

D I S T I L

l i m i n a l a r c h i t e c t u r e

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M A R C H (P R O F)

M a r n i v a n d e r H o v e n

| 1 2 1 3 6 7 2 8 |

“ l i m i n a l ”

:

occupying a position at, or on both sides

of, a boundary or threshold.

*Adaptive reuse of an abandoned water reservoir at
the limen between
the URBAN and NATURAL environments*

THE SITE
*Magalies Mountain, Mamelodi West,
Gauteng, South Africa.*
25°41'54.51"S
28°20'35.04"E

THE PROGRAM
Distilling of Place and its People

KEYWORDS
*Distillation;
Edge Condition;
Memory;
Threshold;
Liminality
Adaptive Re-use*

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RESEARCH FIELDS
*Human Settlements and Urbanism
Heritage and Cultural Landscapes
Environmental Potential*



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P R E F A C E

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DECLARATION

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

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

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

Marni van der Hoven

...

ACKNOWLEDGMENTS

Thank you to...

My Abba Vader. my rock and refuge, for giving me passion and strength.

Psalm 18:2.

My parents, Henry and Erna for believing in me and your encouragement through the difficult times.

The Godsent comrades. Michelle and Rudolph Erasmus, Lucille Witthuhn and Buckley Thompson. Words can not describe the depth of my gratefulness for each of you. I would not have done it without all the help your supplied me with.

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Cindi Janse van Vuuren, for the light you carry.

Doctor Carin Combrick for helping me in helping me craft my thought for the dissertation.

My editor, Lizann Keuler.

...

ABSTRAK

Tussen die rustige natuurlike landskap van die Magaliesberg en die bruisende chaos van Mamelodi Wes is 'n onderskatte drumpel wat hierdie twee kontrasterende omgewings verbind. Die landskaperfenis vertel 'n verhaal van herstel en opheffing. Hierdie eens gebroke landskap is nou 'n omgewingstoeflug. Die drumpel word gedefinieer deur daardie ontasbare kwaliteit – gemeenskaplike energie – van die tussenruimte. Die behoefte om ruimte in hierdie tussenin-plek te skep is geïdentifiseer om die energie van hierdie omgewing vas te vang en die drumpel te definieer. Die drumpel is die gekose plek vir hierdie verhandeling.

Hierdie projek fokus dus op die definieer- en skep van plek in die tussenruimte as verbindinding van die stedelike omgewing met die natuurlike omgewing.

Die projek maak gebruik van 'n verlate waterreservoir geleë aan die voet van die Magaliesberg en aangrensend aan die drumpel. Die ingryping beoog die hergebruik van hierdie infrastruktuur om 'n essensiële oliedestillasie fasiliteit te huisves. Hierdie fasiliteit vertel 'n verhaal wat prakties sowel as poëties is. Die drumpel grens aan die Mothong landskap waar medisinale plante en kruie gekweek word. In reaksie op die Mothong bewarings- en omgewingsinisiatief is die geleentheid vir sosio-ekonomiese ontwikkeling geïdentifiseer, tewegebring deur die skepping van 'n distillasiefasiliteit wat openbare interaksie met die prosesse moontlik maak.

Toepaslike teoretiese benaderings word gebruik as 'n hulpmiddel om die terrein, program en gebruikers van die gebou te verstaan deur die werk van Arnold van Gennep (1960) en Victor Witter Turner (1979). Die konteks se tekortkominge en geleenthede dien as inspirasie vir die ontwerp. Die doel van die projek is om huidige omgewingsinisiatiewe uit te brei en sosio-ekonomiese geleenthede deur die voorgestelde program aan te wakker. Dit sal 'n meer bestendige toekoms vir die stedelike- en natuurlike omgewing moontlik maak.

...

ABSTRACT

Between the serene natural landscape of the Magaliesberg and the bustling chaos of the Mamelodi West Township lies an understated threshold that links these two contrasting environments. The heritage of the landscape tells of recovery and appreciation, as this once-broken landscape is now regarded as a small environmental haven. This threshold is defined by the intangible quality of the in-between space – that of communal energy. Therefore, the need to create space in this non-place is identified as this can capture its energy and define the threshold, which is the chosen site for this study.

The intention is for the architectural intervention to become a transitional device; allowing the user passage from the urban- to the natural landscape. The project focuses on defining and creating 'place' in the 'in-between' space of the threshold that connects the urban and natural environment.

The project utilises an abandoned water reservoir, which is within the threshold located at the foot of the Magaliesberg. The intervention envisions the re-purpose of this infrastructure to house an essential oils distillation facility. The threshold links to a landscape called Mothong, where medicinal plants and herbs are cultivated. In response to this existing conservation and environmental initiatives, the opportunity for socio-economic development was identified through the creation of a distillation facility that allows for public interaction with the processes.

The theoretical grounding for this project considers the concept of liminality of rites of passage as discussed through the work of Arnold van Gennep (1960) and Victor Witter Turner (1979). The Oxford English Dictionary defines liminality as being "*of or pertaining to the threshold or initial stage of a process*" (Oxford Dictionaries English, 2018). Tracing its etymology, liminality has the Latin origin "*limen*" – translating as "*threshold*" – which is an inherently architectural element.

The concept of liminality is introduced by an anthropology approach, which describes its three phases as separation, margin and aggregation. This guided the architectural interpretation of theory in this project.

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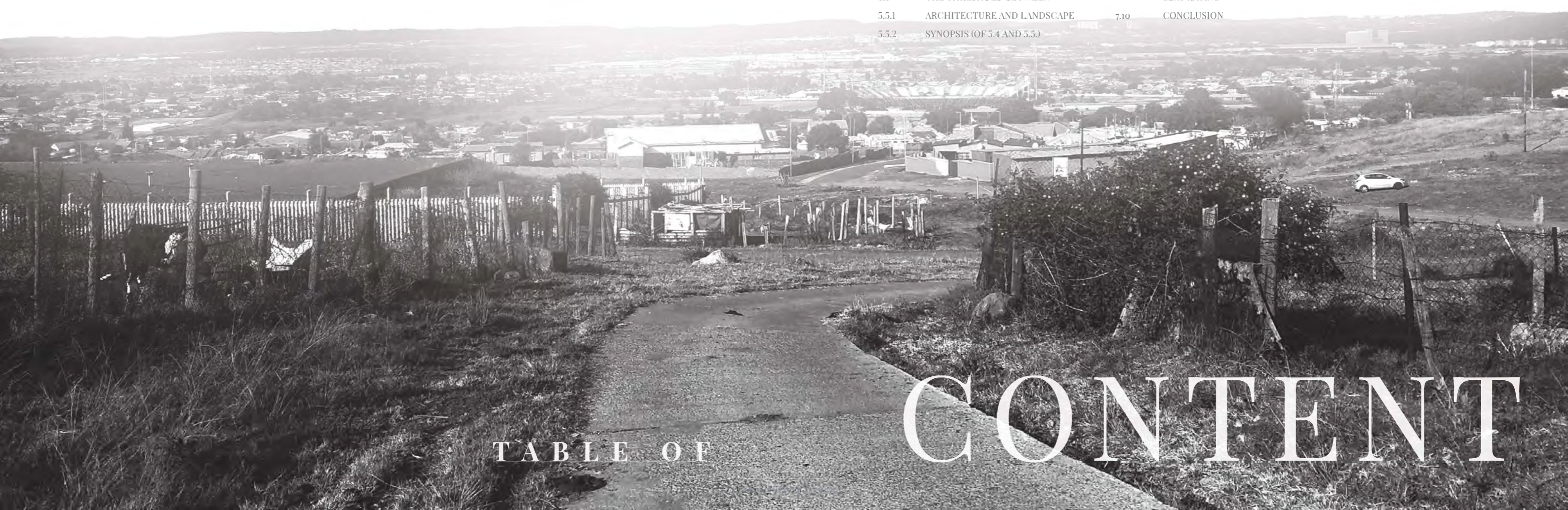


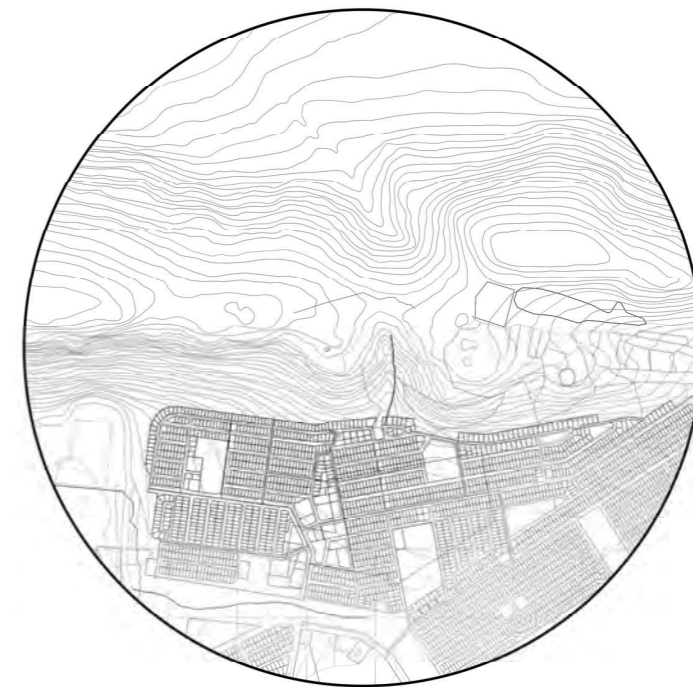
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MAMELODI



Area: 45.19 km²
Population: 334577 (7403.17 per km²)
Elevation: 1400m
Ecozone:
Climate: Cwa
Time Zone: (UTC+2)
Postal Code: 0122 (+)

Established: 1945
Demonym: Black African 98.9%
Language:
• Northern Sotho 42.3%
• Zulu 12.2%
• Tsonga 10.7%
• S. Ndebele 8.8%
• Other 26.0%

...

The following chapter will discuss the proposed context, followed by the research problem, research question project intention, research methodology and finally the delimitations of the project.

1.1 PROPOSED CONTEXT

...

Mamelodi West and the Magalies Mountain Range as study area

Nestled between the Magaliesberg and the industrialised area of Silverton lies the township of Mamelodi. This precinct is located on the periphery of the City of Tshwane, with its northern edge defined by the Magaliesberg mountain range.

Mamelodi is a residential suburb of approximately 45.19km² in size. Its origin can be traced to about 1860, when a group of indigenous people, seeking employment in the then newly established city of Pretoria, settled on the farm Vlakfontein. In 1890, the first stop on the railway line from Pretoria to Lourenço Marques (now Maputo) was at Eerste Fabrieken, an industrial area just outside Pretoria. This created economic impetus in the region and the settlement expanded to become a prominent black residential area in terms of the Native Lands Act 27 of 1913 (Nice & Walker et al 1991). Mamelodi was established on 30 October 1945 when the Pretoria City Council (PCC) bought parts 2 and 3 of the Vlakfontein 329 JR farm for

the purpose of laying out black urban areas (Walter & Van Der Waal 1991:3-4). Since 1987 development in Mamelodi has been to the east; starting with Mamelodi Extension 3 and through to the Mahube Valley. Development continues in Mamelodi - with the largest number of townships being concentrated in the Mahube Valley (Maree 2012:3).

Mamelodi hosts a large number of informal settlements, most of which have limited infrastructure. Although the township is expanding to the east-west lying escarpment of the Magaliesberg (Maree 2012:2), expansion area is limited. In the western section development is restricted by the cemetery that borders Eersterust. The northern part, which hosts the rapidly developing semi-urban areas of Derdepoort, Bavianspoort and Roodeplaat Dam is restricted by the Magaliesberg itself.

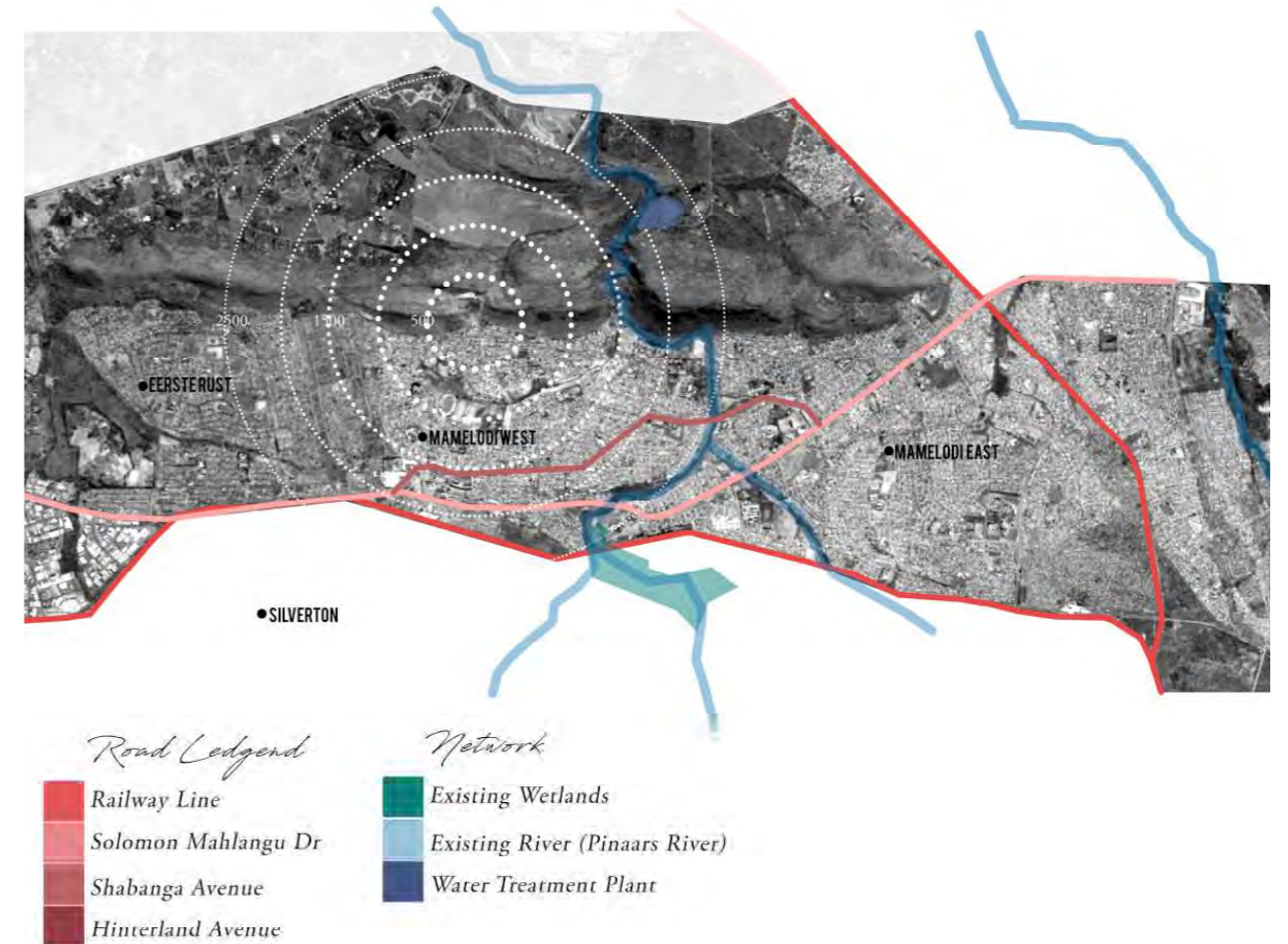


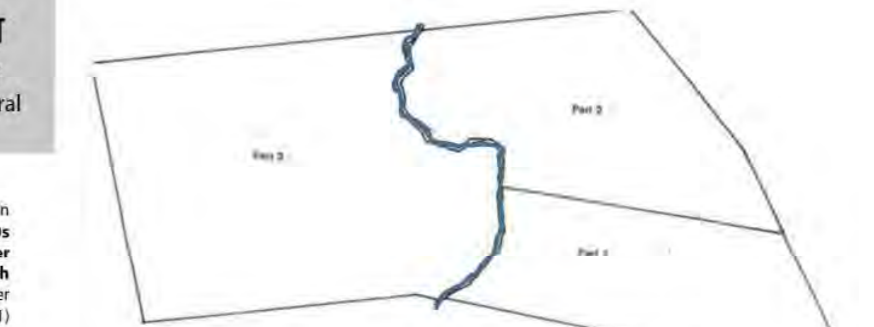
Figure 1.1: Mamelodi as study area (Author: 2018)

Figure 1.2: Historical Development (Walter & Van Der Waal, 1991)

HISTORY_NATURAL CONTEXT

The idea that place entails unending descriptions of 'processes that shape existential and aesthetic cultural experience' (Rewers 2004: 161).

- 1] Subdivision of the farm Vlakfontein 329 JR during the 1870s showing Pinaar's River cutting North-South (Walker & Van Der Waal, 1991)



1.2. NORMATIVE POSITION

... *design philosophy*



Figure 1.3: Capturing ideas of the author's normative position (Author: 2018).

The author's design philosophy is defined by two core principles: drawing from the context and including cultures.

Drawing from the context

Although history and physical appearance form a relevant part of the context in which architecture is situated, context is more than this. Context is how the new will live with the old.

Context draws on the senses: the sights, smells and memories that define a place and adds to its uniqueness. It grows from communities and people, and architecture should respond to it.

Including cultures |

Architecture should aim to reflect and capture the shared strengths of a community, thus reinforcing pride in individuals and moving curiosity in visitors.

The inclusion of collective beliefs, the traditions and aspirations of a society, reinforces the respect of the society and drives design decisions.

In essence, the design philosophy is characterized by simplicity and purity in design; where architecture exists in harmony with its environment and has a deeper meaning than only the aesthetic. Architecture should always strive to capture not only the natural realm but also the cultural- and human environment to allow for a deep phenomenological understanding of place. Architecture, in the author's opinion, should allow the existing, utilise the existing, and serve to improve the existing – which can result in the making of meaningful places.

1.3. RESEARCH PROBLEM

... [1.3.1]

General Issue

Current land use in the areas that border the Magaliesberg region place direct pressure on natural zones and biodiversity in the region. This is partly due to the need for housing and to poor land-use management. The natural landscape of the Magaliesberg (forming the northern periphery of Mamelodi) has seen early signs of urban sprawl encroaching the foot of the mountain range. Unfortunately, the section of the Magaliesberg adjacent to the townships of Mamelodi (to the east of the City of Tshwane) is characterised by socio-economic and development pressures that place a strain on natural resources and lead to the degradation of biodiversity and conservation.

The Gauteng Conservation Plan (C-Plan) and National Protected Areas Expansion Strategy (NPEAS) both identify the Magaliesberg mountain range as a natural feature with high biodiversity value (Maree 2012:3). Biodiversity is the variety of life forms within a given ecosystem, biome, or the entire Earth. It is often used as a measure of the health of biological systems. Protection of the Magaliesberg ridges will contribute significantly to the conservation of biodiversity, as these ridges are important predictors of biodiversity in the region. The ridges of Gauteng form a vital habitat for many endangered or Red Data plant species. Conservation of these ridges would therefore provide a habitat for a significant number of plant species – allowing their continued survival in a rapidly urbanising province. As this is a desirable long-term conservation plan, it is critical to establish appropriate measures to put a stop to urban sprawl on the natural environment (Maree 2012:11).

The 1999 Ecological assessment does not support the proposal for fencing off a part of the mountain for conservation and protection from the township for many the most obvious measure to contain this urban sprawl. The 1999 Ecological Assessment, found the proposal of demarcation to be unfeasible although it has been suggested that the value of this resources must be communicated to the local community (Maree 2012:12).

In the essay Conservation Biology, it is stated that people often seem unconcerned about the current unprecedented loss of biodiversity, as “a great many people simply do not prioritise the environment as an important concern relative to other issues in their lives” (Pew Research Centre 2015; (Manfredo et al 2017).

The introduction of social-ecological systems as a conceptual approach, in which values are seen not only as motivational goals held by people but also as ideas that are deeply embedded in society's material culture, collective behaviour, traditions and institutions (Manfredo et al 2017), can raise hopes for creating a change in land value.

Social values are the cognitive foundation on which people's prioritizations are built. If values change, corresponding behavioural changes typically follow across many situations. The values of individuals are largely shaped in youth and remain relatively stable throughout their lives (Inglehart 1997; Manfredo et al 2017).

The value-shift argument has permeated the conservation sciences for many years (Manfredo et al 2017). In the extensive social sciences literature regarding attitude and behaviour change, environmental education (Smyth 2006); government policy (Hoff-Elimari et al 2014); and deliberation (Dietz 2013) have all been proposed as vehicles for creating value change.

Therefore, evoking large-scale value change for the sake of conservation would require not only change among individuals but also among the groups, organisations, and societies in which those individuals are nested.

The social value of these groups should shift and directed to socio-ecological values. Change is slow, path-dependent, and occurs in response to other changes in a person's socio-ecological surroundings. A change in values contributes to the process of shifting behaviour (Manfredo et al 2017).

The conservation social sciences will be far more effective in contributing to long-term solutions if the focus is on attitude, norm, and behaviour change in the context of specific behaviours and the situations in which they occur (McKenzie-Mohr 2013; Manfredo et al 2017).

The dissertation argues that if there is an alignment on social and environmental values the resilience of the natural environment will be enhanced. In conclusion, the rich natural landscape should be valued for what it can offer to the urban environment without the depletion of its resources.

The prohibition process of urban encroachment requires re-conceptualization. The threshold between the natural environment of the Magaliesberg and the urban context of Mamelodi is investigated for possible solutions beyond the fencing off of environments. The dissertation takes a conceptual stance though problem solving of a possible strategy for developing a conservation plan.



[1.3.2]
Urban Issue



Figure 1.5: Open land or natural environments in proximity to rural-urban areas are experiencing a loss of ecological contribution and resourcefulness (Author: 2018).

The Magaliesberg, which is a prominent natural geographical feature of Mamelodi, is negatively affected by urban sprawl. Urban sprawl is thus an environmental threat to the natural landscape.

United Nations Educational, Scientific and Cultural Organisation (UNESCO) recognises the Magaliesberg as a Biosphere and as part of the Gauteng provincial conservation area (Unesco.org 2018). The mountain range stretches 120km from Bronkhorstspuit Dam (east of Pretoria) to Rustenburg in the west. The South African National Biodiversity Institute (SANBI) does not regard the portion of the Magaliesberg ranging eastwards from Wonderboom Nature Reserve toward Mamelodi as part of the conservation region. This further contributes to the threat of the natural environment.

“In areas where sprawl is not controlled, the concentration of human presence in residential and industrial settings may lead to an alteration of ecosystem patterns and processes” (Grimm et al 2000).

In Mamelodi, urban sprawl and industrialisation are cause for environmental concerns regarding the natural environment.

Open land or natural environments in proximity to rural-urban areas are experiencing a loss of ecological contribution and resourcefulness. The resourcefulness of the natural environment is overlooked as the need for housing development takes priority. Humanity’s impact through urban sprawl has resulted in the build-up of the city fabric to the foot of the Magaliesberg, thus causing tension between the natural landscape and the city.

[1.3.3]
Architectural Issue

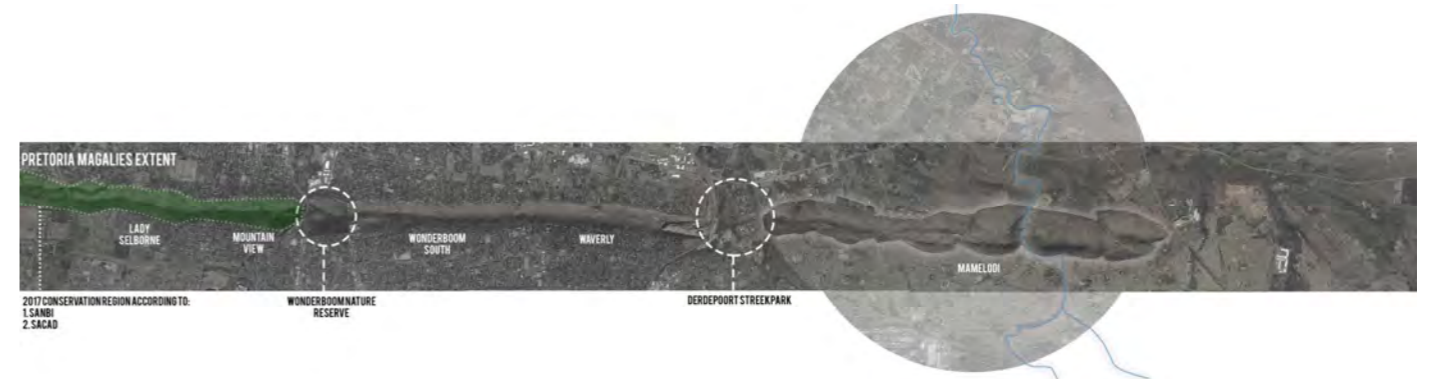


Figure 1.5: Magalies Mountain conservation region and the gateways that separate Mamelodi from (Tuke 2018)



Figure 1.6: Site as threshold - undefined and in neglected condition (Author: 2018)

The threshold between the serene, natural landscape of the Magaliesberg and the bustling chaos of the Mamelodi West Township, is evidence of the impact urban tension has on the natural environment. Spatially the threshold between the natural landscape and the township currently lacks definition and exists as a non-place.

Catherine Dee (2001) in her book ‘Form and Fabric in Architecture’ regards the threshold as a spatial component that provides for integration, subtitle and complex transitions: the threshold is the space that links spaces, mediums or objects. The threshold separates and connects

contrasting environments – the urban to the natural and the natural to the urban – therefore taking on a hybrid identity formed of both realms. As an architectural element and spatial configuration the threshold as a transitional device encompasses the concept of the “limen” (Turner 1963) or threshold. An architectural typology within the threshold “can often provide visual and physical integration of the landscape if it possesses qualities of both the spaces it connects, the environment that is left behind as well as the place being entered” (Dee 2001:171). The concept of threshold in this dissertation suggests cohesion between contrasting environments that entices integration and symbiosis.

Footnote

1. Symbiosis: 1877, as a biological term, “mutually beneficial association of two different organisms.” Given a wider (non-biological) sense by 1921. An earlier sense of “communal or social life” is found in 1620.s (www.thesaurus.com, 2018).

[1.4]

Project Intentions

It is the intention of the project to harness the site potentials concerning the current environmental and infrastructural features. The dissertation conceptualises the relevant theoretical approach of liminality to construct a framework for the program. Though a layered programmatic approach the dual purpose of a practical and poetic interpretation of distill[ing] is applied through the three stages of liminality. The first layer of providing a of essential oil distillation plant stimulates socio economic opportunity. The second poetic layer considers the way through which people, place and building can transition the different stages within the building.

Furthermore, the project aims to give form to the spatial configuration of the threshold. This is done by using architecture to create a spatial morphology based on the understanding and experience of the limen. The architectural intervention is to become the transitional device for the user moving from the urban to the natural context.

The architectural intervention through spatial practice becomes the transitional device for the user from the urban to the natural context. This dissertation investigates the spatial practice for “producing the spatial forms and practices appropriate to, and necessary for, different productive and reproductive activities” (Borden et al 2001:6). Furthermore, the intervention extends current environmental initiatives (in the physical environment) to stimulate socio-economic opportunity.

[1.5]

RESEARCH QUESTION AND SUB-QUESTIONS

> MAIN QUESTION

How can architecture facilitate the transition of the liminal space between the urban and natural environments for the user?

> SUB- QUESTIONS

What are the experiential and architectural constructs of threshold space under the context-specific conditions of the site?

[1.6]

RESEARCH METHODOLOGY

To address the research issues and intentions, the following methods were used to develop the appropriate architectural response.

SITE INTERPRETATIONS

(Mapping: documents, site visits, photographs, verbal)

Various site visits were undertaken at sundry stages of the year and at different times of the day and week. Site sketches were made and photographs taken to capture the prevailing character and atmosphere of the area. The approach to mapping dealt with the statistical data of interpreting the surrounding area. The urban values were mapped as “modes of representation to confront an impermanent urban ground.” This included mapping the surroundings in

terms of rehabilitating landscapes; active social nodes; relevant institutions; bio-climatic conditions; water sources; and fauna and flora. Further documentation of factual and empirical data; agricultural farms; recreational activities in the Magaliesberg; and existing architecture was conducted.

THEORETICAL EXPLORATION

The theoretical approach to this project was guided through an understanding of the characteristics of the chosen site. The concept of liminality very strongly relates to the in-between condition, therefore liminality theory was the most appropriate lens. Liminality has been thoroughly studied in the field of anthropology under the themes of separation, transition and integration. These three conceptual themes were design

[1.7]

LIMITATIONS, DELIMITATIONS, ASSUMPTIONS

Various areas and possible locations for the intervention were explored in and around the study area. This exploration is illustrated in the Design Development chapter. It was decided to focus the design on the adaptation of the identified existing reservoir structure as this proved to be the most appropriate option.

It is assumed that the aim of this project on a conceptual level will have the desired effect on the

user, although emotions are subjective and cannot be generalised. Furthermore, the argument of the dissertation is a means of exploring the topic of liminality in architecture and is not applicable specific to all projects.

CONTEXT

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- 3.6 URBAN VISION
 - 3.6.1 PRECEDENT
- 3.7 URBAN VISION



...

3.1

INTRODUCTION

The following chapter will contextualize the project issues and intentions previously discussed. The analysis focuses on three scales of the urban, natural and site scale. The analysis will uncover the tangible and intangible attributes of the study area that will be used as design driver

The theory of liminality serves as an analogy to interpret the mapping of these two contexts (Mamelodi West and Magalies Mountain East). It guided the author to approach the constructs of this chapter on context according to her personal experience of liminality.

The author's exposure to Mamelodi throughout 2017 and 2018 was primarily urban-based of Mamelodi's urban users and around the existing architecture. At the end of 2017 the author encountered one of the stakeholders in Mamelodi, Doctor Emperiam Mabena; a professional African Indigenous Knowledge System (AIKS) researcher, registered doctor and conservationist.

In this liminal time (at the end of 2017 and the start of 2018) the author's interest in research in Mamelodi shifted from the urban towards working more within the nature context. Dr Mabena led the author to discover the Mothong African heritage site located in Magalies Mountain East and the serenity it holds. The two contexts that the dissertation considers are Mamelodi West and Magalies Mountain East. The following section analyse these environments in order to define the threshold connecting them. The mapping done firstly introduces the two contexts of the urban and the natural, where after the threshold is analysed.

3.2 URBAN ANALYSIS MAMELODI WEST

3.2.1 // MACRO ANALYSIS URBAN CONDITION

The macro-mapping illustrates Mamelodi's location in proximity to Pretoria (figure 3.1). The main roads leading in and out of Mamelodi are Solomon Mahlangu Drive, Tsamaya Avenue and Hinterland Avenue. The main environmental features are the Pienaars River and the Magaliesberg (figure 3.2). The wetlands of the Pienaars Rivier and smaller rivers in the context are considered green belts as they house vegetation and can be connected to open land areas. Other important environmental and recreational spaces are Moretele Park and the HM Pitje stadium (although it is not currently in use).

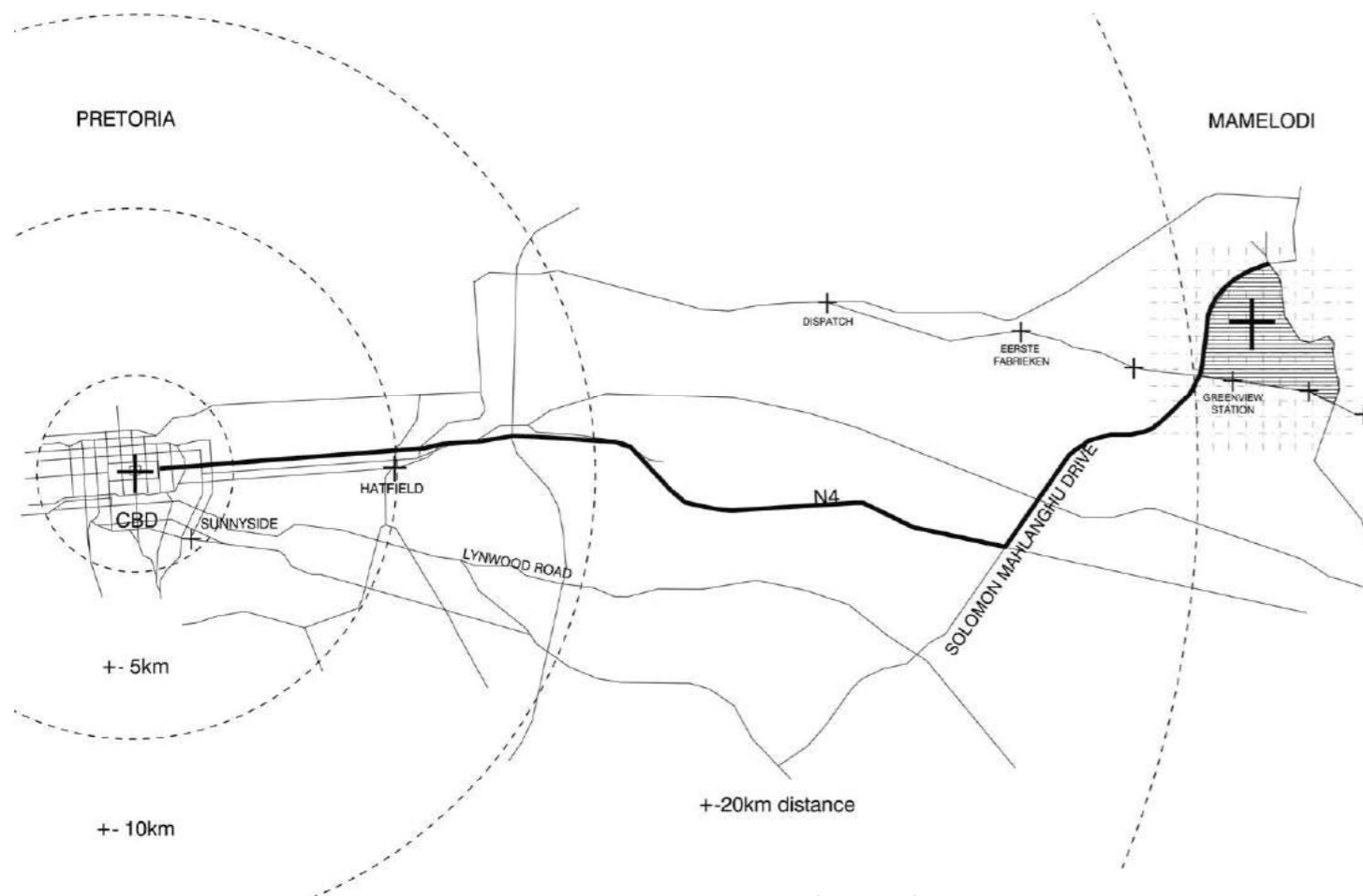


Figure 3.1: Neighborhoods in Mamelodi West (Kotze: 2014)

3.2.2 // MESO ANALYSIS

The precinct mapping zooms in on Mamelodi West and on the location of the proposed area for the scheme.

Mamelodi West is older than the area's eastern precinct, as the township originated in the west and only later developed to the east. Therefore, this precinct has a rich culture and a number of recreational spaces as well as a cemetery, The Mamelodi Rondavels, the Mamelodi Cricket oval, the That's it! Art Gallery and others. According to a recent report in The Guardian (2018), the precinct is not only established and still growing in the socio-cultural realm but also in the socio-environmental realm. In 2001, the African Mothong Heritage Trust

was established by Dr Mabena in association with the Council of Scientific and Industrial Research (CSIR, Technical University of Tshwane (TUT) and the University of Pretoria (UP). The site has only recently gained popularity with the community.

The activities mapped in Mamelodi West illustrate main roads that lead to Magaliesberg East, educational nodes, and cultural nodes. The mapping orientates the possible involvement of schools and inhabitants in the surrounds of the site, within a 5km and 10km radius.

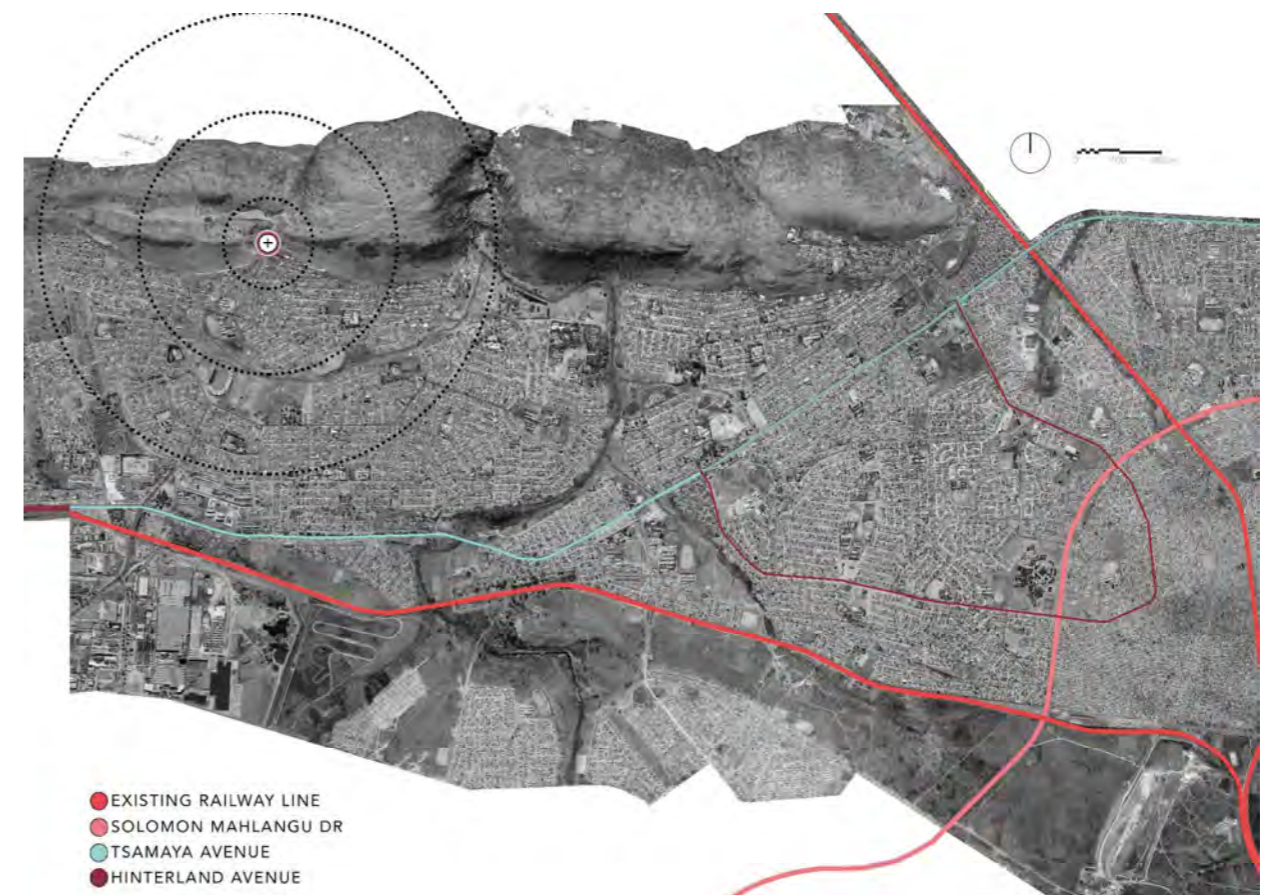


Figure 3.2: Neighborhoods in Mamelodi West (Author: 2018)

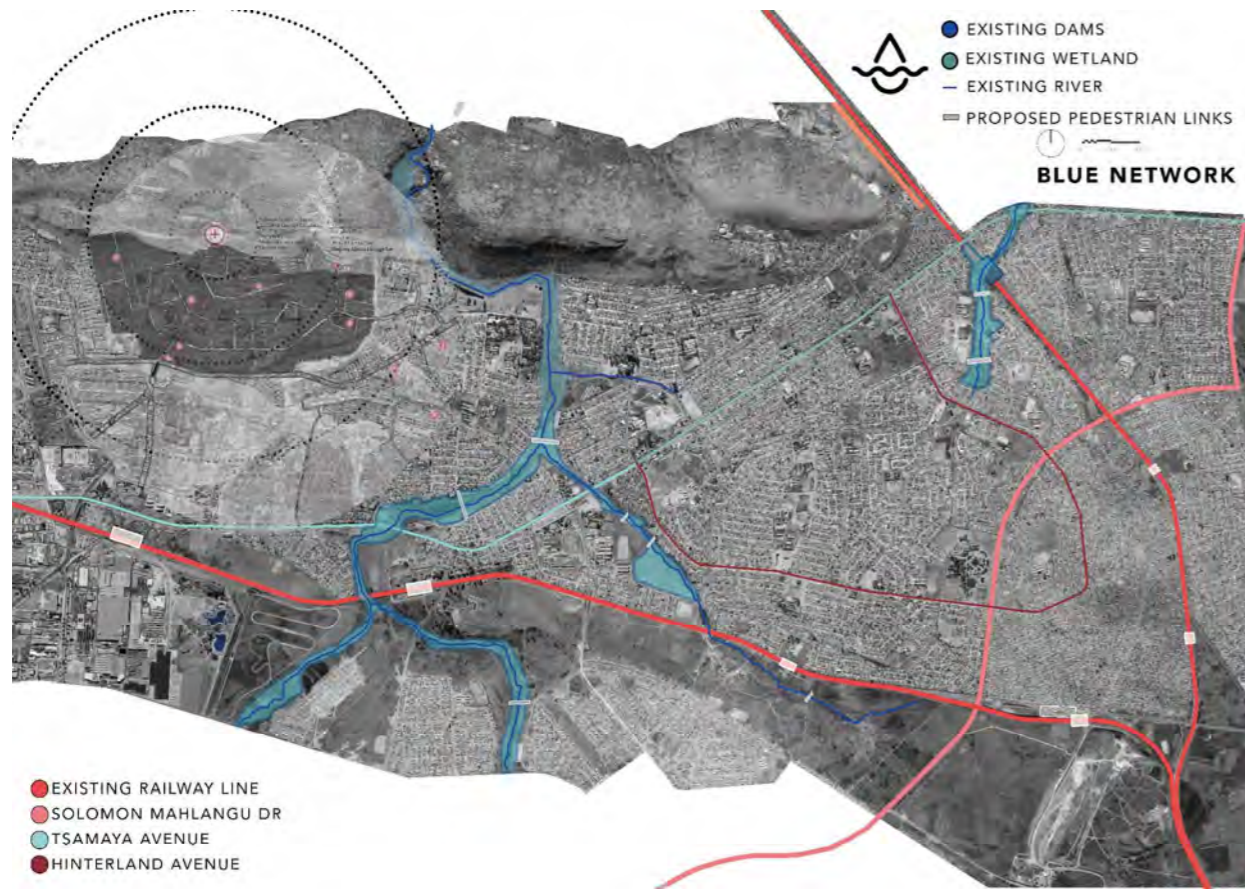


Figure 3.3. Blue Network in Mamelodi (Author: 2018)

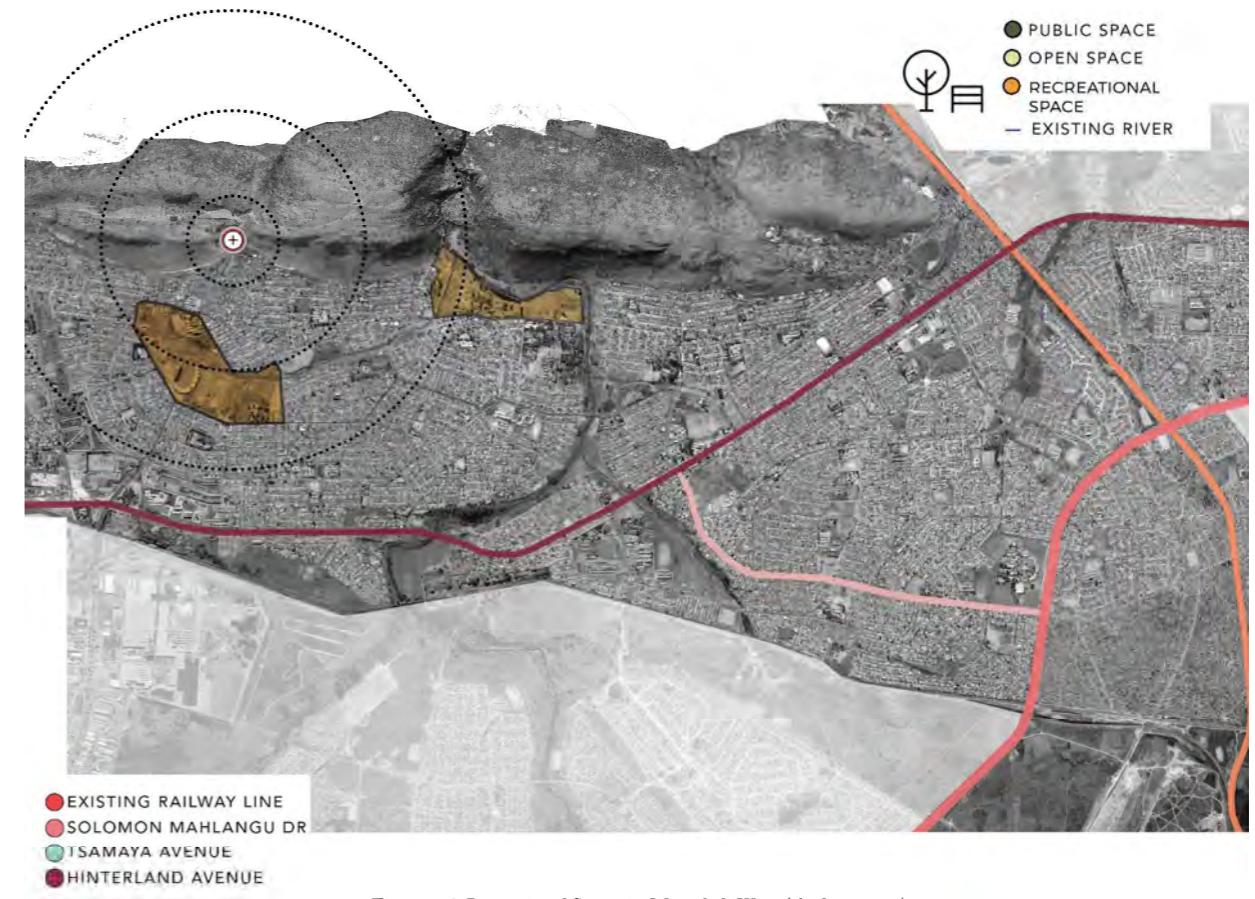


Figure 3.5: Recreational Spaces in Mamelodi West (Author: 2018)

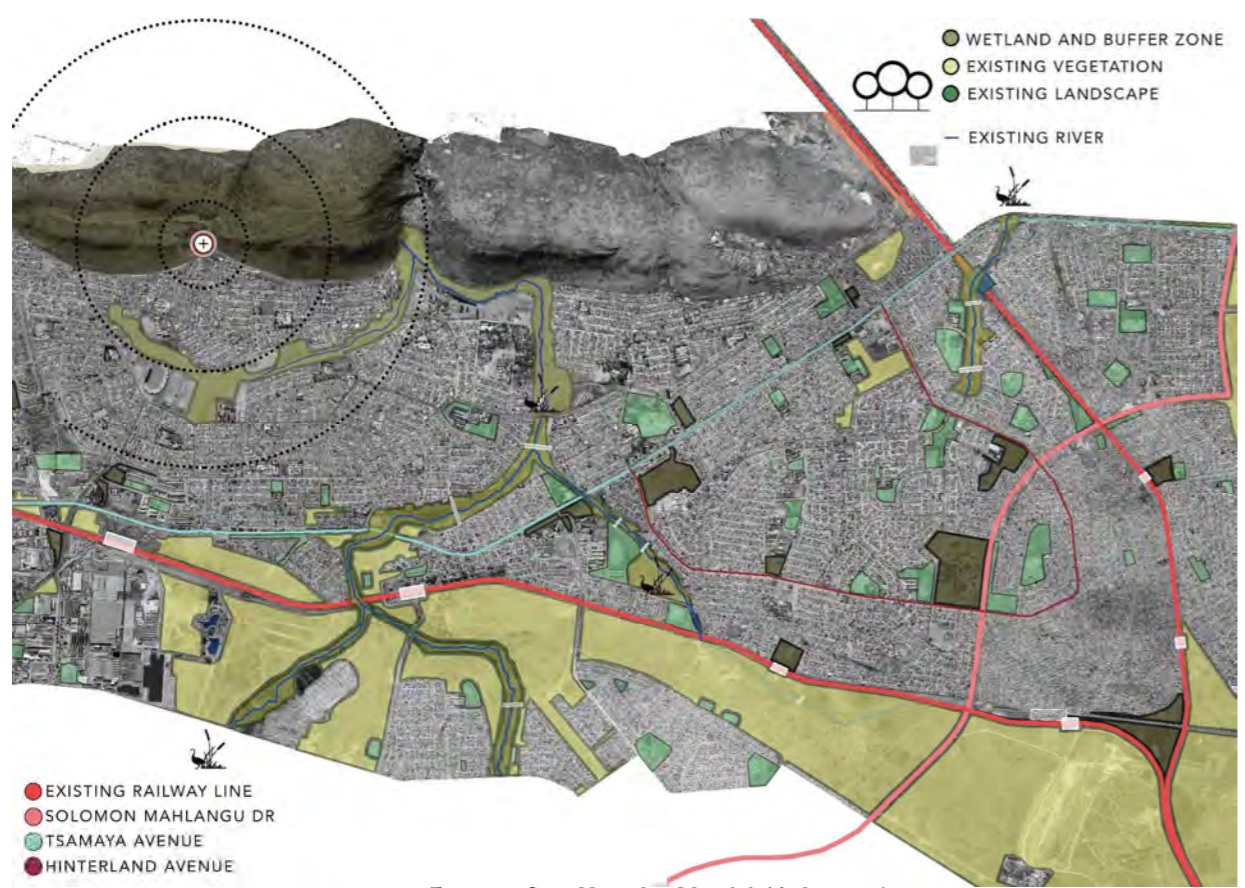


Figure 3.4: Green Network in Mamelodi (Author: 2018)



Figure 3.6 : Meso Mapping: Showing (+) Threshold location - main streets in residential area marked out to show access routes to site (Levi: 2018)

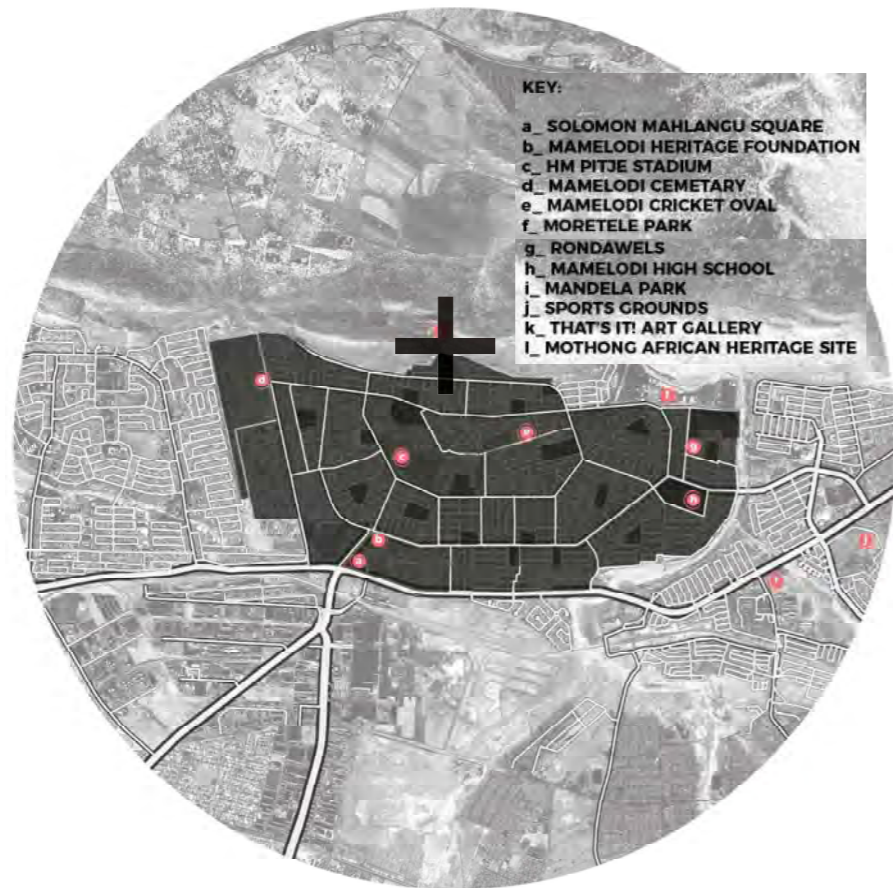


Figure 3.7: Cultural and Recreational nodes in Mamelodi West (Levi 2018)

3.2.3. MICRO ANALYSIS SITE FEATURES

Photographs of surrounding urban context

The area under study for the preliminal phase (urban) houses pockets of residential houses. It is accessed by End Street, which leads to the current entrance that is marked by a municipal fence at the foot of the mountain. The urban context is connected to the natural context by a wetland running through to Malaka Street. A small church is situated on the western edge of the wetland, whilst to the east and west informal housing can be seen.



