

# PRECEDENT STUDY

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## 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*

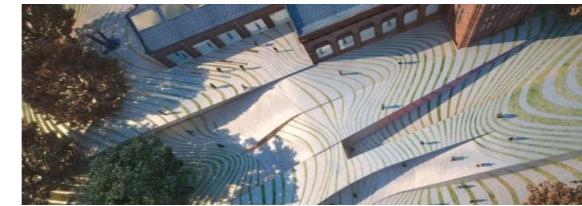


Figure 5.4: *Blurring of boundaries between landscape and architecture (Levette, 2009).*

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*



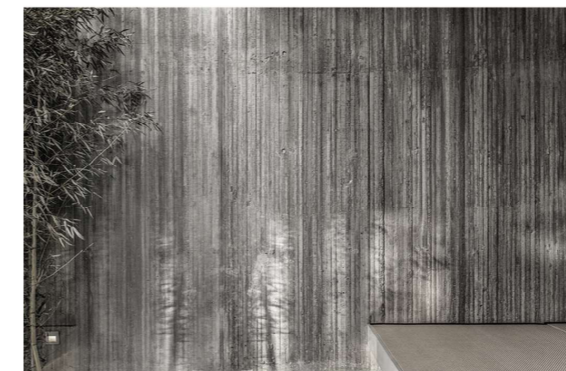
*Figure 5.8: The gradual transition from inside to outside space through the spatial organization of the interior environment (Archdaily: 2017).*

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.)

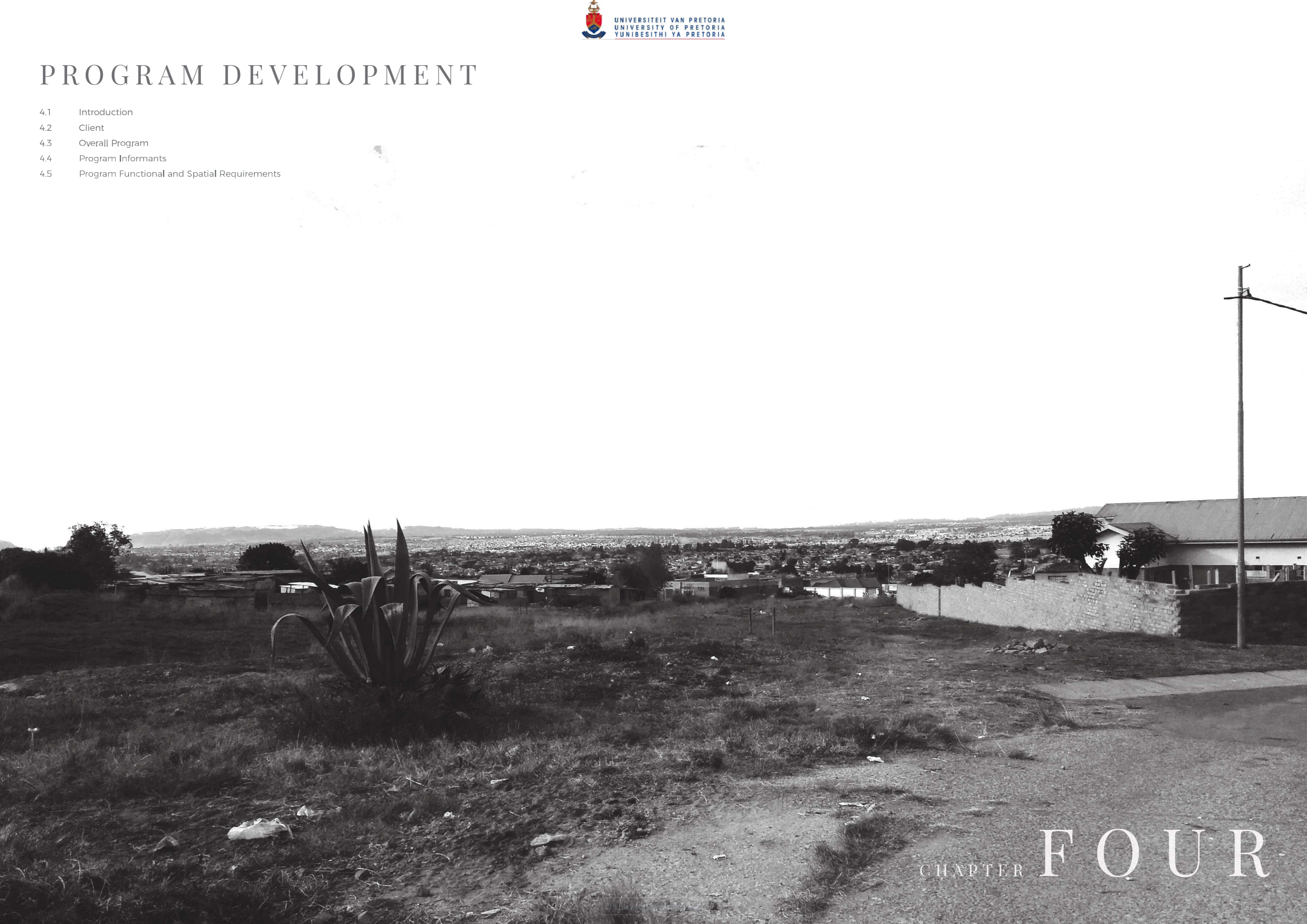
The threshold between landscape and architecture can be captured through the three modes of contrast, merger and ‘reciprocity’.

- 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





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*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:

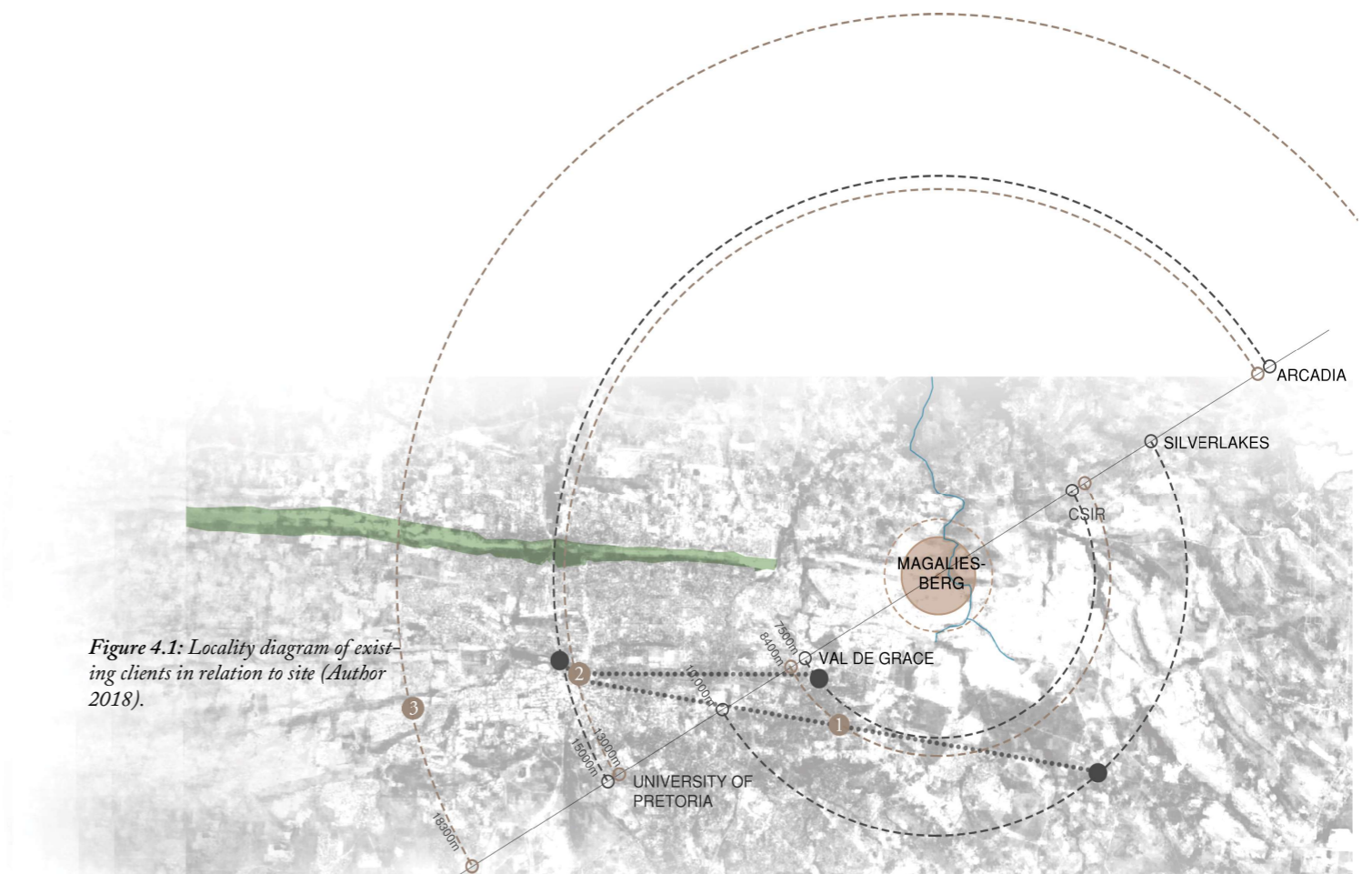


Figure 4.1: Locality diagram of existing clients in relation to site (Author 2018).

## 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.

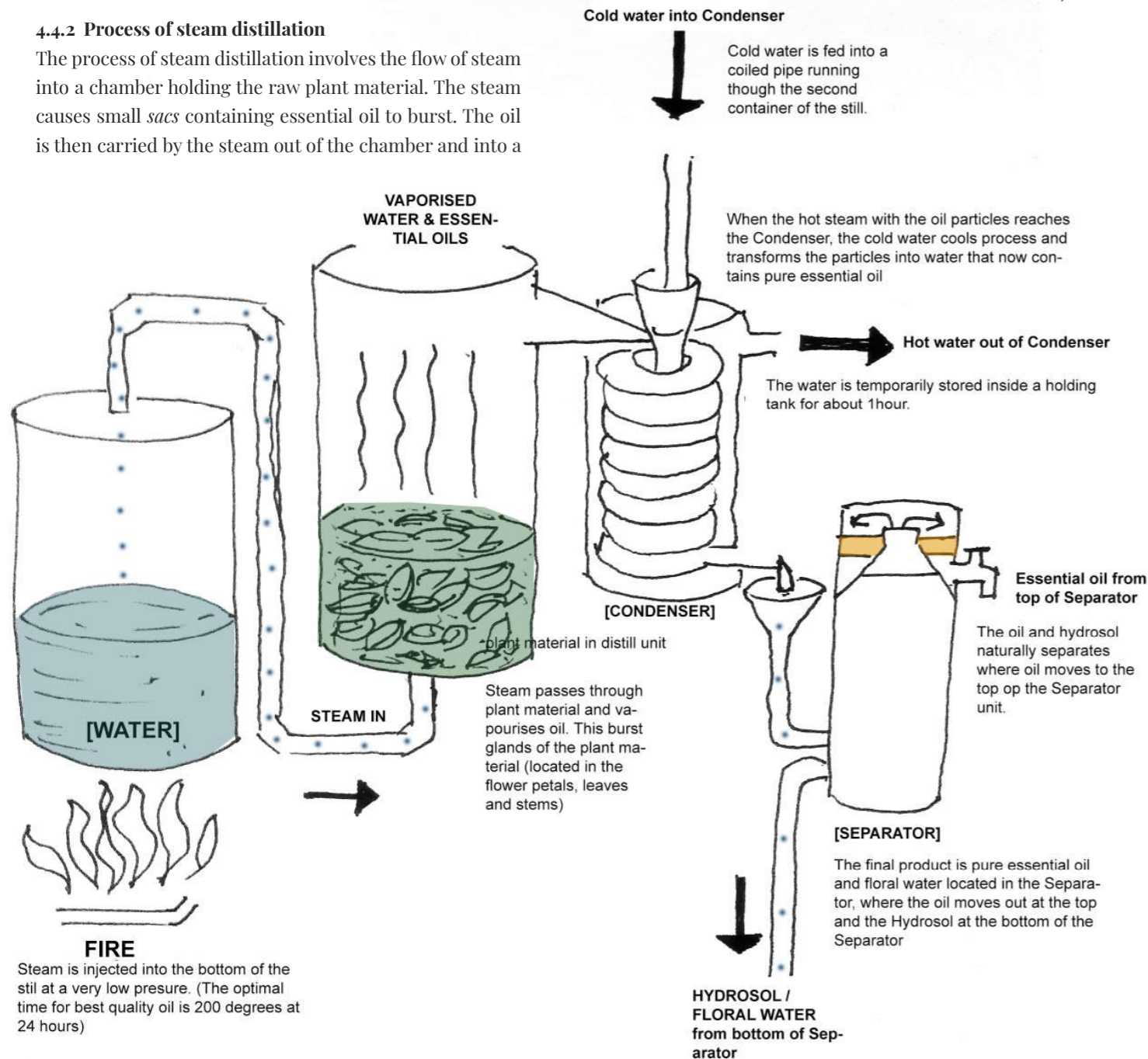
chilled condenser, where the steam once again becomes water. The oil and water are then separated; the water referred to as a 'hydrosol', can be retained as it will have some of the plant essences. {ADD REF}

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) ±172m<sup>2</sup>  
Design Assumptions (SANS 10400-XA: 2011)

#### > RECEPTION AND ADMINISTRATION

Waiting space, Reception counter, Filing

(Neufert 2000:) ±15m<sup>2</sup>  
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) ±15m<sup>2</sup>  
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"> <li>Wet service - large washing basins with running water</li> <li>Heating for drying process, requires direct controlled exposure to natural daylight for heating purposes.</li> <li>Warm Cupboards with canvas shelves for drying sensitive plant species</li> <li>Large clear floor surface areas for drying large amounts of flowers, requires easy drainage and cleaning.</li> <li>Link to service route for deliveries</li> </ul>	<ul style="list-style-type: none"> <li>double volume space</li> <li>controlled exposure to natural daylight</li> <li>daylight</li> <li>controlled natural ventilation</li> <li>direct connection to hydrophonic greenhouses</li> <li>multi-level space</li> <li>connection to public area</li> </ul>
 <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"> <li>Main Water and storage tanks</li> <li>Industrial floor that can be easily washed</li> <li>Water storage room that house for steam chamber.</li> <li>link to the back of house service passage</li> </ul>	<ul style="list-style-type: none"> <li>Enough head Height for the distillation equipment</li> <li>Well ventilated space, natural ventilation ideally</li> <li>Natural daylight into space</li> <li>Connection to visitor viewing passage</li> </ul>
 <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"> <li>Storage shelves</li> <li>Natural ventilation</li> <li>No contact to natural sunlight</li> </ul>	
 <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"> <li>Connection to essential oil</li> <li>Cooling unit</li> <li>Small heat source</li> <li>Single volume space</li> <li>Open plan as multi-functional workshop space</li> <li>Natural Ventilation</li> <li>Extraction van</li> <li>Link to essential oil retail space</li> <li>Soap curing space (temporary storage 4 weeks curing)</li> </ul>	<ul style="list-style-type: none"> <li>Workshop table</li> <li>- Equipment and chemical storage</li> </ul>

