UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

# THE REDOLENCE OF LANDSCAPE

An Essential Oil Farm in The City


redolence

noun | red·o·lence | \ˈre-də-lən(t)s\

an often pungent or agreeable odour

Submitted by: Chanel Steenkamp

Study Leader: Ida Breed

Course Coordinator: Johan N. Prinsloo

Submitted in partial fulfilment of the requirements for the degree Master of Landscape Architecture (Professional) in the Department of Architecture, Faculty of Engineering, Built Environment and Information Technology, University of Pretoria

Pretoria, South Africa, November 2016.

Dissertation title: The Redolence of Landscape

Site description: Old Railway Maintenance Shunting yard.

Address: 71 Skietpoort Avenue, Tshwane, South Africa

GPS Coordinates: -25.758599, 28.183973

Client: City of Tshwane and Governmental Departments such as the Department of Parks and Recreation and the Department of Environmental Affairs along with POP-UP and the Community.

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 Landscape Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.
I further state that no part of my dissertation has already been, or is currently being, submitted for any such degree, diploma or other qualification.
I further declare that this dissertation is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

## Abstract:

The public, especially in Pretoria Central are deprived of their right to rich accessible outdoor space, the intervention aims to enrich public life in the city by invigorating the outdoor experience by enhancing the sensory experience an individual can potentially experience in the landscape. The human sense of smell was chosen as the driver of the dissertation as it has not yet been explored to its full potential in the discipline of landscape architecture.

This is achieved though the basis of an urban park focusing on sensorial experience. The proposed location of the design is in Salvokop on the periphery of Pretoria inner city. In memory of the sites historic function as a railway maintenance shunting yard the palimpsest of the land is acknowledged in the form and details of the design

By incorporating economic and social initiatives the upliftment of the community will be catalysed. Pleasant fragrance along with a natural setting offers many physical and psychological health benefits discussed in the dissertation.

Table of Content

This dissertation investigates smell in the landscape and considers the potential benefit of using productive landscapes and the manufacturing of fragrance oil to promote community upliftment and empowerment.

# CHAPTER ONE

## Introduction to the Urban Essential Oil Farm

### Chapter Overview

In the following chapter the author will discuss the main research question, hypothesis and sub-questions along with the delimitations of the study and a brief site introduction.

## Introduction

There is room for a different approach to landscape architecture in a South African context. This is evident when we look at what countries like the United Kingdom, Australia and China are achieving in the landscape architectural profession. When we concider our current public parks and open green spaces in Pretoria for example Burgers Park, Church Square, Venning Park and The Union Building Gardens and compare them to the requirements that successful public parks should meet seen in figure 1.1 set up by CABE Space, a part to the Commission for Architecture & the Built Environment in the United Kingdom, South African parks lack many of these factors. Our Public parks lack many factors for example to reflect and enhance local identity, provide for choice and to provide a range of habitats, to be able to reach their full potential in providing a satisfactory service to the public.

For public parks to be able to reach their full potential in providing a satisfactory service to the public's need, they need to reflect and enhance the local identity, provide for choice and provide a range of habitats just to mention a few.

**Thinking about design: Watch points**

- Be clear about function
  Decision-makers should be sure about why they are creating or retaining a space, who will use it and how. They should carefully consider all the potential economic, social and environmental benefits
- Reflect and enhance local identity
  Parks, squares and gardens can contribute to the identity of a place, reflecting the complexity of local landscape, culture and heritage
- Integrate green spaces with building design
  Decision-makers need to consider carefully how buildings can help to make green spaces overlooked and well-defined. Housing areas should provide a range of good private and public spaces
- Consider how each space relates to the public realm network
  Parks, woodlands, river corridors and other green spaces should form part of an accessible hierarchy of linked green andivic spaces of different functions, scales and characters
- Provide for choice
  Green spaces should be designed to allow for choice and play, and for people to experiment with using and experiencing them in different ways
- Build for longevity and flexibility
  Consider how spaces might adapt to changing social, economic and environmental conditions
- Consider all user groups
  Public open spaces should not be dominated by any singlegroup in such a way as to make others feel uncomfortable. This means catering for a range of needs and involving a range of users
- Provide a range of habitats
  Public and private green spaces of all scales should be designed to work with nature to enhance and develop local biodiversity.

Figure 1.1: Urban Green Space Guidelines
(Cabe Space 2005:85)

Landscape architects need to be constantly reaching for higher goals, to enhance the experience of the user. According to Norman Newton "the only intelligent measure of a successful design is its impact on the user" (Swaffield 2002:61). Landscape architects need to make sure that they do not stagnate in their designing capabilities. Parks need to provide proper benefits to the users, while being innovative in other areas of design for instant stimulating the users' senses.

Dawid Howe remind us: "We relate and create environments through all of our senses." (in Choudhury 2015:2)

It is very beneficial to consider the sensory enhancement that could be incorporated in the design through using the natural environment (Choudhury 2015), to make the best of a range of different design scenarios. Sensory experiences are also crucial for the proper development of children (Gainsley 2012:2). Steven Spears national leader in performance-based design notes that there is an immense opportunity for landscape architects to advance theory and the practical implementation of designing by keeping "the human senses in mind"

"Our world is a sense scape and both physical and ambient environments are provided by the things we can smell, hear, touch and feel" (Choudhury 2015;2)

Working or living in the CBD can be exhausting and draining if one does not regularly come in contact with nature. The scheme for this dissertation seeks to enable the community to experience nature daily and reinvigorate their senses and restore their mind and heart. According to Richard Ryan (2010), a professor of psychology, psychiatry, and education at the University of Rochester, being outside in nature makes people feel more alive.

"Nature is fuel for the soul" says Ryan. "Often when we feel depleted we reach for a cup of coffee, but research suggests a better way to get energized is to connect with nature". In recent years, numerous experimental psychology studies have linked exposure to nature with increased energy and a heightened sense of well-being (Ryan 2010).

The findings, adds Ryan, are important for both mental and physical health. "Research has shown that people with a greater sense of vitality don't just have more energy for things they want to do, they are also more resilient to physical illnesses. One of the pathways to health may be to spend more time in natural settings" (Ryan 2010).

There is a need for a new way of design and a new way of experiencing Urban Parks as mentioned above. According to Nishimura (2011) smell has potential to invigorate design. The author will seek to further prove this in the dissertation, as a way to improve user experience in South African public parks. It is a proven fact that pleasant smells make you happier, "smelling a fragrance you perceive as pleasant has a positive effect on the mind (Wyatt 2014)." Smell is one of our strongest senses and is deeply connected to memory and emotion (Wyatt 2014). Palmer (2013) states that "Smell is the most sensitive of the senses. People can remember smells with 65% accuracy after a year, while visual recall is about 50% after three months". Smell used in design plays an important part in place making and the unique identity of places (Henwshaw 2014:52).

## Site Introduction

The site is located in Salvokop, situated West of the Pretoria Train Station bordering the strong city grid, but disconnected from it due to the train tracks running through the northern part of the site. The site is grounded in an important railway heritage layered in industrial reminiscence and time.

The site is bordered by Kgosi Mampuru Street on the west, Skietpoort Avenue of the south and the PRASA railway lines on the north. The author considered the area which is in dire need of green open space and economic empowerment.

The site was chosen because of its proximity to the CBD, the poetic and programmed nature of the site, its beautiful view over the city as well to the hills and its proximity to public transport.

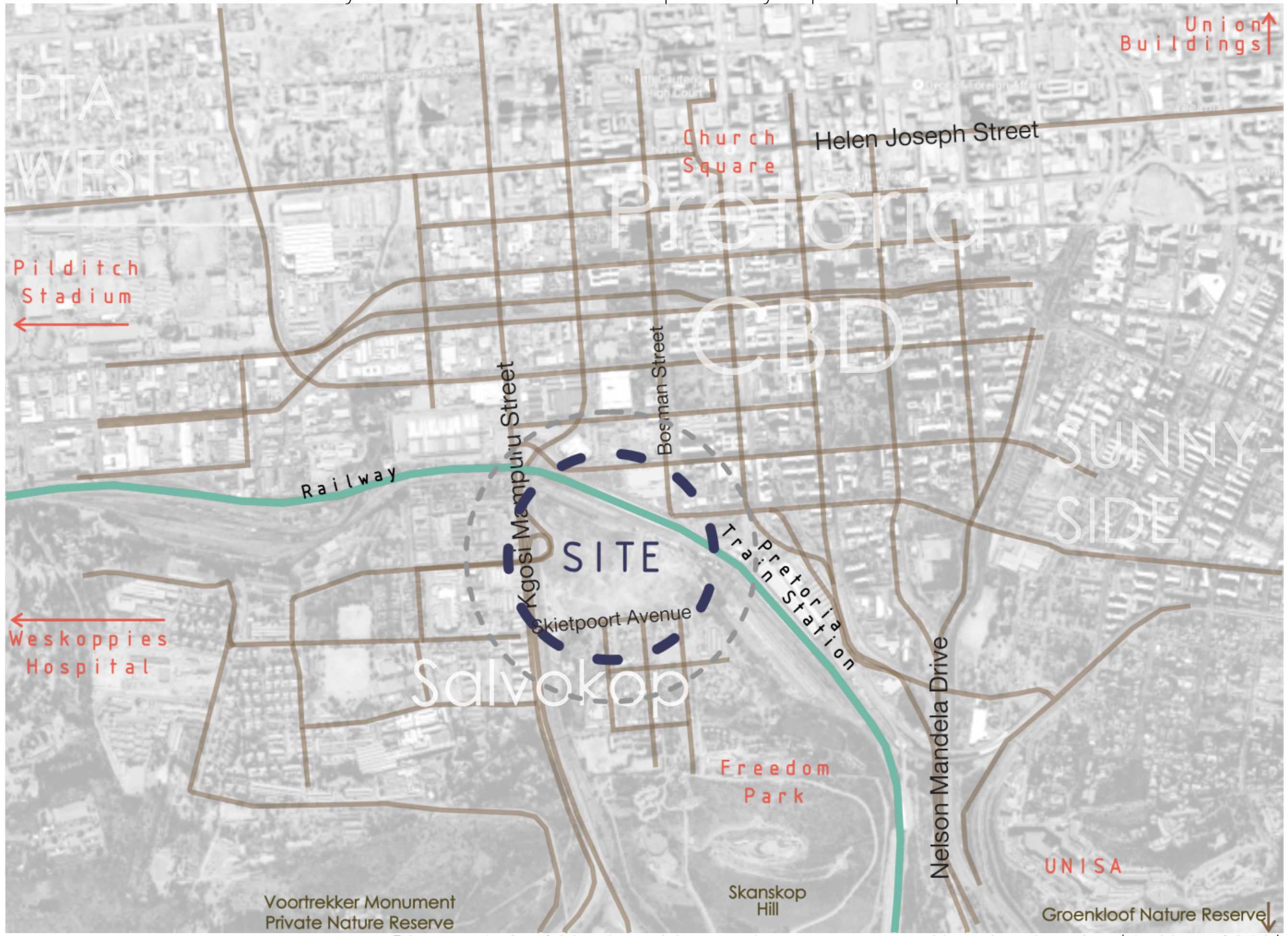



Figure 1.2: Site location and some surrounding landmarks (Author 2016)

## Research Question

How can smell guide landscape design to enhance the overall user experience of spaces as well as uplift and empower the surrounding community?

## Sub Questions

1. How can the sense of smell and fragrance inform landscape design?
2. How can landscape design through smell uplift a community (spiritually)?
3. How can landscape design through smell lead to economic empowerment?

**Aims of the study** - The dissertation aims to:

- Seek out new approached to design that are not only visually driven.
- Explore ways in which there may be dealt with smell in the landscape.
- Be an example of an inclusive landscape for all people with any disability.
- Achieve a design where all can experience and gain something from the landscape.
- Promote productive landscapes to uplift and empower the community
- Improve accessibility to recreational facilities and add value to the surrounding environment and community.

## Research Methodology

The following research methods were used to gain understanding:

1. Literature review
- On the history and recognition of smell in the landscape
- On our human sense of smell
- On the design capability of smell in the landscape

2. Investigation
- Precedents relating to the topic or any aspects of the study

3.To explore the design possibilities of smell (tangibly)
- In depth research of chosen plants
- Tangible interaction with fragrant plant material
Making of own essential oils

## Limitations

Assumptions were made on the fertility of the soil on site because there were no opportunities to chemically test soil samples.

## Methodology Diagram

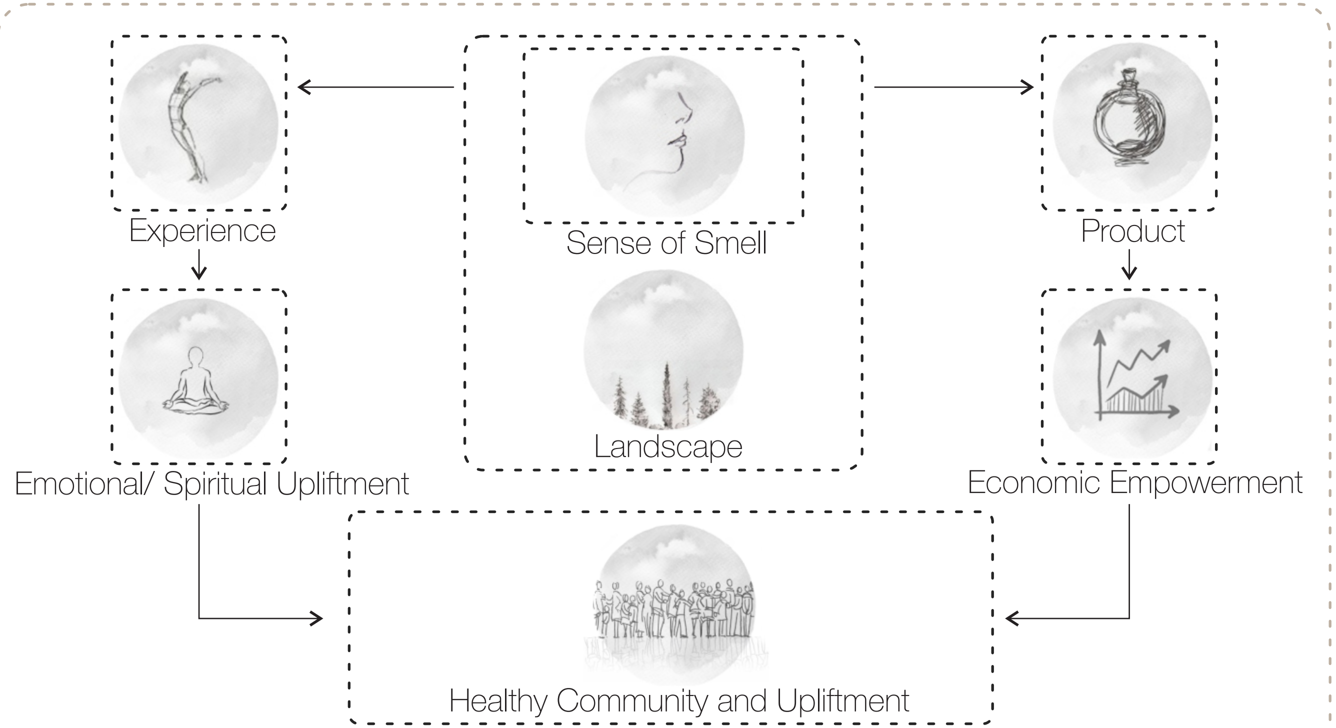



Figure 1.3: Methodology diagram (Author 2016)

## Client Profile

Gov.
Department of Agriculture
Department of Environmental Affairs

NGO
Peoples Upliftment Programme (POP-UP)

Private
Retail
Businesses
Residential

Community Body
Salvokop

# CHAPTER TWO

## Theory and research

### Introduction

A pleasant fragrance has the ability to aluminate its surrounds, uplift the spirit of the people smelling it and conjure up beautiful memories (Mercola 2015), it also has positive health and mental benefits in store for us, yet it is not often used in Landscape design.
Throughout history smell has been regarded as less important than sight and touch especially in the enlightenment era. Smell was considered the sense of intuition and sentiment and was associated with women only. Worse still, smell was associated with 'savagery' and even madness (Cattaneo 2003:12).