Figure 3.8
Illegal shack on the eastern ridge. There is an attempt to halt and manage the spread of illegal housing on the mountain; note the "remove" sign on the shack (Maree, 2012:30).



Figure 3.9:
Cattle farming occupying just south of the Mothong project, intense cattle grazing (Maree, 2012:30)..



Figure 3.10
Encroaching up the ridge from formal and informal settlements (note the large Mamelodi cemetery in the Background (Maree, 2012:30).

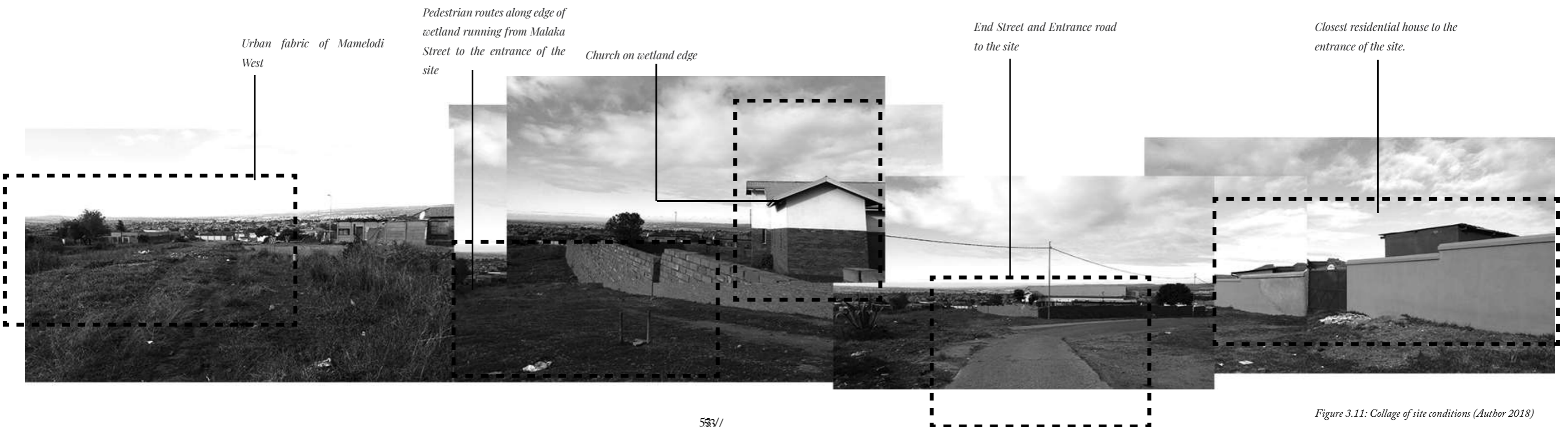
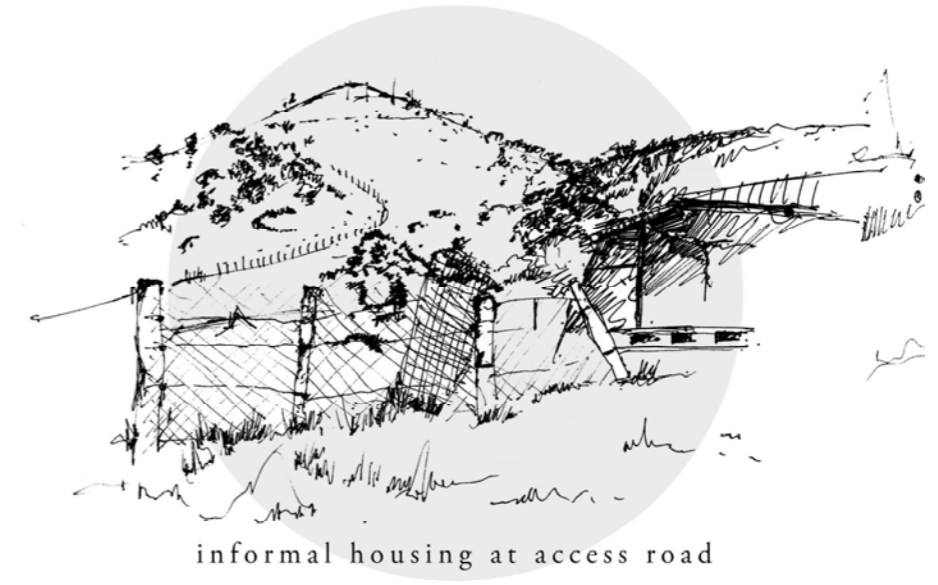


Figure 3.11: Collage of site conditions (Author 2018)

3.3 THRESHOLD ANALYSIS FOOT OF MOUNTAIN



informal housing at access road

Figure 3.12: Informal housing at entrance to site (Author 2018).

The 'threshold' lies between the states and statuses that the individual needs to cross and the change the community needs to recognise. For Van Genep (1960), this phase lies between two conditions: the one from which the individual or group departs and the one they will enter. The site serves as the transitional moment between the bustling urban context of Mamelodi West and the serene natural landscape of the Magaliesberg.

3.3.1 SITE SELECTION

The author's personal journey of discovery, combined with her desire to work within the natural context in proximity to Mamelodi, were the main drivers of the site selection. The site was also chosen for its proximity to the greater economic area of Mamelodi

West; its poetic and programmed nature; its magnificent view overlooking the city; and its current value to a greater cause by being a natural and valued resource.

According to the Ridge Policy of 1999, all construction on the mountain ridge should be avoided as these zones house Red Data fauna and flora (Maree 2012:12). Taking all these factors into account, the most appropriate location for the intervention, where possible development can take place, is at the foot of the mountain.

3.3.2 SITE FEATURES

The main physical features of the site are the connecting road leading from End Street (heading southwards and meandering all the way up

the foot of the mountain to the entrance of the African Mothong Heritage Site to the north) and the municipally constructed wire fence. There is a wetland running through the entire site, which almost reads as part of the mountain bleeding into the urban and contributes to the physical connection between the two environments.

The site has a presence of vastness as the outspread landscape and hills of the Magaliesberg present as such. Its intangible features are the community and the pedestrian energy generated by movement across the site. The sound of urban bustling is experienced as white background noise, which contributes to the feeling of becoming separated from one's former urban context. Closer to the threshold, natural

features, such as indigenous plant life, trees, and the soft sounds of birds, become more evident. This makes the idea of change and transition evident.

To the north-eastern side of the site, lies a monolithic structure embedded in the natural topography of the mountain hills.

Although its presence is understated, it is established through its flatness and concrete construction. According to historical maps, this abandoned water reservoir has been present on site since the establishment of Mamelodi West (figure 3.14).

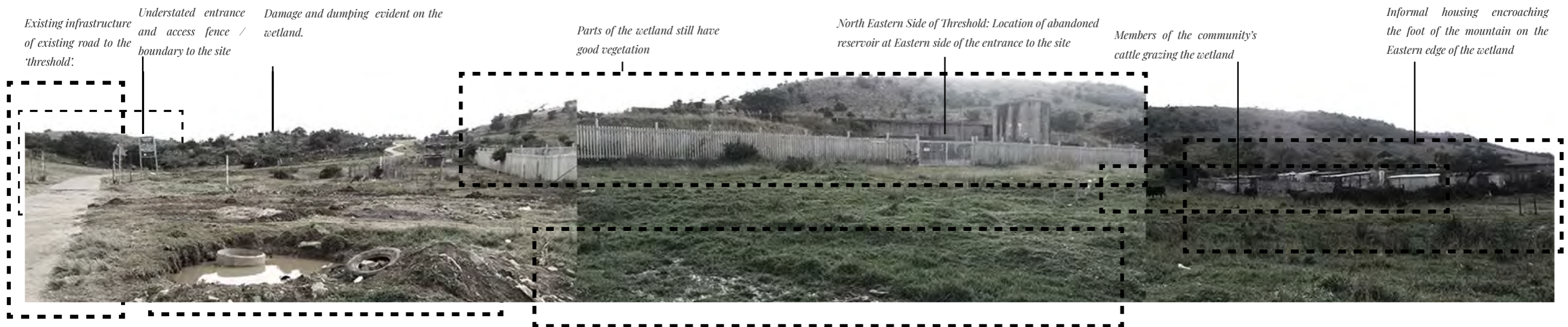


Figure 1:

Figure 3.13: Collage of site conditions (Author 2018)

3.3.3 DAMAGE TO THE SITE

Degradation to the site, as a result of grazing livestock and manure damage, is evident in the area's wetlands. Furthermore, both the fence and the road to the foot of the mountain are ill-maintained. The water reservoir is still in a good condition, although its perimeter walls have been damaged

3.3.4 USER OF THE SITE

The site is used by an array of people and animals. Community members and residents in close proximity to the site experience it the most. Furthermore, it is also used by visitors to the Mothong Site as well as Dr Mabena and the employees maintaining the herb gardens. In closing, the site is not seen as a destination by its users, but rather as a place of movement and momentary pause.

3.3.5 SITE HYDROLOGY

The site drains to the south into the wetland due to the natural fall of the terrain's steep contours. There is a lack of infrastructure for water catchment along the foot of the mountain, which is addressed in the urban vision. The water reservoir no longer serves its function due to repairs that had to be done to the structure in 1999. According to an interview with a stakeholder (who grew up, and is still active, in the area) the reservoir had to be completely drained for repairs. Unfortunately, the project was stopped due to hazardous conditions on and around the site at the time. Even after rehabilitation of the area, the repair project was never completed and the reservoir has remained empty and forgotten ever since.

3.3.6 EXISTING INFRASTRUCTURE

Abandoned water reservoir

The architectural elements of the existing building include a concrete roof slab, thick concrete perimeter walls, concrete columns and a granolithic concrete floor slab. In order to facilitate the infiltration of the programme, adaptive spatiality is applied to the architecture of the monolithic, flat, enclosed structure. This changes its materiality, rhythm, and spatial experience to a lighter, more 'open' structure.

> APPROACHED TO THE EXISTING

Allowing the structure to open up two of its edges allows for public infiltration and a spatial experience of the distilling process of people and the place. A primary consideration of the scheme was the adaptive reuse of the existing structure. Approaching the existing concrete structure through the lens of adaptive reuse meant giving careful consideration to the existing roof, columns, walls and floor that will be discussed in the design development chapter.

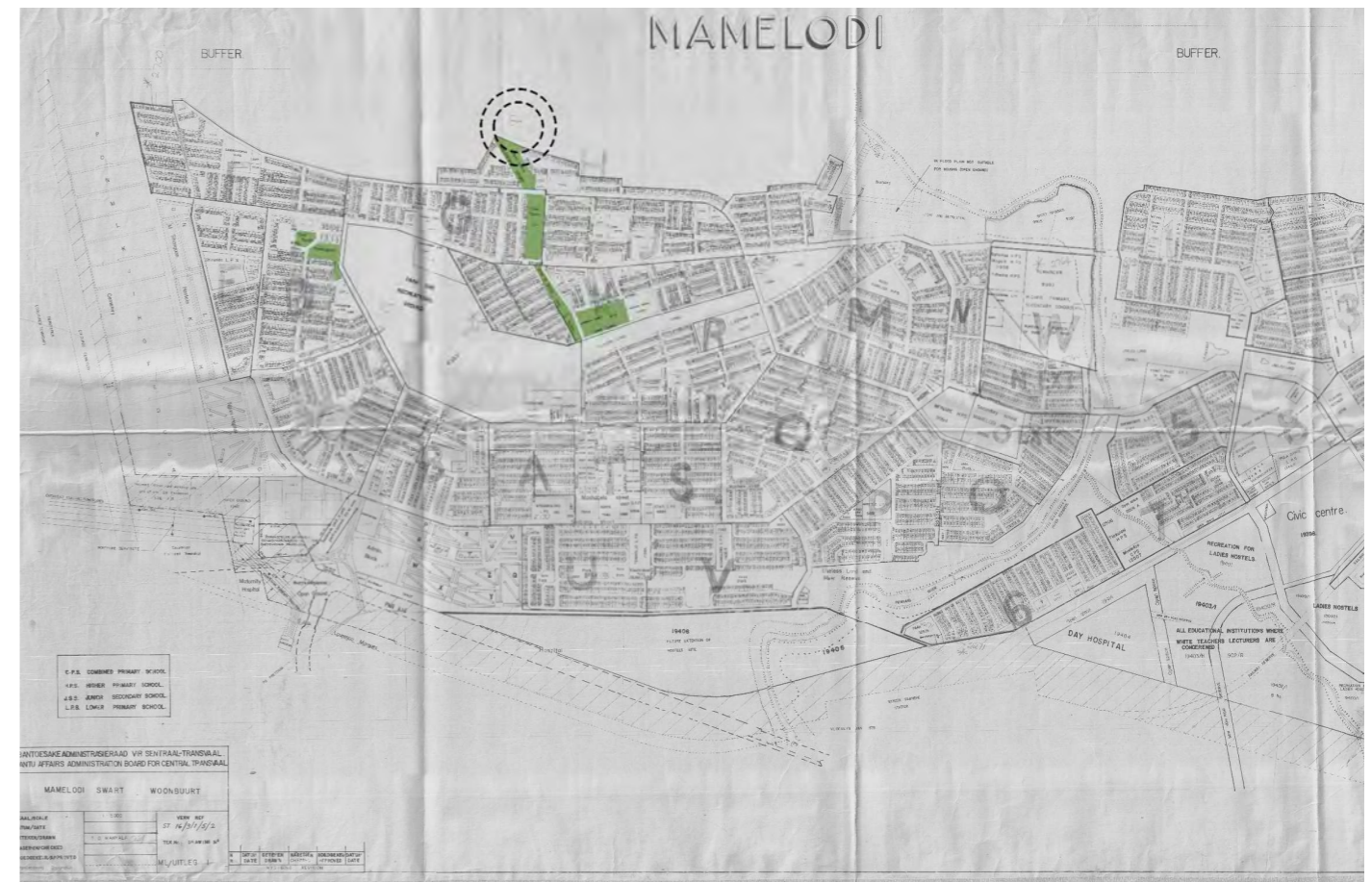


Figure 3.14: Historical Map Mamelodi showing location of water reservoir (Author 2018)



Figure 3.15: Site Location (Author : 2018)

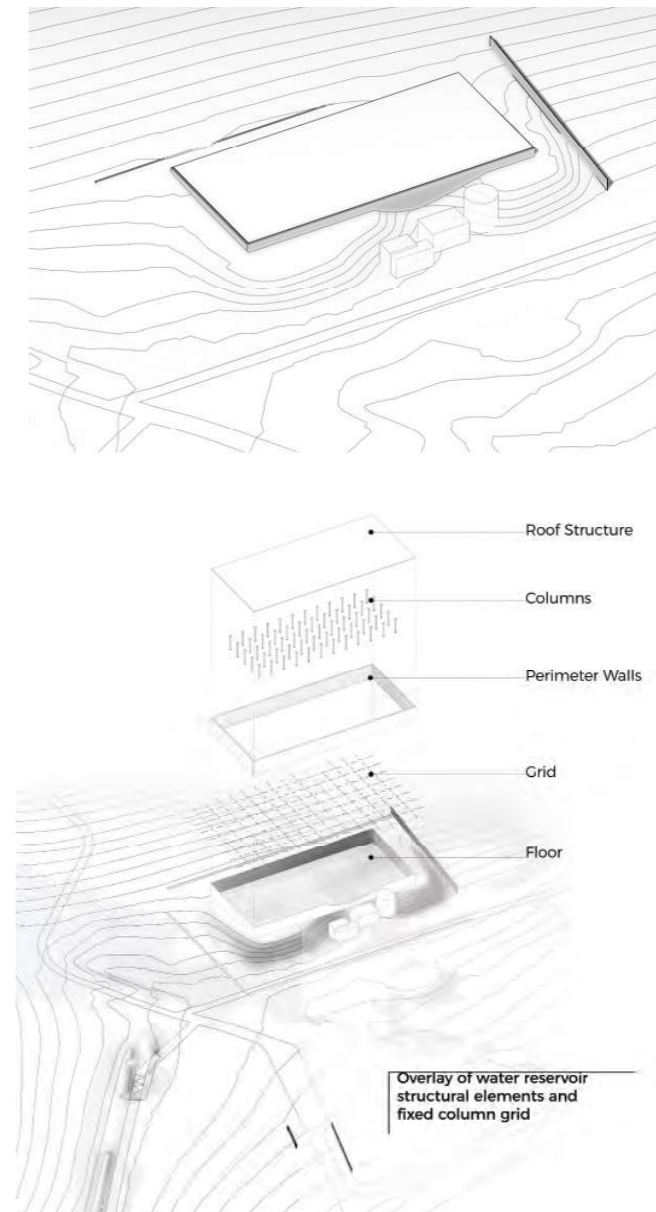


Figure 3.16: Existing Structure of abandoned reservoir exploded (Author : 2018)

3.4 NATURE ANALYSIS MAGALIESBERG

The final stage Van Gennep (1960) is re-aggregation or incorporation. In this stage the individual or group is readmitted to society as the bearer of a new status and identity. This final stage includes symbolic phenomena that represent the return of the initiate individual in their new identity to a stable, well-defined position and place.

The macro-mapping illustrates Mamelodi's location in proximity to Pretoria, the main roads leading in and out of the township, its main environmental features (the Pienaars River, the Magaliesberg, its wetlands, the existing vegetation and open land), and the recreational spaces in proximity to the proposed site.

3.4.1 // MACRO ANALYSIS

The Magaliesberg forms Mamelodi's northern edge and separates the township from farmlands further north. From the initial establishment of Mamelodi in 1945, through its development towards the east, and on to today, the mountain has played a substantial role in the shaping of the township.

3.4.1.a ENVIRONMENTAL FEATURES

The Magalies Mountain range is one of the most prominent and well known features of Gauteng. The mountain range is characterised by rocky hills and ridges with more dense woody vegetation and is famous for its indigenous animal and plant life,



Figure 3.17: Quartzridges of the Magaliesberg - avoid for construction [marked in red] (Author: 2018).

water life, recreational space and activities being a tourist attraction (Unesco.org, 2005). The value of the ecological mapping is to substantiate the choice of threshold site, the primal and ecological value of the natural environment

> Geology

Rocks found in the area are found in the Transvaal Sequence which is composed of mainly of quartzite with deeply eroded shales found between the

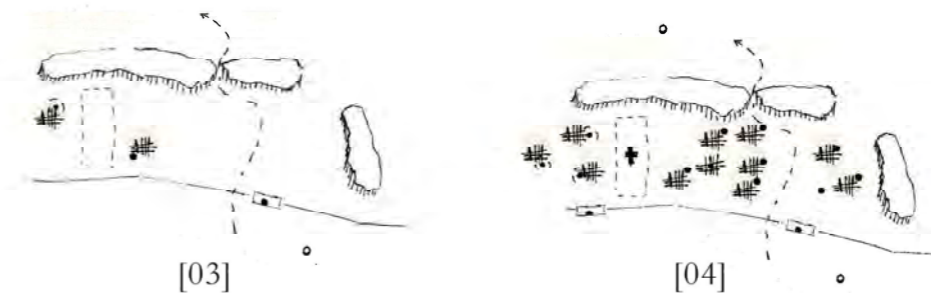
quartzite. The quartzite has been utilized in various areas for high-grade silica sand, Kimberlite pipes are located outside the study area which is normally Diamond bearing and Silverton Shales are used for brick making. (Maree, 2012:3). Quartziridges should be avoided for construction to preserve rd data Fauna and Flora. Therefore this understanding of the ridge policy of the Mountain indicates no-zones for possible intervention to take place.



The unoccupied mountain

- Housing built for workers of first the factory then the station north of the railway line

- Sammy Marks home is south of the railway line



- Group Areas Act bring a regulated demarcation of development.
- The mountain, cemetery and railway line act as spatial divides between urban compounds of different racial groups

- Mamelodi expands Eastwards in patterns of individually grouped neighborhood systems. Overcrowding leads to housing developments pushed against and onto the mountain

- Eersterust develops eastwards

- Baviaanspoort develops northwards with farms, prison development and wastewater treatments developing southwards towards the mountains

Figure 3.18: Development of the Magaliesberg in relation to Mamelodi (Author 2018).

3.4.2 // MESO MAPPING

Activities within the postliminal

The Meso analysis takes a closer approach to the map the activities within *postliminal or* natural environment of the Magaliesberg. the mapping animal and plant life, recreational space and users of the site.

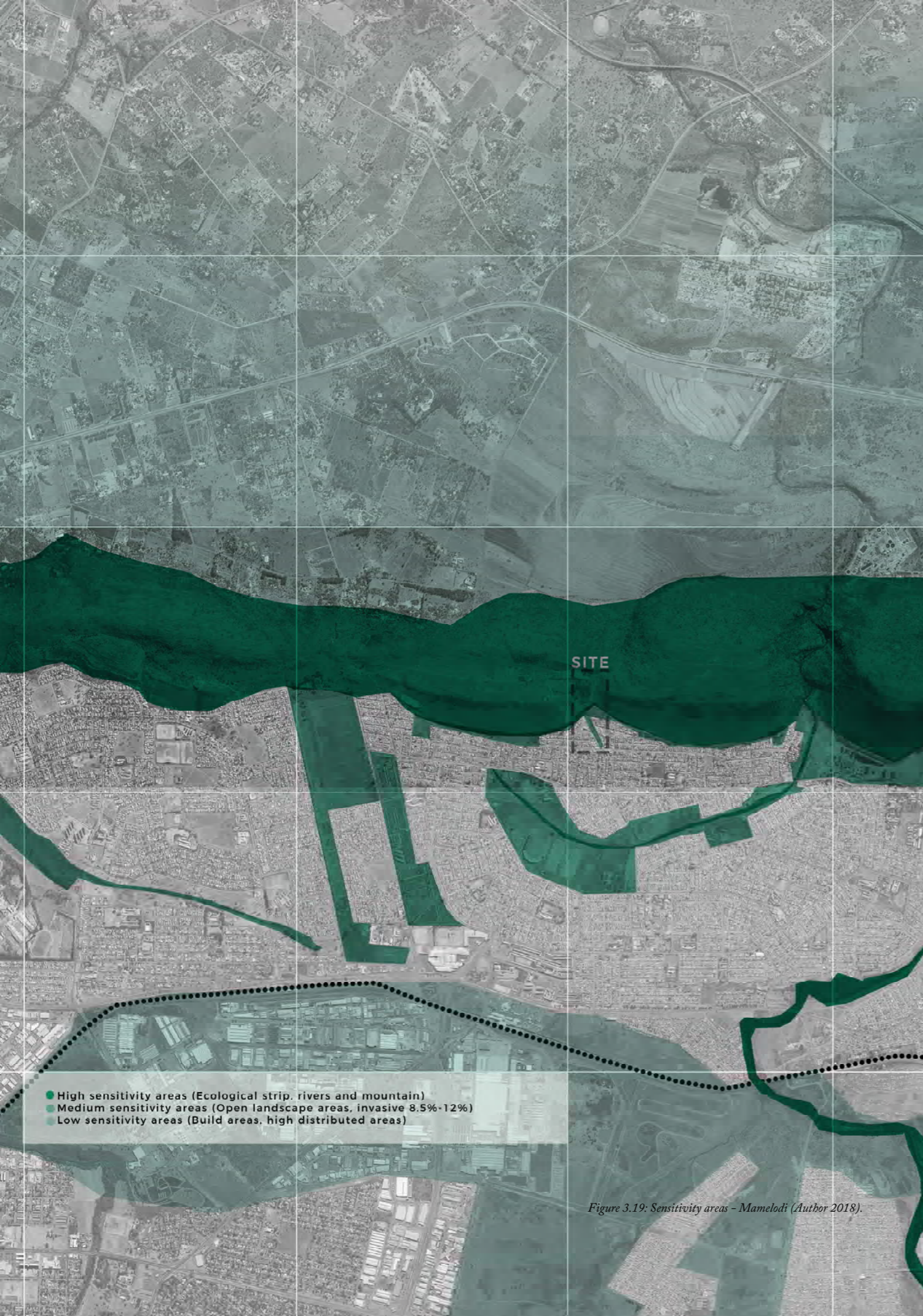


Figure 3.19: Sensitivity areas - Mamelodi (Author 2018).



Figure 3.20: Land use by community for cattle kraals (Author 2018)



-  Abandoned Water Reservoir
-  Identified threshold marked at focus area



Figure 3.21: Pedestrian movement on site (Author 2018).

> Movement

Movement on the site is primarily pedestrian. The secondary movement is vehicular although the use of the road running up the foot of the mountain is used by visitors to Mothong.

> Access

The main access for vehicles and pedestrians is through the existing fence adjacent to the water reservoir.

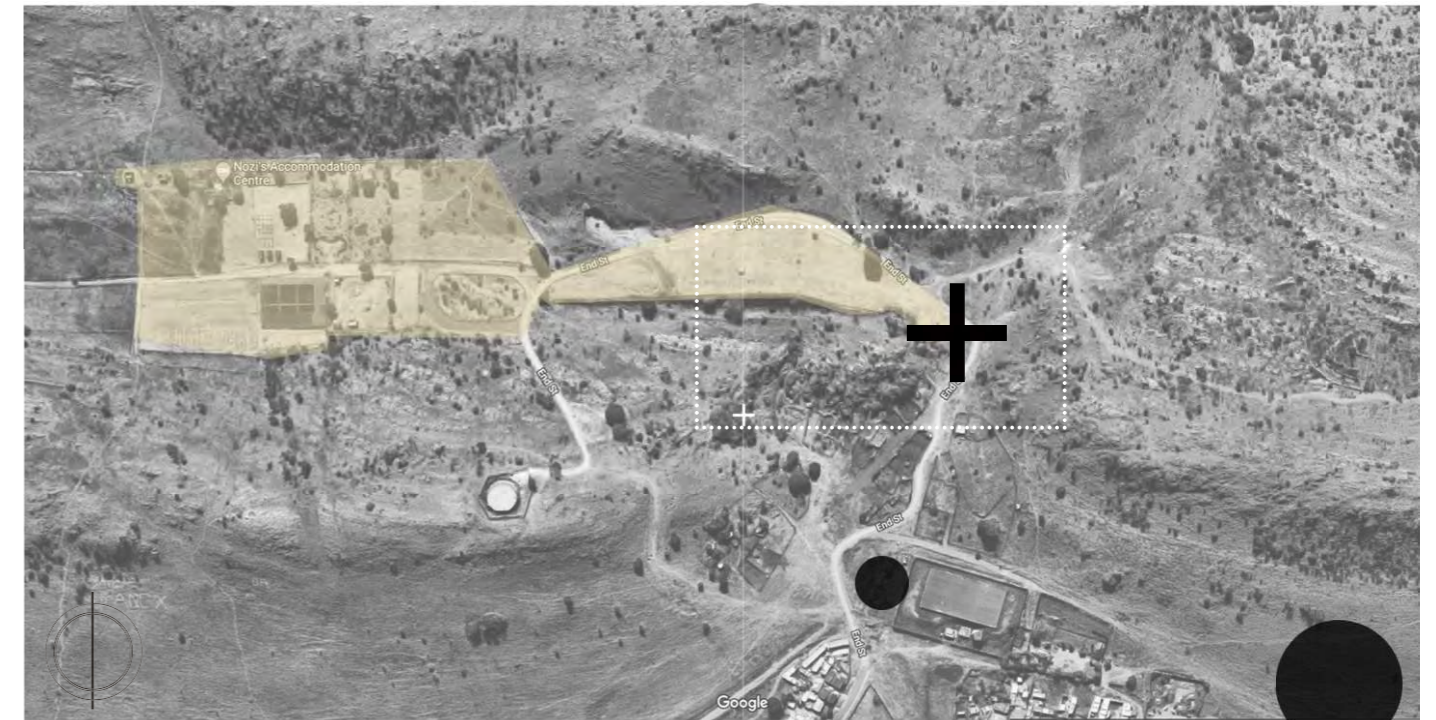


Figure 3.23: Dedicated area of Mothong African Heritage site (Author 2018).

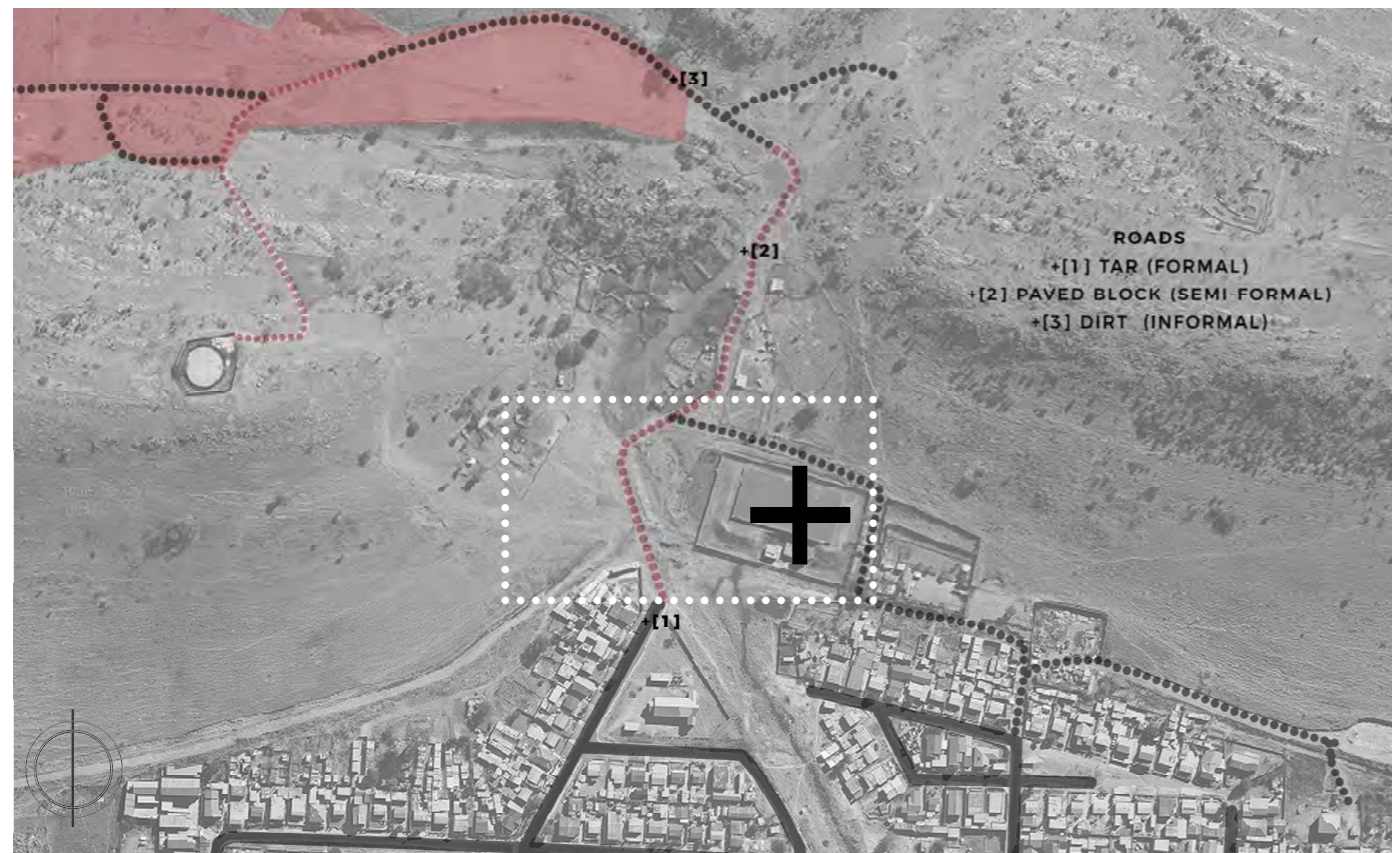


Figure 3.22: Existing road (Author 2018).



Figure 3.24: Pockets of residential houses (Author 2018).

3.5 MICRO MAPPING

the way of discovering the site – a narrative of the postliminal zone



Figure 3.25: Hydrology: Water infrastructure on site (Author 2018)

> Typography

The site has a steep slope towards the north and gradually becomes flatter towards the south as it is on the foot of the mountain. The typography slopes to the south towards the wetland in front of the site.



Figure 3.26: Hydrology: Wetland connecting urban and entrance of the site (Author 2018)

> Drainage

There is insufficient infrastructure in place for storm water catchment or site drainage. Water runoff is towards the south of the site, that runs into the northern edges of the residential pockets and partly into the wetland.



Figure 3.27: Doctor Ephriam Mabena and the Magalies Mountain (Author 2018)

In 1990, Dr Ephriam Mabena, a traditional healer to the residents of Mamelodi, received an ancestral calling to rehabilitate the misused plateau that is part of the Magaliesberg above Mamelodi, Section H. This once-broken piece of land – a messy, misused and extremely hazardous dump – has been healed and rehabilitated and is now a place of education and conservation. It is a little environmental haven. Starting in 2001, Dr Mabena has worked tirelessly to establish an indigenous planting nursery. This is the Mothong

African Heritage Site located on top of the plateau. It features a big garden where indigenous medicinal plants are cultivated and a large open garden available for camping, cultural events, and traditional ceremonies (Ledwaba 2018). This part of the Magaliesberg is a peaceful space in stark contrast to the “chaos below in the township’s streets, where taxis hoot endlessly, music blares from households and people mill about” (Ledwaba, 2018). The natural area around Mothong is also a haven for small creatures – home to various species of fauna and flora. Dr. Mabena hopes to build an environment where indigenous plants can be processed into cosmetic and medicinal products. As a man

with the gift of healing, he believes that the landscape is a resource that should be cared for and that should provide healing for the people that use it. The educational value of the site is in schools that occasionally bring pupils to learn about the plants and animals on the mountain and the significance of conservation. Through this, the youth is educated and encouraged to develop an appreciation for the natural landscape. Furthermore, this landscape is used as a base for knowledge sharing; specifically regarding traditional methods of planting and indigenous knowledge. Mabena’s efforts to preserve this part of the Magaliesberg, where the national flower, the protea,

grows in abundance, have not gone unnoticed. Mothong is in partnership with Unisa, the University of Pretoria, the Tshwane University of Technology, the Council for Scientific and Industrial Research and the department of science and technology. These partnerships include programmes in which botany and natural sciences students share knowledge and study indigenous plants and medicine (Ledwaba 2018).

3.5.1 FAUNA AND FLORA

Current conservation and indigenous systems at the Mothong Heritage site.

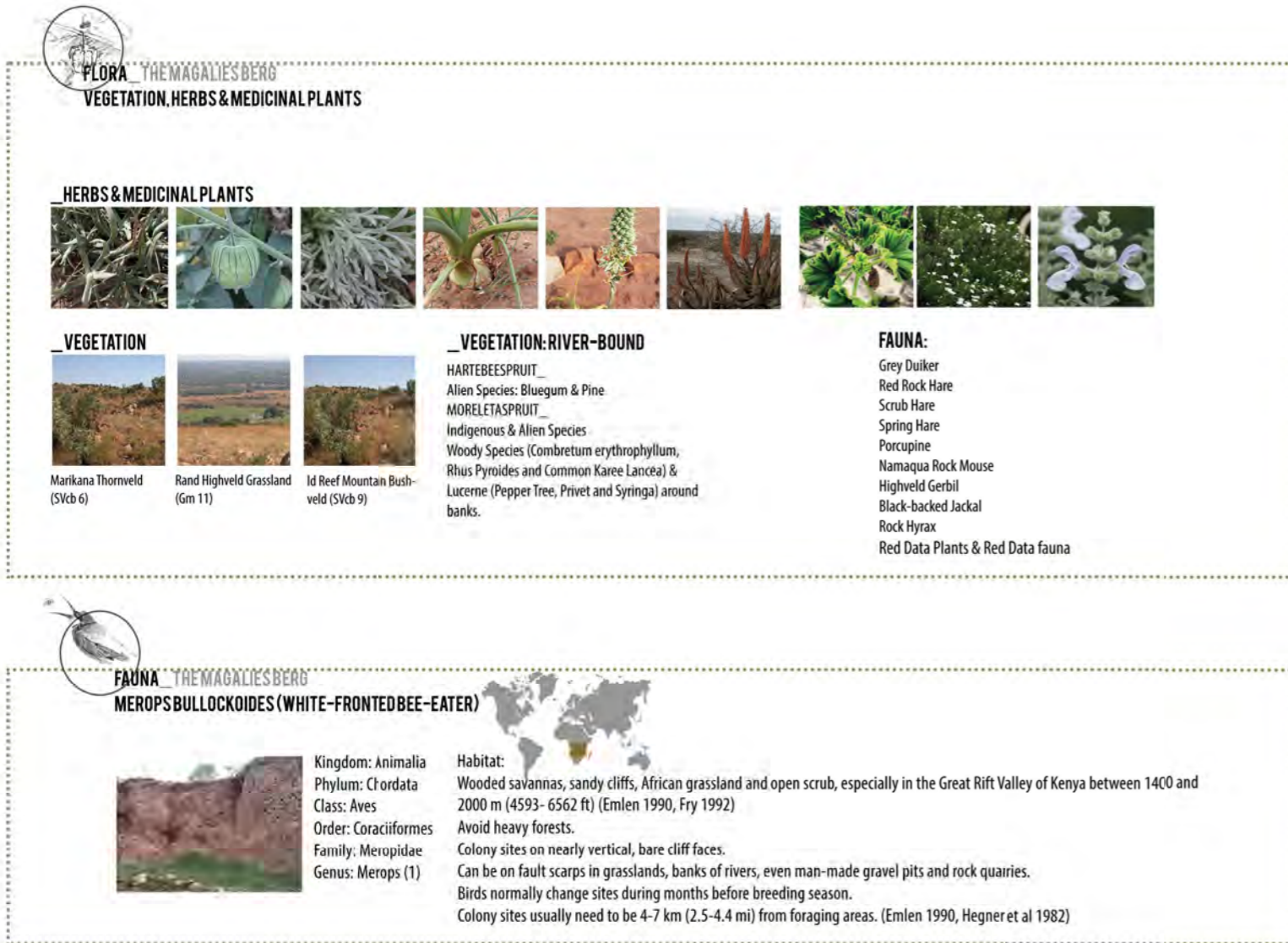


Figure 3.28: Current conservation and indigenous fauna and flora at the Mothong Heritage site. (Author 2018)



Figure 3.29 Collage of photographs showing workers till with the soil at the Mothong African Heritage Trust (Oupa Nkosi/ M&G) (Ledwaba, 2018).

From the analysis the following has been concluded :

Strengths

- Biodiversity conservation at Mothong African Heritage site.
 - Indigenous plant life and medicinal herbs give a unique characteristic to the site and strengthens the biodiversity of the areas.
 - The study area's proximity to the residential area and community.
- The site is in proximity to greater economic region of Mamelodi is of great benefit to the scheme.
- The existing infrastructure of the reservoir at the threshold is in a good state, therefore it can be utilized.
 - There is beautiful views from the site overlooking Mamelodi West.
 - The site is rich in recreational activities as seen at Mothong, as well as other uses by the community.

Weaknesses

- There is a lack of infrastructure for storm water harvesting.
- The wetland is in a deteriorative state.
- Roads leading to and on the site lacking infrastructure for water harvesting as well as pedestrian walkways.

Opportunities

- The threshold between the urban and natural context has great pedestrian energy that can be harnessed.
- The energy on site can be harnessed to benefit the conservation and recreational activities of the area.

Threats

- The urban fabric is building up onto the foot of the mountain.
- Dumping at the wetland area and soil erosion due to the use of urban inhabitants are threatening the biodiversity of the natural landscape.



Figure 3.30: Hand drawing of the conservation area of the bird sanctuary (Author 2018)

3.6 // URBAN VISION

3.6.1 PRECEDENT

Mamelodi Regeneration Strategy - GAPP Architects and Urban Designers

The Mamelodi Regeneration Strategy is a development proposal for the pre-appraisal phase of the City of Tshwane's Neighbourhood Development Programme, known as the Tsosoloso Programme (GAPP 2010:5).

The concept guiding this development proposes that the most effective way of stimulating economic activity, is to cluster appropriate land uses into hierarchical nodes, and link them with activity corridors that promote growth (GAPP Architects & Urban Designers 2010:21). The intention of this strategy is to concentrate activities in order to make services and facilities available and accessible via public roads, pathways and other supporting infrastructure (GAPP 2010:21).

Critique on this proposal is that the architects and planners were unable to capture and respond to the uniqueness of the township's contextual and historic layers. In the proposal, the planners prioritized green and open space within the urban context only while inclusion of the major historic and natural feature of the Magaliesberg is lacking.

The urban vision aims to use this nodal activation as a base, but relate it closer to the Northern periphery of Mamelodi. The urban vision aims to draw attention more towards the environmental and recreational opportunity present within the natural context.

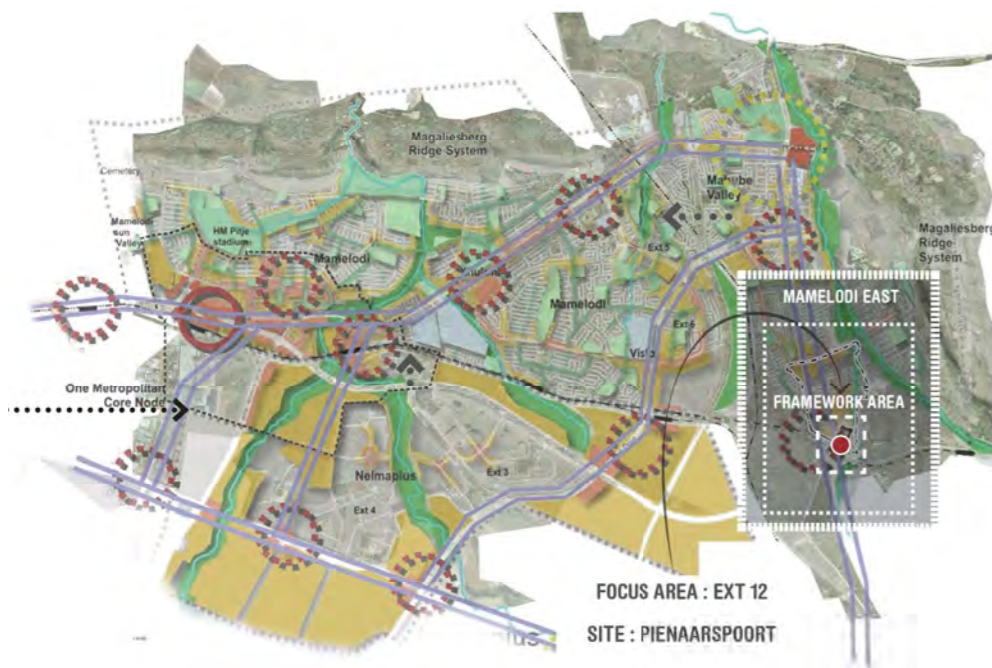


Figure 3.31: (Left) Mamelodi Framework proposal. (GAPP 2010)

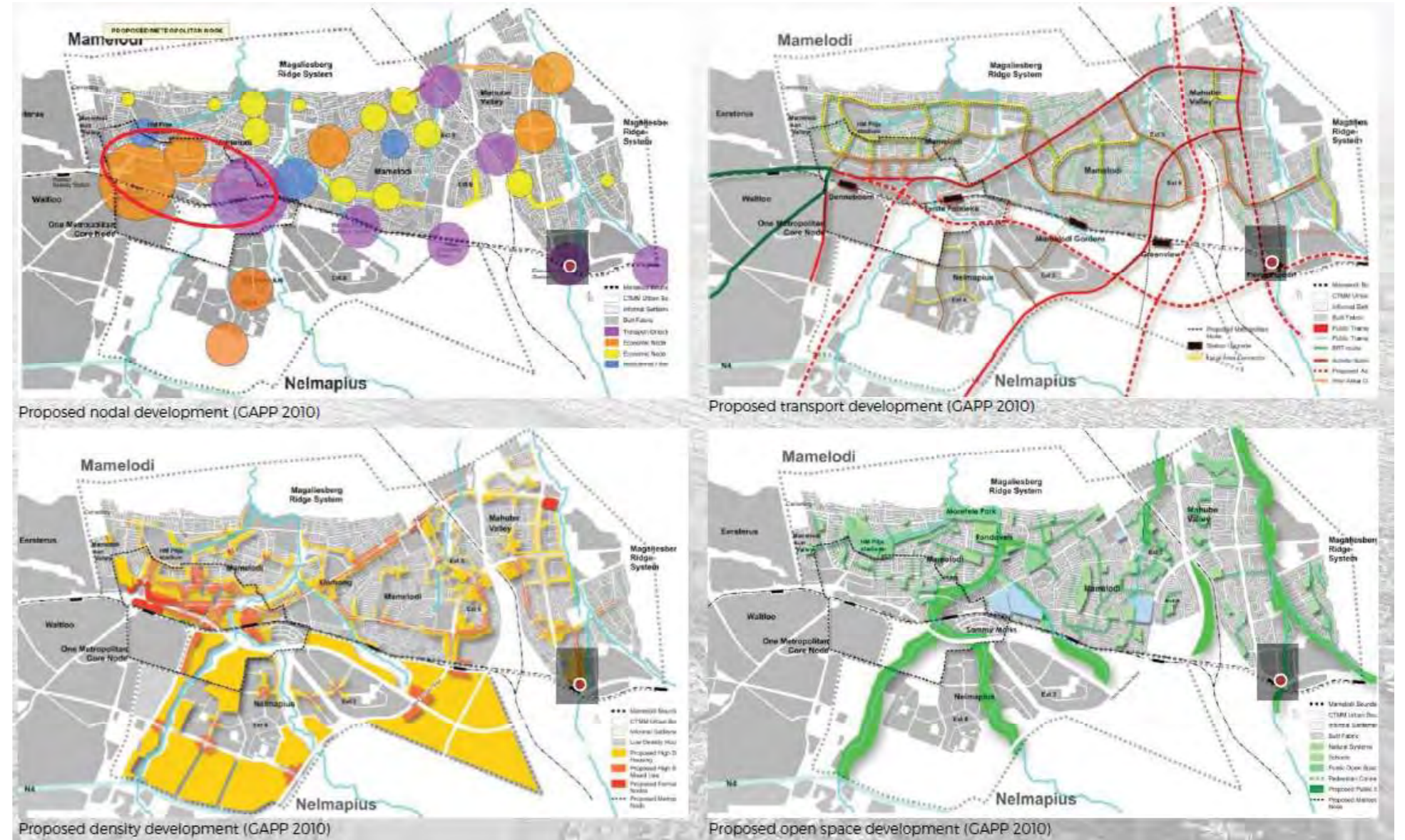


Figure 3.32: (Above) Collage of strategies depicting nodal development, vehicular movement, open space and housing density (GAPP 2010).

3.7 // URBAN VISION

URBAN AND PRECINCT VISION APPROACH

By understanding the context of Mamelodi through research and mapping, it has been identified that there is an imbalance between prioritizing urban enablement versus natural enablement.

The Magaliesberg 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 permanent river and smaller seasonal watercourse; heritage routes and cultural values as well as close proximity to the urban fabric.

The urban vision harnesses two identified nodes of access from the urban context to the mountain. These nodes were chosen for investigation for two 2018 Masters in Architecture projects. These two access nodes include Moretele Park at the Pienaars River and the Mothong African Heritage Site.

WHY THE SITES WERE CHOSEN?

(01) Marni van der Hoven

Distil - Architecture of the In-Between Condition

The proposed site is chosen due to its proximity to the greater economic area of Mamelodi West; the poetic and programmed nature of the site; its magnificent view overlooking the city; as well as its current value of being a natural resource.

(02) Cindi Janse van Vuuren

The Unending Rainfall of Architecture

The site choice originates from the normative position of the architecture student relating to the concept of non-place exploration through the catalysing potential of water. Mamelodi was chosen firstly for its position within the spatial legacy in the South African context, and the severe implication of ownership of place in the Magaliesberg where the Pienaars River enters the urban condition of Mamelodi West, near Moretele Park.

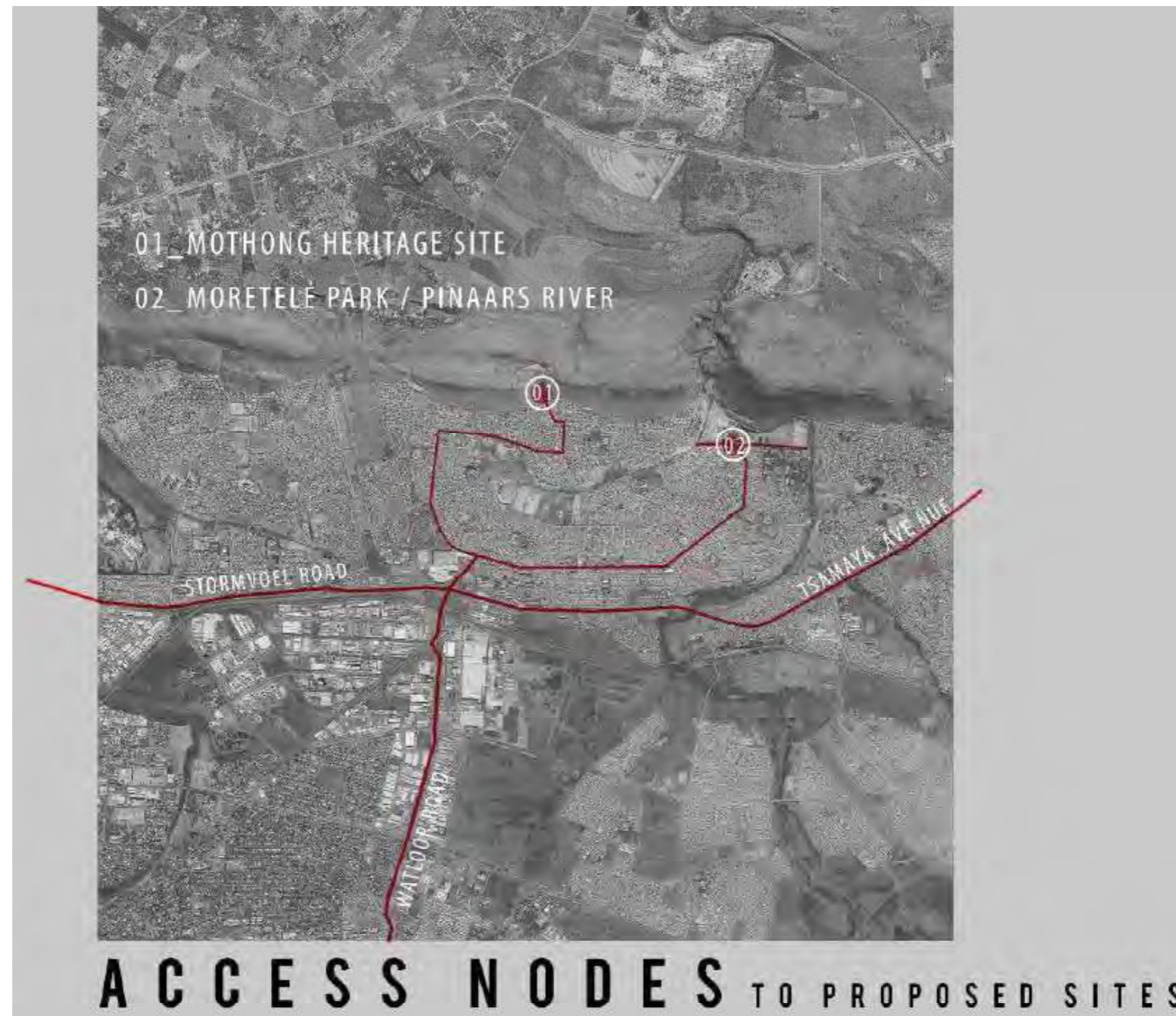


Figure 3.33: Access nodes to the Magaliesberg (Author 2018).