SPACE	DESCRIPTION	FUNCTIONAL REQUIREMENTS	SPATIAL REQUIREMENTS
 <p>Scent library and passage</p>	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"> <li>• Ventilation</li> <li>• Indirect natural light</li> <li>• Display shelves</li> </ul>	<p>Connection with the market and retail space. Link to the bottling service passage.</p>
 <p>Organic kitchen and restaurant</p>	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"> <li>• Connection to service passage</li> <li>• Wash basin and sinks</li> <li>• Access to public space</li> </ul>	<p>Connection to restaurant seating space View from public space Natural ventilation Natural daylight</p>
 <p>Market and retail space</p>	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"> <li>• Storage shelves</li> <li>• Climatic control</li> <li>• Direct access from service route</li> <li>• Direct access from soap workshop space</li> </ul>	- Indirect sunlight
 <p>Hydroponic greenhouse</p>	The greenhouse	<ul style="list-style-type: none"> <li>• rainwater catchment</li> <li>• Hydroponic nutrient tank / reservoir</li> <li>• Overhead rainwater cistern with integrated natural filter system with layers of gravel, sand, charcoal.</li> <li>• Evaporative coolers</li> <li>• Irrigation</li> <li>• Link/ access to water tower</li> </ul>	<p>+ vertical growth + box planters</p>

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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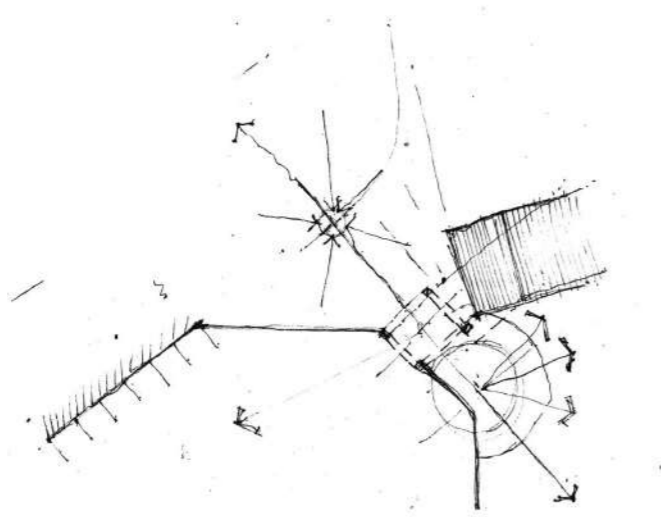


Figure: 6. 1: Threshold concept (Author 2018)

...

*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 ]

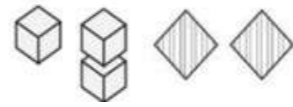
The adaptive reuse of a building considers the most important and meaningful factor in the design, that is of course, the original building, and its establishment of a relationship between the old and the new (Brookner and Stone 2004:78). This relationship can be established according to the three categories 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.*

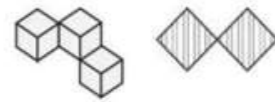
no contact - spacial tention



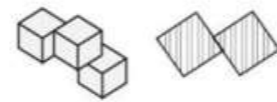
**[i] INSTALLATION**

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



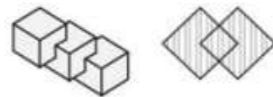
surface to surface contact



**[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:*

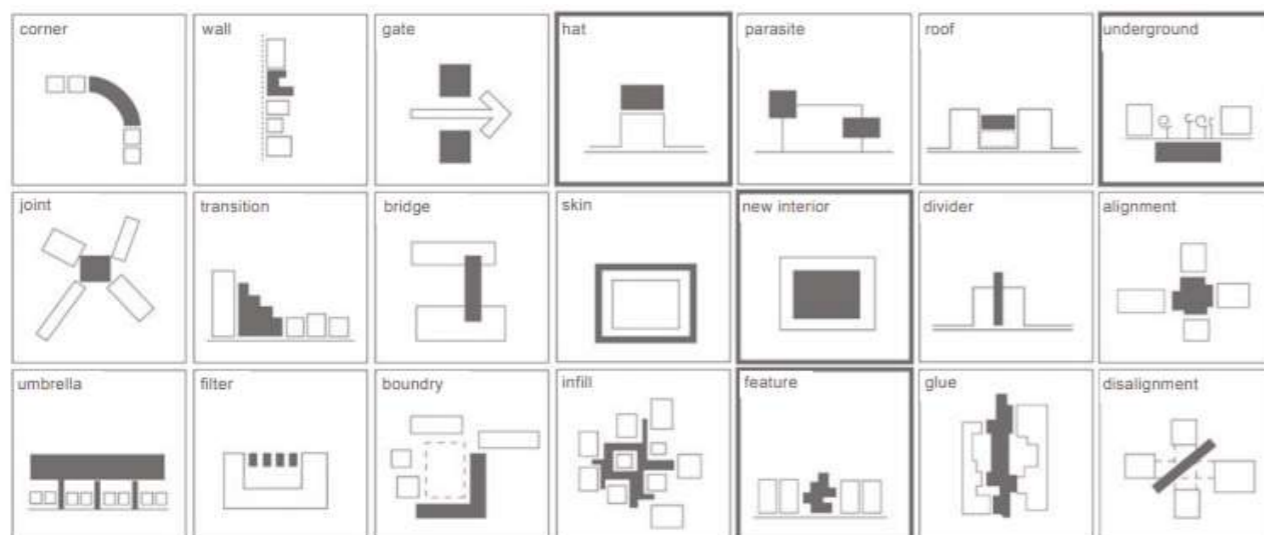


Figure 6.3: Diagrams of different intervention types (Gewirtzman, 2016).

**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.

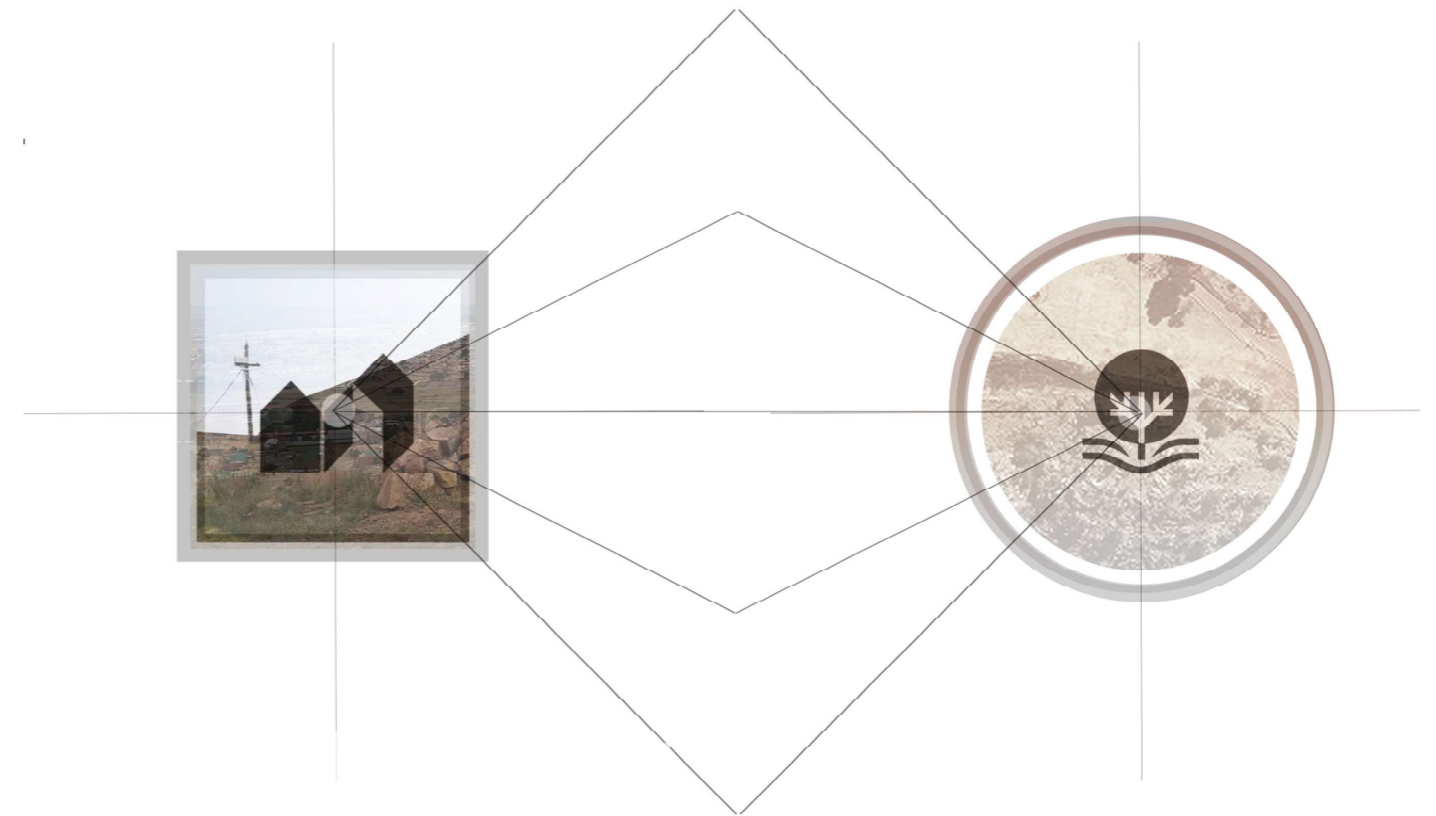


Figure 6.4: Harassing / connecting between opposing states (Author 2018).

6.4  
INSTALLATION / INSERTION  
Connection  
Iteration 1

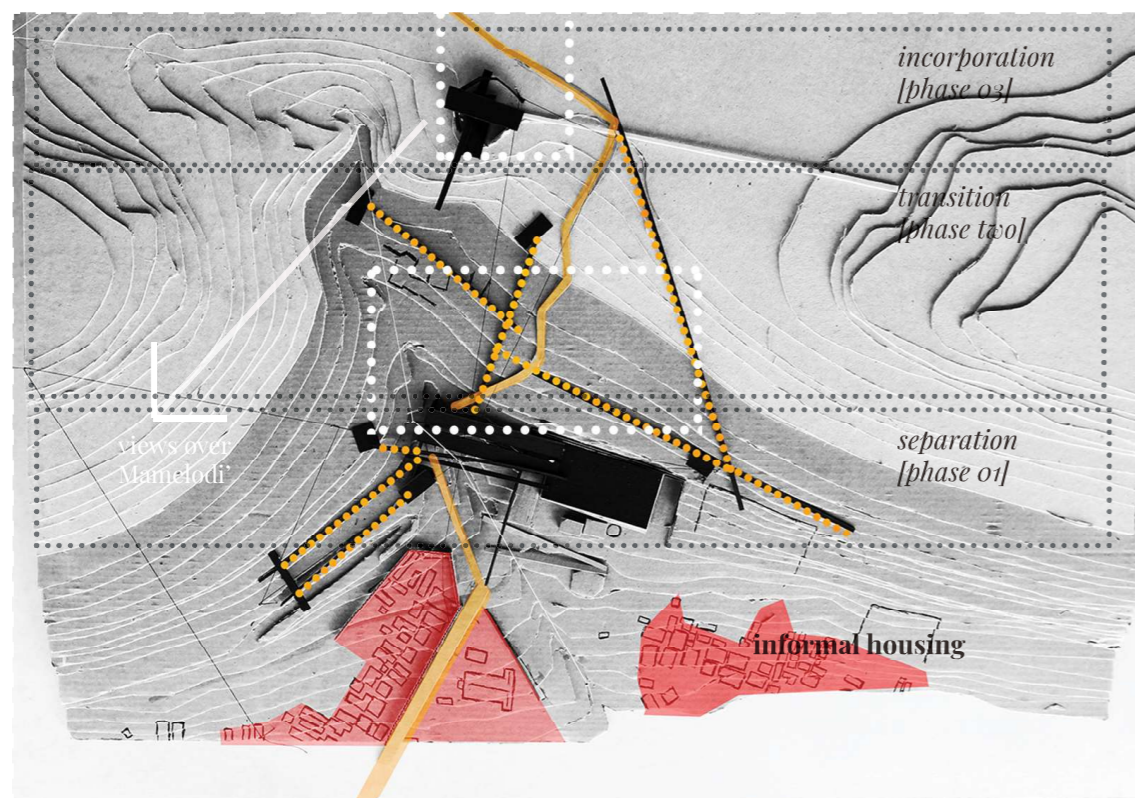
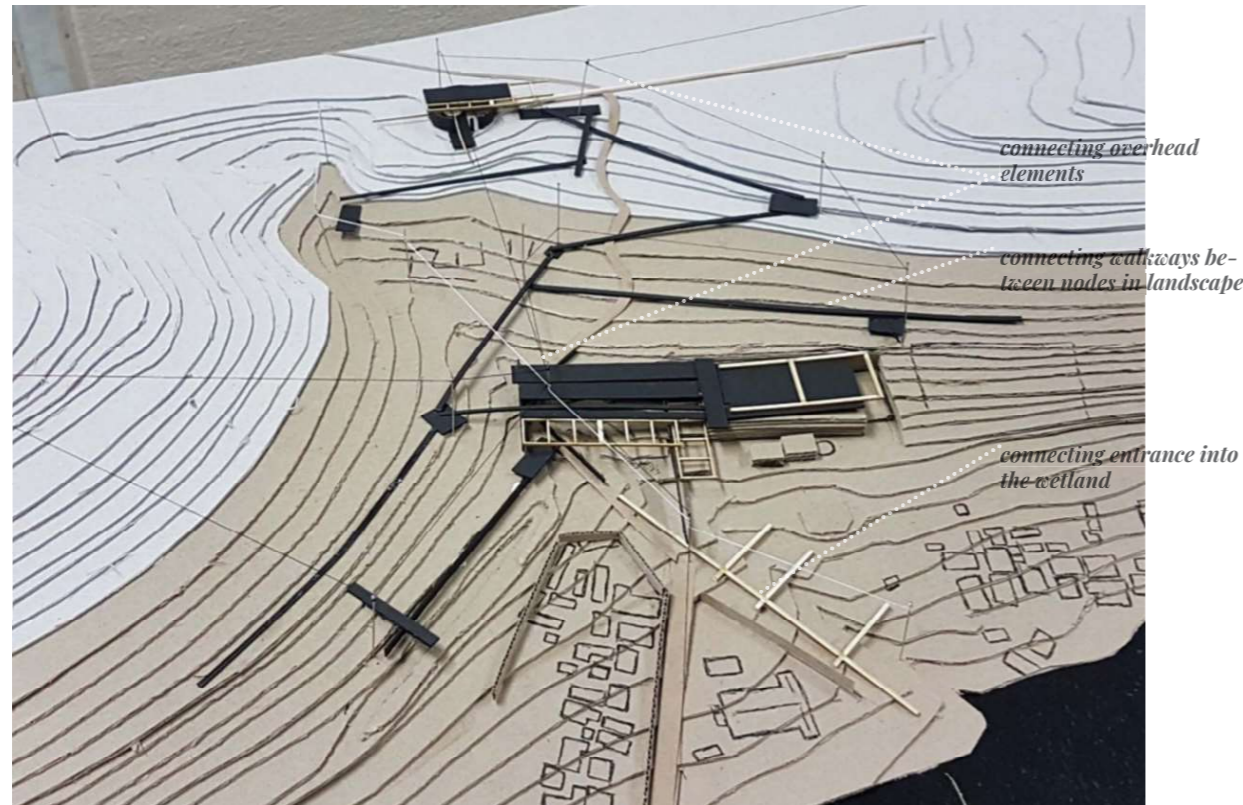


Figure 6.5: Photograph of Conceptual Model for March Crit: Series of smaller interventions along the route and within the landscape (Author 2018)

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.

