts the buildings water supply into full action.

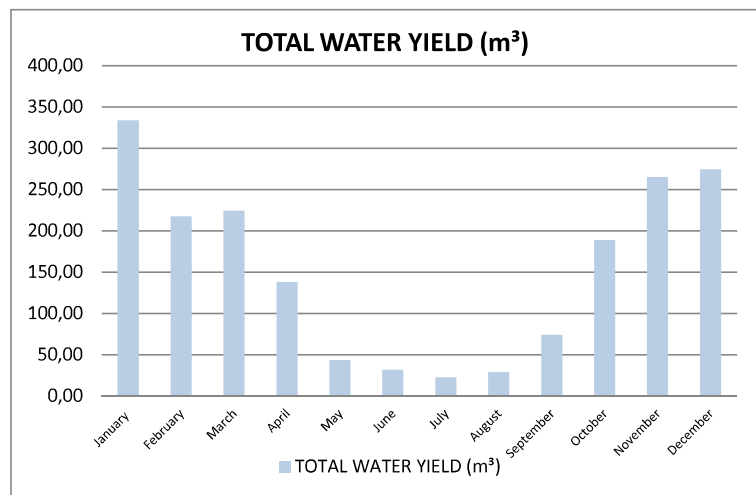
The rest of the water, being roughly 80m<sup>3</sup>/monthly, is returned to the Pienaars River, at a %5 slope from the Retention dam adjacent to the wetland. This insures abundant return to the natural resource on site, that is receiving cleaner and wetland/filtered water into its streams.

## WATER MANAGEMENT MODEL

### A WATER RESOURCE INFORMATION (YIELD, m<sup>3</sup>)

#### A1 RAIN WATER HARVESTING DATA

| DESCRIPTION               | AREA (m <sup>2</sup> ) | RUNOFF COEFF. (C) |
|---------------------------|------------------------|-------------------|
| Roof structures           | 1863                   | 0,9               |
| Timber entrance           | 161                    | 0,7               |
| Homestead timber platform | 532                    | 0,7               |
| Lawn                      | 297                    | 0,35              |
| Wetland                   | 100                    | 1                 |
| <b>TOTAL AREA (A)</b>     | <b>2953,00</b>         |                   |
| <b>WEIGHTED C</b>         |                        | <b>0,80</b>       |



#### A3 TOTAL WATER YIELD

| MONTH              | AVE RAINFALL , P (m) | CATCHMENT YIELD (m <sup>3</sup> ) (Yield = PxAxC) | ALTERNATIVE WATER SOURCE (m <sup>3</sup> ) | TOTAL WATER YIELD (m <sup>3</sup> ) |
|--------------------|----------------------|---|--|-------------------------------------|
| January            | 0,13                 | 314,64  | 18,84                                      | 333,48                              |
| February           | 0,09                 | 201,09  | 16,04                                      | 217,13                              |
| March              | 0,09                 | 208,19  | 16,04                                      | 224,23                              |
| April              | 0,05                 | 123,02  | 14,84                                      | 137,86                              |
| May                | 0,01                 | 28,39   | 14,84                                      | 43,23                               |
| June               | 0,01                 | 18,93   | 12,84                                      | 31,77                               |
| July               | 0,00                 | 9,46  | 12,84                                      | 22,30                               |
| August             | 0,01                 | 14,19   | 14,84                                      | 29,03                               |
| September          | 0,03                 | 59,14   | 14,84                                      | 73,98                               |
| October            | 0,07                 | 172,70  | 16,04                                      | 188,74                              |
| November           | 0,10                 | 246,04  | 18,84                                      | 264,88                              |
| December           | 0,11                 | 255,50  | 18,84                                      | 274,34                              |
| <b>ANNUAL AVE.</b> | <b>0,70</b>          | <b>1651,29</b>                                    | <b>189,68</b>                              | <b>1840,97</b>                      |

## B WATER DEMAND

### B1 LANDSCAPE IRRIGATION DEMAND (m<sup>3</sup>)

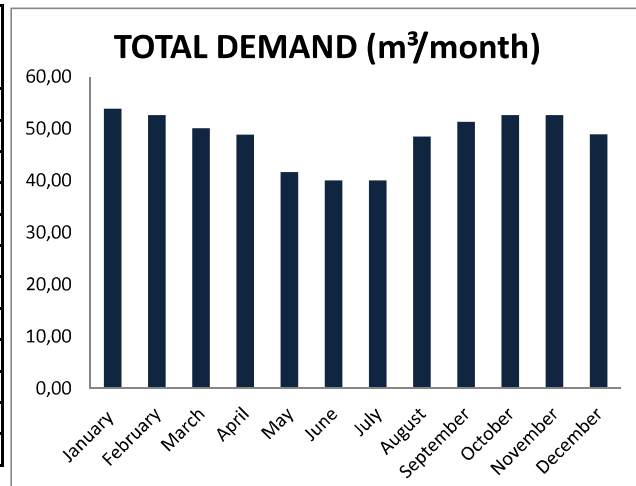
| DESCRIPTION:        | LAWN (m <sup>2</sup> ): 297 |                                  | AGRI (m <sup>2</sup> ): 83 |                                  | PLANTING (m <sup>2</sup> ): 16 |                                  | TOTAL MONTHLY IRR. DEMAND (m <sup>3</sup> ) |
|---------------------|-----------------------------|----------------------------------|----------------------------|----------------------------------|--------------------------------|----------------------------------|---|
| MONTH               | WEEKLY IRR. (m)             | MONTHLY DEMAND (m <sup>3</sup> ) | WEEKLY IRR. (m)            | MONTHLY DEMAND (m <sup>3</sup> ) | WEEKLY IRR. (m)                | MONTHLY DEMAND (m <sup>3</sup> ) |   |
| January             | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| February            | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| March               | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| April               | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| May                 | 0,01                        | 11,88                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 20,5  |
| June                | 0,01                        | 11,88                            | 0,025                      | 8,3                              | 0                              | 0                                | 20,18                                       |
| July                | 0,01                        | 11,88                            | 0,025                      | 8,3                              | 0                              | 0                                | 20,18                                       |
| August              | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0                              | 0                                | 26,12                                       |
| September           | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| October             | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| November            | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| December            | 0,015                       | 17,82                            | 0,025                      | 8,3                              | 0,005                          | 0,32                             | 26,44                                       |
| <b>ANNUAL TOTAL</b> |                             | <b>196,02</b>                    |                            | <b>99,6</b>                      |                                | <b>2,88</b>                      | <b>298,5</b>                                |

### B3 EVAPORATION LOSS (For 'open' reservoirs)

35mm - 45mm/week in summer

B4

| MONTH               | EVAPORATION RATE (m/week) | EVAPORATION RATE (m/month) | TOTAL LOSS (m <sup>3</sup> /month) |
|---------------------|---------------------------|----------------------------|------------------------------------|
| January             | 0,04                      | 0,16                       | 10,08                              |
| February            | 0,035                     | 0,14                       | 8,82                               |
| March               | 0,025                     | 0,1                        | 6,3                                |
| April               | 0,02                      | 0,08                       | 5,04                               |
| May                 | 0,015                     | 0,06                       | 3,78                               |
| June                | 0,01                      | 0,04                       | 2,52                               |
| July                | 0,01                      | 0,04                       | 2,52                               |
| August              | 0,02                      | 0,08                       | 5,04                               |
| September           | 0,03                      | 0,12                       | 7,56                               |
| October             | 0,035                     | 0,14                       | 8,82                               |
| November            | 0,035                     | 0,14                       | 8,82                               |
| December            | 0,04                      | 0,16                       | 10,08                              |
| <b>ANNUAL TOTAL</b> | <b>0,32</b>               | <b>1,26</b>                | <b>79,38</b>                       |



### A1 DOMESTIC & WC DEMAND

| MONTH               | PERSONS/DAY | WATER/CAPITA/DAY (l) | DOMESTIC DEMAND (m <sup>3</sup> /month) |
|---------------------|-------------|----------------------|---|
| January             | 70          | 8                    | 17,36                                   |
| February            | 70          | 8                    | 17,36                                   |
| March               | 70          | 8                    | 17,36                                   |
| April               | 70          | 8                    | 17,36                                   |
| May                 | 70          | 8                    | 17,36                                   |
| June                | 70          | 8                    | 17,36                                   |
| July                | 70          | 8                    | 17,36                                   |
| August              | 70          | 8                    | 17,36                                   |
| September           | 70          | 8                    | 17,36                                   |
| October             | 70          | 8                    | 17,36                                   |
| November            | 70          | 8                    | 17,36                                   |
| December            | 50          | 8                    | 12,4                                    |
| <b>ANNUAL TOTAL</b> |             |                      | <b>203,36</b>                           |

## C WATER BUDGET

 TANK CAPACITY (m<sup>3</sup>):

|            |
|------------|
| <b>260</b> |
|------------|

 MIN VOLUME (m<sup>3</sup>):
 

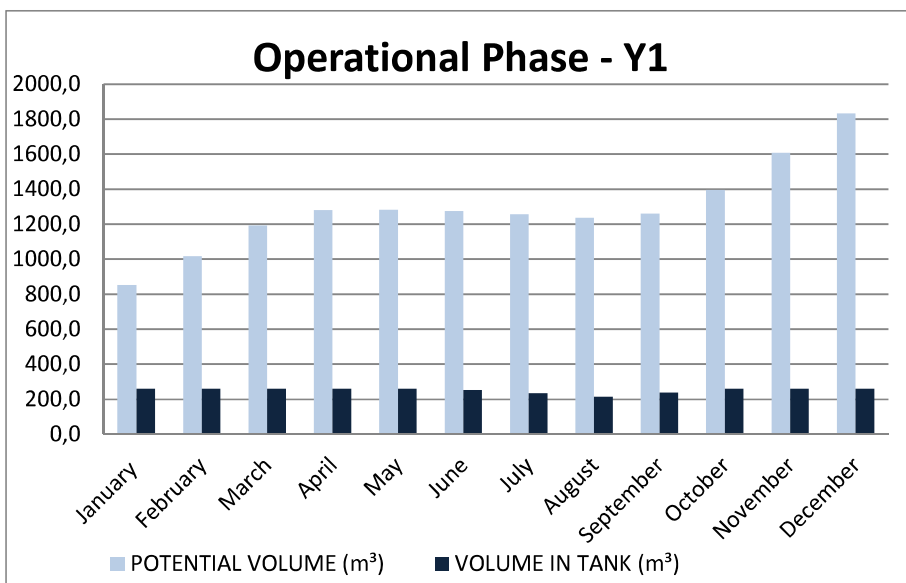
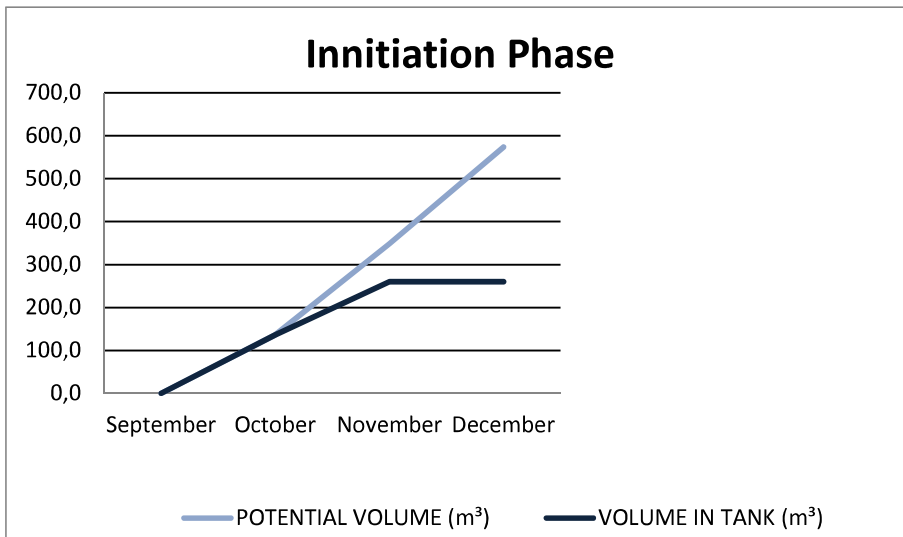
|  |
|--|
|  |
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### C1 WATER BUDGET                      INNITIATION PHASE

| MONTH        | YIELD<br>(m <sup>3</sup> /month) | DEMAND<br>(m <sup>3</sup> /month) | MONTHLY<br>BALANCE | POTENTIAL<br>VOLUME (m <sup>3</sup> ) | VOLUME IN<br>TANK (m <sup>3</sup> ) |
|--------------|----------------------------------|-----------------------------------|--------------------|---------------------------------------|-------------------------------------|
| September    | 74,0                             | 51,4                              | 22,6               | <b>0,0</b>                            | <b>0,0</b>                          |
| October      | 188,7                            | 52,6                              | 136,1              | <b>136,1</b>                          | <b>136,1</b>                        |
| November     | 264,9                            | 52,6                              | 212,3              | <b>348,4</b>                          | <b>260,0</b>                        |
| December     | 274,3                            | 48,9                              | 225,4              | <b>573,8</b>                          | <b>260,0</b>                        |
| <b>801,9</b> |                                  | <b>205,5</b>                      | <b>596,4</b>       |                                       |                                     |

### C2 WATER BUDGET                      YEAR 1

| MONTH              | YIELD<br>(m <sup>3</sup> /month) | DEMAND<br>(m <sup>3</sup> /month) | MONTHLY<br>BALANCE | POTENTIAL<br>VOLUME (m <sup>3</sup> ) | VOLUME IN<br>TANK (m <sup>3</sup> ) |
|--------------------|----------------------------------|-----------------------------------|--------------------|---------------------------------------|-------------------------------------|
| January            | 333,5                            | 53,9                              | 279,6              | <b>853,4</b>                          | <b>260,0</b>                        |
| February           | 217,1                            | 52,6                              | 164,5              | <b>1017,9</b>                         | <b>260,0</b>                        |
| March              | 224,2                            | 50,1                              | 174,1              | <b>1192,0</b>                         | <b>260,0</b>                        |
| April              | 137,9                            | 48,8                              | 89,0               | <b>1281,1</b>                         | <b>260,0</b>                        |
| May                | 43,2                             | 41,6                              | 1,6                | <b>1282,6</b>                         | <b>260,0</b>                        |
| June               | 31,8                             | 40,1                              | -8,3               | <b>1274,4</b>                         | <b>251,7</b>                        |
| July               | 22,3                             | 40,1                              | -17,8              | <b>1256,6</b>                         | <b>233,9</b>                        |
| August             | 29,0                             | 48,5                              | -19,5              | <b>1237,1</b>                         | <b>214,5</b>                        |
| September          | 74,0                             | 51,4                              | 22,6               | <b>1259,7</b>                         | <b>237,1</b>                        |
| October            | 188,7                            | 52,6                              | 136,1              | <b>1395,9</b>                         | <b>260,0</b>                        |
| November           | 264,9                            | 52,6                              | 212,3              | <b>1608,1</b>                         | <b>260,0</b>                        |
| December           | 274,3                            | 48,9                              | 225,4              | <b>1833,5</b>                         | <b>260,0</b>                        |
| <b>ANNUAL AVE.</b> | <b>1841,0</b>                    | <b>581,2</b>                      | <b>1259,7</b>      |                                       |                                     |



## 6.2 VENTILATION AND THERMAL COMFORT

This iteration includes the comfortability of the building in terms of ventilation and incorporates design principles that facilitate climatic wellbeing. The value of spaces within the building are directly linked to the level of wellbeing able to be achieved by the users of within the space. Appropriations of passive and active strategies are to be applied to achieve optimal climatic comfort and enhanced thermal functions within the building. As with acoustic appropriations necessary in order to facilitate optimal recording spaces, the constructibility of materials, scale and economic viability is taken into consideration.

Leading factors concerning these iterations deal with practicality, maintenance requirement, life-cycle considerations, energy use and overall environmental impact, in keeping with principles of regenerative theory. The outcome of these systems within the building are also considered within the authors phenomenological intentions, and therefore consider the integration and visibility of practical conformations, as integral to the scheme, as the poetics of water.

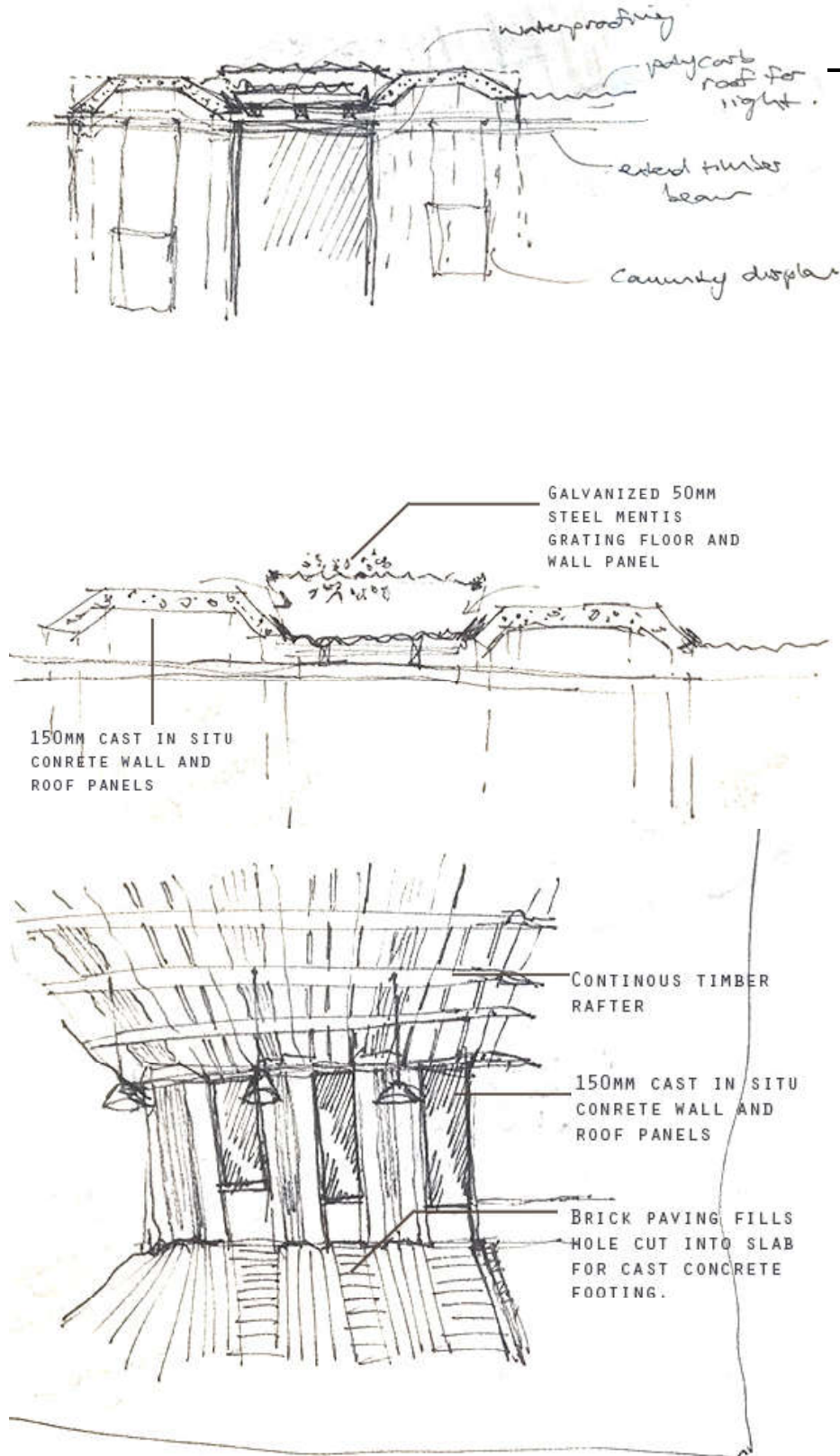
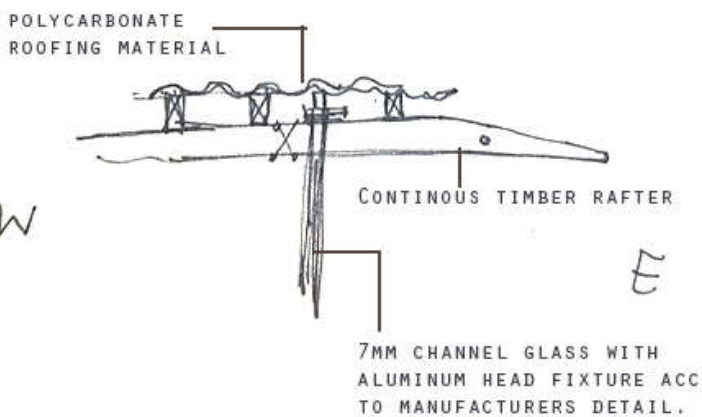
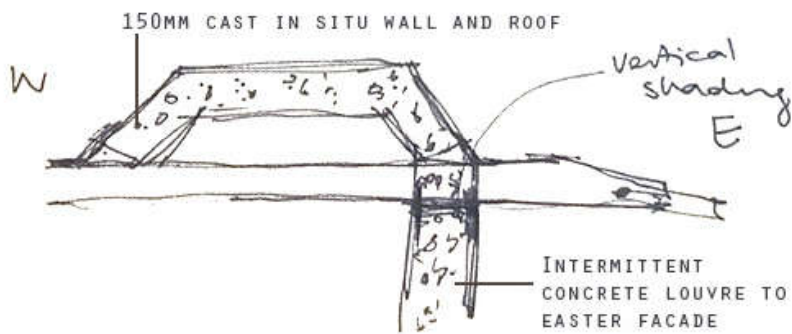


FIG. 116 :PROCESS WORK ;  
ITERATIVE TECHNICAL DESIGN  
SKETCHES (AUTHOR, 2018)

END OF ROOF CONDITIONS:



RHYTHM OF CONCRETE AND GLAZING

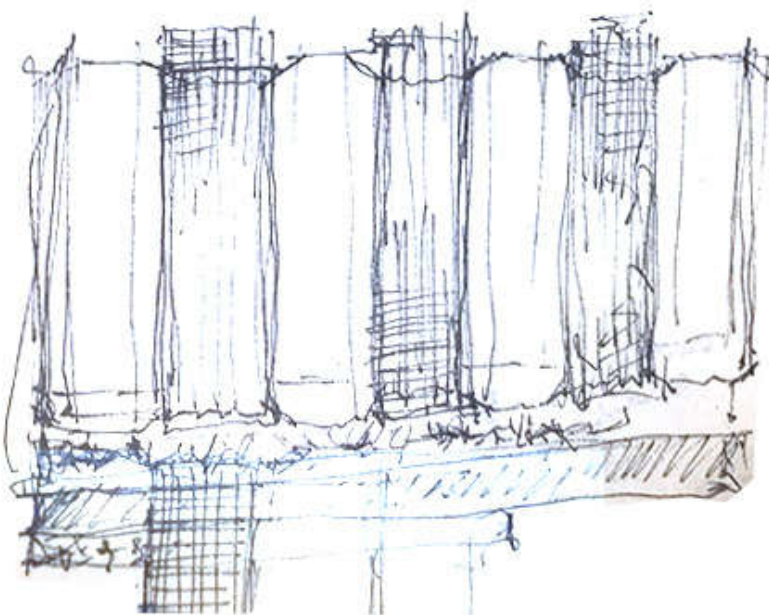


Fig. 117 :PROCESS WORK ; ITERATIVE TECHNICAL DESIGN SKETCHES (AUTHOR, 2018)



FIG. 118 :DIAGRAM SHOWING WATER ROUTE & PLANTING SCHEMES(AUTHOR, 2018)

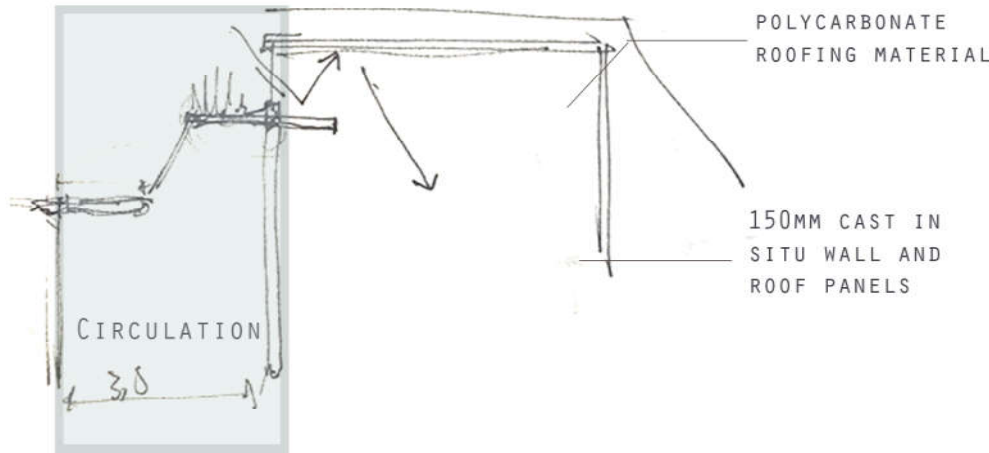


FIG. 119 :DIAGRAM SHOWING VERTICAL CIRCULATION (AUTHOR, 2018)

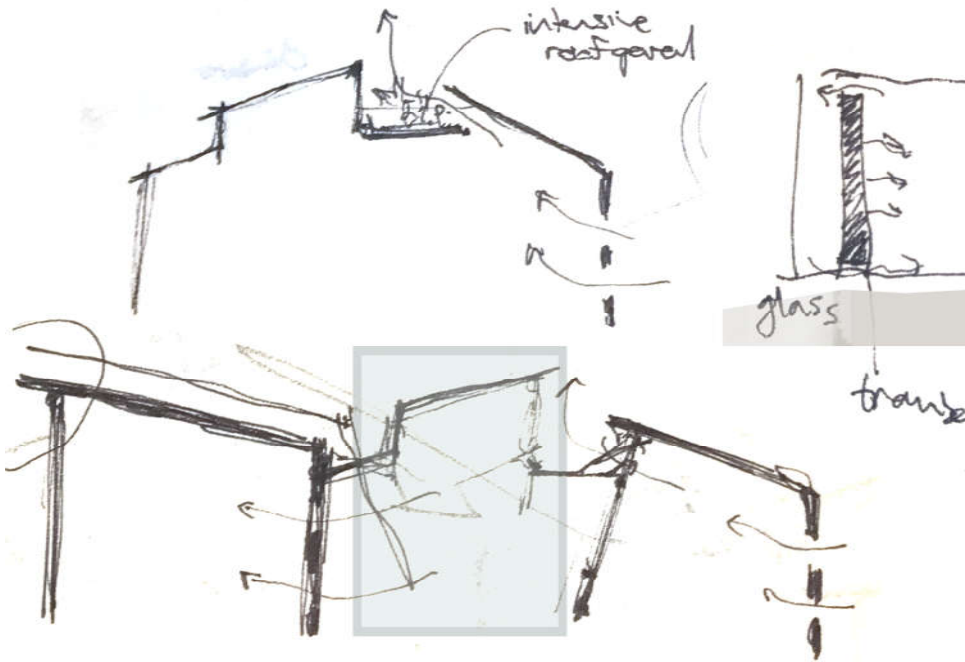
6.2.1 PASSIVE ELEMENTS:

Ideally, the aim is to evoke as little as possible strain both environmentally and economically, whilst assuring that the building envelope retains an optimal thermal performance. This requires the building envelope to allow for passive heating and cooling through appropriate material choice, insulation, ventilation, glazing, shading and roofing choices. It is furthermore implemented within the design strategies of SANS 10400-XA:20011 (Energy usage in buildings) regarding temperate interiors, Climatic Zone 2.