The intention for the urban vision is to create an architecture of 'community' and 'dialogue' and of the human and formal building of the 'realm of the in-between' place.

Investigation of the node at Mothong Heritage Site is investigated further into a site vision for this architecture dissertation.

(01) DISTIL - Architecture of the In-Between Condition

The site vision's theoretical approach considers the three zones of liminality namely the preliminal (the urban), the liminal (the threshold) and the postliminal (the Magaliesberg). The vision harnesses and builds on the existing positive features identified in the site by extending and increasing the area's biodiversity through the inclusion of socio-ecological and recreational activities.

Furthermore, the framework utilizes the strengths of the area and to adapt the principles of the GAPP (2012) urban upgrade to the context within the study area. The aim is then to make a positive contribution to the natural- and urban environments through the proposal at the threshold node. Furthermore,

3.8.2 // THE ISSUES AND PROPOSAL

IDENTIFIED DURING THE PRECINCT MAPPING:

1. The wetland in front of the site is a major contributor to the site's biodiversity, but is currently in a deteriorated and neglected state. Rehabilitation of the wetland is prioritised in the urban vision.

2. There is a lack of infrastructure for storm water catchment off of the slope at the foot of the mountain. The framework proposes that storm water be harvested through the provision of storm water channels at the foot of the mountain ridge. These will be channelled to the wetland in front of the proposed site and will therefore aid in the wetland's rehabilitation.

3. Extending on the GAPP (2010) proposal, corridors and pathways between nodes will be upgraded with sidewalks and storm water channels.

The urban vision proposes that the routes be upgraded in the following manner:

1. Pedestrian routes and walkways leading to the site 'node' are to be activated to give awareness of the 'node'.
2. End Street and the suggested roads leading to the site are to be activated with proper sidewalks, streetlights and bicycle routes.
3. Water is to be collected along these routes in order to be harvested and recycled – the proposal is that the water runs through the wetland to the water storage tank.
4. Bioswales are to be incorporated into the surrounding roads in the area as well as into new parking areas.

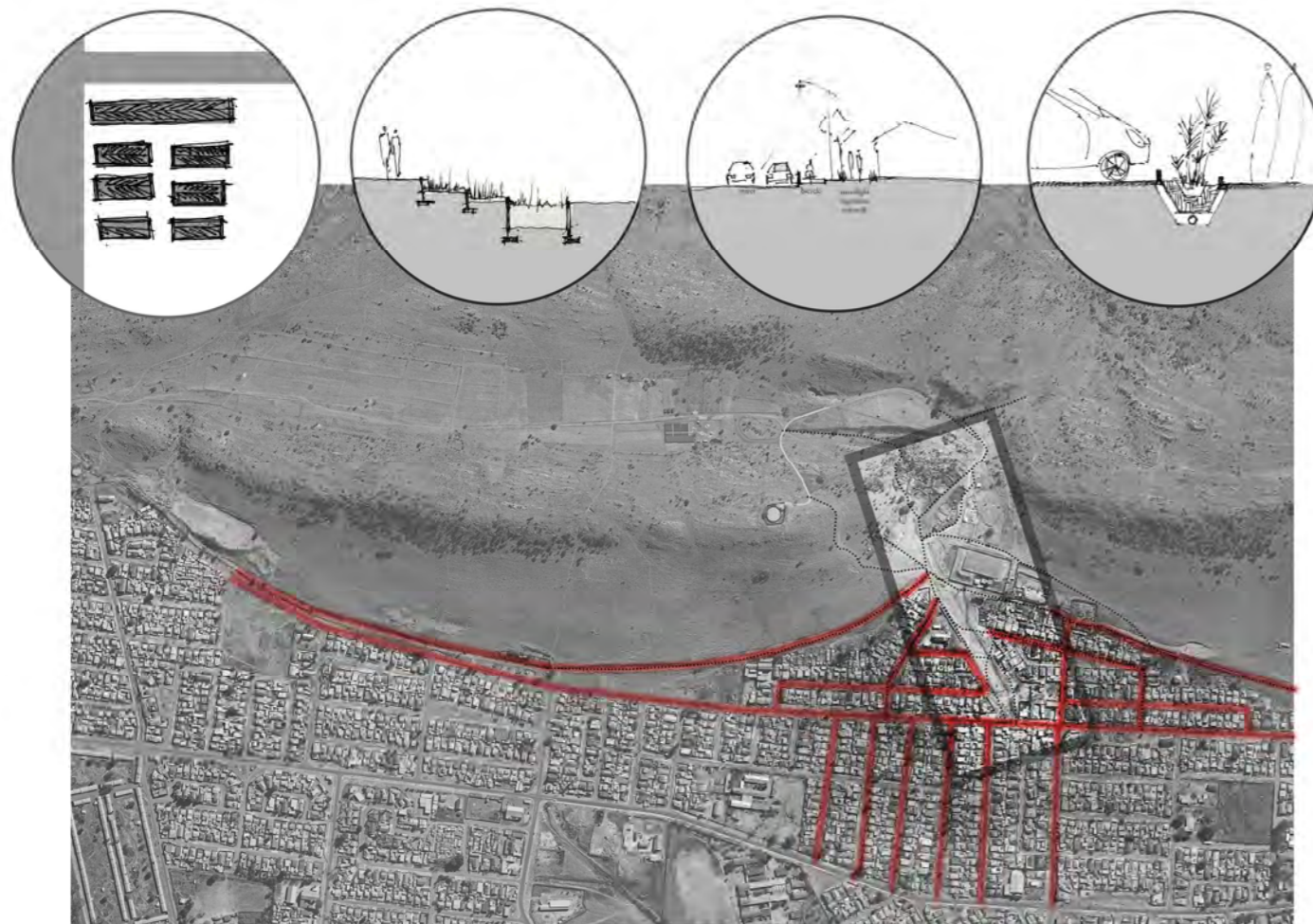


Figure 3.34: Site vision proposed urban upgrade diagram (Author 2018).



The amalgamation of instinctive social and natural conditions

Figure 3.35: Amalgamation of instinctive social and natural conditions (Jansen van Vuuren 2018).

SITE VISION

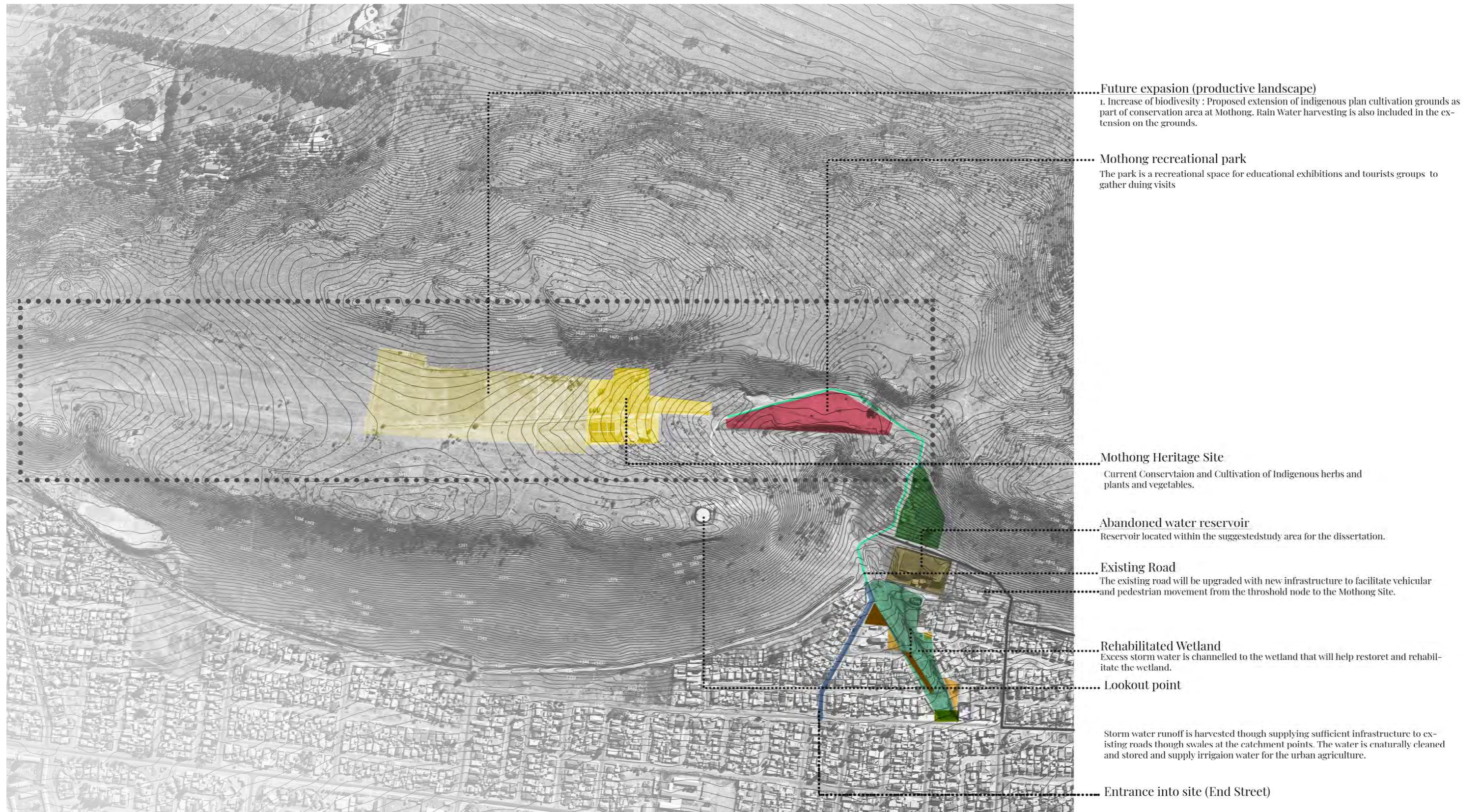


Figure 3.36: Urban vision diagram (Author 2018).

T H E O R Y

- 2.1 LIMINALITY THEORY
 - 2.1.1 INTRODUCTION
 - 2.1.2 THE LIMEN ADOPTED INTO ANTHROPOLOGY
- 2.2 THREE PHASES
 - 2.2.1 SEPARATION
 - 2.2.2 MARGIN
 - 2.2.3 INTEGRATION
 - 2.2.4 CONCLUSION
- 2.3 ADAPTIVE RE-USE THEORY



...

This chapter discusses the theoretical approach of Liminality and adaptive reuse as a result of an understanding of the site condition as an in-between condition between the natural and the urban context.

LIMINALITY THEORY

The three phases of Liminality in Rite of Passage

2.1.1. // INTRODUCTION

The dissertation research problem deals with the importance of the transitional moment between the harsh urban and serene natural environment. The value of the theoretical grounding is to enable a better understanding of the transitional moment within socio-cultural realms – specifically through the lens of anthropology that gives insight into the human experience within this process. This transitional moment paves the way for a design grounded in liminality. The etymology of liminality shows the Latin root word “limen” that means threshold, which is an inherently architectural element.

Turner (1963) stated that liminality refers to any “betwixt and between” situation or object. Common architectural spaces that represent the in-between can, for example, be a parking lot, which can only function as itself in conjunction with another space – the space to which you are going. Therefore, the in-between space is not a destination but a place adjoining the former and the coming state. Other examples of liminality are, firstly, stairwells and elevators, which are clearly in-between spaces or thresholds as their purpose is to get you from one point to another. Secondly, liminality can be found in areas or zones such as the border areas between nations; in monasteries or prisons, and at seaside resorts or airports. Liminality can, thirdly, occur in “countries” or larger regions and even continents (Thomassen 2009:13).

Within the field of anthropology, the theory of liminality has been extended in thought, complexified in concept, and represented within the socio-cultural realm. In this study it is substantiated through a site analysis that discerned the characteristics of the site as being a threshold and in-between space. This chapter unpacks these themes and translates them to the discipline of architecture in order to aid the creation of spaces for people.

Liminality theory is comprehensively explored in the works of authors such as Arnold van Gennep in

Rite de Passage (1960) and Victor Turner in *Betwixt and Between* (1963). The exploration of liminality through anthropology provides a definition of the theoretical concept. Van Gennep (1960) and others have, however, showed that the construct of limen (as discussed in Rite de Passage) is not confined to culturally defined life-crises, but may accompany any change from one state to another (Turner: 1967: 93). Therefore, the liminal – meaning threshold and/or relating to a sensory threshold, or being an intermediate state, with the characteristic of being an in-between condition – can be translated into architecture.

“I prefer to regard transition as a process, a becoming, and, in the case of rites de passage, even a transformation” (Turner 1963:4).

2.1.2 // THE LIMEN ADAPTED INTO ANTHROPOLOGY

(i) Arnold van Gennep: Rite de Passage (1690)

Van Gennep defined rites de passage as those rites that “accompany every change of place, state, social position and age” (Turner 1960:4). There is differentiation between “transition”, which implies various moments and is considered a process, and “state”, which is considered a stable condition. Van Gennep (1960) distinguished between rites that mark the passage of a social group from one status to another and those that mark transition in the passage of time. Accordingly, he went on to explore “the basis of characteristic patterns in the order of ceremonies” (Van Gennep 1960:10). He discovered that during these cultural ceremonies, a person undergoing the transition process, occupies a state of in-between-ness.

Emphasising the significance of transitions in any society, Van Gennep (1960) favoured rite de passage as a distinct category, which shows that all rites of transition

2.2 THREE PHASES

2.2.1 // Separation PRELIMINAL PHASE

The state of familiarity

are marked by three phases: separation, margin (or limen), and aggregation (Turner 1963:5). The structure of these three phases is each unique as a stable 'state'. He found that, often, all the rites can be present in the margin phase. Thus, rite de passage implies that there is a distinct moment of transition within a state of flux that is positioned within the in-between-ness of two distinct and stable states. Van Gennep (1960) distinguished between a state (a fixed or unwavering condition) and transition (the process of transforming and becoming).

(ii) Victor W. Turner: Betwixt and Between (1963)

Turner (1963) expanded on the importance of the limen and built on Van Gennep's (1960) understanding of rites de passage.

His discovery of Van Gennep's (1960) Rite de Passage in the summer of 1963 inspired him to write the essay "Betwixt and Between: The Liminal Period in Rite of Passage", which became the most famous chapter of his 1967 publication, *The Forest of Symbols*. Turner (1963) confirmed Van Gennep's (1960) definition of society as a structure of positions, of which each marks a change in an individual's status. Turner (1963) stated that 'liminality refers to any betwixt and between situation and object.' It is evident that this understanding opens up the discussion for possible uses of the concept far beyond those that Turner (1963) himself had suggested.

The concept of the liminal space of cultural rituals focuses on how the 'passenger', the person within the phase, exits within these states and how the limen is defined through this.



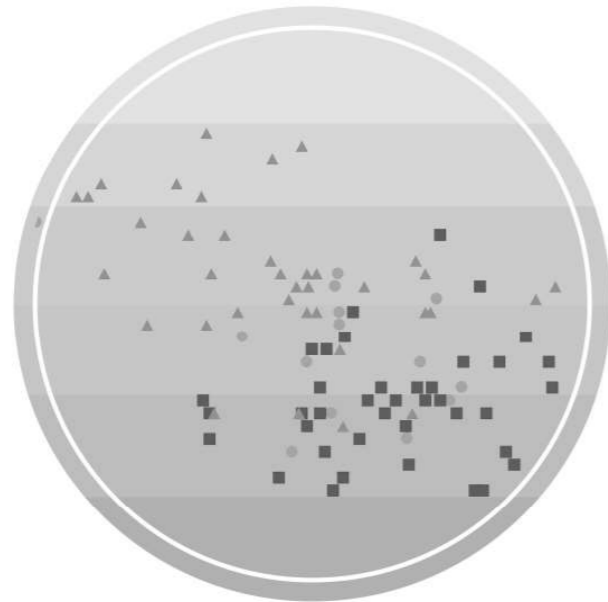
- Separation -

*Figure 2.1: Conceptual Illustration of State of Separation - Preliminal
(Author: 2018)*

The symbolic behaviour of this stage signifies the detachment of the person or group from an earlier fixed point in the social structure; from a set of cultural conditions or "state" (Turner 1963:5). This state can also be representative of what is known and familiar to a person, such as norms, value, and culture or routine. Van Gennep (1960) described this rite of separation as the pre-liminal rite, which metaphorically is the "death" of a person – the person is obligated to strip themselves from all things binding them to their former condition or routine. Symbolically, this rite signifies the initiation of the individual to detach themselves from a former fixed point in their social structure; enabling to continue to the next rite, which is the marginal phase.

2.2.2 // Margin LIMINAL PHASE

The state of change



- Transition -

Figure 2.2: Conceptual Illustration of State of Transition - Liminal (Author: 2018)

Van Gennep (1960) defined the liminal phase as a state, which implies a stable condition. This intermediate stage in the rite de passage is the liminal period. It is within the liminal phase that the person is subject to experiencing ambiguity, as they pass through a realm that has few or no attachments to either the past (separation) or coming (aggregation) state. In the ritual condition, the individual becomes nameless or without identity. Therefore, the power of this state to influence the perception of the individual is greater than that of any other state (Thomassen, 2006:22). The person in the liminal rite is disconnected and disassociated from anything they knew and their future is uncertain. This liminal period is very powerful as it has a very distinct energy. This period is one with great potential to either damage a person or raise great possibilities. This is the moment where the greatest potential for change can occur.

Turner considered the structurally negative characteristics of a person within the transition as to have nothing: he expressed it through the attributes of “structural invisibility”.

“We must regard the period of margin or ‘liminality’ as an interstructural situation” Turner (1963). The positive aspects of liminality are accompanied by

the processes of growth, transformation and the reformulation of old elements into new patterns (Turner 1963:6). According to Turner (1963), the symbolic power of this encourages the “passenger” to think about their society, and the powers that sustain them, although they have been detached from former norms and sentiments.

“Liminality may be partly described as a stage of reflection” (Turner 1963:14).

This understanding of liminality can inspire architecture in the making of spaces for reflection. The experience of the liminal space causes the occupant to question their surroundings, thus leading to a heightened awareness of the space as a transformative threshold between distinct places. Turner (1963) stated that the metaphor of dissolution is often applied to the liminal stage. What had previously constituted the identity of a place or person before separation must be broken down to enable transformation to Turner (1963), occur in order to enter the new state of aggregation. In Chapter 3 of his book Turner (1967) says stated that “during the intervening liminal period, the characteristic of the ritual subject is ambiguous, as he or she passes through a cultural realm that has few or none of the attributes of the past or coming state.” The person’s

status is therefore ambiguous: the person may feel confused, dislocated, lost and vulnerable; therefore this stage has the power to be destructive.

Moreover, as liminality is considered a process (Gennep 1960), a moment has to be created for reflection, thus a ‘pause’ must take place. Yi-Fu Tuan stated in *Space and Place* (1977) that “if we think of space that allows movement, then the place is a pause; each pause in movement makes it possible for a location to be transformed into place.” It is in this place of pause that the identity of a space can be explored by the user and a moment for reflection be created.

Fundamentally, the liminal stage is transitional and allows for change and growth. Through this scheme the characteristic of this phase that will be focused on is constructive rather than destructive. Therefore, the activities within this phase prioritise regenerative and enabling properties.

2.2.3 // Aggregation POSTLIMINAL PHASE

The state of unknown / new



- Integration -

Figure 2.3: Conceptual Illustration of State of Integration - Postliminal (Author: 2018)

Thirdly, the postliminal rite is as a state of integration back into society with a new identity, as a “new being” (Gennep: 1960: 21). Here the individual is “consummated in a stable state once more and by virtue of this gains rights and obligations of a clearly defined and structural type (personae), and is expected to behave in accordance with certain customary norms and ethical standards” (Gennep: 1967, p. 4-5).

2.2.4 // CONCLUSION

Liminality refers to a transformative state during cultural rituals. It is a phase that connects two contrasting conditions (the former and the future). Therefore, the state of liminality takes on a hybrid identity – reflecting both conditions, whilst being a state in its own character.

This state is fundamentally abstract as it is characterised by being a threshold or boundary: an in-between. In *Complexity and Contradiction in Architecture*, Robert Venturi (1966) defined the ‘both-and’ condition in which space has multiple readings; meaning it is both one thing and at the same time another’. From this viewpoint, the limen has very specific possibilities in the architectural realm.

It is important to note that liminality in Rite de Passage relates not only to cultural rituals of transition, but that its definition also has degrees that include physical markings, such as in the field of architecture. Liminality in historical architecture, according to Van Gennep (1960), is “about differentiating between”, what he calls, the “profane and the sacred world” (Turner 1960:94).

Van Gennep (1960) presented that in any rite of passage the “incompatibility between the profane and sacred world is so great that man cannot pass through one to the other without going through an intermediate stage.” The contrast between the two realms of the preliminal (represented by the profane) and the postliminal (representing the sacred) has to have a moment in between. It is this intermediate stage that is represented through the liminal realm.

“In memorable experiences, if architecture, space, matter and time fuse into one single dimension, into the basic substance of being that penetrate the consciousness, we identify ourselves with this space, this place, this moment and these dimensions, as they become ingredients of our very experience. Architecture is the art of mediation and reconciliation” (Pallasmaa 2007). It is understood through this that the elements of space, matter and time are inseparable from architectural experience.

The experience of the liminal space is more than just the static moment of existing between two conditions but a process (Van Gennep 1960). The making of architecture through conventions of form, material and light as well as the consideration of movement and change within place-specific conditions is a strong representation of the making of a liminal space in architecture. Kent Bloomer (1977) suggested in his book *Body, Memory, and Architecture* that architecture is “an incitement to action, a state for movement and interaction.” Emphasis on both the physical space and the qualities that make it a desirable place to inhabit can create a more powerful sense of place.

2.3

ADAPTIVE REUSE THEORY

Approaches to remodeling existing infrastructure

The London Based architects, Graeme Brookner and Sally Stone (2004) argue that when a building is reused, the most important and meaningful factor in the design of the new building is the relationship between the old and the new (Brookner and Stone 2004:79). The principles of adaptive re-use for this dissertation considers both the design of the original building, and function the original building. However, the building’s value extends beyond the physical bounds to the creation of new identity of place and the development of the history of the specific site. Adapting to the robust structure allows for the creation of a new ‘layer’ of old structure though using new elements and programme to highlight the potential of physical environment.

The Brookner and Stone (2004) developed three categories or strategies of building reuse based on the extent of integration between the host building and the new elements. These strategies are intervention, insertion, and installation, as defined below:

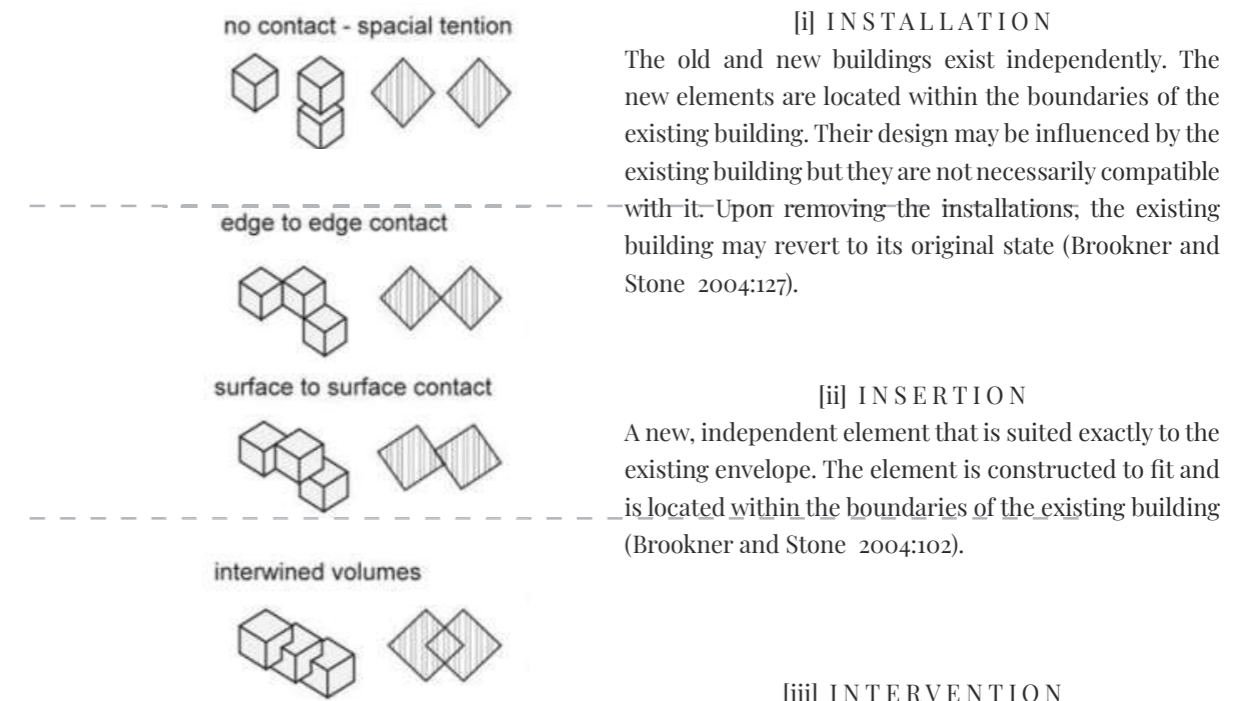


Figure 2.4: The extent of transformation of an existing building, including the three categories/strategies, four diagrams that illustrate the physical application, and a numeric scale that links the two measures (Gewirtzman, 2016).

The work of Parks and White who suggests simple diagrams to interpret possible **interventions** types. The categories include the following: “Gate, Wall, Corner, Bridge, Transition, Joint, Boundary, Filter, Umbrella, Roof, Parasite, Hat, Divider, New interior, Skin, Glue, Feature, Infill, Underground, Alignment and Dis-alignment” (Gewirtzman, 2016:8).

These categories are used throughout the design development of the project to interpret different adaptive reuse approaches to the existing infrastructure on the site. Within the built fabric, the elements such as wall, roof, column, and floor were considered for transformation. The new intervention in relation to the existing building took on various approached.

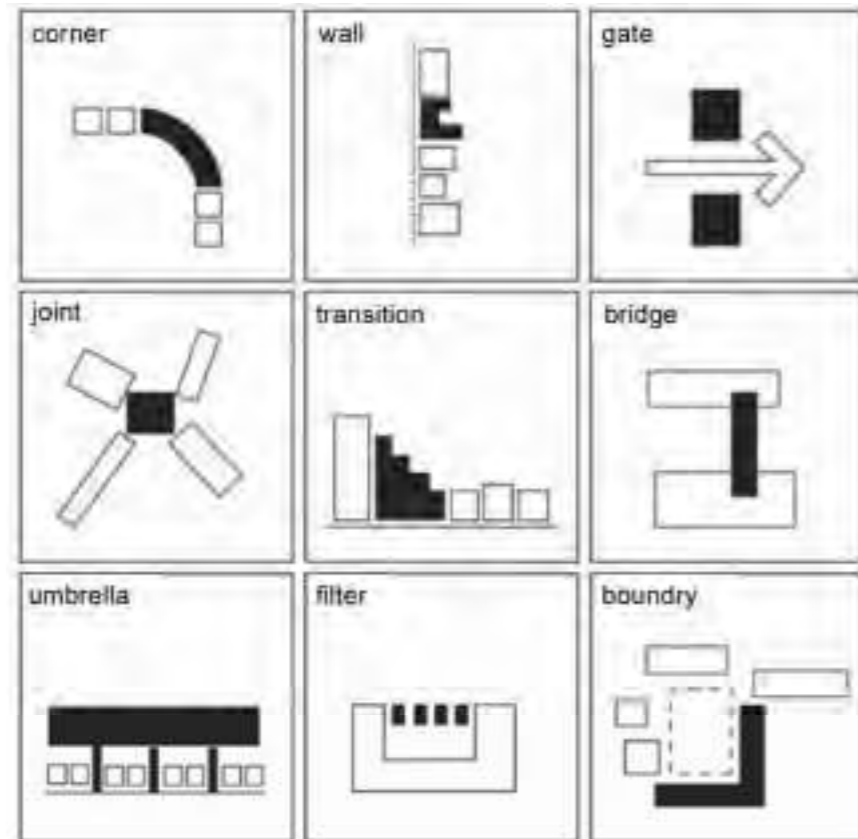


Figure 2.5: Intervention types (Gewirtzman, 2016).

PRECEDENT STUDY

- 5.1 INTRODUCTION
- 5.2 THE THRESHOLD OF
 - 5.2.1 MOVEMENT AND PAUSE
 - 5.2.2 SYNOPSIS
- 5.3 THE THRESHOLD OF
 - 5.3.1 MOVEMENT
 - 5.3.2 SYNOPSIS
- 5.4 THE THRESHOLD BETWEEN
 - 5.4.1 ARCHITECTURE AND LANDSCAPE
- 5.5 THE THRESHOLD BETWEEN
 - 5.5.1 ARCHITECTURE AND LANDSCAPE
 - 5.5.2 SYNOPSIS (OF 5.4 AND 5.5.)



5.1 // INTRODUCTION

“Thresholds are places of transition and, if well designed, places that help to integrate the physical landscape and the experience of it. Thresholds give spatial configuration to people’s need to adjust from one situation or experience to another. They are places in which people wait, rest, anticipate, arrive and leave, greet, contemplate, change...” (Dee 2001:172).

Describing what constitutes ‘architecture’ is very hard to do succinctly. It is often the case that this most intangible attribute, of what we call architecture, can be most easily revealed in transitions. The following precedent studies investigate selected examples of the concept of threshold or limen expressed through architecture. The aim of this analysis is to gain an understanding of architectural representation of threshold and transitional space through this dissertation’s theoretical argument of the in-between space.

The study investigates edge conditions, corridors, passages, the interstitial space between inside and outside spaces, threshold volume, and the materiality of the architectural examples. For each analysis, a synopsis is given of the qualities that guided the design development.

5.2 THE THRESHOLD OF

5.2.1 MOVEMENT AND PAUSE

Expo'98 Portuguese National Pavilion

Architects: *Álvaro Siza Vieira*

Location: *Rossio Olivais*

Year: *1998*



Figure 5.1: The Public threshold of the Pavilion (Archdaily: 2015).

According to Dee (2011), thresholds or liminal spaces that are integrated with edges enable movement across or through the edges to connect the spaces on either side (Dee 2011:174). These thresholds can vary in scale and size.

The threshold of the building is expressed through a simple, concrete canopy, draped effortlessly between the two mighty porticoes..." (ArchDaily2015).

The liminal space here allows for a great number of people to move from one space to the other. The increase of space and volume through its inclusive scale has the physical implication of reading more monumental than intimate. Its visual implication allows people to easily move around and visualise the adjacent spaces.

Furthermore, the pavilion grants a clear transition between the city and the water's edge by creating a gathering place for large groups of people. The edges connected to the threshold space are highlighted by the pavilion's light concrete canopy but are in contrast with the vastness of the threshold, as the scale is immediately reduced.

The concrete porticoes express the heaviness of the concrete constitution in the corridor. Within the portico is a series of other, smaller thresholds, which increases the intimacy of the space. The limited width of the space forces people to walk in single file singularly – making the intention of the space movement rather than socialisation. The project is seen as a layering of thresholds: Alvaro Siza succeeded in the creation of a transitional space. The dramatic spatial change at the point of connection between the thresholds emphasises that entry into a new threshold.



Fig. 5.2: (Left) Passage within the portico at the Pavilion (Archdaily: 2015).



Fig. 5.3: (Left) Dramatic change in scale between two thresholds are marked with the two different concrete constructions of the canopy and portico. The two are connected with light steel members to express the idea of separation (Archdaily: 2015).

5.2.2 SYNOPSIS

- A threshold can increase and decrease, or expand and shrink, which contributes to the representation of the liminal experience of an in-between space.
- A threshold can allow for movement or pause.
- A threshold of movement can be designed to hold large groups or Individuals moving in single file Individuals moving in single file.
- A threshold can employ scale and materiality to effect dramatic and sudden change between spaces and to emphasise the transitional experience.

5.3 THE THRESHOLD OF

5.3.1 MOVEMENT

Whitworth Art Gallery - Extension

Architects: *Amanda Levette Architects*

Location: *Manchester, United Kingdom*



Figure 5.4: Blurring of boundaries between landscape and architecture (Levette, 2009).

The landscape in front of the Withworth Art Gallery - Extension aims to blur the boundaries between the building and landscape through the manipulation of landscape levels. The concept for the landscape design was conceived as folds of fabric that are dissected, pushed, pulled and sliced to manipulate user experience (Levette 2009). The dynamic urban landscape of this public space became habitable through this manipulation of surfaces. The project emphasises the importance of the in-between to be a not only a spatial and architectural experience but also a place for people.

5.3.2 SYNOPSIS

- The blurring of the boundary between building and landscape can be done by changing and elevating the landscape.
- The manipulation of a surface can be used to realise the idea of a 'delineated boundary'.
- A threshold is a habitable space.
- A threshold is a place for the gathering or movement (or both) of people, therefore the primary design consideration must be the user's experience of the architectural space.

5.4 THE THRESHOLD BETWEEN 5.4.1 ARCHITECTURE AND LANDSCAPE

The Therme Vals

Architect: *Peter Zumthor*

Location: *Graubünden, Switzerland*

Year: *1996*



Figure 5.5: The 'framed' threshold between inside and outside.

The nexus between landscape and architecture - the interstitial space - is at the very edge of things. In nature, boundaries are typically rich, fertile areas. In the built environment, edges can also offer richness in adjacent spaces by shaping the human experience through a variety of design approaches.

The history of architecture and landscape architecture reveals three basic modes between architecture and landscape. These modes present a way in which to consider interstitial spaces of "contrast", "merger" and "reciprocity" (Reuben, 1988).

This precedent investigates Peter Zumthor's approach to architecture in landscape. The significance of his work in this context provides an understanding of modes when considering the interstitial or space between building and landscape.

Zumthor's approach to materiality in the design of a landscape setting considers that the materials used must match the historically grown substance of the landscape. In other words, the material, as well as the construction has to relate to the place, and where possible, even come from it.

The building's relationship to the landscape should become an object within the landscape; be embedded in the landscape; and not take away too much from the initial perception of the context.

Zumthor's design philosophy can be seen in his approach to the Thermal Vals in Switzerland. The architecture is set within the natural surroundings with the idea of creating a cave or quarry-like structure. The roof structure is partially buried into the hillside and the building material (Valser Quartzite slabs) was sourced from a local quarry. The building is made with the stone of the mountain and built both into the mountain and out of the mountain.

Zumthor, in his book 'Thinking Architecture', stated that landscapes provide a sense of freedom and

serenity - therefore, they should be enhanced. He further stated that as a designer he wants to do justice to the landscape in which he works. To do so, he declared that one needs to take three things into account. Firstly, one should look at landscape elements such as trees, wood, stone, grasses, leaves, and the animated surface of the earth. Secondly, one should take care of and nurture the environment, in other words design to be sustainable. Thirdly, one should consider the right measure of scale, size and shape of the object in its surroundings



Figure: 5.6, 5.7: Collage of architecture works by Peter Zumthor. (top) The Therme Vals, Switzerland 1996 (Archdaily: 2009).

5.5 THE THRESHOLD BETWEEN 5.5.1 ARCHITECTURE AND LANDSCAPE

Waterside Buddhist Shrine

Architects: *Archstudio*

Location: *Tangshan, Hebei, China*

Year: *2017*



Figure 5.8: The gradual transition from inside to outside space through the spatial organization of the interior environment (Archdaily: 2017).

The Waterside Buddhist Shrine is located within a liminal space on the very edge between land and water. The shrine is representative of a threshold as it “provides a visual and physical integration of the landscape” (Dee 2001:171).

The entrance to the building creates a slow transition between the outdoor and indoor spaces through the articulation of the walls with the slope of the typography; the texture and materiality of the entrance walls, and the impressive natural wood grain in the ceiling, which resembles the surrounding trees.

The design is orientated around nature to create as little disruption as possible and to enhance the beauty and unity of the building and its environment. Spaces within the Buddhist shrine are specifically designed around the concept of tranquillity and mediation. These spaces take advantage of large skylights that admit floods of natural light and also allow for views of three Bhutanese.

This design can be said to be in the second of Zumthor’s three modes: merger. Merger is the polar opposite of contrast, which is the juxtaposition of architecture with the natural or cultural landscape (Rainey 1988:4). The interstitial space between architecture and landscape as merger calls for the building to appear as an integral part of its natural and cultural landscape (Rainey 1988:4).



Figure 5.9: The interstitial space between inside and outside. The wall resembles qualities of the trees of the surrounding forest (Archdaily: 2017).



Figure 5.10: The transitional moment between outside and inside is gradual (Archdaily: 2017)



Figure 5.11: The landscape and building merging into one another through manipulation of the typography onto the building (Archdaily: 2017).

5.5.2 SYNOPSIS (of 5.4 and 5.5.)

The threshold between landscape and architecture can be captured through the three modes of contrast, merger and ‘reciprocity’.

- The design of the threshold emphasises the type or desired transition between the two environments.
- Gradual transition from the outside to the inside space is achieved through the manipulation of wall height and application of physical qualities and characteristics that resemble the natural space.
- The texture of materiality in architecture has the ability to represent and resemble nature.
- The haptic qualities of architecture can be used to design transitional spaces between building and nature.
- The threshold between architecture and nature can be expressed in views of nature.

PROGRAM DEVELOPMENT

- 4.1 Introduction
- 4.2 Client
- 4.3 Overall Program
- 4.4 Program Informants
- 4.5 Program Functional and Spatial Requirements



...

*The following chapter discusses the program development
though a culmination of the project issues and opportunities
concerning the context.*

CONCEPTUAL EXPLORATION OF NODE



*Figure: Conceptual Exploration
through clay art of the site as intersec-
tion (Author 2018)*

4.1 PROJECT CONCEPT

“...Sometimes this spatial symbolism may be the precursor of a real and permanent change...” (Turner 1977:33).

The programmatic concept is underpinned by theory. The intention of the program is to harness the identified positive attributes of the site and to extend on it. It is proposed that the project will expand on the initiatives at the Mothong site though providing an essential oil distillation facility that will allow for *real and change* of the plants and the place.

As discussed in Chapter 1, the general issue of the dissertation is that the value of conservation of natural areas are not always understood or equally valued by the public as their personal values are not aligned.

If values change, corresponding behavioural changes typically follow across many situations (Inglehart 1997) (Manfredo et al., 2017).

It is the aim of the program to *change* people’s perception of the value the environment hold though an holistic approach to essential oil distillation with will be discussed in this chapter.

4.2 PROJECT INFORMANTS

4.2. CONTEXT AS INFORMANT

4.2.1 Essential Oil Industry In South Africa

A brief history of the essential oil industry in South African is discussed.

While a late entry into global markets, South Africa’s research outputs on the biological activities of essential oils have escalated significantly over the past 20 years. To this end, during the period 1995 to 1999, South Africa contributed 56% of the 40 research papers submitted by African countries, while in the period 2000 to 2004 South Africa’s contribution constituted 55% of the total number of 76 papers (Light et al, 2005).

Essential oils have evolved to become one of the most vital ingredients in many of the world’s largest industrial manufacturing sectors industries, including aromatherapy, cosmetics and perfumery, deodorants, food and beverage flavoring, domestic and industrial cleaning products and

health-care pharmaceuticals (A PROFILE OF THE SOUTH AFRICAN ESSENTIAL OILS MARKET VALUE CHAIN, 2018).

The healing properties of essential oils have long been known and have found application in traditional medicines for use against skin infections, cancer and a host of other degenerative illnesses. With the development of modern, state-of-the-art biotechnology equipment the antibiotic and medicinal properties of some of the essential oils were successfully tested and verified in clinical trials and several scientific and medical research laboratories (Kuriyama et al, 2005; Prabuseenivasan et al, 2006; Komiya et al, 2006; Magwa et al, 2006; Mhinana et al, 2007).

In South Africa, an estimated 1 970 hectares were utilized for essential oils crop production by 2010, with Mpumalanga, KwaZulu-Natal and the Eastern Cape the most active, utilizing 943ha, 422ha and 300ha respectively (Department of Agriculture, Forestry & Fisheries, South Africa, 2010).

Plant species such as Rose Geranium, Lavandin, Rosemary and Buchu, *Lippia javanica* will be used for the essential oil distillation as they are the most commonly use in Gauteng (Department of Agriculture, Forestry & Fisheries, City of Tshwane 2010: 17).

The current size of the South African industry is determined by the number of operational distillation facilities, according to the South African Essential Oil Producers Association (SAEOPA) there are approximately 33 commercial stills in operation, most of which range from 250kg to 500kg units and would therefore be regarded as sub-economic in the essential oil industry (South African Essential Oil Producers Association, 2001).

These aspects will guide the program in order to determine what the most appropriate method for essential oil distillation is required.

4.2.2 Identified products of Essential Oil relevant to South Africa

Although its has aromatic and therapeutic value in the role of sensual well-being, according to a report called *South African Essential Oils Market Value Chain* of done by the Department of Agriculture, Forestry and Fisheries of South Africa (2016) it remains a viable component of the market for the South

African market. There is a number of alternative ways to create value added products though the use of essential oil such as Scented candles, and soap. Small scale farming for essential oil target niche markets as the commercial market it too difficult to enter into (2016:7).

Lavender and Geranium essential oils are also mostly used in the Pharmaceutical industry such as Homeopathy, Health-care products, Aromatherapy (Department of Agriculture, Forestry & Fisheries, City of Tshwane 2010: 45).

Therefore, for the scope of this project, the most appropriate method for making essential oil and value added products from these oils will be on a small scale. Lavender and Geranium oils will be used for soap and candle making in the workshops in the scheme.

4.2.3 Role-players in the industry

One of the main role players in the value chain of essential oils in South Africa in the The South African Essential Oils Producer Association (SAEOPA).

SAEOPA is created in 2000 by farmers for farmers within the industry with the primary aims of sharing information and providing support on essential oil production.

i. The membership: People involved in cottage industries and community projects, commercial farmers, companies and emerging farmer co-operatives.

ii. (SAEOPA) vision: is to create “an essential oils industry established with production, quality, sustainability, value adding and marketing of international standards.

ii. (SAEOPA) mission: to offer training opportunities in new skills such as essential oil production and medicinal plant production, the training of unskilled and unemployed people from impoverished communities, to apply acquired knowledge into skill-based workshops, to create employment on unproductive farms and to contribute to improvement of the agricultural potential of small farmers.

iv. (SAEOPA) aims: to boost economic self-sustainability, to increase the scientific quality control of the industry, to build the industry to compete world-wide and to sustain depleting reserves of endangered species.

Other role players in the essential oil value chain can be identified as; Growers, Distillers Researchers,



Figure: Current cultivation and harvesting activities at Mothong (Author: 2018).

Figure: Current cultivation and harvesting activities at Mothong (Author: 2018).

Government, Marketers and the Consumers or Buyers (Ledwaba, 2018).

According to this, the involvement of SAEOPA to the project can be of great value to the project and is identified as a client.

4.2.2 Mothong African Heritage site

The informant responds to the existing initiatives on the site of the growing of medicinal herbs gardens at the Mothong Grounds on the plateau. The program is considered as an extension and development of this initiatives and addresses the socio-economic opportunity though establishing an essential oil distillation facility. A mentioned in Chapter 3, the site is currently under the supervision of Dr. Emperiam Mabena.

EXISTING ACTIVITY AT MOTHONG (Maree 2012)

1. Conservation indigenous fauna and flora
2. Cultivation and harvesting of medicinal herbs and plants.
4. Camping for tourist and local and external schools
5. Education on African Indigenous Knowledge System (AIKS).

Since 2001 he has established an indigenous planting nursery in association with UP, TUT and the CSIR. This is the Mothong African Heritage Site located on top of the plateau. There it features a large garden, where indigenous medicinal plants are being cultivated as well as a large open garden to cater to camping, cultural events, and traditional ceremonies (Ledwaba, 2018).

Mothong is in partnership with Unisa, the University of Pretoria, the Tshwane University of Technology, the Council for Scientific and Industrial Research and the department of science and

4.3 CLIENTS

From the previous discussion the client list as well as the visitors to the facility has been established.

The clients identified range from institutional to community level. The three clients already involved with the site are listed as the first three. These clients contribute towards research and partial funding of the activities currently at the Mothong Grounds. Newly involved clients include The South African Essential Oils Producer Association as well as the community and general public to the facility.

Medicinal Plant Science.

iii. TUT: The Department of Sciences is involved in research on medicinal plants and products with Doctor Mabena.

New clients- South African Role players:

iv. SAEOPA: The South African Essential Oils Producer Association

v. General public and partakers in the workshops and distillation production.

Existing Clients involved with Mothong African Heritage Trust :

- i. CSIR: The Built Environment and Natural Environment Departments are involved with strategies for development to the Mothong Site.
- ii. UP: The Department of Plant and Soil Sciences is involved with providing a Process Plant in the near future for the Mothong Site. Specific involvement: NRF/DST Chair: Plant health Products from IKS, Professor Plant Science, Section:



Figure 4.1: Locality diagram of existing clients in relation to site (Author 2018).

4.4 DISTILLATION

There are various types of distillation processes available to produce essential oils. Some of the common types include Hydrodistillation (HD), Steam distillation (SD), Solvent extraction, Enfleurage, Cohobation, and Maceration which are the roughly traditional and generally used methods (119)

Steam distillation is the chosen method for essential oil production as this is the most common method. It is a more modern version of the traditional technique that follows the same principle.

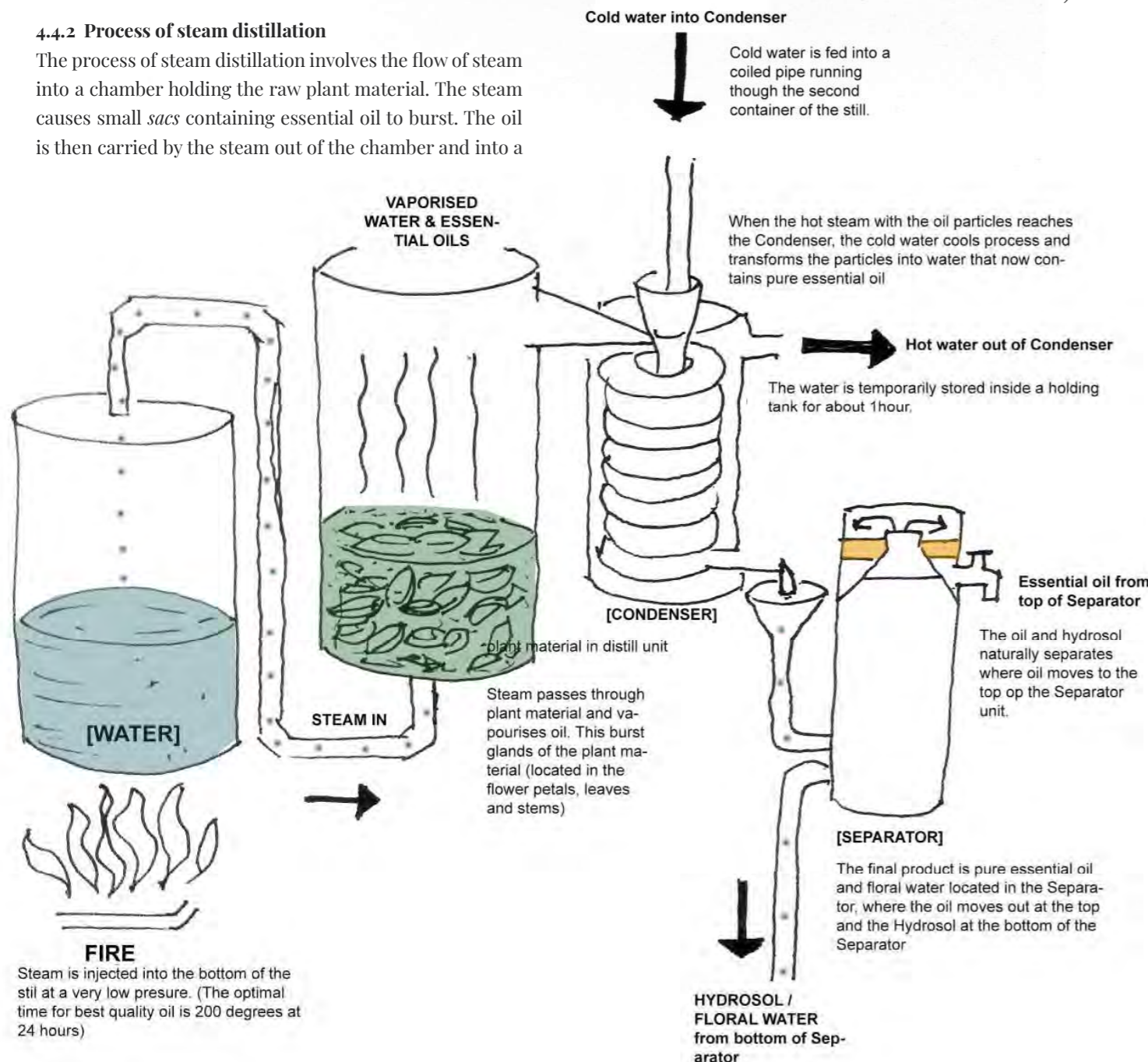
chilled condenser, where the steam once again becomes water. The oil and water are then separated; the water referred to as a 'hydrosol', can be retained as it will have some of the plant essences. {ADD REF}

Advantages apparent in this method such as the controllability of the amount and quality of steam, there is a lower risk of thermal degradation as temperature generally is not above 100°C, it is a widely used process, therefore employability is easier, it produces a high quality of essential oil and it is the most cost-effective method.

Figure 4.4: Essential oil distillation process (Author 2018).

4.4.2 Process of steam distillation

The process of steam distillation involves the flow of steam into a chamber holding the raw plant material. The steam causes small sacs containing essential oil to burst. The oil is then carried by the steam out of the chamber and into a



{ADD REF}

The program will make use of all of the possible products from the essential oil process which area:

i) Essential oil

The essential oil is the primary product of the distillation process. The oil is bottled and stored where it is used in the food at the restaurant, sold for pharmaceutical purposes.

ii) Hydrolate

The Hydrolate or hydrosol (floral water) is the distilled water enriched with plant volatiles that is the by-product generated water the water and oil has been separated in the condenser. This by-product is bottled and stored

iii) Value Adding products identified as soap and candles.

4.4.3.1. Steam Distillation Components

An essential oil distillation unit has four primary components. From the diagram above the following component will have spatial implications of the essential oil distillation space.

> A steam generator

>Still / Condenser

The size of the still is determined by the field capacity and plant material. The still is where the oil is displaced from the biomass material placed inside by the steam coming from the steam generator. The still is made of food grade stainless steel (SS304 or SS316). It consists of a round steel column, inside it has a perforated grid where the plants are placed on and steam from the bottom of the still is injected and passes through the plants. As the steam passes through it extracts the essential oil from the biomass. At the top of the still there is an outlet for the steam to move to the condenser.

> Condenser

The condenser cools down the steam carrying the essential oil water mixture to separate the water from the oil particles. The elements of the condensing plant are:

- A condenser
- Supply of cooling or injecting water for condensing exhaust steam
- A pump to circulate the cooling water
- A pump called a wet air pump to remove the condensed steam (condensate), the air and condensed water vapor and gases from the condenser
- A hot-well, where the condensed steam can be discharged and from which the boiler feed water is taken

- An arrangement cooling tower or cooling pond for cooling the circulation water

>Separator

The Separator separates the oil and hydrosol. Designed for the machine's flow rate and oil properties of plant material used. The separators are available for oils lighter and/or heavier than water.