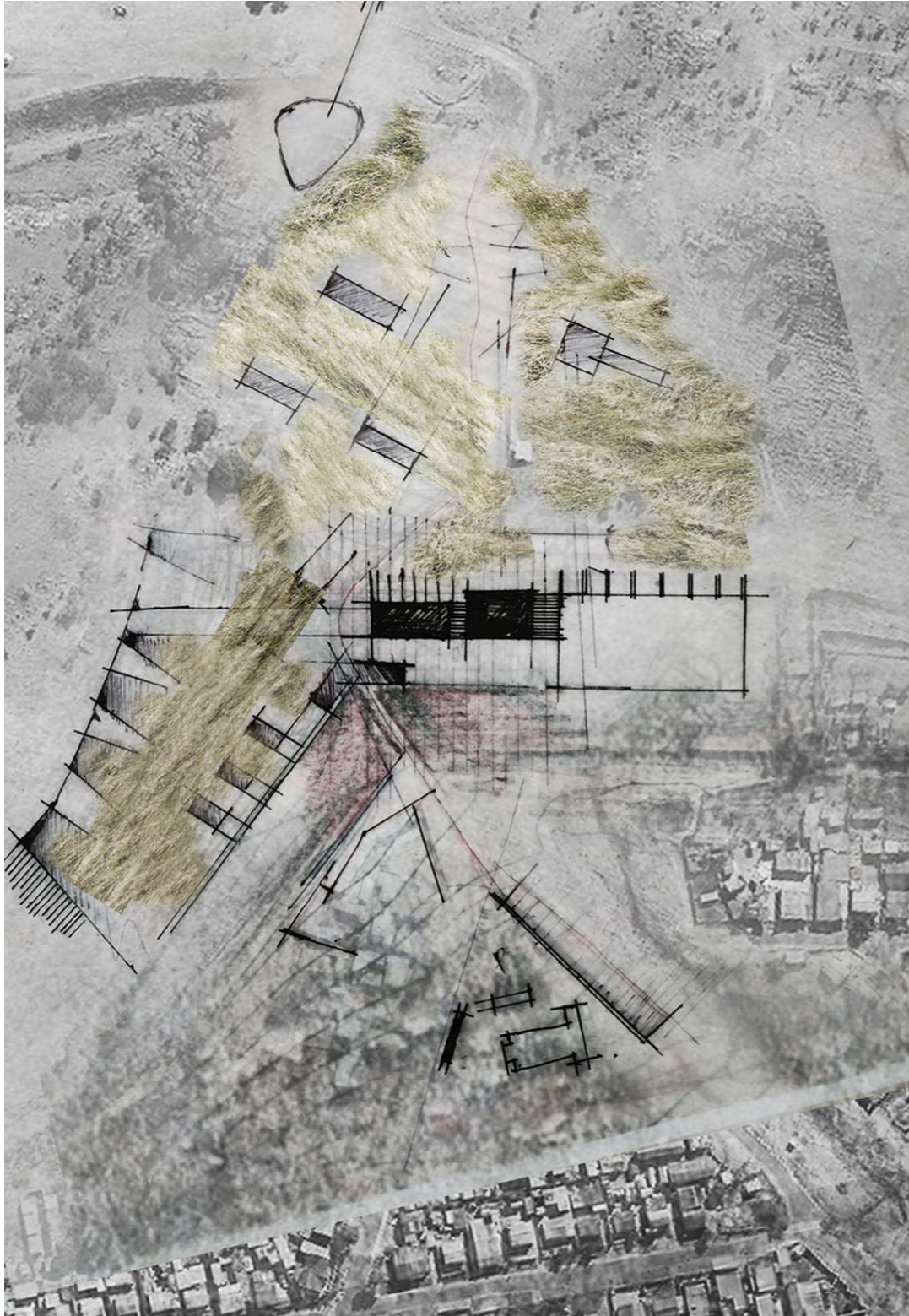


Figure 6.7: Collage of the Conceptual Model 1 development (Author 2018)

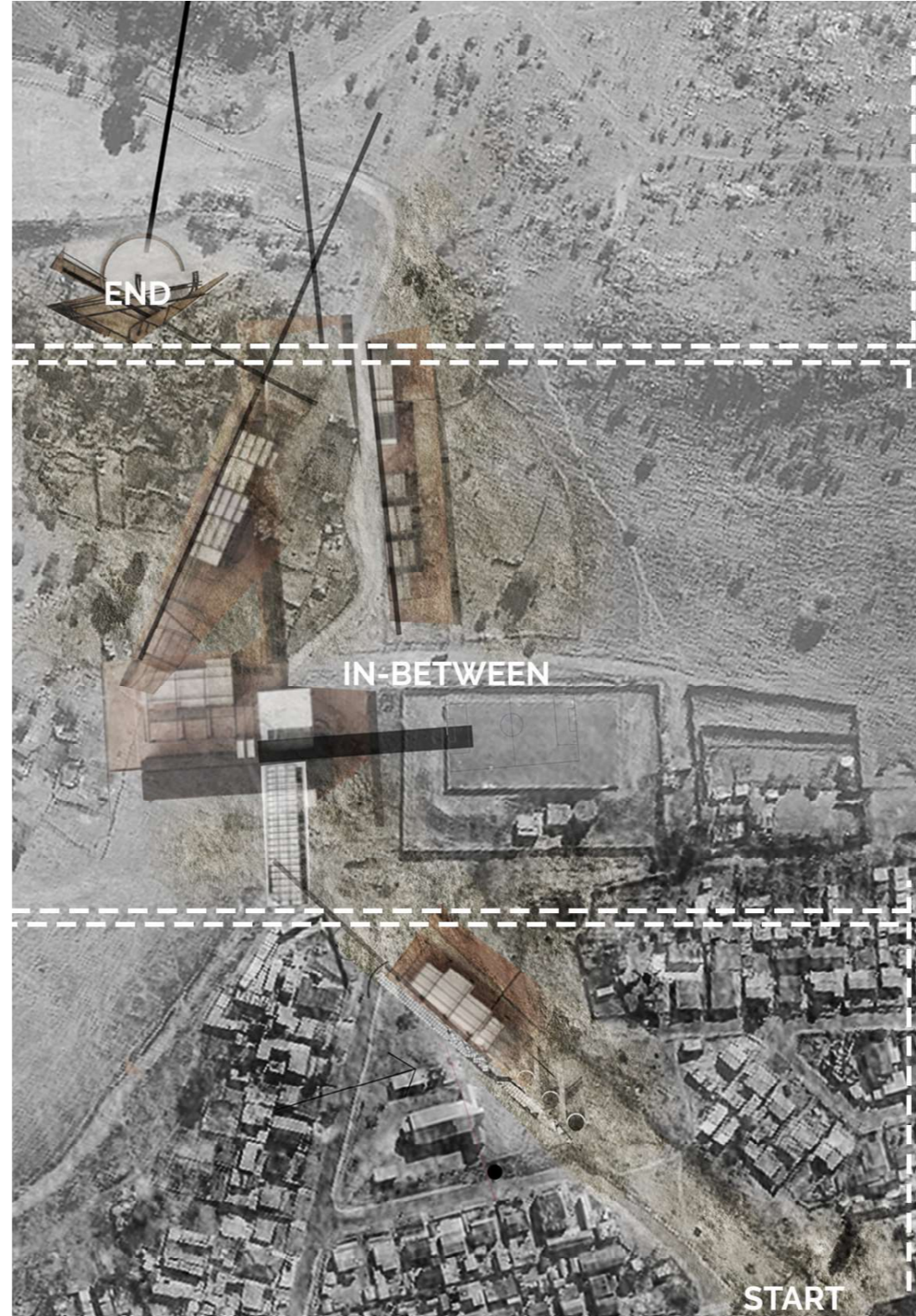
> Reflection

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).

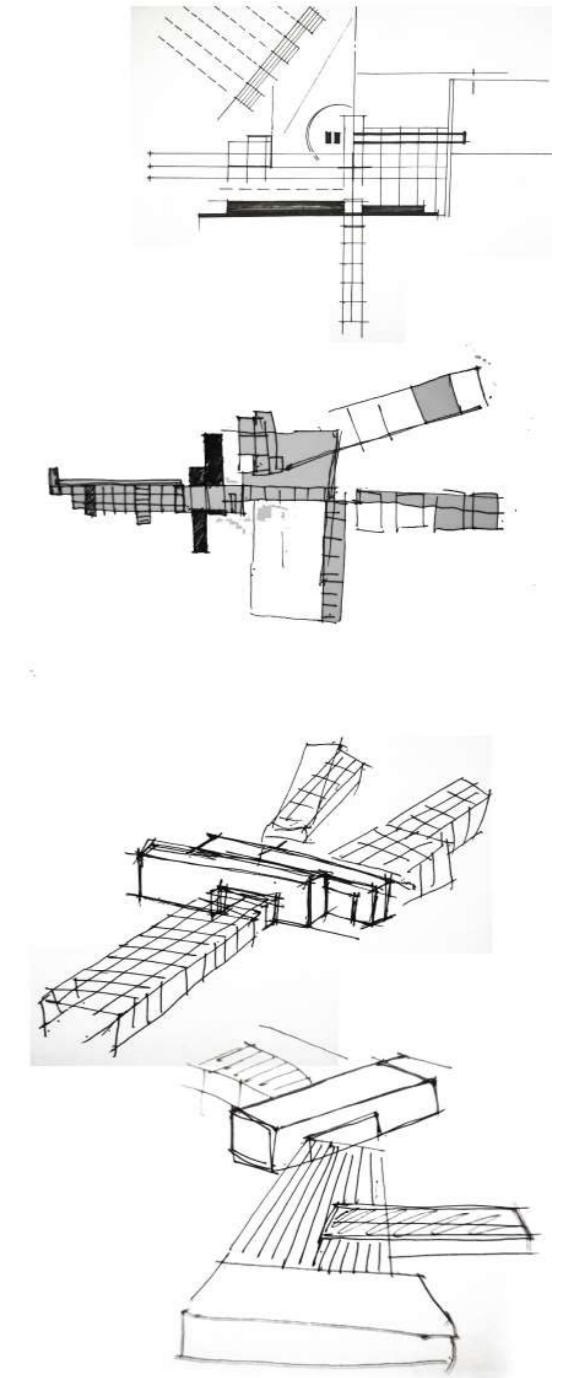
**Figure 6.8:**  
*(Below) Conceptual Exploration of different approaches to the site and relationship between old and existing structure (Author 2018).*



**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 preliminary 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.

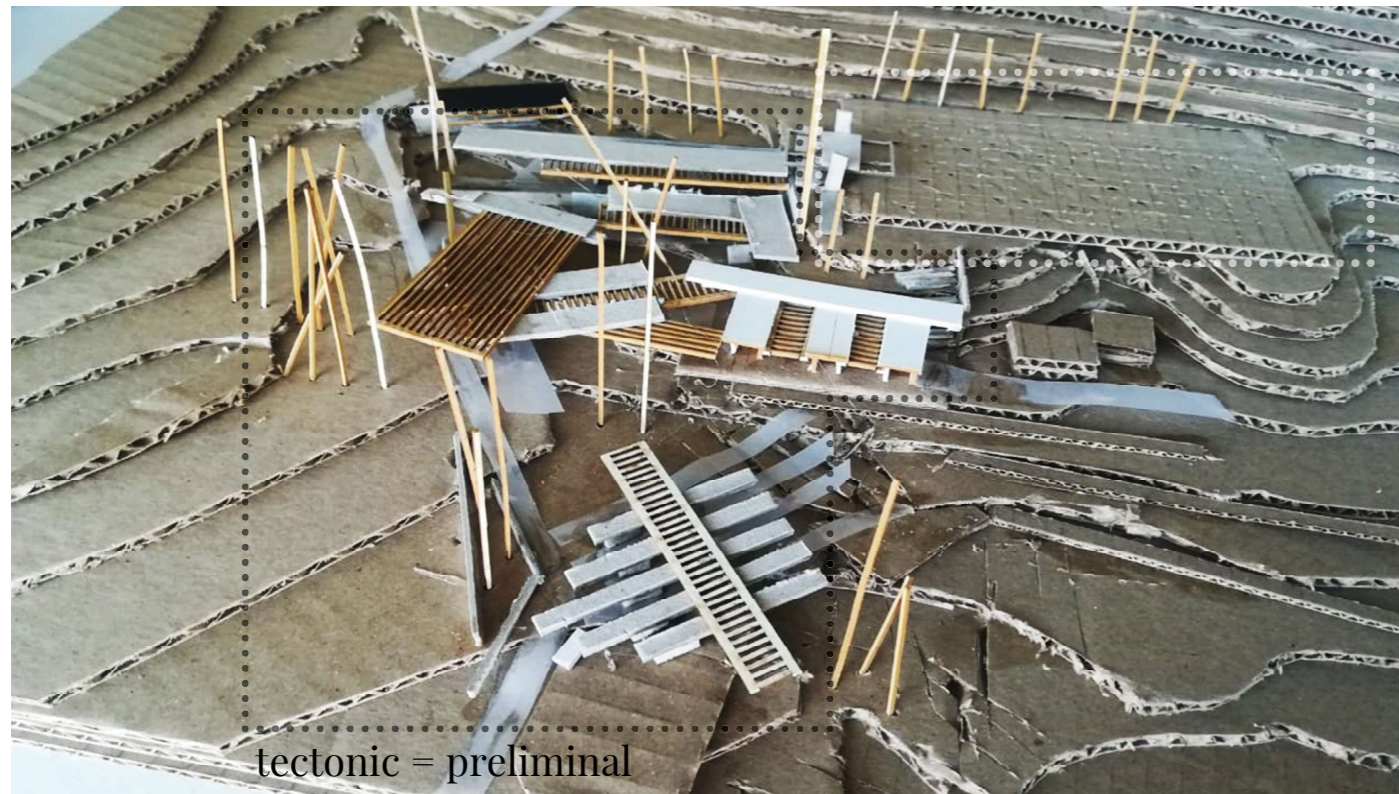


Figure 6.11: Photograph Collage of Conceptual Model for (Author 2018)

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 through 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).