## VENTILATION EXPLORATION



### EXTENSIVE ROOF GARDEN AND LIGHT SHELF



### STACK AND DISPLACEMENT VENTILATION

FIG. 120 :PROCESS WORK:  
TECHNICAL ROOF ITERATIONS  
(AUTHOR, 2018)

## 6.2.2 SOLAR GAIN:

Fundamental principles of sustainable solar design is implemented in order to regulate the internal heat of the building, caused by the sun. These investigations aim to iterate different methods of maximum solar gain in the winter, and minimum solar gain in the warmer summer months. These strategies include iterating glazing (area, type, Low-E), the orientation of the building and placement of glazed elements, as well as thermal massing employment through appropriate material choices, in this case concrete

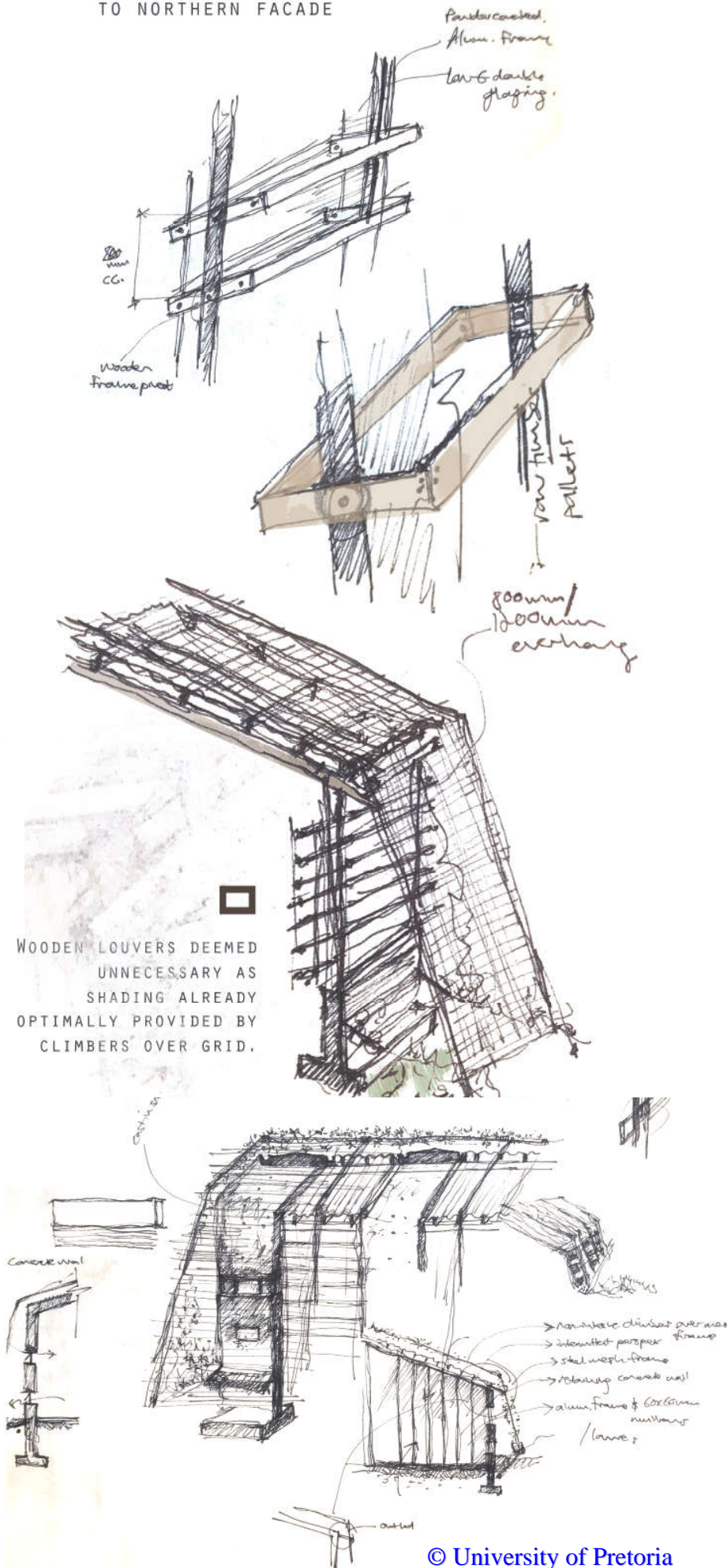
## 6.2.3 GLAZING:

The Ener-G Smart Low E range of products complies to SANS 1263:Part 1 when laminated (PVB layer between coated surface glass panel), with a compliant U-value of  $3.7\text{W/m}^2\text{K}$  and shading coefficient of 0.46. As non-laminated ordinary glass is responsible for up to 40% of lost energy in a building, PG SmartGlass high-performance glass products make for the smarter and more efficient choice to achieve better energy efficiency and low-cost/passive heating and cooling strategies (Pgsmartglass.co.za, 2018).

The glazing on the 1st floor northern, eastern and southern façades are indispensable to the theory of reckoning and reflective conceptual program of the building.



LOUVRE EXPLORATION  
TO NORTHERN FACADE



6.2.4 VENTILATION:

The abundant allowance for natural fresh air in the space is made optimal by the rural and relatively pristine conditions of the site. As there is minimal urban pollution impact, passive ventilation strategies can be more readily applied in this case, in contrast to a heavily urban condition scenario. As the building is situated in close proximity of the perennial Pienaars River (approximately 10m off of the 50-year flood line), the quality of cool air can be employed with strategies such as evaporative cooling and ventilation. This is to be further investigated.

With further integration of intensive and extensive roof gardens, ample shading of Northern and eastern façades provided by planting structures (all western walls are retaining and solid within the earth) it is concluded that only natural ventilation will be applied to the 1st floor and entrance level of the building. As these public spaces are sufficiently insulated with 150-200mm concrete walls, floors and roofs, ample green (and thereby cooling) shading from climber structures and louvres, and retained by 6m+ of soil on all western façades, with perimeter insulation, free area openings only are required. These openings are placed in order to make full use of natural buoyancy and stratification of rising hot air and falling cool air, as seen on pg.151.

FIG. 121 :PROCESS WORK:  
TECHNICAL CONCRETE WALL-ROOF  
AND CLIMBER ITERATIONS (AUTHOR,  
2018)

### 6.3.5 THERMAL MASSING:

As large parts of the building are in-situ concrete walls floors and roofs, with proper insulation and waterproofing, this allows for optimal storage of excessive heat during the warmer seasons, systematically releasing the heat 8 hours after retention in the colder night time periods. This ability of absorbing and storing heat energy, is called thermal massing, and is present in high density materials used in the project such as brick, concrete and brick paving/tiles.

The conductivity of concrete depends on type of aggregate, moisture content, density, and temperature of concrete, and is therefore appropriately achieved according to engineer's specifications. When the concrete is saturated, the conductivity ranges generally between about 1.4 and 3.4  $\text{J/m}^2\text{s}^\circ\text{C/m}$ . Scientifically, thermal mass is equivalent to thermal capacitance or heat capacity, the ability of a body to store thermal energy. It is typically referred to by the symbol  $C_{th}$  and measured in units of  $\text{J}/^\circ\text{C}$  or  $\text{J}/\text{K}$  (which are equivalent) (Eco-Principles, 2018).

FIG. 122 ; ITERATION OF NORTH-SOUTH SECTION IN ORDER TO DETERMINE THERMAL MASSING AND OPTIMAL SUN ANGLES (AUTHOR, 2018)

01

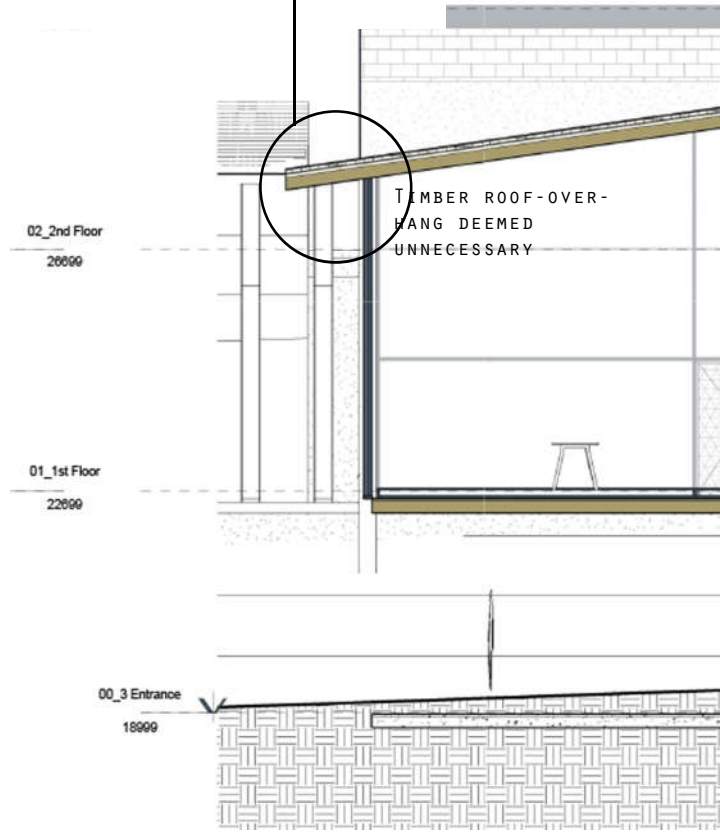
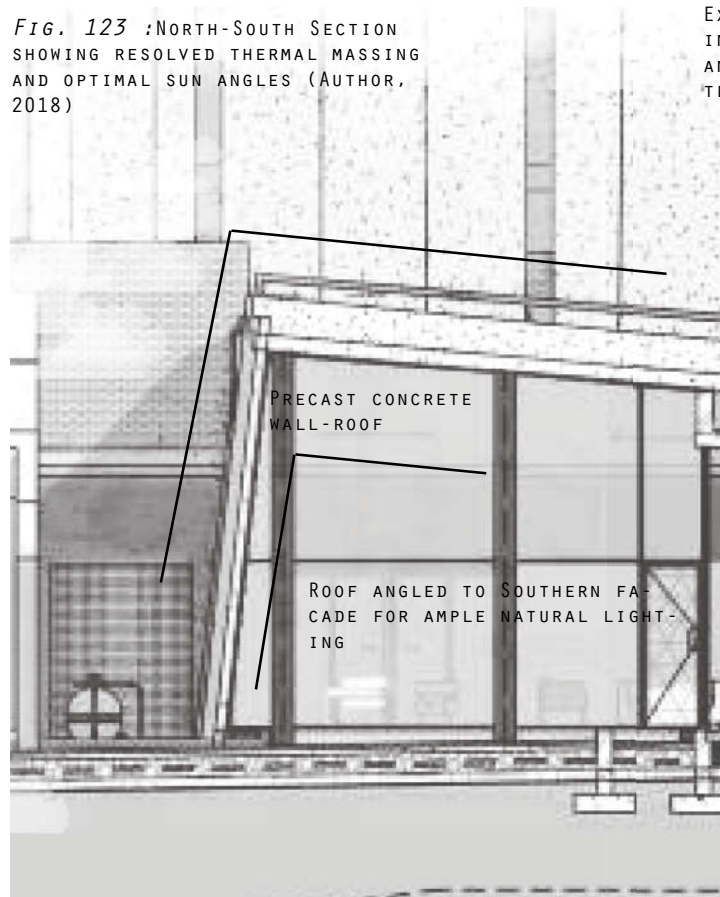
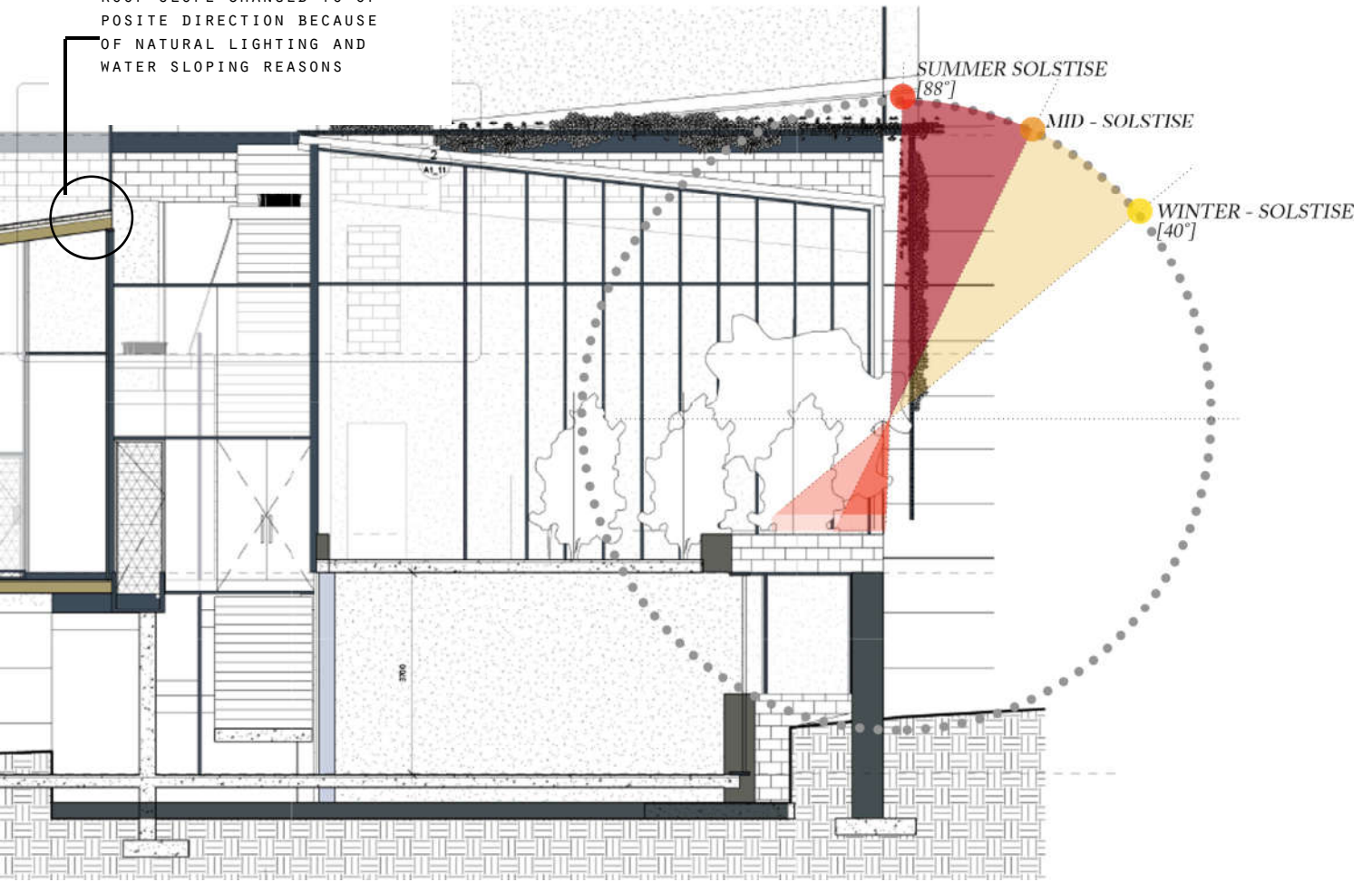


FIG. 123 ; NORTH-SOUTH SECTION SHOWING RESOLVED THERMAL MASSING AND OPTIMAL SUN ANGLES (AUTHOR, 2018)

02

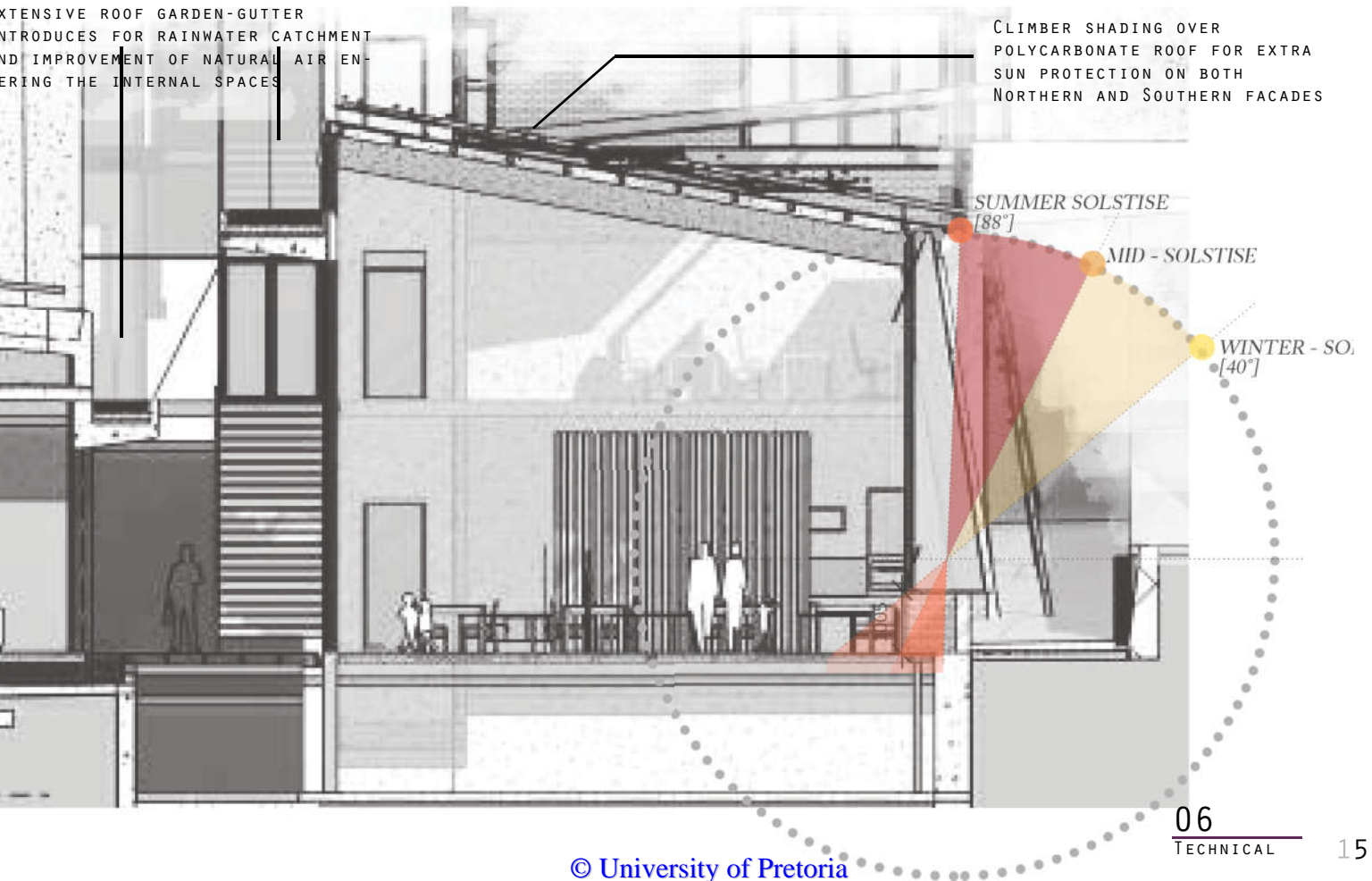


ROOF SLOPE CHANGED TO OPPOSITE DIRECTION BECAUSE OF NATURAL LIGHTING AND WATER SLOPING REASONS



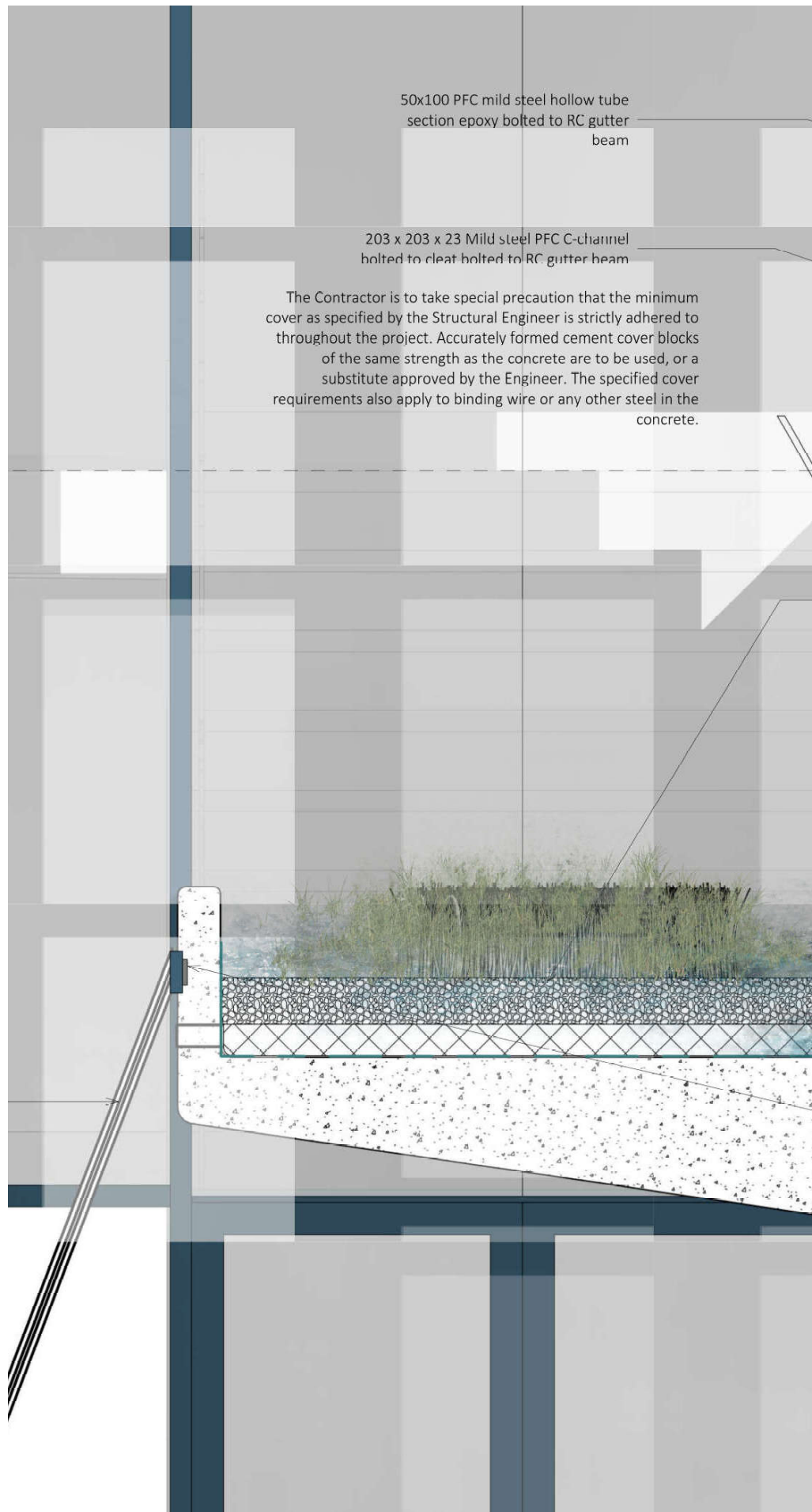
EXTENSIVE ROOF GARDEN-GUTTER INTRODUCES FOR RAINWATER CATCHMENT AND IMPROVEMENT OF NATURAL AIR ENTERING THE INTERNAL SPACES

CLIMBER SHADING OVER POLYCARBONATE ROOF FOR EXTRA SUN PROTECTION ON BOTH NORTHERN AND SOUTHERN FACADES



These naturally ventilated spaces will be required to comply with the Lighting and ventilation standards of SANS 10400-Part O;2011. This stipulates free area openings of minimum 5% of the floor area, to be aptly arranged for optimal cross-flow ventilation and equal distribution, in accordance with the minimum required air-flow rates of fresh air for various occupied spaces. The general indicative values for optimal thermal comfort is a dry-bulb temperature range of 21-14deg, relative humidity of 35-70%, and air movement velocity of less than 0.1m/s for the mean population (ASHRAE, 62.1-2013).