This raises important questions, why is there a lesser value that we place on smell? Is smell of less meaning and not as useful as a design tool in society today? Or is this lack of understanding and appreciation instead the product of extended development of a built environments that failed to provide great satisfaction to “delight our nostrils, tickle our trigeminal nerves and stimulate our olfactory imaginations” (Henshaw 2014:23).

Dr Victoria Henshaw, urban smell specialist and author of Urban Smellscapes from the University of Sheffield (2014) believes that the built environment professions have suffered from disciplinary perspectives and that they ignored design opportunities inspired by the sense of smell.

To smell nature is an amazing experience as nature offers an enormous amount of pleasant smells for one to enjoy. This opportunity has not been sufficiently explored in Landscape Architecture and this dissertation will focus on fully exploiting the design potential of smell in the landscape.

This chapter will consider the sense of smell by three themes, namely; the power of smell, the role of fragrance in design and characteristics influencing smellscape design. It will also be discussed how smell in landscape design can lead to economic empowerment and finally, how landscape design through smell can uplift a community spiritually.

## The Power of Smell

"As an adult, you can distinguish about 10,000 different smells" (Wyatt 2014).

The reason one seems to be flooded by nostalgia or certain memories when they smell something specific, is because human odorant receptors (neurons in the brain responsible for the detection of odours) are connected to a part of the brain (see figure 2.1) which controls emotions and is concerned with mood and instinct. This is called the limbic system, the most primitive part of the brain. Aromatic sensations perceived are conveyed to the cortex, where cognitive recognition occurs only after the limbic system has been stimulated. By the time one correctly identifies a scent, for example jasmine, it has already activated the limbic system, stirring up deep emotional responses (Fox 2002:4).

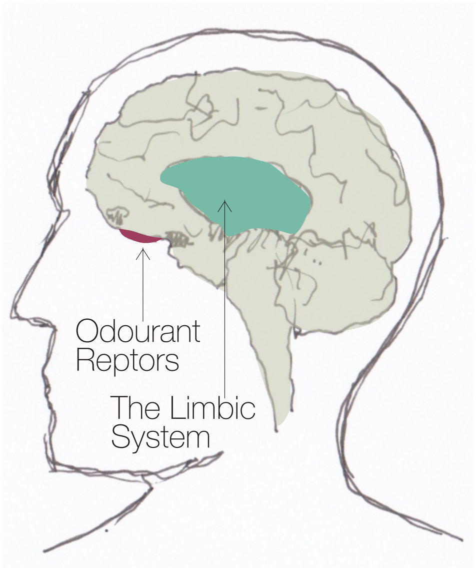



Figure 2.1: The location of the limbic system and odourant reptors in the brain (Author 2016)

Studies have shown that seventy five percent of emotions are triggered by smell and that these emotions are specifically linked to emotion, well-being, pleasure and memory (Palmer 2013).

For this reason it is suggested by Meyer that; "Landscape architects designing gardens for the senses must be able to understand how large odorant molecules become chemical impulses into the brain and thus links to the memory of the time and place of the experience" (Meyer 2007:9).

Helen Keller a world famous deaf and blind activist and author of the book *The World I live In* (2013) stated the following: "I doubt if there is any sensation arising from sight more delightful than the odours which filter though sun-warmed, wind-tossed branches, or the tide of scents which swells, subsided, rises again wave on wave, filling the wide world with sweetness. A whiff of the universe makes us dream of worlds we have never seen, recalls in a flash entire epoch of our dearest experience". Have we then forgotten about this delight that the sensory aromatic sphere has to offer due to the habits we have developed to focus only on the visual? The author believes that one can learn from Keller's experience of the sensory and revive these feelings in individuals imparting beautiful memories into their existence by creating spaces that provoke them.

## The Role of Fragrance in Design

Harold Osbourne (in Nishimura 2011:33) claims, on the basis of aesthetic-attitude theory, that one can experience a smell aesthetically as well as a musical note or a colour by sustaining attention with heightened awareness to the sensory content itself (Nishimura 2011:33).

The ability of smell to transform spatial experience has an effect upon the emotions and not on the intellect as highlighted by the section above and quote by Keller. Through these circumstances observed, spaces and their shapes and forms can be changed and moulded. As Malnar and Vodvarka (in Bowring 2006:163) observed, "The question remains whether odours—and our sensing of them—can act as primary determinants of spatial judgements. If by this we mean effective spatial judgments, the answer must surely be affirmative (Bowring 2006:163).

Questions arise as to how something that is invisible can be characterised, revealed and represented spatially? Bowring (2006;161) suggests that the visual has a part to play in triggering sensorial experience and thus should not be forgotten as Meyer (2007:10) noted "Landscape architects have largely neglected the sense of smell to focus on visual and auditory effects" but to place emphasis on such olfactory elusive elements, visual elements need to be present to frame the invisible (Bowring 2006:161).

Research on the human sense of smell has escalated with recent interest on the topic among academics due to its varies applications in healing, improving general health and quality of life (Pines 2004). Except for its health benefits smell has become a branding tool whereas hotel chains in America have developed and claimed certain scents as their signature fragrance; Sheraton Hotels smell like jasmine, fig and clove, Westin lobbies use white tea fragrance to scent their spaces and the Four Points Hotels smell of cinnamon. Smell has the potential to advance businesses to personalise their image and stir the user to store their experience in a deeper part of their memory.

The many benefits and evidence of considering specifically smell in spatial experiences and processes is evident. Landscape Architects can move forward by seeking practical ways in which to accomplish the design with smell within the discipline.

## Characteristics Influencing Smellscape Design

Smellscapes are classified by Henshaw (2014) as "the total smell landscape, including individual odours, odours that have mixed, and the overall background odours". The smell specific places and spaces that are designed by the author can be classified as smellscapes.

According to Henshaw (2014:181) the congruence between odour and place impacts on perceptions of both. Characteristics and factors influencing smellscapes could be identified as: air movement, topography, microclimates & moisture in the air, materials (hard and soft), activity density, age group of the perceiver of smell and memory. Each of these will be considered respectively:

### 1 Air Movement

Any smell that one perceives in an outdoor space is due to odorous chemicals transmitted from its original source by the wind to our olfactory system. Air movement is made visible through the physical effects it has on the environment for example leaves withering. The haptic and thermal qualities that wind projects onto ones skin also make the individual aware of its presence. (Henshaw 2014:168-169).

Wind exposure promotes heat loss in winter, but can be used for ventilation and cooling in warmer climates. In addition, the prevailing wind direction has an influence on the dispersion of dust, noise and odour. Built environmental form can impact directly on odour concentration, dilution and movement (Henshaw 2014:182). The transmission of odour through the air from the source is what one ultimately smells, thus wind and air quality directly affects what smells arev perceived in the end. The term regularly used to describe air is "fresh" this is when other traffic pollutants have not been emitted by the wind (Henshaw 2014:169). Wind is perceived to dilute negative odour intensities with fresh air and odours of vegetation at a micro level (Henshaw 2014:171).

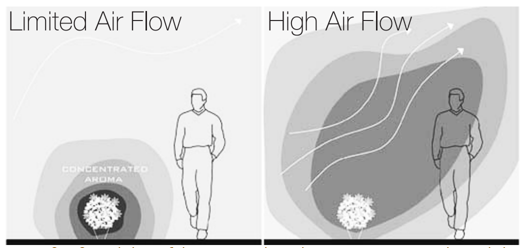



Figure 2.2: Air flow and odour concentration (image drawn by Nabil Awad) (Henshaw 2014:182)

If there is less air movement in an area you would generally smell a lot more, the smells would also be much stronger. Henshaw (2014:182) suggest that designers should use the built environment form to limit wind speed to a gentle breeze of less than five meters per second; this is a general guideline but may differ depending on the specific context. A desired environment such as this is suggested so that the smells would not be overpowering but disperse into the air to be permitted by the human nose on a comfortable level. Wind is the carrier of odour, this can be perceived as negative or positive (Henshaw 2014:183).

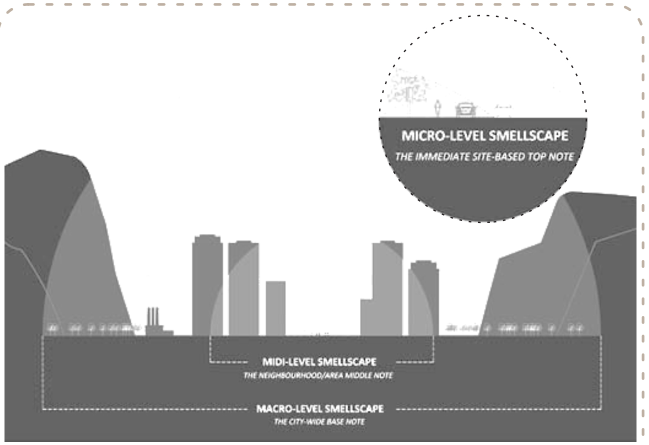



Figure 2.3: The smellscape as a composition of different notes (image drawn by Nabil Awad) (Henshaw 2014:170)

When looking at the structure of smellscapes in the city it can be categorised into base, middle and top notes, just like in perfumery. As seen in figure 2.3 the larger macro-level smellscapes (involuntary odours) forms the background to smellscape experiences. Within this realm we then experience episodic odours within the midi-level smellscape realm; this would be dominant smells within a specific neighbourhood. Then Lastly, the individual experiences micro-level smellscapes which are short lived or intense specific smells coming from a building or specific activity nearby. The lack or presence, as well as intensity of air movement in an area, can influence urban smellscapes on a variety of levels (Henshaw 2014:171).

The size and layout of spaces have the potential to direct air flow or to limit it.

## Microclimate and moisture in the air

Creating microclimates that are colder and release moisture in the air will allow the odour molecules in some spaces to be enhanced and the specific smell in areas will be clearly conveyed to the user.

It is a proven fact that one can smell things better in the spring and summer this is because of additional moisture in the air. To explain this theory by means of a practical example there can be noted that ones sense of smell is also much stronger after exercise. This is due to "increased moisture in the nasal passage" (Palmer 2013).

"Colder (denser) air also means there is a higher concentration of odour molecules per square inch. Similarly, water vapour traps scent molecules, enhancing the odour they release and slowing their diffusion into the air. A combination of cool, moist air results in scent that stronger as well as heavier and closer to the ground" (Dr Woods: 2015).

## Topography

Topography influences smellscapes through; aspect, slope and heat accumulation as well as drainage. "Topography plays a significant role in the movement of air in and around the city, important in promoting more positive experiences" (Henshaw 2014:187).

### Aspect, Slope and heat accumulation

Hillier and more undulating topography in areas can also be problematic for example where vehicles stop on inclines traffic odours seem to be particularly strong (Henshaw2014:186). The topography of an area along with the wind direction also affects the frequency and detection of odour in an ambient environment (Naddeo et al 2013:188).

As cold air on southern slopes in the southern hemisphere moves down odour is most likely to move with the air. These conditions are further altered in more windy conditions and become more unpredictable.

### Drainage

Where the topography is flat and allows for water to become stagnant and starts to emit bad odours it can have a negative influence on the surrounds. (Henshaw 2014:186).


## Materials (Hard and Soft Elements)

Henshaw stresses how different building materials can have an effect on the smell of spaces. This is determined by the age of a building project and its materials as well as the type of materials used and whether they had absorption or non-absorption qualities. The effect that vegetation has on its surrounding smellscape is also quite great. It affects the legibility (2014:188) experience of place (2014: 190) and they are associated with specific memories of which the most are good and happy memories (2014:174).

The breathing in of odours of vegetation seems to have a cleansing effect and a good impact on the human body and health. These specific odours of different types of vegetation were most of the times associated with positive memories, emotional attachments, well-being and feelings of nostalgia and escape. Henshaw notes (2014:174). "I guess flowers again are what you associate with happiness and contentment." The introduction of more greenery into urban areas was therefore seen as a direct means of improving smell environments: "We need more green to smell good."

From case studies Henshaw noted that: 'Occasionally participants went out of their way to smell flowers: '…little low bushes and tiny flowers, a lovely smell … if I'm in the area, I'm going shopping down there and I've got time, I nip in and have a sniff' (Henshaw 2014:177).

Planting is, therefore, one of the most important and direct materials to our purposeful intentions to smell the environment.


## Activity Density

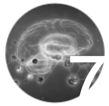
Activity density usually influences the smellscape on a micro-level. Depending on the functionality of the space and the sort of smells that would be emitted in the space, it would ask for different design guidelines. Looking specifically at activities taking place within the public sphere Henshaw (2014:183) suggest that it is the intensity of the space as well as their closed and concentrated nature that contribute to their success in terms of smellscape design.

Henshaw uses markets as an example where different odours as well as energy from different stalls feed off of each other to create an overall vibrant environment. The different smells give the user the freedom of choice to interact with their unique preferred stall. This applies within market buildings as well as in the wider ambient outdoor environment (Henshaw 2014:184).


## User Age Group

There is also a distinction in the way different age groups perceive smells; this has the potential to influence the outcome of different spaces and plant palettes. Up until the age of 4, any smell - no matter how gross to adults - is merely interesting to children (Wyatt 2014. TED Talks). Sensory experiences are crucial for the proper development of children's brain (Gainsley 2012:2).

It is important that all of the five senses; smell, touch, sight, hearing and taste gets stimulated. Encouraging and understanding the way that children play and experience the natural word is clearly important. The author will not specifically focus on children play areas in detail but it will be considered on a master plan level.




## Memory

As mentioned under the topic: The Power of Smell in this Chapter, memory is notably significant when considering designing with smell for smell is directly linked to a part of the brain responsible for memory and emotion. Steven Spears national leader in performance-based design and recently elevated to the American Society of Landscape Architects Council of Fellows, notes that there are still many open-ended possibilities and opportunities when looking at the way people use space due to specific memories of a space or place and the connection it has to the human senses. Spears stated that "human sensory design is a key component of the design process and I am keenly interested in this and want to know more. How can designers use the human senses and their relation to memory in a provocative way? More importantly, how can this be measured so that it becomes the research avenue of a design process?" (Landscape Architecture Foundation 2014)

## Conclusion

As these olfactory design tools were laid out, in theory, the challenge will be to translate them into design. The sense of smell as a design informant is making waves in the built environment industry with much research to support the current theories. The potential of odour in design can thus now be recognised and used to create spaces.