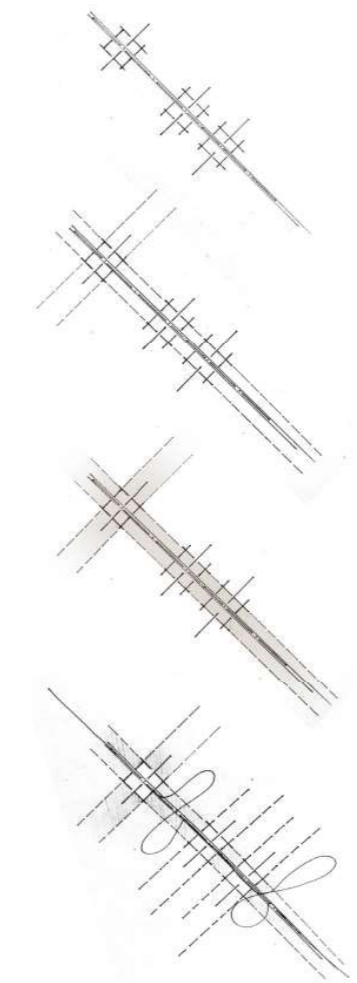
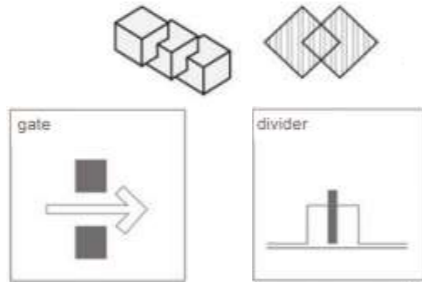


Figure 6.13: Transition through thresholds (Author 2018)



6.7  
**INTERVENTION**  
Divider + gate  
*Iteration 3*

interwined volumes

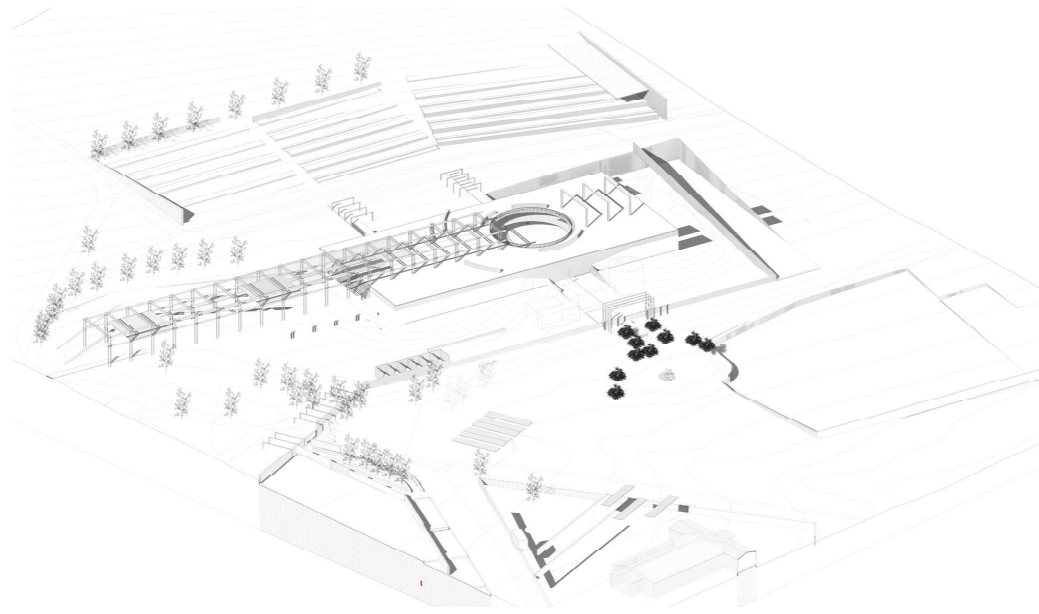


**> ACCESS**

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*

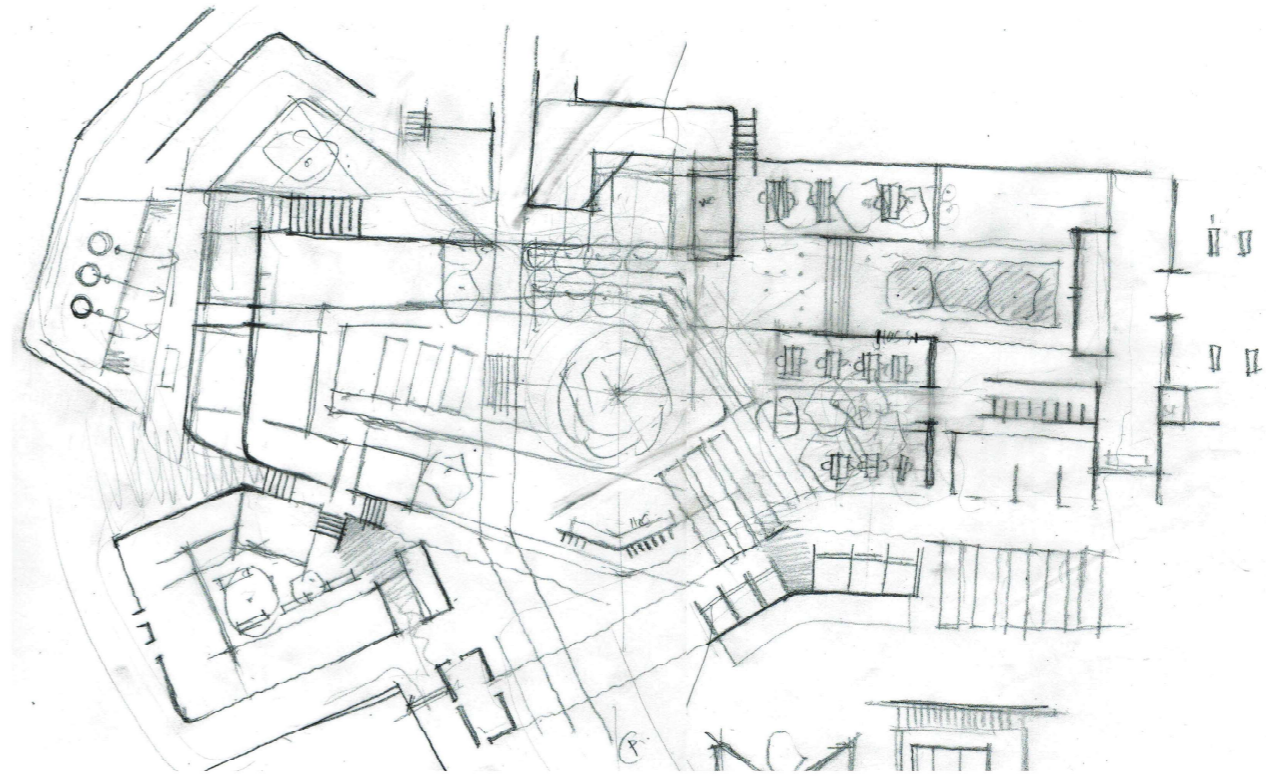


Figure 6.15: Sketch plan development  
Insertion: Organic arrangement to contrast with existing geometry (Author 2018)

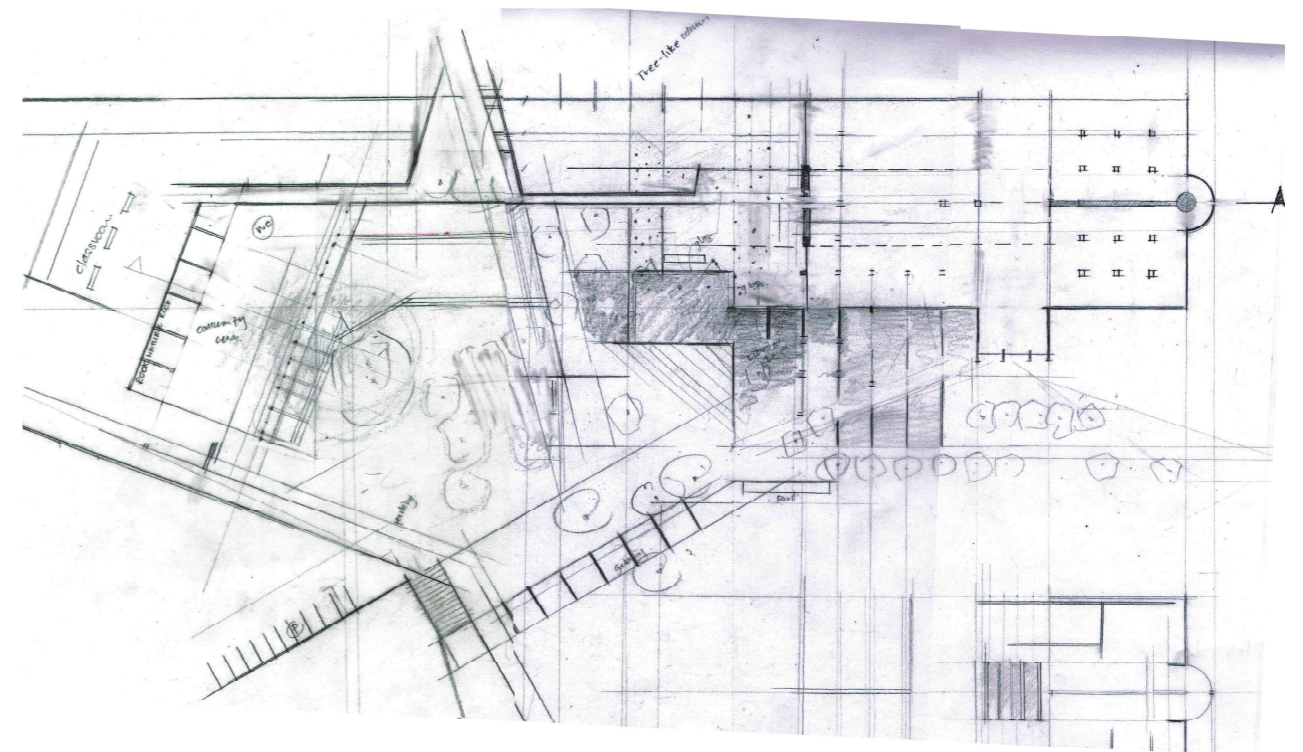


Figure 6.16: Sketch plan development  
Insertion: Rigid arrangement to synergise with existing geometry (Author 2018)

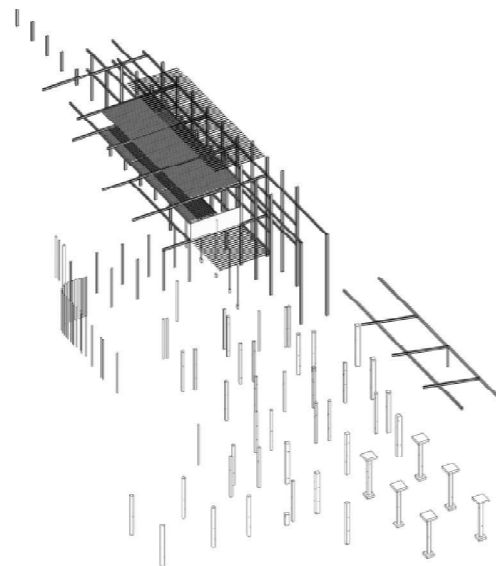
6.8  
**INTERVENTION**  
Divider + gate  
*Iteration 5.1*