The installation of adjustable louvres to the Eastern façade is also to assist with indoor thermal comfort in peak summer and winter, one can consider to angle some of the louvered openings during those times by actuated dampers linked to temperature sensors or manually adjustable louver blades. This will eliminate the risk of blocking the flow of fresh air into the space, contrary to completely closing the blades as this is unnecessary due to other compensating architectural features that further optimize passive strategies.



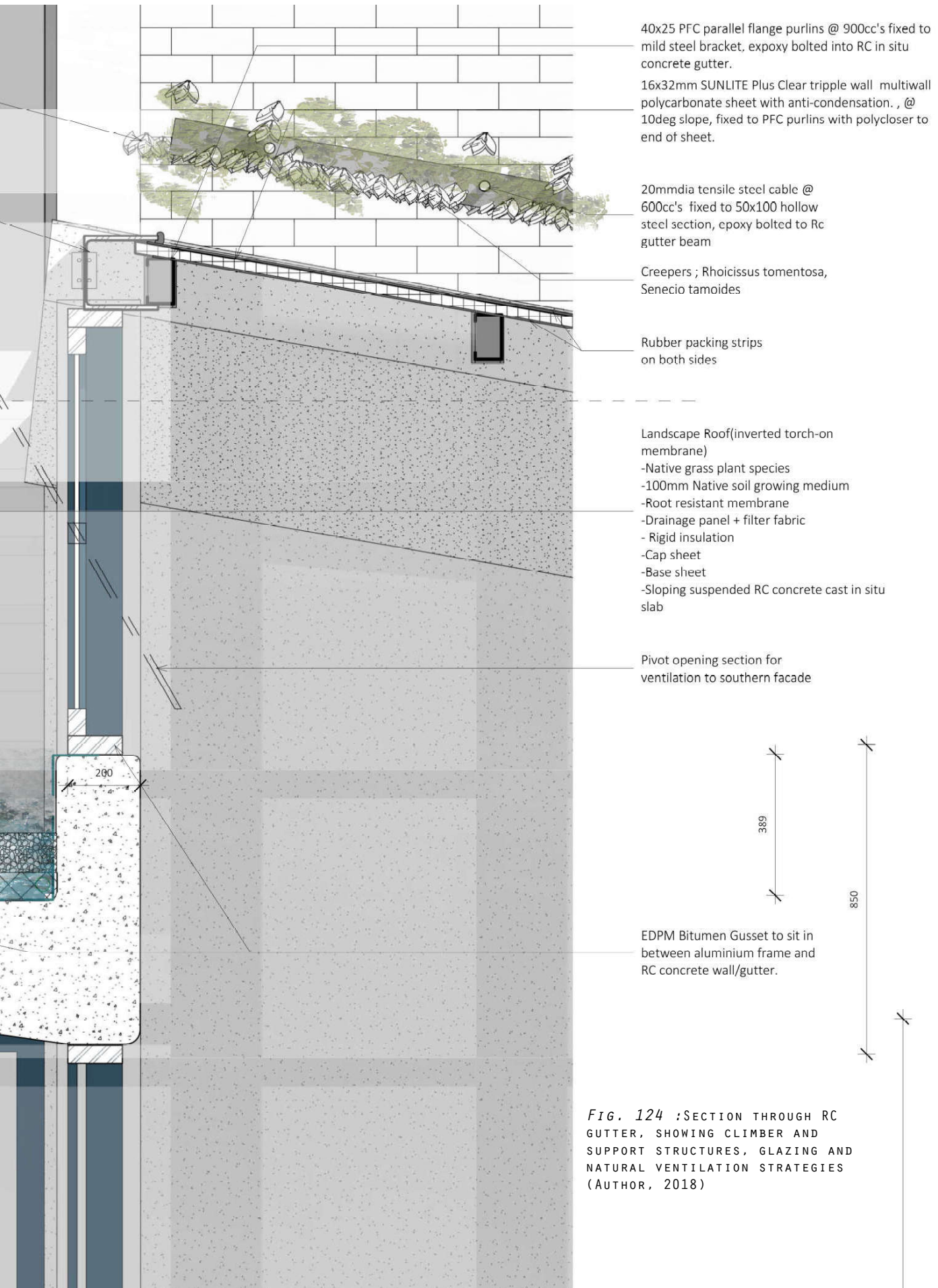


FIG. 124 :SECTION THROUGH RC GUTTER, SHOWING CLIMBER AND SUPPORT STRUCTURES, GLAZING AND NATURAL VENTILATION STRATEGIES (AUTHOR, 2018)

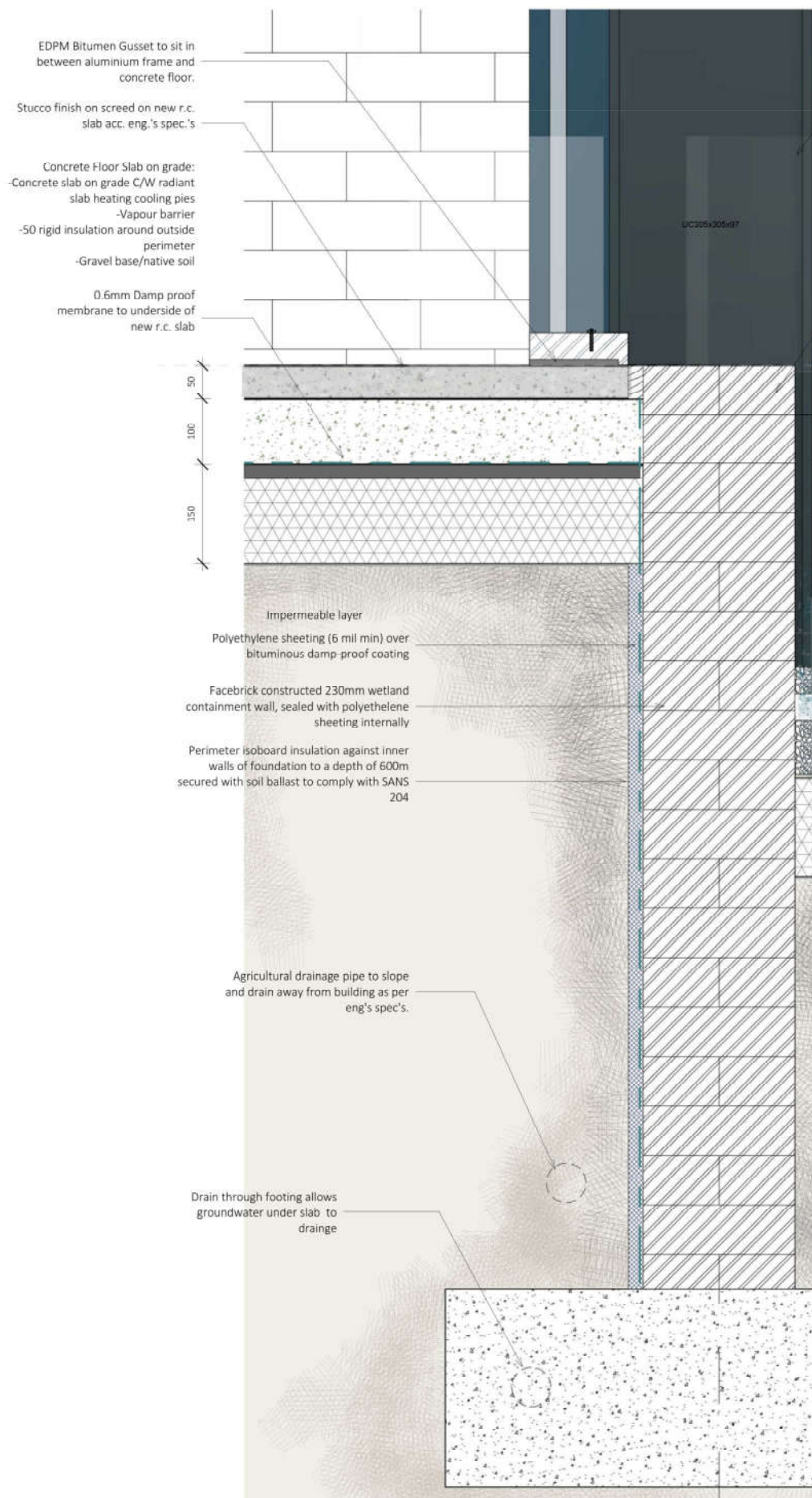
It is understood that certain spaces within the building is in greater need of optimal thermal comfortability, more so than perhaps general public and circulation spaces, such as the 1st floor zoning. These spaces that need extra consideration include lecture halls, research commons, computer labs, and recording studios. As some of these functions limited less natural light, absolute sound insulation, complete interior isolation, or plain optimal human-comfort, the design strategy has to change from passive to active. According to SANS part O, it is against the regulations to combine natural and mechanical ventilation in one space, as the minimum air flow rates for the two differ.

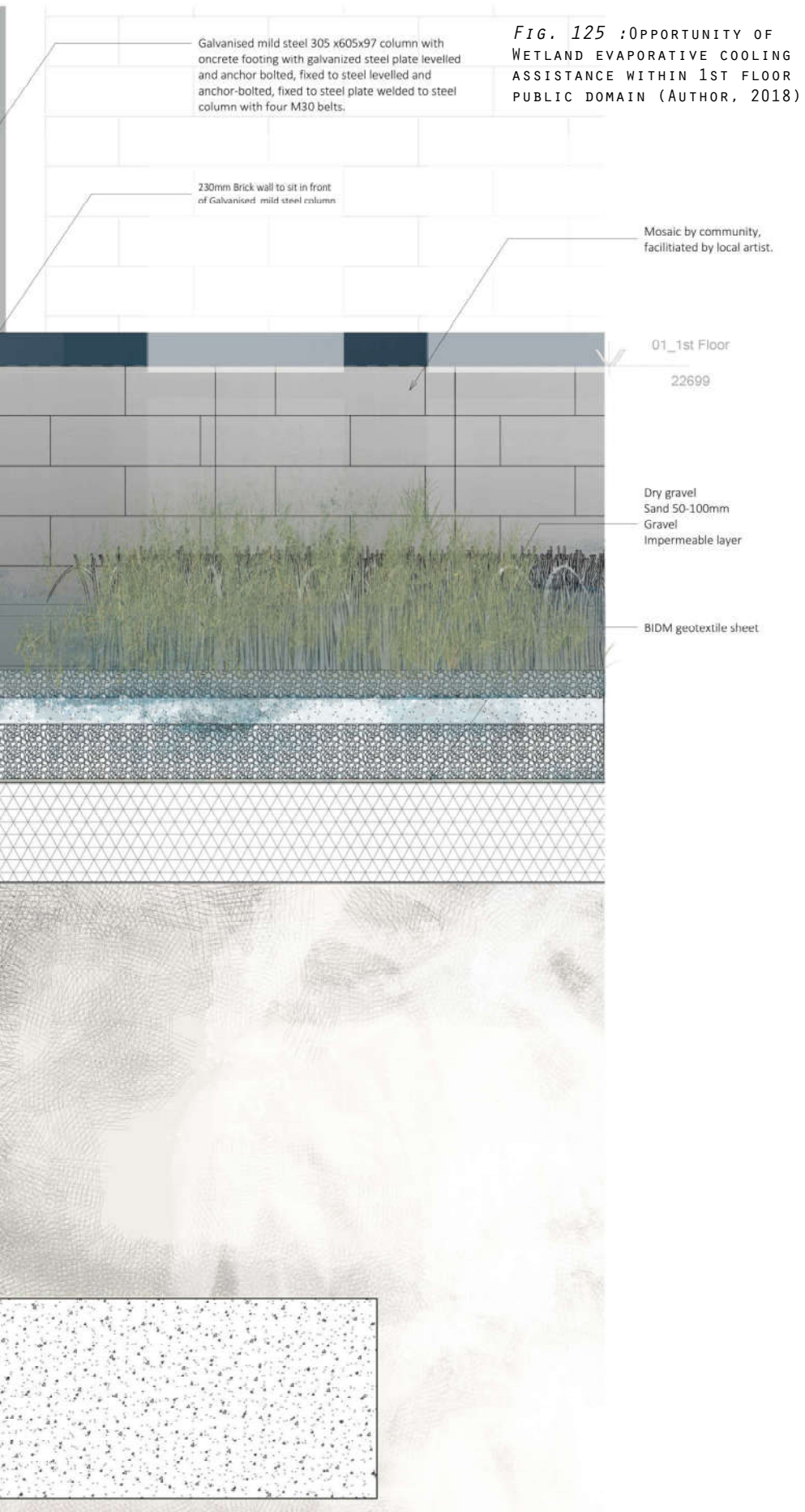
### 6.3.6 COOLING & HEATING:

The chosen form of mechanical ventilation is investigated in terms of cost, estimated financial impact, environmental impact and concept and architectural impact.

**Evaporative cooling:** Although this method seems plausible within the constructs of the natural and river bound site, this method is not approved by the Green Building Council of South Africa, as the quality of water mixed with the air makes the level of possible bacteria hard to control, and could be a possible health concern. This method of cooling involves a constant water supply for the cooling of evaporative wet packs which releases fresh air through a fan and ducting system.

This system is relatively cheap and usually lower than domestic HVAC systems, but does involve a constant supply of water, that is equal to the amount that can be captured by grey water and rain water catchment, and is therefore not a sustainable method within the greater scheme of the project. Although the presence of an exposed aqueduct on the 1st floor public level does utilise extra cooling through air movement over the water, it is not seen as evaporative cooling as it is without wet packs or ducting systems.





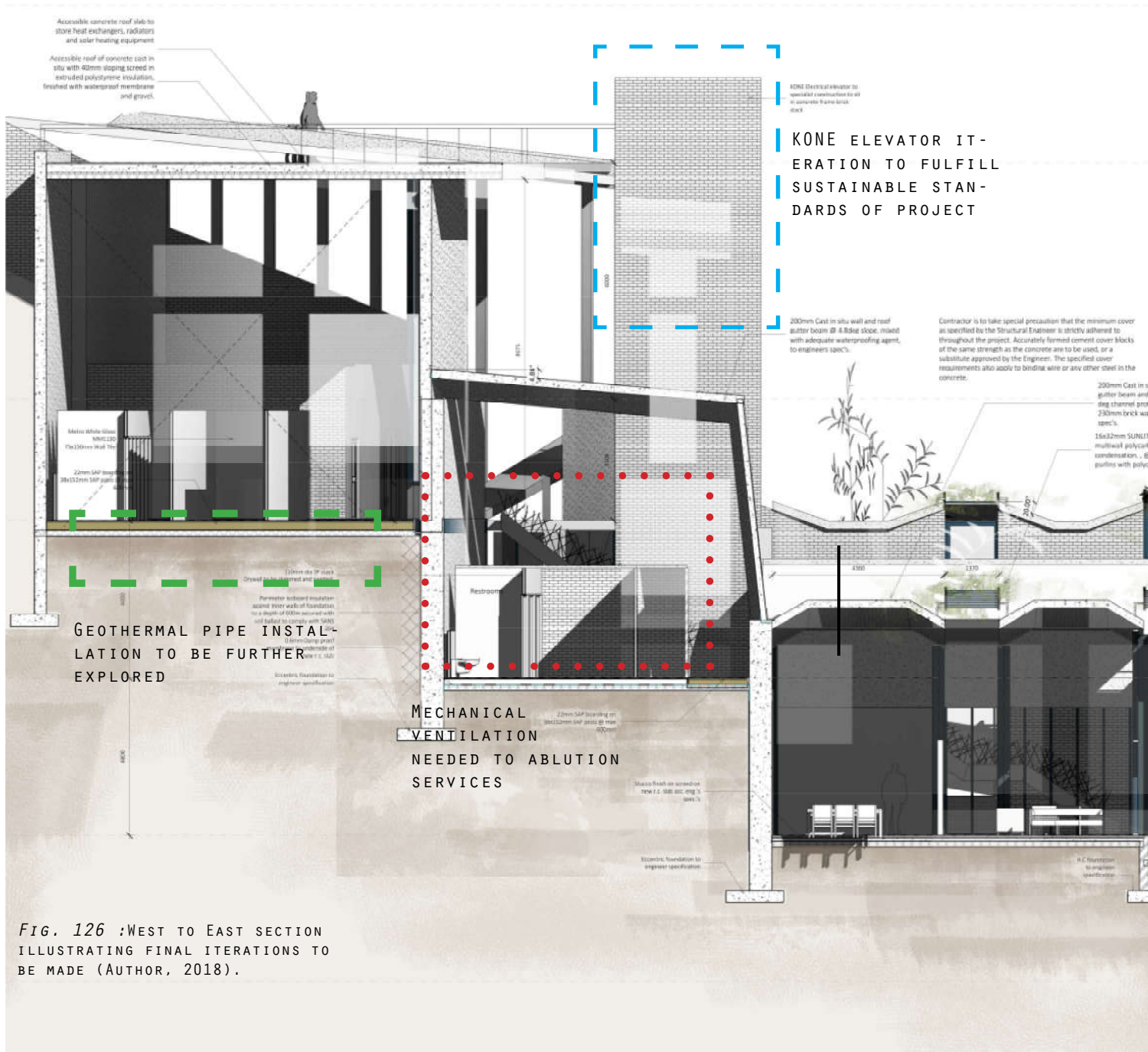


FIG. 126 :WEST TO EAST SECTION ILLUSTRATING FINAL ITERATIONS TO BE MADE (AUTHOR, 2018).

### 6.3.7 GEOTHERMAL:

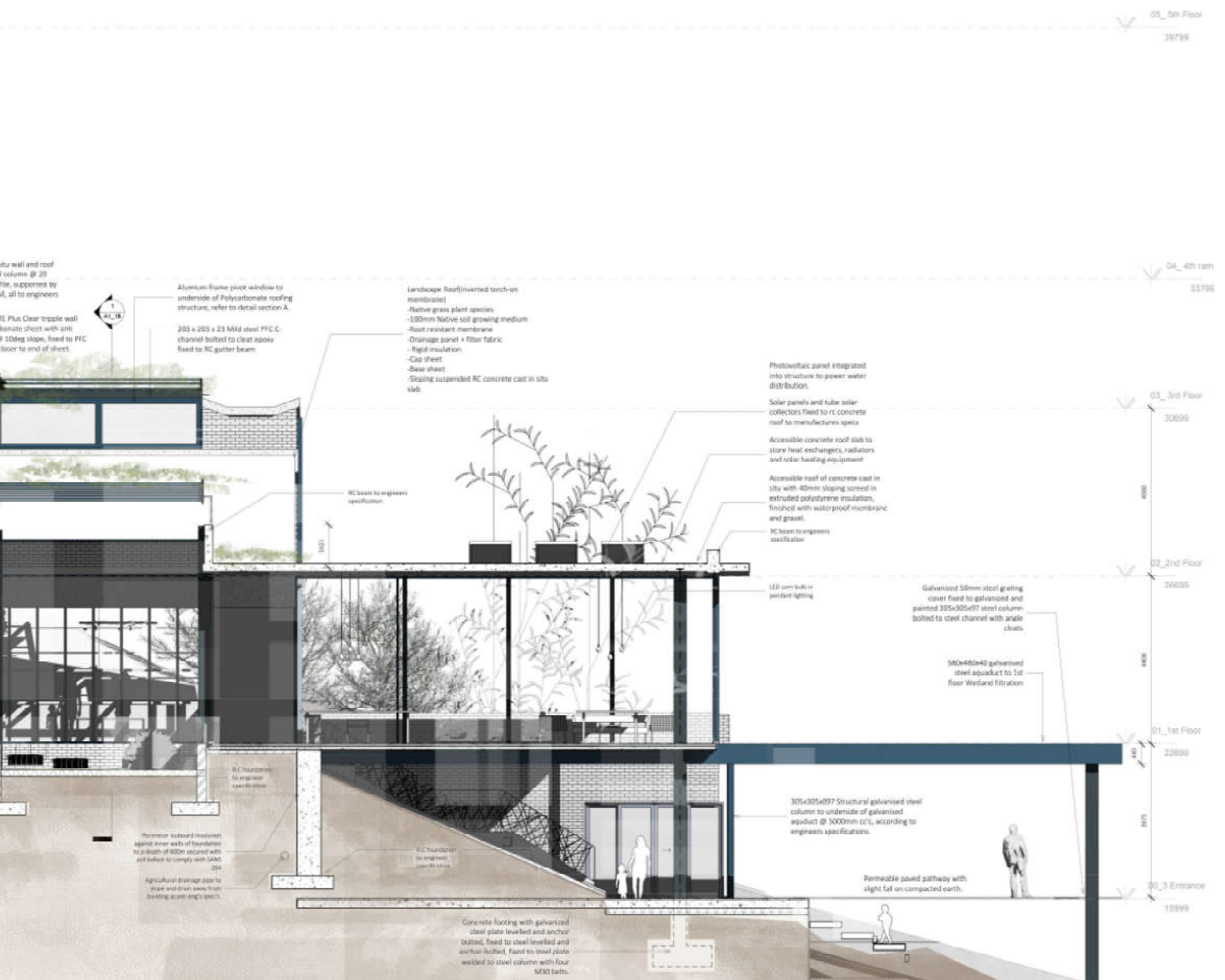
As the building is situated on a steep slope, thereby utilising the cut and fill technique, a lot of the internal spaces are retained by 500mm concrete retaining walls. The retained earth behind these western retaining walls offer an opportunity of utilising geothermal techniques for heating or cooling within the building. This method uses a heat pump system using refrigeration cycles that move heat energy either low-high energy spaces, or vice versa. The soil in this climate is generally 10deg colder than the air in the warmer months, and 8-10deg warmer than the air in

the cooler months (acting as natural thermal massing). The refrigeration coil systems transfers heat to/from closed loop water pipes installed underground, as the earth thereby acting as a heat sink or source, depending on seasonal temperatures. This system thereby provides not only cool air circulation, as evaporative systems do, but also heated energy, making it a more effective resolution as a whole.

The water involved in this closed system is not an entire extra source to e provided especially to the system, but utilises the buildings hot and cold water supply and recirculates, leaving no wasted water in its wake.