Designers should effectively test these seven aspects and their impact on the smellscape to create designs that can influence the experience of the user at a level often not considered.

## How Can Landscape Design Lead to Economic Empowerment

Now that we have verified the impact of smell on user perception and spatial experience, in the context of Salvokop we need to ask how can landscape design through smell lead to economic empowerment.

What is economic empowerment?
Economic Empowerment is the capacity of a poor individual to benefit from economic development processes in a system which allow the individual to contribute to and fairly benefit from the economic progression. The terms of the individuals involvement in the process are recognised for the value of their assistances (contribution). The individuals' dignity is respected and it is made possible for the individual to equitably negotiate a fairer distribution of the benefits of growth (Eyben et al. 2008:9-10).

"Empowerment broadens poor people's freedom of choice and action, expanding their assets and capabilities and enabling them… to participate in, negotiate with, influence, control and hold institutions (or rather spaces and activities) accountable, that affect their lives" (Eyben et al. 2008:5).

Economic empowerment enables individuals to think beyond their immediate survival needs, taking them from surviving to thriving, facilitating the individual to exercise greater control over their resources and choices (Eyben 2008:10). Landscape Architecture interventions should be designed and programmed in such a way as to create a diverse range of job opportunities (permanent and temporary). They should also create additional job opportunities for example where someone is employed in a park to harvest seed or cuttings from a productive garden for the specific functioning and program of the park. The employee then learns a new skill and now he/she can also harvest some extra seeds and cuttings to sell in his/her community. Food gardens can also provide a community with specific economic and health benefits plus work opportunities.

## How can Landscape Design through Smell lead to Economic Empowerment

To economically empower a community smell in itself cannot do much but the product which emits pleasant fragrance can. Through the production of essential oil many job opportunities can be created consisting of permanent positions as well as temporary positions to create opportunities for additional income. The programming on the site and functions of the intervention thus also needs to fit in with existing organizations on site if possible to promote the involvement of as many organizations as possible to ensure the resilience of the intervention.

A very simple way to assist in the process of economic empowerment and the sustainability of a community would be to enable and educate a community on the benefits of urban agriculture to provoke a movement and action to care for and sustain personal and communal gardens that can be managed by POP-UP (People's Upliftment Program) a non-governmental organizations currently operating on the site. As the price of food increases due to transport costs and a lack of water to irrigate large portions of agriculture, a need arises to promote productive food gardens which can easily be watered on a small scale by recycling water. Many individuals and residents can cut some of their expenses on basic needs like food. Although the focus of the project will not be on this specific topic the author feels it is still important to be incorporated in all urban green spaces and it is thus part of the framework and masterplan for this design proposal as taste is also another sense often neglected in landscape design.

How does one economically empowerment a community?

Several guidance programs exist to direct organizations in catalysing the economic empowerment of people who are living in poverty for example POVNET and The Noar Foundation who offers a wide variety of strategies.

The author has looked at these international models as they have proven to be successful but also due to the lack of proper South African models to initiate the economic empowerment of communities.

According to The Noar Foundation for Global Community Development from the USA, sustainable economic growth of communities will take place in environments that do the following:

| To reach sustainable economic growth the design needs to: | Translated in specific design proposal for Salvokop |
|---|---|
| 1.Promote and cultivates opportunities for economic growth in communities. | New job opportunities will be created through interventions such as the essential oil factory, coffee shops, restaurants and the fragrant flower market. |
| 2.Provide educational advancement for the surrounding community on a tertiary, secondary and at university level. | Through the integration of POP-UP and surrounding educational facilities learning will become a big part of the design and program. Outdoor learning will also be encouraged with specific safe routes from the educational facilities to the park. People can further be educated by what they see on info boards in the design. |
| 3.Promotes and understands the unique community identity | Salvokop has evolved as a community into a diverse neighbourhood housing people from many ethnicities and backgrounds. This must influence the design proposal in material, spatial and programmatic levels. |
| 4.Endorses healthy social and familial interaction | The new design intervention will greatly encourage social interaction Designing diverse and comfortable public spaces for different scales of gathering. The design will seek to incorporate some of the design materials seen in the area. |
| 5.Values men and woman as equal, striving to provide equal opportunities for both (Noar Foundation. 2010) | This principle will be revealed in the program and governing bodies on site as the equal treatment of both men and women is of importance to POP-UP. POP-UP will be incorporated in many design decisions and programs on site. |

Figure 2.4: The Noar Foundation principles and local application (Author 2016)

A strategy has been derived from the knowledge gathered on economic empowerment. For the current community to be empowered many opportunities are going to have to be created. The following table illustrates extra programs needed to be in place as an additive to the table above.

| | |
|---|---|
| Safe and reliable child day care facilities need to be in place to enable parents and caretakers to advance themselves in their daily work. | POP-UP has a day care facility which will be re-designed and used in the programming of the new park (outdoor play will be an emphasis on the development of children at the daycare). This will allow parents to economically advance themselves without having the great full-time responsibility of looking after their children. |
| Fair business opportunities need to be presented as well as advancement in current or new employment positions. | Creating new job opportunities and innovative employment structure as part of POP-UP students promotion. |
| Extra income OPPORTUNITIES | In the programme extra income opportunities can be created where an employee has an opportunity to learn from ideas implemented on site and start his/her own initiatives after specific knowledge is gained. |
| healthy business connections and opportunities to socialise with people from different field | Creating an all-inclusive environment through design and programming. |
| Environments that promote mental and physical health | Through sensory stimulation, encouraging outdoor activities and spaces that create a sense of belonging (See next section on spiritual upliftment). |
| inspirations and aspiration – public business talks and skills training | Through programming in multifunctional and comfortable outdoor (or indoor) spaces, using POP-UP as a facilitator to guide these activities. |

Figure 2.5: Principles for economic empowerment and local application (Author 2016)

- Courses within the POP-UP skills training programmes can be adjusted to meet local specific needs, and accommodate future development of the proposed design and programme. By working with POP-UP the community can be empowered.

- Drawing tourists and daily visitors to the site and to the products sold on site. Creating programmes where visitors could make their own essential oil to become involved in the process.

In conclusion, the capability of smell to empower a community economically is largely due to a physical product that relates to the sense of smell, in this case, essential oil. This presents business opportunities and allows for a relationship to be born to an organization like POP-UP that already operates on site and empowers the community.

## How Can Landscape Design Through Smell Uplift A Community Spiritually?

Restorative Environments

Restorative environments are environments that promote restoration to recover and be renewed physically and psychologically.

Stephen Kaplan, a Professor of Psychology at the University of Michigan identifies four factors that make up restorative environments.

1.Being away from your usual daily setting to rest ones directed attention; this can take place in accessible urban parks.

2.Feelings of extent and emplacement created through design concepts like miniaturization, trails and paths.

3.Fascination with natural elements, masses of flowers, leaves withering in the wind and groupings of trees. Kaplan also refers to these elements as 'soft fascination' having the power to allow people to contemplate deeper thought leading to restoration.

4.The Compatibility of outdoor spaces with the need of the user, for example the need for an employee to take a walk after work or to enjoy lunch in an outdoor setting without having to drive far to be able to satisfy that need.

As an additive to the second factor mentioned above scientific studies have shown that for a holistic spatial experience, emplacement (thought to happen by visual and tangible experiences) should be reconceived to include and acknowledge the power of the rich sensory dimension to which individuals are interconnected to (Howes 2005:200). As we focus on environment sustainability Choudhury suggests (2015:7) that we also need to" look for urban models that can sustain our sensory lived experience". Working with the human senses can invigorate the outdoor experience.

Victoria Henshaw notes that there is "a potential role for smell in enhancing restorative experiences from urban environments, whether derived from natural or non-natural sources, has previously been overlooked in research on restorative environments" (Henshaw 2014:188). It can thus be said that there are clearly many opportunities for landscape architects to seriously consider designing with the sense of smell in mind.

The benefits of pleasant fragrance

*Increased performance*

Experiments have shown that exposure to pleasant fragrances significantly enhance performance on work-related tasks. In particular, poignant fragrances such as peppermint, which increase alertness, have been found to improve work based performance (Fox 2002:16).

*Increased well-being*

"The science of the sense of smell, Aromachology, focuses on our perception of smells. It refers to collection of data to study the interrelationship of psychology and fragrance technology to transmit a variety of specific feelings and enhance behaviour through the olfactory experience. Research seeks to establish the effects of aromas on human behaviour. It focuses on the olfactory system, which provides us with our sense of smell."

*Aromatherapy*

Aromatherapy is wort mentioning due to the evidence that can be provided from the practice thereof, solely relying on the human olfactory system. The term Aromatherapy was coined in 1920 by Rene Maurice Gattefosse, a French chemist, to describe the practice of using fragrance oils from plants in healing (Mathrani 2008). The practice of Aromatherapy has been proven to relax, restore and re-energize individuals, by focusing on scent.

Therapeutic environments

As mentioned in chapter one as well as in this chapter, outdoor green spaces have the ability to mentally and physically restore the individual. Daniel Winterbottom and Amy Wagenfeld authors of Therapeutic Gardens name four principles of how this can be achieved on a practical level. In teenagers with ADHD and other attention and behavioural disorders their presence in nature has resulted in significant improvement of their conditions (APA Howard Frumkin 2007).

| Therapeutic landscape design principles | How implemented in design |
| --- | --- |
| By allowing the user of the space to make choices a sense of control is perceived and experienced. This provides individuals with the sensation of escape (being away) which allows the individual to gain control of his/her emotions and refocus to rationally move forward. | Instead of forcing a user to take one specific route a variety of routes and spatial experiences can be offered to the user in an attempt to satisfy their unique need. Legibility and way-finding will be used to make sure that the visitor does not get lost feeling in control. |
| Spaces need to foster a sense of belonging and connection, by promoting a sense of attachment and familiarity. A variety of different enclosed, public and private spaces are needed to catalyse social interactions to take place. | Due to the strong connection to memory has to smells and the familiarity of many indigenous plants to be used, new and old memories and connections will be made possible. |
| Designs need to allow comfortable movement and exercise to take place. Activities like walking jogging, wheelchair mobility, play, gardening and formal exercise uplifts the mood of the partaker and reduces stress among many other benefits. | The design aims to be inclusive in all its efforts and also seeks to encourage exercise by making it more accessible to the public and by providing space for these physical activities to take place. |
| Spaces need to offer “heightened interactions with nature through the senses”. Encouraging sensory nourishment to take place which improves the emotional state of the individual, fostering positive physiological outcomes and diminished troublesome thoughts (Winterbottom and Wagenfeld 2015:52) | There is a strong focus on the senses in the design of the project specifically focusing on the sense of smell in the vegetation that is provided for interaction. Other smells like that of fresh air, soil, coffee and food is also considered in the design. |

Figure 2.6: Therapeutic design principles (Author 2016)

There is not only great opportunity to heal and improve impaired individuals (Winterbottom and Wagenfeld 2015:52) but as mentioned above there are many emotional benefits in store for one by being exposed to a pleasant fragrance. Smell can uplift the individual not just physically but spiritually we do not purely exist just in the physical but just as much in the spiritual. This is a realm that needs to be taken seriously.

## Conclusion

Public parks ensure that people come in contact with nature. Contact with nature is proven to provide health benefits and enhance the users' well-being (Frumkin 2007). The natural environment, be it man made or first nature, that lead to all of the beneficial results mentioned in this chapter are clearly due to the holistic experience that we perceive in nature but it is also very clear that pleasant fragrance has a very big part to play in this.

The theoretical design guidelines pertaining to smell, identified and discussed in this chapter are further explored and applied in chapter 6.

# CHAPTER THREE

## Context, History & Site Analysis

### Introduction

The study area, chosen by the author is located in the south-western quadrant of Pretoria in Salvokop. The site is situated on the northern slope of Salvokop Hill between Pretoria Main Road and the Pretoria Station. The site is currently vacant and mainly characterized by alien vegetation and an undulating slope. It is bordered and cut off from the high rise, dense CBD which is directly north of the site, by railway tracks.

In this chapter a quick overview of the development of Tshwane will be given, secondly the urban context will be studied to gain an entire understanding of the surrounding area of the site. After contextual knowledge has been gained a comprehensive analysis of the specific site will be presented with conclusive information gained in the study.

Site Location

## DEVELOPMENT OF THE CITY OF TSHWANE

The development of the City of Tshwane started in 1853 when itinerant Boers established it as the capital of the ZAR (Zuid-Afrikaansche Republiek) after being granted independence by Great Britain which dominated Southern Africa at the time.
An orthogonal grid was developed to accommodate the evolving capital's needs.

The capital then started to rapidly develop from a rural settlement to an urban society with the discovery of gold in the Witwatersrand (1886). This had a major impact on the Zuid-Afrikaansche Republiek.
The first expansions of the city was lodged within the central grid layout delimited by the Apies River in the North, East and South and by the Steenhoven Stream in the West (see figure 3.1).

As the city further expanded outside of the city center there was a greater need for residential areas which was then placed South-East of the city in the form of an orthogonal grid (which was to become Sunnyside)(Clarke et al 2011:883-884).

Further Expansion Eastwards (Arcadia) was planned using Church Street (the main horizontal axis of the city) as a main connection to the city center and as a tool for the growth of the capital.
Expansion continued to the East and West as it was limited to the North and South by the predominant ridges surrounding the city.

Figure 3.1: The Development of Pretoria (Van der Waal Versameling 2009)

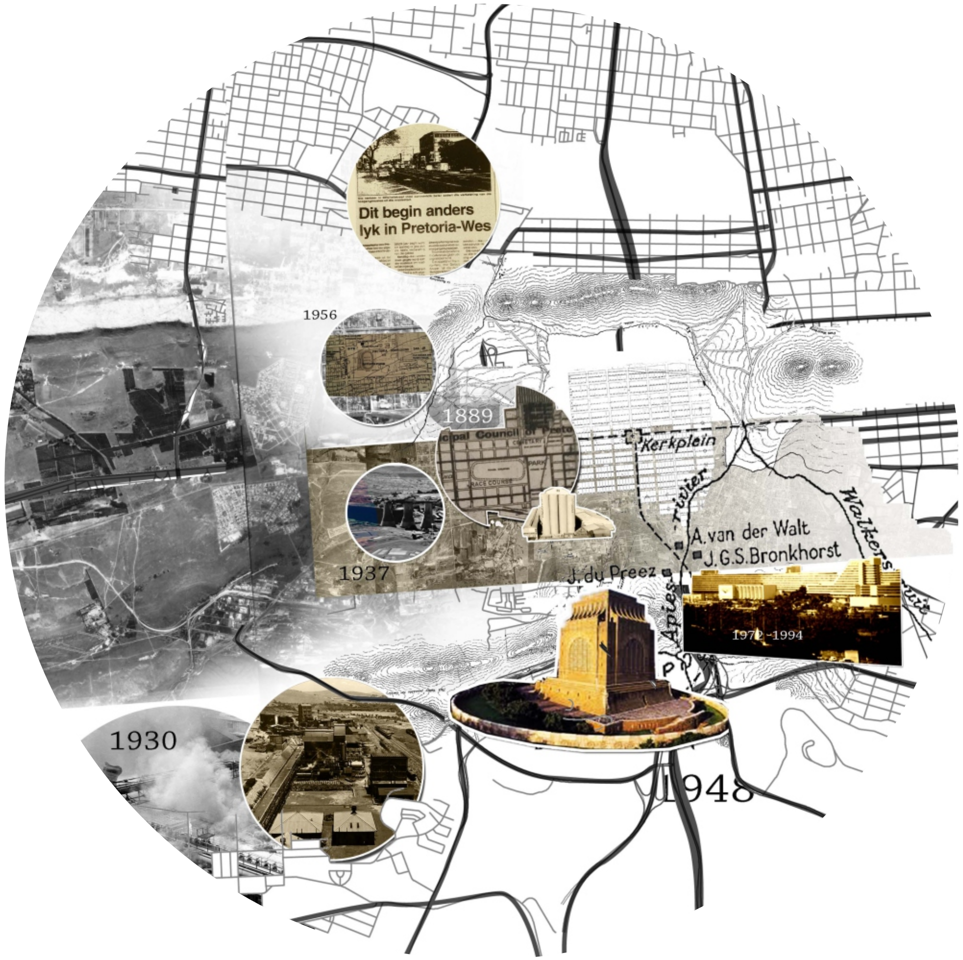



Figure 3.2: Timeline of landmarks and monuments (Discarded Landscapes Group 2016)

As an addition to the timeline on the previous page the following figure illustrates further expansion of Pretoria and highlights a few important landmark formed for example the Voortrekker Monument, Pilditch Stadium and UNISA.