3 Dimensional projection



3 Dimensional projection

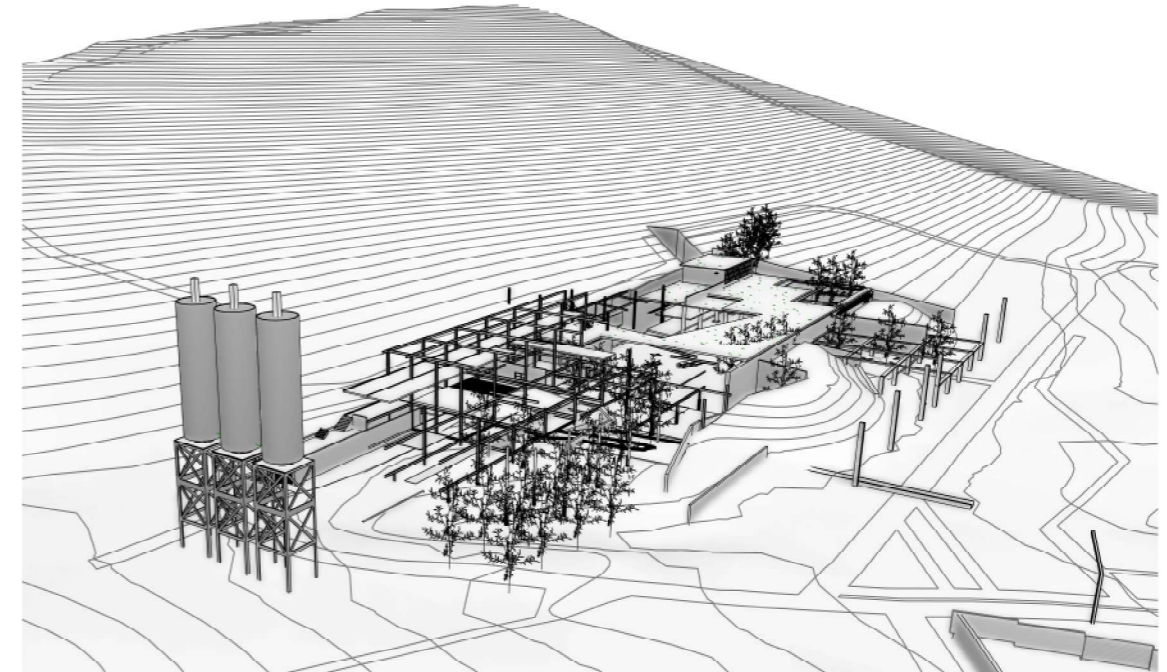


Axonometric projection

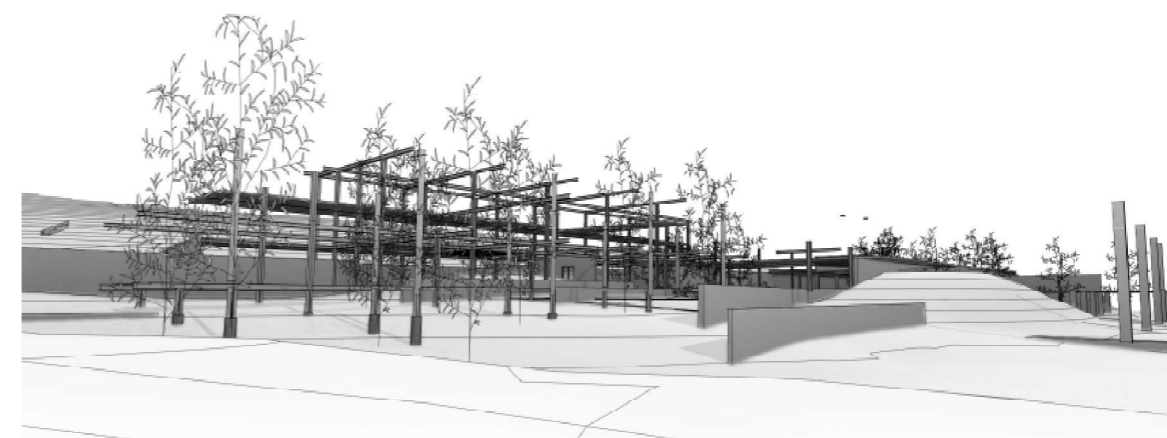
Figure 6.17: Collage of Iteration 5.1 (Author 2018)

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.

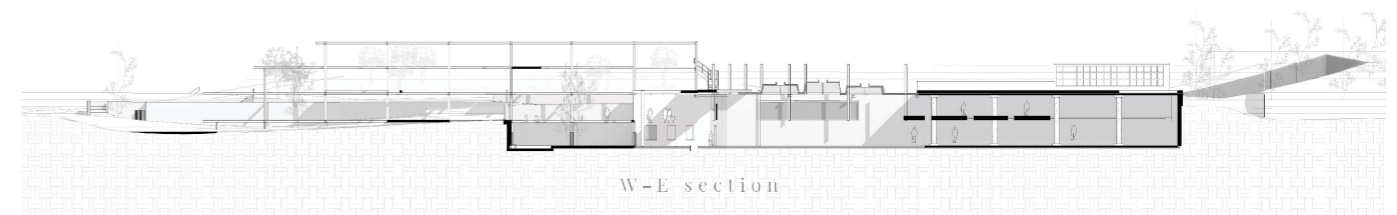
**INTERVENTION**  
Divider + gate  
*Iteration 5.2*



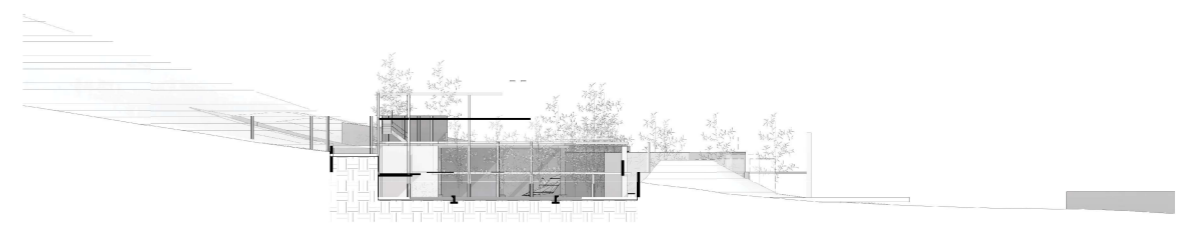
3 Dimensional projection



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

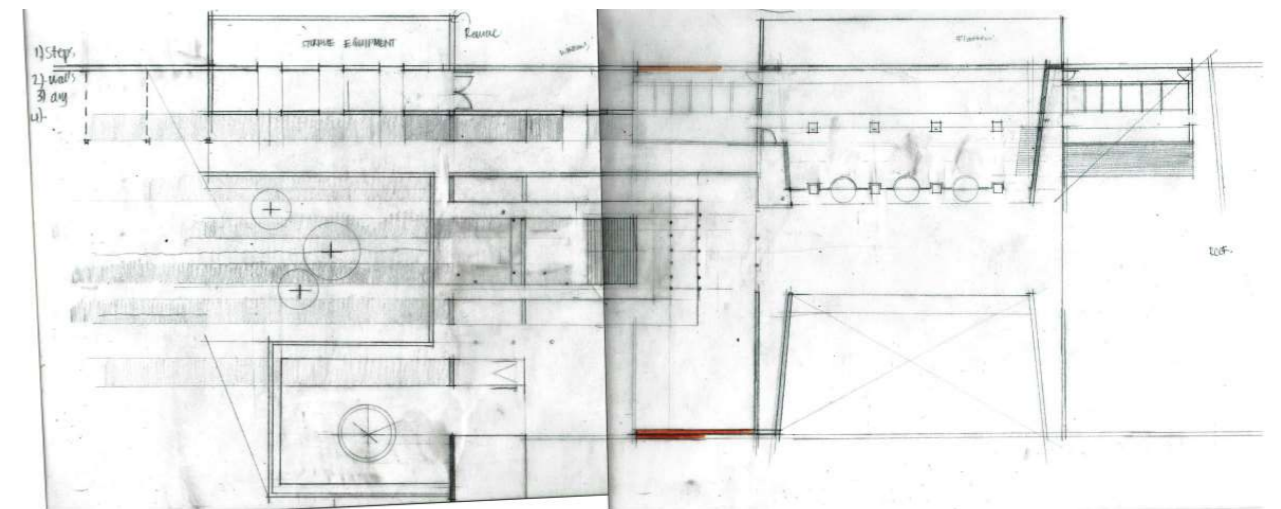
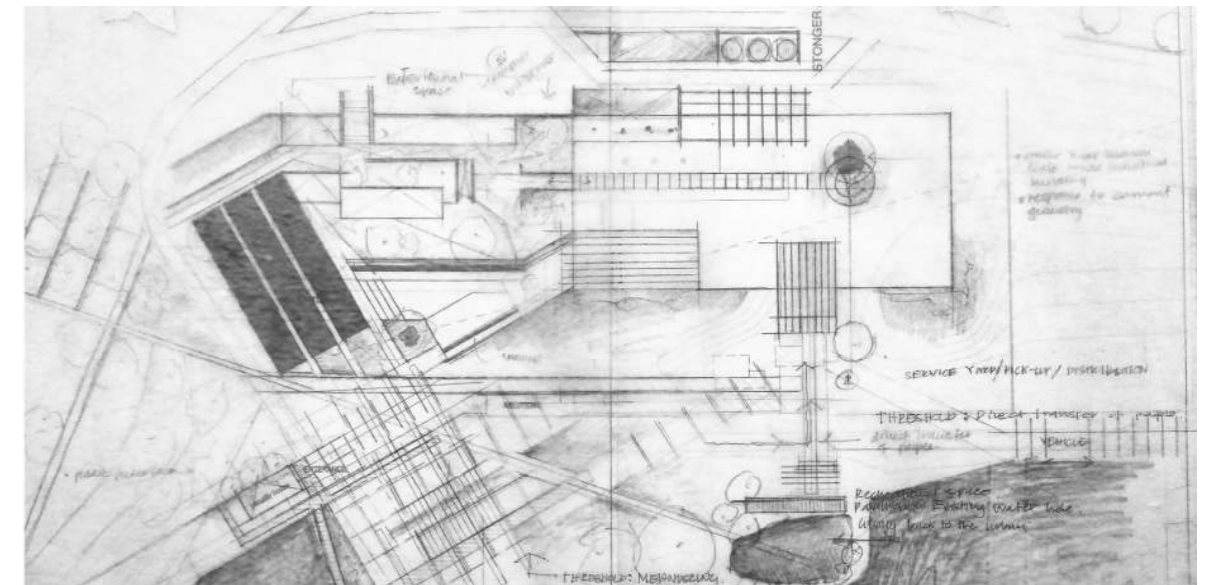
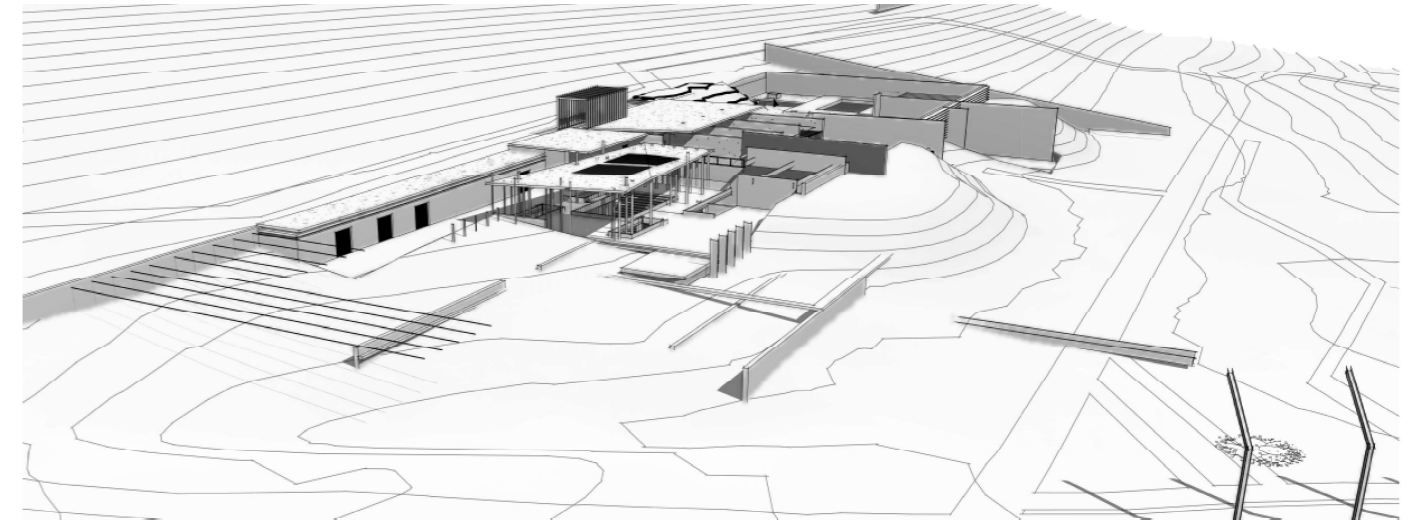


Figure 6.19: Conceptual Exploration through clay art of the site as intersection (Author 2018)

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

6.6

INTERVENTION

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 through 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)