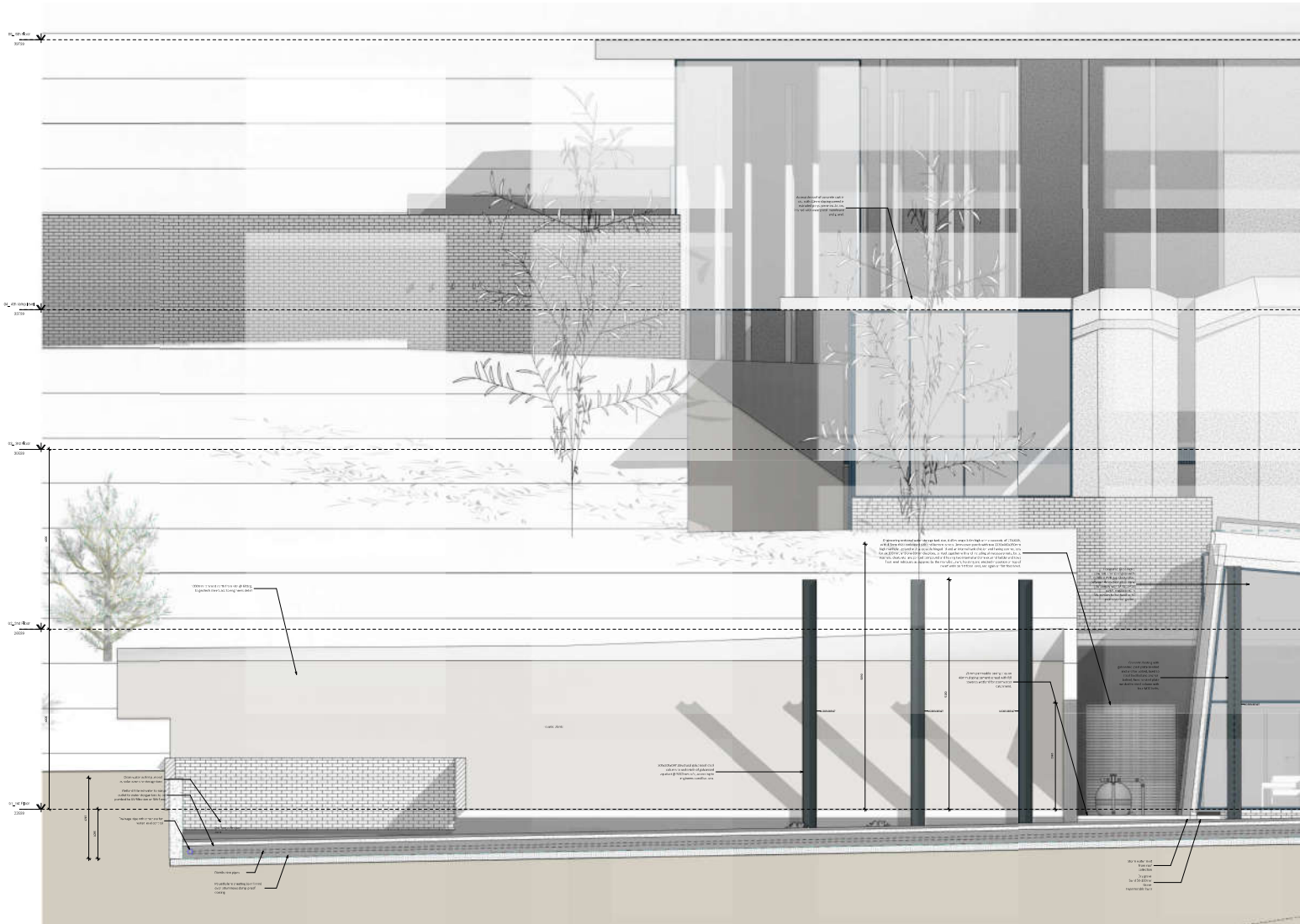
The implication of this system is the ducting needed internally for air distribution of from the underground installation of closed loop water circulation (augmented with a geothermal heat pump).





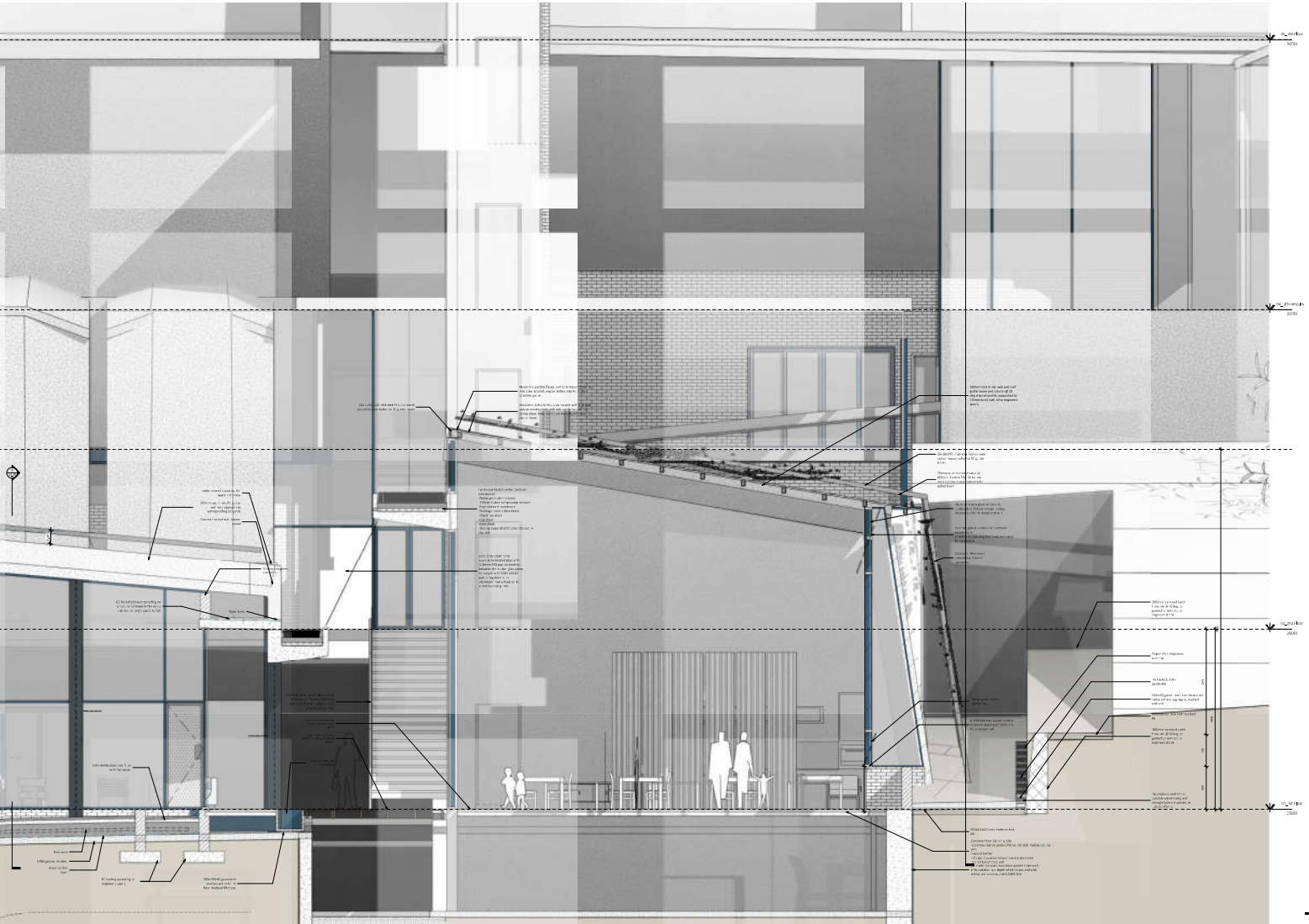
Although this is a rather expensive system to employ, it does provide a strong sustainability argument as it is very low energy (approximately 30-40% lower than domestic HVAC systems). The relatively constant geothermal temperature of 10-15%, acting as either heat sink/source, can be assisted by the implementation of a geothermal heat pump compressor, if/when ground temperature proves insufficient.

Mechanical ventilation required for ablutions areas to be confirmed. 20 air changes per hour necessary, and 4 air changes per hour for the public and instructional spaces as per regulation (SANS 10400 Part O)



**Fig. 127 :South - North Section  
 ON 1ST FLOOR LEVEL OF BUILDING,  
 SHOWING SIMPLE RESOLUTION OF ROOF,  
 FLOOR, WALL AND WETLAND ELEMENTS  
 (AUTHOR, 2018).**

KONE ELEVATOR ITERATION  
TO FULFILL SUSTAINABLE  
STANDARDS OF PROJECT



### 6.3.8 KONE ELEVATOR S MINISPACE CAR:

#### A green hoisting system

This system reduces the amount of energy that is used with traditional geared hoisting machines. The energy efficiency of the DC gearless KONE 'EcoDisc' is achieved with the use of synchronous magnets, as well as drive system that is vector-controlled with energy re-use options. These systems achieve a high total efficiency and thereby minimizes electrical and mechanical energy loss (Kone.co.za, 2018).

#### Regenerative drive

As the car descends with a heavy load, or ascends with a light load, potential energy is lost. The KONE elevator implements a regenerative drive that recovers this lost kinetic energy. This results in an energy saving of up to

#### Energy Saving

With standby mode Lights, signalization, and ventilation can consume a considerable amount of energy even when the elevator is not moving. 1. Automatic car light operation turns off the lights automatically when the car is not in use and on again when the car is called. 2. Corridor illumination control automatically controls the light on the destination floor. 3. The power stage of the drive is set to sleep mode when not in use. 4. Signalization displays are dimmed when not in use. 5. The car fan is turned off when the elevator is not in use.

#### Eco-efficient car lighting

Surprisingly, the car lighting can account for up to 40% (1100 kWh) of an elevator's energy consumption. Halogen spots have been replaced with eco-efficient, long-lasting LED and modern fluorescent lighting technology. The lights are optimized for maximum efficiency and natural colour saturation. LED lights last up to 10 times longer than traditional halogen bulbs and use up to 80% less energy (Kone.co.za, 2018).

The elevator is to have a double glazed wall to the northern and southern façades, as per the engineers specifications.

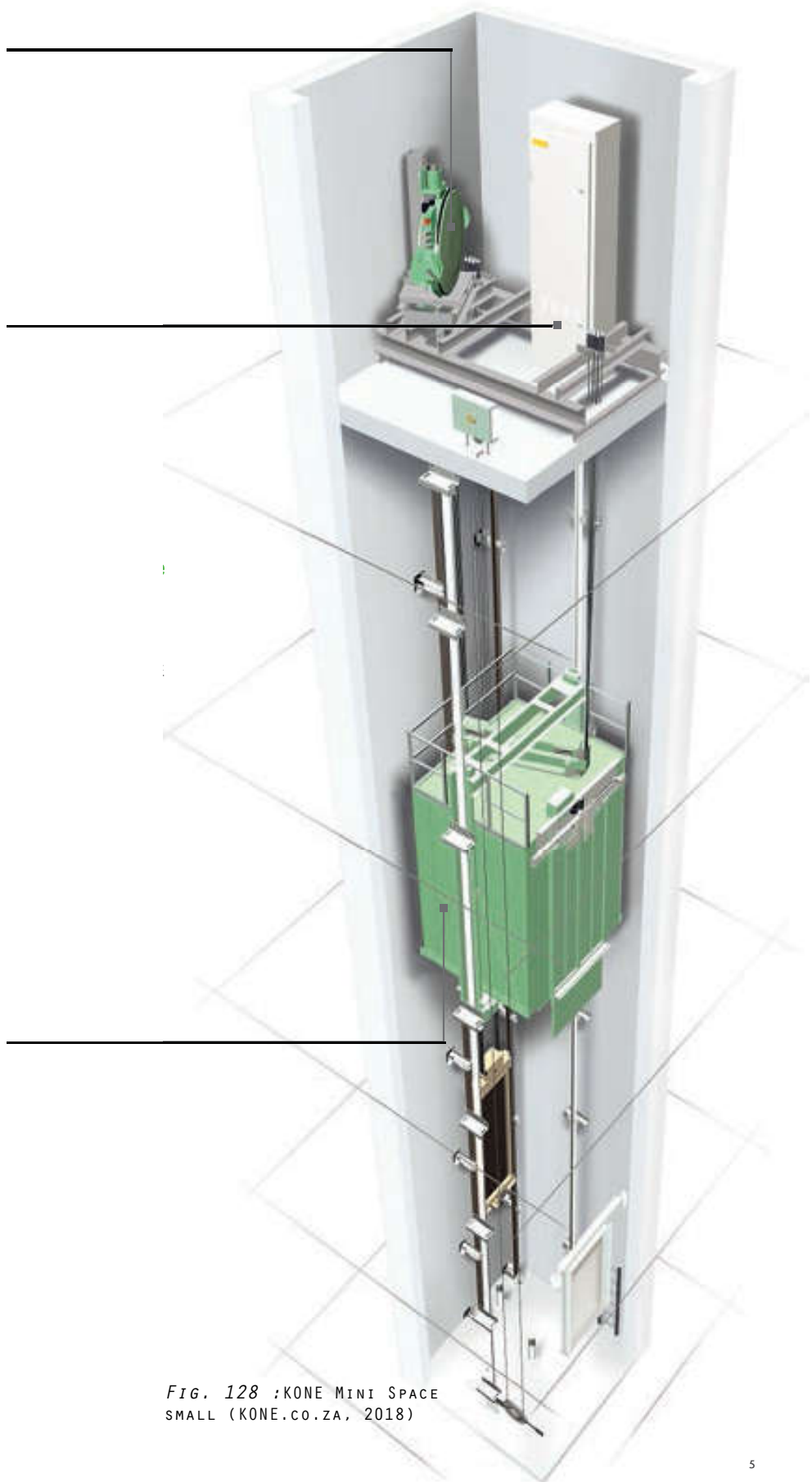


FIG. 128 :KONE MINI SPACE  
SMALL (KONE.CO.ZA, 2018)

### 6.3.9 ACOUSTICS - THERMACORK:

A Carbon sink is defined as anything that catches carbon, holds onto it, changes it into oxygen. Deforestation hinders this process, thereby counting most insulation products available. This is the importance of carbon negative processing and products. The cork oak tree used for cork manufacturing (usually found in Portugal) provides bark every nine years with harvesting by hand - the only carbon produced in transport and manufacturing. Cork manufactures use boilers for cork processing, giving 93% energy efficiency. Cork is a super-insulator, lowering amount of carbon being generated and the amount of money spent on other carbon positive insulating materials such as carpet (Thermacork, 2018).

The THERMACork product used in this project is the ThermaCork Facade covering as a finish for external walls where acoustic properties are of great concern. This product is thereby applied to the radio station recording rooms as well as computer facilities in the building. This is a 100% natural, additive-free, and sustainable facade covering with excellent durability. ThermaCork Facade is a natural and renewable material, and the industrial process is 100% natural, requiring no additives or any kind of treatment. It's an excellent thermal and acoustical insulation, and can work between (-) 180 degrees C to (+) 120 degrees C, making it an ideal material choice for the temperate Mamelodi conditions.



FIG. 129 ;THERMACORK FACADE  
 (THERMACORK, 2018)

### 6.3.10 SOLAR POWERED SYSTEM:

Solar panels consist of cells (photovoltaic) that collect and store sunlight that is converted into electricity, better known as the photovoltaic effect. These cells that convert sun-energy consist of two semi-conductive materials, one that is loaded positively and one negatively, usually silicon. The sunlight is absorbed by the negative semiconductor, at the bottom, free electrons up to flow to the positive semiconductor (at the top), when connected to an electrical load. These individual solar cells are connected in parallel in a way that builds the voltage necessary for electrical equipment. This flow creates a direct current of electricity.

These panels are laminated and sealed and placed in a rigid frame - ready for use in residential/industrial/commercial set-ups. This is therefore a carbon negative approach to energy supply, as the manufacturing and transport of PV panels are balanced out by the intake of solar energy as an electrical generator (Sustainable.co.za, 2018).

The chosen product, provided by local importer Sustainable.co.za, is the certified and in-house manufactured Renewsys Deserv 1640mm x 990mm x 40mm 270W (64.8kw per month) Solar panel. The goal is to produce 80% of the buildings used power by solar gain. As seen by the buildings lighting requirements, the lighting electrical load of the building and all its designated spaces and landscaping, is 425,537kw/month or 13,727kW/day (Charlston, 2018). This, in conjunction with the computer room (11points), and an average of 40 plug points for general appliances (e.g., Wi-Fi point, pc's, kettle, cell phones, sound equipment, monitors, microwaves) (Saveonenergy.com, 2018).

ITERATION OF AMOUNT  
AND POSITION OF  
SOLAR PANELS NEED  
TO BE UPGRADED TO  
20PANELS

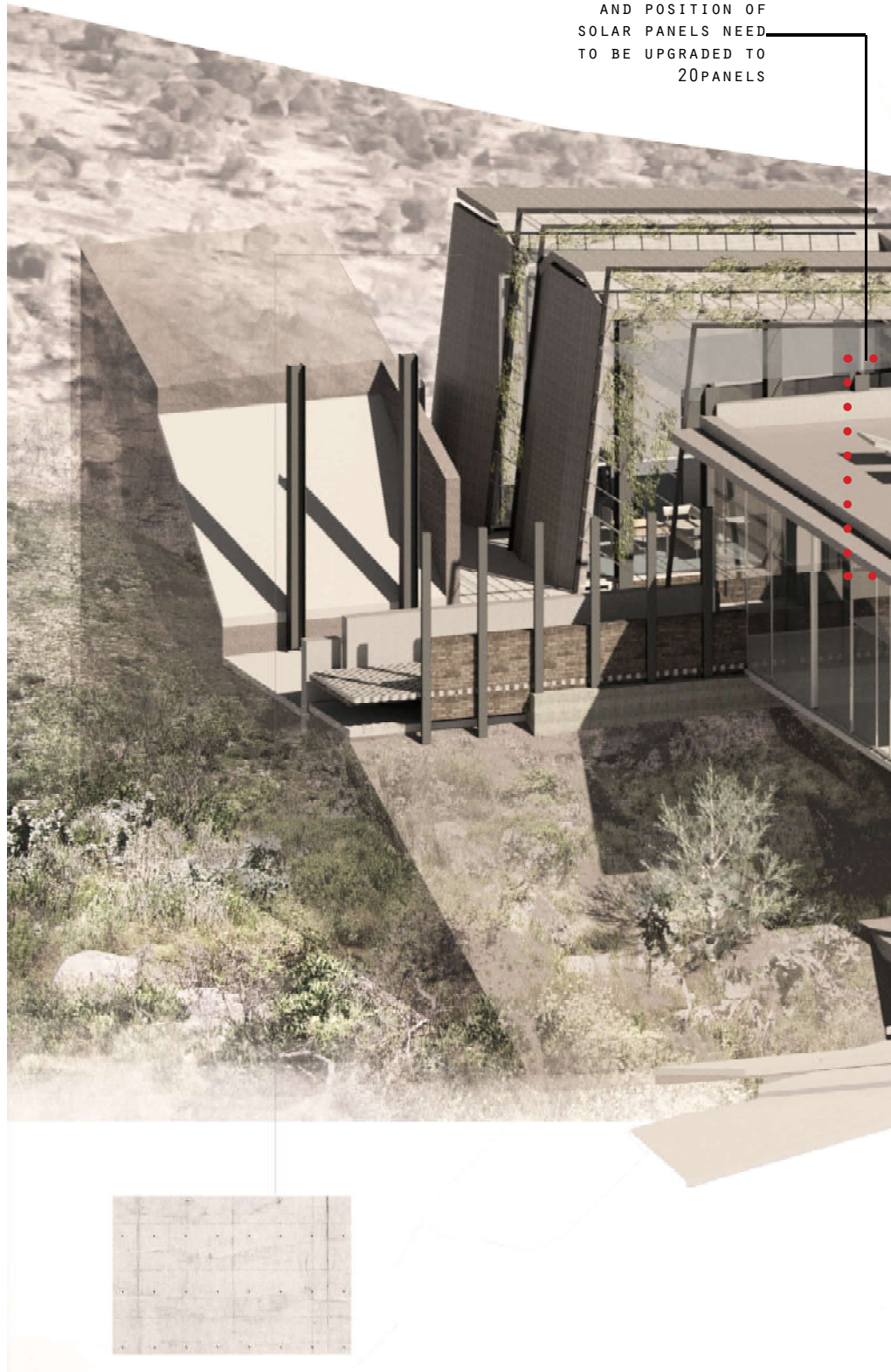


FIG. 130 :EASTERN SECTION CUT INTO PUBLIC DOMAIN OF BUILDING TO SHOW MATERIALITY, ENVIRONMENTAL STRATEGIES SUCH AS PV PANELS, AQUEDUCT SYSTEM, INTENSIVE & EXTENSIVE ROOF GARDENS, WALL CLIMBERS AND SHADING

3-dimensional section showing  
convoluting systems and materials  
as a whole



**Solar surface pump:** to sit above ground and move water through pipes from wetland to detention dam. Solar pumps operate more efficiently when pointed in a northerly direction, mounted to the concrete roof of the building. This surface pump generates its own energy via photovoltaic cells and therefore is not included in the gross total of electrical expenditures.

IS end suction centrifugal circulating water pump: single-stage single-suction centrifugal water pump, applied usually to industrial and urban water supply and drainage and agricultural irrigation. It is used for conveying water from the wetland detention ponds to the UV filtration level on the 5th floor. The inlet pressure is 0.6 MPa. This uses 0.96kw for the shaft and 2.2kw for the motor. Totalling 3.16kW per day (Zoompumps.com, 2018)

Equipment wattage calculations:

11x Computer-125W x 3hrs per day = 4125W per day - 4.12kW per day or 127kW per month.

2x Refrigerator: 300W/per day x 24hrs = 7.2kWhours per day or 216kWh per month (432kW per month for 2 refrigerators)

6x Ceiling fans: 65W x 3hrs = 195W per day or

5.8kW per month (34.8kW per month for all 6 fans)

Microwave: 750W per day - 15kW per month

Coffee Maker: 800W per day - 24kW per month

In summation:

425,54kW p.m. for Lighting

127kW p.m. for Digital equipment

471kW p.m. for Kitchen appliances

94kW p.m. for Centrifugal water pump

5.8kWh p.m. for electrical cooling

**Totalling: 1117.54kW per month in total.**

kWh per month / (avg sunlight per day \* 30) = kW solar system

425.54kW p.m for Lighting

127kW p.m for Digital equipment

471kW p.m for Kitchen appliances

94kW p.m for Centrifugal water pump

1117.54kW per month in total

or 37.25kW per day.

Therefore, kWh per month/ (average sunlight per day x 30)

1117.54 / (6 x 30) = 6.2kW solar system; this means a solar array that produces 6.2kWh for every hour of direct sunlight.

So a 6.2kW solar system would produce 37.25kW per day.