4.5 Spatial requirements

4.4.1 Steam Distillation

From the information previously discussed, the spatial requirements for the distillation, bottling and gathering of the products, soap and candle making workshop and storage is required.

...

4.5 Program requirements

The program and the spaces catering for the various need of the building are listed according to each phase of Liminality to illustrate the consideration for its specific placement in the building. Each space is analysed according to the number of people that needs to be accommodated (Neufert 2000) at any time and the SANS 10400-XA recommendation for occupancy times. The **public, public and private** and **private** requirements of each space is also considered.

Phase 01: SEPARATION *The Preliminal*

> LIBRARY

(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

> OFFICES AND MEETING SPACE

Shared open plan office and meeting space with storage

(Neufert 2000:346) ±172m²
Design Assumptions (SANS 10400-XA: 2011)

> RECEPTION AND ADMINISTRATION

Waiting space, Reception counter, Filing

(Neufert 2000:) ±15m²
Design Assumptions SANS 10400-XA: 2011)

Phase 02: The liminal | TRANSITION

SOAP MAKING WORKSHOP

(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

ESSENTIAL OIL DISTILLATION

(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

Phase 03: The Postliminal | INTERGRATION

Storage Space

BOTTILING SPACE

(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

KITCHEN

(Neufert 2000:457) ±15m²
Design Assumptions (SANS 10400-XA: 2011)
Daily occupancy times:

Design Assumptions (SANS 10252-1:2012)
Daily water demand
Daily hot water demand:

SOAP AND ESSENTIAL OIL RETAIL SPACE




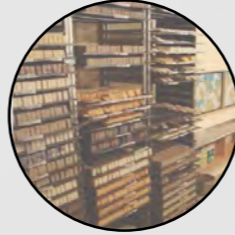
(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

ABLUTIONS

Staff ablutions and visitors ablutions

(Neufert 2000:)
Design Assumptions SANS 10400-XA: 2011)

4.5.1 ESSENTIAL OIL DISTILLATION FACILITY FUNCTIONAL AND SPATIAL REQUIREMENTS

SPACE	DESCRIPTION	FUNCTIONAL REQUIREMENTS	SPATIAL REQUIREMENTS
 <p>WASHING AND DRYING space</p>	<p>This is the space where the harvested plants are washed and cut, the plant material is cleaned to the essential parts that will be placed in the distillers and oil will be made from. The plant species are not all the same, some may require drying before the distillation process and other can be used immediately after washing.</p>	<ul style="list-style-type: none"> Wet service - large washing basins with running water Heating for drying process, requires direct controlled exposure to natural daylight for heating purposes. Warm Cupboards with canvas shelves for drying sensitive plant species Large clear floor surface areas for drying large amounts of flowers, requires easy drainage and cleaning. Link to service route for deliveries 	<ul style="list-style-type: none"> double volume space controlled exposure to natural daylight daylight controlled natural ventilation direct connection to hydrophonic greenhouses multi-level space connection to public area
 <p>Steam DISTILLATION</p>	<p>See diagram of the distillation process. The raw plant material is placed in the stills on a perforated grid.</p>	<ul style="list-style-type: none"> Main Water and storage tanks Industrial floor that can be easily washed Water storage room that house for steam chamber. link to the back of house service passage 	<ul style="list-style-type: none"> Enough head Height for the distillation equipment Well ventilated space, natural ventilation ideally Natural daylight into space Connection to visitor viewing passage
 <p>Essential oil storage and exhibition</p>	<p>The storage space is where the essential oils will be stored, from this space it will can be taken to the soap workshop or be taken to the retail space to be sold.</p>	<ul style="list-style-type: none"> Storage shelves Natural ventilation No contact to natural sunlight 	
 <p>Soap and candle workshop</p>	<p>Cold process soap making with herbs and essential oils workshop is introduced as a profitable to the South African market. The workshop can be done by tourists, school groups and visitors to the facility where education on natural soap making process is done.</p>	<ul style="list-style-type: none"> Connection to essential oil Cooling unit Small heat source Single volume space Open plan as multi-functional workshop space Natural Ventilation Extraction van Link to essential oil retail space Soap curing space (temporary storage 4 weeks curing) 	<ul style="list-style-type: none"> Workshop table - Equipment and chemical storage

SPACE	DESCRIPTION	FUNCTIONAL REQUIREMENTS	SPATIAL REQUIREMENTS
 Scent library and passage	The scent library is part of the exhibition space where the product, such as the oil and soap will be displayed for the public.	<ul style="list-style-type: none"> • Ventilation • Indirect natural light • Display shelves 	Connection with the market and retail space. Link to the bottling service passage.
 Organic kitchen and restaurant	Here some of the herbs and oil are used in the food at the restaurant as well as locally grown vegetables.	<ul style="list-style-type: none"> • Connection to service passage • Wash basin and sinks • Access to public space 	Connection to restaurant seating space View from public space Natural ventilation Natural daylight
 Market and retail space	This space is where the essential oils as well as the soaps and at home soap-making are stored, exhibited and sold to the visitors. The essential oils and soaps must be stored in a cool, dark space with no exposure to direct sunlight.	<ul style="list-style-type: none"> • Storage shelves • Climatic control • Direct access from service route • Direct access from soap workshop space 	- Indirect sunlight
 Hydroponic greenhouse	The greenhouse	<ul style="list-style-type: none"> • rainwater catchment • Hydroponic nutrient tank / reservoir • Overhead rainwater cistern with integrated natural filter system with layers of gravel, sand, charcoal. • Evaporative coolers • Irrigation • Link/ access to water tower 	+ vertical growth + box planters

Table 3.2: Table of functionals and spatial requirements of distillation program (Author 2018).

CONCEPT AND DESIGN DEVELOPMENT

- 6.1 INTRODUCTION
- 6.2 CONCEPT AND INTENTIONS
- 6.3 ARCHITECTURAL INTENTION
- 6.4 CONNECTION- ITERATION 1
- 6.5 THRESHOLD- ITERATION 2
- 6.6 JUNE EXAM - ITERATION 3
- 6.7 TECHNICAL - SEPTEMBER 2018 CRIT- ITERATION 4
- 6.8 REFLECTION



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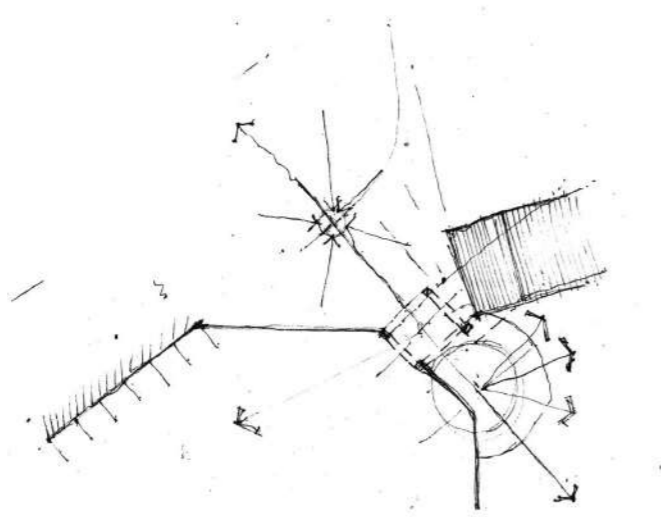


Figure: 6. 1: Threshold concept (Author 2018)

...

This chapter discusses the conceptual thought process and the development of the design to the technical phase. The formulation of the project intention has developed, as a deeper understanding of its implications has resulted in changes to the site- and design approaches. The primary idea of the intervention is a series of smaller 'moments' along the route and within the landscape. This approach was altered and the intervention was consolidated into a specific area in order to be less intrusive to the natural landscape

6.1 // INTRODUCTION

This chapter translates the theoretical and contextual information into architectural expression. The design of architecture of the in-between condition results from manifesting the analytical, theoretical, programmatic and precedent premises as discussed in the previous chapters. The project investigates the condition within the threshold which currently

resides as a non-place. Through various approaches, the project investigates the creation of meaningful space within the non-place though physical and spatial connections between the urban and natural conditions. The mapping and analysis of the context facilitates the potential explorations of the design development.

6.2 // DESIGN INFORMANTS

6.2.1 Contextual Informant

The design of the intervention within the threshold is based on the general, urban and architectural issues of the dissertation. These site's geographical location proves ideal for architecture of a periphery condition.

Mamelodi is nested against the foot of the Magaliesberg where the threshold, identified as the site, provides potential of tangible and intangible design responses.

6.2.2 Program Informant

The programmatic potential of the project is realized through an understanding and discovery of existing and contextual potentials. The proposed programs are based on the socio-ecological contribution to the environment. The intention of the programme is to

harness and extend the potential to contribute towards the socio-ecological and socio-economical potentials of the site. By this understanding it is proposed that the project expand on the cultivation and conservation initiatives at the Mothong Heritage site.

6.2.3 Theoretical Informant

[L i m i n a l i t y]

"The passage from one social status to another is often accompanied by a parallel passage in space, a geographical movement from one place to another. The movement between the stages "may take the form of a mere opening of doors or the literal crossing of a threshold which separates two distinct areas, one associated with the subject's pre-ritual or preliminal status, and the other with his post-ritual or postliminal status" (Turner 1979:17).

Theory as the main driver of the project is underpinned in both the conceptual and programmatic informants. The theory implies, in short, that the threshold or limen to separate two opposing ontologies and physical movement between the ontologies implies a change to occur.

6.2.4 Theoretical Informant

[a d a p t i v e r e u s e]

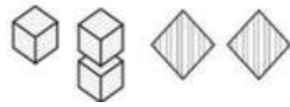
The adaptive reuse of a building considers the most important and meaningful factor in the design, that is of course, the original building, and its establishment of a relationship between the old and the new (Brookner and Stone 2004:78). This relationship can be established according to the three categories of insertion; installation; intervention as suggested by Brooker and Stone (2004). Furthermore, the building's

value extends beyond the physical bounds to the creation of new identity of place and the development of the history of the specific site. Adapting to the robust built fabric allows for the creation of a new 'layer' of old structure though using new elements and programme to highlight the potential of physical environment.

THE ADAPTIVE REUSE CRITERIA

guided the design to understand the spatial and organisational relationship between the old infrastructure and new intervention.

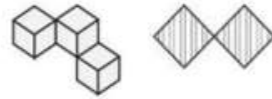
no contact - spacial tention



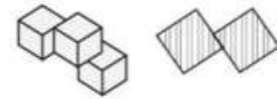
[i] INSTALLATION

The old and new buildings exist independently. The new elements are located within the boundaries of the existing building. Their design may be influenced by the existing building but they are not necessarily compatible with it. Upon removing the installations, the existing building may revert to its original state (Brookner and Stone 2004:127).

edge to edge contact



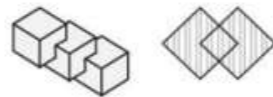
surface to surface contact



[ii] INSERTION

A new, independent element that is suited exactly to the existing envelope. The element is constructed to fit and is located within the boundaries of the existing building (Brookner and Stone 2004:102).

intwined volumes



[iii] INTERVENTION

The existing structure undergoes major transformations so that it can no longer exist independently. The old and the new additions are completely integrated. The big challenge in the formal analysis of adaptive reuse architecture is the need to consider both the original building with its original use and physical structure, and the transformed building with its new use and new physical structure. In addition, there is the process of transformation or change to consider as well (Brookner and Stone 2004:81).

Figure 6.2: Diagrams of the three categories/strategies of the understanding between old and new buildings (Gewirtzman, 2016).

Diagrams to interpret possible interventions types:

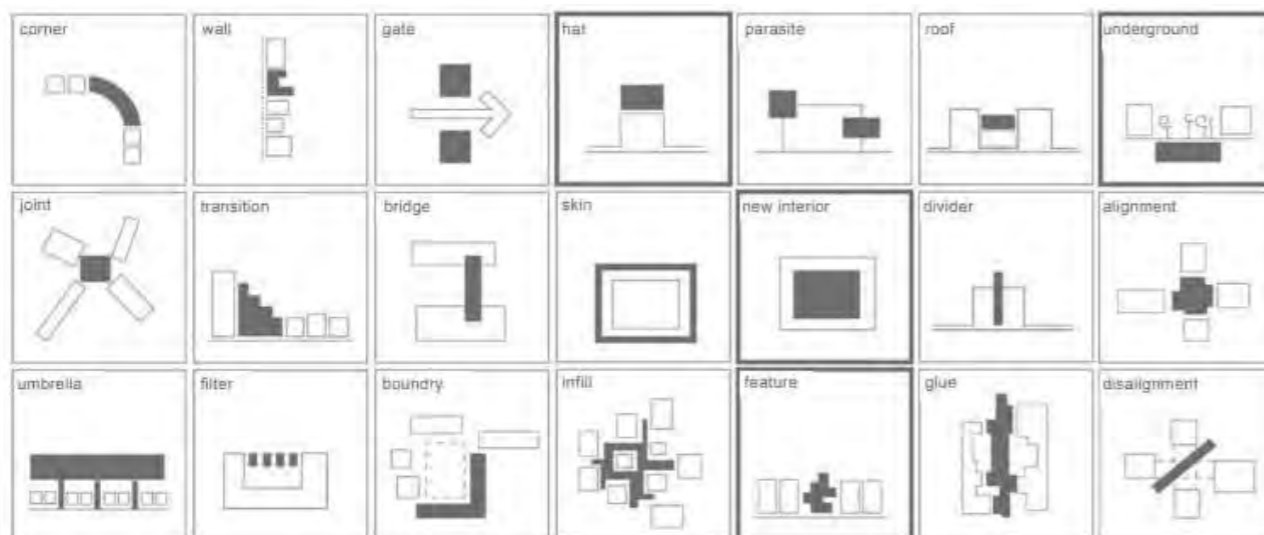


Figure 6.3: Diagrams of different intervention types (Gewirtzman, 2016).

6.2 // CONCEPT AND INTENTIONS

In conclusion to all of the above mentioned design informants, it is the intention of the intervention within the threshold to become the transitional device between the urban and the natural condition. This entails that the intervention should allow for movement, change, adaptation and conversion.

The project concept is for the transition of the site's elements within and moving through the threshold to transition from a former state into a new state.

The architectural element of threshold 'can often provide visual and physical integration of the landscape if it possesses qualities of both the spaces it connects, the environment that is left behind as well as the place being entered' (Dee 2001:17). The concept of the limen has a direct spatial and physical implication.

The architectural response is derived through an understanding of both the project issues and theory.

The design criteria is underpinned by the two theory concepts of Liminality and Adaptive reuse; as well as site considerations. The integration of the project intentions with the relevant site potentials is illustrated in the various iterations and approaches in this chapter.

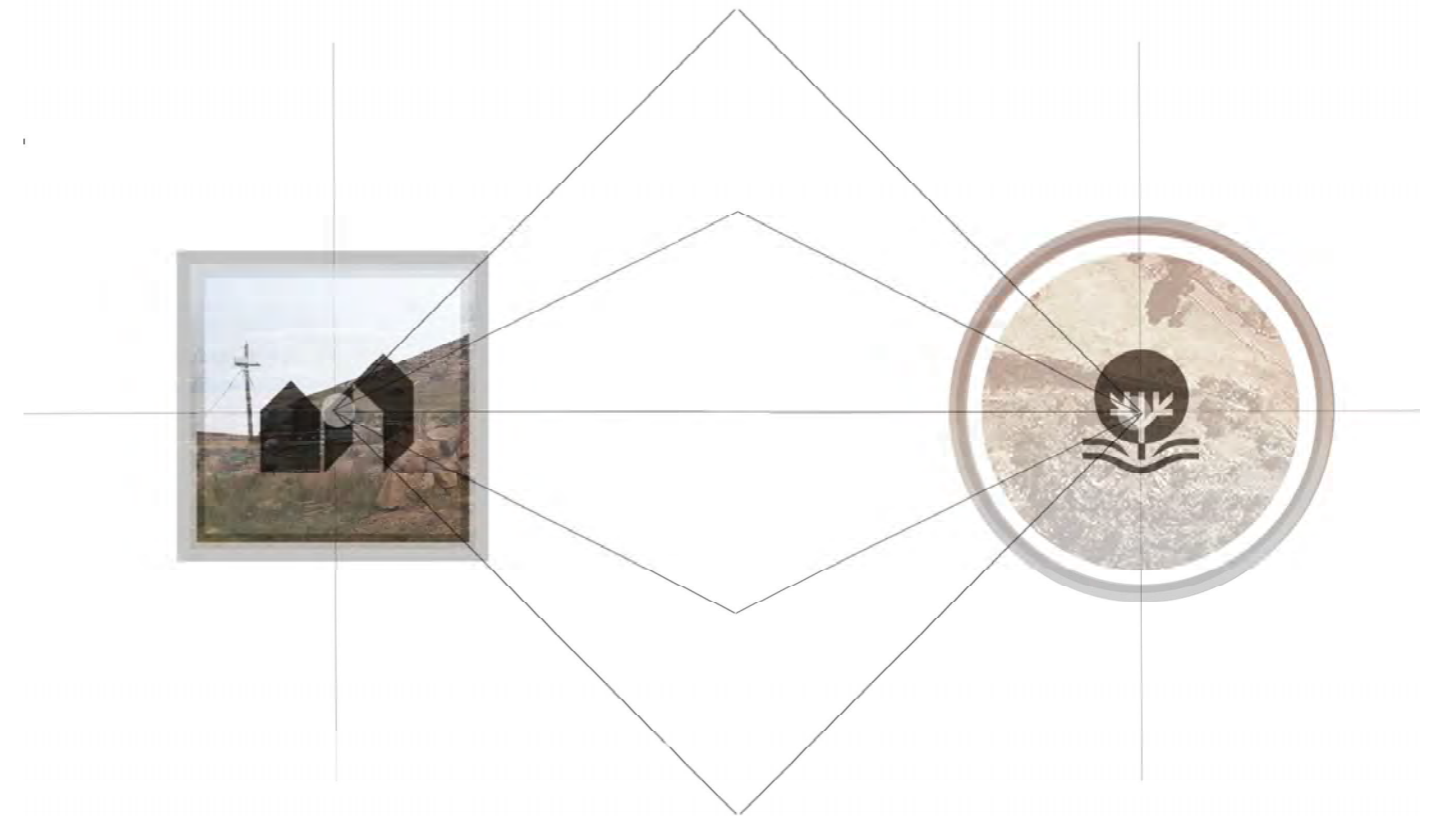


Figure 6.4: Harassing / connecting between opposing states (Author 2018).

6.4
INSTALLATION / INSERTION
Connection
Iteration 1

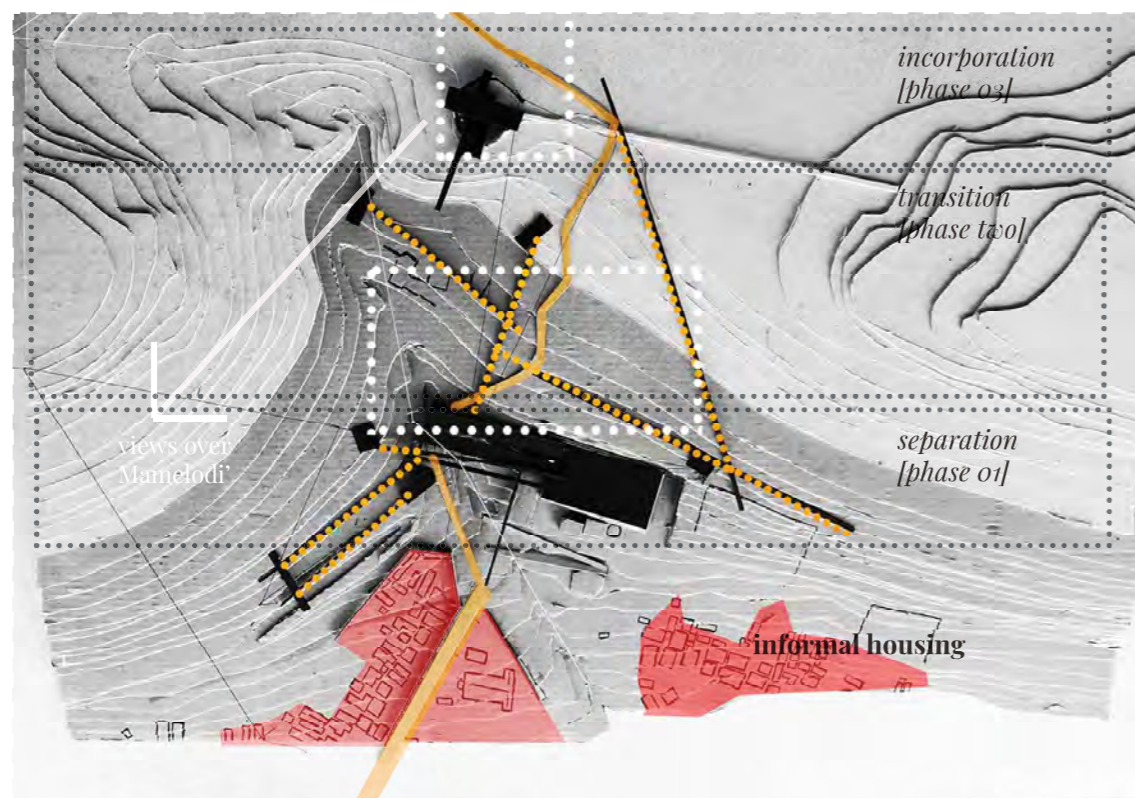
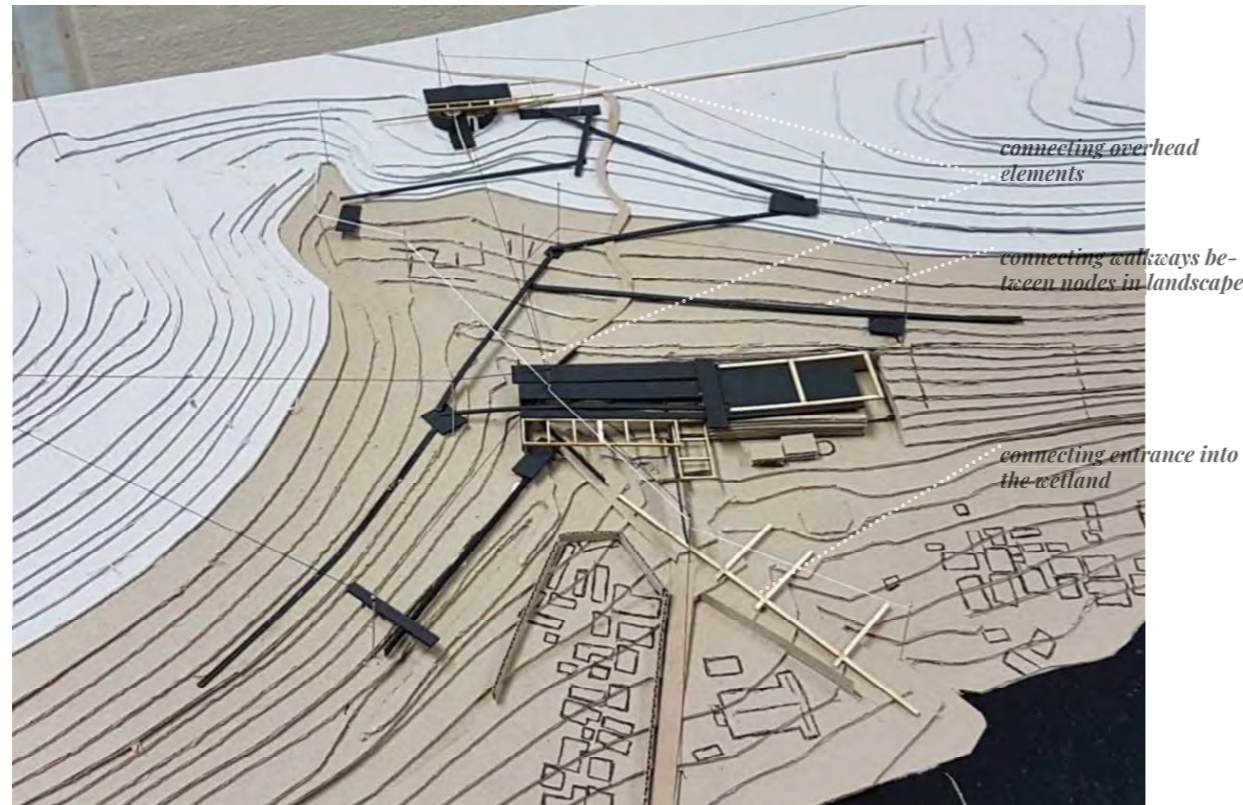


Figure 6.5: Photograph of Conceptual Model for March Crit: Series of smaller interventions along the route and within the landscape (Author 2018)

Figure 6.6: Photograph of Conceptual Model for March Crit from above: Series of smaller interventions along the route and within the landscape (Author 2018)

6.4.1 // Theoretical consideration

(i) Liminality

The exploration of theory considers the idea of liminality in rites of passage between the sacred- and profane worlds. When describing the three phases of liminality, Van Gennep (1977:21) stated, "I propose to call the rites of separation from the previous world, the preliminal, those executed during the transitional stage liminal (or threshold) rites, and the ceremonies of incorporation into the new world postliminal rites." (Van Gennep 1977:21). This idea of liminality was given form – the 'threshold' aims to create a clear moment of separation and symbolises the detachment of the individual from their former condition. Smaller nodal interventions symbolise the 'transition' between the stages and the connecting paths between the nodes create a journey to the moment of incorporation represented as the 'sacred' place.

- There needs to be a clear differentiation between the states of separation and of incorporation. This idea was explored through a difference in the scale and geometry of the two interventions.
- The threshold between the two opposing states creates a gradual transition from the outside- to the inside space

(ii) Adaptive Reuse : INSTALLATION / INSERTION

Adaptive reuse of the water reservoir:
The new additions has a direct architectural relationship with the existing although exists independent to the existing structure. The new mimics the scale, height and geometry of the existing. This approach to be as sensitive to the existing structure.

> Contextual consideration

The placement of the interventions considers the site's topography of flatter surfaces. The smaller interventions are the result of sensitivity to the protection of the natural landscape.

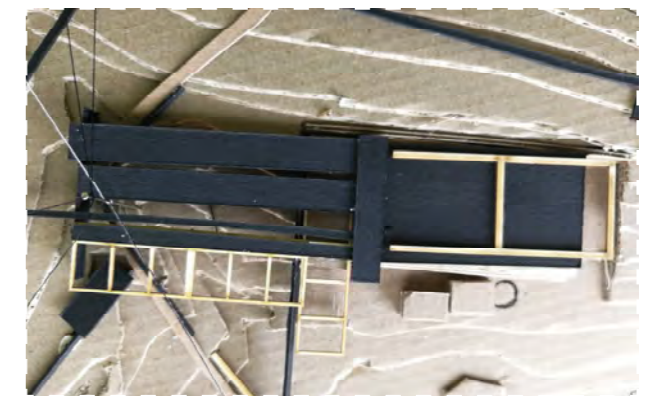


Figure 6.7: Collage of the Conceptual Model 1 development (Author 2018)

> Reflection

Adaptive Reuse approach of insertion completely overshadowed the existing structure, thus there is an imbalanced relationship between old and new. For a successful dialogue to be established, the two components must be speaking equally loudly, albeit in different languages (Brookner and Stone 2004:102).

Figure 6.8:
(Below) Conceptual Exploration of different approaches to the site and relationship between old and existing structure (Author 2018).

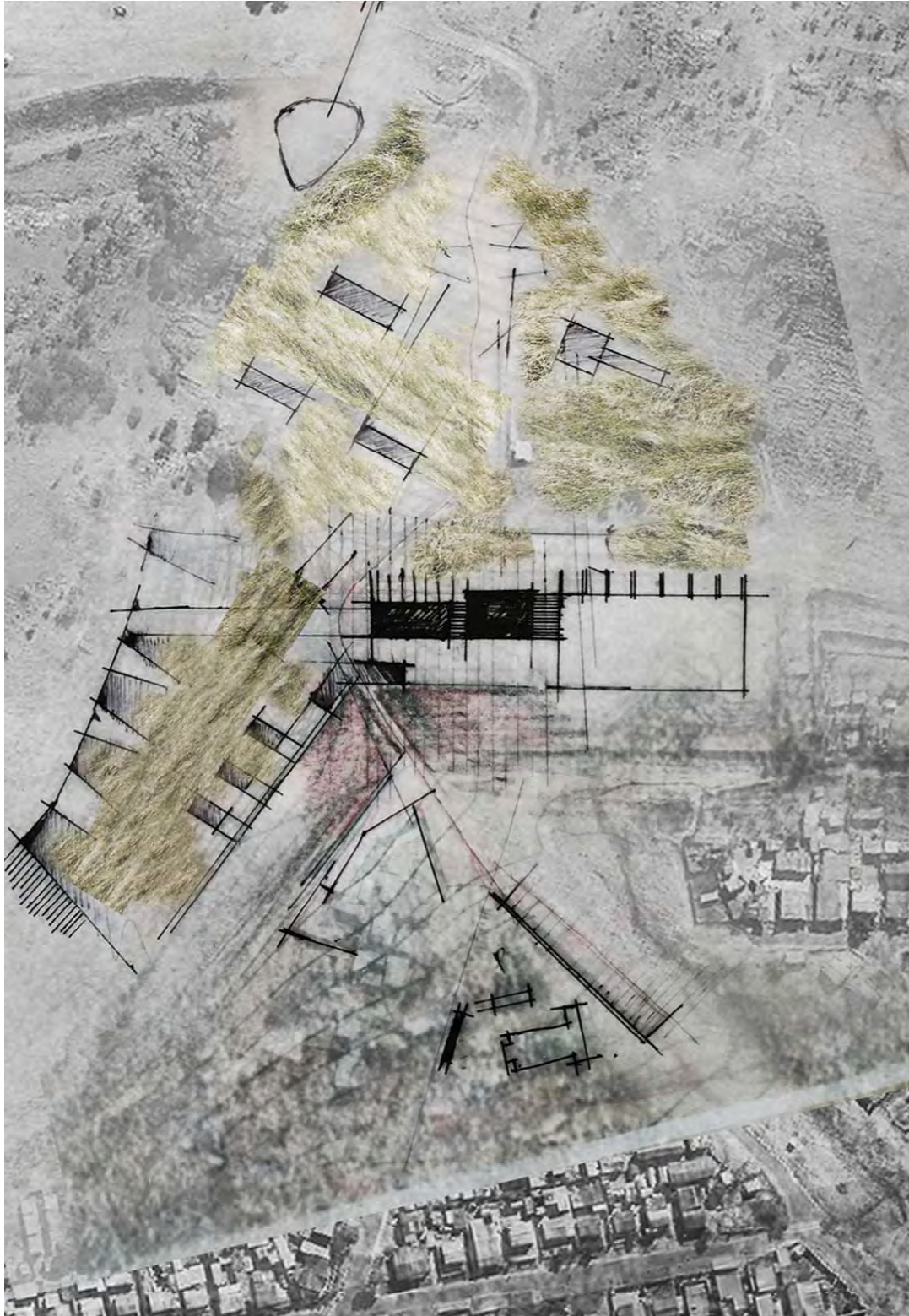


Figure 6.9:
(Below) Conceptual Exploration of different approaches to the site and relationship between old and existing structure (Author 2018).

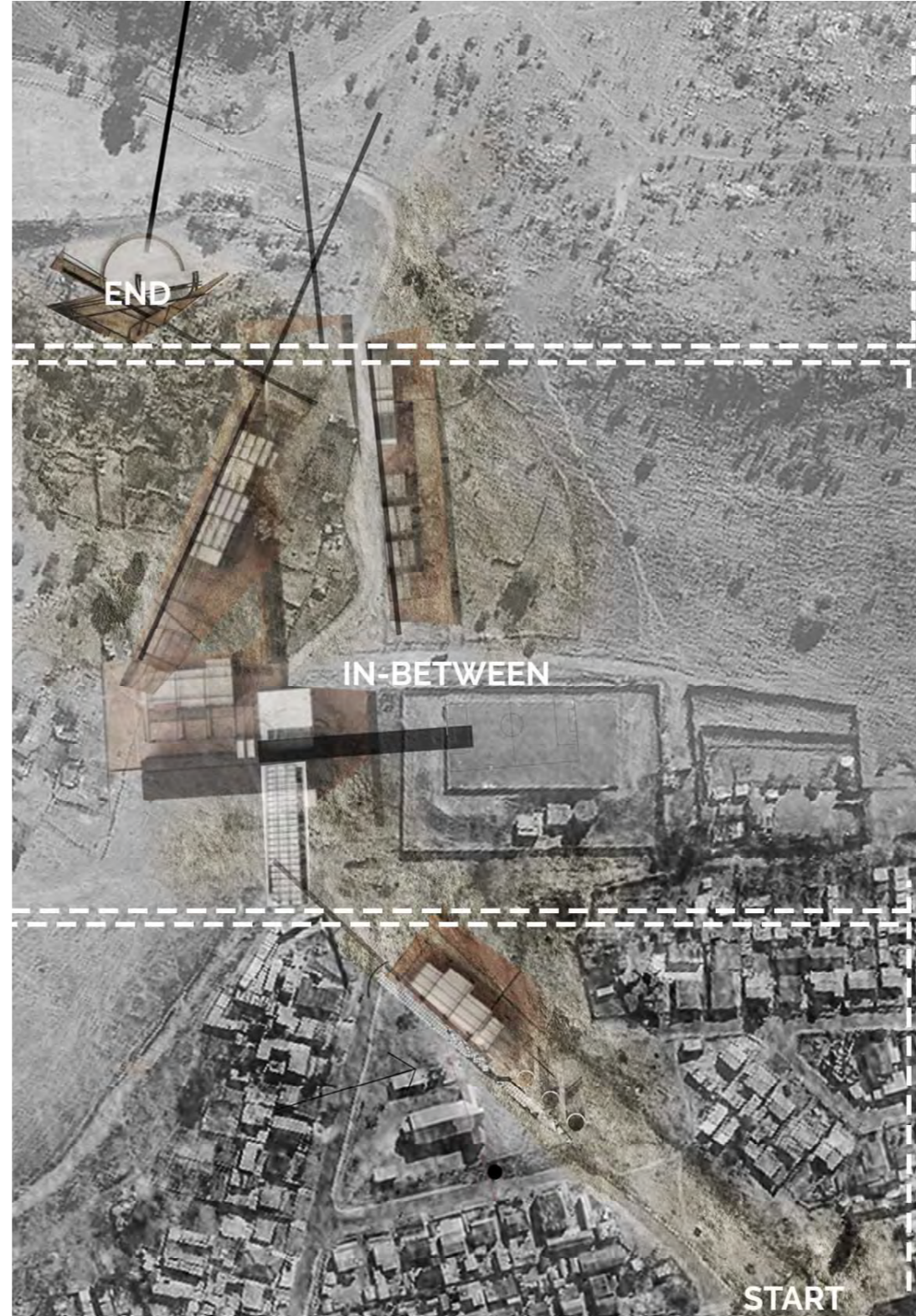
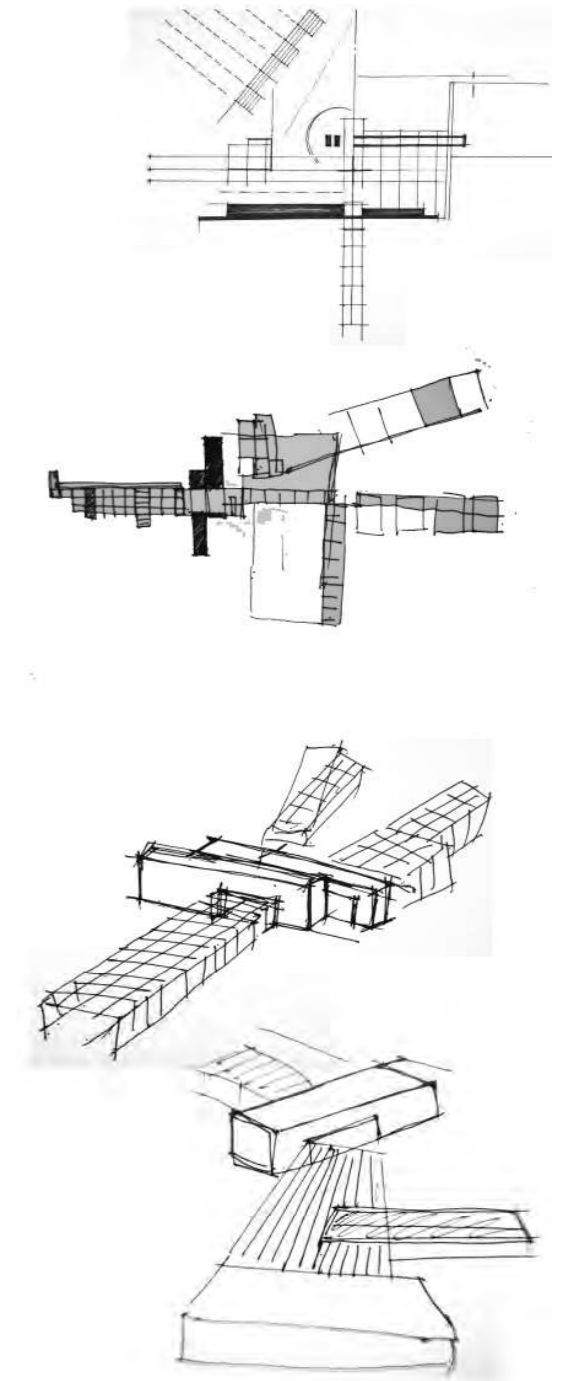


Figure 6.10:
(Below) Massing exploration of the 'threshold' (Author 2018).



6.5

INSERTION Organic Threshold Iteration 2

> DISCUSSION

A clear understanding was established of where the main focus of the intervention should be. Between the March 2018 crit and the June 2018 examination the decision was made to consolidate the design proposal in one area. The main drivers for this decision were theory and specification of the greatest liminal (threshold) moment on the site.

> Context

The conceptual exploration (above) was considered to be contradictory to the project's argument of

limiting development in the sensitive mountainous area. The result is an exploration of the conceptual model to cluster all the interventions in the focus area within the threshold.

> Theory and Architectural consideration

(i) Liminality

The model explored with the idea of the *preliminal* being representative of Mamelodi as the former condition, through the tectonic language and organic placement of form and space that relates to the built fabric of Mamelodi. The monolithic structure

of the reservoir was interpreted the a platform for recreational activities as the intervention attached to its side reservoir.

(ii) Adaptive Reuse : INSERTION

Following from Iteration 1, the second approach of Insertion was for the new to establish its own language through contrasting with the existing

language. Therefore the tectonic language of the preliminal is appropriate for the new as it contrasts with the stereotomic water reservoir. The organic placement of form in space of the new created small internal courtyard spaces. This is done purposefully to contrast with the enclosed structure. The Insertion explored with Edge to edge contact, instead of surface to surface contact which resulted in the intervention to nestle against the existing structure.

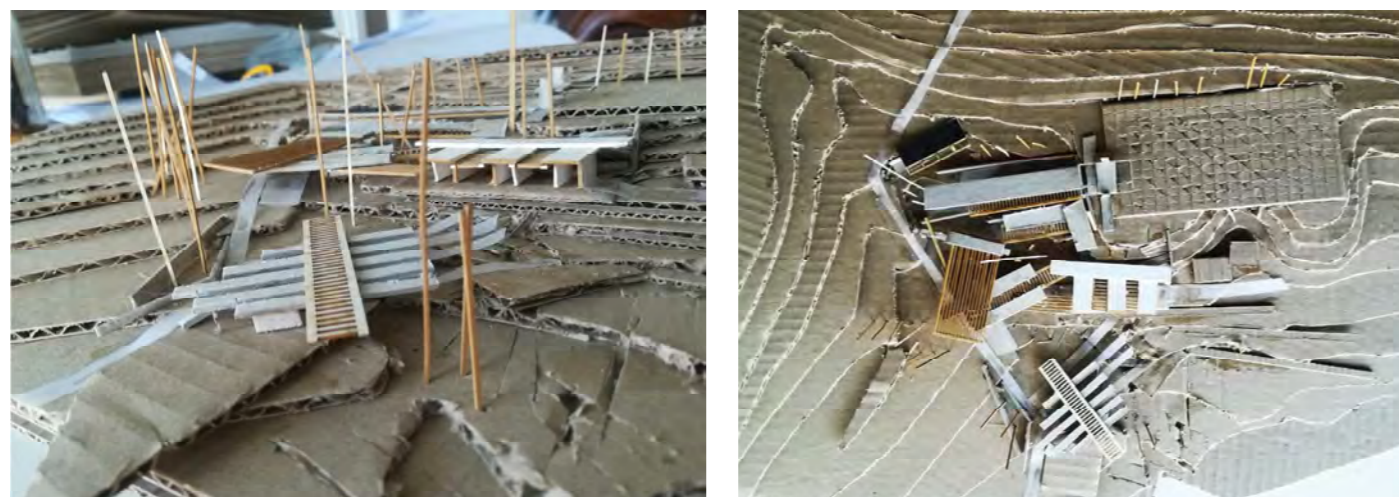


Figure 6.11: Photograph Collage of Conceptual Model for (Author 2018)

6.6

INSERTION Parasitic Threshold Iteration 3

As the design development continued, the Insertion of the new combined edge and surface contact with the existing structure. The utilization of space on and around the water reservoir showed opportunity to physically and visually connect the natural and urban environments. The tectonic placement of form and space began to nestle onto the existing rigid structure. Rather than occupying the entire threshold, this iteration resulted in better use of space as it allows for movement though the threshold.

The relationship between the old and new is more desirable as the new no longer overpowers the original building. This also proved to be display greater concern for the environment for the intervention to make use of existing built fabric, rather than create a completely new intervention.

In reflection, the author realised that the use of the redundant or neglected internal space of the reservoir can also serve to enhance the experience of movement through the threshold. Therefore, the following design development approaches INTERVENE with the existing building.



Figure 6.12: Conceptual Exploration of tectonic (new) to the stereotomic (existing) (Author 2018).

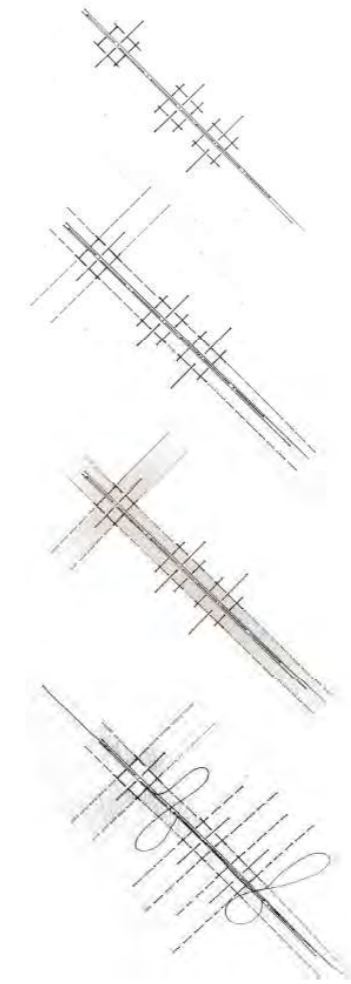
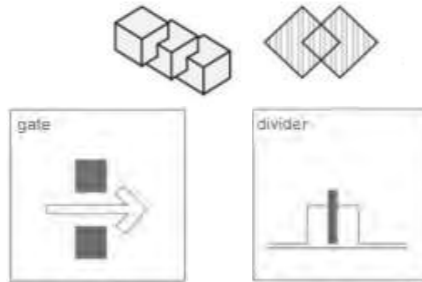


Figure 6.13: Transition through thresholds (Author 2018)

6.7
INTERVENTION
Divider + gate
Iteration 3

interwined volumes

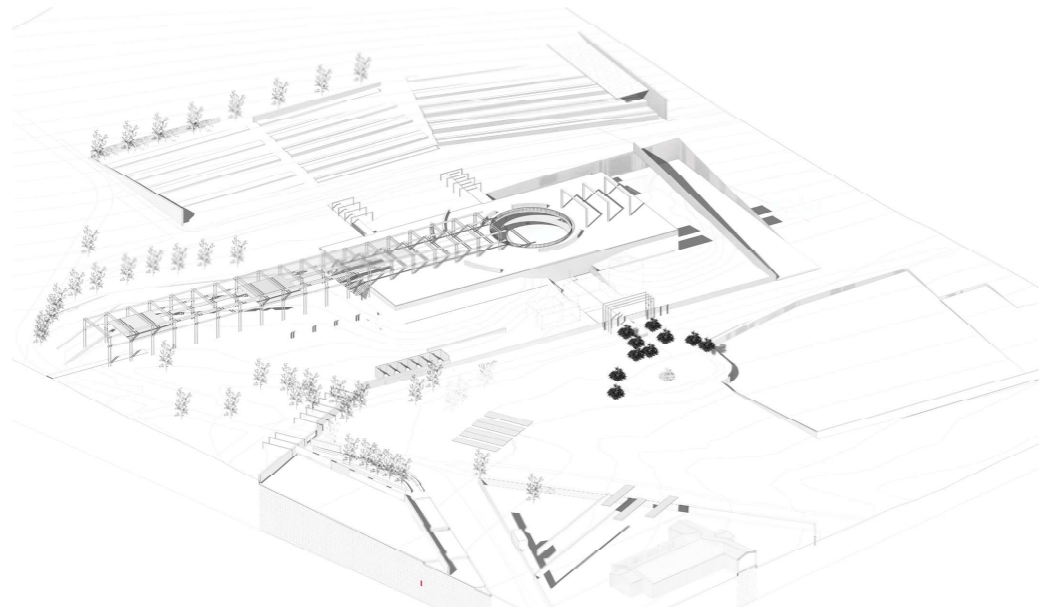


> ACCESS

The entrance to the building responds to the site's most public side. Therefore, the design opens up the western perimeter walk and a portion of the southern perimeter wall. These function as access points to the basement and roof level of the reservoir.

> CONTEXT

The existing building is partly embedded in the ground and only a portion of the top of the structure is visible. This quality is harnessed as it contributes to the in-betweenness of being – it being neither completely integrated into the earth nor completely separate from the earth.