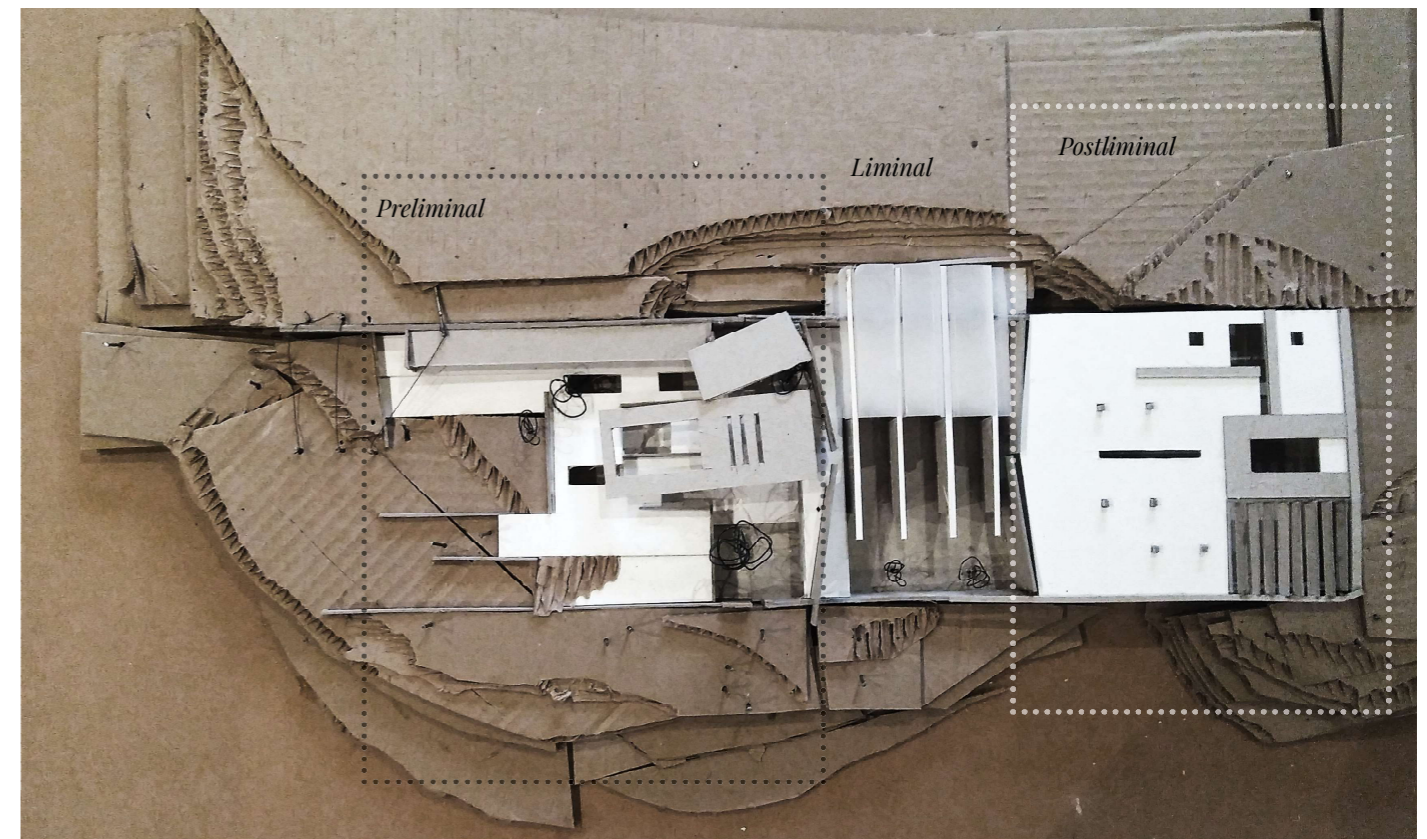
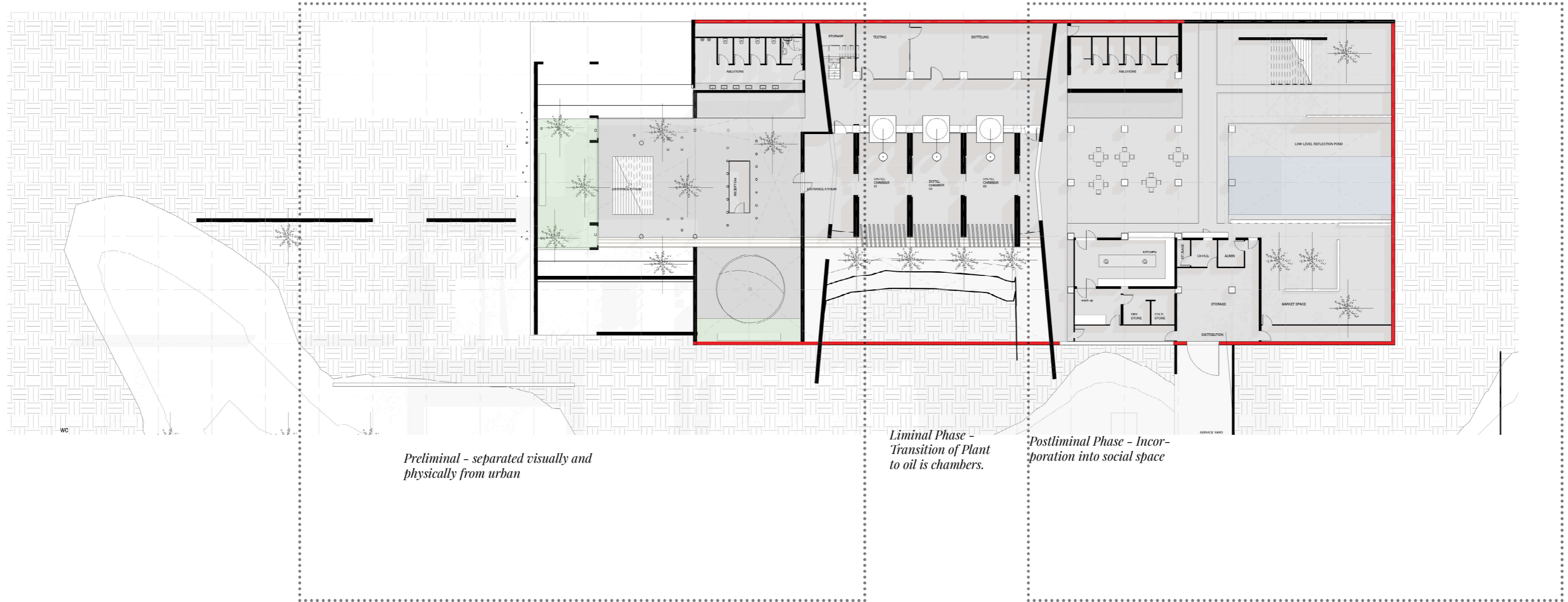
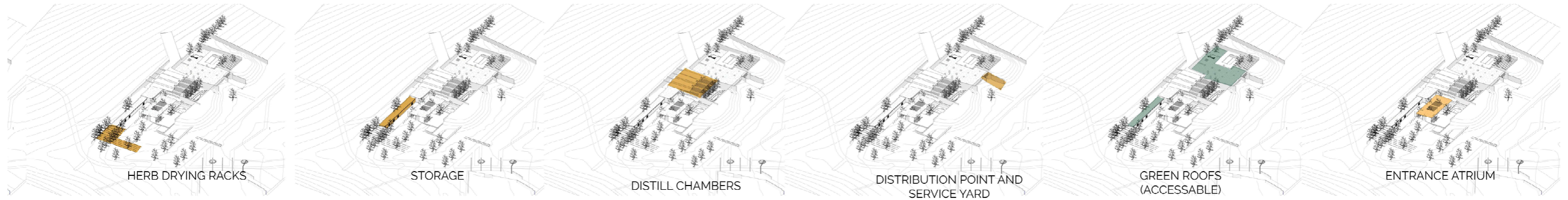
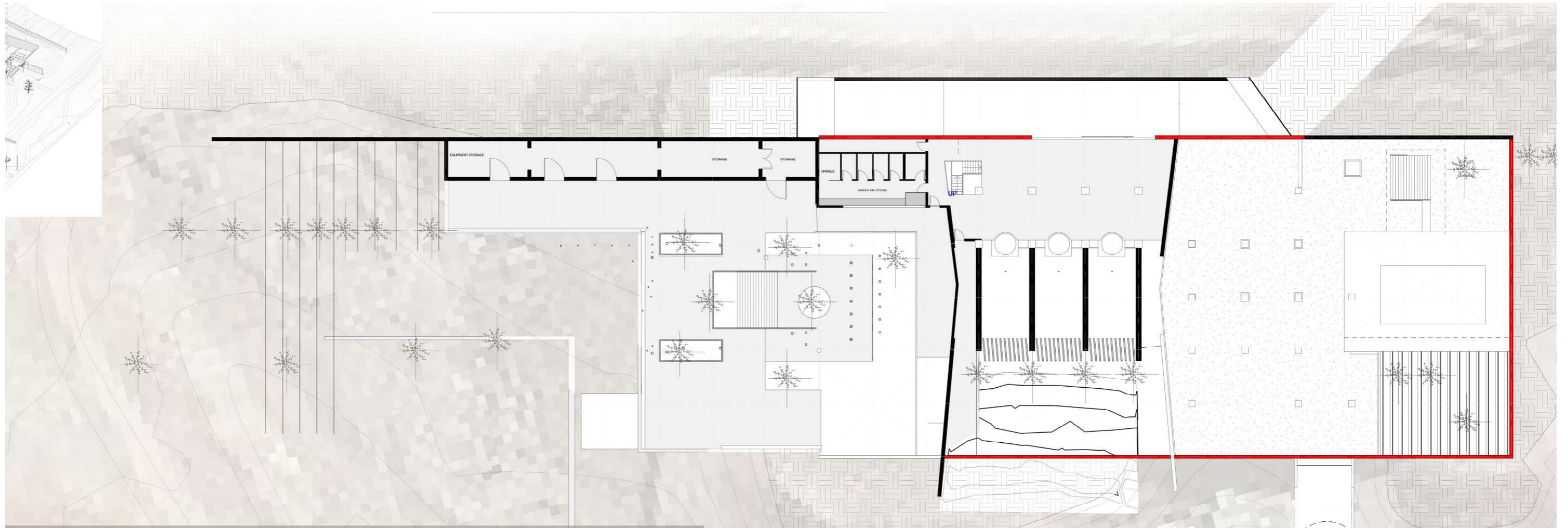
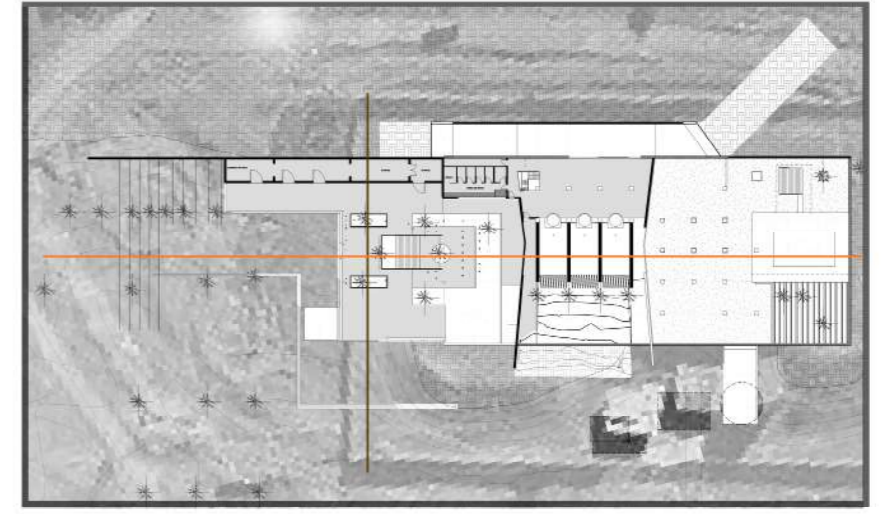
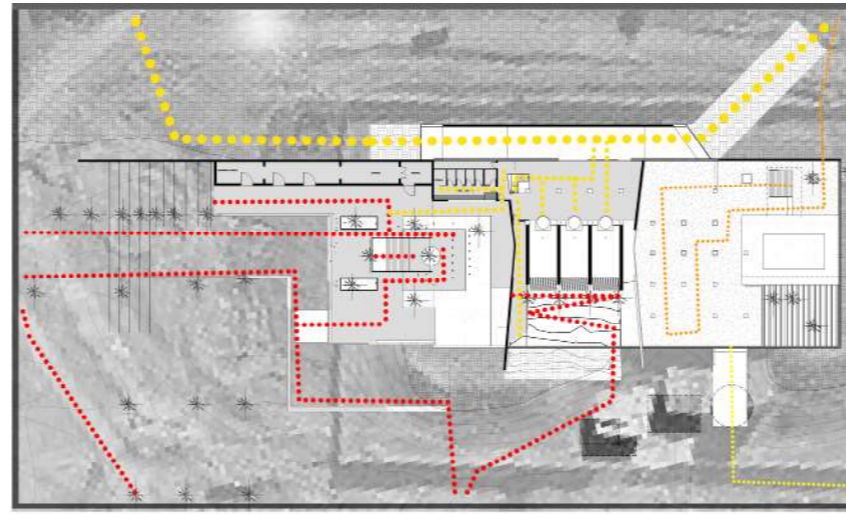
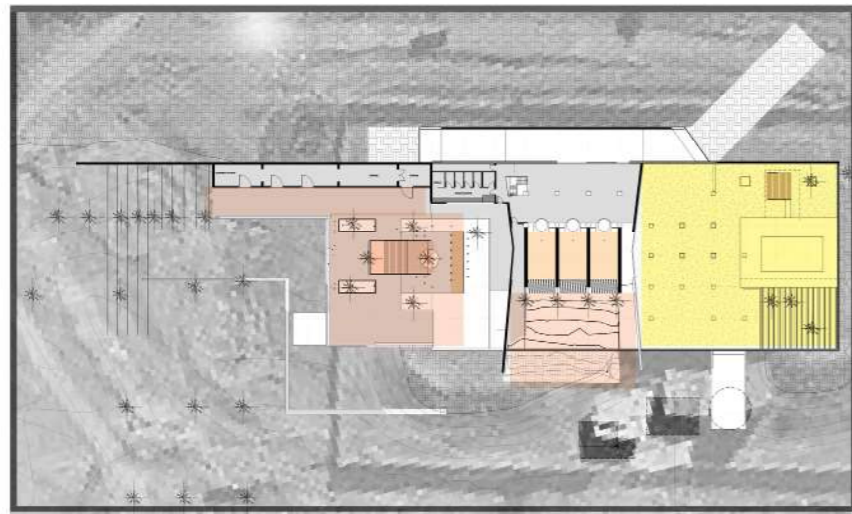
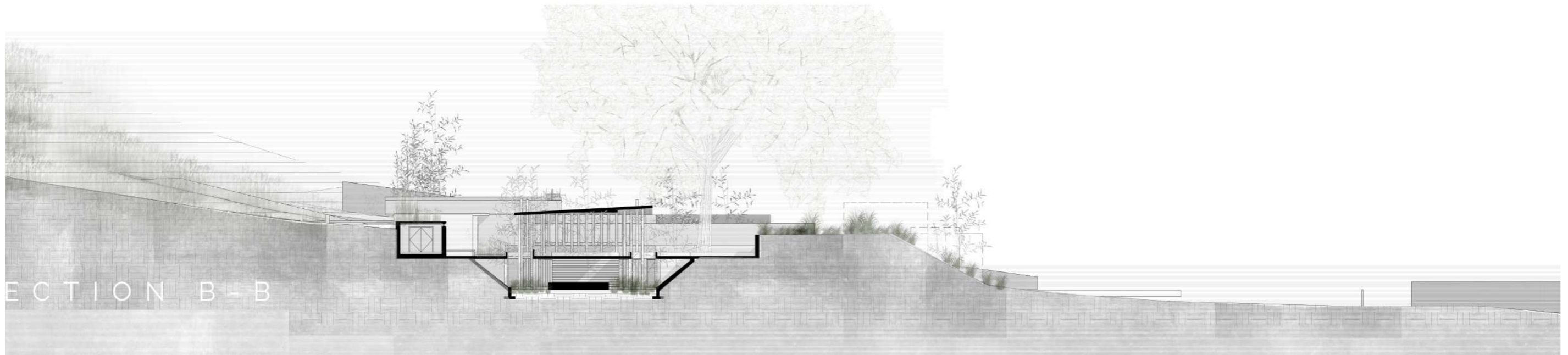


Figure 6.22: Photograph of June Crit Model (Author 2018)







> **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.