6.2kW x 1000W / 300W panel = 20 x 300W solar panels needed.

| ROOM                      | DIMENSIONS |            |           | AREA  | LUX REQUIRED | LUMENS  |
|---------------------------|------------|------------|-----------|-------|--------------|---------|
|                           | Width (m)  | Length (m) | height(m) |       |              |         |
| <b>INDOOR AREAS</b>       |            |            |           |       |              |         |
| Kitchenette               | 4,4        | 7,1        |           | 31,2  | 500          | 15620,0 |
| Lift                      | 2,4        | 1,8        |           | 4,3   | 300          | 1296,0  |
| Lobby Entrance            | 9,0        | 6,4        |           | 57,6  | 75           | 4320,0  |
| Open Meeting Space        | 5,0        | 8,3        |           | 41,5  | 75           | 3112,5  |
| Minor Passages            | 2,0        | 16,0       |           | 32,0  | 100          | 3200,0  |
| Major Passages            | 3,0        | 17         |           | 51,0  | 100          | 5100,0  |
| Vertical Circulation      | 1,5        | 16,8       |           | 25,2  | 100          | 2520,0  |
| Computer Room             | 5,8        | 7,8        |           | 45,2  | 300          | 13572,0 |
| Media Meeting Space       | 7,0        | 12,0       |           | 84,0  | 500          | 42000,0 |
| Seminar Room              | 4,2        | 8,3        |           | 34,9  | 300          | 10458,0 |
| Library                   | 11,0       | 15,0       |           | 165,0 | 300          | 49500,0 |
| Community Space           | 7,6        | 12,2       |           | 92,7  | 300          | 27816,0 |
| Ablutions Female          | 4,5        | 5,5        |           | 24,8  | 100          | 2475,0  |
| Ablutions Male            | 3,9        | 3,5        |           | 13,7  | 100          | 1365,0  |
| Ablutions Disabled        | 1,8        | 1,8        |           | 3,2   | 100          | 324,0   |
| Relaxation Area/Working   | 8,2        | 9,1        |           | 74,6  | 200          | 14924,0 |
| Recording Rooms           | 5,4        | 7,6        |           | 41,04 | 100          | 4104,0  |
| Store Room Type 1         | 2,6        | 6,4        |           | 16,64 | 100          | 1664,0  |
| Store Room Type 2         | 2,6        | 4,2        |           | 10,92 | 100          | 1092,0  |
| Electrical Equipment Room | 2,6        | 3,5        |           | 9,10  | 100          | 910,0   |
| Server Room               | 2,6        | 6,4        |           | 16,64 | 100          | 1664,0  |
| Emergency Escape Stairs   | 13,5       | 2,6        |           | 35,10 | 100          | 3510,0  |
| <b>OUTDOOR AREAS</b>      |            |            |           |       |              |         |
| Wetland & Entrance        | 4,5        | 16,8       |           | 75,60 | 50           | 3780,0  |
| Waterwheel                | 6,0        | 5,0        |           | 30,00 | 50           | 1500,0  |

Source: p372-p375

| <b>OUTDOOR LAMPS WITH OWN PV PANELS</b> |      |      |  |        |    |         |
|---|------|------|--|--------|----|---------|
| Outdoor Path to Waterwheel              | 2,0  | 30,0 |  | 60,00  | 50 | 3000,0  |
| Waterwheel Platform                     | 16,0 | 21,0 |  | 336,00 | 50 | 16800,0 |



**LIGHTING REQUIREMENTS**

| LIGHT TYPE                         | LUMENS/<br>UNIT | WATT/<br>UNIT | QUANTITY/<br>AREA | TOTAL<br>WATT | AMOUNT<br>OF ROOMS | HOURS<br>USE/DAY | TOTAL POWER<br>DRAW<br><br>(Watt/Hours/<br>day) |
|------------------------------------|-----------------|---------------|-------------------|---------------|--------------------|------------------|---|
| LED Pendant light Globe            | 300,0           | 3,0           | 52                | 156,2         | 2                  | 2                | 624,80  |
| LED Panel Light                    | 3256,0          | 44,0          | 0                 | 17,5          | 1                  | 12               | 210,16  |
| LED Pendant light Globe            | 300,0           | 3,0           | 14                | 43,2          | 1                  | 8                | 345,60  |
| LED Pendant light Globe            | 300             | 3             | 10                | 31,1          | 1                  | 8                | 249,00  |
| Round Ultra-Thin Panel Light (LED) | 880,0           | 11,0          | 4                 | 40,0          | 2                  | 2                | 160,00  |
| Round Ultra-Thin Panel Light (LED) | 880,0           | 11,0          | 6                 | 63,8          | 2                  | 12               | 1530,00   |
| High Bay Warehouse Light (LED)     | 6700,0          | 60,0          | 0                 | 22,6          | 3                  | 12               | 812,42  |
| LED Tube                           | 1120,0          | 8,0           | 12                | 96,9          | 1                  | 4                | 387,77  |
| LED Corn Bulb                      | 880,0           | 24,0          | 48                | 1145,5        | 1                  | 2                | 2290,91   |
| LED Panel Light                    | 3256,0          | 44,0          | 3                 | 141,3         | 1                  | 4                | 565,30  |
| LED Panel Light                    | 3256,0          | 44,0          | 15                | 668,9         | 1                  | 4                | 2675,68   |
| High Bay Warehouse Light (LED)     | 6700,0          | 60,0          | 4                 | 249,1         | 1                  | 8                | 1992,79   |
| LED Corn Bulb                      | 880,0           | 24,0          | 3                 | 67,5          | 2                  | 3                | 405,00  |
| LED Corn Bulb                      | 880,0           | 24,0          | 2                 | 37,2          | 2                  | 3                | 223,36  |
| LED Corn Bulb                      | 880,0           | 24,0          | 0                 | 8,8           | 2                  | 3                | 53,02   |
| High Bay Warehouse Light (LED)     | 6700,0          | 60,0          | 2                 | 133,6         | 1                  | 2                | 267,30  |
| LED Tube                           | 1120,0          | 8,0           | 4                 | 29,3          | 2                  | 1                | 58,63   |
| LED Tube                           | 1120,0          | 8,0           | 1                 | 11,9          | 2                  | 1                | 23,7714   |
| LED Tube                           | 1120,0          | 8,0           | 1                 | 7,8           | 2                  | 1                | 15,60   |
| LED Tube                           | 1120,0          | 8,0           | 1                 | 6,5           | 1                  | 0,5              | 3,25  |
| LED Tube                           | 1120,0          | 8,0           | 1                 | 11,9          | 1                  | 0,5              | 5,94  |
| LED Tube                           | 1120,0          | 8,0           | 3                 | 25,1          | 2                  | 12               | 601,71  |
| LED Corn Bulb                      | 880,0           | 24,0          | 4                 | 103,1         | 1                  | 0                | 0,00  |
| LED Landscape spotlight            | 800,0           | 10,0          | 2                 | 18,8          | 1                  | 12               | 225,00  |
|                                    |                 |               |                   |               |                    |                  | 13727,01 W/day                                  |
|                                    |                 |               |                   |               |                    |                  | 13,727 kW/day                                   |
| LED street lamp                    | 1200,0          | 12,0          | 3                 | 30,0          | 1                  | 12               | 360,00  |
| LED street lamp                    | 1200,0          | 12,0          | 14                | 168,0         | 1                  | 12               | 2016,00   |
|                                    |                 |               |                   |               |                    |                  | 2376,00 W/day                                   |

# SUSTAINABLE BUILDING ASSESSMENT TOOL

1,04

Achieved

## SB SBAT REPORT

4.5

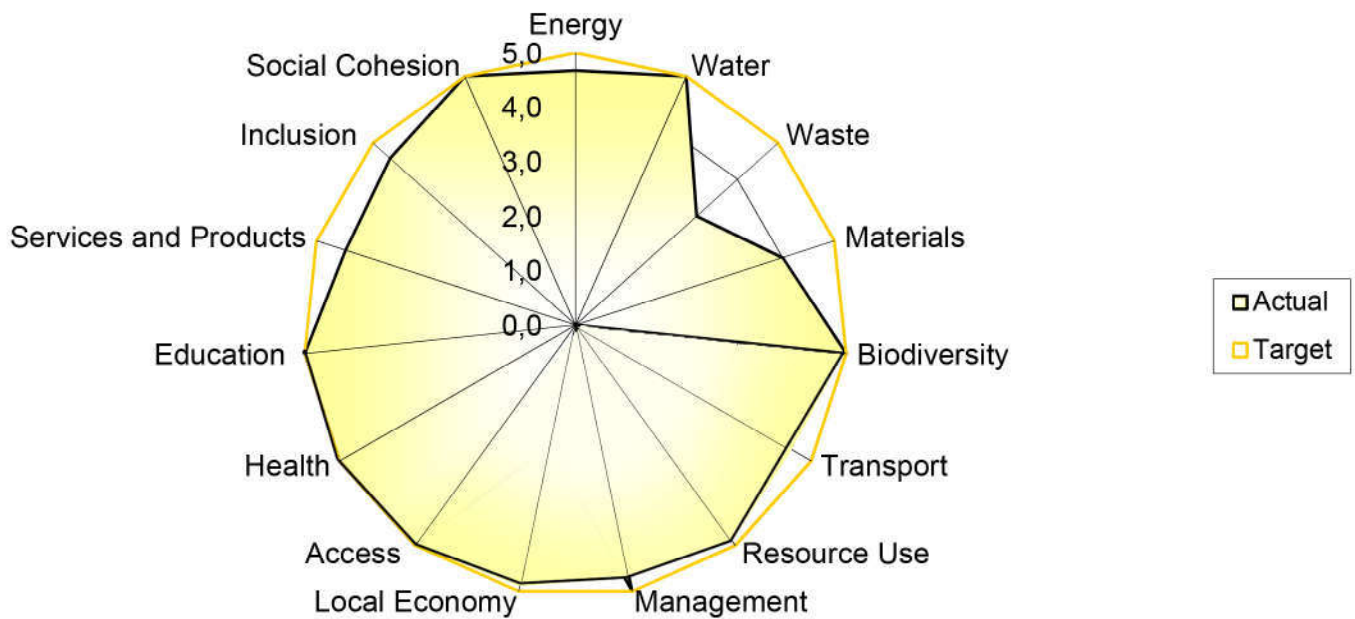
### SB1 Project

The Unending Rainfall of Architecture

### SB2 Address

Magaliesberg Mountain at entrance of pienaar river, Mamelodi

### SB3 SBAT Graph



### SB4 Environmental, Social and Economic Performance

Score

|               |     |
|---------------|-----|
| Environmental | 4,3 |
| Economic      | 4,5 |
| Social        | 4,8 |
| SBAT Rating   | 4,5 |

### SB5 EF and HDI Factors

Score

|            |     |
|------------|-----|
| EF Factor  | 4   |
| HDI Factor | 4,2 |

### SB6 Targets

Percentage

|               |    |
|---------------|----|
| Environmental | 87 |
| Economic      | 90 |
| Social        | 96 |

### SB7 Self Assessment: Information supplied and confirmed by

|                             |      |            |
|-----------------------------|------|------------|
| Name Cindi Janse van Vuuren | Date | 2018 11 13 |
| Signature                   |      |            |

## 6.4 FINAL ITERATIONS

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## 5.6 FINAL ITERATION

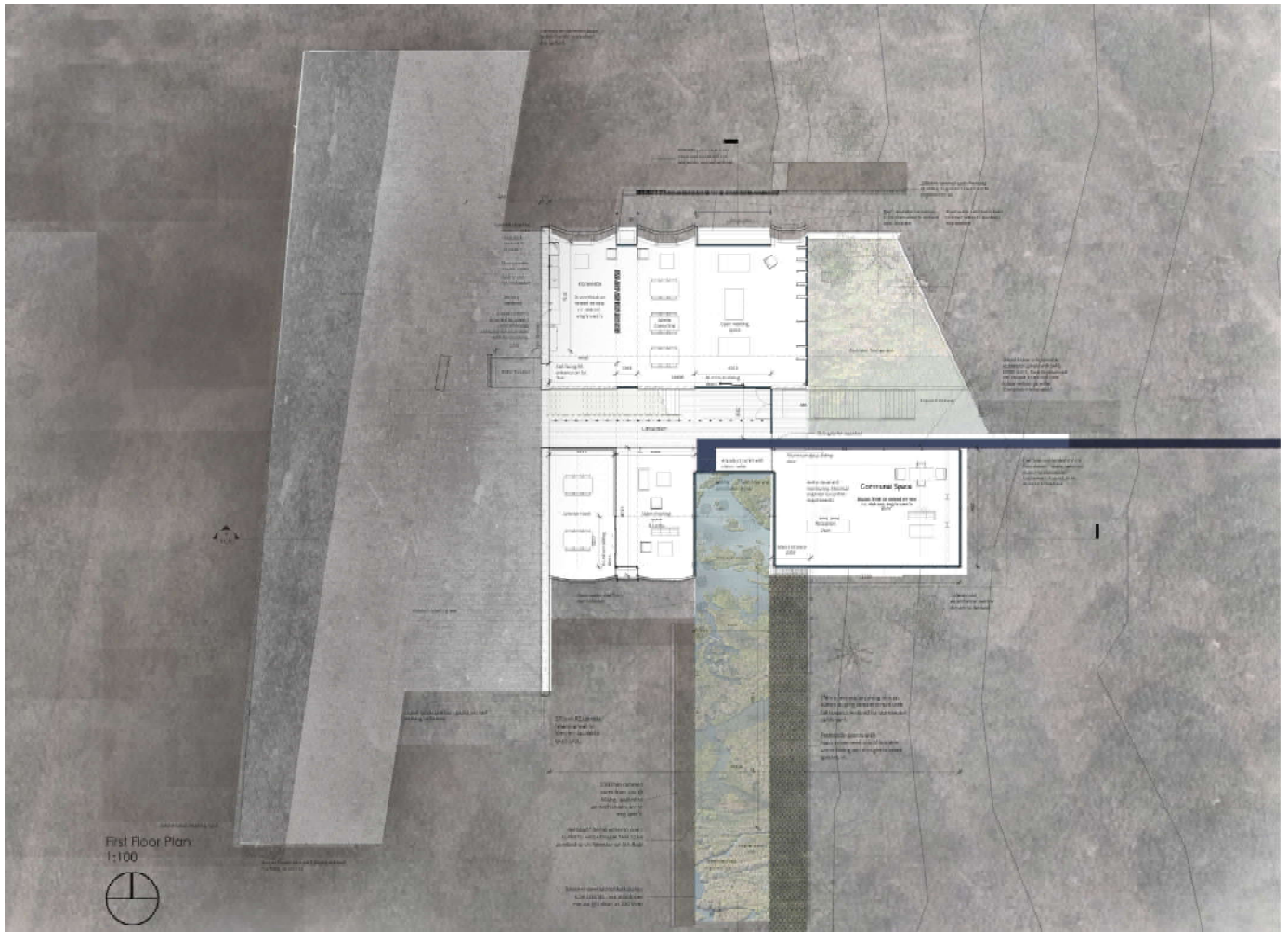


FIG. 131 :FINAL 1ST &  
ENTRANCE FLOOR PLAN

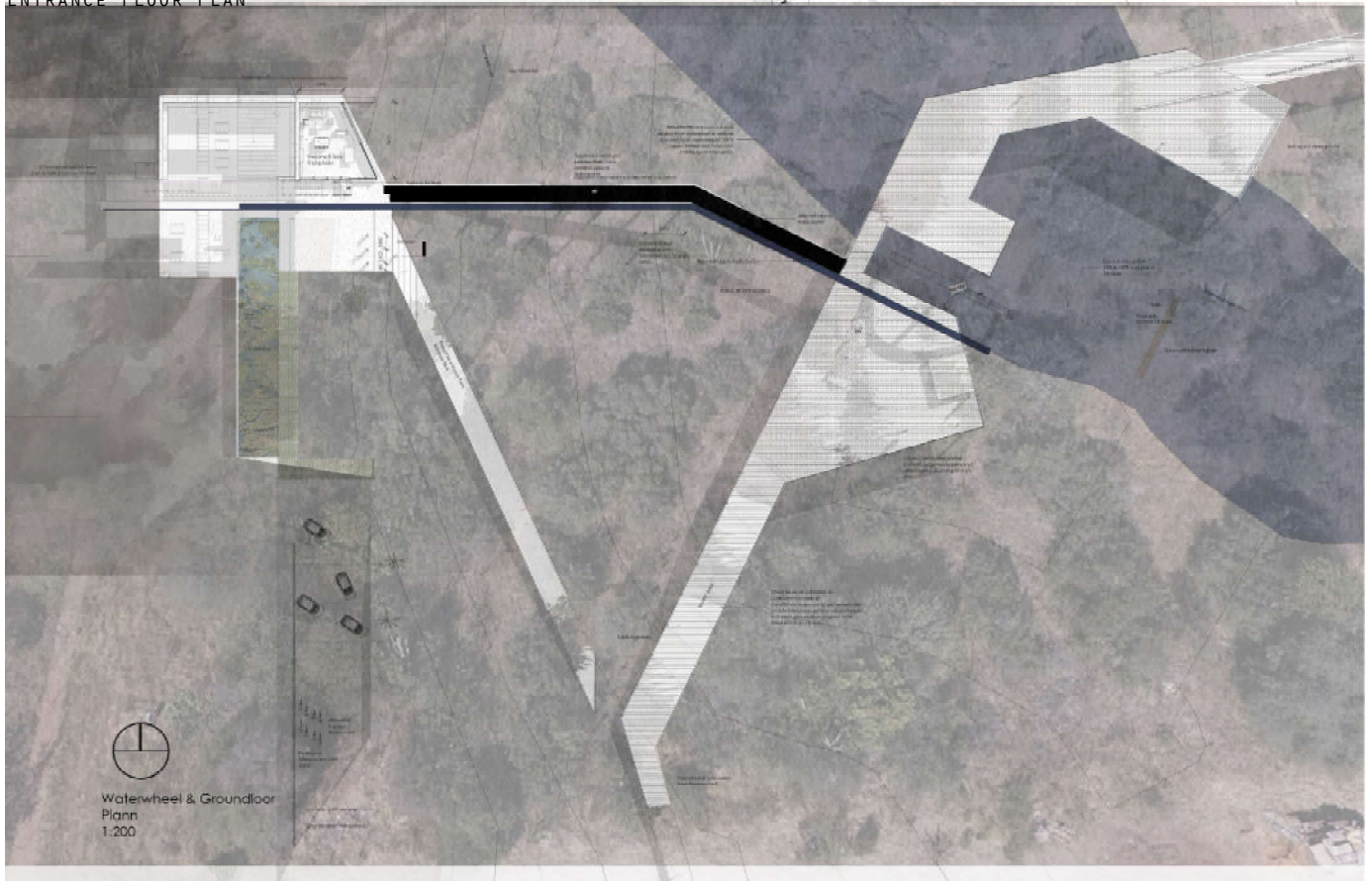
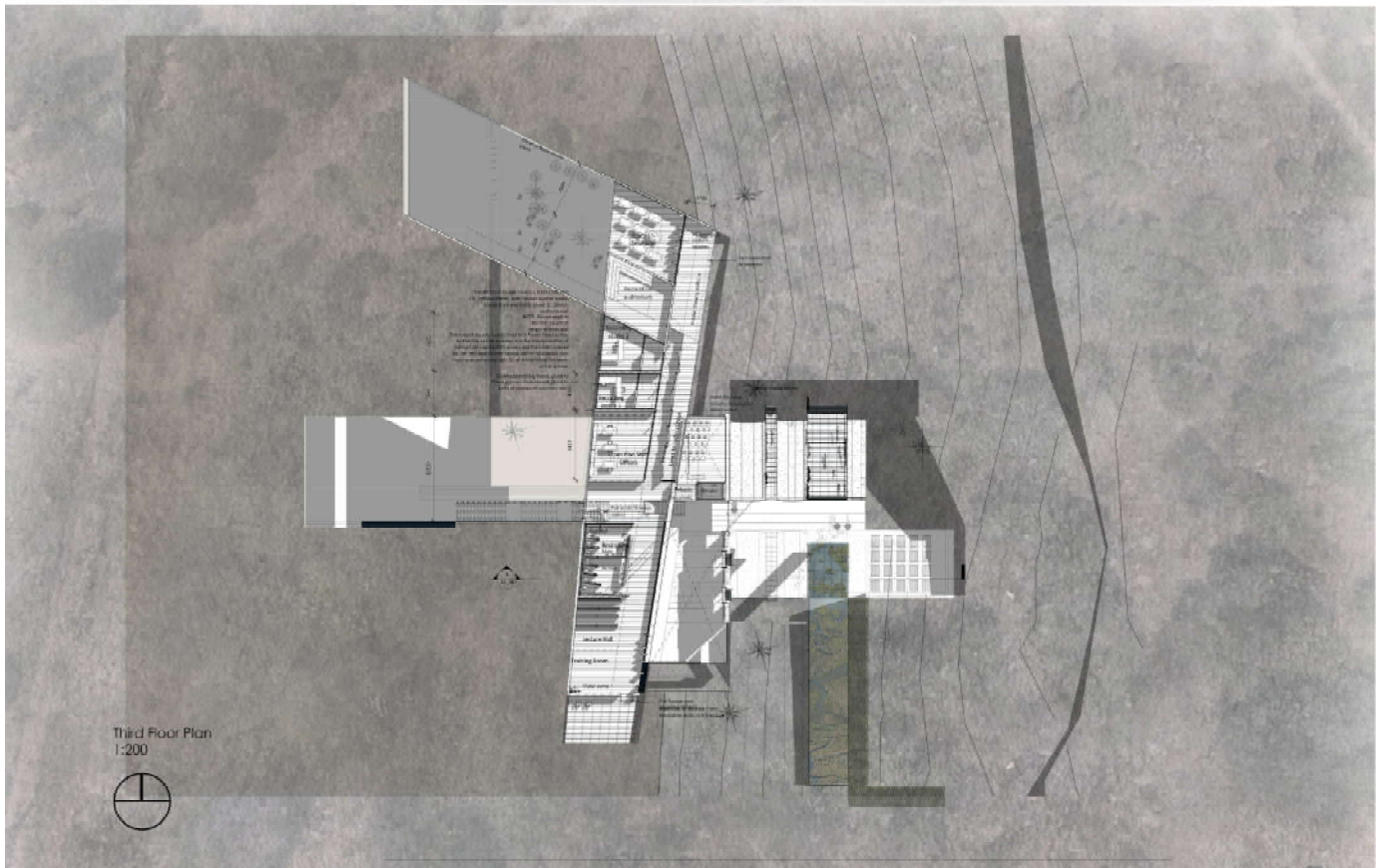




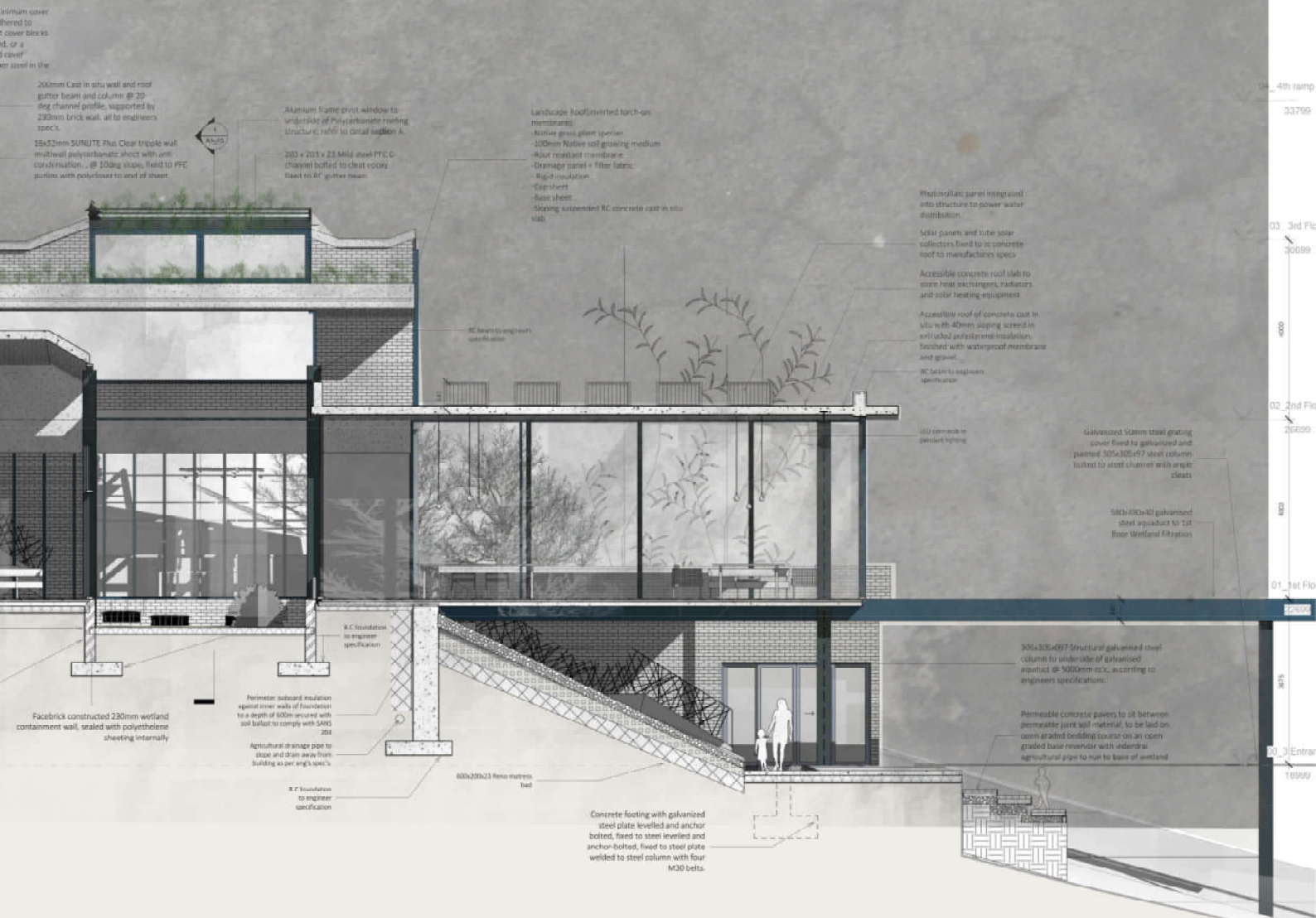
FIG. 132 : FINAL 2ND & 3RD FLOOR PLAN





SECTION NORTH TO WEST  
1:50

FIG. 133 :FINAL EAST  
TO WEST SECTION





Cast in Place Concrete walls and roofs



Permeable concrete pavers to sit between permeable joint soil material, to be laid on open graded bedding course on an open graded base reservoir with inderdrai agricultural pipe to run to base of wetland

Indigenous creepers, and extensive and intensive roof garden/gutter grasses and shrubs





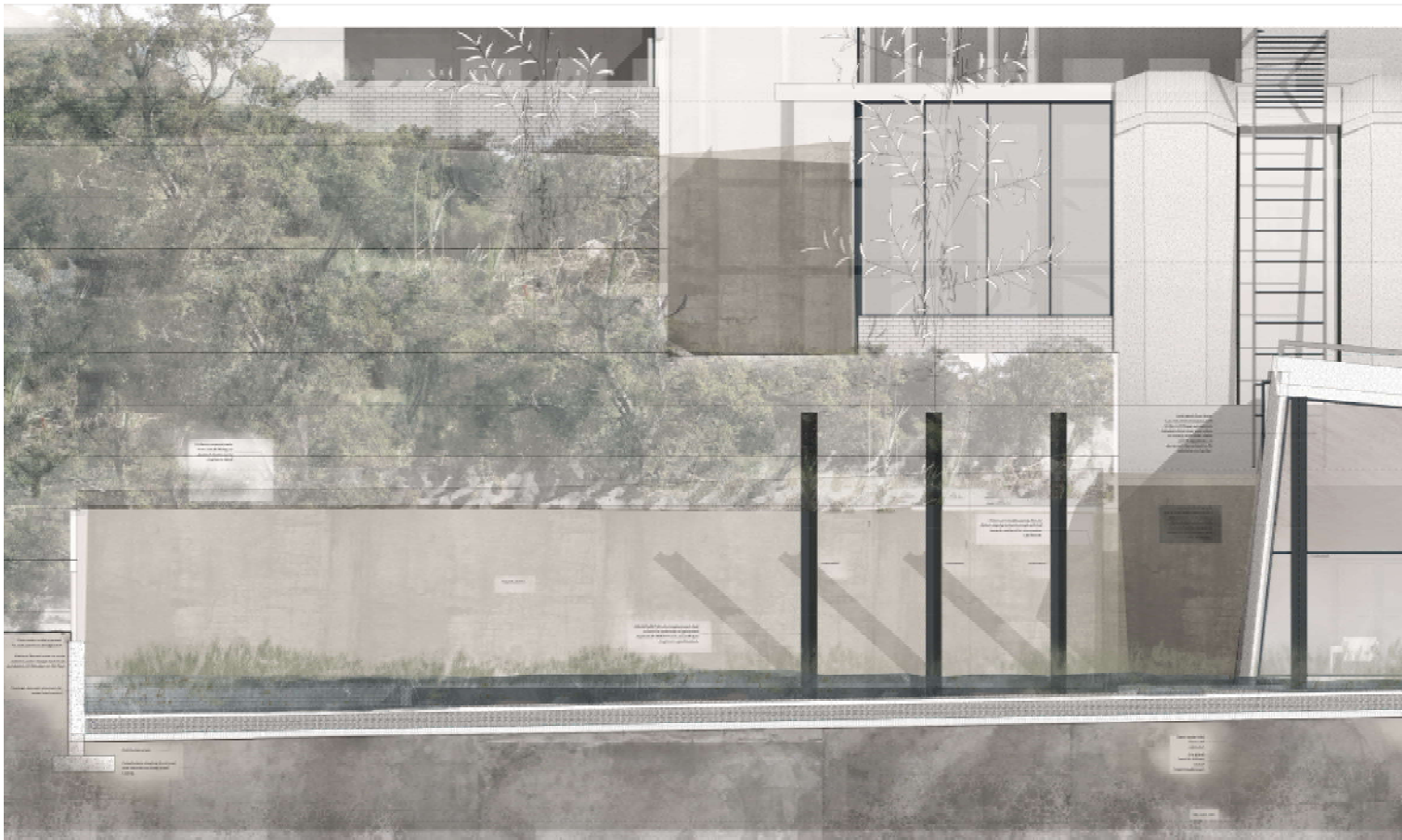
Partial 3-dimensional section showing main arteries of circulation, systems and materials as a whole



Polycarbonate Riifor ample visibility, natural sunlight and insulation



Water transported from the Plenaars River and filtered in various stages.