3 Dimensional projection

INTERVENTION
Divider + gate
organic versus rigid exploration

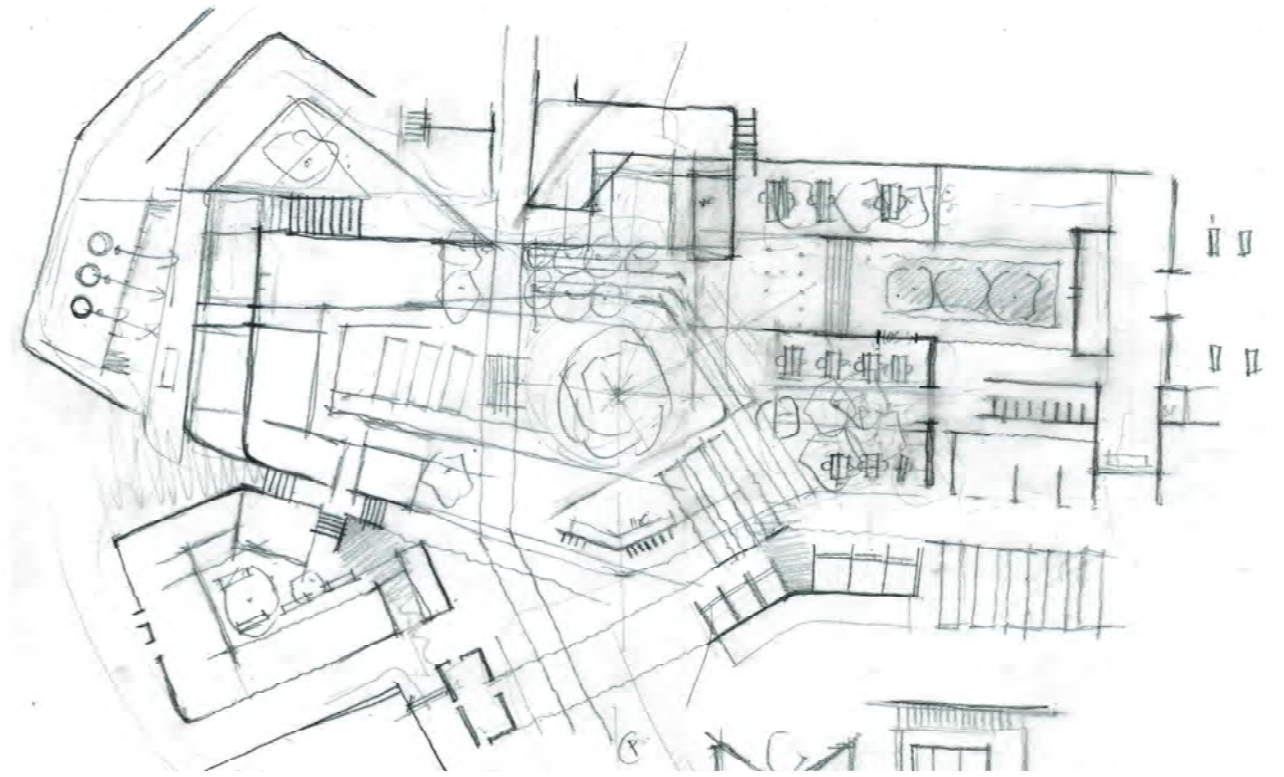


Figure 6.15: Sketch plan development
Insertion: Organic arrangement to contrast with existing geometry (Author 2018)

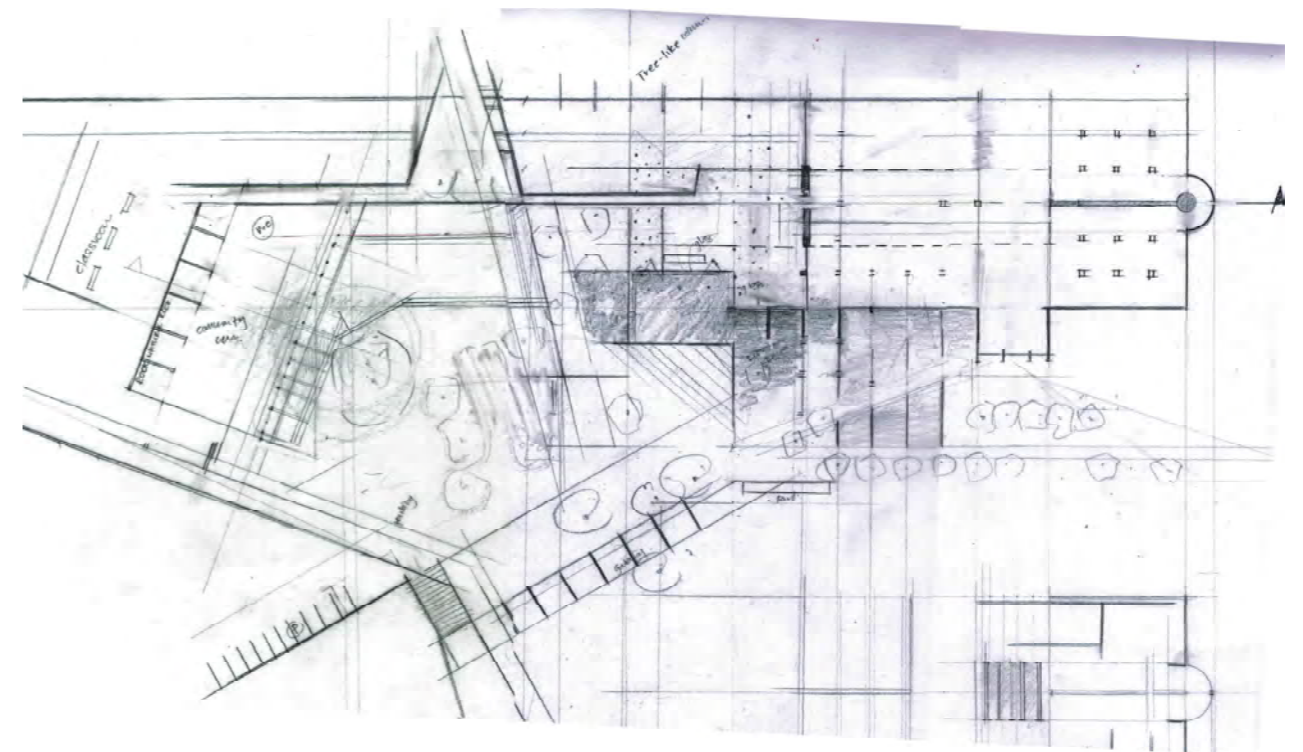
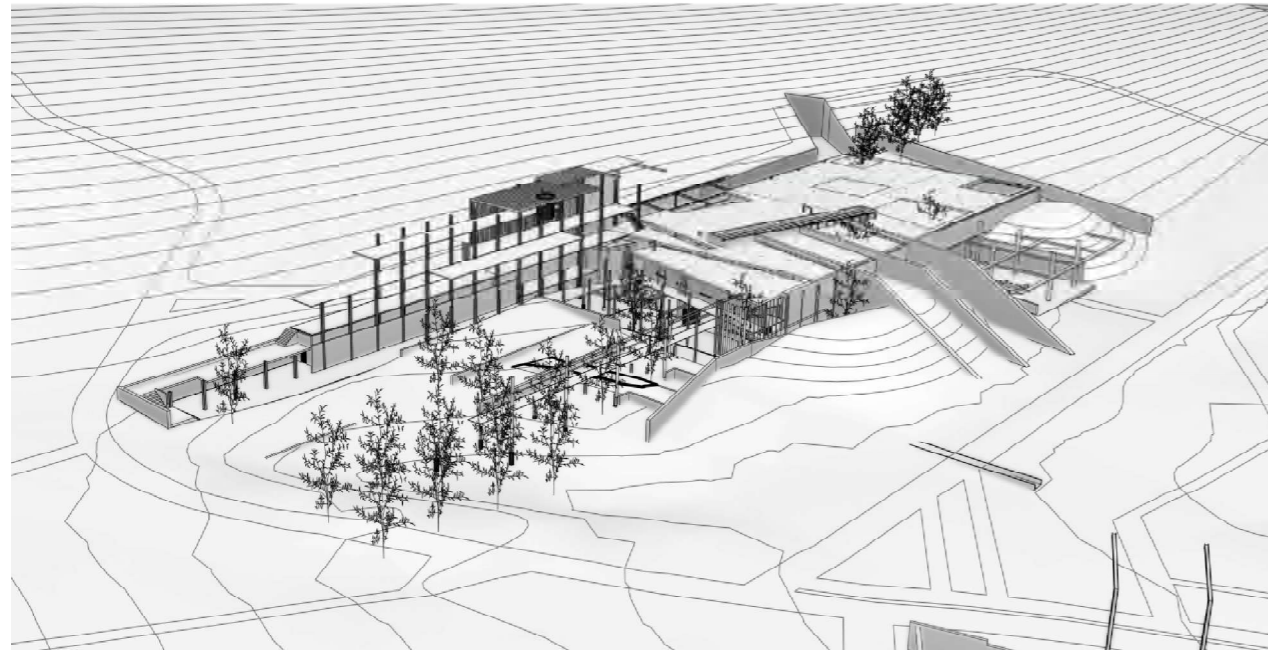
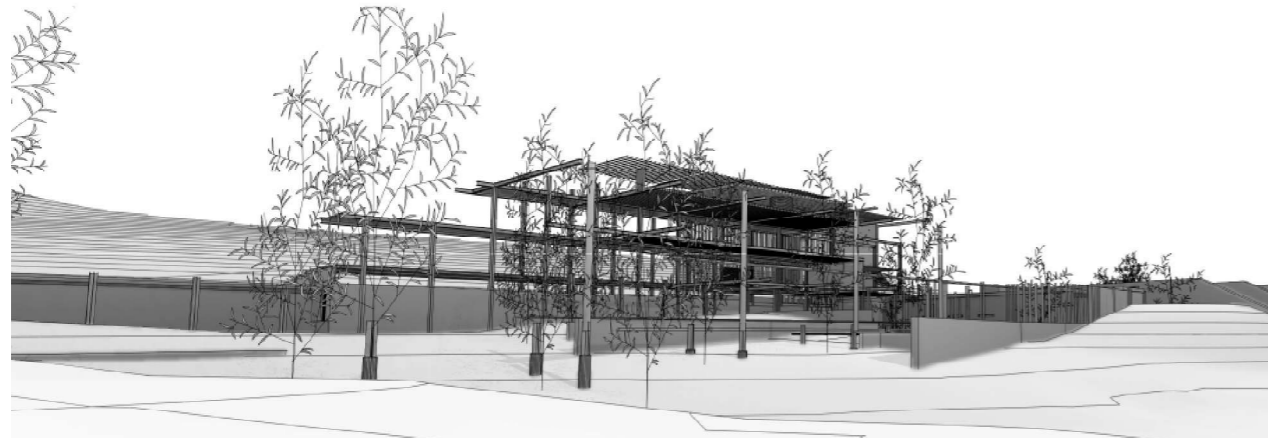


Figure 6.16: Sketch plan development
Insertion: Rigid arrangement to synergise with existing geometry (Author 2018)

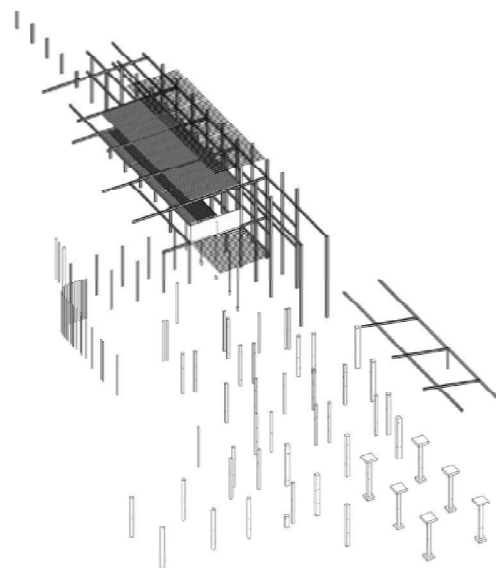
6.8
INTERVENTION
Divider + gate
Iteration 5.1



3 Dimensional projection



3 Dimensional projection

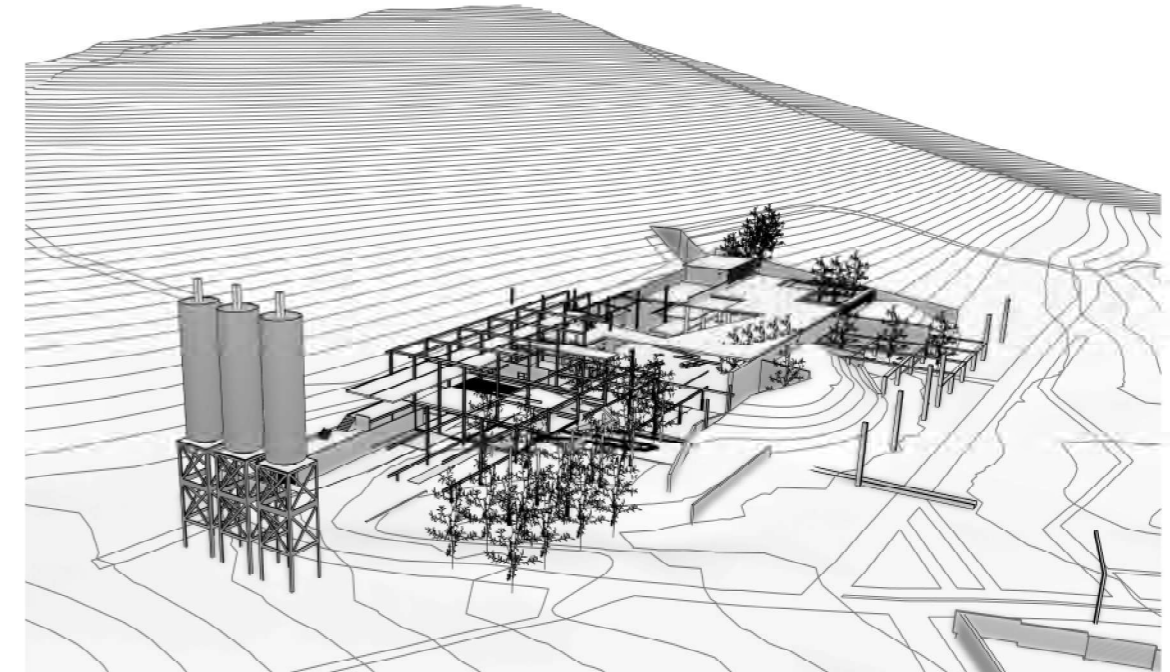


Axonometric projection

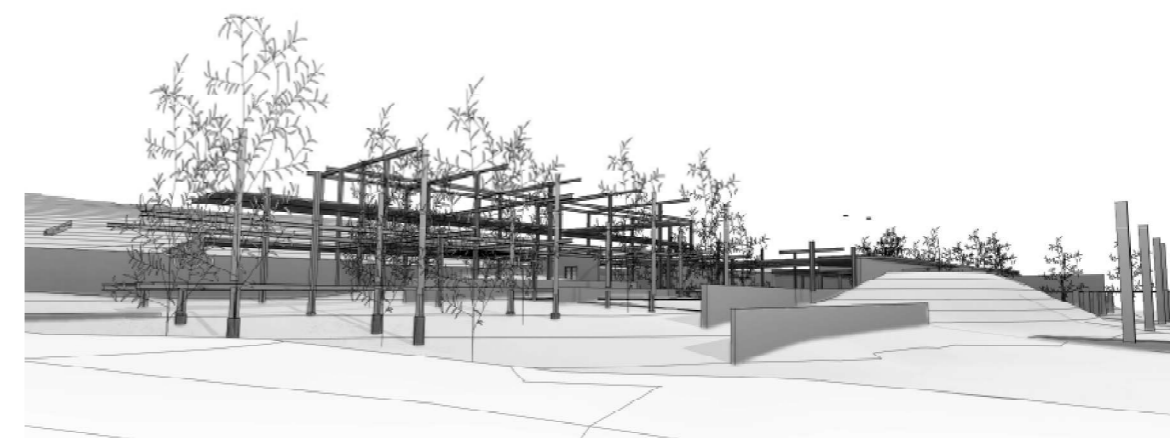
Figure 6.17: Collage of Iteration 5.1 (Author 2018)

Rooting from the project concept, the process of transition is expressed in the reuse of the architectural element of the concrete columns of the existing structure. The adaptive reuse transforms the extant columns (on the eastern side of the structure) to the new columns envisioned on the western side. The transition from original to new occurred in terms of materiality, rhythm, structure, spatial arrangement and volume.

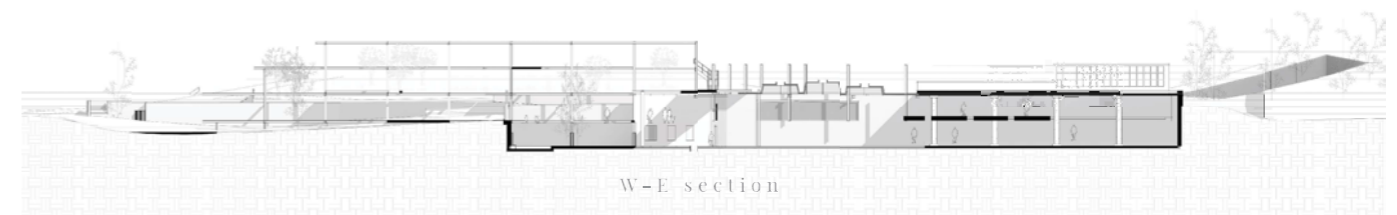
INTERVENTION
Divider + gate
Iteration 5.2



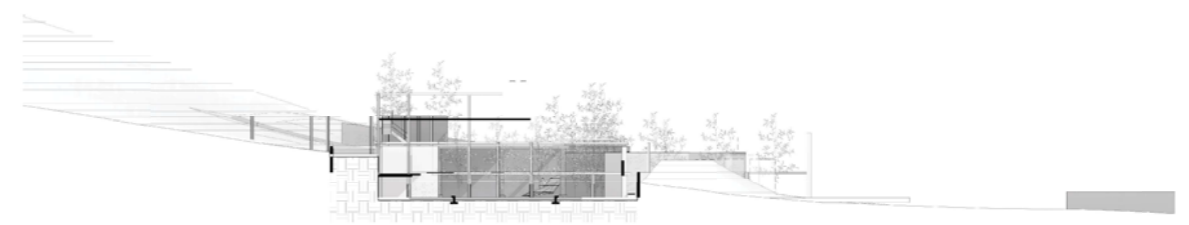
3 Dimensional projection



3 Dimensional projection



W-E section



N-S section

Figure 6.18: Collage of Iteration 5.2 (Author 2018)

6.8
INTERVENTION
Divider + gate
Iteration 5.1

CONCEPTUAL EXPLORATION OF NODE



Figure 6.19: Conceptual Exploration through clay art of the site as intersection (Author 2018)

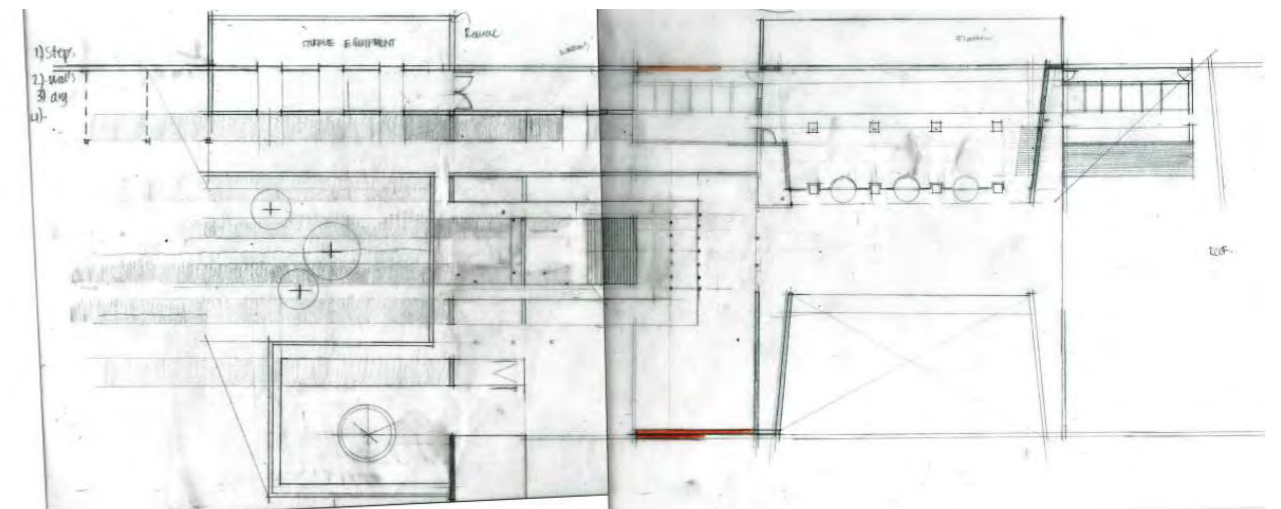
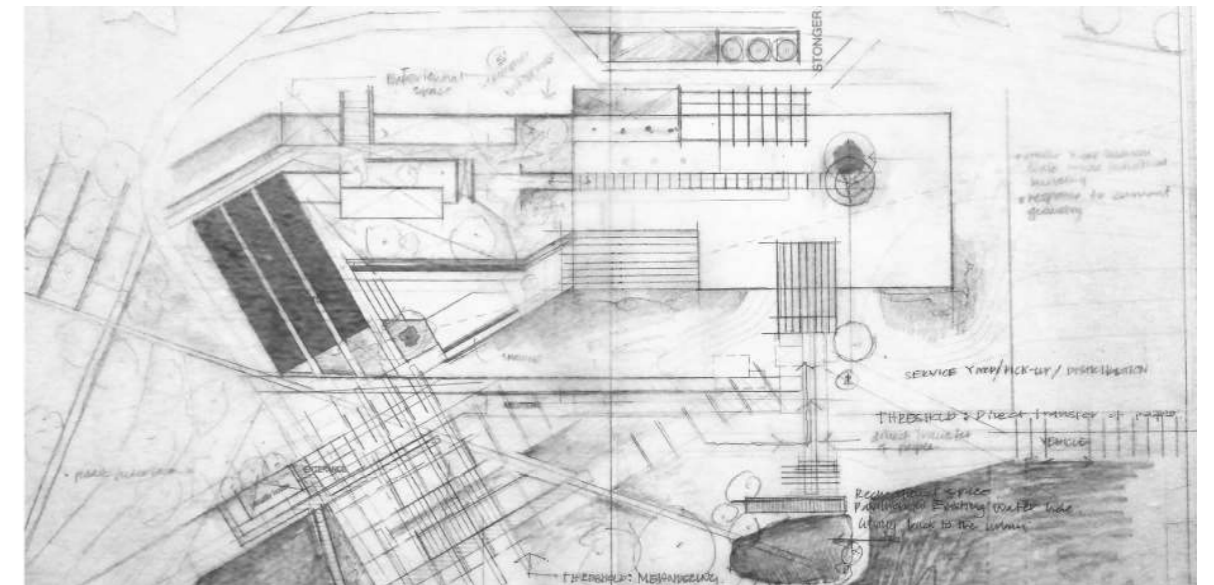
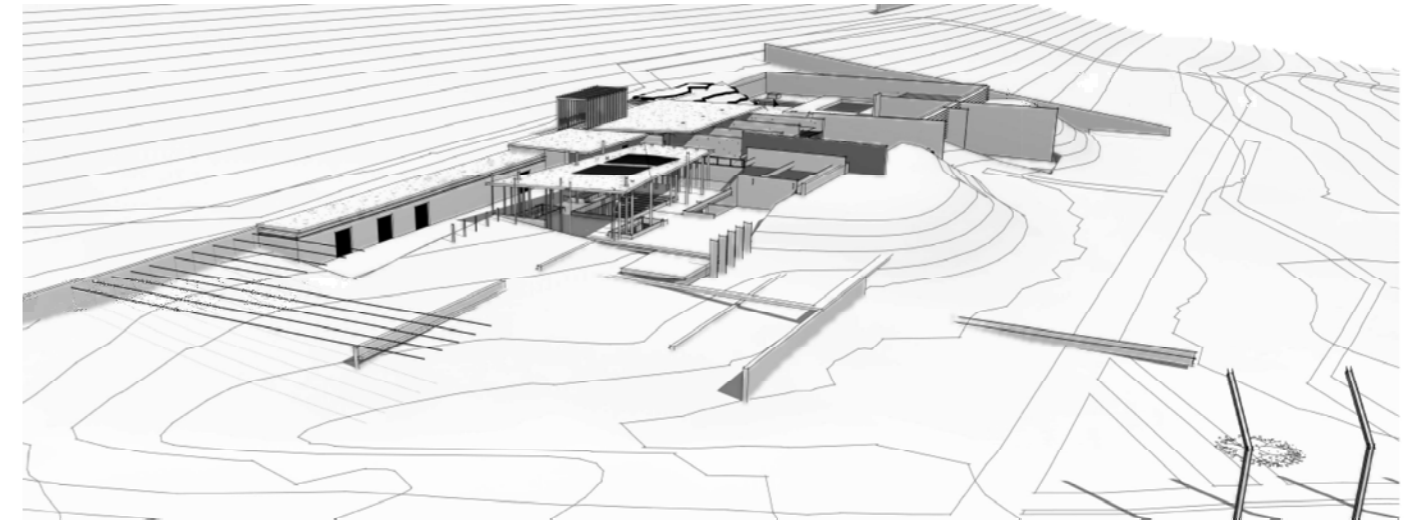


Figure 6.20: Collage of Design developments (Author: 2018)

6.6

I N T E R V E N T I O N

June Exam - Iteration 6

By mid-2018 theory became the driving force of the project. Therefore, each design consideration discussed below (architectural, contextual and functional) has a theoretical underpinning. The INSERTION of new function and form allowed for the internal spatial quality of the water reservoir to be explored.

> **Design Challenges**

The water reservoir harbours a very flat and dark internal space. This presented a number of design challenges in terms of ways of allowing in natural light, air and environmental systems. The architectural elements of the existing structure are discussed in Chapter 3.

> **Theoretical consideration**

The three phases of rites of passage in liminality are physically illustrated in the June Model as the model express three unique states. The journey though the stages is described below:

i. The Preliminal phase -Separation

Along the western side of the building are a recreational space connected to the wetland and drying grounds

for herbs. These spaces are connected to the building through extended walls and circulation platforms that are nestled in the landscape. This aims to pull the initiate (Foster 1994:373) (the person within the liminal period who will be undergoing the ceremony of change) into the space to separate them from their previous context.

The entrance to the building responds to the site's most public side. Therefore, the design opens up the western perimeter walk and a portion of the southern perimeter wall. These function as access points to the basement level of the reservoir. On the basement level, the visitor is visually separated from the urban environment. The space is surrounded by a combination of concrete walls and vegetation. It creates a moment of pause and reflection before the user is introduced to the distillation process.

ii. The Liminal phase -Transition

The primary consideration in this phase is transition. The idea of transition is expressed in the programme by utilising the material found on site. The medicinal plants and herbs on site transition into essential oil through the distillation process. The liminal

moment houses the still, where the plant material is transformed into oil. Changes to the existing concrete roof slab allow elements such as water, light and ventilation into the space.

iii. The Postliminal phase -Integration

In this phase the initiate (having experienced the transitional phase) can be integrated back into the societal structure. Therefore, the space houses social activities such as restaurant- and market spaces. Little change was made to the original structure in this phase, as the structure is already stable and integrated.

(ii) Adaptive Reuse

The existing structure undergoes major transformations so that it can no longer exist independently. The old and the new additions are completely integrated (Brookner and Stone 2004:81). In this intervention there is cohesion established

between the tectonic and stereotomic languages. This is the desired effect as the old and new volumes as well as inside and outside space become intertwined. The modifications to the building are not subtle but are extensive which causes character change of the original building. This alterations and subtractions to the original structure is related to the theoretical grounding of liminality.

Through the process fragmentation of the original, the structure creates a new energy and inviting presence to the threshold.

As the internal space of the building is now exposed to the outside, the greatest impact of the building is creating presence during the day and light as the massive embedded structure functions as a light well during the day and beacon at night.



Figure 6.21: Site Plan and spatial vignettes (Author 2018)

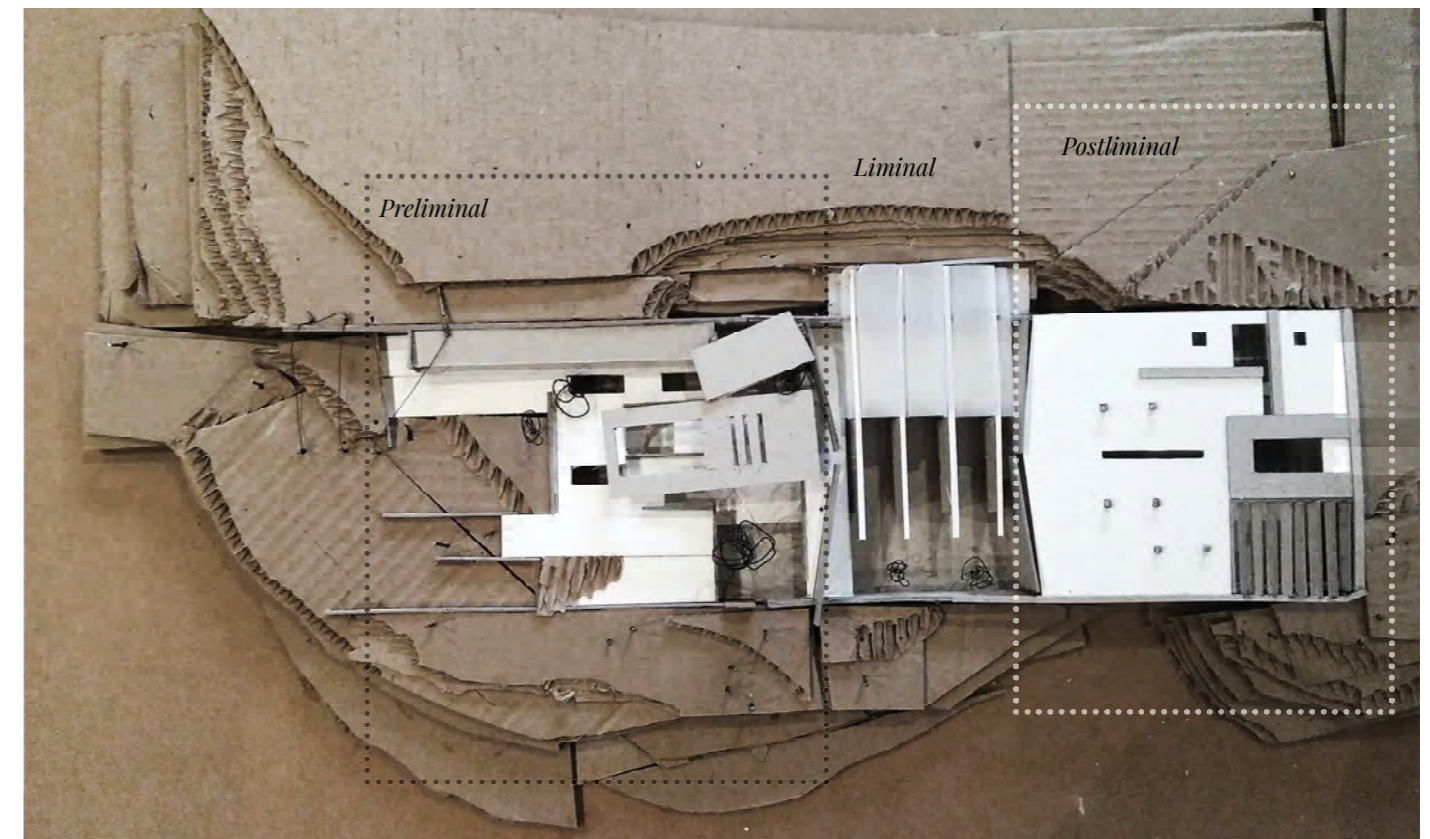
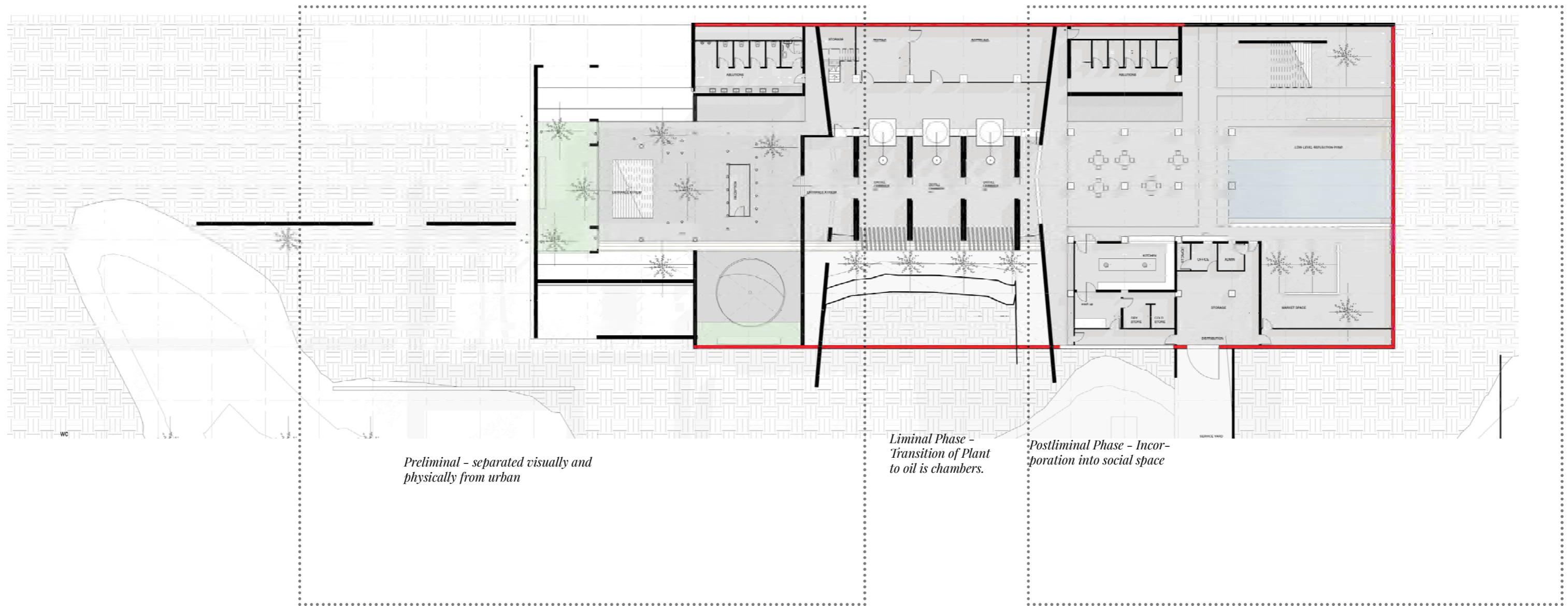
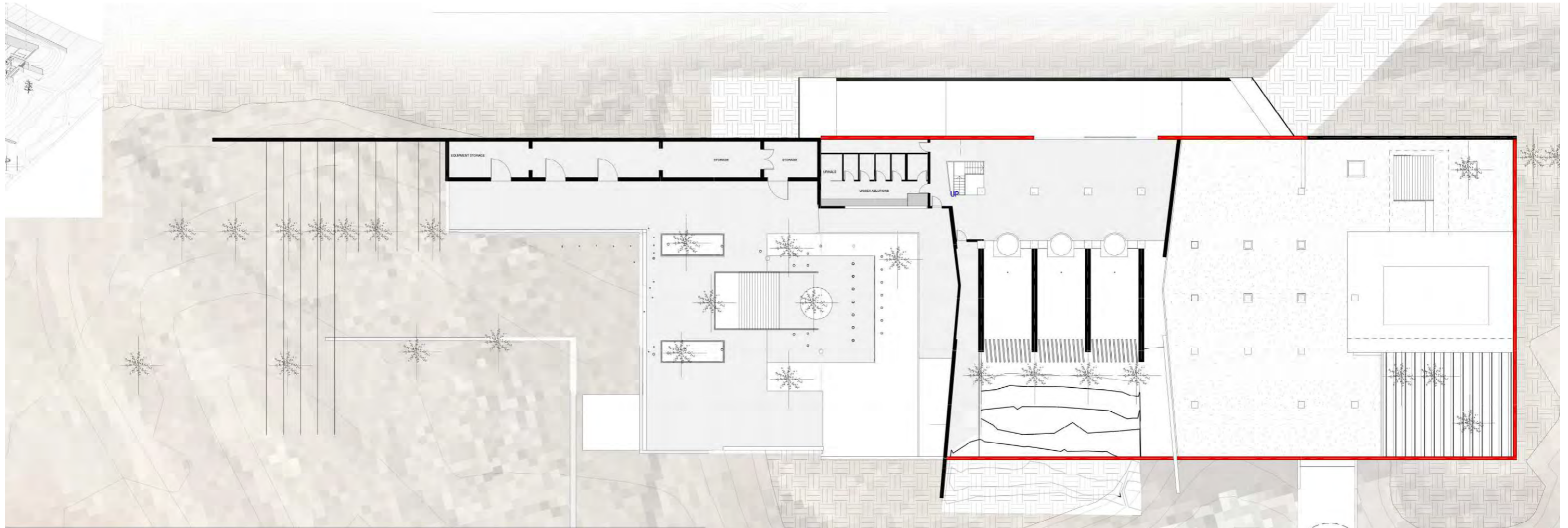
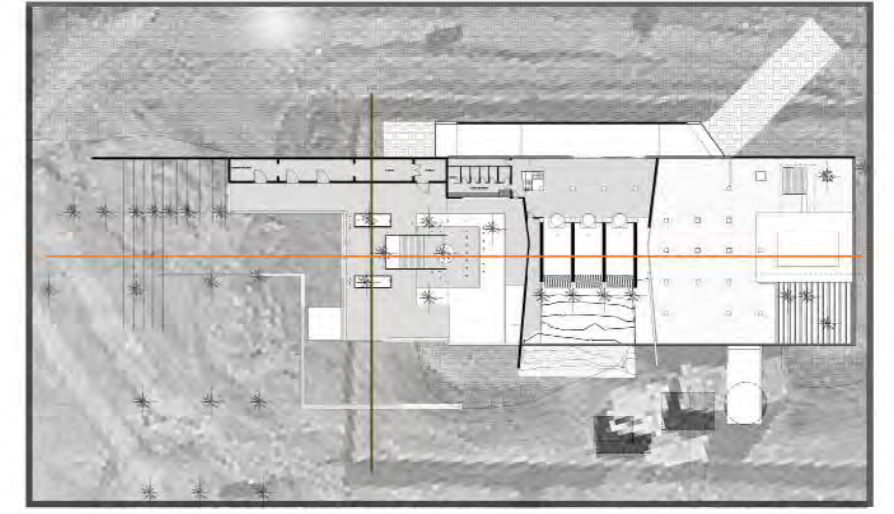
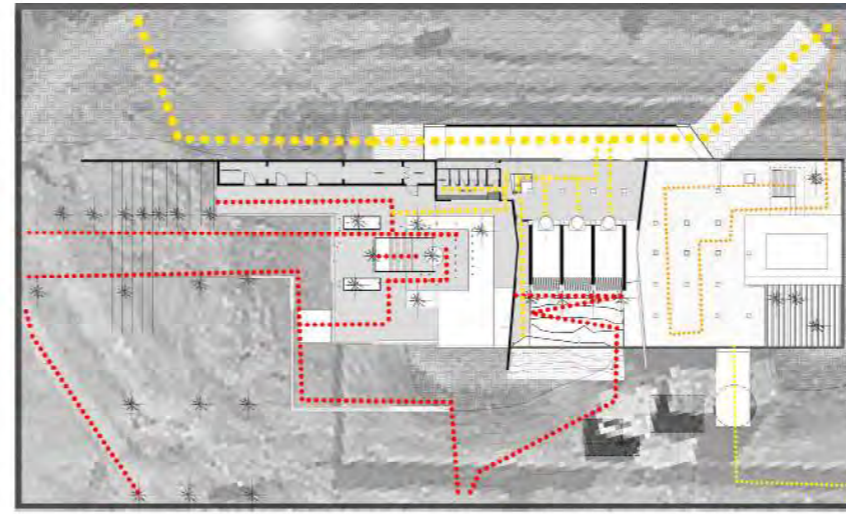
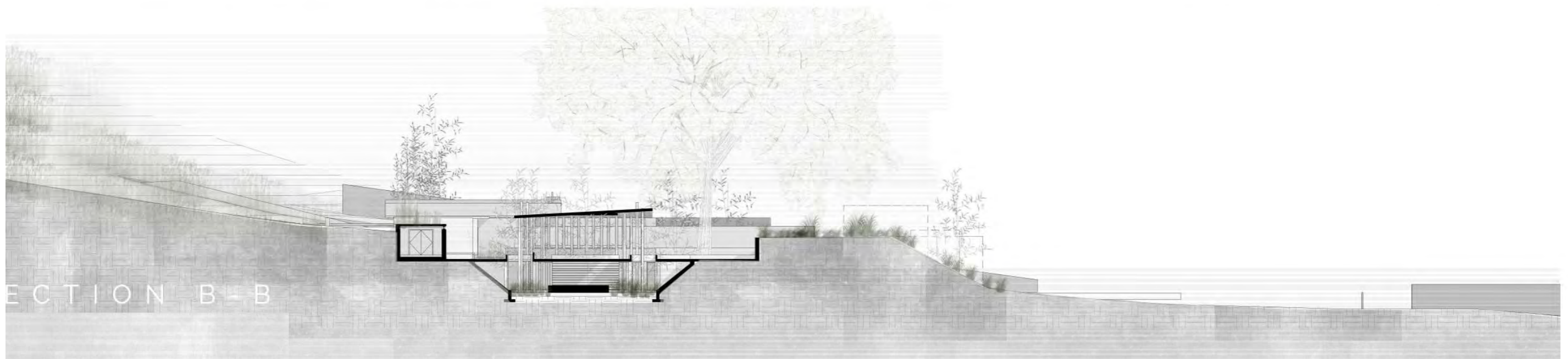


Figure 6.22: Photograph of June Crit Model (Author 2018)







> **REFLECTION**

Feedback from the March 2018 crit was to more thoroughly explore the idea of change and transition by also considering the existing grid. The spatial logic required a re-conceptualisation concerning the flow of production processes and of people. The interaction between the public, public - private and private processes in the building had to be rearranged.

Figure 6.25: June Crit Conceptual sections expressing intention (Author 2018)

6.7

INTERVENTION

September 2018 Crit- Iteration 7

The design development further explored deeper consideration for the adaptations to existing roof, columns and grid though the theoretical underpinning.

From the previous development, this iteration developed the idea of how the liminal processes is experienced by a user.

> PROGRAMME

The programme developed to include more processes in which the distilled essential oils can make a socio-economic contribution. Workshops for soap- and candle making (for the community

and tourists) are therefore included in the plan for the ground floor.

> ACCESS

The opening at the southern edge became more integral to the connection with the wetland in the outside space which allows for more integration of the internal space with the outside context.

The design was successful in its approach to changing the grid in the liminal moment, in the spatial engagement of programmes; and for internal circulation.

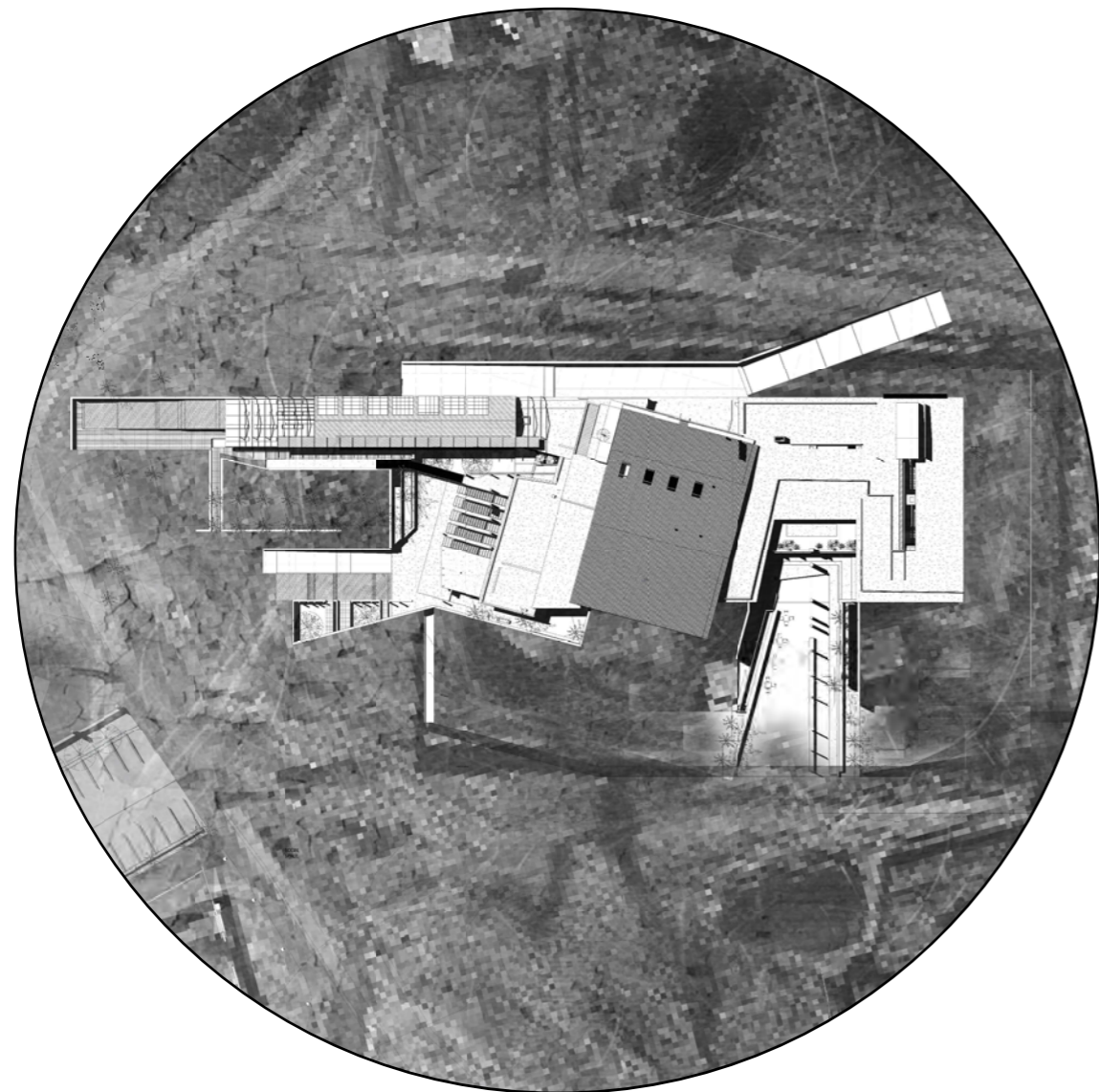
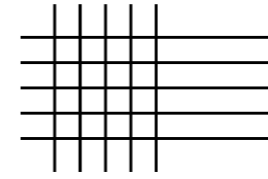
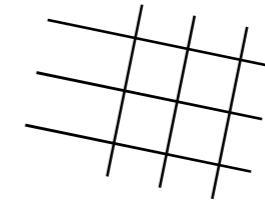


Figure 6.26: Site Plan Design Iteration 7 (Author: 2018)

Preliminal grid of a finer grain



Liminal Phase grid orientated 15° North east informed by the contour lines of the typography



Postliminal Phase - Existing rigid grid

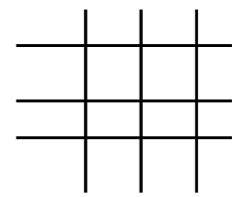


Figure 6.27: Diagram illustrating the concept of change of the existing grid (right) to 15 degrees towards the east (mid) and eventually taking on a smaller grid (left) (Author: 2018).

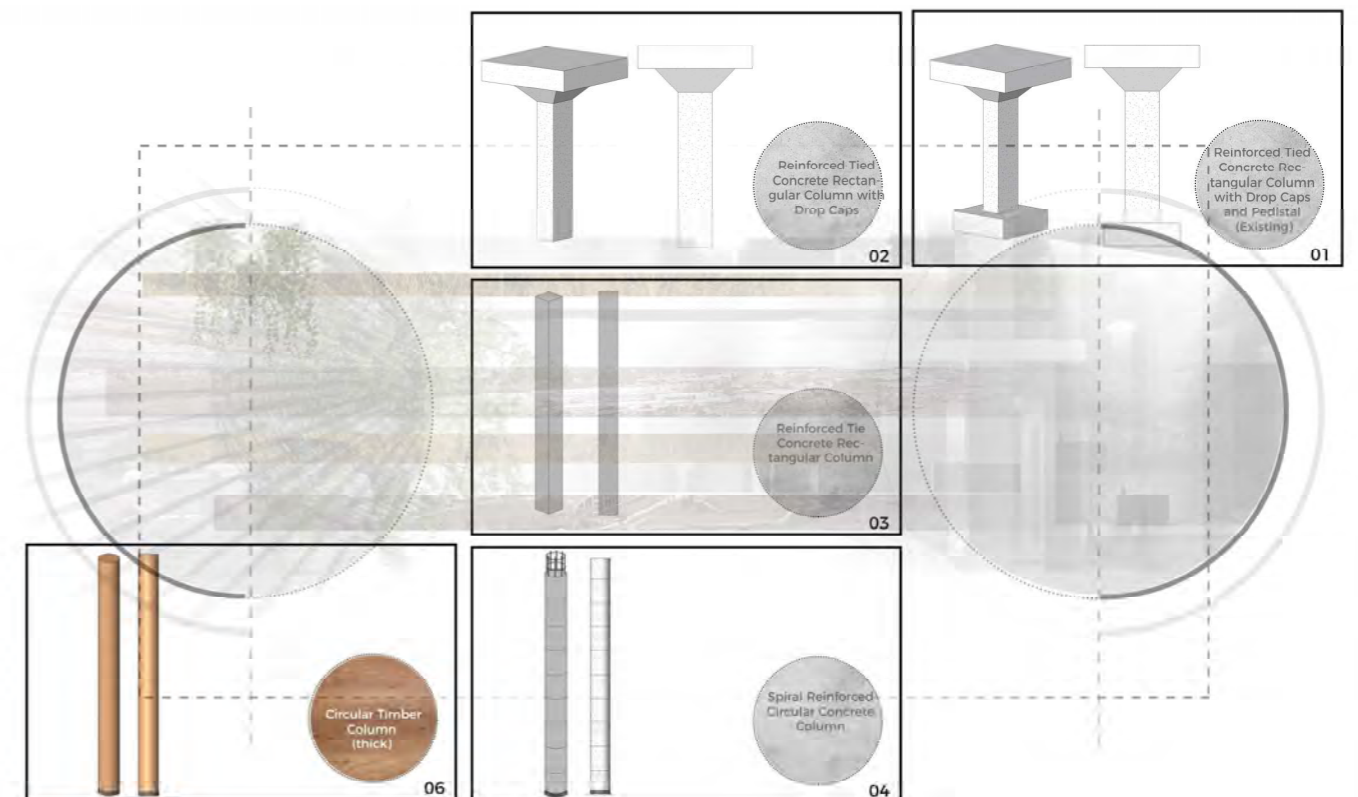
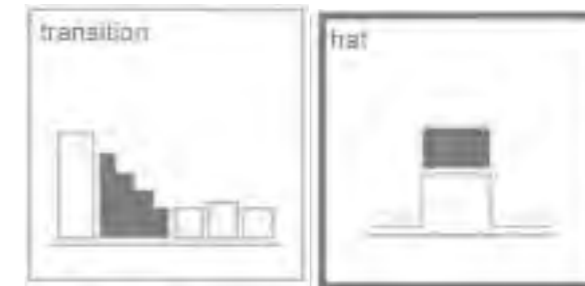


Figure 6.28: Diagram illustrating the concept of change for the existing concrete columns to a simpler column (Author: 2018)

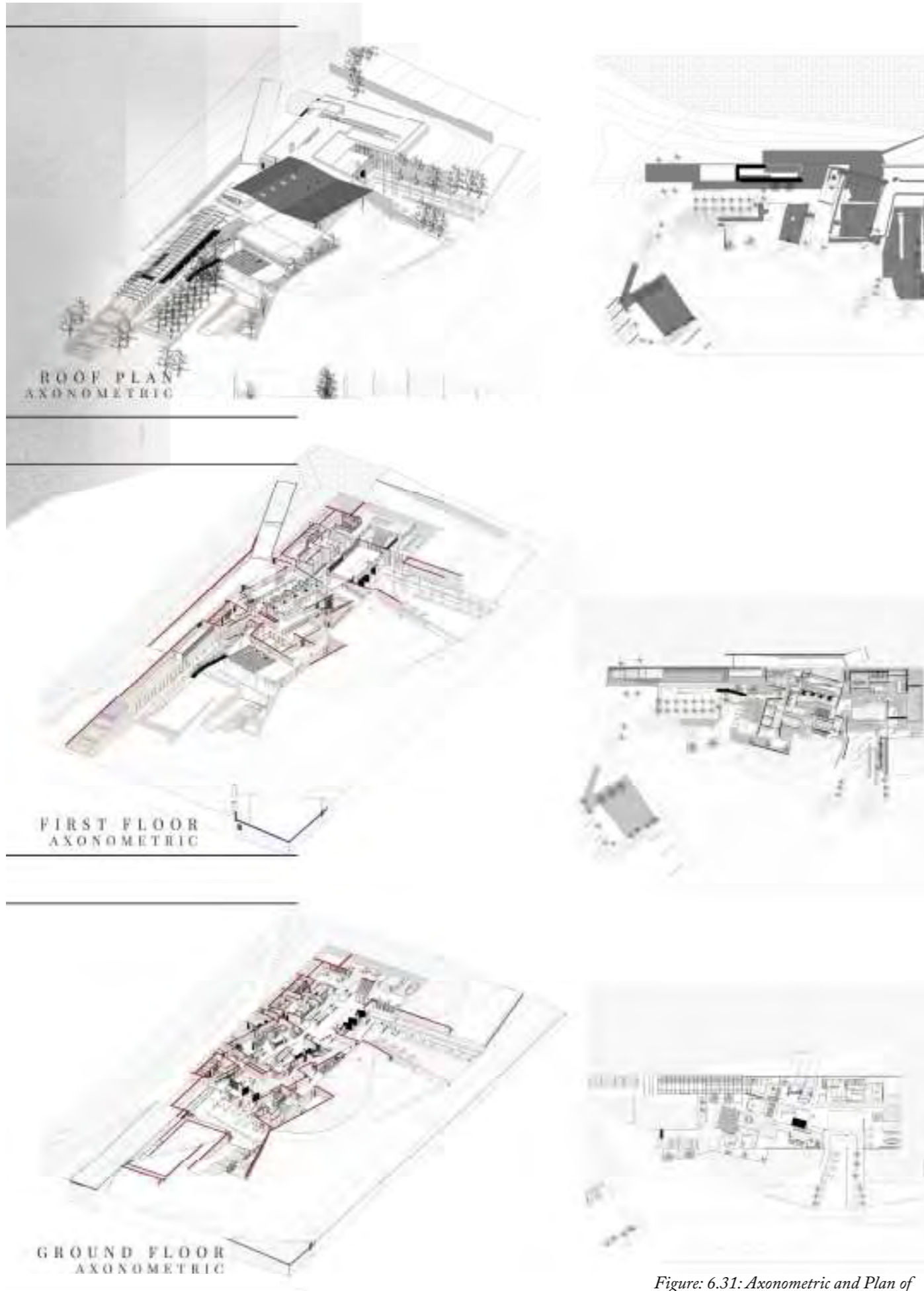
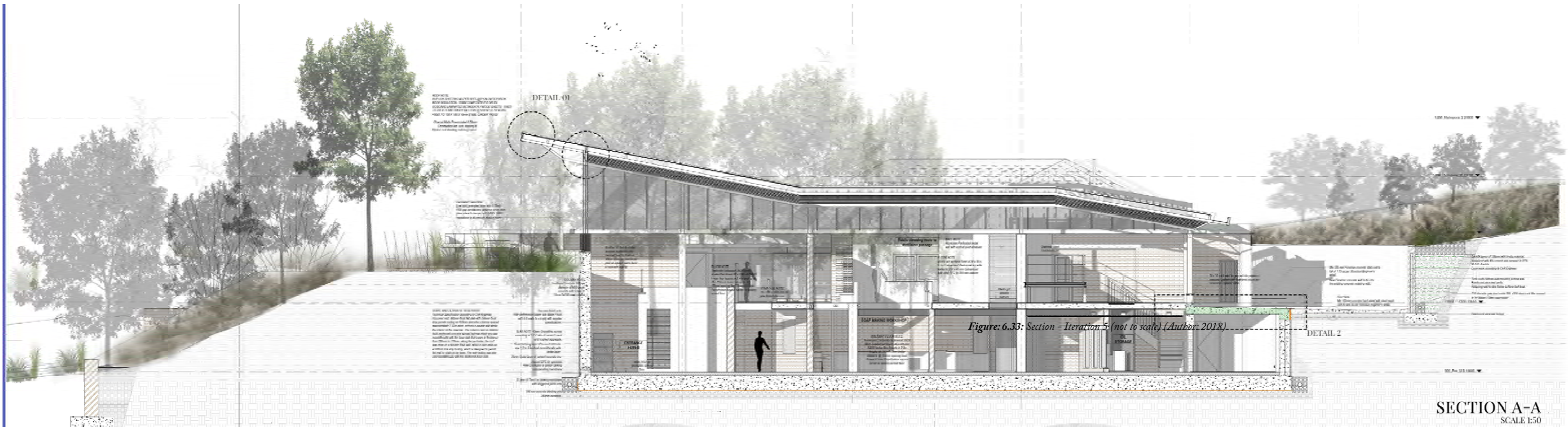


Figure 6.31: Axonometric and Plan of June Crit (Author: 2018).