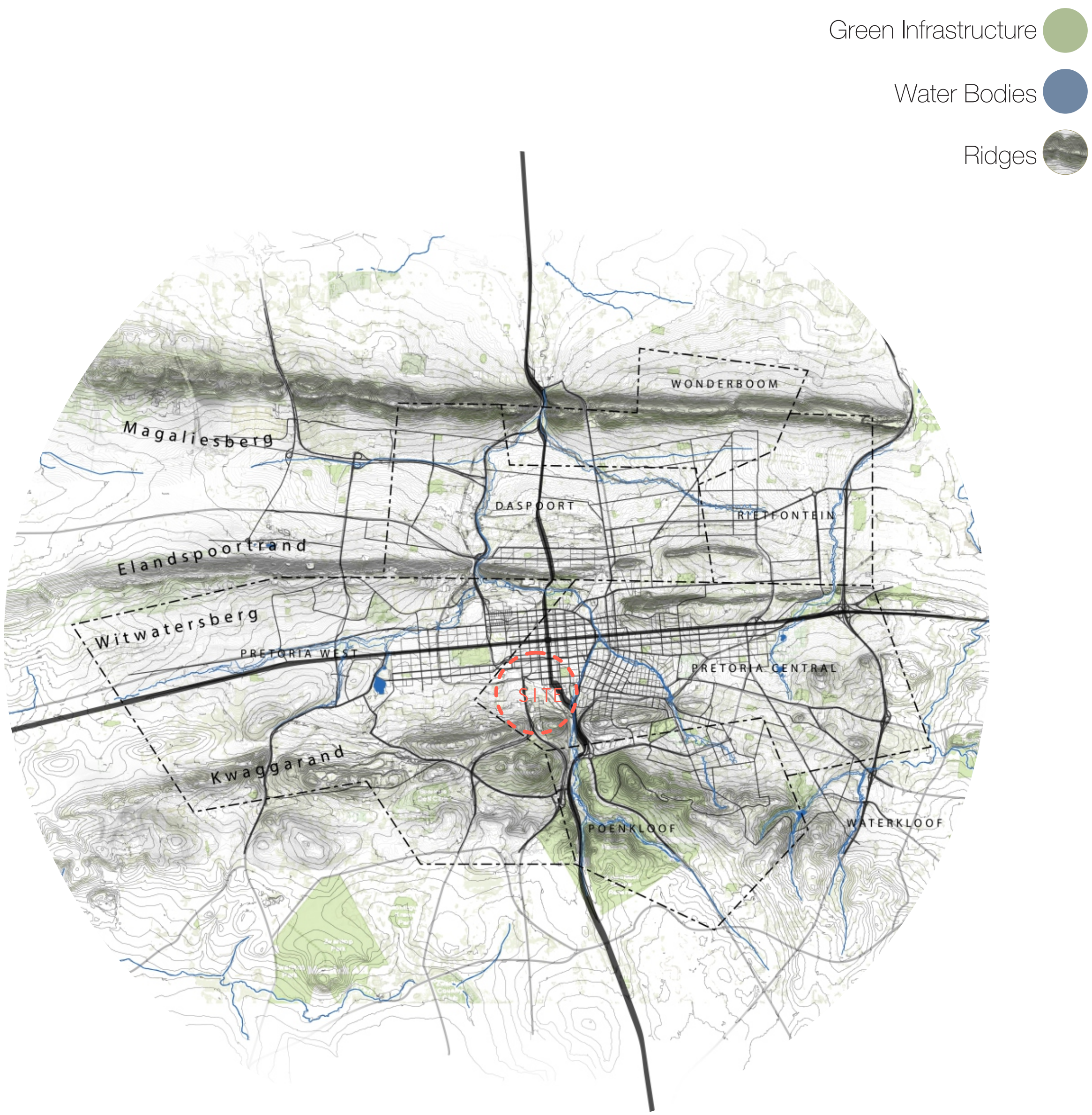



Figure 3.3: Ecological elements in Tshwane (Discarded Landscapes Group 2016)

## Ecological Elements

The evolution of Pretoria as mentioned was greatly influenced by its topography and ecological elements. In an urban study of Tshwane seen in figure 3.3 these elements are highlighted.

The river networks along with the ridges have steered the development of the city seen in figure 3.3. Here these can clearly be seen how the ridges steered the development of Pretoria to the east and west.


Figure 3.4: Image showing Public and private open space (Discarded Landscapes Group 2016)

## Public and Private, Healthy and Degraded Open Space

Looking at the available open space, public space, degraded space a well as private open space, one can note that the worst degradation of land is taking place in the inner city of Tshwane. Accessible public open space to a large extent can only be found outside of the CBD as development extend towards the east of Tshwane.

Designers cannot allow the inner city to degrade and ultimately be unusable. As urbanization takes place in unsustainable ways it is the designer's job to catalyse the redevelopment and re-purpose buildings and spaces in the inner city.

Significant heritage fabric

Degraded heritage fabric


Figure 3.5: The heritage fabric in Tshwane (Discarded Landscapes Group 2016)

## Heritage Fabric

Figure 3.5 shows the tangible heritage and cultural significance as well as lost and forgotten heritage fabric in the current context.

Many building within the inner city have great heritage and cultural value as this is in the vicinity of the original precinct where Pretoria evolved and thus most of the building are older than 60 years .

## History of the Site

Salvokop has an important railway heritage that has been quite well preserved (Cultmatrix 2003:32. This is due to its isolation from the CBD because of the railway lines the site has received less pressure for development.

in 1892 the very first station building was built and the area was established as a railway camp after there was enough funds due to the discovery of the main gold reef in Witwatersrand (now called Johannesburg the main intention at that time for the railway was to link Pretoria (now Tshwane to Delagoabaai (now Maputo(Le Roux 1993:26. The Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij (NZASM was commissioned to lead the development of the area, thus they established a permanent railway camp in Salvokop (Salvokop Steering Committee 2003:21) .

After the new nationalist government launched new larger railway complexes in Koedoespoort, north of Pretoria (Tshwane the railway complex at Salvokop rapidly decreased and later all of the facilities were moved to other railway facilities (Salvokop Steering Committee 2003:9).

Since 1900 up till today Transnet and its subsidiaries have been the national operator in charge of the railway (ibid:11).

1937 1939 1947 1991

Figure 3.6: The development of Salvokop seen on aerial photographs (Van der Waal 2009)

2001 2005 2009 2016

NORTH — Scale: NTS

Figure 3.7: The development of Salvokop seen on aerial photographs (Google Earth)

Locality


Figure 3.8: Locality mappof the proposed site (Author 2016)

## Land Use Analysis

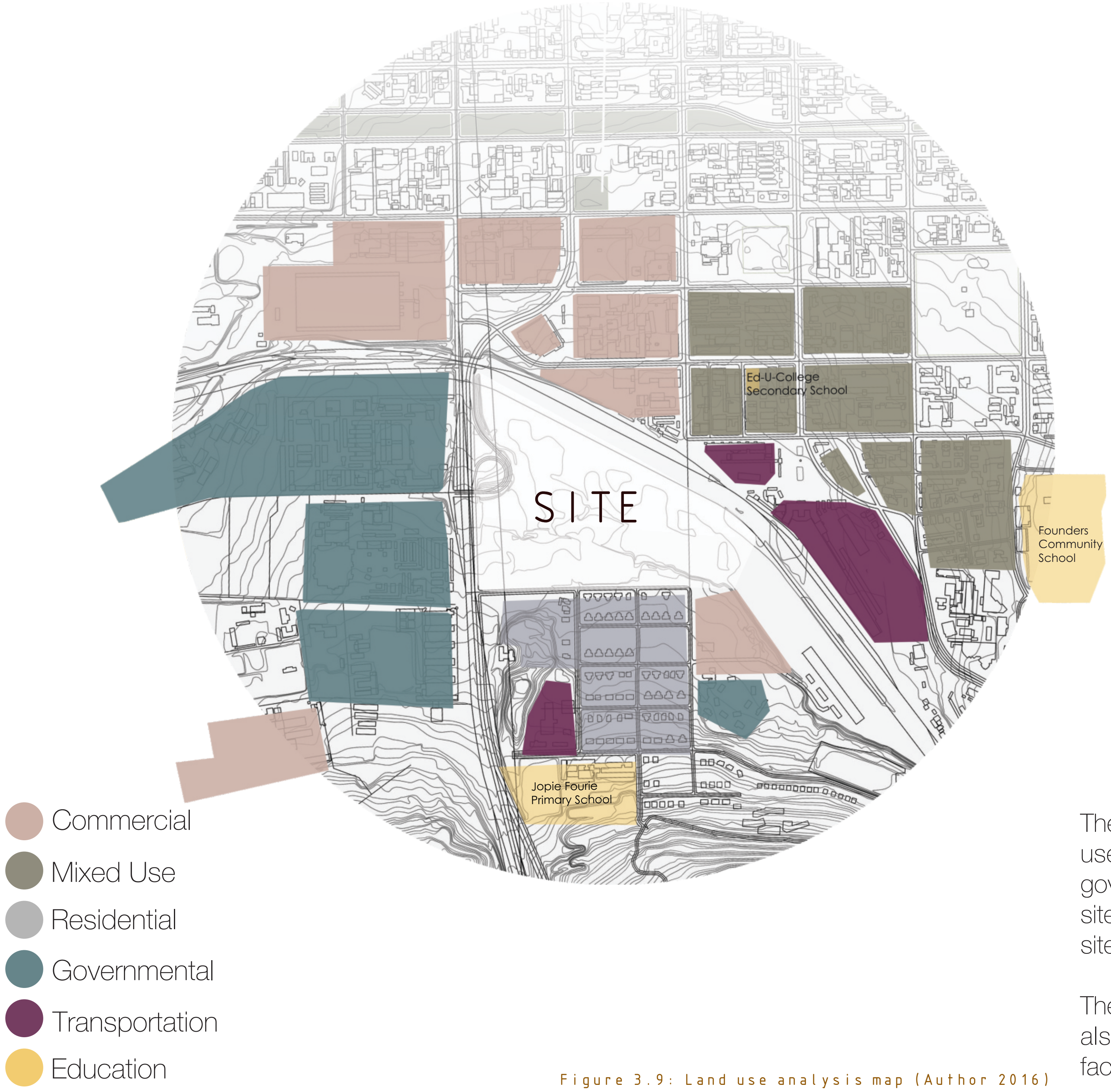



Figure 3.9: Land use analysis map (Author 2016)

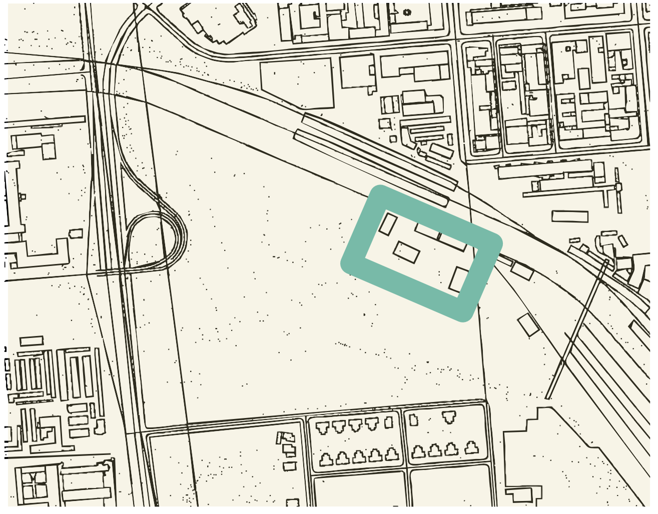
The following figure illustrates the different land use types around the site. There is a large governmental presence on the western side of the site and commercial and mixed use north of the site.

The strong transportation presence near site can also be notes along with three educational facilities close to site.

## Site Photos

Figure 3.10: Photo of site (Author 2106)

## Current Activities on Site



POP-UP is a NPO (non-profit organisation) with a holistic attitude toward the upliftment of under-privileged communities, aimed at teaching someone a skill and placing them back into the employment system of South Africa. As previously mentioned their main centre is situated on the proposed study area in Salvokop occupying the old resident engineers building among other seen in figure 3.11 .

An enrolment fee of one hundred rand is required as a commitment to the programme and everything else thereafter is then free of charge. Learners receive breakfast and lunch every day of their training at POP-UP. Before learners are referred to a specific program they all need to attend the Personal Growth and Life Skills program where basic life skills and etiquette is taught.

POPUP offers nine SETA accredited market related skills programmes as well as other non-accredited programmes to unemployed persons between the age of 18 and 45.