*Fig. 135* : NORTH-SOUTH  
SECTION SHOWING WETLAND  
INTO 1ST FLOOR & PUBLIC  
DOMAIN





CHAPTER **07**

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**REFLECTION**

CONCLUSION

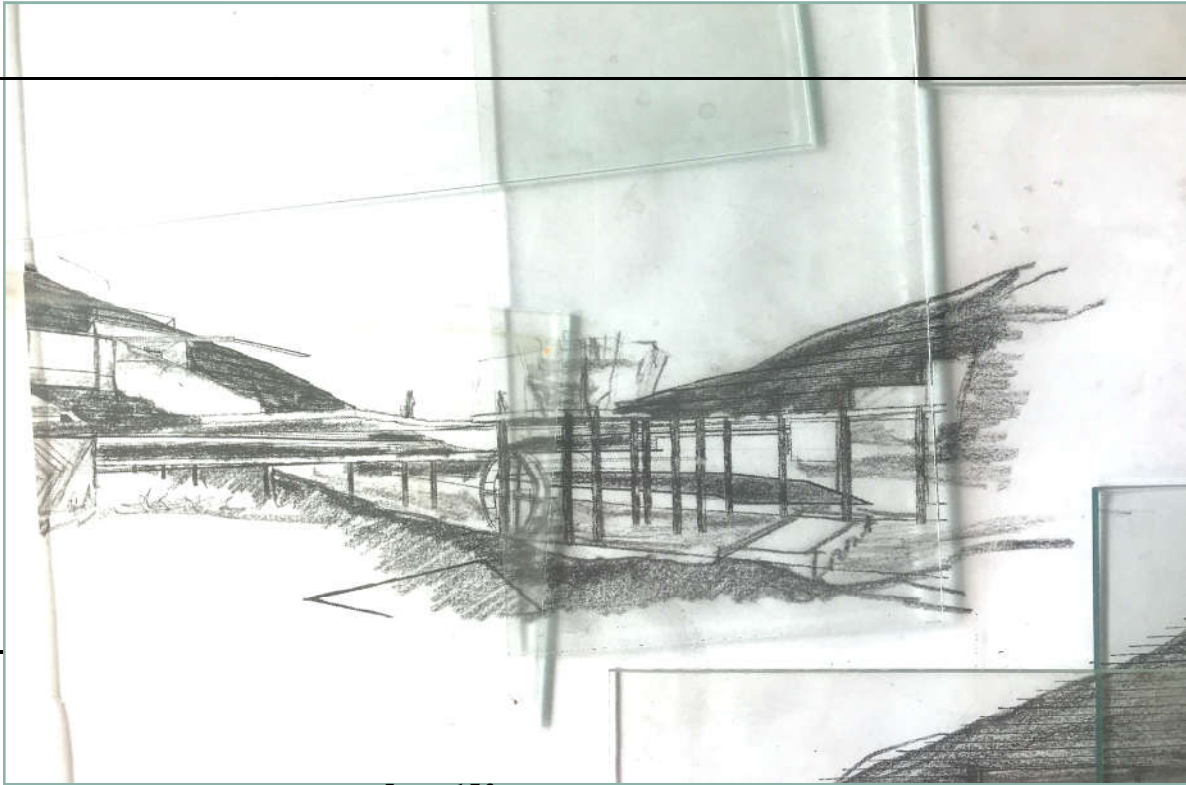
- 7.1. Asked and answered
- 7.2 The Unending and Unbroken thread
- 7.3 Full Circle

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*FIG. 131* :REFLECTIVE &  
RESPONSIVE LANDSCAPE (AUTHOR,  
2018)



*FIG. 132* ;THE DIVIDE OF THE  
RESPONSE AND REFLECTION (AUTHOR,  
2018)

### 7.1 ASKED AND ANSWERED

The questions asked in terms of phenomenological and regenerative aspects of this project should be answered in terms of the architectural resolution. Theoretical conclusions within the framework of phenomenology predict patterns of importance relating to scale, form, light and texture that is experienced throughout architecture. Regenerative theory advances environmental and well-being strategies, focusing the architecture towards sustainability within societal well-being. The combination of these parallel guidelines is explored as an architectural whole that relies on the efficiency of all its parts.



RENDERED 1ST FLOOR VIEW OF  
WETLAND(AUTHOR, 2018)

Public Domain  
to the





& Lobby view  
South

## 7.2 THE UNENDING AND UNBROKEN THREAD

The previous chapters' deal with the parts of the whole, focussing on the workings of each contextual, technological and theoretical aspect within the larger spectrum of the research intention. To go full circle, the author investigates the probability of achieving phenomenological experiences within an architecture that adheres to sustainable and regenerative principles. The unending and unbroken thread of interventions concerning material choices, form and space making, the institution of programs implemented, river and water systems all link into the conceptual and theoretical principle of reflection and contextually appropriate reckoning.

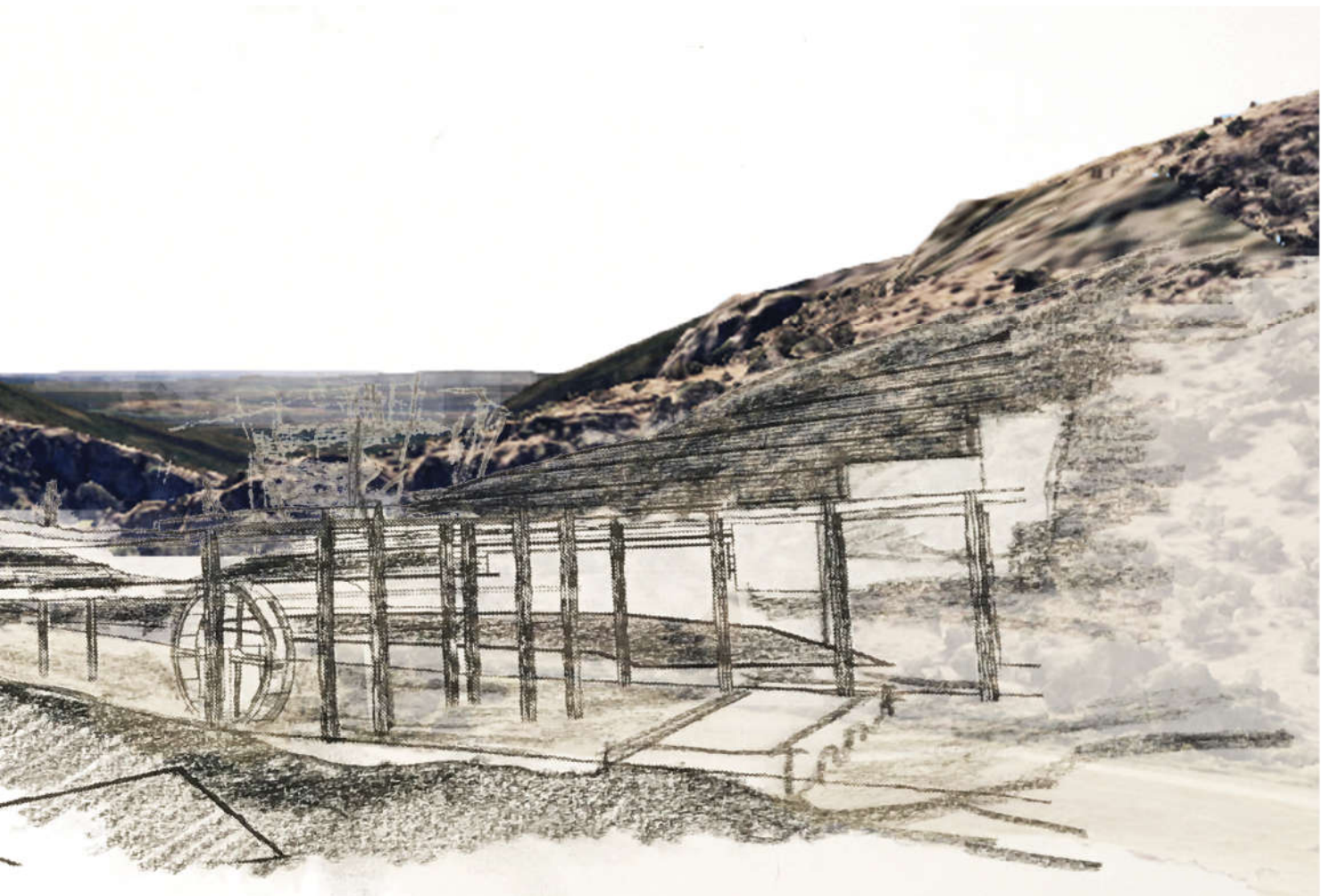
The relocation of the Mamelodi FM radio station to an appropriately equipped and resourceful institution, encourages local growth and development that becomes an architectural invention of community activation. This addresses the point of self-reflection, community reflection and knowledge transference, that relates to the reckoning of the current and future state of the populace. The implementation of the water wheel into the Pienaars River acts firstly as a visual infrastructural invitation to the site, as well as a positive contribution to the environment and negative carbon footprint of the new building. This harnessing of community and environmental resources intends to act as a catalyst to the surrounding urban (and rural) Mamelodi, to exhibit well-being through didactic permaculture.



FIG. 133 :CONCEPTUAL LANDSCAPE + ARCHITECTURE SKETCH SHOWING IMPOSITION AND SPACE-MAKING (AUTHOR, 2018)

The shift of the natural landscape into one of social and economic resilience, holds fast to the tide of change concerning the urbanization of the township, that the government programs seek to realise (Mpangane and Fakir, 2018). However, the new structures aim to create the final barrier of development upon the Magaliesberg mountain, steering clear of the Mothong heritage site but staying close to the urban fabric of Mamelodi West. The initial visual contact of the architecture from the urban landscape creates a contrasted impression of immediate and digressing solidity.

The stereotomic nature of the concrete units, and the tectonics of the water system and wheel, conceives separately a grounding and lightness that is made fluid and whole by the punctuation of the natural landscape. The bulk of the public and economic space is embedded within the earthbound structure, that allows for incisive overlaying of planting and natural structures throughout and within the form. Throughout the process of form development, the pervasiveness of the building was taken into account and manipulated to retain as much as possible of the natural slope. As the buildings follow the natural contours of the site, away from the 50year flood-line of the river, the impact on the landscape is aimed to be less pervasive.





RENDERED VIEW OF SITE APPROACH  
FROM MORETELE PARK (AUTHOR,  
2018)



FIG. 134 ;FINAL RENDERED  
ITERATION OF THE OUTCOME (AUTHOR,  
2018)

### 7.3 FULL CIRCLE

The natural landscape has lost its purpose as a tool for reckoning throughout these iterations, as the initiatives and programmes of the structures are aimed at the rehabilitation of a neglected and rubbish strewn landscape. It is no longer able to stand testimony to human neglect or imperviousness, but instead able to build upon a restorative language of reckoning. What was, is changed by what is, but inevitably noted to be still further changed by what will be.

The nature of the building itself is also left in the hands of time. The possible means of appropriation with regards to architecture has been left open for multiple interpretations. As referred to in the title explanation of the 'Unending Rainfall of Architecture', the experience of the spaces and programmes are circumstantial to the user and the context. As the context of Mamelodi is aimed to undergo a more sustainable urban transformation based on the Tshwane Open Space Framework, this leaves the users and their current modes of industry at the mercy of the architecture (Mpangane and Fakir, 2018).

In this regard, architecture seeks to create a current condition, as much as it seeks to compensate for the past; all within a framework that allows word fluid and unending change.

The author concludes that this is the test of the architectural practise that all buildings will continue to undergo, the designers and primary users long since forgotten. Noting that the initial need for the structure has been filled and perhaps in the process catalysed important change, which without, the future would not be the same. This is how the author proposes the architecture is taken full circle.







Waterwheel Platform view to the West



Entrance on 1st floor, from urban fabric





Public Domain & Lobby view  
to the North-East

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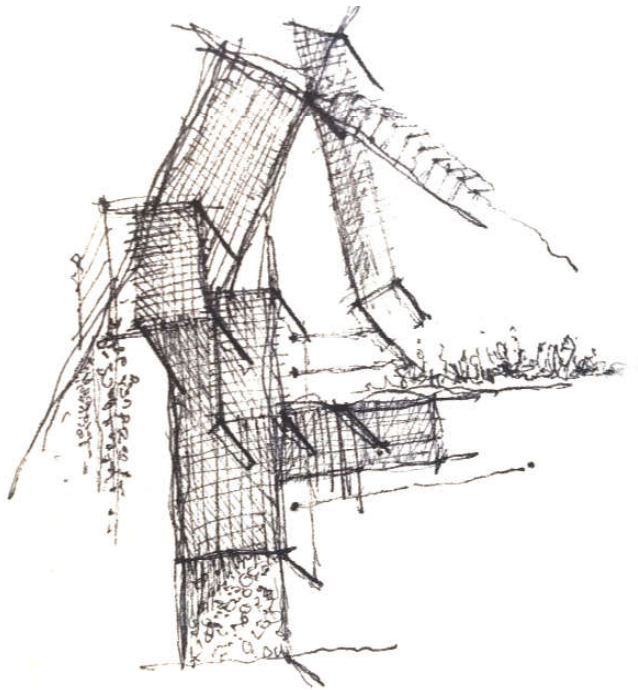
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Cindi Janse van Vauren

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## The unending rainfall of architecture

*Finding the autogenetic within the phenomenological.  
Architecture as the omniscient observer to human and natural developments.*

Our history and our inevitable progression  
Our blind repetition  
Layers of icons migrate, stagnate, and dictate  
Standing guard against ambiguous plains.  
Conductors and Spectators  
Bleak skies and collapsing horizons  
Adding and subtracting,  
Concealing and revealing,  
Reflecting and repeating,  
Attempting to root oneself in that which is not solid  
(Curlowe et. al. 2017).

### Gestures and Investigations

This paper aims to address the distance between an architecture that is omniscient of human and natural experience, as well as sensitive to emerging strategies of regenerative place-making. This theoretical stance therefore suggests strong input from phenomenological as well as regenerative thoughts and typologies. The essential goal for this investigation is to come to a place where the rational and slightly ridiculous anomalies of architectural understanding meet. This incision into theoretical understanding seeks to place itself within a contextual background that is relevant to current South

African developments of thinking and building. The academic and practical world of the architectural industry share many aggressive biased or openly fluid comments on the current trend of 'constructing' architecture. The application of this academic attempt is not in the interest of persuading certain typologies of theory, but rather in the exploration of certain dogmas and how these are applicable to the creation of architecture that speaks of individual dreams whilst caressing a universal regenerative intent.

A strong basis for this intention is to well enough establish how certain strong leaders in these fields have successfully contributed in the harnessing of future developmental typologies. This asks for investigation of precedent and theoretical establishment, as well as the authors own experience and discretion in the placement and value of certain paradoxes. The interest of phenomenology and regenerative theory does not stand alone and is accompanied by a wider variety of theory regarding space, place and form. Placing the palimpsest

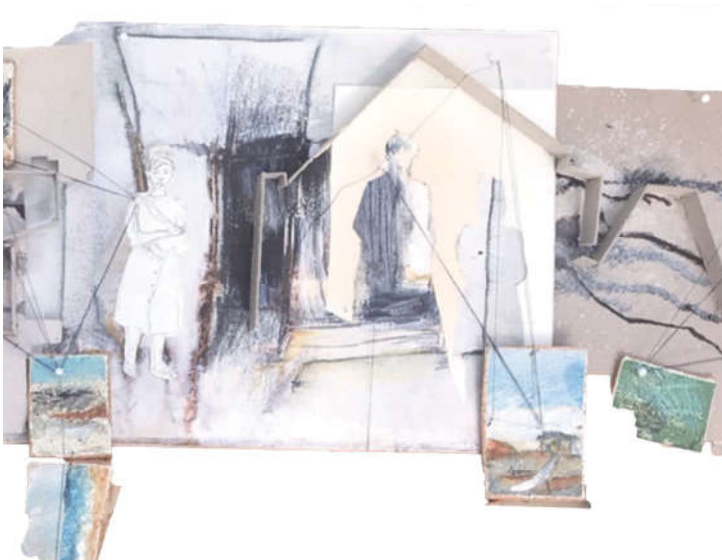


Fig. 01. Above; Exploration on Dwelling(Author, 2018)

of history underneath this investigation also renders a more complete response and allows the reader to inflict his/her own understanding upon the discussion. Establishing the research methodology, its outcomes and vocal focus points becomes a feeding circle of problem solving and does not result in a list of problems to solve and a list of problems to ignore (Lorenzo, 2017). Human and natural phenomenological application here is to be seen as the underlying golden thread; engaging with society's cultural, educational and basic need-fulfilment.

'Instead of participating in the process of further speeding up the experience of the world, architecture has to slow down experience, halt time, defend the natural slowness and diversity of experience. Architecture must defend us against excessive exposure,

noise and communication' (Pallasmaa)  
The 'unending rainfall of images', a phrase coined by Italian writer Italo Calvino, refers to the phantasmagorical eruption of unimportant and disruptive patterns of image/information overload of our current era. 'Much of this cloud of visual images fades at once, like the dreams that leave no trace in the memory, but what does not fade is a feeling of alienation and discomfort. Maybe this lack of substance is not to be found in images or in language alone, but in the world itself' (Calvino 1985). The paradoxical reference of this phrase in this article refers to the possibility of abandoning the alienation and the reach of an architectural dream, but for the continuation of an experience that is rooted in context and rationally emitted by the practise or object of architectural intent.

In a way the architecture here aims to deduce the 'rubble' of modern world excess, into simplified amounts of didacticism. The architectural intent is to absorb the economic and environmental squander and succinctly deduce it into a convalescing public and private experience.

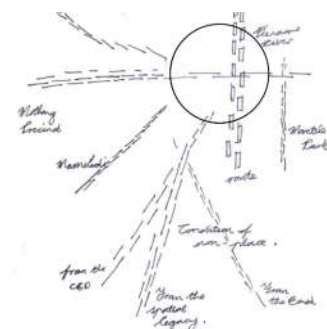


Fig. 02. Below Left; The Program of Reflection (Author, 2018)

Fig. 03. Right; Urban site elements(Author, 2018)

The pluvial part of the title refers to the body of water and its contribution to the theoretical and architectural investigation. The place-making possibilities of water is crucial to the dissertation and therefore forms a valuable part of this article as

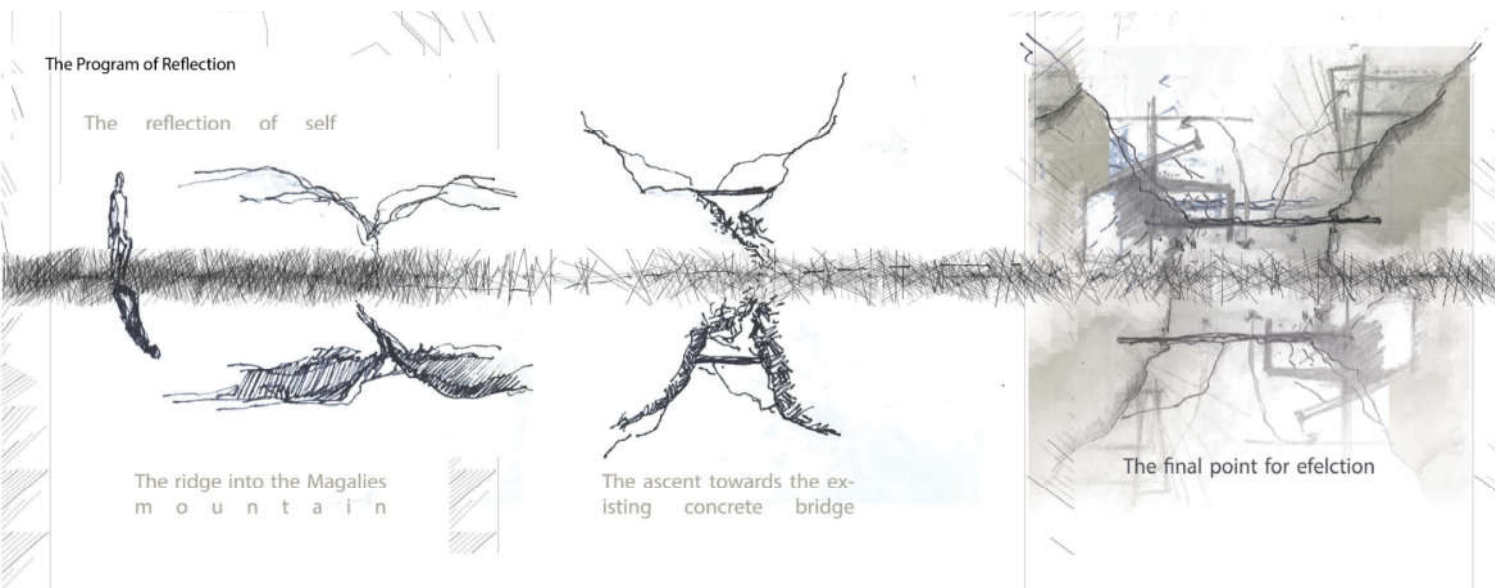


Fig. 04. Left; Phenomenological Approach (Author, 2018)

Fig. 05. Opposite Top Right; The Experience of Reckoning (Author, 2018)

Fig. 06. Opposite Bottom Right; The Pendulum of Understanding (Author, 2018)

a primary informant.