Figure 6.32: Detail Call-outs (Author: 2018).



6.8 // REFLECTION

The original intention of the project evolved in the process of design in the period during the June 2018 crit and September 2018 crit.

Critical reflection and critique from the crit:

- (1) The iteration became function-led. The form of the new building dictated the form of the original building. The initial intention of the old to inform the new became altered though functional considerations above form.
- (2) The distinctive qualities of the original that was explored in earlier iterations was not envisioned and celebrated.
- (3) The approach taken for the June 2018 crit was more appropriate in terms of the intervention of the existing structure.
- (4) The

Going forward, the following will be considered:

- (1) The original function and memory of the water reservoir to determine more of the new spaces.
- (2) For new and hidden meanings of the original structure to be revealed, the building becomes endowed with significance greater than the value of new

- use, but for the intervention to be seen as the activation of the place.
- (3) To retain more of the distinctive qualities of the original building,



TECHNÉ

- 7.1 INTRODUCTION
- 7.2 TECTONIC CONCEPT
- 7.3 STRUCTURAL INTENTIONS
- 7.4 MATERIAL PALETTE
- 7.5 WATER
- 7.7 STEAM DISTILLATION
- 7.8 ENERGY
- 7.9 ENVIRONMENTAL PERFORMANCE
- SBAT RATING
- 7.10 CONCLUSION

CHAPTER

07

...

This chapter discusses the technical resolution of the design based on the theoretical and programmatic requirements. The technical concept underpins all tectonic decisions regarding structure, materiality, systems and technology.

Thresholds are spatial components of landscape and architecture that provide integrated, subtle, and complex transitions through landscape and architecture (Dee 2011:69). This chapter aims to translate the theoretical and design intention into a coherent technical resolution. The technical concept underpins all technical design decisions regarding the structure, materiality, systems and technology. The application of environmental strategies and passive systems is discussed as it relates to the building and its surrounding context.

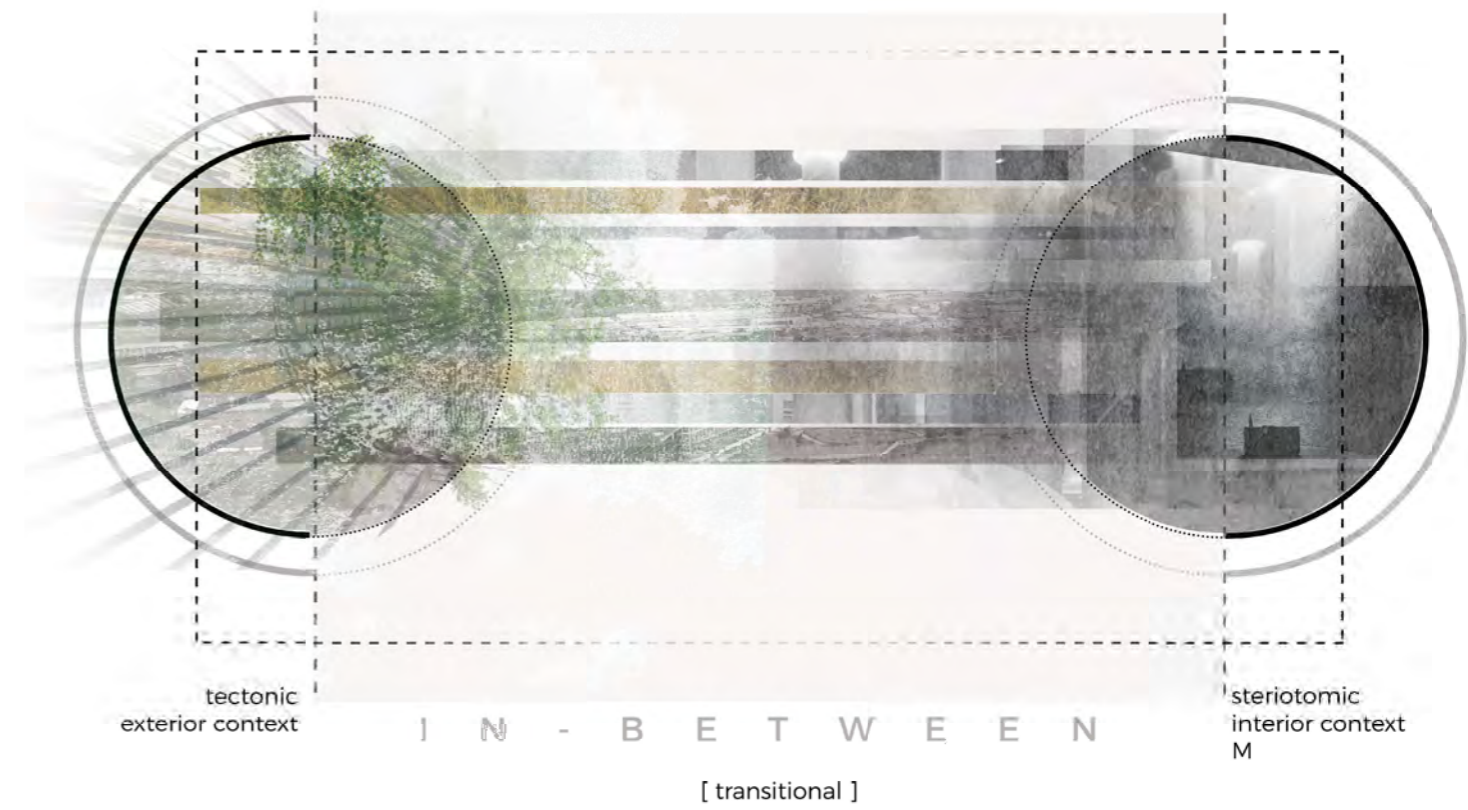


Figure 7.1: Conceptual diagram of tectonic intention (Author: 2018).

TECTONIC CONCEPT

The technical approach is rooted in the theoretical background as it echoes the primary consideration of the design, which considers the threshold conditions. Framed within the themes of liminality, as suggested by Van Gennepe (1960), the symbolic value of the rites of passage represents three stable states: the state of separation, the state of transition and the state of integration. The first (separation) and the last (integration) are considered to be two distinct opposites. The structural investigation, based on the theory, aims to resonate with a similar theoretical premise within the field of architecture. German architect, Gottfried Semper (1803–1879) in his book

‘Die Vier Elemente der Baukunst’ (Four Elements of Architecture), argued that architectural composition can be divided into two distinct opposites: the stereotomic and the tectonic. The stereotomic relates to solidity and the tectonic defines dematerialisation (Semper 1995:3). Kenneth Frampton (1990) best defined the stereotomic and the tectonic. According to Frampton (1990:518) the inherent opposites in architectural materiality are cosmological opposites of each other, where the tectonic symbolises the sky and the stereotomic the earth.

The technical concept therefore considers the tectonic and stereotomic within the themes of liminality in order to define each state. In the design the state of separation (beginning state) is represented by the tectonic, the state of integration (final state) is represented by the stereotomic and the state of transition (in-between state) is represented by the relationship between the two opposites of the tectonic and the stereotomic. The adaptive re-use project of the water reservoir utilizes the main architectural elements of the granolithic concrete basement floor with the monolithically cast concrete walls, the concrete roof and concrete columns as the primary

structural elements which provide the context to define the stereotomic. Through this understanding of the typology of the stereotomic, an appropriate typology for the tectonic language, as the state of separation can be established. The use of steel, timber and organic shaped rammed earth walls is chosen to express a ‘lighter’ typology.



Figure 7.2: Photograph showing the stereotomic of the existing abandoned structure in natural context with tectonic urban fabric. (Author: 2018)

7.3

STRUCTURAL INTENTIONS

The structural intention is seen as an extension of the design concept.

The reuse of an existing structure as a transition device allows movement, change and conversion of the elements within and moving through the building.

The structural qualities of the adapted building harness attributes of both the original and the new.

Furthermore, the project utilises adaptive spatiality through architecture of the monolithic, flat and enclosed structure to

transition to a lighter and 'open' structure.

The adapted Magalies Reservoir now has a series of public and recreational spaces at the lower level, that of the original basement floor. Also on this level, a series of water channels reinstates the original function of the building.

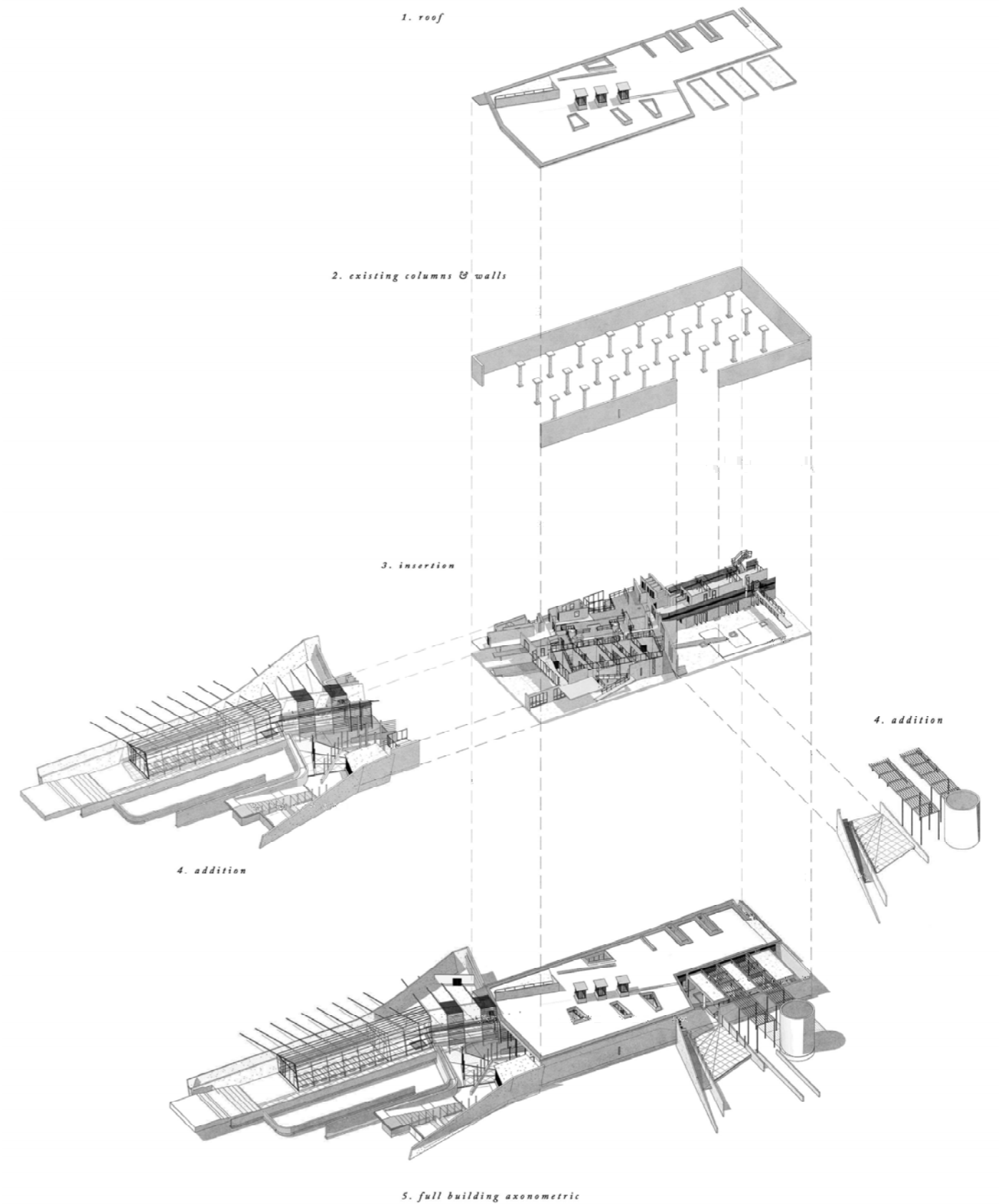
Through a process of natural filtration systems, the water channels suggests the circulation and separation of public activity and private activity of the building.

ROLES

Tectonic = (state of separation) [preliminal]

Stereotomic / Tectonic = (state of change) [liminal]

Stereotomic = (state of integration) [postliminal]



AXONOMETRIC

axonometric diagram highlighting key parts and responses to existing water reservoir

Figure 7.3: Axonometric: Structural Intention (Author: 2018).

7.4

MATERIAL PALETTE

The material palette responds to the qualitative and quantitative attributes in order to satisfy the experiential and functional requirements of the scheme.

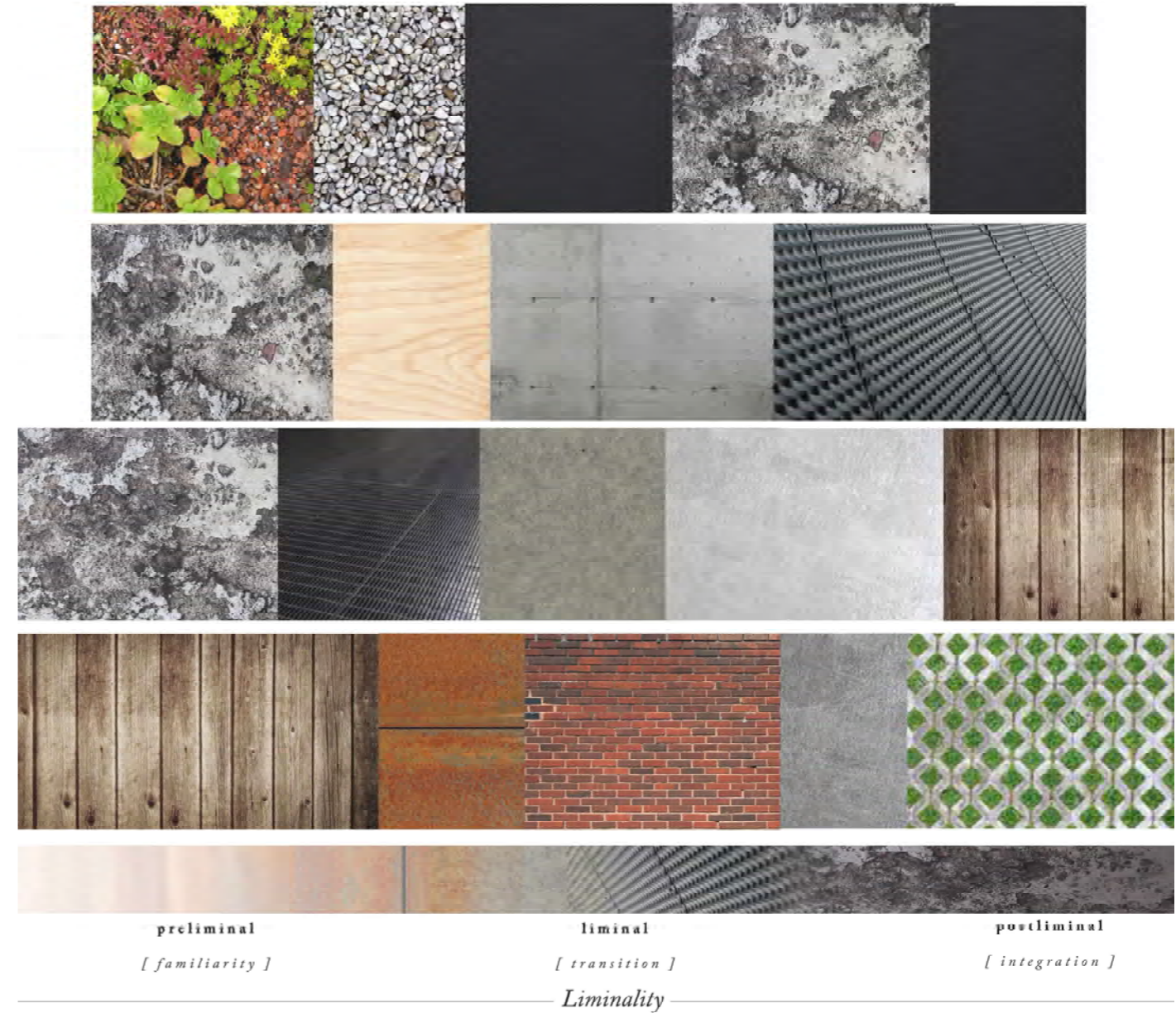
As part of the tectonic concept, a robust material palette of three materials for the eastern chamber of- steel, aluminium and concrete as contemporary partners of the historic concrete was chosen to match the stereotomic aesthetic.

In contrast the western chamber of the host three lightweight roofs floats above the entrance leading

to the original basement floor. The entry points to the reservoir are guided with organically shaped landscape walls feeding from the surrounding landscape. The rammed earth walls from reclaimed earth in combination with indigenous planting soften the approach to the structure. A lighter quality of steel and timber were chosen for the tectonic language of the western chamber.

The reservoir roof blends in with the surrounding landscape with the simple gesture of a gently inclined grasses plane with indigenous species.

Tectonic = timber + steel + new concrete (state of separation) [preliminal]
Stereotomic / Tectonic = existing+ new concrete + timber (state of change) [liminal]
Stereotomic = existing concrete (state of integration) [postliminal]



7.5
WATER

Water in this scheme is a main agent for in the design. The integration of water harvesting, filtration and circulation through the building enhance the architectural experience through the regenerative and corrosive qualities of water. Furthermore, the sensory experience of water is expressed within the circulation of people and processes in the building. The synergy of water and energy systems in the building is seen as an extension of the project concept. Water and energy systems are combined in the transitional moment of the distilling of plants to essential oils.

The primary system in the building is water specifically the circulation and treatment of water.

This system of water in the building can be explained through the water diagrammed. The on-site treatment of surface runoff to usable and potable water is understood through using the Advanced Grey water treatment (AGT) system .

> **WATER DEMAND**

- a. Grey water
 - Irrigation for the greenhouse and orchid and vegetables.
 - Flushing of toilets

b. **Potable water**

- Essential oil Distillation
- Restaurant
- Hand wash basin
- Washing of vegetables and herbs.

Potable water is required for the essential oil distillation process as well as domestic use in the kitchen and hand wash basins. Rainwater is collected

> **WATER HARVESTING**

The storm water management plan includes the harvesting and filtration of rainwater, which will then be used in the building for domestic and production purposes.

Rainwater is harvested from the surface runoff from the South sloping mountain hill. The northern retaining wall of the service yard is designed as a berm wall (point B) with a constructed swale for storm water harvesting. Excess water at this point will overflow as runoff into the street and handled as storm water. From B water is fed into the system, where it is throttled (allowing a maximum and controlled amount of water flow).

The water then flows into the Stack Bio-filter (sand filter) that removes the organic and degradable wastes. Between B and C the water is used for the greenhouse, and fruit orchard, then the runoff is still collected and pumped back into the biofilter.

The bio-filter uses bio-reactors containing living material to capture and biologically degrade pollutants) From the bio-filter, water is pumped into

and stored in a tank, where it moves through a sand filter system, then through a UV treatment and into a clean water storage tank for domestic use. The water for the essential oil distillation process is stored on the mezzanine level as the system does not require a lot of pressure.

Grey water is recycled from the hand wash basins in the building and cleaned through the constructed wetlands in the building.

Blackwater and other water that cannot be recycled cannot be reused as grey water, will be sent into the municipal sewer system.

the Multimedia Filter at point D - the multimedia filters have different media of: plants and reeds and fish and sand that are used to filter the water.

At point E the effluent then enters a deep bed multimedia filter to remove the very fine particles and organic materials.

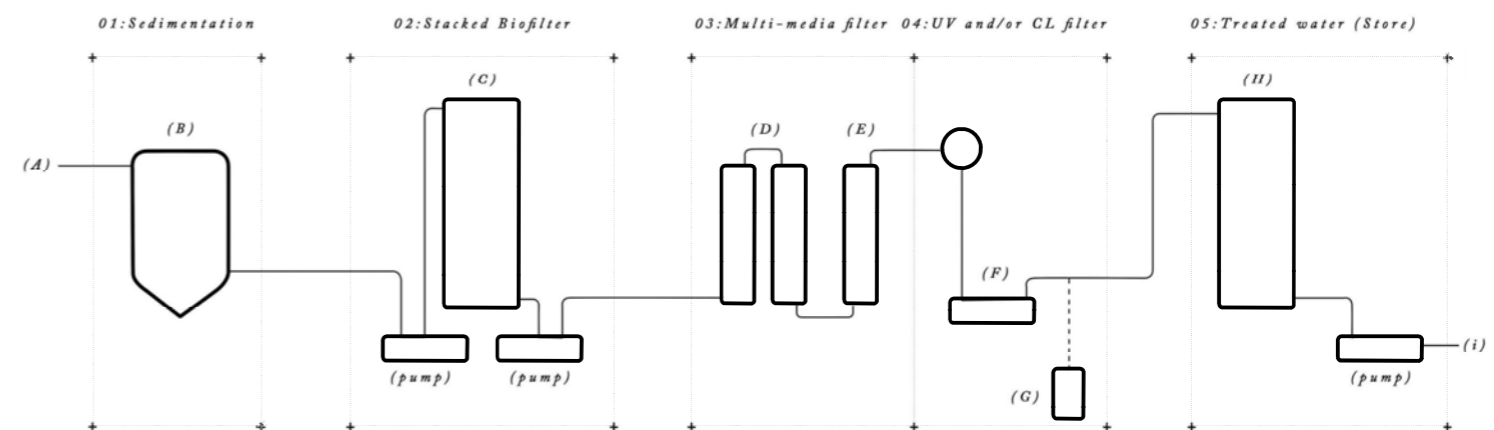
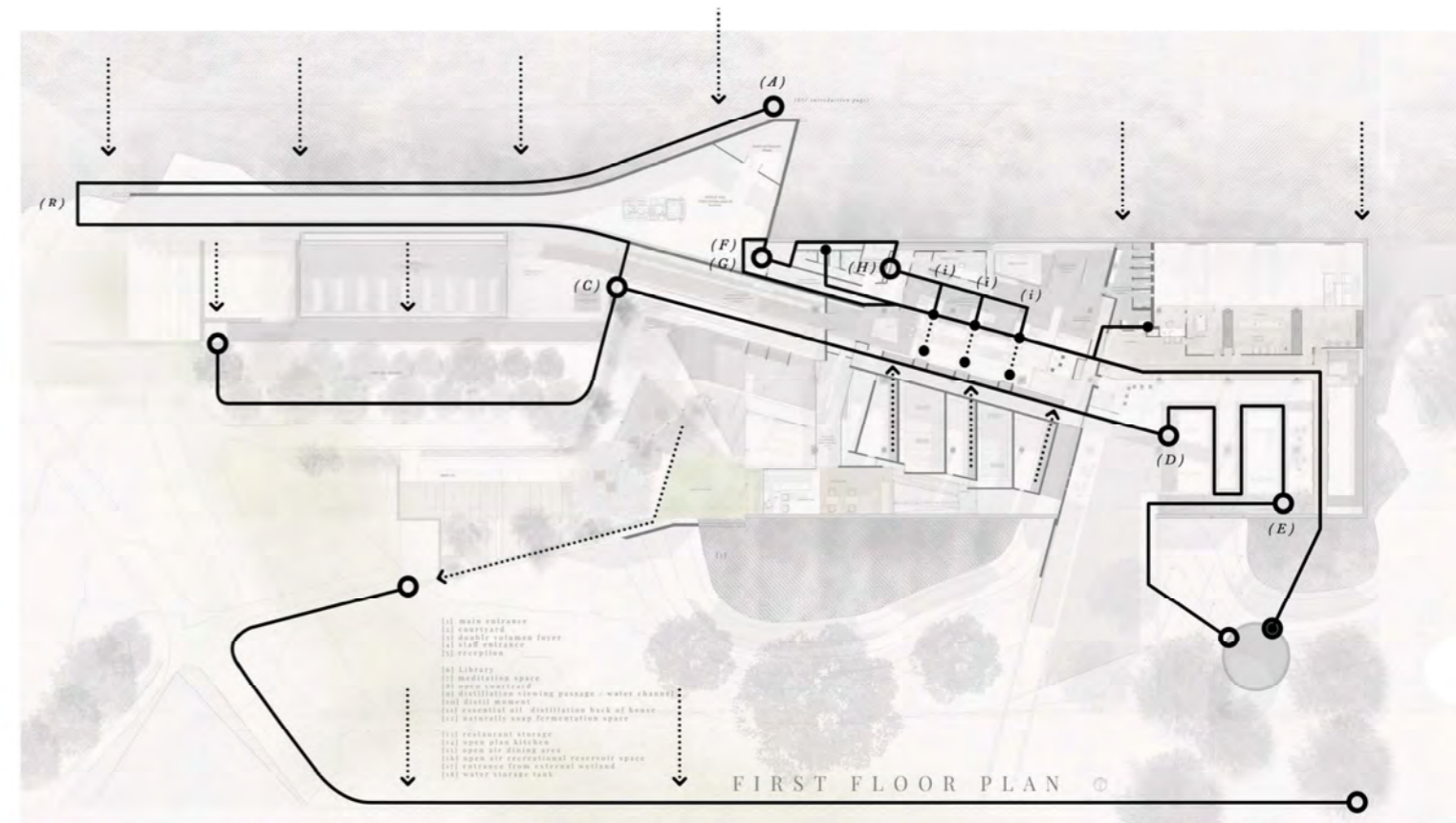
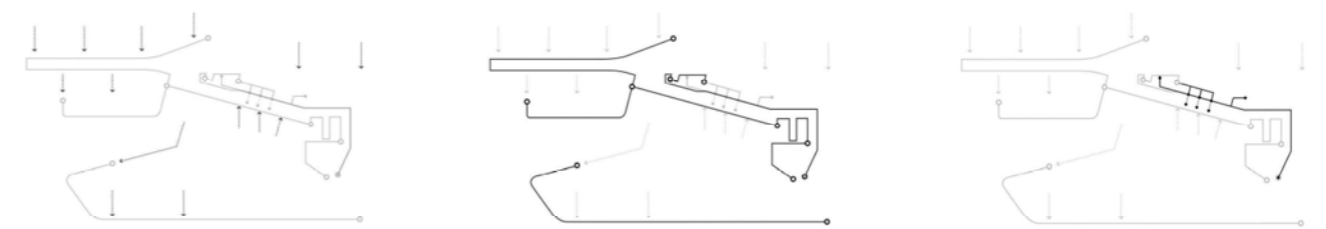
From there the water is now treated where it can now be used as grey water but it is not yet potable.

From the storage point the treated water can be used. From this point the water can be pumped back into the building where it then meets the uv and chlorine filter at point F. Here the water flows to the granular Activated carbon Filters to remove dissolved organic materials and dissolved salts. This system and the uv filtration system is located in the mechanical room on the ground floor.

The potable water is then pumped to point H which is a storage tank located on grade of the existing roof.

SYSTEM: WATER

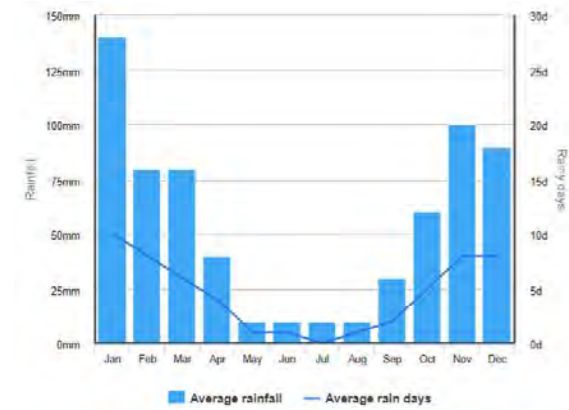
the on-site treatment of surface runoff to usable and potable water standards using the Advanced Grey Water Treatment (AGT) system



KEY

- (B) A water-driven centrifugal separator removes large particles and solids and then enters an Equalization Tank.
- (C) A Stacked Bio-filter can be employed to remove any organics/degradable wastes.
- (D) + (E) Effluent then enters a deep-bed Multi-Media Filter to remove very fine particles and organic materials.
- (F) Water then flows to Granular Activated Carbon (GAC) Filters (or nano-filtration/ deionization) to remove dissolved organic materials and dissolved salts.
- (G) UV (or Ozone) Disinfection is used for the final stage of treatment to remove pathogens, colour and produce extremely highly treated water.

7.7 STEAM DISTILLATION



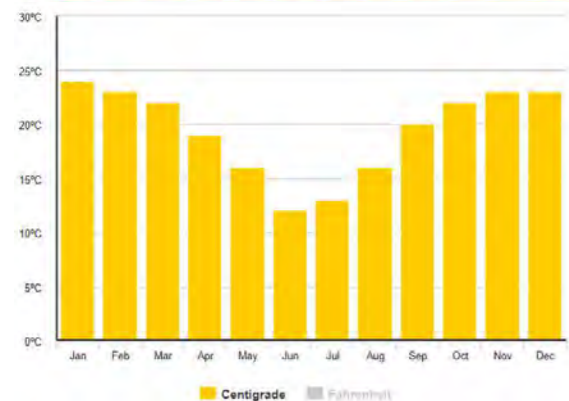
Average Rainfall: Pretoria

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm	140	80	80	40	10	10	10	10	30	60	100	90
Days	10	8	8	5	3	3	3	3	3	5	8	9



Average High/Low Temperature: Pretoria

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High °C	29	28	27	25	23	19	20	24	28	29	29	28
High °F	84	82	81	77	73	66	68	75	82	84	84	82
Low °C	18	18	18	13	9	5	5	8	12	15	16	17
Low °F	64	64	64	56	48	41	41	46	54	59	61	63



Average Temperature: Pretoria

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°C	24	23	22	19	16	12	13	16	20	22	23	23
°F	75	73	72	66	61	54	55	61	68	72	73	73

From this point the water system **transitions** though to the energy system for the essential oil distillation process. The energy of heat source for the process is generated through the use of parabolic trough collector that uses the energy from the sun. these are located on top of the existing concrete roof, facing north at 26 degrees.

From point H the water is heated through the parabolic solar collector system and fed into the steam line connected to the three stainless steel distillation units (i) inside the building.

1. ESSENTIAL OIL DISTILLATION PROCESS > Process of steam distillation

There are various types of distillation processes available to produce essential oils. Some of the common types include Hydrodistillation (HD), Steam distillation (SD), Solvent extraction, Enfleurage, Cohobation, and Maceration which are the roughly traditional and generally used method.

Steam distillation is the chosen method for essential oil production as this is the most common method. It is a more modern version of the traditional technique that follows the same principle.

The process of steam distillation involves the flow of steam into a chamber holding the raw plant material. The steam causes small sacs containing essential oil to burst. The oil is then carried by the steam out of the chamber and into a chilled condenser, where the steam once again becomes water. The oil and water are then separated; the water referred to as a 'hydrosol', can be retained as it will have some of the plant essences.

Advantages apparent in this method such as the controllability of the amount and quality of steam, there is a lower risk of thermal degradation as temperature generally is not above 100°C, it is a widely used process, therefore employability is easier, it produces a high quality of essential oil and it is the most cost-effective method.

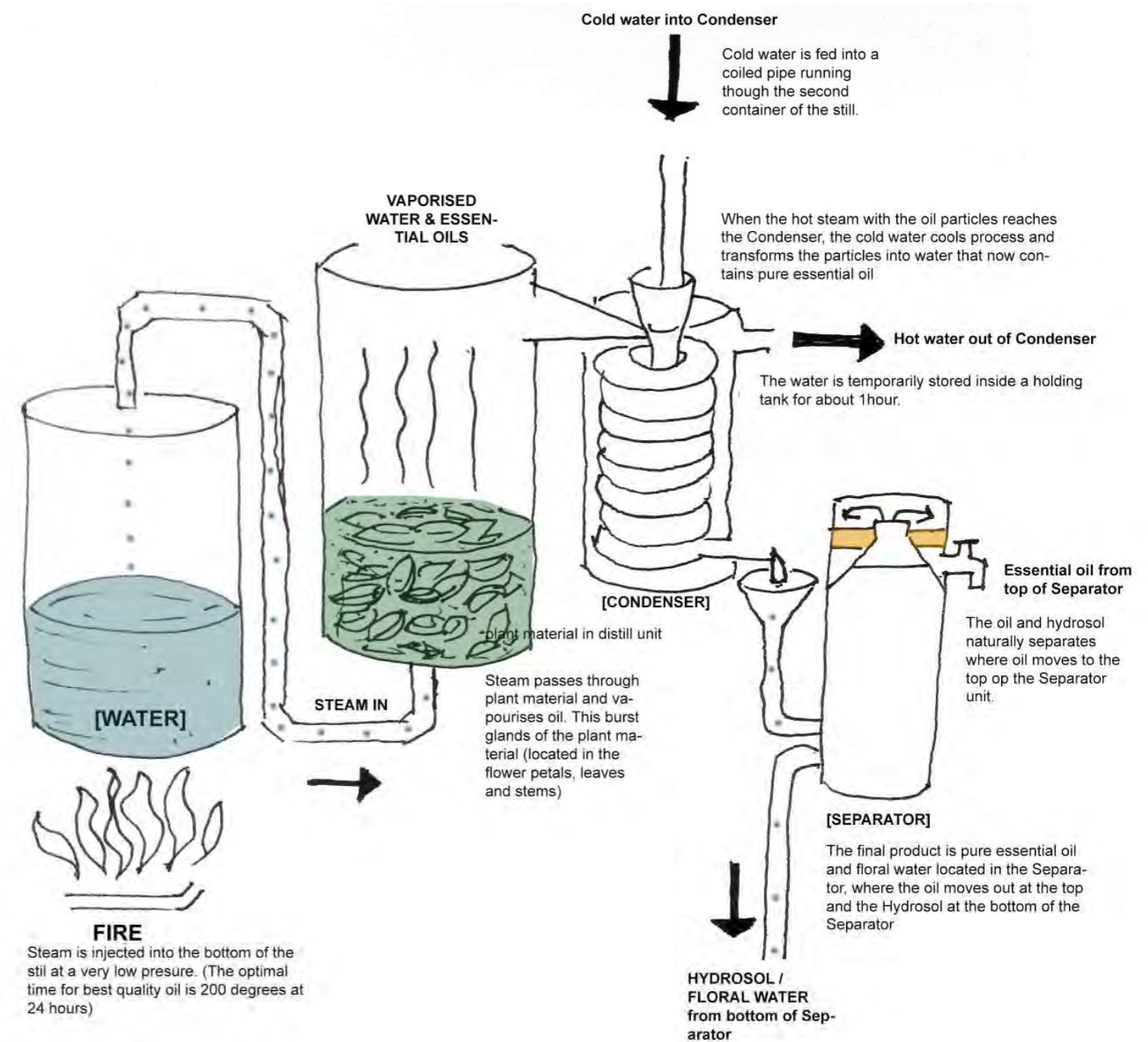


Figure 7.5: Essential oil distillation process (Author 2018).

7.8
ENERGY

> Products from the PLANTS and ESSENTIAL OILS

i) Essential oil

The essential oil is the primary product of the distillation process. The oil is bottled and stored where it is used in the food at the restaurant, sold for pharmaceutical purposes.

ii) Hydrolate

The Hydrolate or hydrosol (floral water) is the distilled water enriched with plant volatiles that is the by-product generated when the water and oil have been separated in the condenser. This by-product is bottled and stored.

iii) Value Adding products identified as soap and candles.

iv) Medicinal and herbal teas

> Steam Distillation Components

> A steam generator

> Still / Condenser

The still is where the oil is displaced from the biomass material placed inside by the steam coming from the steam generator. The still is made of food grade stainless steel (SS304 or SS316). It consists of a round

steel column, inside it has a perforated grid where the plants are placed on and steam from the bottom of the still is injected and passes through the plants. At the top of the still there is an outlet for the steam to move to the condenser.

> Condenser

The condenser cools down the steam carrying the essential oil water mixture to separate the water from the oil particles.

> Separator

The Separator separates the oil and hydrosol. Designed for the machine's flow rate and oil properties of plant material used. The separators are available for oils lighter and/or heavier than water.

The synergy of water and energy systems in the building is seen as an extension of the project concept. Water and energy systems are combined in the transitional moment of the distilling of plants to essential oils.

> Parabolic trough collector

The energy system of a Parabolic trough collector is used to generate steam for the essential oil distillation process. A parabolic trough is made up of long parabolic-trough mirrors, each with a heat-collecting tube when sunlight is reflected by the silver mirror to the central heat-collecting tube it heats up the synthetic oil composites inside the tube. The temperature at the focal point is 70 times higher than normal sunlight. The thermal energy collected is used to heat up the liquid oil composites. The high temperature liquids flow into the exchanger from the tubes, through a water chamber, causing the water to boil at an extremely high temperature, thus generating steam as it passes through the water chamber and through to the steam line to the distillation units- where the steam then passes through the distiller units filled with plant materials. The steam passes through the plant material and vaporizes water and essential oil. When the hot water and the oil particles reach the condenser, the cold water cools down the process and transforms the particles into water and pure essential oil.

The final stage is the separator where hydrosol or floral water is tapped from the bottom of the separator and the essential oil from the top of the separator.

The reasons for using this system as the energy source for the distillation process is that there is a lot of challenges and safety issues when a furnace as the heat source is placed inside the building, and economically, the gas is too expensive.

> Photovoltaic Panels

The secondary energy system utilises Photovoltaic Panels (PV panels) for supply of electricity to the building.

Energy uses is for artificial lights, cooking and mechanical equipment such as fridges. The PV panels are located on top of the greenhouse structure and angled at 26 degrees to the north to maximise the available solar gain.

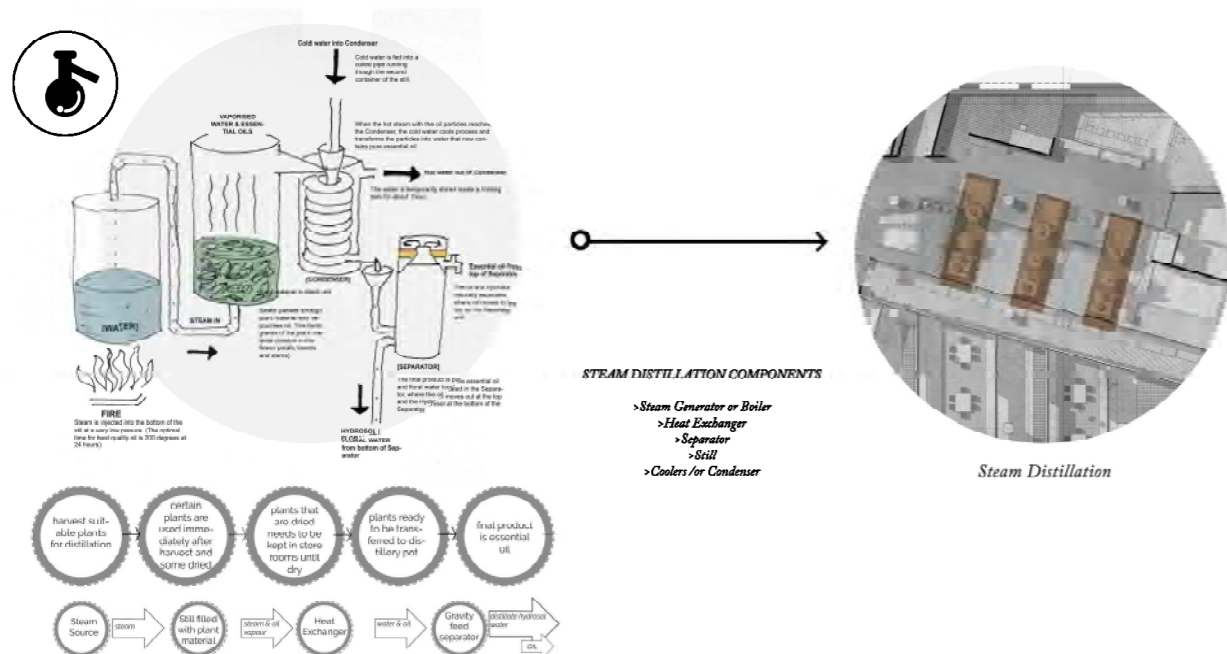


Figure 7.6: Process illustration and Location of essential oil distillation units (Author: 2018).

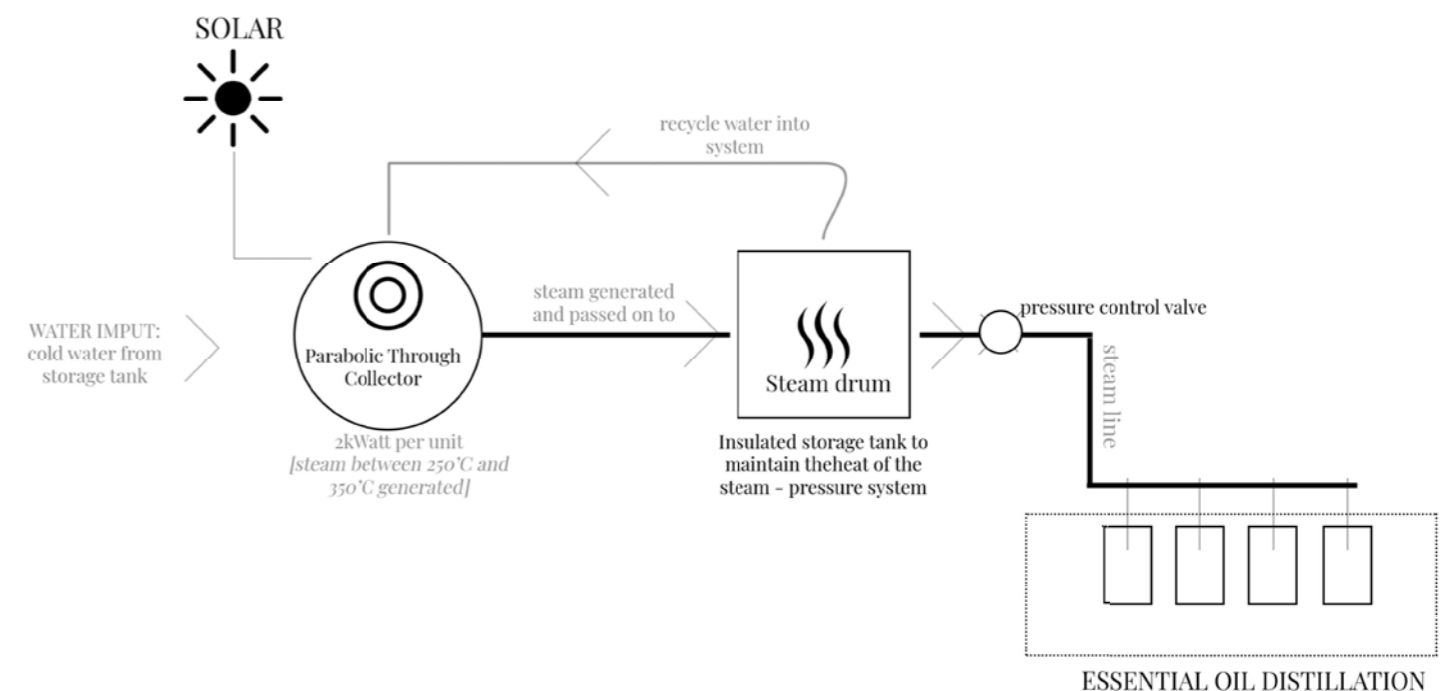


Figure 7.7: Parabolic Trough Collector Strategy (Author: 2018).



ELECTRICITY

USE
LIGHTS
WATER PUMP
APPLIANCES

DISTILL ENERGY CALCULATIONS										SOLAR DEMAND CALCULATION					
appliances	WATT (W)	kW	USAGE (H/DAY)	QTY	SPEC	AREA	total kWh/day (H)	kWh/month	kWh/year	total kW/y	solar array (m ²) (L)	Solar panel Wattage (W)	(H) kW -solar array (H/L)	panels required (N/M/1000)	panels total (ave)
streetlights (independent lighting)	30	0,03	8	50	BEKA SOLAR	parking, sidewalk	12	7,2	86,4	4320	8,8	300	1,363636364	4,545454545	5
interior lights	3	0,003	4	100	LED Solar Solution	unit building zones	1,2	0,36	4,32	432	8,8	300	0,136363636	0,454545455	0,5
garden lights	30	0,03	8	45	BEKA BEACON LED 30W, OPAQUE OR FLUTED 45 DIFFUSER	site light	10,8	7,2	86,4	3888	8,8	300	1,227272727	4,090909091	4
computer	180	0,18	4	2	Generic (Desktop & 2 monitor)	FF: study area	1,44	21,6	259,2	518,4	8,8	300	0,163636364	0,545454545	0,5
refrigerator	90	0,09	19	2	energy saver 250 L	GF: Kitchen	3,42	51,3	615,6	1231,2	8,8	300	0,388636364	1,295454545	2
freezer	105	0,105	4	2		GF: Kitchen	0,84	12,6	151,2	302,4	8,8	300	0,095454545	0,318181818	0,5
water pump for potable water to solar heater	300	0,3	8	1			7,2	86,4	864	864					1
pump - wetland circulation	450	0,45	8	2		pump room	7,2	108	1296	2592	8,8	300	0,818181818	2,727272727	3
pump - storm water to irrigation taps	650	0,65	8	2		pump room	10,4	156	1872	3744	8,8	300	1,181818182	3,939393939	4
Bundus Power 300 Watt, 36V Solar Panel										total solar panels required: 30					
TOTAL:										46,46	351,66	4219,92	16725,6		

Figure 7.7 Electricity Calculations (Author: 2018).

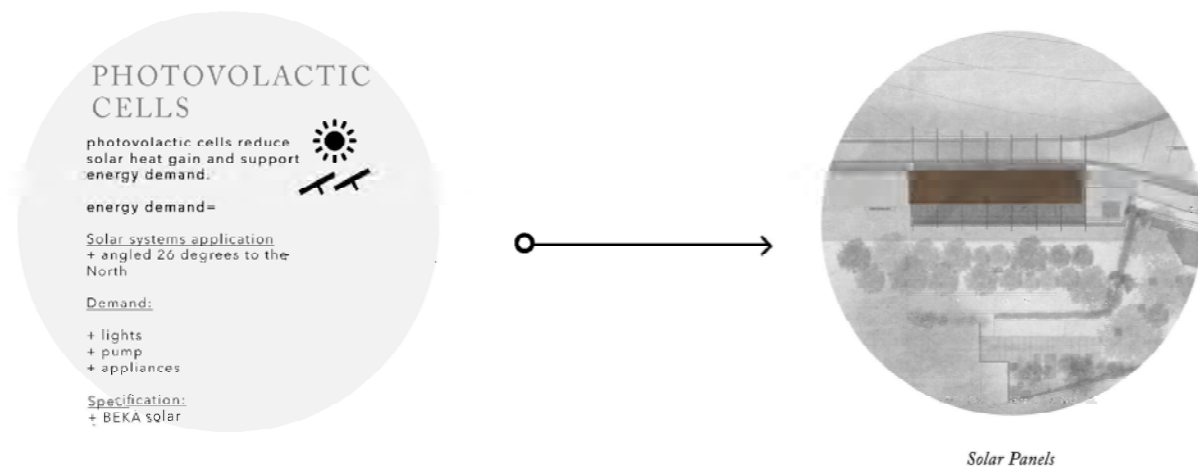


Figure 7.8: Solar Panel location (Author: 2018).

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7.9 ENVIRONMENTAL PERFORMANCE

SBAT RATING

Sustainable Building Assessment Tool

In order to establish the effects of the proposed intervention within the threshold in terms of sustainability the SBAT analysis tool was used. The diagram illustrated the study that was made to identify that numerous social, economic and environmental issues have been improved through the proposed intervention.

The areas that show the most successful that either meet or exceed the target is the service and products, social cohesion, water, transport, management, access and health. The greatest rating of it all is the service and products as a major part of the program includes cultivation of plants and herbs, as well as small scale agriculture to supply the building with produce. The building target is met in terms of water, social cohesion and transport. The achieved Environmental, Economic and Social overall rating of 4.2 is very successful as it is 0.8 from the target. In conclusion, the project is successful in creating synergy between social and environmental performance.

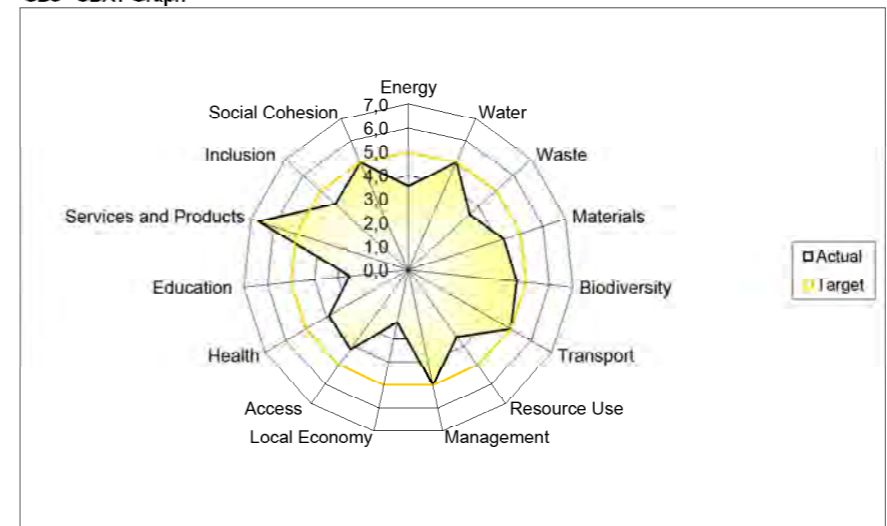
SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL 1,04

SB SBAT REPORT Achieved 4,2

SB1 Project Distil

SB2 Address Threshold between End Street and Magaliesberg, Mamelodi West

SB3 SBAT Graph



SB4 Environmental, Social and Economic Performance	Score
Environmental	4,2
Economic	4,0
Social	4,4
SBAT Rating	4,2

SB5 EF and HDI Factors	Score
EF Factor	4,4
HDI Factor	3,2

SB6 Targets	Percentage
Environmental	84
Economic	80
Social	89

SB7 Self Assessment: Information supplied and confirmed by
Name _____ Date _____
Signature _____

SB8 Validation: Documentation validated by
Name _____ Date _____
Signature _____

SB9 Validation Report Version _____ IVR _____

ADAPTIVE REUSE
Adaptive reuse architecture is a special form of refurbishment that poses a number of sustainable implications, as well as clear economic, environmental and social benefits (Gewirtzman, 2016). These include advantages of significantly lower impact on the environment when compared to the development of new structure as well as the amount of energy consumed is significantly less than that of a new building.

DAYLIGHTING
Adequate day lighting into the interior spaces is achieved through the opening of the existing structure's perimeter walls on the Western edge and a portion of the Southern edge. The entrances to the entrance threshold of the building allows for ample amounts of natural light into the interior space. Furthermore, the existing roof is opened at specific spaces in order to allow for natural daylight into deep internal spaces of the building.

Figure 7.9: SBAT Rating (Author: 2018).

CONCLUSION

In conclusion, the initial intention of the creation of architecture as enabler resulted in the reappropriation of an abandoned infrastructure to facilitate transition and connection.

In memory of the original function of the abandoned building the role of water takes on the role as the main agent to enable change.

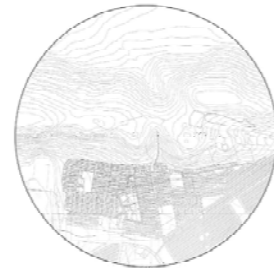
Though which the way water naturally moves through the site, and is harvested and utilized in the building, aids in the transition of the physical place, elements of place and people. Architecture of transition harnesses the intangible, social, and environmental opportunities of the specific context to distil values by defining the liminal space.