Accredited Skills Programmes:
- AET (adult education and training) - English literacy and numeracy
- Hospitality services
- Sewing
- Computer and office administration - call centre training and cashier training
- ECD - early childhood development
- Home-based care

Non-Accredited Skills Programmes:
- Readers are Leaders
- Waitron Training
- Child minding
- Cooking and Domestic Training
- Life Skills
- Basic Computer
- Cookie Jar Training (Baking for Profit)
- Work Place Readiness

Figure 3.11:Old engineers building now occupied by POP-UP (Author 2016)

Figure 3.12: Photo of Computer and office administration class (Author 2016)

Figure 3.13: Photo of sewing class currently in a corrugated steel building on site (Author 2016)

Figure 3.14: Photo of POP Kids who attend classes in these containers (Author 2016)

Figure 3.15: Photo of Vegetable tunnels whom one of the learners at POP-UP care for (Author 2016)

Pedestrian bridge

Vehicular movement

Pedestrian movement

Buildings and sites with important heritage value

Public recreational open green space

Public open green space

Train movement

Existing entrances onto site

Figure 3.16: Site Analysis (Author 2106)

## Site Analysis

### Movement

The site analysis that was carried out reveals that the most movement occurred on the edges of the site where men and woman would access the CBD on their way to work and back home via the bridge on the eastern side of the site (seen in figure 3.16) and then also along Kgosi Mampuru and Pretoria Main Street on the Western side of the site. Movement on the site is only to and from POP-UP

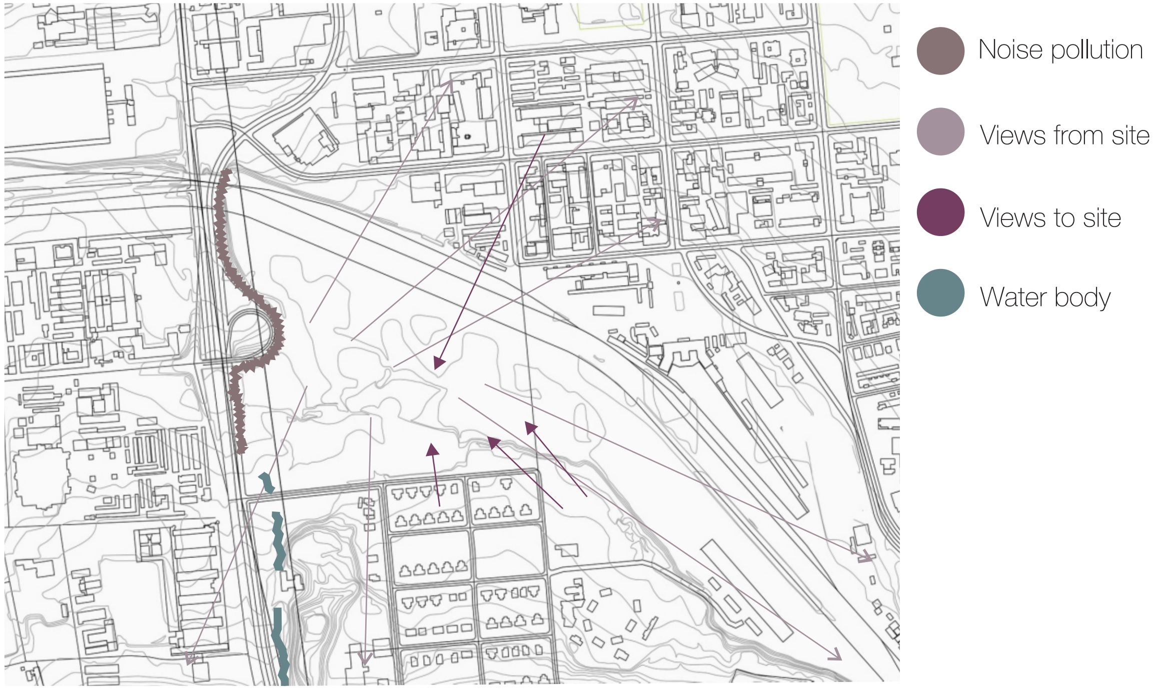
### Heritage

Salvokop has high cultural heritage significance (Pelser 2013:3). Many structures in the area is older than sixty year, for example the NZASM (Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij) Heritage Village, NZASM Court and the CSAR (Central South African Railways) semi-detached quarters (Pelser 2013:9).

On the proposed site itself building with high cultural heritage significance is the CSAR Resident Engineer's Office (currently inhabited by POP-UP), the SAR Workshop and Steam Hammer Workshop.

### Access

The site is only accessible by vehicle from the south. Most of the open green space illustrated in figure 3.16 are mainly overtaken by alien invasive plants and need to be rehabilitated.



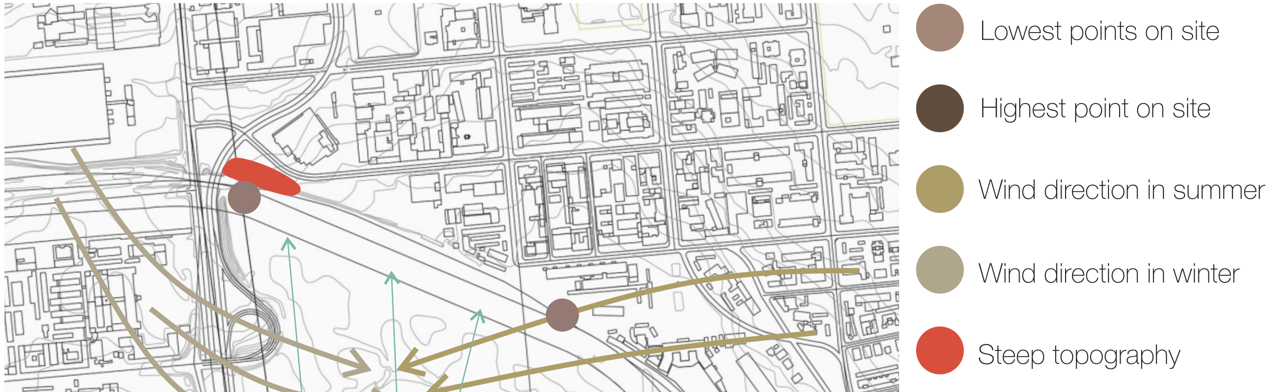




Figure 3.17: Site Analysis (Author 2106)

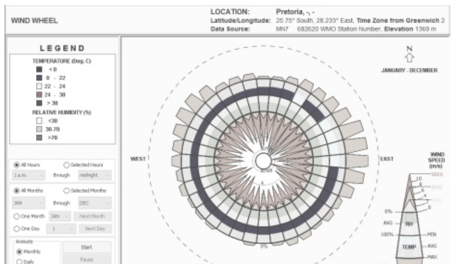



Figure 3.18: Wind study (CSIR)

The Sensory

There are some breath-taking views on site as one looks at the city skyline facing north and Salvokop Hill as one faces south. There are a few building in close proximity to the site that will also have a view onto the site for example the new STATS SA building, the Department of Home Affairs building in the city as well as a few on the governmental and institutional building situated on the western side of the site.

The noise of trains passing by the site contributes to a certain unique vibrant feeling of the site. This can be seen as a negative or positive depending on the user. There is quite a bit of noise pollution coming from the cars driving past the site on Kgosi Mampuru and Pretoria Main Street especially in peak hour traffic times. Not many exhaust fumes enter the site due to its relation in height to these roads.

Topography

The surface of the site is not steep with a general slope of 1:40. A small portion of the site on the very eastern corner has a very steep slope of 1:4. Drainage is this towards the north.

Air Movement

In a study by the CSIR specific information about the predominant wind direction as well as wind speed in the area could be accessed.

.

From the analysis the following has been concluded:

Strengths

- The study area's proximity to public transport nodes is of great benefit. It is walking distance from the Pretoria train station as well as the Pretoria Gautrain station.
- The site lies west of Pretoria Main and Kgosi Mampuru Street allowing quick and easy access to site and to public transport.
- The site is in close proximity to the CBD of Pretoria thus ensuring that there is a great demand of people in close proximity to the site daily.
- The Study Area has a very important heritage fabric which can be preserved through the upliftment of the area.

Weaknesses

- The heritage significant buildings in Salvokop have not been looked after and maintained thus they are deteriorating.
- Although the highway right next to the site is a big strength there are times through the day where it can be seen as a weakness due to the noise from traffic that it projects on to the site.
- The site is disconnected from the CBD by the harsh train tracts with a very small bridge linking Salvokop and the site to the CBD.
- There is a shortage and of residential units in the area as one starts to see 2 – 3 families sharing a single residential property and with the new Stats SA building almost finished (housing 3000 employers in it vicinity) in Salvokop this problem will become worse.

Opportunities

- The terrain is unplanned and ambiguous.
- There are beautiful views from the site to the City and to Salvokop.
- It is in close proximity to many transport nodes.
-Many studies have already been done on the ecological and heritage significance of the site making the influence of these factors on the site very clear to the author.
- POP-UP (People's Upliftment Programme) a NGO currently operating on site can be used to run various programmes of a design proposal empowering POP-UP as well as the greater area.

Threats

- There are certain corners on site that are deemed as unsafe because lack of surveillance due to minimal pedestrian access.
- The soil on site is not in a very good condition due to previous development on site, vehicular circulation on the soil, pumping of heavy building material on site and the removal thereof exposing the soil resulting in the capping of the soil.
- There are many alien plant species growing on site.
- There are train tract remains in certain areas on site underground.
- Just next to the site a few trains lay abandoned and disintegrated.

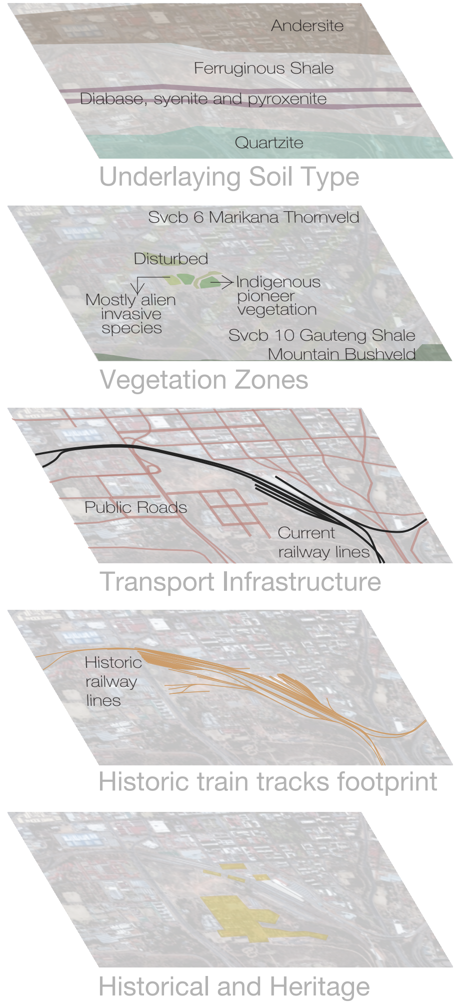



Figure 3.19: Extra Analysis (Author 2016)

Except for the strength and opportunities mentioned above that will enhance the design, weaknesses and threats will be vigorously addressed to turn these negative aspects on site into positives through design.

# CHAPTER FOUR

## Urban Framwork

### Introduction

It was important to develop a framework for the design of the site due to its public nature. Many external as well as internal factors are exercised onto the site which needs to be understood.

In the Development of the framework many previous frameworks were re-visited as to understand the approach to the site in a holistic sense.

## Previous Framework Analysis

Tshwane Open Space Framework

In 2005 the City of Tshwane produced a document comprising of 3 different volumes in which they analyse static environmental features of the city as well as the current open space situations within Tshwane then suggest different appropriate frameworks and visions with detailed implementation strategies.

They define the term open space (in its broadest sense) as:

'Areas predominantly free of building that provide ecological, socio-economic and place-making functions at all scales of the metropolitan area.'

The Tshwane Open Space Framework is rooted in a holistic understanding of Tshwane through detailed analysis. Detailed Plans, Policy and Visions were then generated through the understanding of internal and external influences on specific areas.

Zooming into the framework proposal for Salvokop (see figure 4.1) Red nodes are classified as "the most important place-making components" of the framework, green Nodes are protected areas of ecological importance and brown nodes are recreational parks or sport facilities. The grey dashed lines are railway tracks and brown lines are highways or main roads (TOSF Vol 3 2005:121-127).

Because The Tshwane Open Space was done in such a large context it was not possible for the team to make specific and detailed suggestions.

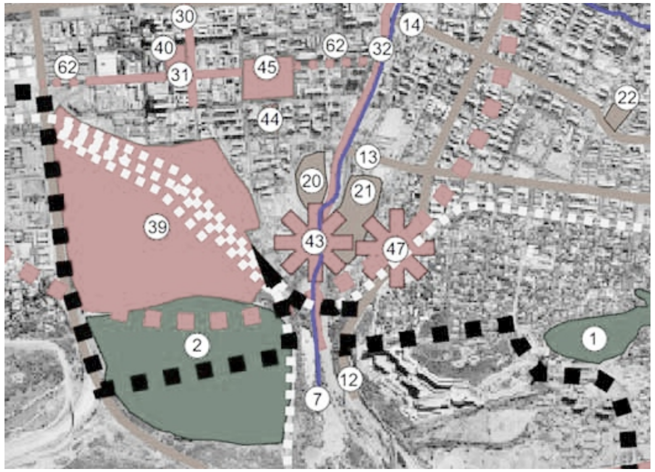



Figure 4.1: Tshwane Open Space Framework Vision (TOSF 2005:107)

The following ideas of this framework has been adopted to fit into a new framework generated by the author:

In the beginning of the design process the author attempted to gain a holistic understanding of the area and site by reading the very document published in which this framework was generated. It was important for the author to note that the Tshwane Open Space Framework has classified the whole site as an important place making component in the framework.

Figure 4.2: Framework for Salvokop by GAPP (Culmatrix 2003)

**GAPP Framework for Salvokop.**
An Urban and Spatial design layout for Salvokop produced was by an extensive team of built environment professionals including GAPP Architects and urban designers along with the University of Pretoria. In the framework they suggest that Salvokop should become a mixed use neighbourhood accommodating different residential and commercial entities, a cultural heritage route and nodes leading up to Freedom park promoting tourism and convenient public transport nodes.

The Vision that is generated for Salvokop is to be an all-encompassing village within the city celebrating cultural, heritage, commercial and residential entities all co-exiting as a whole within Salvokop.

The framework is mainly concerned with 3 key issues: Movement and Access, Significant Places Strategy & Integration of site to greater context (Pretoria CBD).

The framework is very considerate towards the heritage significant structures in Salvokop but the urban densification of the whole area does not allow for decent open urban public space.

The following ideas of this framework has been adopted to fit into a new framework generated by the author;

The Idea of a mixed use neighbourhood was adapted along with the suggested cultural heritage route and public transport nodes.

## Re Kgabisa Salvokop Framework

This framework for Salvokop proposes visual and physical links to important landmarks such as the Union Buildings and Church Square to Freedom Park.

There is proposed that Governmental institutions should be reintegrated into the city fabric in a series of nodes along two functional axis' identified in the inner city seen indicated in purple in figure 4.3. The desired outcome is that this could reinstate the capital city status of the CBD and encourage development and growth in the city.

This study strongly focusses on the integration on governmental institutions and neglects many other influences in the area. Although heritage and cultural significant sites as well as the Salvokop township are incorporated into the proposal the unique character of the community was overlooked. The environmental potential of the area was also not considered and included in the framework.

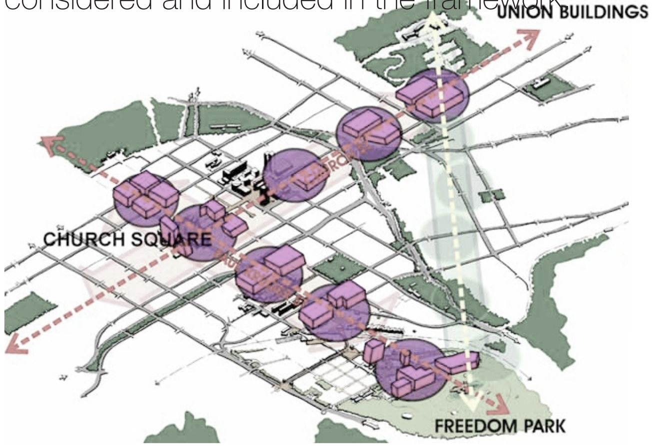



Figure 4.3: Re Kgabisa Framework (Rekgabisa 2013:6)

The following ideas of this framework has been adopted to fit into a new framework generated by the author;

The increased access from the inner city and the promotion of governmental institutions in Pretoria CBD would encourage users to move to site as the city that is currently un-activated should get activated trough this proposal.