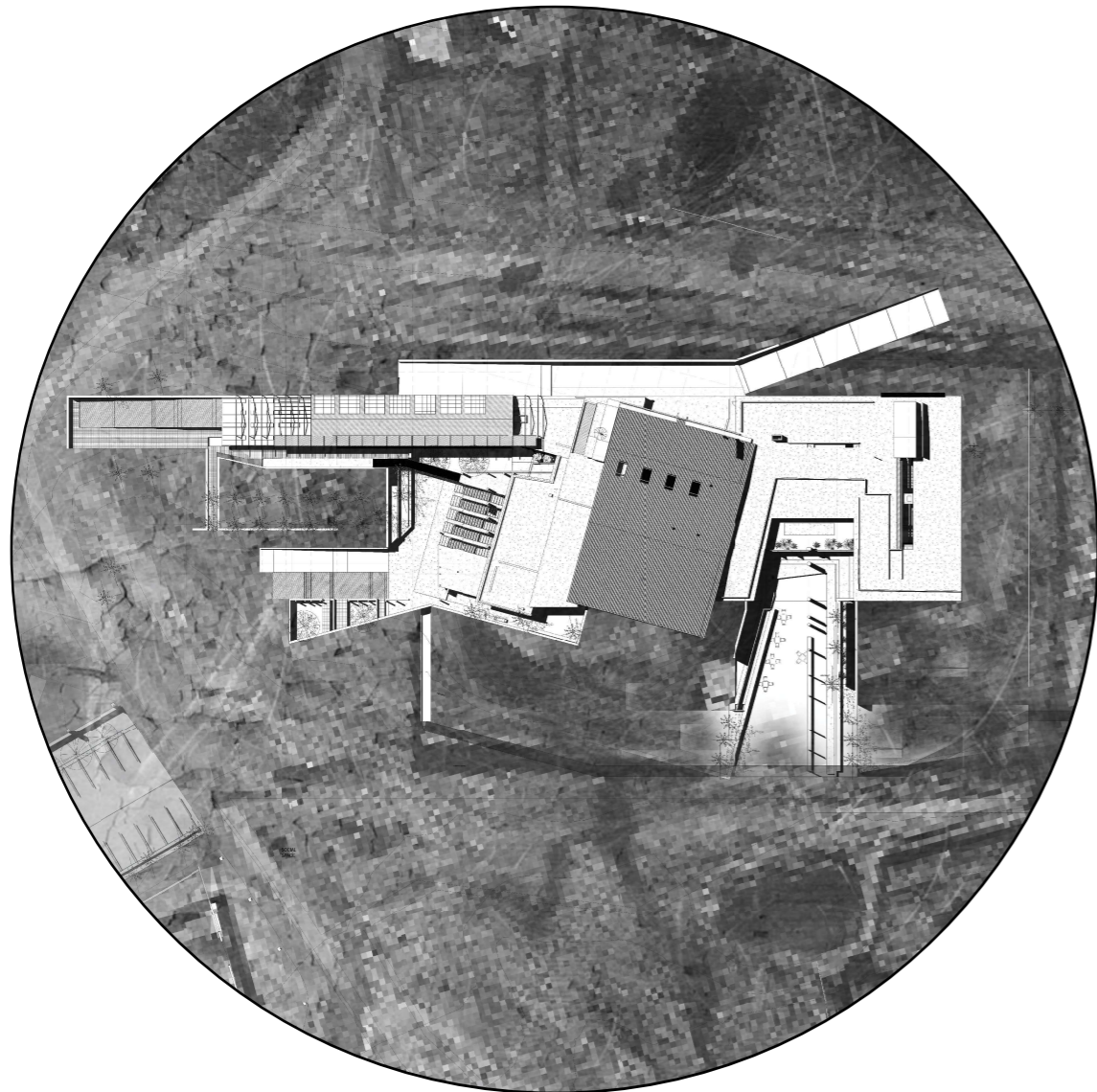
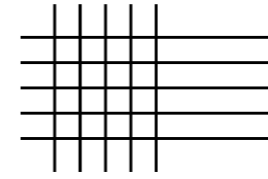
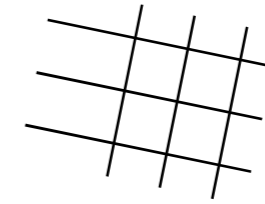


Figure 6.26: Site Plan Design Iteration 7 (Author: 2018)

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

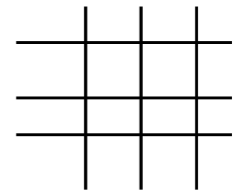


Figure 6.27: Diagram illustrating the concept of change of the existing grid (right) to 15 degrees towards the east (mid) and eventually taking on a smaller grid (left) (Author: 2018).

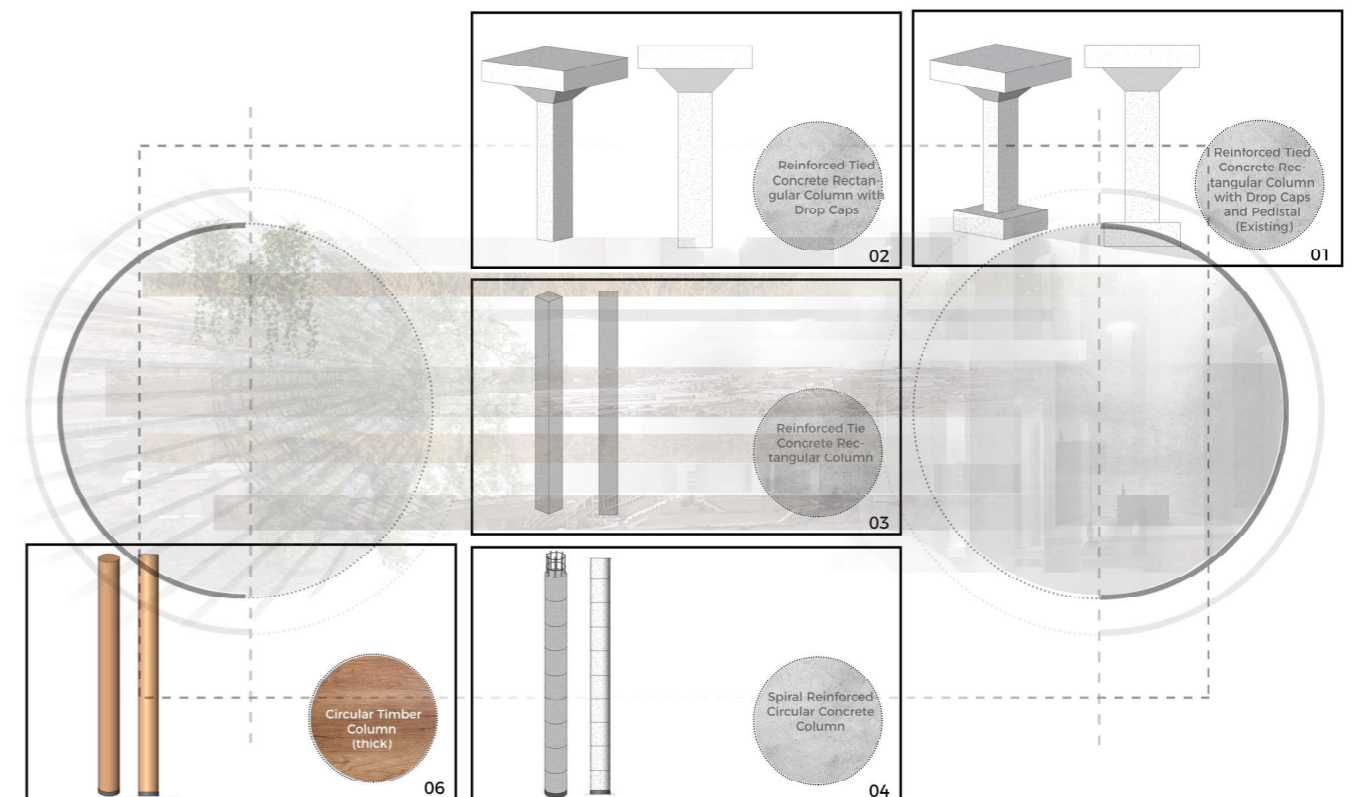
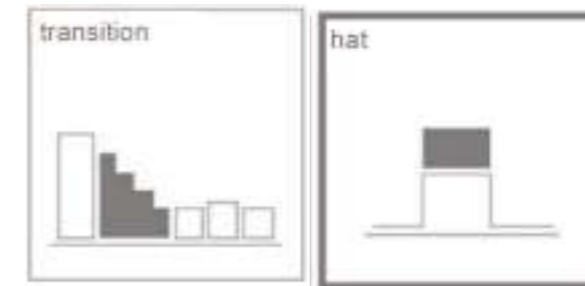


Figure 6.28: Diagram illustrating the concept of change for the existing concrete columns to a simpler column (Author: 2018)



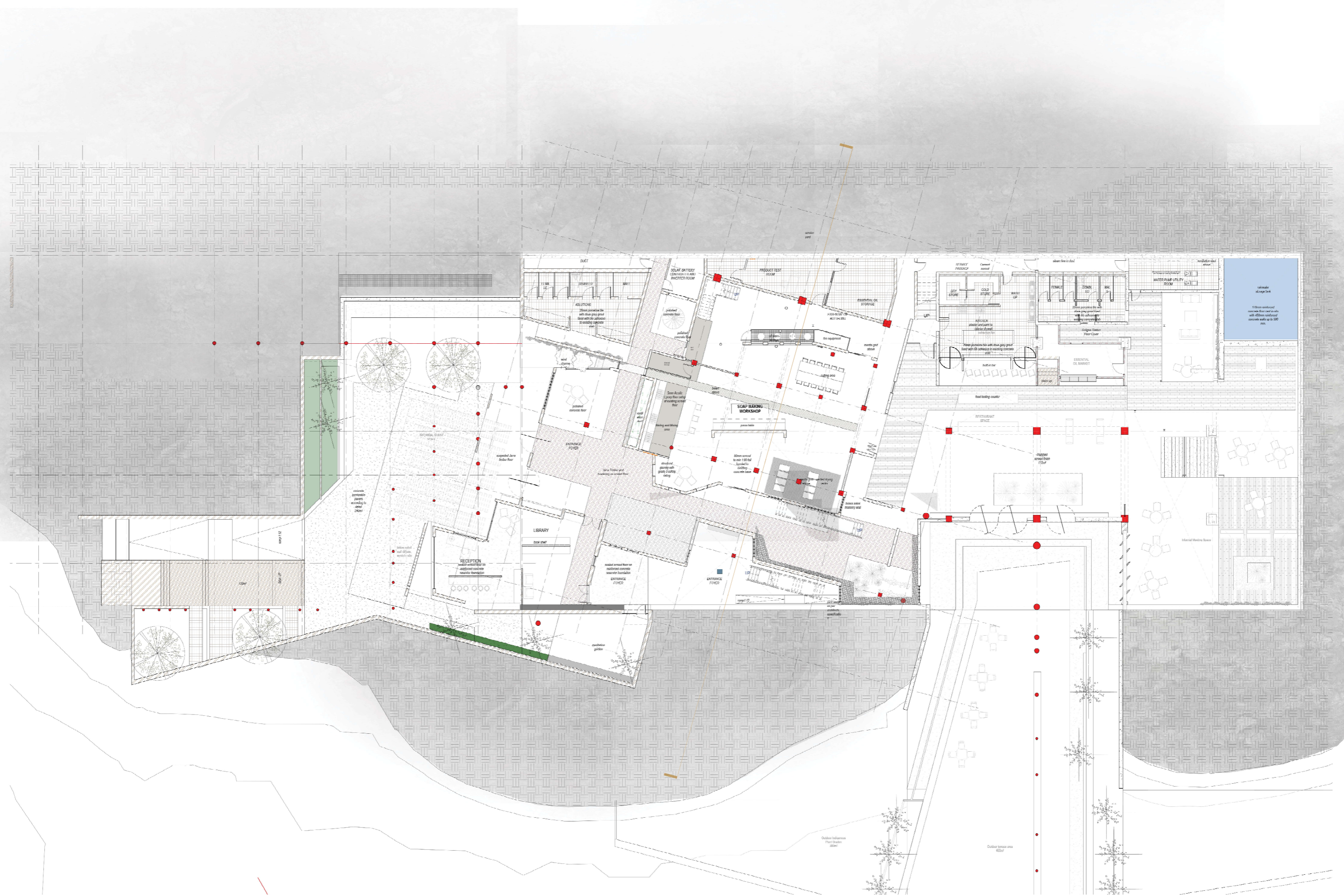
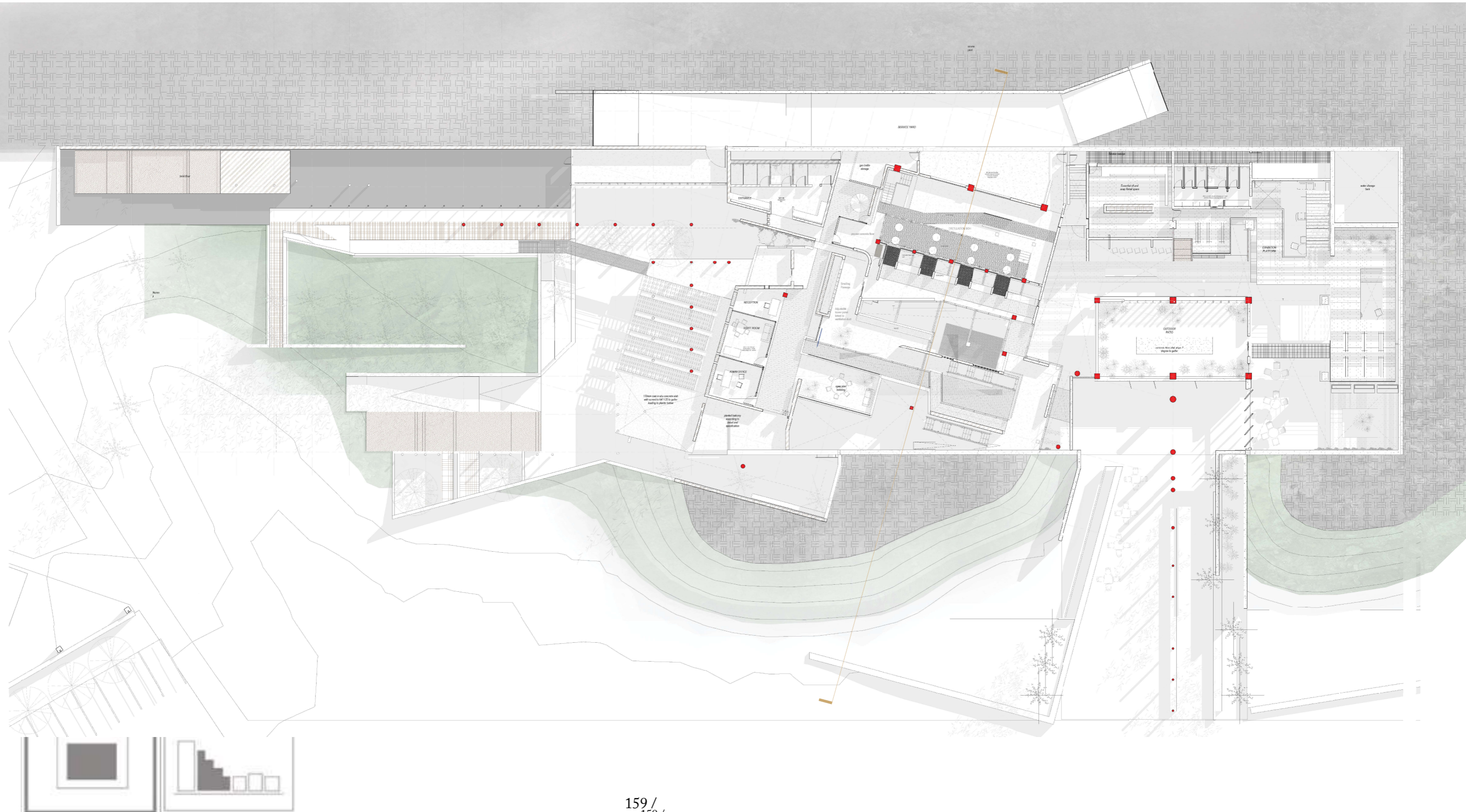


Figure: 6.29: Ground Floor Plan Iteration 7 (not to scale) (Author: 2018).