CONCLUSION

- 8.1 FINAL DESIGN PRESENTATION
- 8.2 LIST OF FIGURES
- 8.3 REFERENCES
- 8.4 ARTICLE



(01/ introduction page)



"liminal"

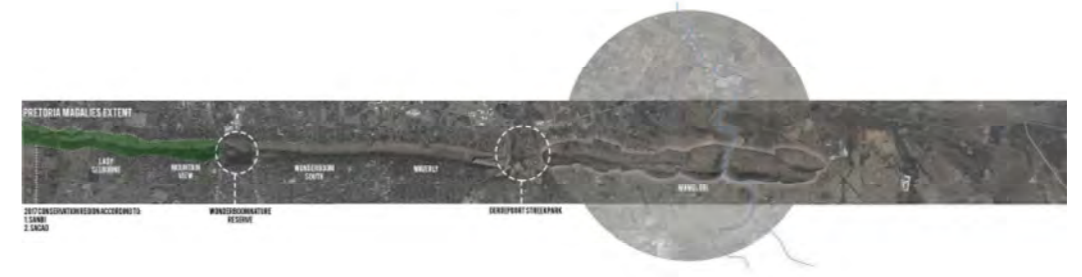
occupying a position at, or on both sides of, a boundary or threshold.

*Adaptive reuse of an abandoned water reservoir at the limen between
the urban and natural environments*



DISTIL

Marni van der Hoven
12136728



GENERAL ISSUE

Magalies Mountain range conservation regains stops eastwards from Wonderboom gateway



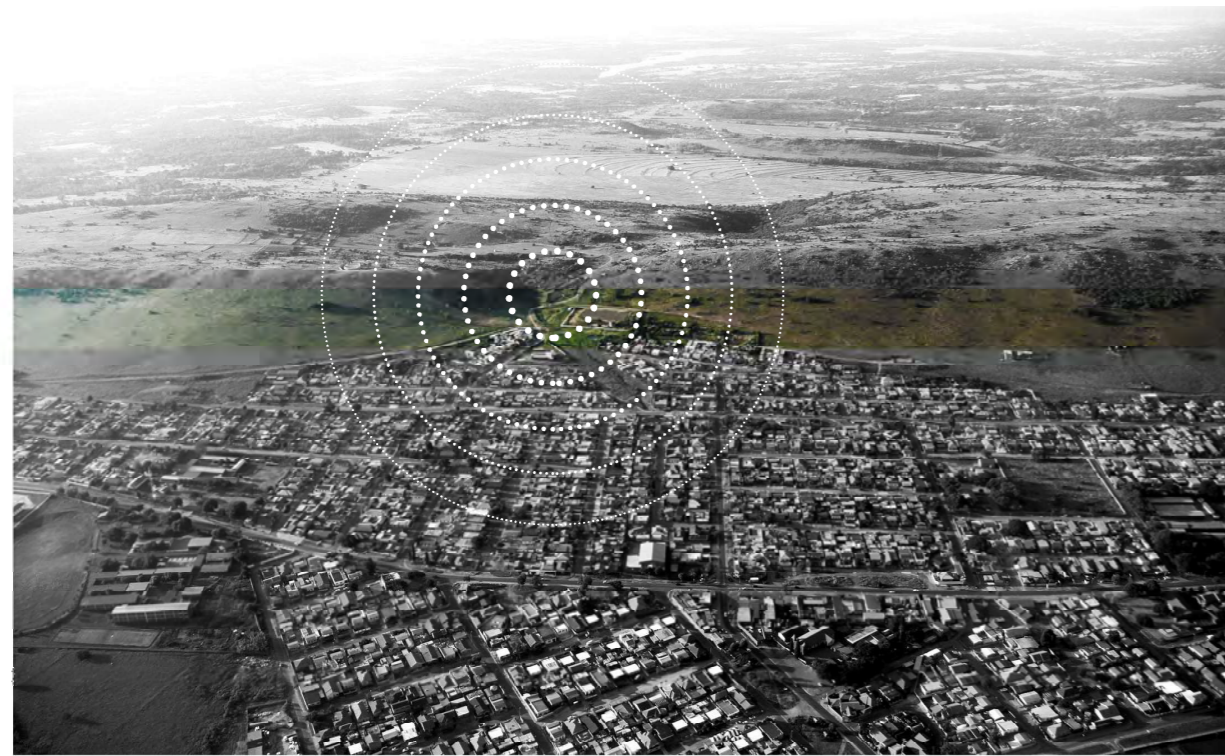
URBAN ISSUE

Urban encroachment threatening the biodiversity of the natural environment



ARCHITECTURAL ISSUE

The threshold in-between the urban and natural environments



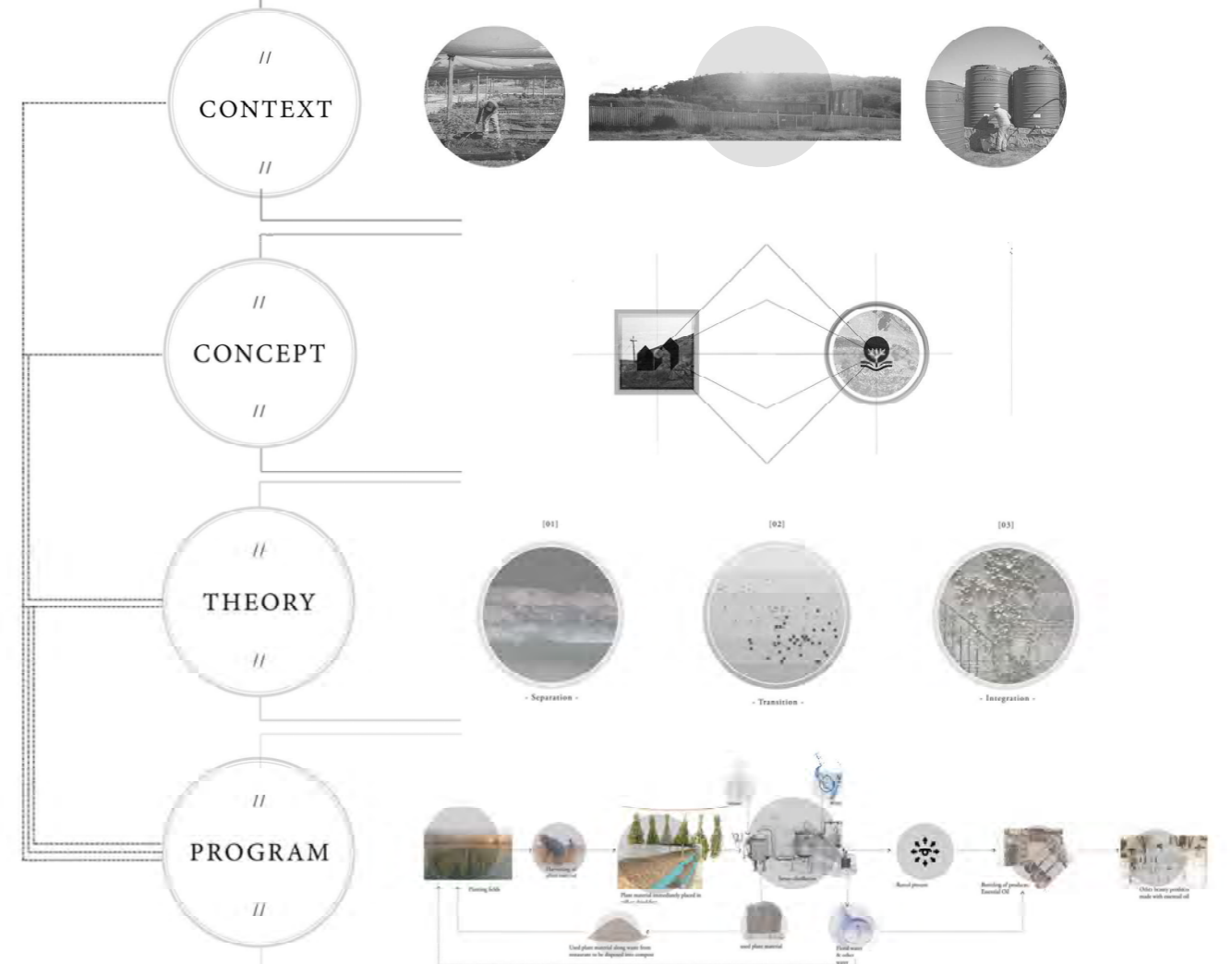
MACRO MAPPING

Mamelodi West & Magalies Mountain Range



MACRO MAPPING

study area in relation to surrounding urban precinct



INFORMANTS

hierarchy of design informants



SITE CONDITIONS

hand drawings of activities at Motbong

+ Abandoned Water Reservoir
□ Identified threshold marked
at focus area



- Movement
Movement on the site is primarily pedestrian. The secondary movement is vehicular although the use of the road running up the foot of the mountain is used by visitors to Mathomo.

- Access
The main access for vehicles and pedestrians is through the existing fence adjacent to the water reservoir.



- Topography
The site has a steep slope towards the north and gradually becomes flatter towards the south as it is on the foot of the mountain. The topography slopes to the south towards the wetland in front of the site.



- Drainage
There is insufficient infrastructure in place for storm water catchment or site drainage. Water runoff is towards the south of the site, that runs into the northern edges of the residential patches and partly into the wetland.



(page number/sub category)

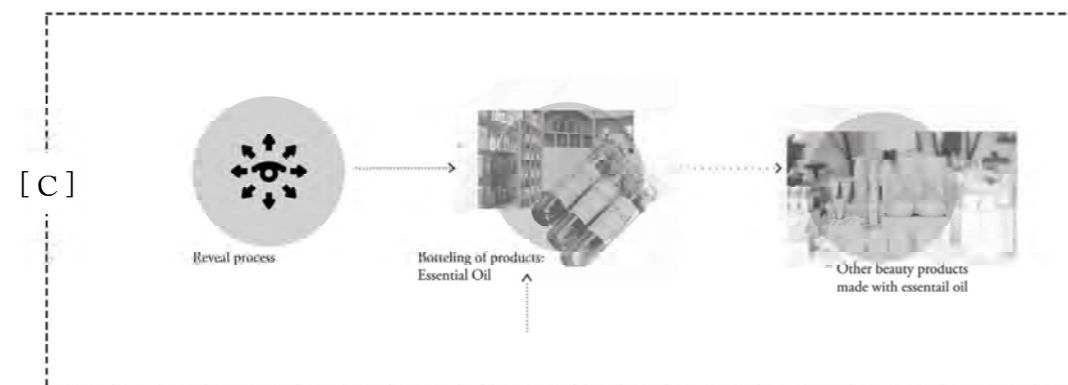
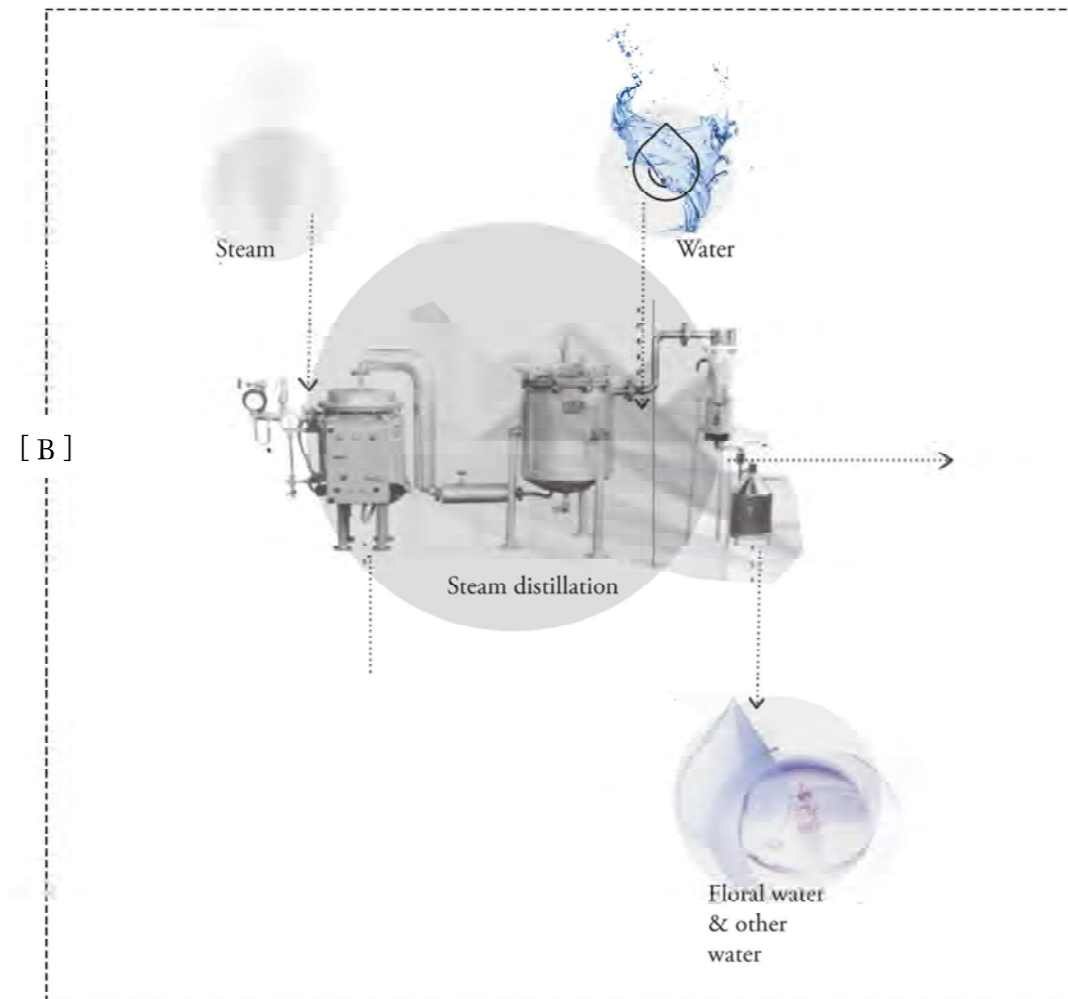
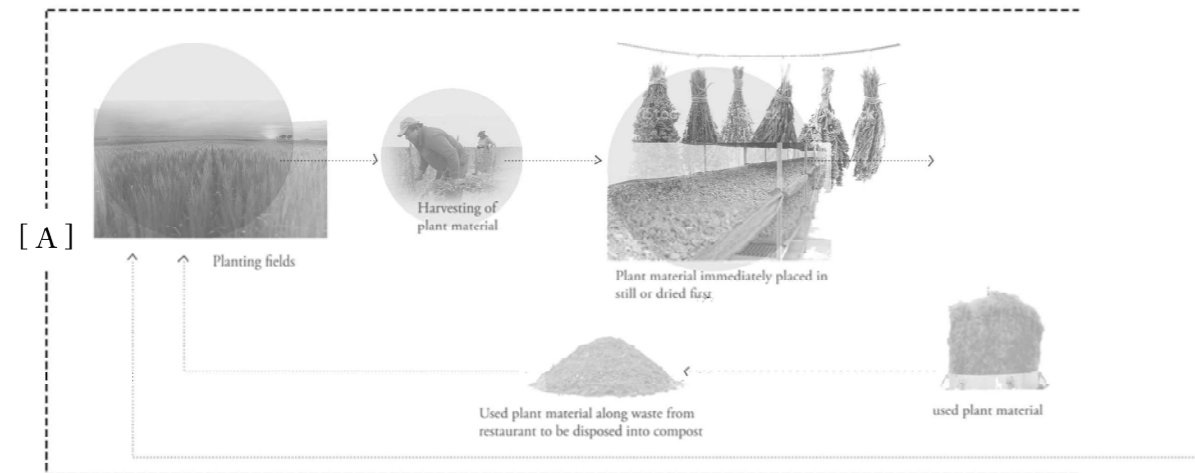


MESO MAPPING

MESO MAPPING

INTENTIONS

connection / transition / harness



PROGRAM

approach and application

LIMINALITY

The three phases of Liminality in Rite of Passage

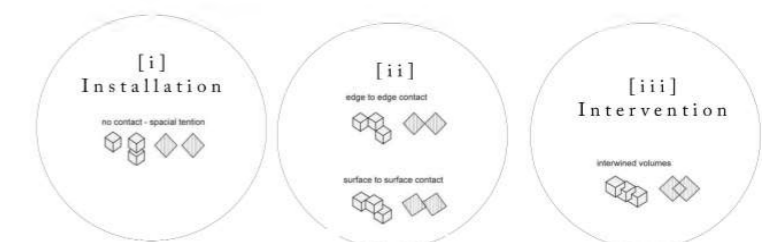
Arnold Van Gennep (1977)
Victor Turner (1960)



ADAPTIVE REUSE

Approaches to remodeling existing infrastructure

Graeme Brookner and Sally Stone (2004)



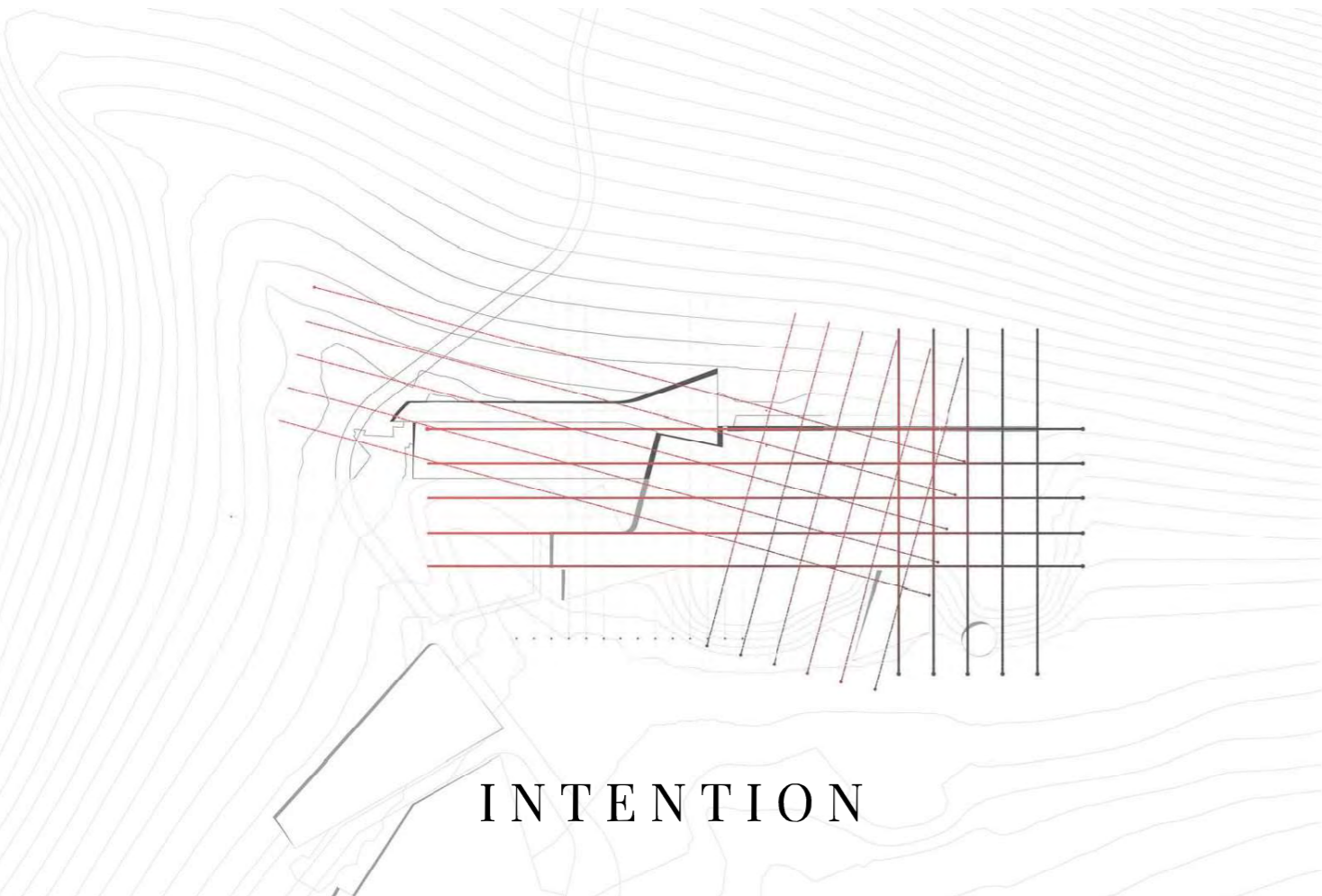
THEORY

sub-heading in lower case - elaborate on main heading



INTENTION

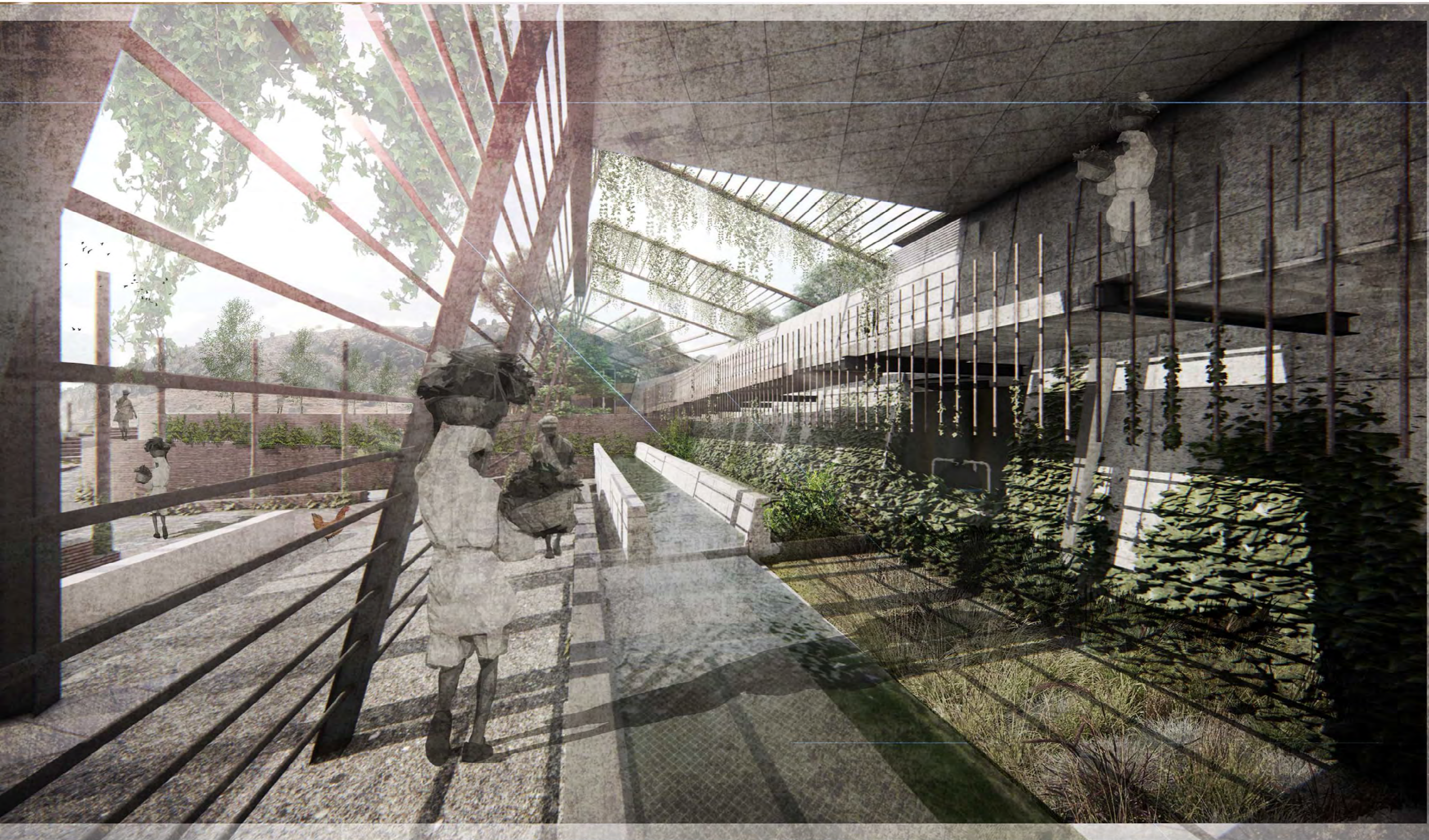
parti diagramme of builing in embeddedness & distilling moment



INTENTION

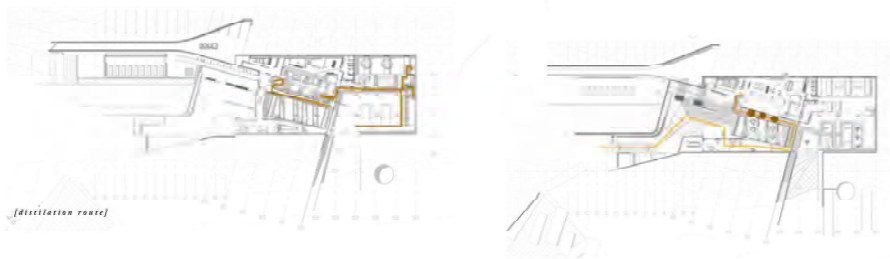
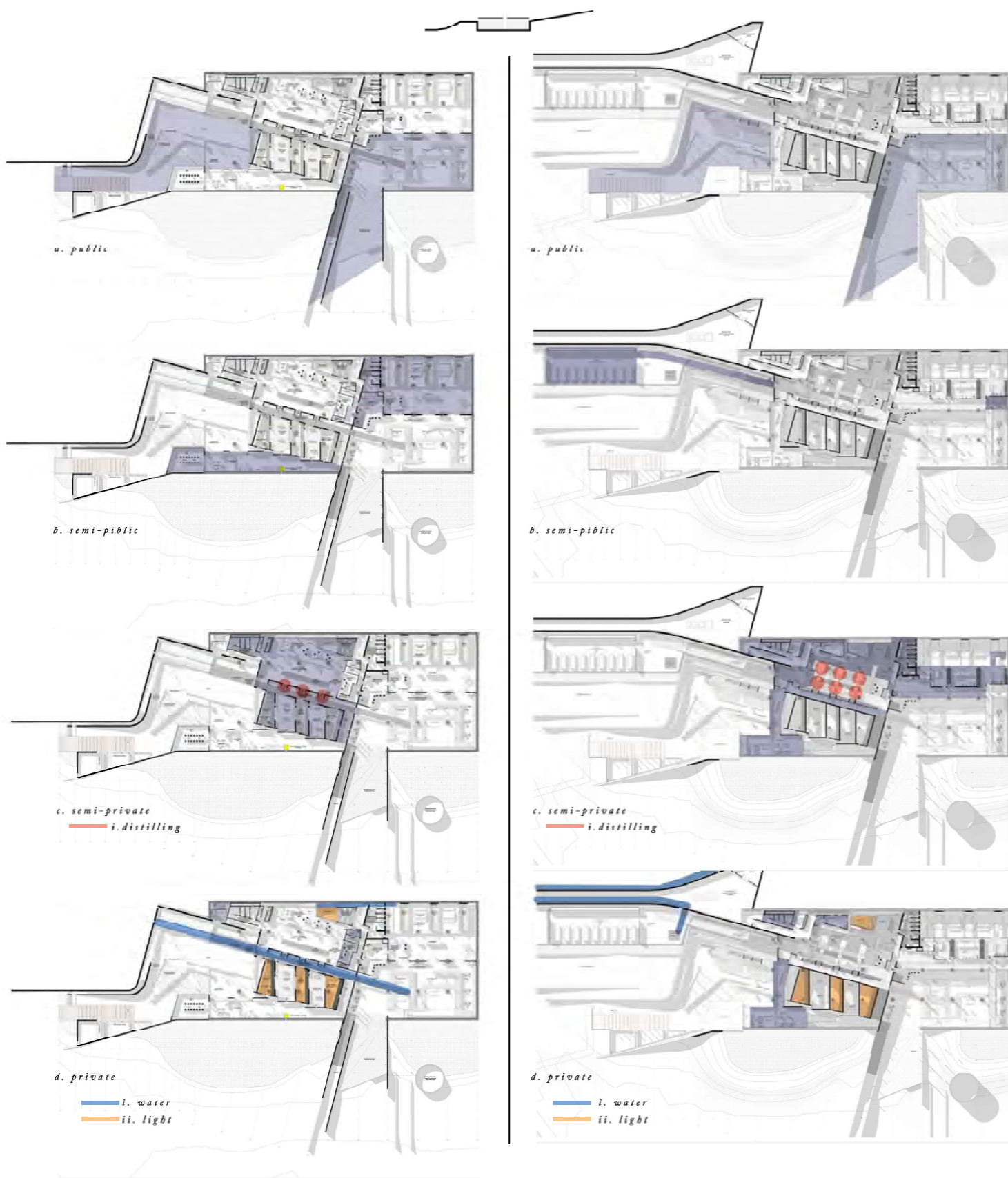
new layer - change in grid : design approach to existing grid to new grid





HARVESTING PASSAGE

PERSPECTIVE : water channel and secondary entrance from Western side of buidling



AXONOMETRIC

zones

OPEN COURTYARD

internal open courtyard with water channel and planting



ENTRANCE leading into recreational space

PERSPECTIVE 03: Southern Entrance

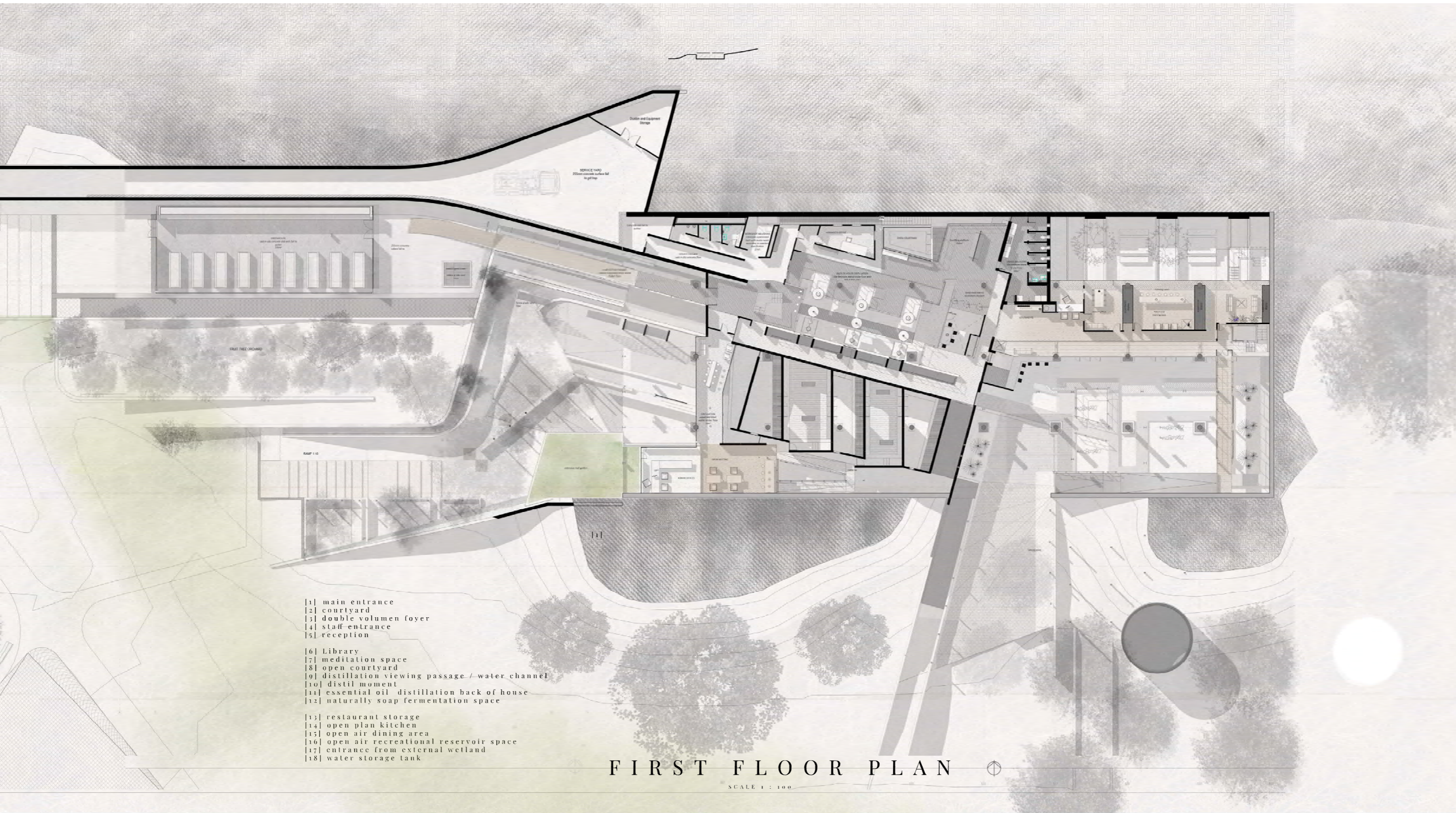
- 1| main entrance
- 2| courtyard
- 3| double volumen foyer
- 4| staff entrance
- 5| reception

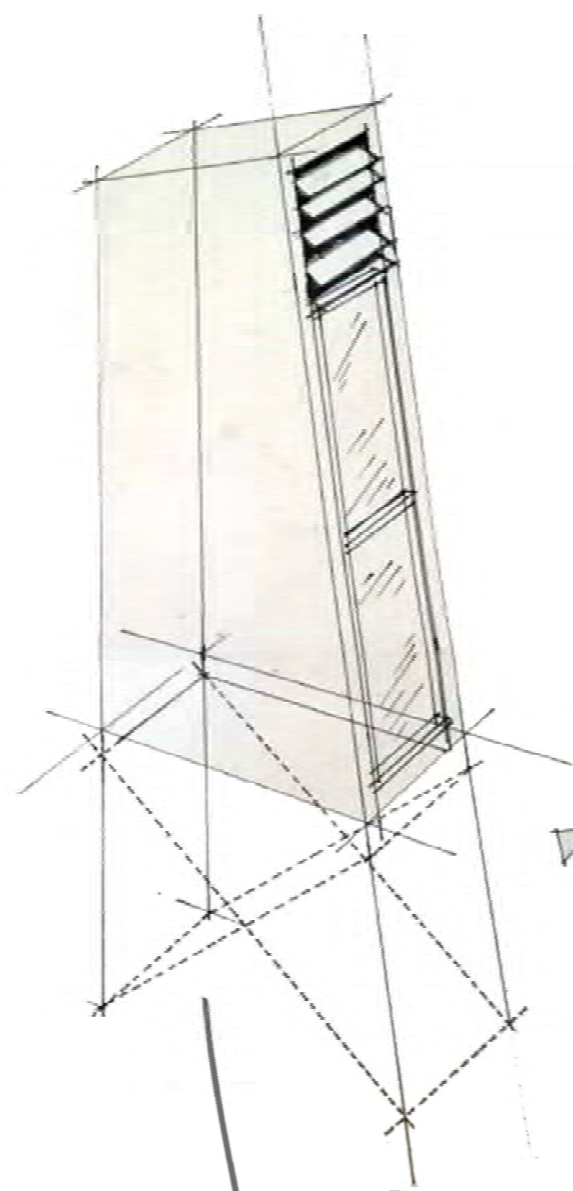
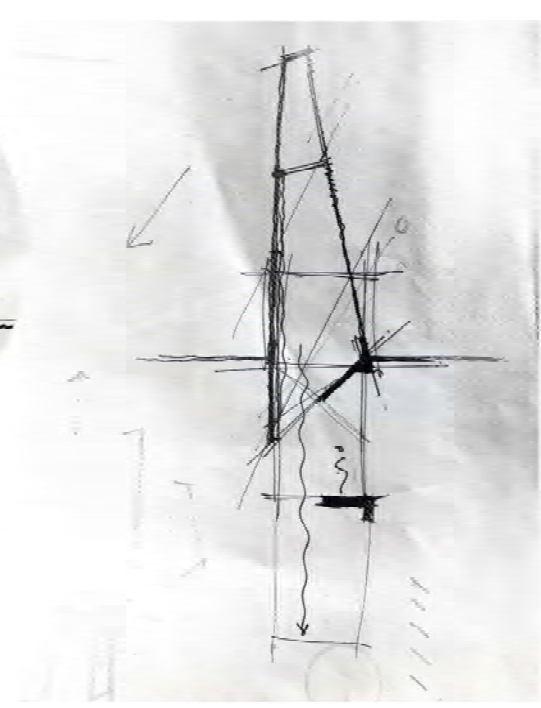
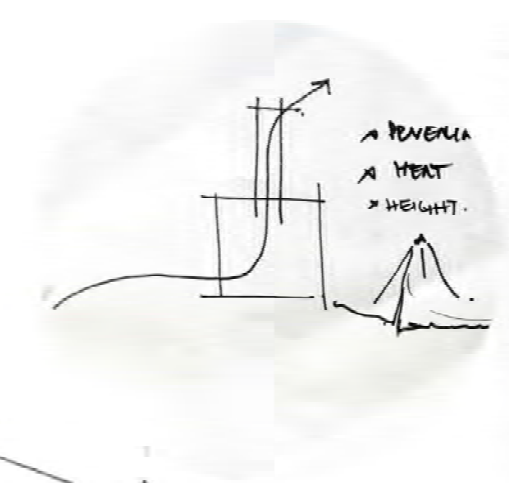
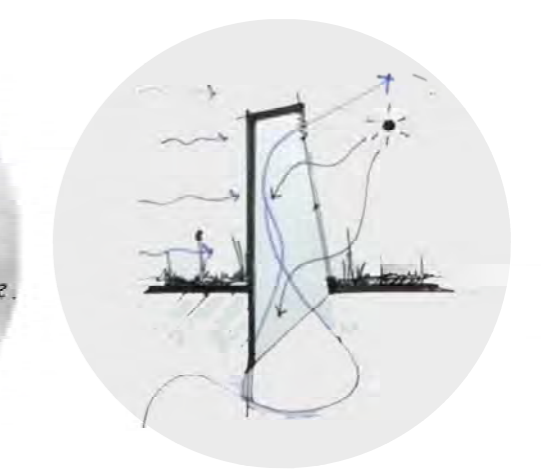
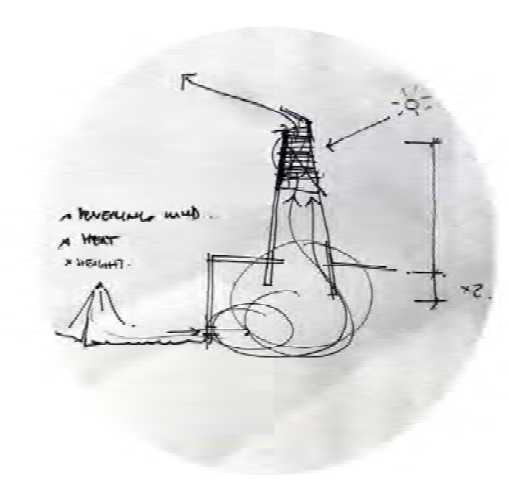
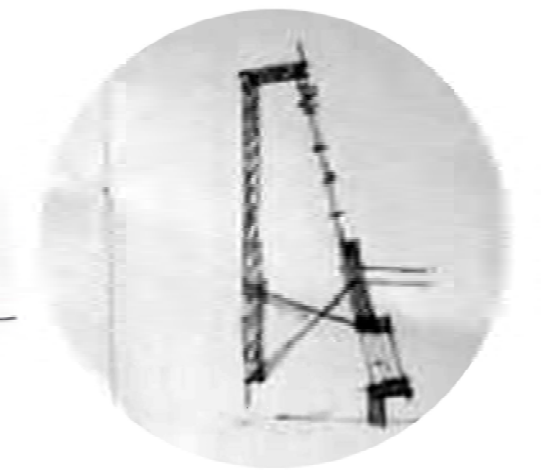
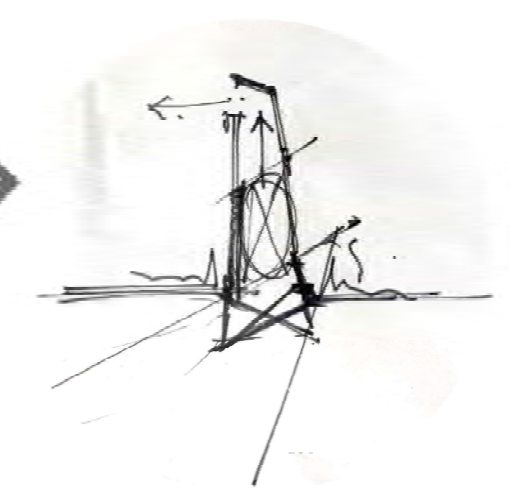
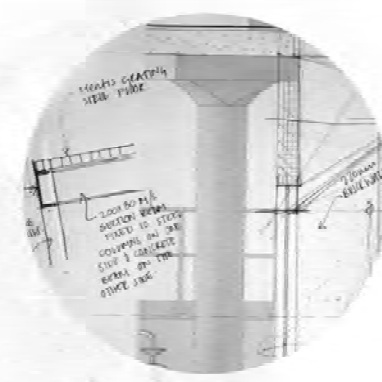
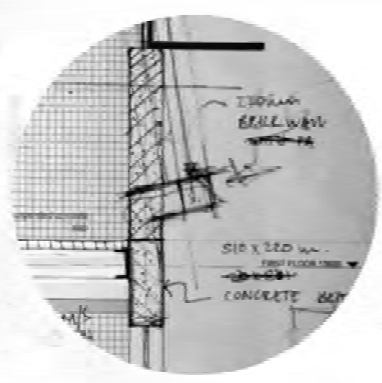
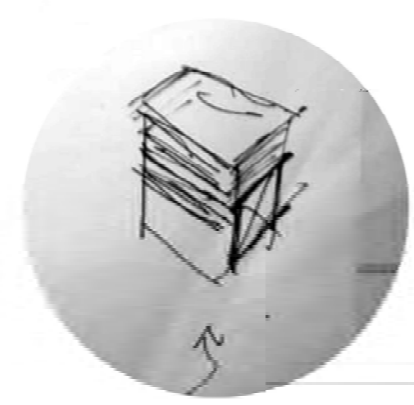
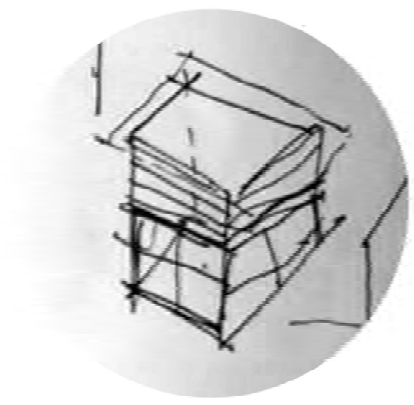
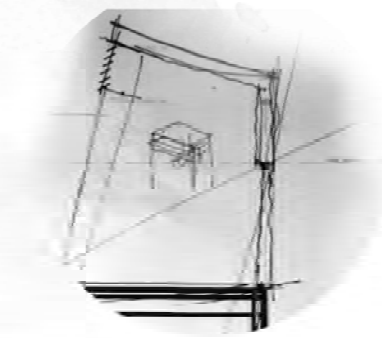
- 16| Library
- 17| meditation space
- 18| open courtyard
- 9| distillation viewing passage / water channel
- 10| distil moment
- 11| essential oil distillation back of house
- 12| naturally soap fermentation space

- 13| restaurant storage
- 14| open plan kitchen
- 15| open air dining area
- 16| open air recreational reservoir space
- 17| entrance from external wetland
- 18| water storage tank

GROUND FLOOR PLAN

SCALE 1 : 100





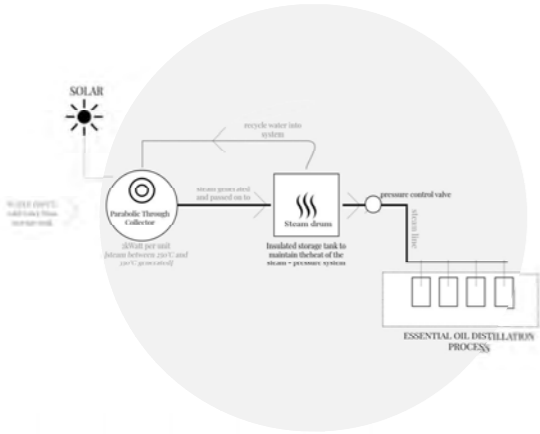
SECTION DEVELOPMENT

section 1:20 conceptual development

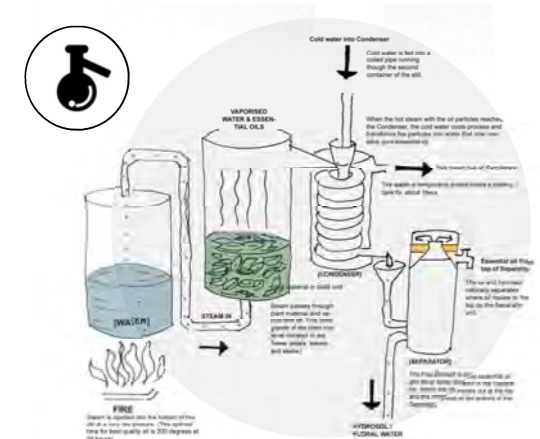


IN MEMORY

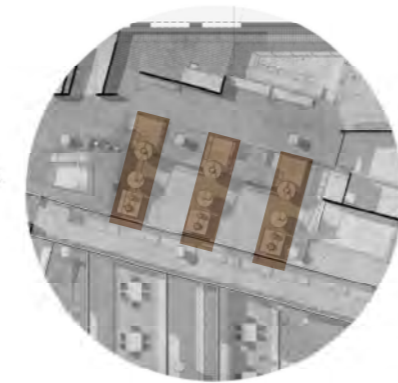
tectonic and stereotomic relationship at opening of reservoir perimeter wall and roof



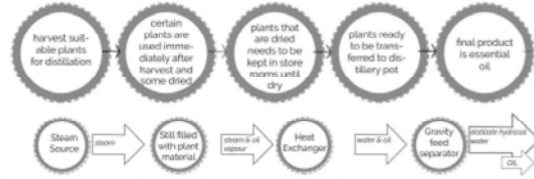
Parabolic Solar Reflector
This system is used to generate steam for the essential oil distillation process as well as warm water for the building.



STEAM DISTILLATION COMPONENTS
 > Steam Generator or Boiler
 > Heat Exchanger
 > Separator
 > Still
 > Coolers for Condenser



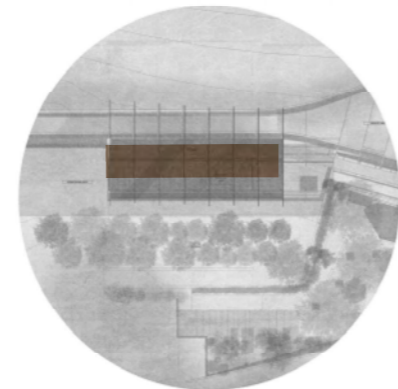
Steam Distillation



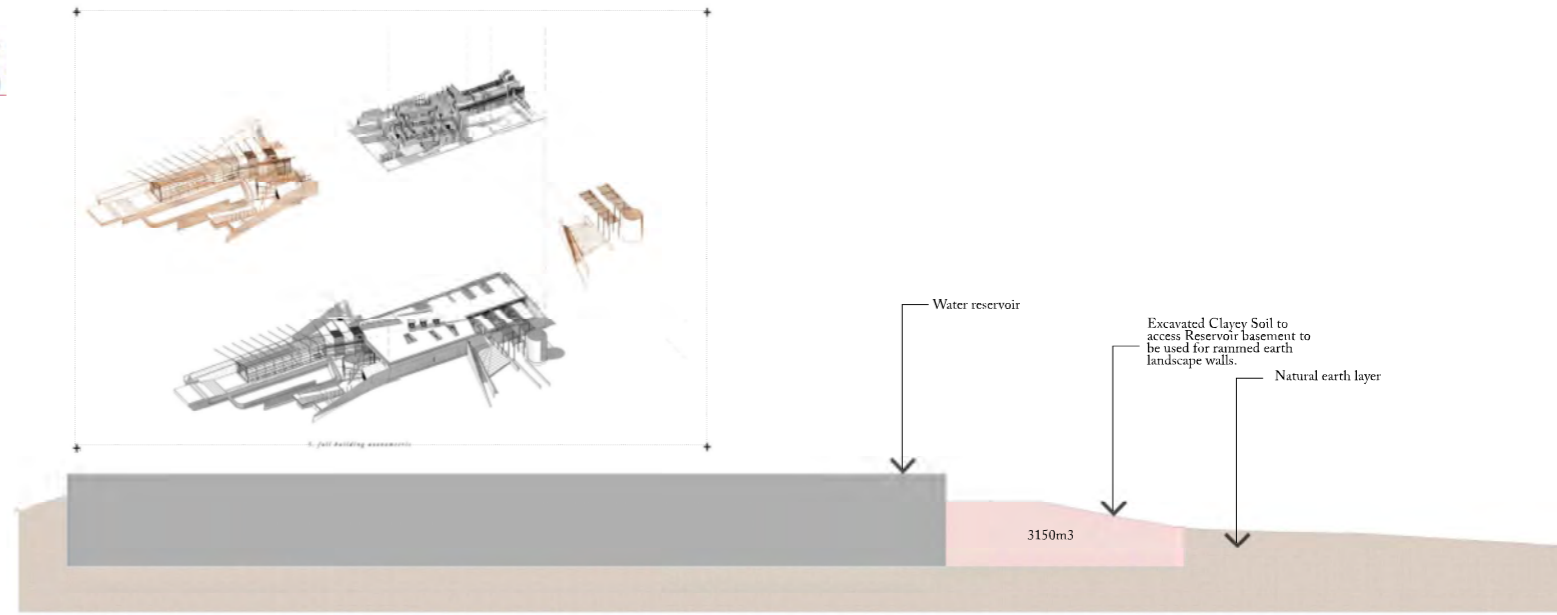
PHOTOVOLACTIC CELLS
 photovoltaic cells reduce solar heat gain and support energy demand.
 energy demand=
 Solar systems application + angled 26 degrees to the North
 Demand:
 + lights
 + pump
 + appliances
 Specification:
 + BEKA solar

SYSTEM

essential oil distillation process and strategy



Solar Panels



Rammed earth is a mixture gravel, clay and concrete. Rammed earth construction has a long history of being used especially during economically challenging times.

ADVANTAGES:

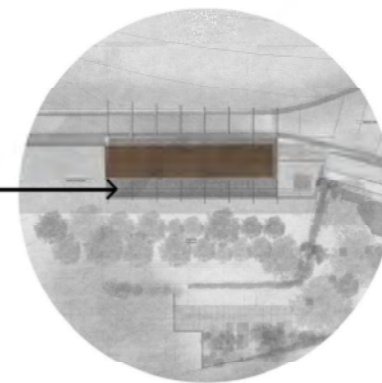
High thermal mass, low embodied energy, thermal regulation, fire resistance, strength and load bearing qualities and pest deterrence (Edmunds 2015).

The addition of Portland cement (adding to surface hardness), damp proof course and concrete or masonry footings and plinths and the addition of water based silicon water repellent, adds to the durability and low maintenance of rammed earth walls (Madobwa.com).

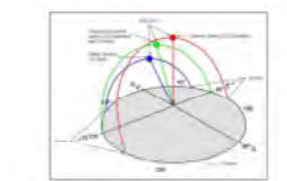
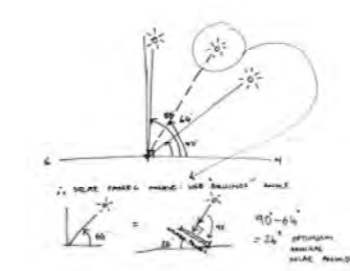
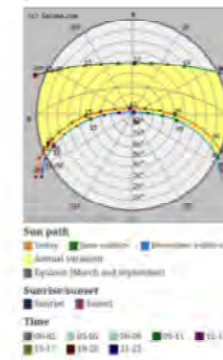
Silane/siloxane aqueous based waterproofing admixture (Techdry.com 2015) minimises water penetration and eliminates using external waterproofing coating and future surface maintenance the rammed earth walls to not need any finishes. Steel reinforcement is often used in the foundations and walls for extra strength. Plywood is usually used as formwork.