The following ideas of this framework has been adopted to fit into a new framework generated by the author;

The placement of and commercial and residential blocks that the group has adapted from the GAPP framework will be accepted and adapted slightly. The positioning or urban agriculture can also be acknowledges and adapted for the final framework.

**Interdisciplinary group Framework by 2011 Masters students**

A group of Architects, Landscape Architects and Interior Architects have generated a framework for the Salvokop precinct in 2011.

By also studying previous frameworks they finally generated their own framework which can be seen in figure 4.4. Their goal in this framework was to connect and preserve; connecting Salvokop to the CBD and preserving the character and open space in the area.

They suggested retaining the open spaces existing within Salvokop and adding a new layer of residential and commercial buildings.

Figure 4.4: Framework for Salvokop (Salvokop Group 2011)

Due to the extensive studies that have been done to arrive at the solutions seen in these previous frameworks it was very important to understand the intention and ideas behind them but the new program, evolution of the site and evolvement of pop-up on site has called for the re-design of a framework. The framework keeps strong ideas of the preceding frameworks by combining these strong ideas and adding a new dimension to the framework it could be appropriated for the specific topic of the dissertation

# Framework Proposal


Figure 4.5: Urban Framework Proposal (Author 2016)

The parking space for the design was demarcated in the south-west corner of the site as the journey through the design will start here, the ground is also already compacted due to the train tracks which are now abandoned, the will be reclaimed as parking space with solar panel structure providing shade.

Before some of the plant get planted in the planting fields they will first be cultivated in a green house on site.

This new entrance to the site will allow for easy access to the site from the inner city.

After a few visits to POP-UP there is suggested that POP-UP gets re-designed to be able to function as a small community.

POP-UP has incredible potential and in an interview with Madelein Wood from POP-UP there was spoken about the expansion of POP-UP.

The building footprints for the mixed use residential framework was adapted from the same group that completed the fourth and last framework that was studies. It was adapted and changed through consultation with architects to arrive at the solution seen here.

As this block of residential housing is low it is suggested that this open space of land gets used to develop low-rise residential units

As development in Salvokop advances there will be a greater demand for residential and office space, thus it is proposed that an incremental development approach will be taken and that every space will be used as efficiently as possible.

As urban agriculture will be implemented as part of POP-UP and managed by POP-UP there is proposed that the skills learned there will inspire the community to start their own vegetable gardens

## Framework Proposal Ideas

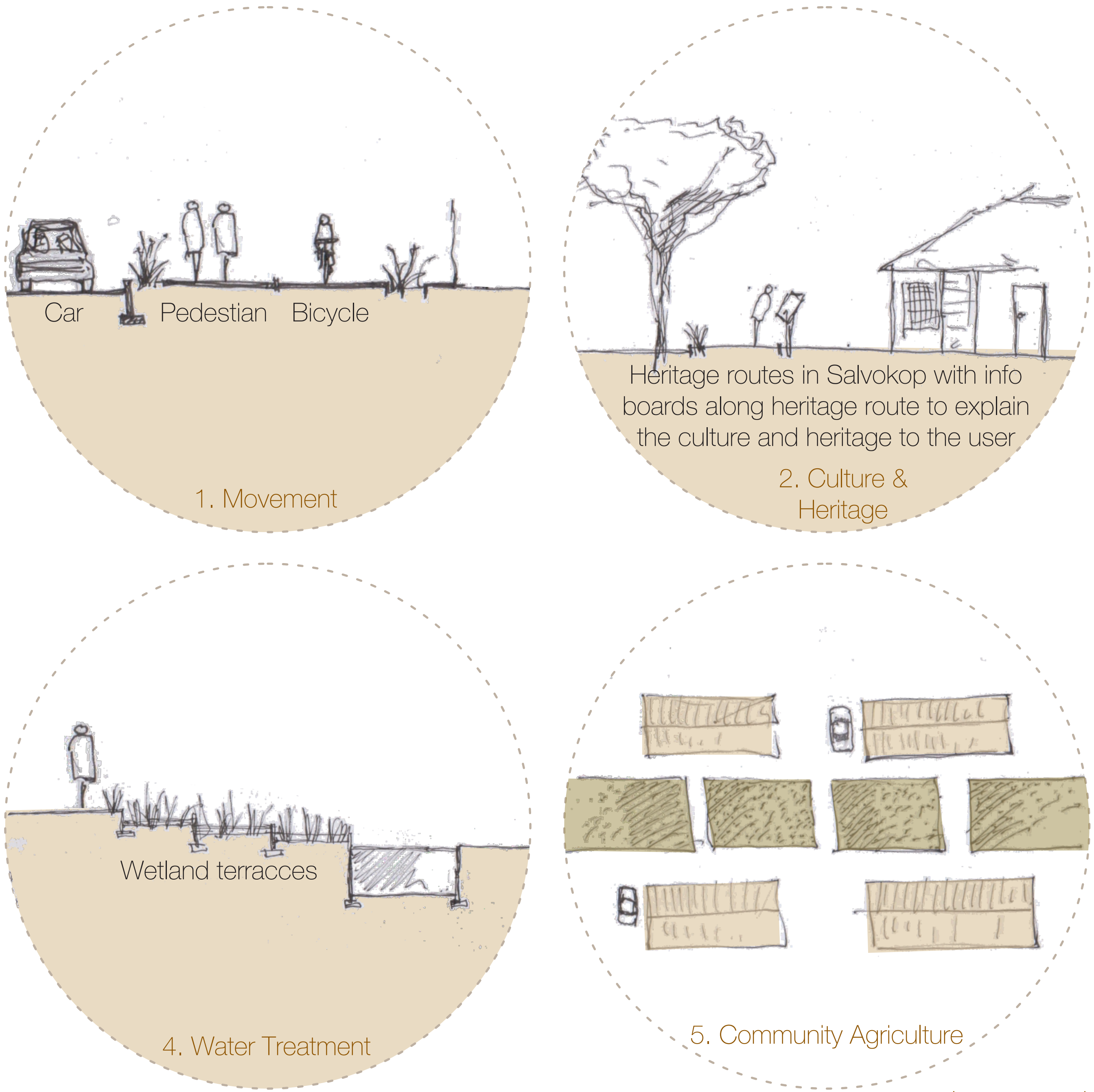



Figure 4.6: Framework proposal ideas (Author 2016)

Ideas proposed in the framework.

1.Proper pedestrian, vehicular and bicycle movement would be provided for in the precinct.

2.Due to the heritage of Salvokop, heritage routes are proposed where information board will provide the user with further information.

3.There is proposed that bioswales would be incorporated into all of the surrounding roads in the area especially new roads and parking lots being built.

4.As water will be recycled and harvested there is proposed that the water harvested from the road first runs through a wetland at the top of the site.

5.While vegetable gardens will be incorporated into a new program at POP-UP the idea is that the community can learn from this and start their own vegetable garden on their properties.

# CHAPTER FIVE

## Development of the Demo Urban Essential Oil Farm

### Introduction

The final master plan is a culmination of the theory premise, the research, the design development and a constant iteration of the outcomes.

Due to the selected site being a brownfield site, the designer had the freedom to fully express the field of smellscape design by means of open space and manipulating topography.

The master plan seeks to provide a general overview of the functions of the whole site to illustrate the validity of other entities and design ideas that developed in the sketch plan area. These entities can thus in the following chapter be seen as the required context for a holistic design approach.

In this chapter the principles used to generate the master plan as well as various design inspirations that originated from the site and research will be discussed. The progression from concept to the iteration of the master plan leading up to the final master plan will be illustrated where the final master plan will then be discussed in detail.

## Overview of the Master Plan

The master plan is a layered solution to satisfy expected diverse users on site, potential local community needs ecological responsibilities, while also trying to challenge the norm in landscape architecture and find new ways to design for a specific human sense namely smell.

The master plan design has to satisfy many different needs on the site and of the surrounding community and users. It was the intention of the author to seek ways in which to do this. The author believes that there are necessary contextual and real issues like the lack of open public green space that should be dealt with as to ensure that the project does not end up as an elitist entity but is grounded in the urban context and surrounding community.

Much of the design and form generation was influenced by basic archetypical principles and elements found in two books; Forms and *Fabric in Landscape Architecture* by Catherine Dee (2001) and in *Architecture: Form Space and Function* by Francis D.K. Ching (2007).

## Program

- Fragrant flower planting fields
- Moments (Spaces) of intense smell
- Urban balcony
- Space for prepping, making, storing and packaging of essential oils
- Skills training facilities for new staff members

- Outdoor recreational and picnic space
- Kids play areas
- Educational outdoor spaces
- Market spaces
- Fragrant flower market (multifunctional)
- Storage space
- Essential oil factory
- Events spaces
- Jogging routes
- Meditation spaces
- Activity route
- Commercial entities
- Reception and Fragrant experience
- POP-UP interaction with site and design
- POP-UP second phase expansion

## Composite Functional Relationship Diagram

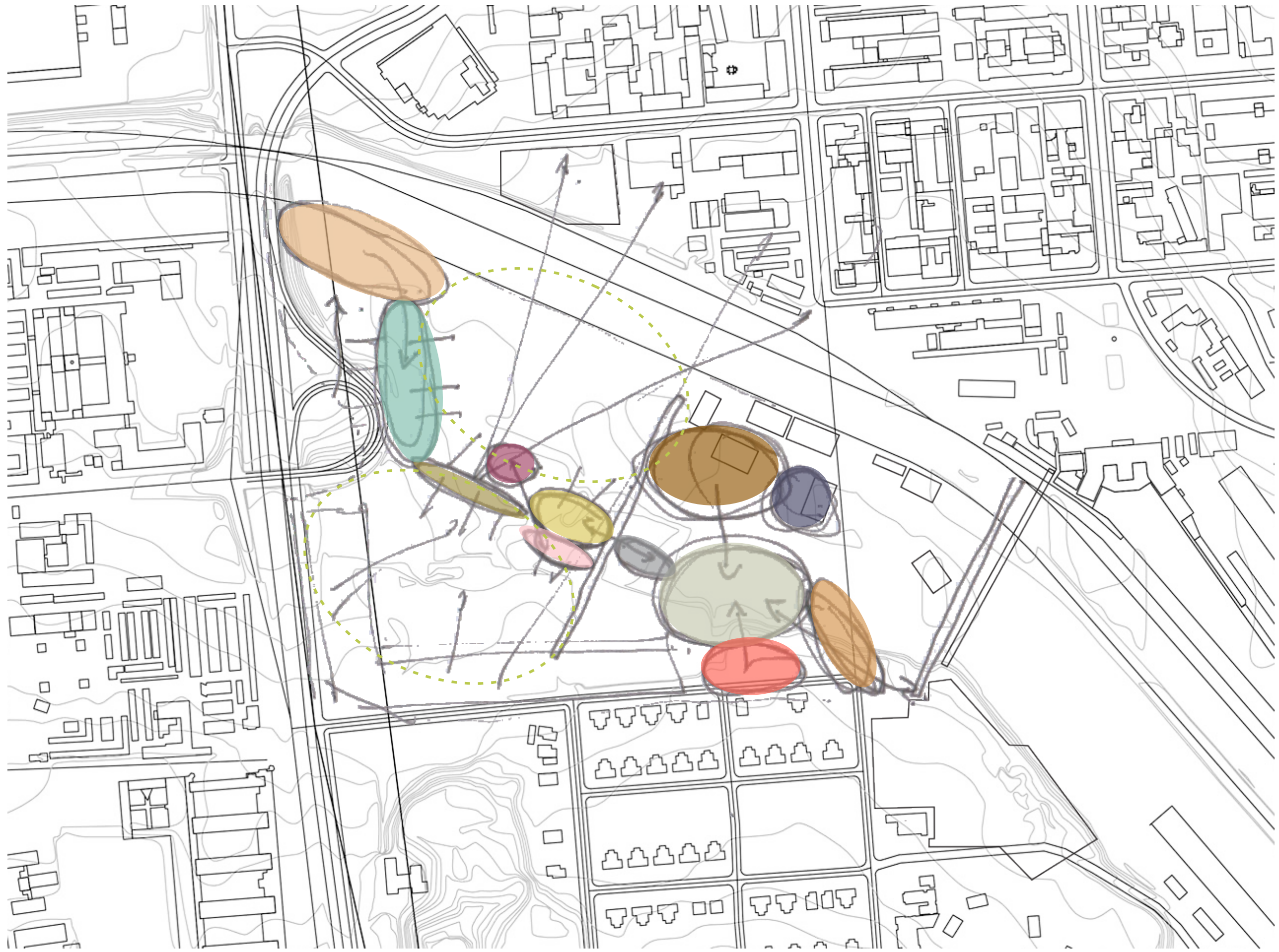


Figure 5.1: Composite Functional Relationship Diagram (Author 2016)


Figure 5.2: Graphic representation of three different layers (Author 2016)

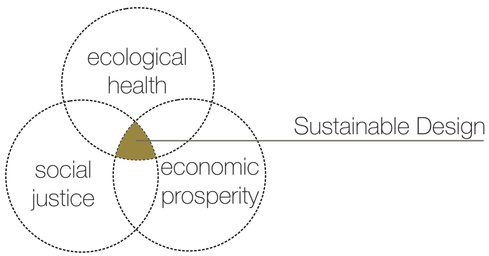



Figure 5.3: Three principles of sustainable landscape design according to Elizabeth Meyer (Author 2016)

## Principles as Layered Approach

Layer 1

This should be a green space which people can enjoy daily, satisfying general daily needs of the surrounding public and making it easier for residents and employees in close proximity to the site to comfortably enjoy the outdoors, daily gaining from the benefits like psychological restoration and revived energy that it has to offer (see chapter 2).

Layer 2

The new design should be ecologically responsible and sustainable. The functioning of the design should not use any resources but it should be able to produce and harvest its own resources off-site and on site.

Layer 3

The design should seek to find new ways in which to create spaces and experiences. Smell has a strong influence on the experience of spaces as mentioned in chapter two. The challenge of this third layer will be to design with the sense of smell as experience.

It is important to note that these layers have been identified at master plan level and does not speak about specific approaches to landscape design yet.

For example sustainability in itself also has many diverse facets and layers attached to it on a design level. This will be elaborated in the next section.

## The layers of sustainability

One of the United States leading landscape architectural theorists, Elizabeth Meyer, in her book 'Sustaining Beauty: The performance of appearance – A manifesto in three parts' explains that sustainable landscape design is understood in relation to three principles; ecological health, social justice and economic prosperity (see figure 5.3), arguing that one needs more than ecologically regenerative interventions to achieve sustainability in landscape design. Designed landscapes need to be constructed human experiences as much as ecosystems (Meyer 2008:21). Mcharg explains that "our [landscape architects] concern is for a method which has the power to reveal nature as process, containing intrinsic form (in Swaffield: 2002:39).