Figure: 6.30: First Floor Plan Iteration 7 (not to scale) (Author: 2018).



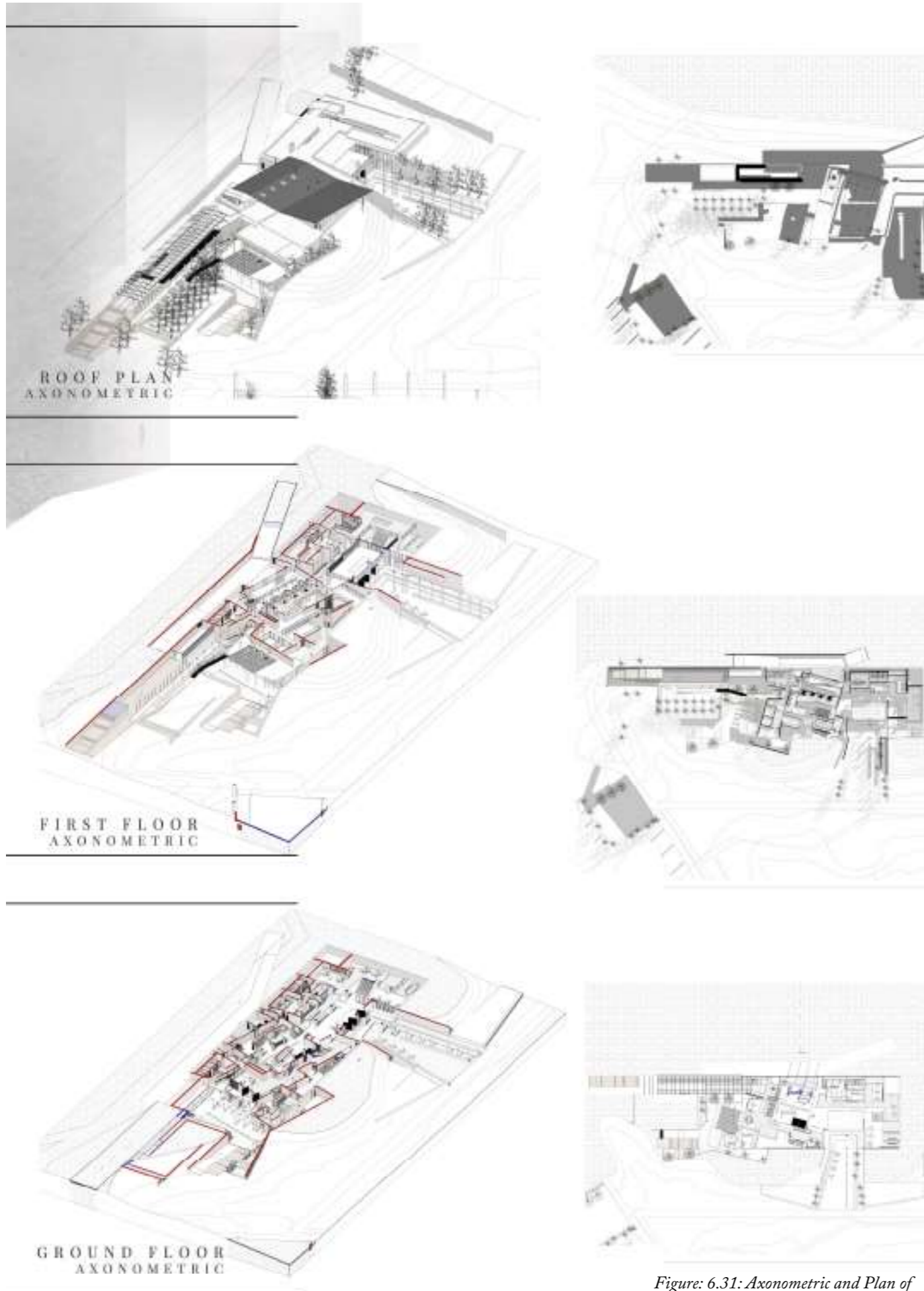
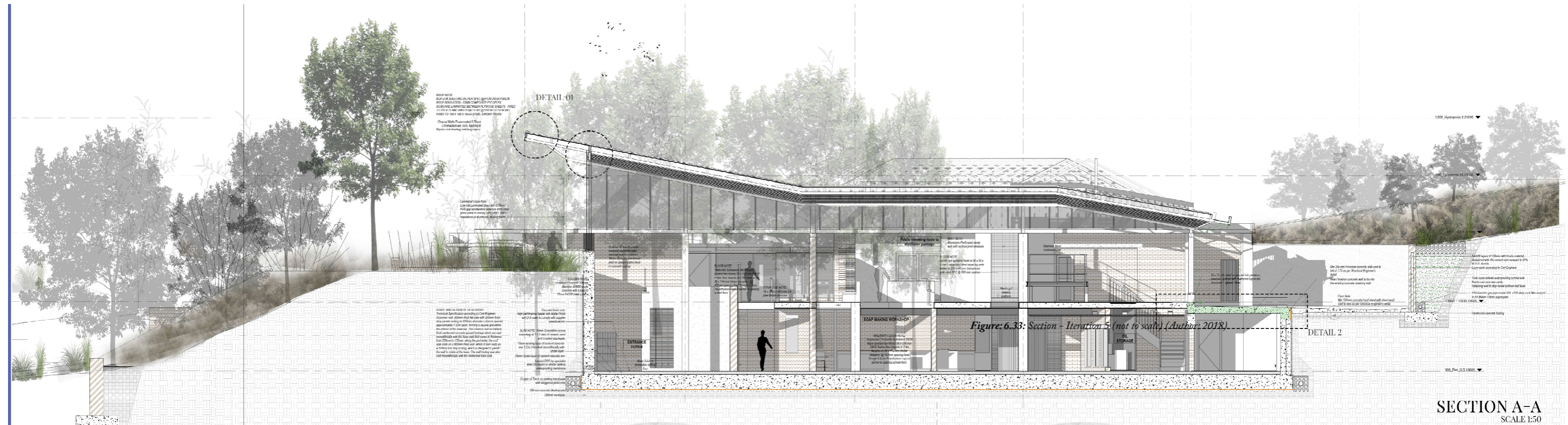


Figure 6.31: Axonometric and Plan of June Crit (Author: 2018).



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,

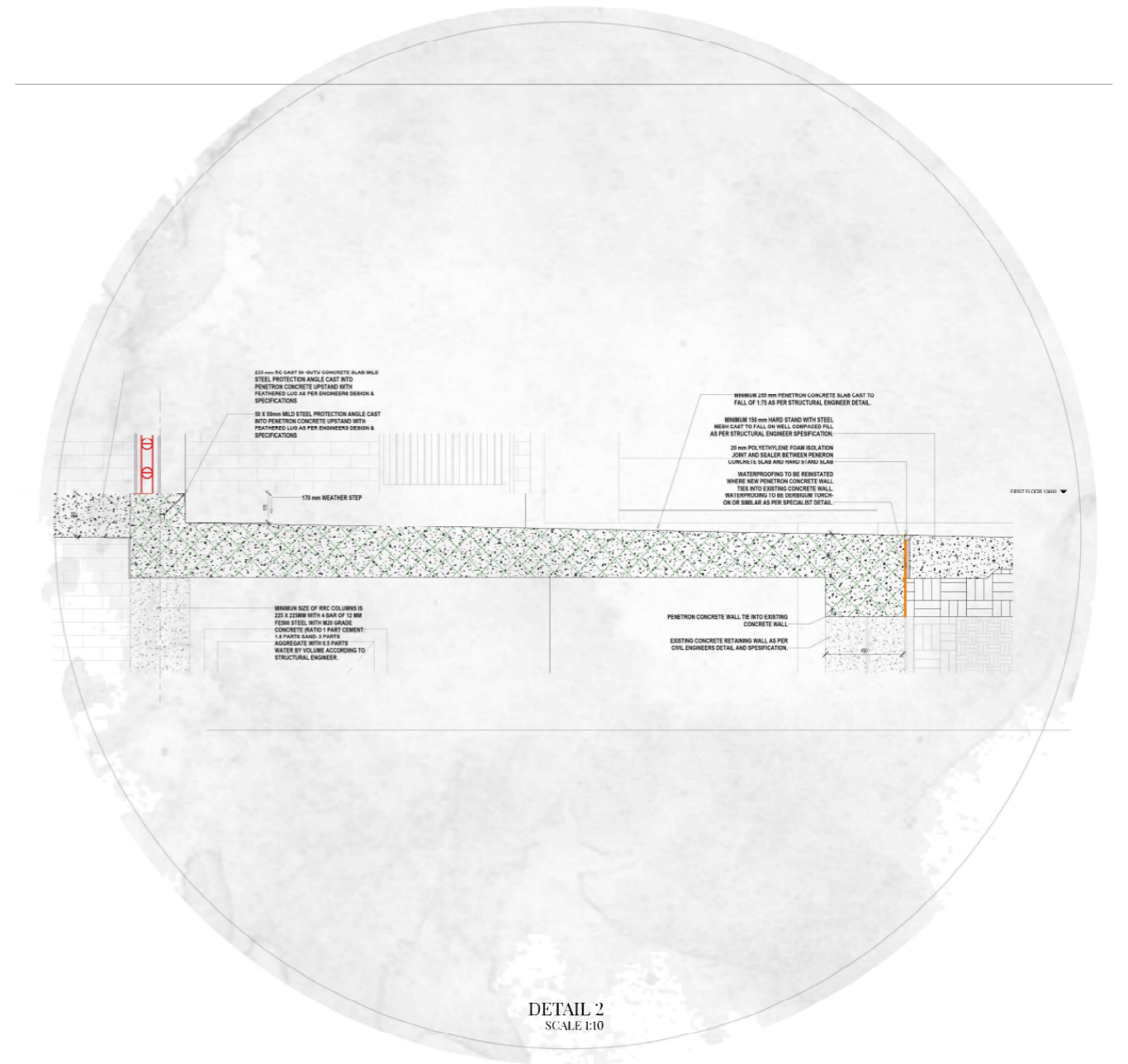
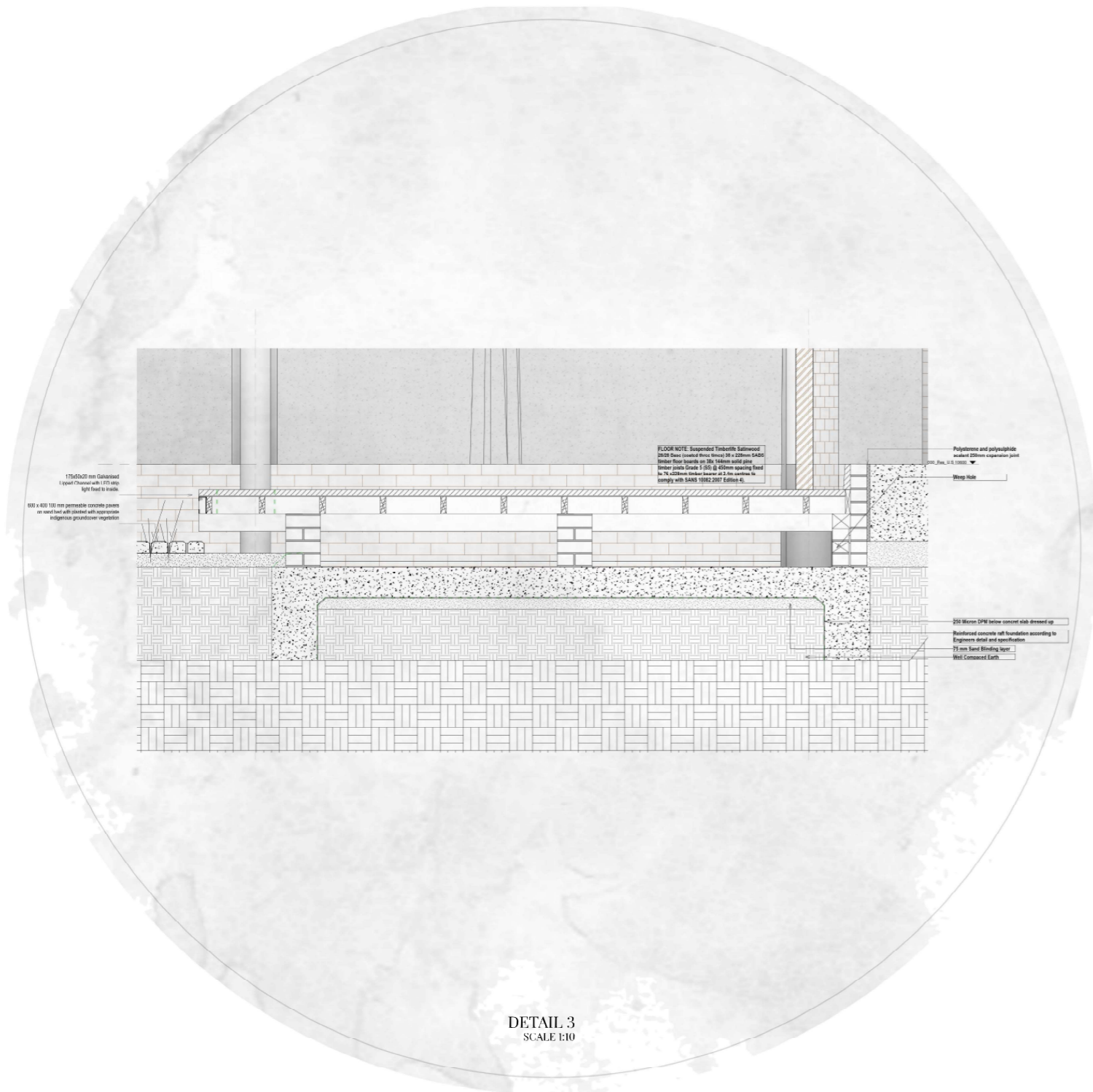


Figure 6.34: Details (Author: 2018).