RAMMED EARTH WALLS
 APPROACH: CUT AND RECYCLE

PHOTOVOLACTIC CELLS
 photovoltaic cells reduce solar heat gain and support energy demand.
 energy demand=
 Solar systems application + angled 26 degrees to the North
 Demand:
 + lights
 + pump
 + appliances
 Specification:
 + BEKA solar

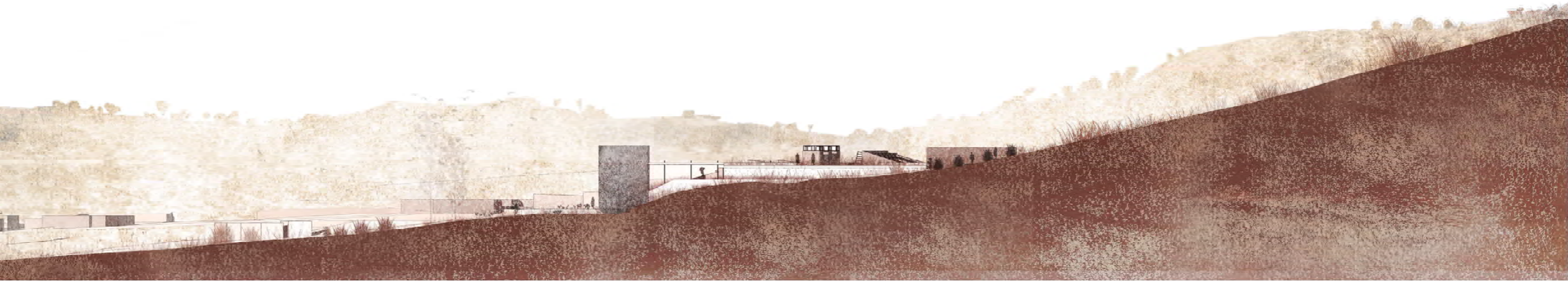


Solar Panels



SOLAR PANEL ENERGY SUPPLY

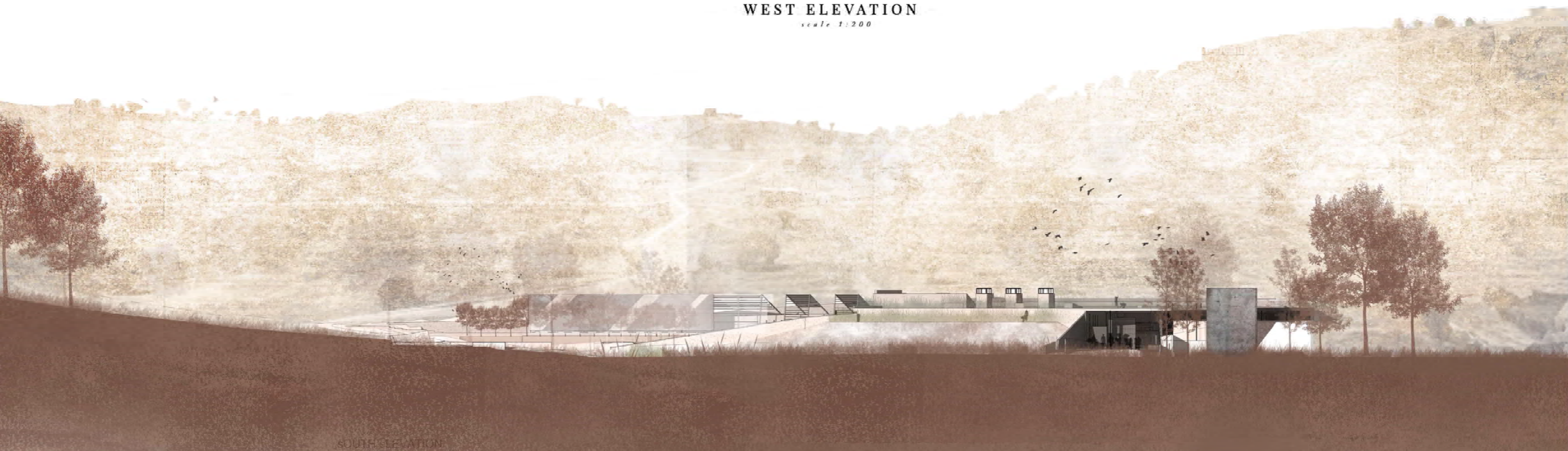
ENVIRONMENTAL



EAST ELEVATION
scale 1:200



WEST ELEVATION
scale 1:200

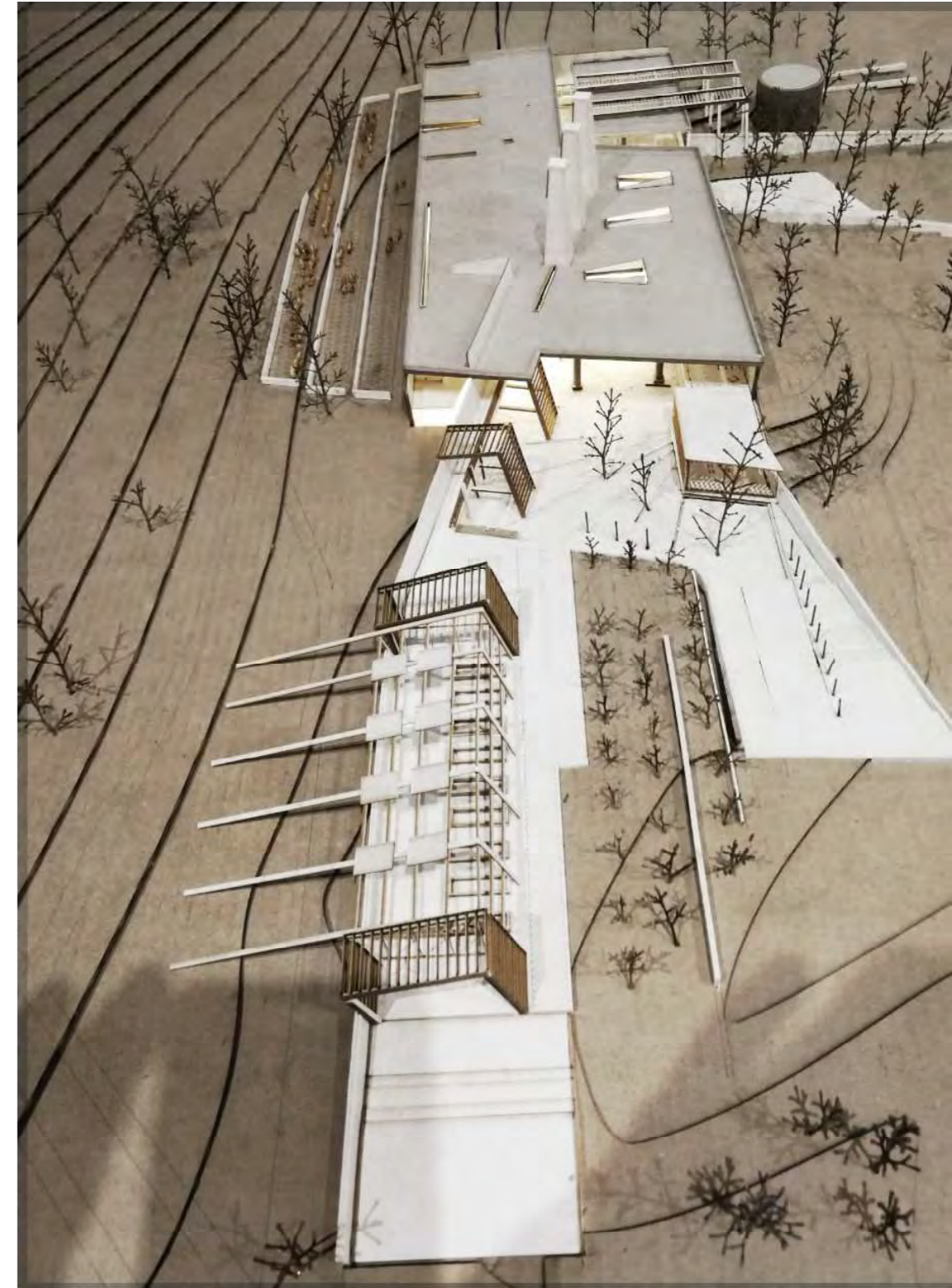
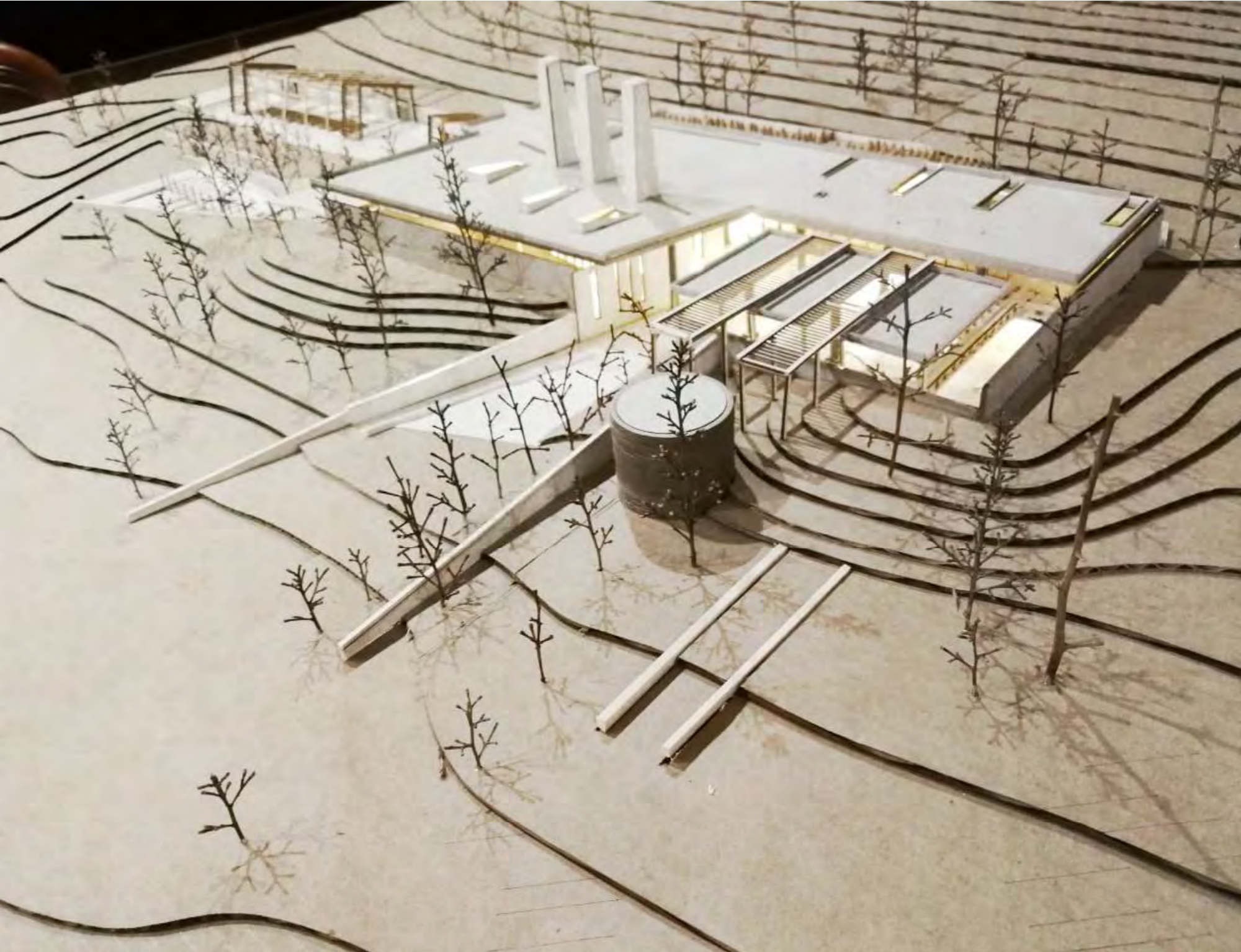


SOUTH ELEVATION
scale 1:200





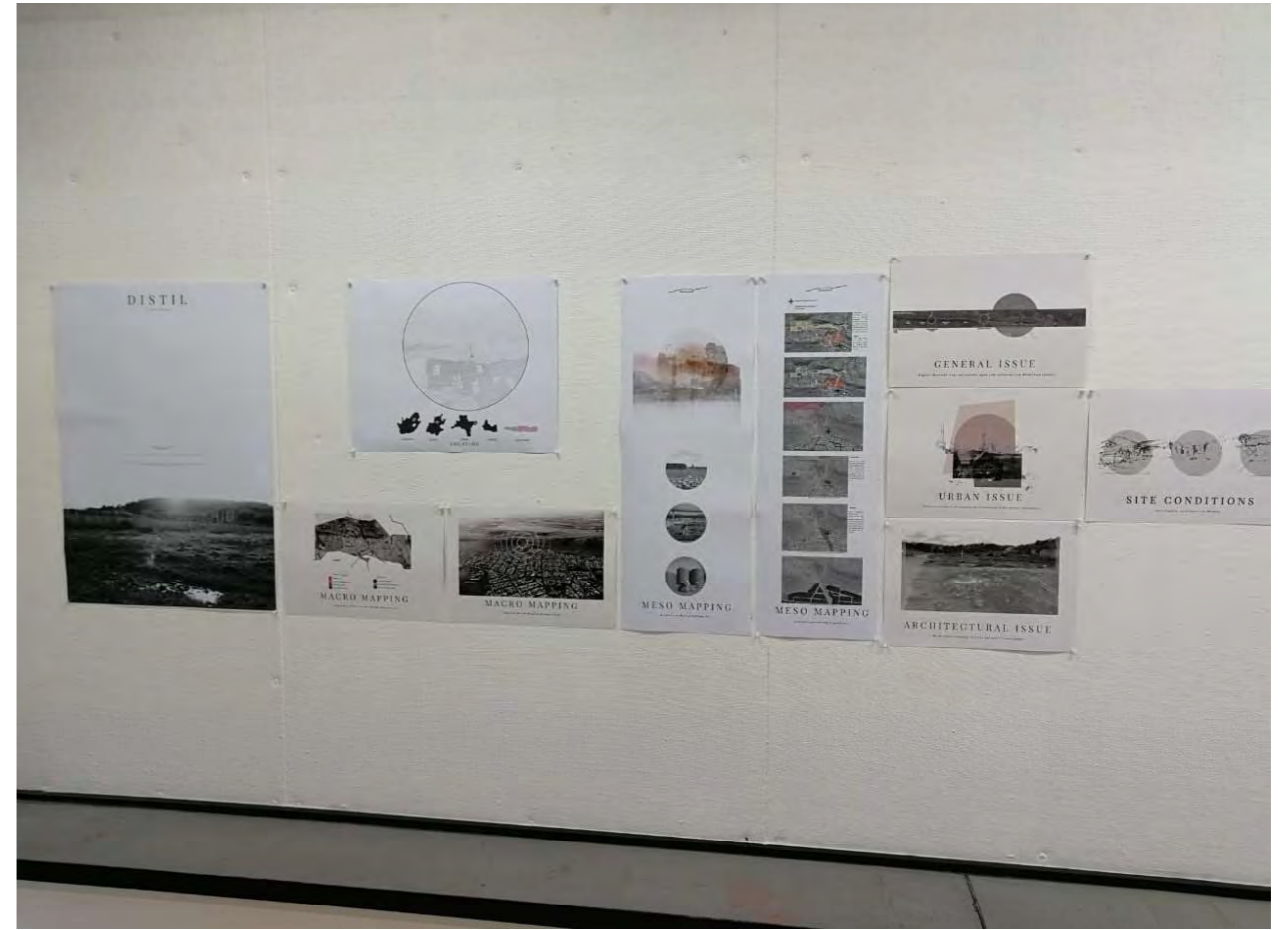
FINAL MODEL











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8.3
APPENDIX

8.3.1 // ARTICLE



Marni van der Hoven

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**Represent-
ing *limen***

Spatial manifestation of liminality through architectural representation.

Marni van der Hoven

R

Representing limen

This theoretical article discusses modes of spatial manifestation of liminality through architectural representation through the lens of anthropology. The architectural term of 'limen' or threshold has been adopted into the field of anthropology. It has been extended in thought and vocabulary, complexified in concept, and re-presented within the socio-cultural realm, although it has not found its way back into the architectural realm. Therefore, it is necessary to utilize this extension of the 'limen', back to its origin in order to derive an architectural vocabulary. This extended architectural vocabulary may expose insight and opportunity to derive modes of architectural representation of the abstract concept. From this viewpoint, a qualitative study of thematic data analysis through a descriptive double narrative method is used that analyses sets of data from anthropology on liminality as well as its application in architectural examples. The contribution lies in providing a framework, consisting of a set of main themes, explanations and attributes through which liminality can be represented architecturally.

KEYWORDS

Liminality; transition; incorporation; separation; threshold; transition; experience

INTRODUCTION

The etymology of liminal comes from the Latin root word "limen", which means threshold and or relating to a sensory threshold, or being an intermediate state, that has characteristic of being an in-between condition. The in-between condition is that is the limen as the "realm of conscious and unconscious speculation and questing - the 'zone' where things concrete and ideas are intermingled, taken apart and reassembled - where memory, values, and intentions collide" (Koetter 1969).

The threshold in is essentially an architectural element, which is substantially ambiguous, is temporary and located in the transitional zone between fixed conditions.

This concept, which has arguably been purchased by the discourse of anthropology from its origins as an architectural feature. The discussion of threshold or limen is fascinating through the way it has been extended in thought, complexified in concept and represented through anthropology in the social-cultural realms of ritual and rites. Liminality is a state of being that is fundamentally abstract as it is characterised by being on a threshold or boundary as Robert Venturi (1966) states in *Complexity and Contradiction in Architecture* the 'both-and' condition in which a space has multiple readings, meaning it is both one thing and at the same time another'. From this viewpoint, the limen has

very specific possibilities in the architectural realm.

It is the aim of this article to derive a vocabulary through which liminality can be interpreted architecturally and represented through modes of spatial and physical elements. Therefore the research question is posed: 'What are the modes of spatial and physical constructs of liminality in the discipline of architecture?'

The paper argues that it is possible to derive modes of architectural representation of the abstract condition of liminality through its extension in anthropology as well as expand the architectural vocabulary through repurchasing the concept back to its origins.

This article is synthesised through the lens of anthropology on liminality theory. Additionally, by means of providing a background of historic constructs investigating the concept of liminal rites through architectural precedents, a spatial and physical understanding is brought to light. Through the viewing of a set of selected historic architectural examples in which the notions of liminality have been experimented with, it can be taken into modern architectural examples. These will be analysed through thematic analysis process of photographs and illustrations to derive principles that will be able to illustrate the physical representation of liminality. In support of this study, literature regarding space and place of the in-between condition in architecture will be discussed. An unpacking and capturing of these definitions and

architectural precedents provide a set of themes, attributes and characteristics that will assist in fabricating a concluding framework. A limitation of the framework is the inclusion of only a few selected buildings, and literature. Further study can be done to extend the framework through including more of the creative disciplines, such as music, sculpture and art. The contribution lies providing a framework, consisting of a set of main themes, explanations and attributes through which liminality can be consciously constructed through architectural representation.

METHOD

The interpretive paradigm is selected as framework for the article which is grounded in an understanding of reality through subjective experiences of the external world. Reeves and Hedberg (2003: 32) stresses that there is a need to put analysis in context within this type of paradigm. Thus, a descriptive double narrative method for data analysis is chosen by which background of a historic construct of liminality is analysed. As Mitchell and Egudo (2003) argue, the narrative approach is an interpretive approach that has a theoretical underpinning in order to ground and support the interpretation of the information. The double narrative is done through existing theory in anthropology as the lens through which the selected architecture precedents is analysed. In qualitative studies the data analysis supports in discovering and analysing patterns, main concepts and ideas of the qualitative data. Thematic analysis is used as the method for data analysis that offers a theoretically flexible approach for identifying, analysing and recording on main concepts and ideas within the data (Braun, Virginia & Clarke 2013: 4-5). The thematic analysis considers the double narrative method of analysis. The first narrative analyses existing theory within the discipline

of anthropology. In support of this research another layer of existing theory is analysed and discussed which forms part of the theoretical framework that anchors the analytic process with specific themes that will be focused on in the analysis process. This constructs the platform on which the second narrative is analysed. The second narrative utilizes real world cases of architecture related to history and modernism, where ideals of liminality have been explored by the architects.

The selected precedents are analysed according to the three main themes of liminality theory namely state of separation, state of transition and state of integration. The selection criteria for the precedents are limited to design projects that demonstrate notions of liminality that has been experimented with conceptually in the architecture. From this, the architecture should have great consideration for the design of threshold spaces, as this is the main element of liminality theory. These threshold spaces can be positioned within or outside of the building, or between the building and the city or the building and its surrounding context. The threshold spaces are analysed according to scale, intimate or public, the choice of materiality for its historical use, symbolism, or what the material represents as well as the haptic qualities of the material. Furthermore, the relationship between interior to exterior space and exterior to interior space is analysed in conjunction to the natural light quality contributing to the spatial experience. The spatial experience of the movement and circulation routes are considered important to analyses as this is considered one of the most liminal spaces in architecture. Within these spaces moments of pause and physical objects are also considered. These principalities formulate the criteria of the main themes, established from the theoretical framework, used to analyse and

interpret four design projects. The understanding of liminality gained through the analysis can influence an approach to architectural design. The insight through the analysis provide the findings of attributes and guidelines

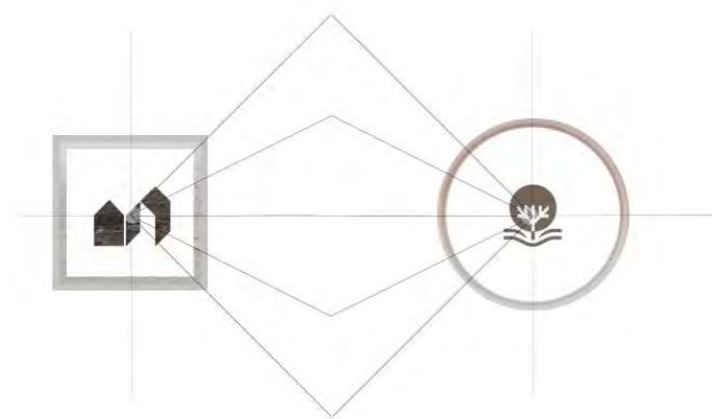


Figure 8.1: (Above) Conceptual composition of the in-between representation (Author:2018)

act as catalyst to generate architectural design solutions that can create an appropriate design set within a liminal environment. The process of data analysis in this article is guided by an interpretation of Braun, Virginia & Clarke's six step guide (Braun, Virginia & Clarke: 2013: 4-5) to apply thematic analysis.

Rigorous data analysis is presented when the assumptions are congruent with the conceptualised manner (Reicher and Taylor 2005:549). The theoretical constructs is synthesised though looking at the first part of the double narrative methodology where liminality is discussed through anthropology. Arnold van Gennep's (1960) work in 'Rite de Passage' in 1908, serves as the lens though the socio-cultural realm which the theoretical data is explored, where after the work of Victor Turner (1960) provides further development and deeper insight into rites in liminality. This anthropological discussion creates the platform of knowledge for the selection criteria for precedents. The discussion forms the second part of the double narrative method where the selected precedents are analysed. From these findings, further analysis on modern examples of architecture is done. Through unpacking the analysed themes, a better understanding of the liminality theory and its relevance within the architectural discourse is provided. From this viewpoint, the results of this analysis directs toward common attributes and characteristic within the architectural realm that represent a liminal approach of form and space making.

THE LIMEN ADAPTED INTO ANTHROPOLOGY

Arnold van Gennep: Rite de Passage (1690)
Van Gennep(1960) distinguishes amongst rites that mark the passage of a social group from one status to another which mark transition in the passage of time, whereupon he went on to explore "the basis of characteristic patterns in the order of ceremonies" (Gennep 1960:10). He discovered that during these cultural ceremonies, a person going through the transition process, he or she occupies a state of in-between-ness. Emphasizing the significance of transitions in any society, van Gennep favoured rite of passage as a distinct category, consisting of three sub-categories, namely rite of separation, rite of transition and rite of incorporation. He notes that the structure of rites of separation, transition and incorporation are not equal and often all the rite can be present in the transitional period. Thus, the liminality discussion implies that there is a distinct moment of transition within the state of flux which is

positioned within the in-between-ness of two clearly distinct and stable states.

The intermediate stage in a rite of passage a liminal period as stated by van Gennep(1960), what he calls 'transition rites' as liminal rites, and he calls 'rites of incorporation' as postliminal rites. He distinguishes a state as being a fixed or unwavering condition and transition as the process of transforming and becoming; therefore implying that it has a time frame. The transition from one stage to the next, or from the profane to the sacred, is so great that there must be an intermediate stage – the liminal stage (Turner 94).

Van Gennep (1960) calls rite of separation as the pre-liminal rite, which metaphorically the "death" of a person, thus he or she are obligated to strip themselves from all things of their bounding them to their former condition or routine and symbolically this rite signifies the initiation of individual to detach themselves from a former fixed point in their social structure, to be able to continue to the next rite being the liminal state. Secondly, van Gennep (1960) defines the 'liminal rite' as a state, which implies a stable condition. He states that during the "liminal" stage the state of the individual is ambiguous, due to the absolute detachment from both its former and following positions, and an attachment to the nothingness in this realm of transition. In the ritual condition, the individual becomes nameless or identity-less, therefore the power of the state to influence the perception of the individual is greater than any other state (Thomassen, 2006, p.22). The person in the liminal rite is disconnected and disassociated from anything he she knew and their future is uncertain. Tough this a person becomes much more aware of themselves and their actions as that are the only thing that can determine their future (van Gennep, 1960, p.20-21). Thirdly, the postliminal rite is as a state of integration back into society with a new identity, as a "new being" (Gennep: 1960, p.21). Here the individual is "consummated in a stable state once more and by virtue of this gains rights and obligations of a clearly defined and structural type (personae), and is expected to behave in accordance with certain customary norms and ethical standards" (Gennep: 1967, p. 4-5).

It is important to note that liminality in Rite of Passage not only relate to special or cultural rituals of transitioning its definition has degrees which include physical markings, such in the field of architecture that will be discussed later in the article. Liminality in historical architecture,

according to van Gennep (1960) is 'about differentiating between', what he calls, the 'profane and the sacred world' (Turner 1960: 94). Furthermore, in any rite of passage the 'incompatibility between the profane and sacred world is so great that man cannot pass tough one to the other without going through an intermediate stage'.

Victor W. Turner: Betwixt and Between (1963)

Van Gennep (1960) calls rite of Victor Turner is the one who re-discovered the importance of the liminality discussion and builds on van Gennep (1960) understands of rites of passage. He discovered van Gennep's work on Rite of Passage in the summer of 1963 that inspired him to write the essay "Betwixt and Between The Liminal Period in Rite of Passage", the famous chapter in his 1967 publication, The Forest of Symbols. He confirms Van Gennep's definition of society as a structure of positions of which each marks a change in an individual's status. Turner (1960) states that 'liminality refers to any betwixt and between situation and object', it is evident that this understanding opens up the discussion for possible uses of the concept far beyond that Turner himself had suggested.

"We must regard the period of margin or 'liminality' as an inter-structural situation between states. By 'state' I mean here a relatively fixed or stable condition. I prefer to regard transition as a process, a becoming or even a transformation" Victor Turner.

Fundamentally, a liminal stage is transitional; it acts as a transition between two fixed states, while a state is a relatively fixed or stable condition" (Turner: 1967:93). Turner stresses that the scale or significance of status at which the transition occurs is not as important as the transition itself (Turner 196: 96). In his chapter 3 of his book Turner (1967) says that 'during the intervening liminal period, the characteristic of the ritual subject is ambiguous, as he or she passes though cultural realm that has few or none of the attributes of the past or coming state'. The person's status is ambiguous, where he or she may feel confused, dislocated, lost and vulnerable, therefore this stage has the power to be destructive or constructive. This is the moment where the greatest potential for change can occur. This liminal stage bridges the two states of profane to sacred and it must be transformative on order for the rite to be complete" (Turner 1960, p. 1). The metaphor of dissolution or dissolution is often applied in the liminal stage (Turner 1967). as these stages are accompanied by growth, transformation, and reformulation.

IDENTITY, SPACE AND PLACE

The elements of space that the in-between zone possess contributes to the making of place according to Yadin Pandya. These elements constitutes the basic identifiable parts of the built environment. The inherit attributes of 'spacemaking' elements such as floor, column, wall, door, window, roof, stairs (Pandya) possesses morphological constructs which provide them as particular spatial properties. Elements of space making as a bridging theory provides the potential for their use and design in architectural representation. The elements, therefore, form part of the criteria to analyse precedents later in the article.

In addition insight to the spatial characteristic of the *limen* is provided by philosophers, such as Michel Foucault(1984), Kent Bloomer (1977) and Yi-Fu Tuan (1977).

The French philosopher Michel Foucault (1984) introduces the idea of 'heterotopia, as the space that lives in-between other spaces' in his article "Of Other Spaces" (Foucault, 1984). Foucault describes heterotopia as a real, defined space that is completely different from all the spaces it reflects', yet it connects the spaces. It exists as its own defined experience, thus giving a tangible articulation to the in-between.

"We do not live in homogeneous and empty space...we live in a set of relations that delineates sites which are irreducible to one another and absolutely not super-imposable on one another" (Foucault, 1984). Through this it is seen that the space we live in is full of social; historical and cultural potential that architects can use as a guide to define the in-between space.

Kent Bloomer (1977) suggests is his book Body, Memory and Architecture, that architecture is "an incitement to action, a state for movement and interaction." An emphasis on the visual form of architecture and not so much the transitional space within the architecture, often leads to the disconnection of user experience (Bloomer 1977). A space that lacks identity and sense of place is when architecture discourages movement and interaction with the space, often experienced with monolithic or civic architecture. The movement becomes more of passing though than a defined experience or becoming part of. The shift in scale becomes more pedestrian oriented. The idea of path of travel and experience of the journey transmits to how the user experiences the liminal qualities of the given space. Bloomer (1977) acknowledges that when an individual have to make decisions about their route of travel they remain more acute to sense of their place and time. When the user partakes in the circulation and movement of the space, a greater

understanding and acknowledgement of the spatial experience is achieved, as Bloomer suggests. Although, the space should allow for a 'moment of pause' in order for attain a liminal spatial experience. Movement and transformation though space of place can be understood. The place of pause represents the liminal state or in-between state of the cultural ritual.

Yi-Fu Tuan (1977) explains that "space is experienced directly as having room in which to move. "Space" is more abstract than "place." Undifferentiated 'space' becomes 'place' as we familiarise ourselves with it and endow it with value. The ideas of "space" and "place" are dependant on one another for definition.

"Place is a type of object. Place and object define space" (Tuan: 1997, p.17).

"Moreover, by shifting from one place to another, a person acquires a sense of direction. Forward, backward, and sideways are experientially differentiated, that one, known subconsciously in the act of motion" (Tuan: 1997, p.12). He states that space is given by the ability to move, therefore, space constitutes movement. If we think of space as that which allows movement, then 'place' is pause; each pause in movement makes it possible for location to be transformed into 'place' (Tuan, 2018:6).

To conclude the elements of space making though the understanding of the characteristics of an in-between space guides the framework for architectural representation.

PRECEDENT ANALYSIS

The following section provides the historical paradigms of the concept through architecture.

Liminality in historical sacred architecture: The Acropolis

In order to comprehend how architecture can enable a contextually liminal understanding, the transition of an individual though the space is analysed. This is done though a study of the Acropolis where the concept of liminal rites has been applied to spatial knowledge. As mentioned before, a liminal state alters a user's perception of space though movement and transition from the profane to the sacred worlds. The word Acropolis, originates from Greek meaning 'acros', that denotes to 'high' or 'upper' and 'polis', meaning 'city', of Athens is a steep-sided hill housing numerous temples, precincts, and other buildings (Sacred Spaces, n.d.).

"When guardians of the threshold take on monumental proportion, as in Egypt, they push the door and the threshold into the background, and prayers and sacrifices are addressed to the guardians alone. A rite of spatial passage has become a rite of spiritual passage."- Van Gennep (1960, p. 40).

The route leading to the Acropolis is in zigzag-shape ascension to sacred space though a series of thresholds. This space becomes transitional, as the pilgrim moves through a series of thresholds that creates a layered effect, while ascending to the sacred space. In addition, the change in elevation contributes to a heightened the awareness of this transition for the pilgrim. . The Propylaea (Figure 3) is the gateway to the sacred realm on the Acropolis (figure 4) which creates a transformative transition between the city and the temple precinct, or the profane and the sacred. The Propylaea marks the separation zone from the profane world as the two arms of the Propylaea reach out as if to pull the pilgrim into the space of separation. This zone of separation also becomes transitional as

	Liminality theory	Themes in liminality		
		[State of separation]	[State of separation]	Post liminal [State of integration]
Definition: anthropology	Limen / threshold	Preliminal	Liminal	Post liminal
Primary data: Authors in anthropology				
Van Gennep (1960)	Profane and sacred world are two opposing states and the liminal or intermediate state should extend on the contrasting nature of the two opposing worlds. All three zones can also be found in the liminal zone.			
Sub-themes		Isolation Bareness detachment	Ambiguous Disassociation detachment	Reintegration
Characteristics:		initiation stage 'death to former self' detachment from previous situations	Disorientation namelessness, identity-less detachment individual is unstable no rules and structure	New identity or new being
Turner				
Sub themes		Isolation Start point	- Stage of dissolution - State of dissociation - state of transition Mid-point	Accumulation End point
characteristics		Own identity	Ambiguous atmosphere Odd space <i>Growth, transformation, and reformulation.</i> Own identity Take on characteristic of neighbouring spaces, therefore having hybrid identity, while still remaining separate the states.	Own identity
Secondary data: Philosophers	Space, Place And Identity of the limen-space			
Architectural thinking	<p>Liminality in architecture, the transition, and elements that make-up the transitional space is fundamental to the spatial experience, regardless of program and function. For example, the threshold at the entrance to a cathedral can have as profound an impact of the threshold at the door of a domestic building. Thus, universally, in a threshold space, an individual is positioned within a transitional stage in which he/she is part of the space they have left or the space they are about to enter. In the threshold space, they an individual is part of the in-between, in an ambiguous condition.</p> <p>2. Arnold van Gennep and Victor Turner on liminality concludes to liminality as in-between condition that has an start and end point in which each must be theatrical enough to recognise that a transition has occurred.</p>			
Themes and findings CRITERIA	<ol style="list-style-type: none"> 1. The space in between two fixed states 2. Character of states: the social, cultural or historical potential 3. Materiality 4. Light quality: abundance or lack 5. Physical objects in space 6. Design of circulation space vs. design of objects in space – establish hierarchy 7. Identify unique character of space: social, cultural, imagined, civic or communal space 8. Static vs. dynamic architecture 9. Static vs. dynamic space 10. Objects having a hybrid identity in the transitional space. 11. Blurring inside and outside space 12. Volume: high or low interior volume 13. Start point, mid-point and terminating point in route/journey 			

Figure. 02. Above; Table 1: Findings summary and criteria for analysis. (Author: 2018)

The zone includes the element of time as the pilgrim has to move through another series of columns and steps (figure 3) to reach the next stage (figure 4). As the pilgrim ascends through the Doric and Ionic colonnade of the Propylaea, they have entered another zone of transition, but still remain separated from the sacred realm, although now removed from the profane world. The threshold into the portico that leads to the Acropolis, the pilgrim has now entered a zone of incorporation, where one is within the sacred realm of the gods.

The change in elevation through steps between the zones of separation and transition and between the zones of transition and incorporation are used to accentuate the threshold from the profane to the sacred space (figure 5). The pediment of the Propylaea building is stepped (figure 6), which acts as a marker to the transitional space, where these elements portray the zones of separation, transition, and incorporation (figure 7) that are included in order to enrich the spatial experience and to change the perception of the pilgrim before they enter the sacred space.

The concept of blurring is created in the Parthenon on the Acropolis through the use of columns (figure 6). Both the Doric and Ionic orders are utilized that creates in an ambiguous reading of the building. The Doric order was mainly used on mainland Greece, furthermore, it was typically used on the exterior of the building to symbolize masculinity (activities performed on the outside, such as fighting and building). On the other hand, the Ionic order was used in Asia Minor, it was used to represent a femininity (activities performed inside such as philosophising, cooking or other luxuries regarded as feminine), it was typically placed on the interior of buildings. The Parthenon keeps the Doric order on the exterior peristyle, but also uses it at the two-story peristyle in the 'cella' and four Ionic columns in the rear 'cella'. The irregular spacing of the Doric columns takes on the character of the Ionic columns, a spacing usually reserved for the Ionic. The combination of the columns illustrates how perceived use of architectural representation and symbolism can be dissociated and re-purpose.

"Elements are withdrawn from their usual settings and combined with one another in a totally unique configuration" (Turner 1986: 105).

In conclusion, the Doric and Ionic (figure 8) columns in the Propylaea: the concept of blurring is introduced to create an ambiguous space as the combination of the different columns results in an ambiguous reading building. Furthermore, the Acropolis depicts visual access and protracted procession into a threshold that separates the experience of an individual from the outside (profane) and the (inside) (sacred) world. The concept of layering is created through the ascension in elevation together with moving through a series of thresholds.

APPLICATION OF HISTORIC KNOWLEDGE TO MODERN ARCHITECTURE:

Mill Owners' Association Building (1954) Le Corbusier

The Mills Owners' Association Building (1954) architectural style combines the repetitive rigidity of Villa Savoye with the curvilinear forms of Ronchamp. "The rectilinear plan and grid expressed on the building's exterior stand in contrast to the interior spaces, which are characterized by convex and concave volumes. As one moves through the interstitial space, the intersection of curvilinear and orthogonal planes creates an experience of compression and release" (Archdaily: 2014). Therefore, the building in its architectural expression becomes the metaphor for liminality that captures the moment of transitioning between two dominant realms.

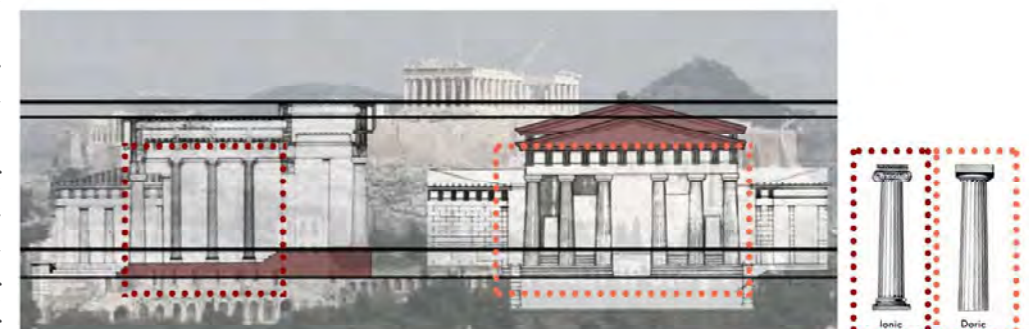


Fig. 06. Above; Elevation of the Propylaea and use of columns (Author:2018)

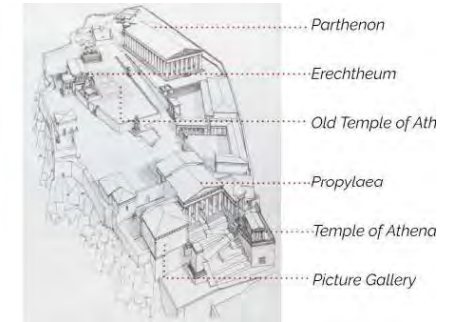


Fig. 03. Above; Entrance to the Acropolis through the winds of the



Fig. 04. Above; View of the Acropolis from the north west. The Clepsydra fountain is seen in the front.

Source: (Regueiro)

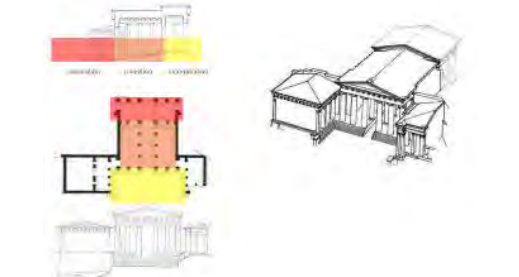


Fig. 05. Above; Liminal zones: Separation, Transition, incorporation in the plan of the Propylaea (Author:2018)

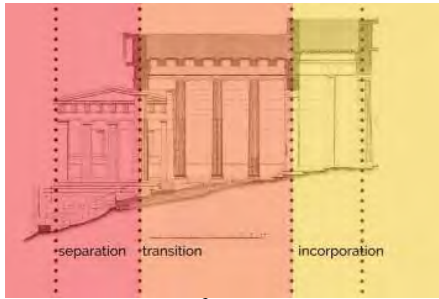


Fig. 07. Zone of Separation, transition and incorporation in the sec-



Fig. 08. Above; Doric and Ionic order in the Propylaea. (Author 2018)

h the building, similar to the route leading to the Propylaea. As a visitor to the building transitions between floors on the staircases, the visitor moves back and forth through the zone of separation (figure 10). The zone of transition or liminal state occurs once the individual have moved past the brises-soleil façade into the next space. Within this space there is a blurring between the interior spaces of the office building and outside spaces of the city, including the main assembly room on the top floor. The blurring between the exterior and interior space in the Mills Owners' Association Building creates the experience in which the occupant might question whether they are inside or outside of the building, when in fact they are within both. This space read (figure 12) as neither inside nor outside, but becomes blurred though the spatial articulation. This is achieved through architectural elements such as wall, roof and volume. The use of natural elements such as vegetation (figure 11) further contributes to the blurring between inside and outside space.

The postliminal state or zone of incorporation, are the thresholds that allow entry into the separate rooms (Figure 09 - blue), and have been designed as intimate

spaces (figure 12), as opposed to the zone of separation. In this building, the visitor is continually transitioning between these three zones, constantly blurring the threshold and occupation of the building. Through this use of threshold and transition, le Corbusier transforms a space of work and thus transforms the spatial experience of the worker. Through this understanding we see that the transition that takes place in the liminal stage is "not a mere acquisition of knowledge, but a change in being" (Turner 102). Correspondingly, in architectural space, the threshold functions to alter the consciousness of the occupant, so it is not merely an alteration of the space that is occurring.

Furthermore, though extending the atrium and seating walls (figure 13), the combination of a long seating space directly connected to the circulation space. There is a place of pause connected to a circulation route. The person sitting has its back to the atrium space, which also houses another movement route; therefore this creates a feeling of vulnerability for the person sitting. The movement route is accentuated with a series of frames that creates the idea of moving through thresholds. The east and the west façades (figure 10) of the building function as both enclosing and porous elements, depending on where the visitor is positioned, it can read as closed at times or open at times (figure 14). It is not until the assembly room The experience of Mill Owners' building never truly becomes separated or integrated, but these zones constantly occur within the transformative space of the building, due to the constant questioning whether they are inside or outside the building.

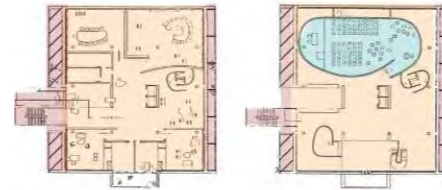


Fig. 09. Three liminal stages conceptually applied to the Mill Owner's building on ground, second and third floor plan (Author 2018)

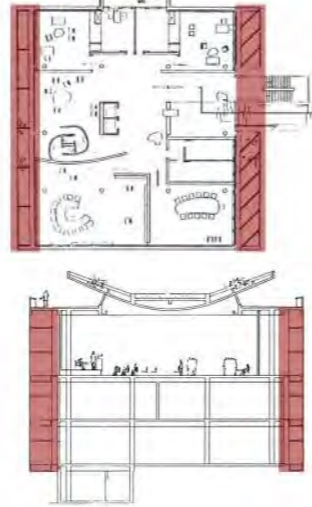


Fig. 10. Above: Mill Owners' Floor Plan and section, showing brise-soleil porous/enclosing elements (Author 2018).



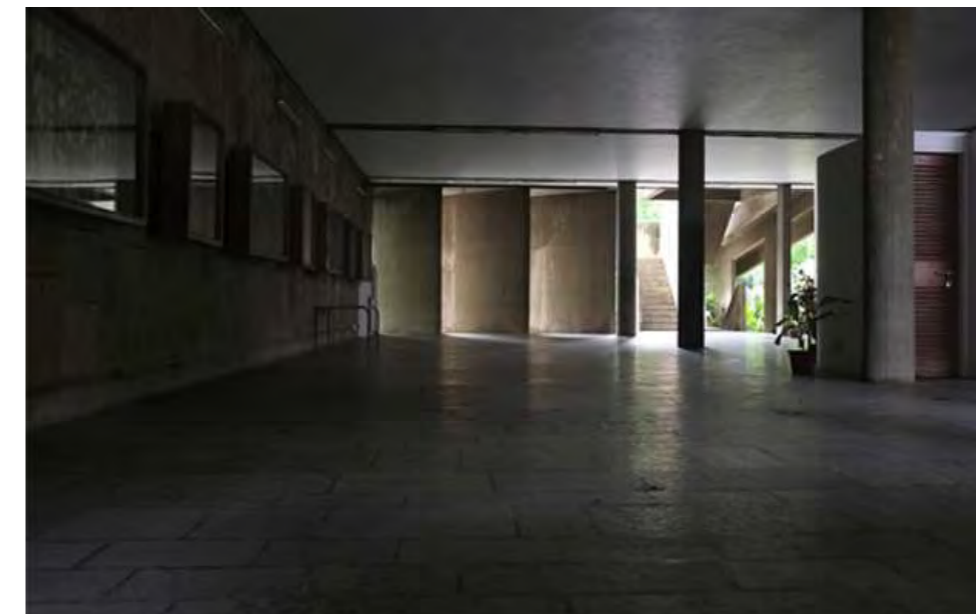
Fig. 11 Above: Photograph of Brise-soleil facade of building



Fig. 12. Above: Photograph of interior of Mill Owner's Association office building, (Source: afa-siaarchzine.com).



Fig. 13. Below (left): Photograph of interior of Mill Owners' Association office building showing 'blurred' liminal space: relationship between interior and exterior space (ArchiSHOTS 2017)



Memorial to the Murdered Jews of Europe completed in 2004

The Memorial to the Murdered Jews (figure 11) in Europe by Peter Eisenman is completed in 2004. The Holocaust Memorial is constructed of massive stone blocks (figure 12) arranged on a 19,000 square meter (204,440 square foot) plot of land between East and West Berlin. The 2,711 rectangular concrete slabs placed on a sloping stretch of land have similar lengths and widths, but various heights. Eisenman constructed the memorial through a layering of the three elements: the city grid, the typography of the site and a structured typography is memory of the deceased. He overlaid city grid to the open sites' typography and from the overlapping conditions, the monolithic concrete blocks were birthed, that created a continuously transformative space in which meaning is merged and therefore blurred. Peter Eisenman combines the elements of blurring and dissociation in this architectural design. Eisenman refers to the slabs in the plural 'steale', which have been used as an ancient architectural tool to honour the dead. The use of material representation and symbolism contributes to the ambiguity of the liminal space. The pathway between the seas of concrete slabs creates a platform for the visitors to the memorial to voyage through the labyrinth. This is another tool used in Greek mythology to create a transformative experience for the visitor, which caused confusion and disorientation (Craven, 2018). "When designing physical spaces, we are also designing, or implicitly specifying distinct experiences, emotions and mental states. In fact, as architects we are operating in the human brain and nervous system as much as in the world of matter and physical construction. I dare to make this statement as science has established that environments change our brains, and those changes in turn alter our behaviour." (Pallasmaa)

To conclude this analysis it is found that the architect utilizes symbolism through materiality to create an ambiguous spatial

one thing and at the same times another, therefore it is an ambiguous atmosphere. Anthropology gave deeper meaning to liminality by applying it to the understanding of cultural ceremonies and initiation of individuals in such communities. Therefore, liminality is seen as an approach to space making that has impact on the human experience and emotion towards a space in architecture. Sacred architecture has clear distinction between what is sacred and profane, as well as the combination of uncharacteristic elements into one space; prolonged procession into a threshold as well as creating build-up for the stages to come. Liminality in modern architecture expressed the power of materiality to express emotion of space, the alternative use of material, as well as contrasting geometry and layering of different grid types, allowing intangible to create the tangible elements in a liminal space. The design of a liminal space in architecture can be achieved through a series of processes applied at different scales, with different materials, and light quality.

A critical element of *state of liminality* in architecture is that the product never has to be final, as it is hosts a state of flux and transition. The architecture can be ever-changing, it can become kinetic, it can become alive. Within this thinking of architecture to have the ability to represent a liminal experience, it gives power to the architect to create and express their own definition of something that previously has no definition. A liminal condition becomes much less of a static experience of spaces, and much more about the living, breathing movement of space, place and context.



Fig. 15. Above: Photograph of Memorial to the Murdered Jews of Europe completed in 2004



Fig. 16. Above: Photograph of 'Steale' - 2,711 rectangular concrete slabs placed on a sloping stretch of land.

experience, furthermore, he uses Greek mythology of the labyrinth to create a feeling of disorientation for the occupant in the space. The architect experimented with repetition of similar elements that has been articulated slightly different. This contributed to a state of blurring.

It was the aim of the architect to create a sense of disorientation and loss for the user within the space. Eisenman also considered an alternative use of the material 'steale'. Typically it is used in memorial projects, and the material represents the dead, where the names of the deceased are engraved on the stone, but Eisenman, on the other hand, left the stones black, and placed the names underneath the stones. This alternative use amplifies the experience of disorientation and feeling lost in the concrete landscape.

The liminal space in each of these projects is one of ambiguity, due to the "undefined" spatial quality. The individual moving through the transformative zone can

experience constant uncertainty of where they are within the process of transitioning through the building or object in the liminal space.

CONTRIBUTION
Application of liminal rites in the architectural discourse

In holistically combining the findings of the literature review, precedent studies the common themes that contribute to the liminal spatial experience, the modes of architectural representation become evident. These common themes are developed into a set of design attributes placed into the main categories of liminal rites, namely separation, transition and integration and sub-categories of blurring, layering,

dissolution and dissociation. The following section of the article assembles the discussion into table (figure 18) that guidelines for the practical application of the conceptual theory on liminality in design as well as selecting a site (figure 19).

CONCLUSION

Liminality is a state of a ritual process. In ritual liminality is an in-between condition that has a clear starting and terminating point that must be dramatic enough to mark that transition has occurred. The character of the in-between space between the two states is peculiar and causes disorientation for the person experiencing that state. The in-between space has multiple readings, meaning it

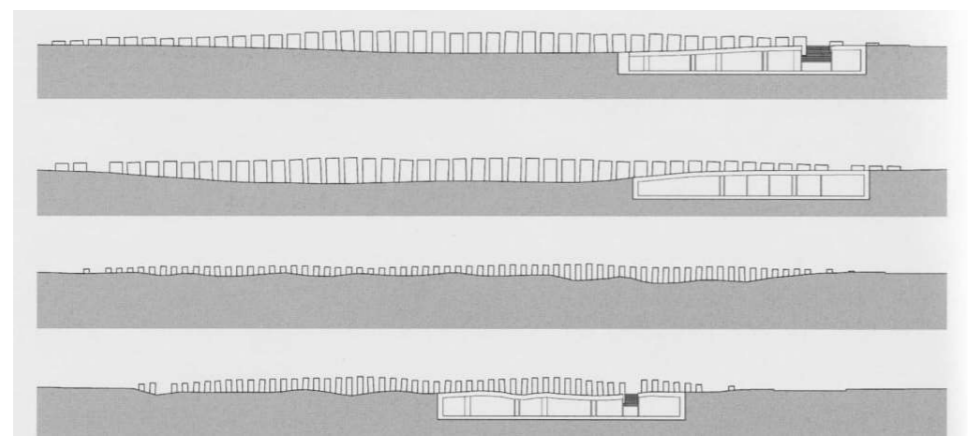


Fig. 17. Left Memorial to the Murdered Jews, Sections (Source: Flickr)



Fig. 19. Above (left): Table 3: Selecting a site in which liminality occurs (Author: 2018)

Fig 20: Below (left): Example of a liminal site (Author: 2018)

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