A concern for beauty and aesthetics is vital in considering sustainable design if it is to have a significant impact on our culture (Meyer 2008:8). Beautiful sustainable landscape design involves the design and creation of experiences as much as the design of ecosystems. These experiences are vehicles for connecting with and caring for the world around us (Meyer 2008:18). Emphasis must also be put on the concept that nature is not out there but in here, interwoven in the human urban condition. Hydrology, ecology and human life is intertwined (Meyer 2008: 16).

## Design Inspiration

There were specific design ideas that originated from the following:

### From Site Analysis

In the site analysis and through the site visits a few features of the site were identified as opportunities. These were:

a) The beautiful views to the city and to Salvokop,(see figure 5.5)
b) Some of the indigenous pioneer grasses that have taken over on site, (see figure 5.6)
c) The barren railway tracks and old building material dumped on site (see figure 5.7)
d) The feeling in the air at dawn and the city lights at night (see figure 5.8)
e) Stone and Concrete pieces left in piles on site (see figure 5.9)

The Idea is to enhance the beautiful view on site and tightly knit it in with the idea of smell, the poetics of fragrance and the idea of escaping from the city. Now seeing the city as an outsider and not being in the 'hustle and bustle' for a moment.

Pioneer vegetation along with alien invasive species started to take over in many parts of the site, in some of these parts it seems like indigenous grasses have predominantly taken over. These grasses are beautiful and the author has decided that they need to be preserved. Users of the site will be allowed to gently move through to experience these 'wild' areas without much disturbance .

Some of the train tracks that are covered with soil will be exposed again to reveal part of the history of the site and to emphasize the theme of linearity that keeps on prevailing in the design. A few piles of steel has been left on site, the designer will use these steel elements in the design and detailing of the project.

Because of the size of the site (13ha) as well as the lack of definition of elements to respond to the author had to seek appropriate ways in which to create form

The linearity of the existing train tracks on the periphery of the site along with the predominant wind directions in summer and in winter (see figure 5.4) provided elements to respond to.

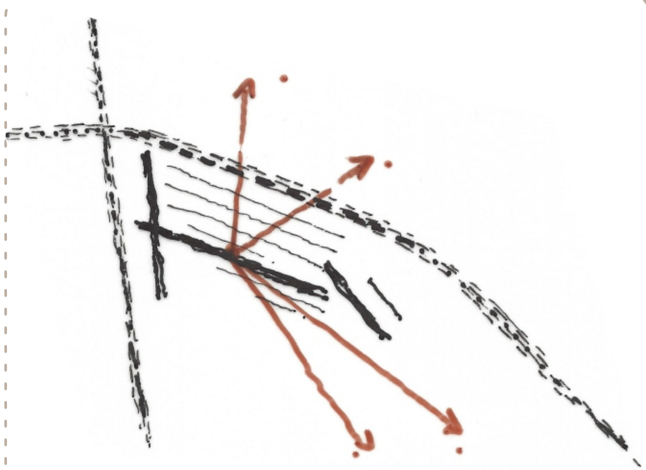


Figure 5.4: Response to the linearity of the train tracks (Author 2016)

Figure 5.5: a) beautiful views to the city (Author 2016)

Figure 5.6: b) indigenous pioneer grasses glowing in the late afternoon sun (Author 2016)

Figure 5.7: c) steel train tracks left on site (Author 2016)

Figure 5.8: d) The city lights at night (Author 2016)

Figure 5.9: e) Stone and concrete pieces left on site (Author 2016)

## From Theory

There are seven factors that influence the design with smell as mentioned and explored in chapter 2. These feature had to be translated into specific design ideas and responses.


Figure 5.10: 7 Factors that influence smellscape design (Author 2016)

Another important factor that is researched as part of the theory chapter is how to achieve the spiritual and economic upliftment of a community. As explained in chapter two it is very important that the site gives back to the community. Ways to ensure this were explored in the following chapter and manifested in the program.

## From Initial Technical Investigations

The method of irrigation used in the project had a great influence on the overall aesthetic and the 'look and feel' of the planting fields which is a big part of the design.

Two different methods have been explored to ensure the viability and sustainability of the project as seen in figure 5.11.

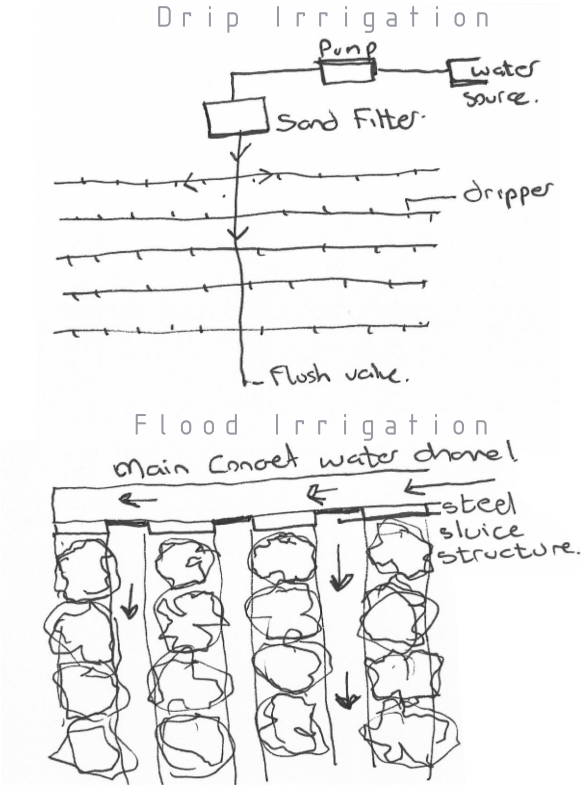



Figure 5.11: Different irrigation systems

*Table 11.3: Typical cross-cut dimensions, lengths and gradients of furrows*

| Soil types | Recommended gradient (vert:hor) | Length | W [mm] | Y [mm] |
|---|---|---|---|---|
| Sand | 1:150 - 1:300 | 50 - 100 | 300 - 500 | 100 - 200 |
| Loam | 1:200 - 1:400 | 100 - 200 | 300 - 600 | 150 - 300 |
| Clay | 1:200 - 1:800 | 200 - 400 | 300 - 700 | 150 - 300 |

Figure 5.12: Recommended gradients for different soil types (AGIS 2002)

## Inspiration from Research on Essential Oil Manufacturing

There are many practicalities of how essential oil farms work and should be managed.

The narrative and practical steps of making essential oil needed to be understood fully. The way plants need to be harvested, kept and the distillation process, machine sizes etc. informing the design. Through understanding this process in detail the narrative of the specific process was translated into design.

### The narrative

harvest plants that are suitable to distil → Some plants are used immediately after harvesting and some are first dried → If the plant material needs to be dried it is kept in store rooms till dry → When the plant material is ready it is placed in the distillery pot → The final product is pure essential oil

### The distillery process

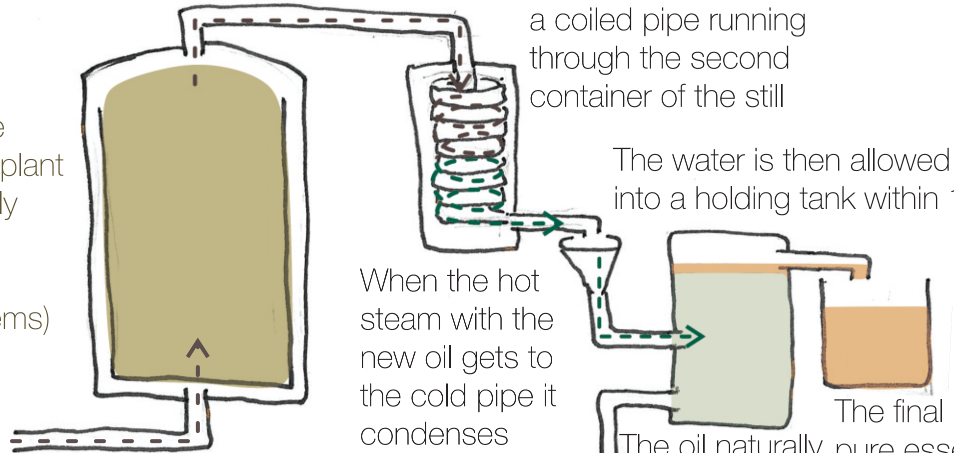
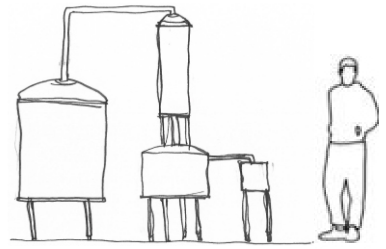



Figure 5.13: The essential oil distillation process (Author 2016)

Distiller: 50kg (material) 180*liter* double pot Installation

Size: 1100 x 2100 x 1650 Weight: 500kg
Water requirements: Boiler - 20*l*/h
Condenser - 250*l*/h



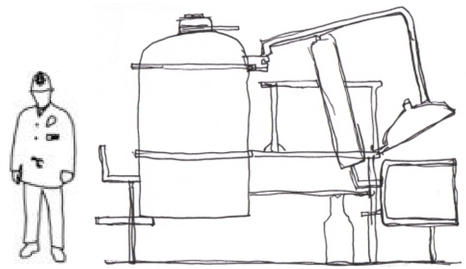


Figure 5.14: Scale of distillation equipment (Author 2016)

Components of Distiller:
- S/S Gravity feed separator
- S/S Horizontal multi-tube condenser
- S/S Still x 2
- S/S Interchangeable lid
- S/S Piping, fittings, valves, gauges etc.
- S/S Mesh lifting trays & chains x 2
- Tipping Frame
- Insulation of pot and piping (EDESA 2016)

## CONCEPTUAL APPROACH

Bringing together site, program and ideas, the concept needed to weave together all of the above mentioned in order to drive the design.

### Concept

Unveiling the redolent potential of landscape architecture thought moments of pleasant fragrant experiences along an olfactory route.

Linking everyday practices to memory and identity through the experience of smell in the landscape.

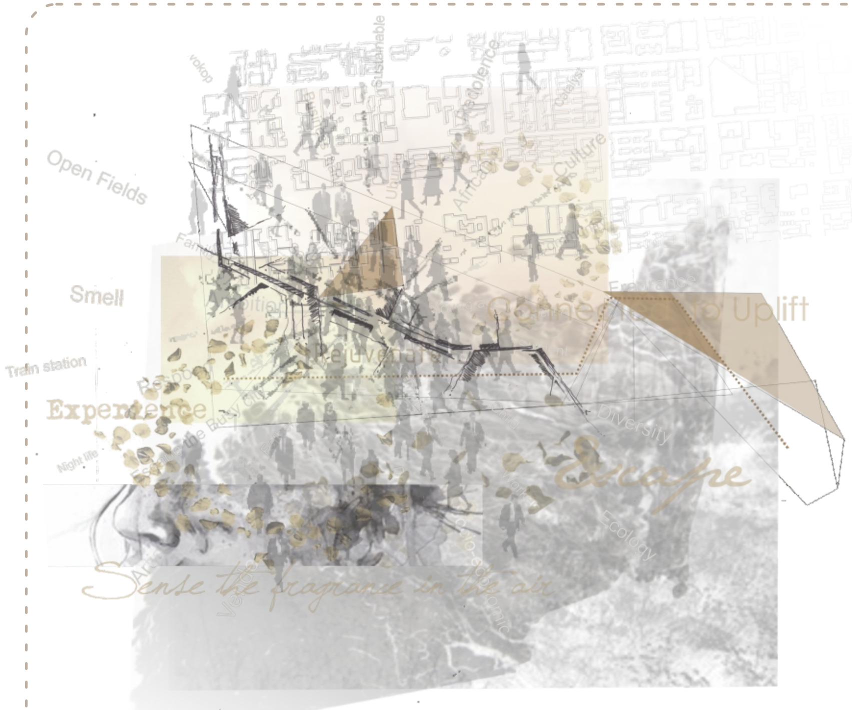



Figure 5.15: Vision for the design

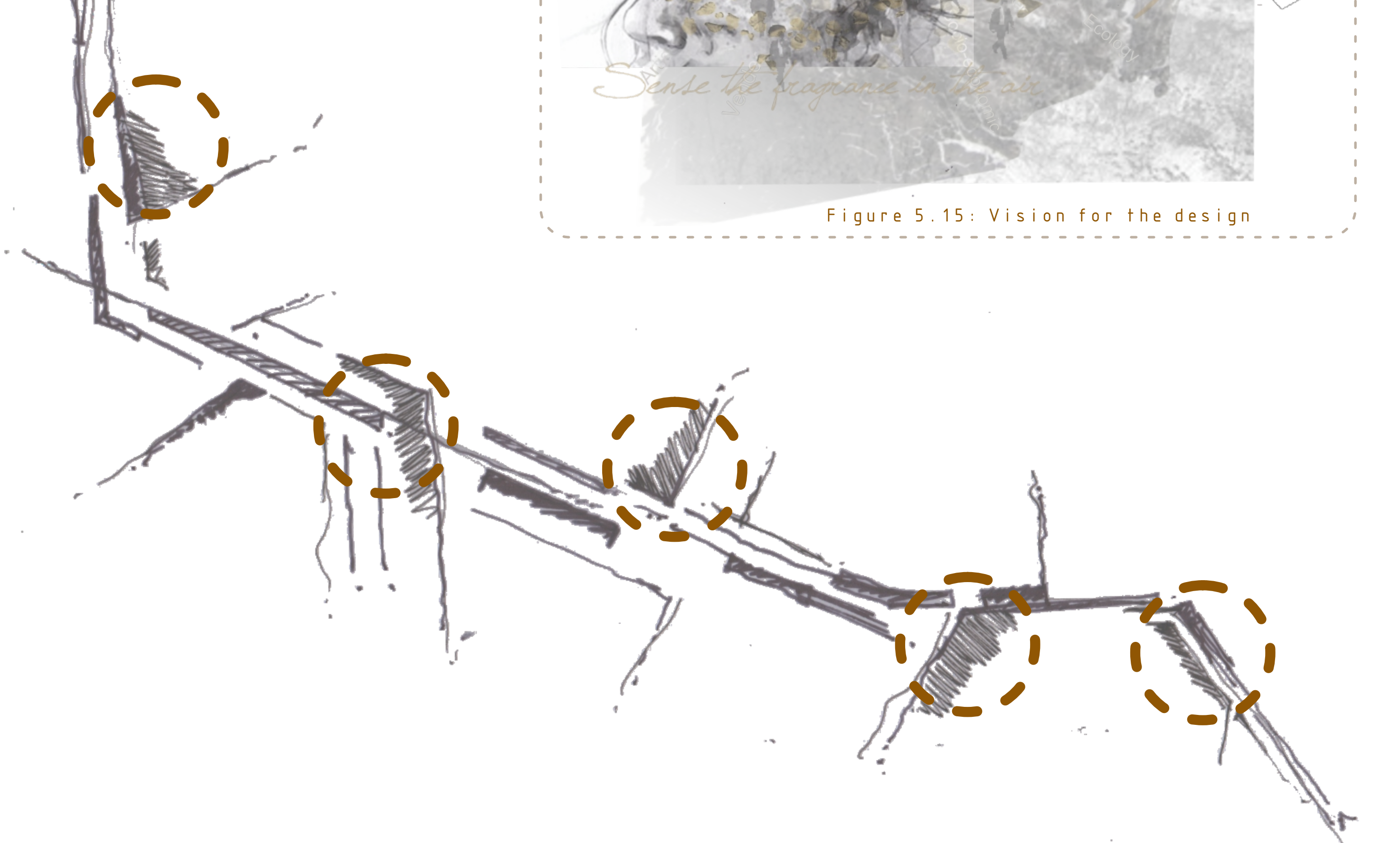


Figure 5.16: Conceptual drawing illustrating the form and potential moments of smell (Author 2016)

Figure 5.17: Informed watercolour abstractions of smellscapes (Author 2106)

In an attempt to translate the intangible to a tangible form as part of the design process the designer drew inspiration from smell by documenting current smell experiences on site and then on new blank pages desired smell experiences on site were created, taking factors like wind and topography into account.