The omniscient possibilities of architecture are here to be seen as mentioned above, as an absorber and observant of life. This negates it to also possess qualities that encompass an understanding of the life that happens beneath, beside and within it, but also form spaces that dictate function with wisdom and care. The context therefore becomes a source of great transcription when piecing together a possible theoretical or practical outcome.

### Two and two together:

The wellbeing of the human life becomes priority for technological advancement and motivates a coherent public health. This program of thought becomes imperative to the educational aspects of society that are the pillars on which any ecological culture can be built on. The following is an excerpt from, *Architecture for Well-being and Health* (2017), 'The health and well-being triple bottom line could be summarised as health, comfort and happiness. In order to draw more direct parallels with the built environment, we can refer to Vitruvius and his tripartite model of the three elements required for a well-designed building (Morgan, 1996)

- I "firmitas" or firmness (health)
- II "utilitas" or commodity (comfort)
- III "venustas" or delight (happiness)

To satisfy sustainable principles, certain elements of architecture is to be investigated through the lenses of experience, space and program – in

order to pacify the multiple dimensions of what can constitute a sustainable/ biophilic design.

This thereby indicates a need for material, economic and construction specification in terms of quantitative: -availability -workability -skill level needed for construction -thermal comfort -economic viability These materials are also analysed in terms of qualitative: -spatial qualities (height or structural constrictions) -sensory experience (textures & colour) -proportions and scale to user Hypothesis:

Architecture has the potential to encompass qualities of phenomenology that promotes wellbeing and encourages a didactic approach to sustainability and a holistic regenerative design process.

### The architectural paradox:

Socrates challenged the mind of the world when he husked away the conventional customs of living and interaction with sobering realism and core truths. This bottom up way of thinking encourages self-evaluation and does not adhere to any customary rule of society; but rather refers back to our own ethical compass. This compass marked the beginnings of what we now understand, means to live well.

The connection to this new ethical challenge and the built environment was synthesized with Winston Churchill's (1949) insight when he gave a speech concerning the rebuilding of the House of Commons. He referred to architecture as the physical tool for culture, as he states that the built

environment conditions our existence. With this argument, architecture plays a phenomenal responsibility in harvesting our human behaviour and experience. As architects, builders, developers and ultimately users of our built environment: we seek to improve upon our worldly circumstances and cast upon the world a certain pursuit which becomes inseparable from our charge as individuals and are essentially grounded in our ethical beliefs. The first premise for an architect is to be a designer, a creator of something that was previously unrealized. If we take into account that the architect knows how he/she is to go about designing the structure, then we can focus on what the designer will achieve with his/her intervention. The initial designing phase follows the briefings from the client and after this has been established, the documentation has been completed and the contractor has completed the building works; the conventional process of building has been completed. What we are left with, is a structure that will either enforce and keep memory and experience that grows and changes with time, or a bland repetition of an idea that is uncomfortable in its context, and will thereby be assumed not to advance perpetual and ephemeral experience. The insertion of these theories into an architectural suggestion in a specific context, is crucial to discussion of this paper

**History and its ideals**

**CONTINUUM OF ARCHITECTURAL REFLECTION:**

'If the universal demand for landscape is therefore so different from the past, what do we gain from a study of history?' (Jellicoe and Jellicoe 1995)  
 The Landscape of Man suggests that there are three reasons that amplify the importance of the landscape and its constant development as our world's most important entity of the arts. The first is the existing balanced order of the delicate biosphere and its disturbance by the activities of man, whereby man is the only fixate of the issue. Secondly, these exertions of man atop nature is a basic return to an 'efficient animal state of sustained existence'. The third point being to the author of most importance, stating that man's destiny to rise above the animal state, he creates around him an environment that is a projection into nature of his abstract ideas (Jellicoe and Jellicoe 1995)'.  
 In the challenge of studying history within its entirety of man's intervention with nature, it is the interpretation of this information and how it is relatable today that becomes imperative. This categorises the continuum into the academic and the ephemeral. In its most basic capacity, this allows us to understand man's response to certain tranquillity and assurances that are found in geometrical forms (squares and circles), and how these are manifested differently according to society, philosophy, morals, geography and economics. These are the informants of a local and transitory nature that come to play in our practise and imaginations. This raises the following subquestion: What is the local and transitory, and how does the universal continuum of architectural development influence current positions?  
 The author responds by way of recognising our five sense themselves as the mechanisms that we observe and create with. 'Within their distortions and peculiarities, these mechanisms have scarcely changes since prehistory and through which all perceptions still pass to simulate emotions and reactions (Jellicoe and Jellicoe 1995)'. Does it then stand that we can measure all levels of history through the lenses of our human senses, and then further dilute into scale, light, material and shadow?



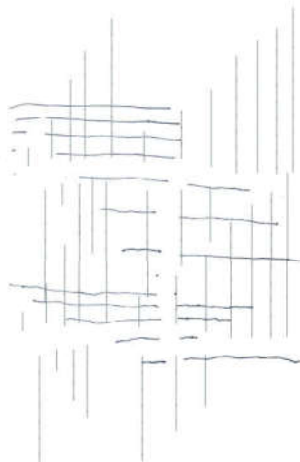
*the disturbance of place and the experience of reckoning. ]*



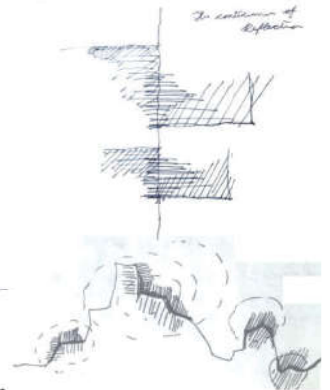
The Pendulum of understanding



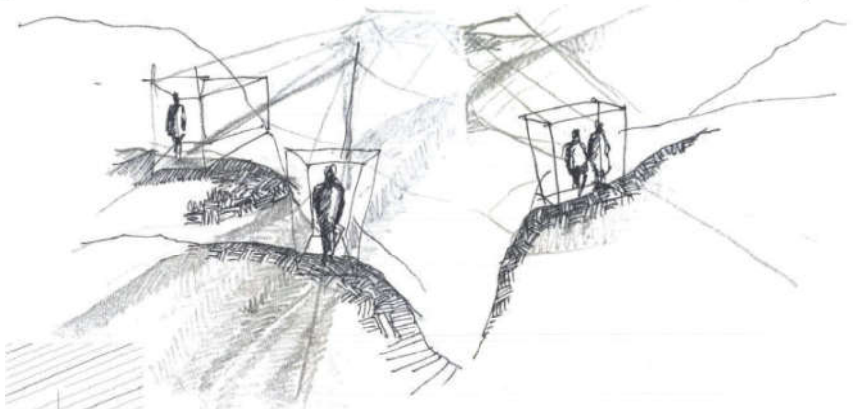
a Study of Reflection

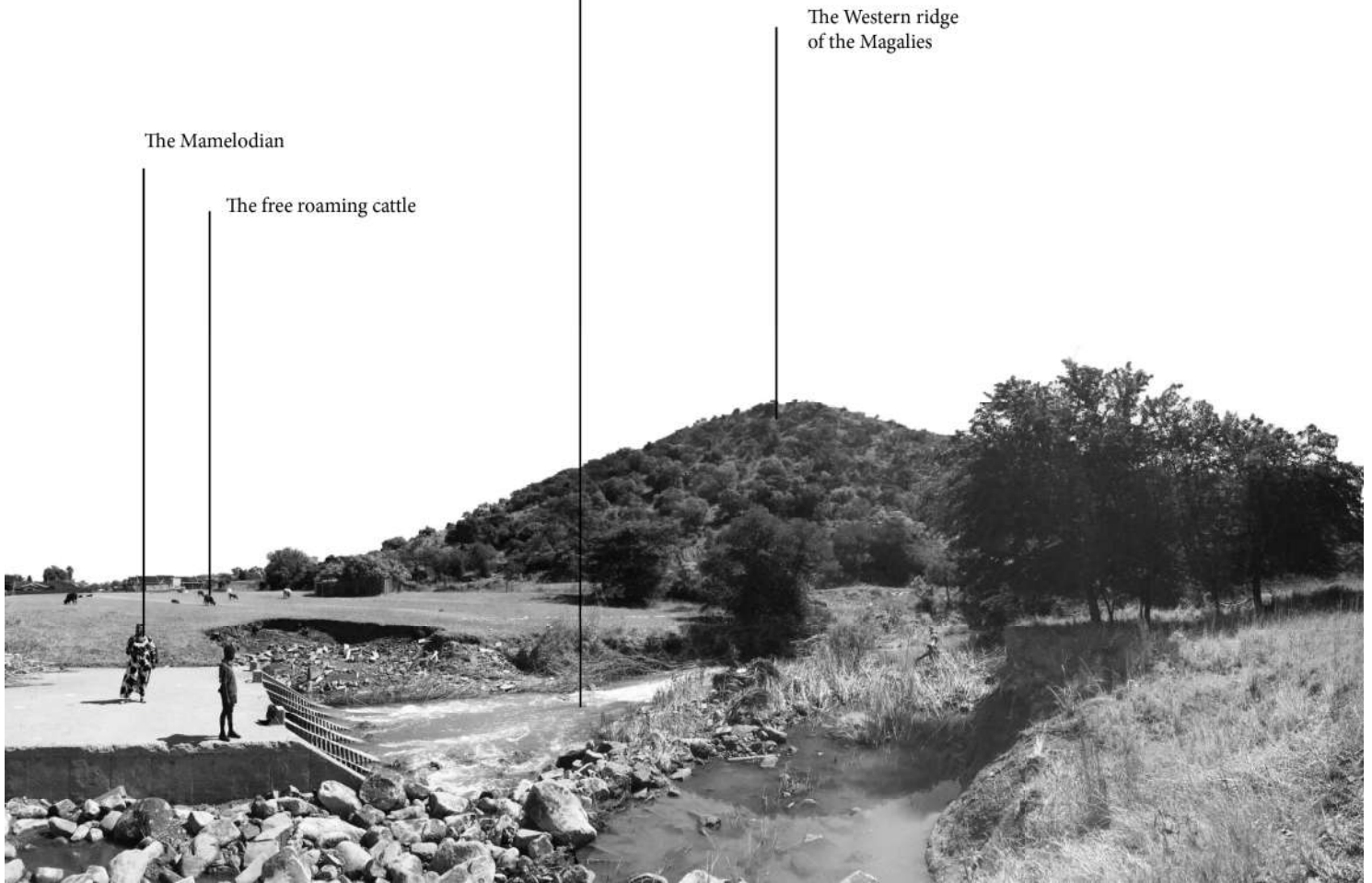


The continuum of reflection



**Where is the line of reaction?**  
 Does it lie on the ground or under? Or in line that the building cuts through the sky?





MORETELE  
PEDESTRIAN BRIDGE



THE RIVER

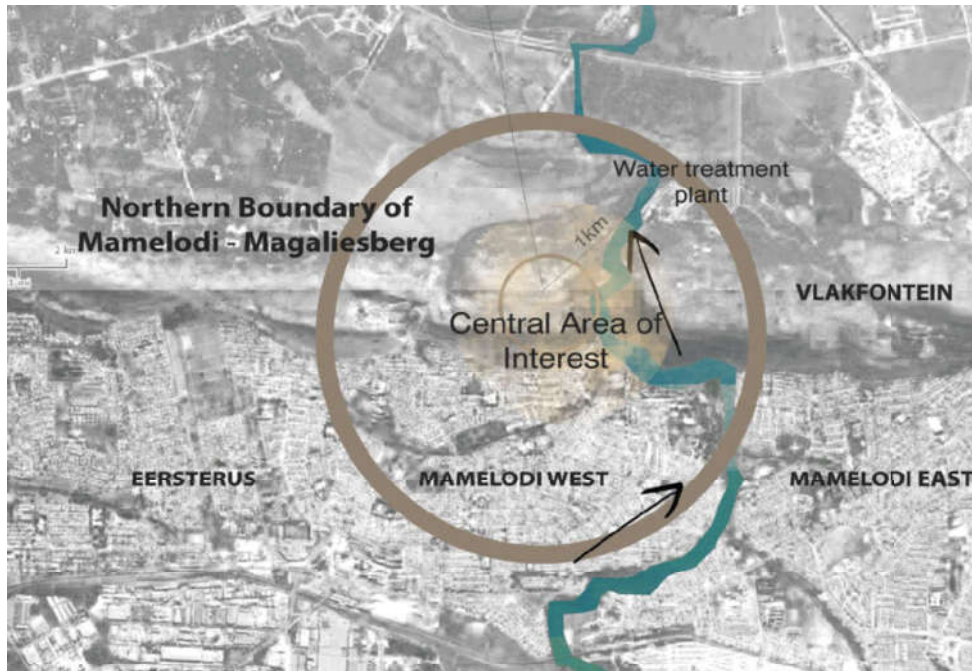


Fig. 07. Left; Central Area of Influence (Author, 2018)

Fig. 08. Opposite Top Right; Intuitive observations (Author, 2018)

Fig. 09. Opposite Bottom Right; The River condition (Author, 2018)

These are the basic principles that phenomenology bases its criterion on, and thereby appropriately contributes to the discussion of architectural continuum and contribution.

Each architectural ideal (Classicism, Eclecticism, Modernism) started off as an aspiration to an architectural dreamland that harmonises its true from through contrast with the natural world. The authors insight into the next paradigm suggests that the ideals of emerging architectural practise is aligning more closely with form that harmonises within and throughout nature (both human and environmental). Historically architecture, as we understand it, embedded within all its controversies and theories, wasn't the main appeal for the ritual of construction, but rather grew out of initial and contextual need. It was shelter, fortification, safe and solid and watered with reason. It was more concerned with providing walls, floors roofs and experience than with the reasoning behind each how and how much.

Necessity has perhaps taken the backseat to exosystemic and economic drive. Which is contextual response and perhaps neither bad or good, but observed by the author none the less. In all of our respective architectural palimpsest of triumphs and trials, it is the insisted plasticity of the ever changing spectator and their backgrounds that constantly lead us to believe in an architectural dreamland (Prak 1968).

The processes wherein we as society expand and contract allows our architecture to therefore shape itself around this convulsion and maximise its incoherence. It is therefore pertinent that this dreamland does not exist, as our buildings should find their roots rather within the bedding of current condition, with respect and acknowledgement for future appropriation, than blanket on an entire existence of shape, space and form.

#### In the Absence of Tabula Rasa

The issues are relative to the context. Relevant issues are identified within the scope that the research aim identifies as discussed in the introduction. At the edge of the water,  
At the foot of the mountain...  
(Water, even in its absence, is vital)

At the northern boundary of Mamelodi, the Pienaars river enters the eastern periphery of the Pretoria Magalies mountain range. This river, a tributary of the Crocodile river, flows northwards through Mamelodi and proceeds into the Roodeplaats dam. The focus of the context lies within the careful extrapolation of the spatial legacy of the natural and urban landscape, its assumed condition of non-place, and the potential of architecture as a stimulant of place through the lens of water as a catalyst. The community of Mamelodi is historically viewed as contested due to social and physical planning skills, which has led to the concentration of a socially marginalized population.

This site choice originates from the authors normative position relating to the concept of non-place exploration through the catalysing potential of water. Mamelodi was chosen firstly for its precarious and interesting position within the spatial legacy in the South African context, and the implication of ownership and place. What is interesting about the site is its position of topographic visibility within the greater surrounding area of Pretoria to the east and west, and its contrasting limited access and ownership (or lack off) within the direct precinct of Mamelodi. I therefore encourage principles of space-making and the legacy of ownership to derive appropriate responses to such an eventless landscape. This is to counter the image of the mountain as a spatial divide and restore and open cultural boundaries.

The layout of Mamelodi as a distant entity to the east of the CBD is a choice not inherent to the audience of the settlement, and cannot be viewed as a result of cultural 'choice'. The interest of place appropriation then becomes how these spaces were 'reclaimed' by the settlers, and how Mamelodi found itself a new cultural identity through the contentions of being a place of outlaws. It is imperative to this greater investigation that the contentions of ownership and place within nature itself is framed as the reflective legacy on the landscape of nature and man. The primary site of interest is the ridge in the Magaliesberg where the Pienaars River enters the urban condition of Mamelodi West, adjacent to Moretele



park. Historical investigation reveals how the river has played a crucial part in the urban sprawl of the greater Mamelodi, where the single-use residential typology has promoted social and economic fragmentation. (Steyn 2005:1) The introduction of a social and environmental viable meeting point, intends to serve and eliminate the marginalization and repair the deviation that was created in the establishment of this precinct (GAPP 2010:19). The interest of the author is to marry the natural contentions of the chosen site, the entrance of the Pienaars river through the Magaliesmountain north of Mamelodi, to the contextual social environment in a way that allows points of reflection and reclamation.

The intention of the author is to create a destination that allows water to stimulate place of social and recreational worth as well as a place of economical facilitation. The concept around an active social gathering space, draws into the apotheosis of the animation and ambition of the social and individual spirit. The established global water management crisis offers a myriad of interesting architectural and programmatic solutions and challenges, considering the environment and human-relationship sensitivity. The idea around the physical architecture of structures, around and throughout the body of water, is to house an economic program. This requires sensitive deliberation around the input and output of what such industry could be, especially pertaining to existing local trade and market in the precinct.

Primary Observations: trying to understand the current conditions of the site, how the approach feels and the experience of the people, cattle and nature of the site condition. The workings of spatial threshold and public boundaries to and from Moretele Park, the landscape and the residential fabric. The pendulum of understanding the palimpsest of the development of architecture, placing the site and my intentions within that pendulum. This becomes a study of reflection based on the authors concept, and reaching a continuum of reflective understanding. Where does the line of architectural ideal and reflection lie? Does it lie on the ground or under? Or in the line that the building cuts through the sky?

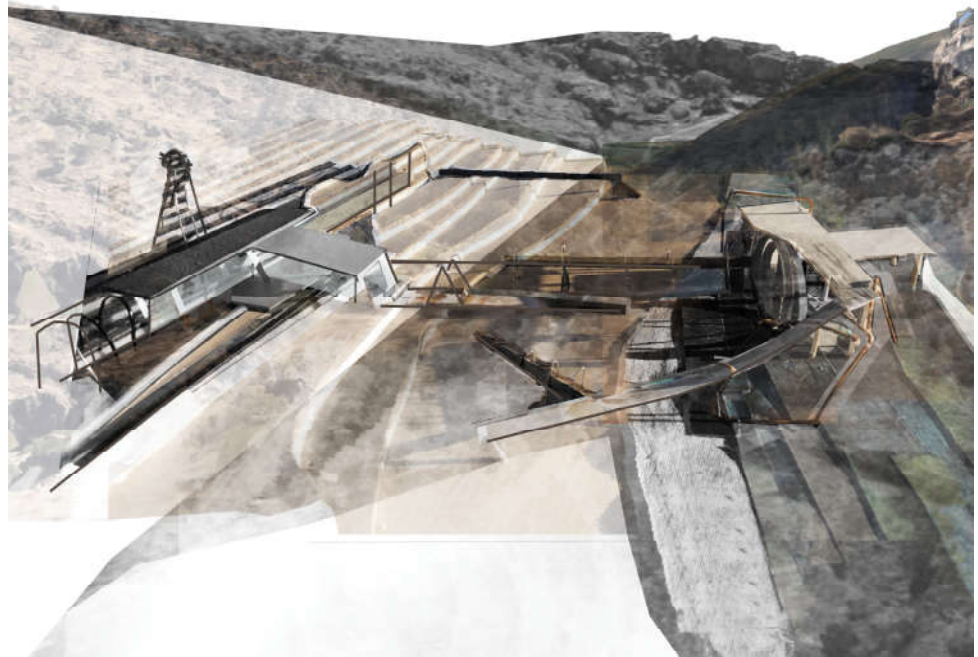


Fig. 10. Opposite Top; Maquette exploration (Author, 2018)

Fig. 11. Opposite Bottom; Mountain sketch perspective (Author, 2018)

**understanding. Where does the line of architectural ideal and reflection lie? Does it lie on the ground or under? Or in the line that the building cuts through the sky?**

Water, even in its absence, is vital

Principle I: Understanding Of Connection Between Water Body And Social Conditions And Influences In The Surrounding Area: To Dwell

The idea that place entails unending descriptions of 'processes that shape existential and aesthetic cultural experience' (Rewers 2004: 161). The 'place' in question is a study of not only geographical location but human behaviour and environment.

Historically the Pienaar's River acted as an important authority to the township as well as the agricultural holdings. "Laundry was done in the river and dried on large flat stones which are still there. Once the washing was completed, one often washed oneself as well. Water for the house was also taken from the river" (Walker & Van Der Waal, 1991: 15). According to Darkey (2000: 9), "the Pienaar's River and flood plain including the smaller tributary which joins the system, still performs an important physical and ecological function. Among others, it provides an environment of food resource for birds, frogs and insects, thus making the area an ideal future urban open space conservation area. These primary and secondary acts of provision by the river created a sense of ownership and involvement by the community that nurtured ownership. This connection has now been lost, as the river is no longer nurturing in a natural way due to the avid pollution inflicted up it by the community, and its lack of basic infrastructural management.

In the quest for achieving a modern civilization, the interconnected relationship between nature and humankind has changed to one of disconnect. This disconnection does not only compromise the natural environment but also underpins most concerns about the health and well-being of people. The Magliesburg Mountain range which borders Mamelodi, Eersterust, and Baviaanspoort is a shared natural resource with benefits currently undervalued. The Mountain-scape boasts rocky outcrops; a valley fed by a permanent river and smaller seasonal

watercourses; heritage and cultural value; as well as close proximity to urban fabrics.

We build by admitting that every site is a mutable constellation – that it operates at many scales and accommodates potentially discontinuous, or even conflicting spaces in the same place (Site Construction). Identifying negative impactors in an urban area becomes easier than identifying a healthy ecosystem. There are glaring issues regarding sustainability within these urban conditions, as the natural habitat of plants and animals are highly effected and maintained by man, creating systems that are irregular with the patterns of nature. Pollution comes in many different forms and settles not only in air, ground and water of the site, but also in the general wellbeing (immune system) in the area and effects its ability to recover.

IDENTIFIED ISSUES WITH PIENAARS RIVER:

- 1) Waste management
  - This relates back to poor infrastructural management. Could be resolved with waste transfer stations, recycling centres, and preventing vehicular access thereby formalising pedestrian open spaces along the banks.
- 2) Storm water design and position
  - Storm water discharges directly into the tributaries and river without erosion protection or siltation. Ideally these outlets should be moved out of the floodline and the flow should be reduced by means of wetlands or retention ponds.
- 3) The disruption of healthy in-stream conditions
  - This is elevated by the lack of proper river bank structure like gabion bank reinforcement, and lack of wetlands to capture silt.
- 4) Lack of community ownership
  - The lack of social infrastructure (lighting, benches, facilities) around the rivers.
- 5) Lack of vegetation around the river

The intention of possible landscape and architectural interventions as stimulant, is not without strong limitation and deliberation of program.

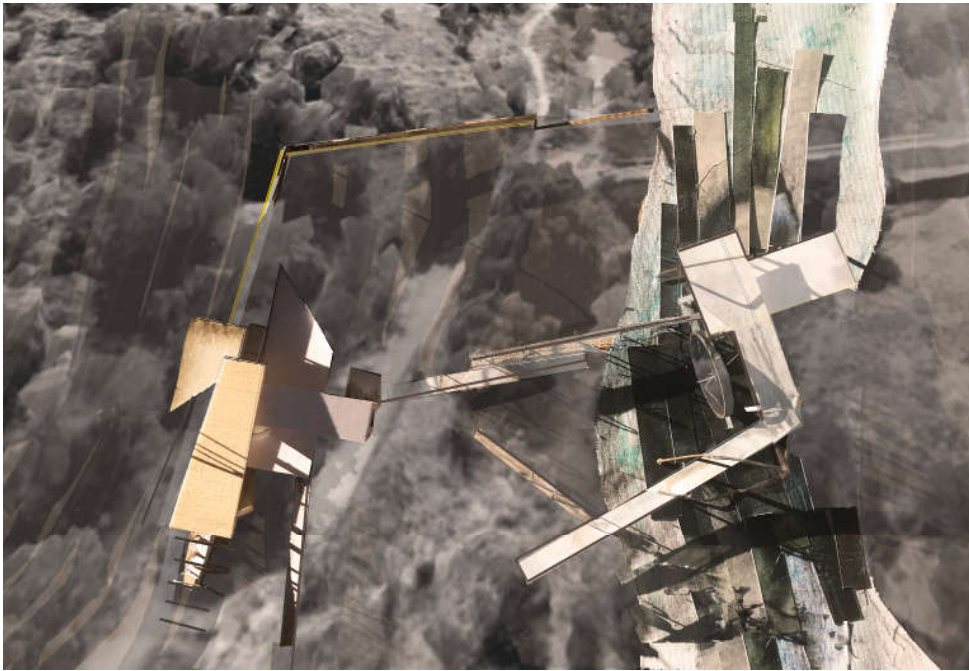


Fig. 12. Left; Architectural imposition on landscape (Author, 2018)  
Fig. 13. Opposite Top Right; Shadow and light play across river (Author, 2018)  
Fig. 14. Opposite Bottom Right; Conceptual sketch showing absence and presence within the landscape(-

The architectural intention should eventually guide and restore the natural condition through a process of reflection and reclamation, as well as respond enthusiastically towards the cultural and social audience. The search seeks for an autogenetic function that supports the ambiguity of function and form in temporal and ephemeral sense.

#### Local and transitory

According to recent studies concerning sites of ecological value, it is the area of 'in between' spaces between the urban flux and outcast of landscape, wherein the highest diversity of natural species and land use patterns are found (Hall 2013:8). These spaces of extensive ecological value and high 'rare' species count, are more so included within areas that are in close proximity to water (Bio Intelligence Commission 2007).

According to the Tshwane Open Space Framework (TOSF), Moretele Park and its surrounding landscape is a marginal and negative space in need of rehabilitation. International research shows that these sorts of spaces become of great interest as they can lead to cultural and scientific opportunities and possibilities (Gandy, 2013). It is believed that these spaces hold the potential to become character building entities within the greater community. The interstitial space of the Pienaars river entering the Magalies mountain, has already been declared as a possible 'landmark' space by the Mamelodi West Local Open Space Plan (LOSP).

The larger area of the site lies empty and abandoned to its former ecological and cultural function, rendering it absolute to the surrounding landscape or the community of Mamelodi West or East. This renders the potential of the river and its edge polluted and unsafe for populace. The theme of river regeneration through architectural and landscape intervention, becomes a crucial aspect in restoring the balance of absence and opportunity in seek of biodiversity and human experience. It becomes necessary to discuss the severity of the pending global misconduct of our natural resources to grasp the importance of acting ethically towards the environment. It is observed that architects are only accountable for 2-5% of built structures cliented by wealth, where the rest of the world's informal infrastructure is left unresolved. Of these structures consist most of the world's accidental symbol of global inequities and targets of political regimes. These constructed environments are also responsible for almost 50 % of the earths current greenhouse gasses (FISHER, 2016). This issue is also magnified by planning techniques that have resulted in urban sprawl and constitutes another 25 % from the needed transport and dependency on fossil fuels (FISHER, 2016). It is clear that the designed world is a potentially large solution to the problem as it constitutes a large part of the obstacle.

The movement towards a more responsible planetary approach is already wide awake in the 'green movement' and shows upon the design

communities' awareness and readiness to change. It is within this regenerative framework of design that we will find the rational guidelines towards a stable, if not very different future. Propagating the sustainable evolution relies on cognitive ethical decisions and strengthens the obligations of regenerative practise.

In a more extensive reach, the configuration of balance between human (practical and cultural) and ecological welfare is coined 'Lifescape' by Loures and Panagopoulos (2007:796). This is the propellant for a deep-rooted connection that propagates a natural restoration to biotic systems.

Our insight into the deconstruction of the architectural practise is made clear by Frank Duffy's explanation of the four independent building layers, namely shell, service, scenery and set. He argues that the shell becomes the most prominent creation of the building, as it is the layer that has to provide the least resistance through future appropriation but the most protection of the inner layer, and 'skin' changes, aptly named by Stewart Brand (Brand 1994:13). It is how we handle these layers that inform our contribution.

#### Absence and opportunity

'Every new work of architecture intervenes in a specific historical situation. It's essential to the quality of the intervention that the new building should embrace qualities that can enter into a meaningful dialogue with the existing situation. For if the intervention is to find its place, it makes us see what

already exists in a new light. We throw a stone into the water: sand swirls up and settles again. The stir is necessary. The stone has found its place, but the pond is no longer the same.' (Zumthor 2006)

Manfred Max-Neef, the Chilean economist, discusses a theory around cities that enable different 'satisfiers' of need. (Cooke, 2016). The first being an inhibiting satisfier, and the next a synergic satisfier. An inhibiting satisfier does exactly what it says, it is a form of top-up intervention upon a city that blocks or disables other parts of society to flourish; whether it be identity, culture or creation. The synergic satisfier refers to a bottom up process that directly enables the participants of the space to direct their own needs and wants. This results in energized group or individual that excels towards the future and no longer suffers a wrong of the past (whether it be political, social or spatial).

The intention is to extrapolate the journey of this energized reflect from the self, outwards to the final architectural intervention.

Process: the investigation of architectural 'voice' within a prominent landscape as a reflective for cultural legacy.

### Program: Contribution

The author recognizes the duality of space as a constant continuum and a stagnant entity that has become so by human influence. It is here where the tension of past, present and future is borne. We recognise the existence of the past space as its nature 1, and understand the continuum of change, to be finalized through the experience of architecture, that will guide it into nature 2 (Ciero cited in Hunt 1993).

The chosen position of the main programmatic intervention, is on the western ridge of the Pienaars river. This allows optimal eastern sunlight as the building splays towards to the northern and southern axis of the site and faces predominantly east. The river serves as nature's first and most recognisable presence (nature 1). The connection of what happens in-between these delimitations is the experience that form and function allows and extrapolates (nature 2). The argument is circumstantial to the final function of the form and its rational reasoning and validity.

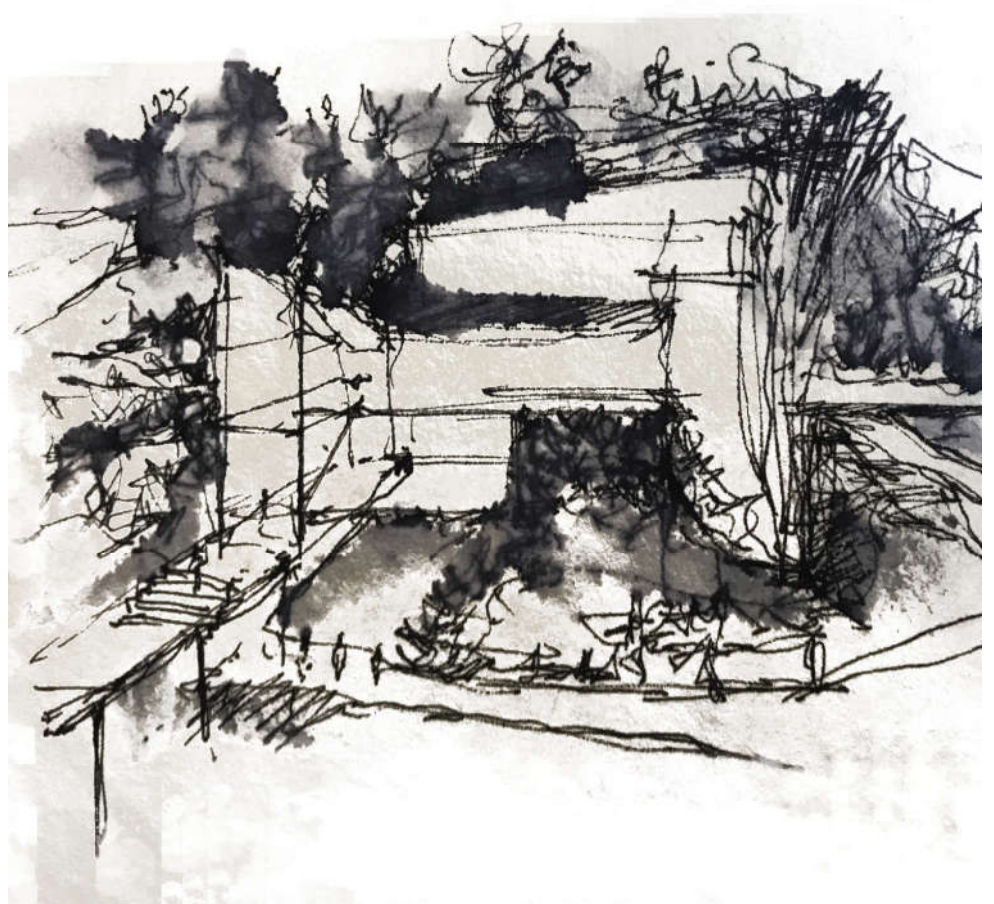




Fig. 15. Left; When the site speaks (Author, 2018)

Fig. 16. Opposite Top Right; Diagrammatical confluence of influences (Author, 2018)

Fig. 17. Opposite Bottom Right; Conceptual sketch (Author, 2018)

This first and main program refers to the reflection of self, and the position of community and culture within the self. Here I introduce the Radio Station and Public initiative project. The transference of knowledge, cultural values, happenings and regional dialogue of value, links back to the sub concept of reckoning. This, making architecture the omniscient observer of human and natural developments, histories, crimes and cultures. The architectural structure will aim to bring about an eco-systemic reclamation and interact 'haptically' with its surroundings, whilst being a constant reflection (transmission) of the world happening around it. This intention is closely linked with the natural conditions of the water-body, and will infuse autogenetic function, such as a waterwheel, and more conceptual function, such as water as a tool for reflection. The public confluence intention of the bridge and water wheel intervention is to secure a thorough public 'investment and return' policy. As radio stations procure a variety of events and public interest sponsorships, the space for this is naturally provided on a site that is a perfect patient for such opportunity. The client for these structures then not only become the story tellers of Mamelodi culture, but also endorsers of public wellbeing in the sense of creating a 'homestead' for happenings. Providing open market space, exhibition space, amphitheatres etc. As music is a large part of the radio station broadcasting, facilities to encourage this activity has

been created.

The reporting and journalistic aspect of the reflection radio program forms a large part of the western building. With provisions for research commons, media consulting rooms, journalism community training. Private & public boundaries are established within the threshold of the second and fourth level.

The didactic response through architecture is secure through the re-establishing of the importance of knowledge, education and culturally appropriate debate through sound. As the water runs northwards into the Magalies and onwards, so does the architectural intent lend itself to this trajectory of movement and spatial discourse.

As the solidity of the river is never broken, only dried out or sunken, so the structure simulates the practise of solid presence and eluding fragility. The spatial constraints of the intrusion onto the landscape is guided by the natural topographic recourse of the site. The challenge of these buildings will be iterated in the balance between the consumption of the building by the landscape, and vice versa.

The exploration of the argument becomes crucial in the concept of experience in terms of the human and environmental scale.

#### AMALGAMATION OF THEORY

An argument for regeneration through experience:

Historically the natural landscape has been adapted for man largely into homogenous landscapes that consume

a lot of resources and deplete the natural integrity of the site. (Kellert 2005)

The relationship of man with nature has unfortunately become disconnected and resulted in landscapes that only propagate the wellbeing of man, and not the nurturing of the two as sustainable entities (Kellert 2005). "The prevailing paradigm of urban development is neither necessary nor sustainable and constitutes more a design deficiency that an intrinsic and inevitable flaw of modern life" (Kellert 2005). The lens of the of experience of the 'ordinary' or daily life becomes important when viewing this disconnect between modern life's disregard for nature and the lack of dialogue between man and nature on a regular basis. This contributes to the authors argument pertaining to principles that facilitate 'non-place', as well as suggest a solution through design as a mediator. Places are, as per Hudson (2001) thought of as complex entities, ensembles of material objects, people, and systems of social relationships embodying distinct cultures and multiple meanings, identities and practices. "As such, places are contested and continually in the process of becoming, rather than fixed, open and a variety of flows in and out rather than closed and hermetically sealed" (Hudson 2001:Chapter 8).

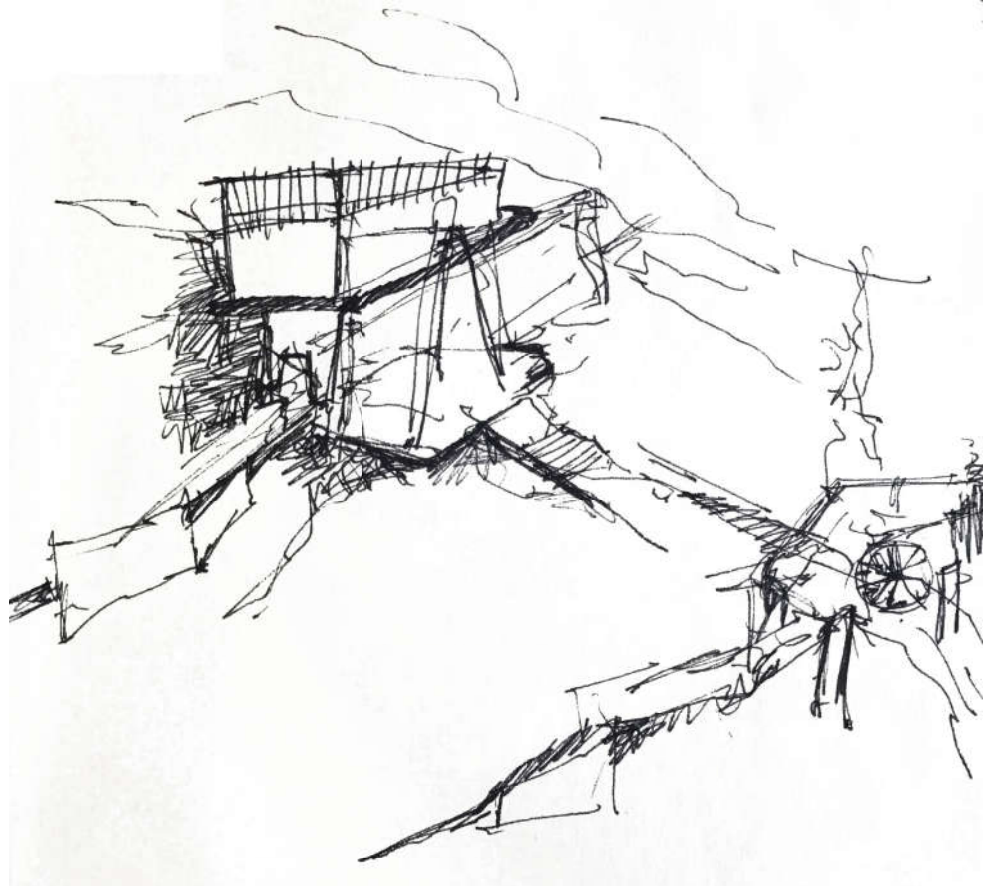
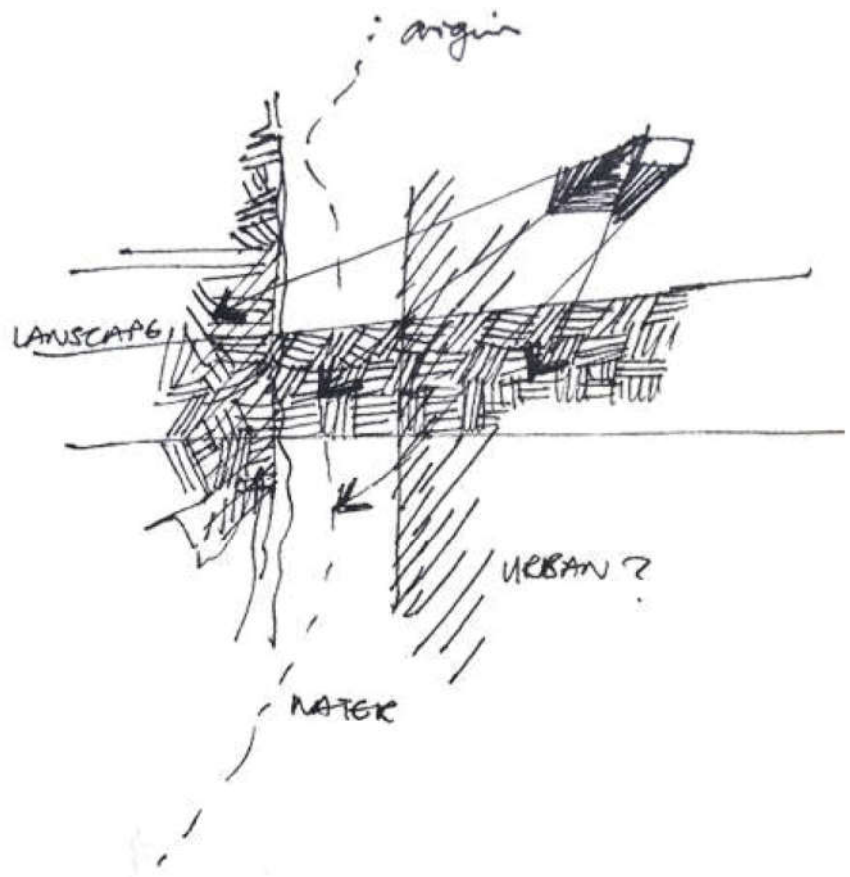
Merely designing for the benefit of 'green' systems are disputed to be inefficient to solve the complicated circuit of the human interaction within the natural sphere. This approach

seems to downplay the role of human activities and aspirations within the constant evolution of natural systems. (Mang & Reed). This solution suggests the complete alignment of human processes within the limitations of nature, and neither preserve nor restore the ecosystem, but rather contribute to the continual evolution of culture to the continual evolution of life.

"A structure in the landscape, like a frame or a concrete acoustic mirror, can help to mediate between ourselves and nature simply by standing in between. Creating a very personal resonance. Like a magic key that unlocks our memories, reminding us that we are part of it all and not separate from nature." (Titman 2013:117). In his work for a London church (2012), Titman reveals the poetics of architectural construct through the manipulation of materials. He uses the simple effect of weathering that occurs naturally, to showcase the immense complexity and possibility of nature within the sensory and functional reach of a building. Steven Holl declares, "While sensations and impressions quietly engage us in the physical phenomena of architecture, the generative force lies in the intentions behind it." (Holl, Pallassmaa, and Perez-Gomez). As with the collective work of Steven Holl, the intricacies of the sensory concept is masterfully intertwined with the user experience. The use of light and texture is manipulated to create space that is not only inherent to its program but positively enforces a user experience that is unique and contextual.

The Herring centre of the Arts, by Holl, combines these tactics of phenomenology with practical function. For instance, all practical services and considerations are concealed with the use of a site build-up of grass mounds and 'reflection' pools that generate a special relationship between the landscape, user and building. The architects' simple conviction of an active landscape generated an innovative concept that combines a visual art and music theme throughout indoor and outdoor spaces. Form stimulates another important reference for design when it comes to this execution of phenomenological design. Simple sketch designs and ideas generated from context is part the complete process that gives the final form to architecture.

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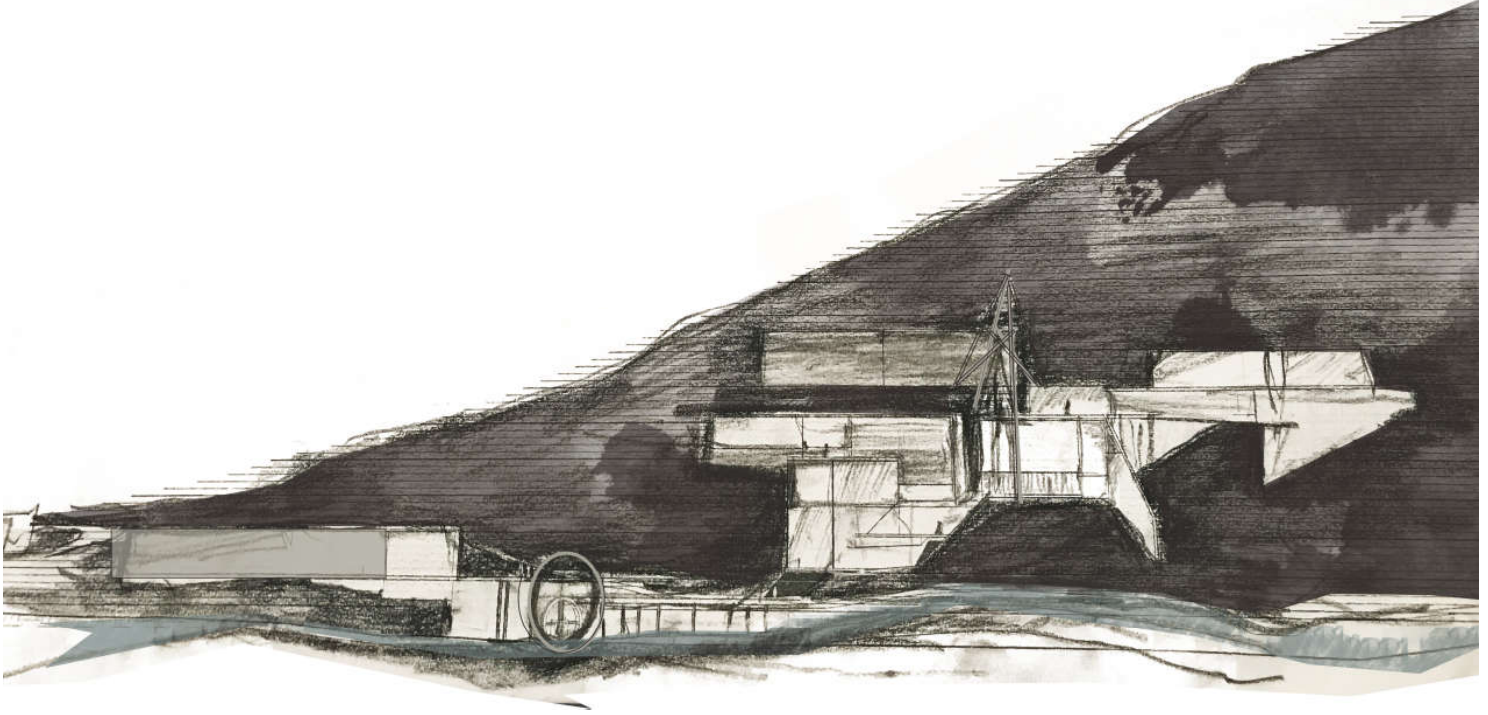


Fig. 18. Left; Harmonising elements of built and natrual origin(Author, 2018)

Simple sketch designs and ideas generated from context is part the complete process that gives the final form to architecture.

The exposition of phenomenology "With life also began individuality, for evolution dictates that no two forms can be exactly alike. Life depends upon light and water, and in straining upwards towards the light the plant evolved its own water reservoir and supply system. This enabled it to invade land (Frazer 1963)". The eternal connection of biotic life lies within light, water and surface. These principles overlap with our basic architectural mediums, but also specifically within a phenomenological framework. As these require our mechanical senses to function in order for us to perceive these experiences, it is the human awareness cultivated from the specifics that really come in to phenomenology-play. One way to understand this phenomenon is to use Rationalism as a counter theory. Rationalism dictates that the truth of experience is not sensory but intellectual and deductive (Bourke p.263). This delivers our experience to us within deducible layers for scientific understanding, where we can once again measure a building as a fourfold layered entity according to Frank Duffy's theory. This article aims to delve into a different interpretation of architectural functionality within a phenomenological construct.

Throughout the revolution and growth of architecture as a tool for and by man, waves of human and natural influence on our structures have fluctuated notably. This relationship has fluctuated between being hostile and exploitative or harmonising and integrated (Nesbitt 1996:30). Phenomenology argues that architecture is a human construct built within nature to function positively in the evolution of our lives. Our architecture should arguably therefore stem from individual and communal human gestures that inspire a wellbeing of life. The integration of function within a sensory framework produces the program for the architecture, and should act as an essential bearer to the practise of phenomenology. 'And if a building is a frozen poem, then the materials used to construct it are the carefully chosen words'. It

offers us a way of appreciating the unquantifiable, the unmeasurable and the irrational. But mostly it gives us a poetic way of looking at nature in beautiful contrast with its massive entropic forces.'(Titman 2013 pg. 117)

### Attempting to experience

We find ourselves,  
 within the provocation of thought,  
 and reckoning of space  
 and the intuitive glance towards the shape,  
 that the building cuts from the sky.  
 We most definitely find ourselves,  
 if only for two beats of footsteps,  
 along a path of dirt or gravel or concrete.  
 We are somewhere and we are thinking.  
 Something...

This self is not self  
 or found  
 without nature.  
 without somewhere to be.

We reflect within the spaces  
 that which we are ourselves without,  
 and within.  
 We toast to our conscious lack of experience  
 To the lack of not knowing there is a lack.

Is this the architecture wherein we live?  
 And do and feel and think and sleep.  
 Is the architect the creator of that which  
 we subconsciously lack  
 within nature?  
 Does the architect attempt to create this  
 experience of that,  
 which lies forgotten by the  
 consciousness.

When we get back to the party that  
 nature has thrown,  
 where materials are as immaterial as  
 they are material,  
 and where the droplets of champagne  
 that we spill on the floor,  
 as we perform our lives,  
 are considered spilled for only a  
 second, until they too disappear.  
 As we ourselves do, as the nature upon  
 which we intrude so enthusiastically,  
 does.

It is only that which we leave behind  
 that which becomes memory,  
 that remains for this landscape  
 of man. (Author 2018)

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