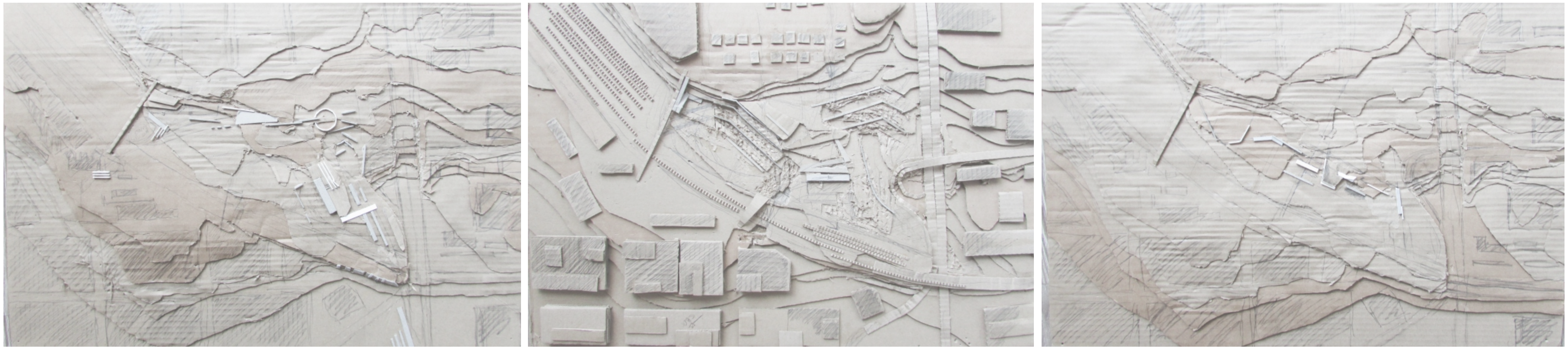


Figure 5.18: Models used in the exploration of different design outcomes (Author 2106)

Due to the nature of the project being highly influenced by on topography as well as to understand and really work with the site specific topography many models were built to understand the site.

# Development of the Master Plan

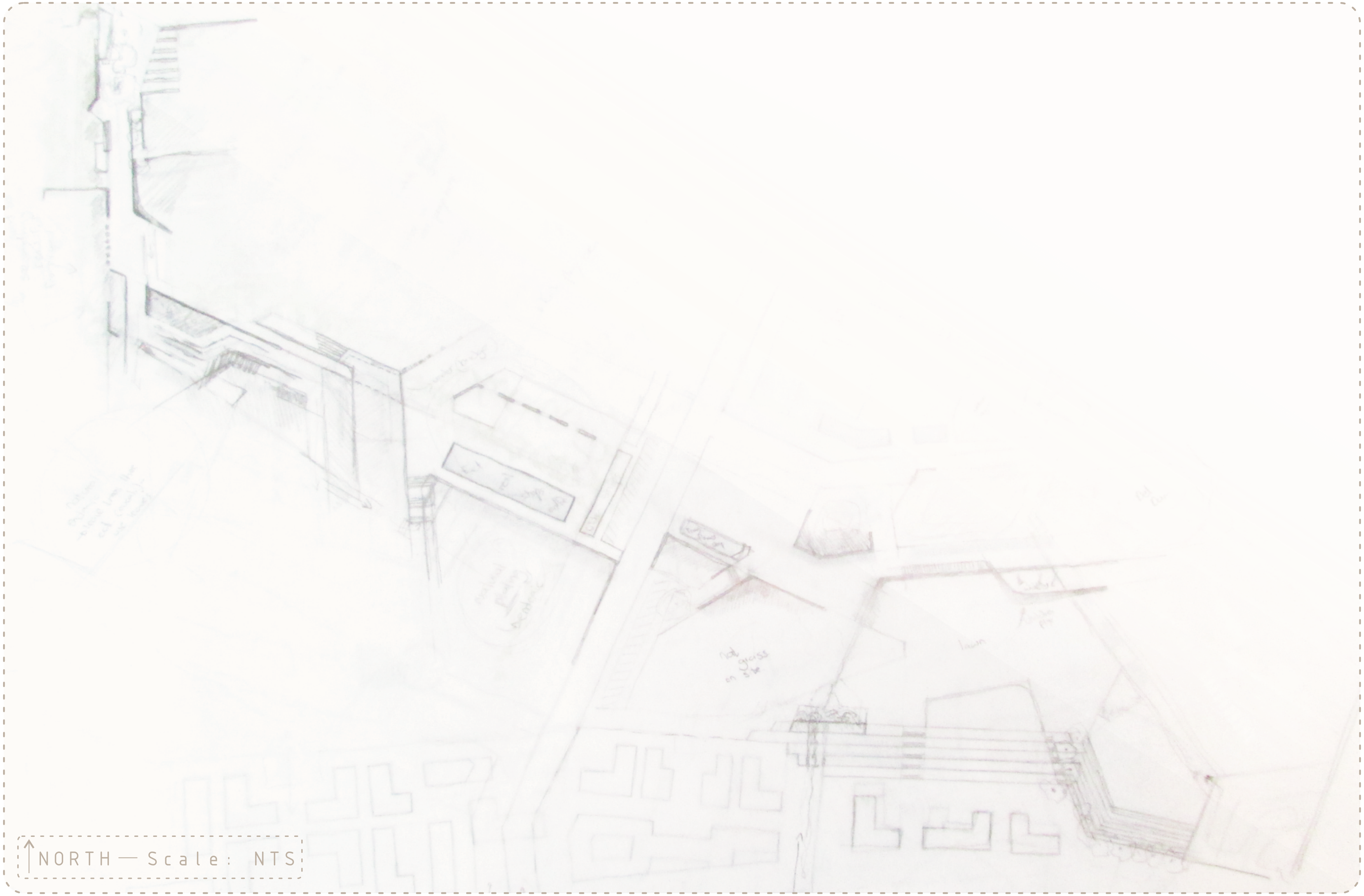



Figure 5.19: Development of the master plan through iteration (Author 2106)

# Development of the Master Plan

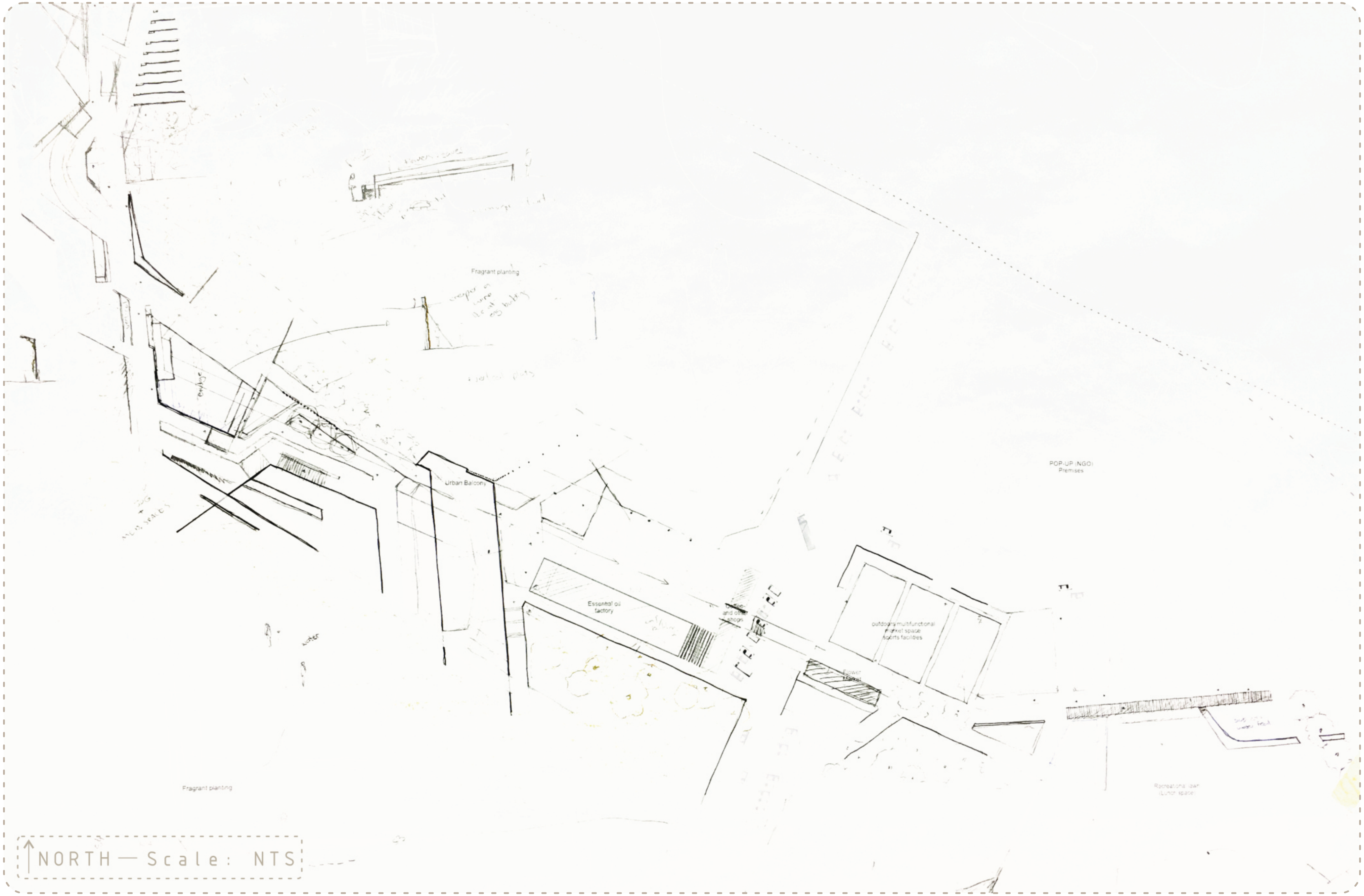



Figure 5.20: Development of the master plan through iteration (Author 2106)

# Development of the Master Plan


Figure 5.21: Development of the master plan through iteration (Author 2106)

# Final Master Plan

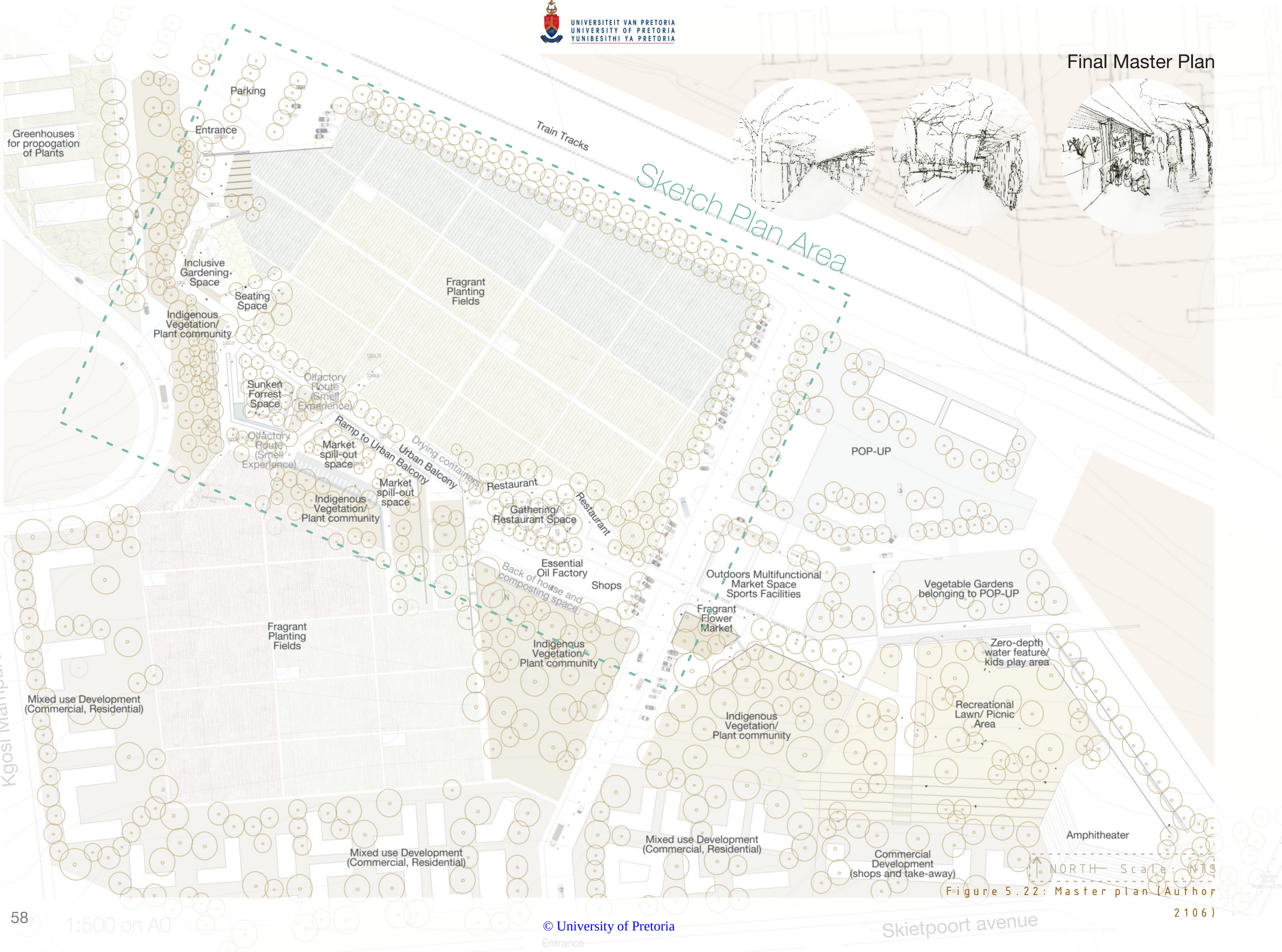



Figure 5.22: Master plan (Author 2106)

## Spatial Organization of Master Plan

The master plan is divided into two parts through a datum line. The axis originated from an existing pathway on site. It was defined as a main entrance into the urban park dividing and defining two areas of the design.

The Western side is more experience orientated. Smell in the landscape is revealed in this area and the process, as well as the making of essential oils, takes place on this side. To secure the productive landscape and factory some access control needs to be in place in this area, thus the area is classified as semi-public.

The Eastern side is more of a functional response to the local community's needs. Many basic needs of the public and POP-UP were satisfied like recreational lawn where lunch can be enjoyed daily, commercial development, restaurants and kiosks, play areas for children, vegetable gardens and multifunctional market and sports spaces for POP-UP, and spaces for public events.

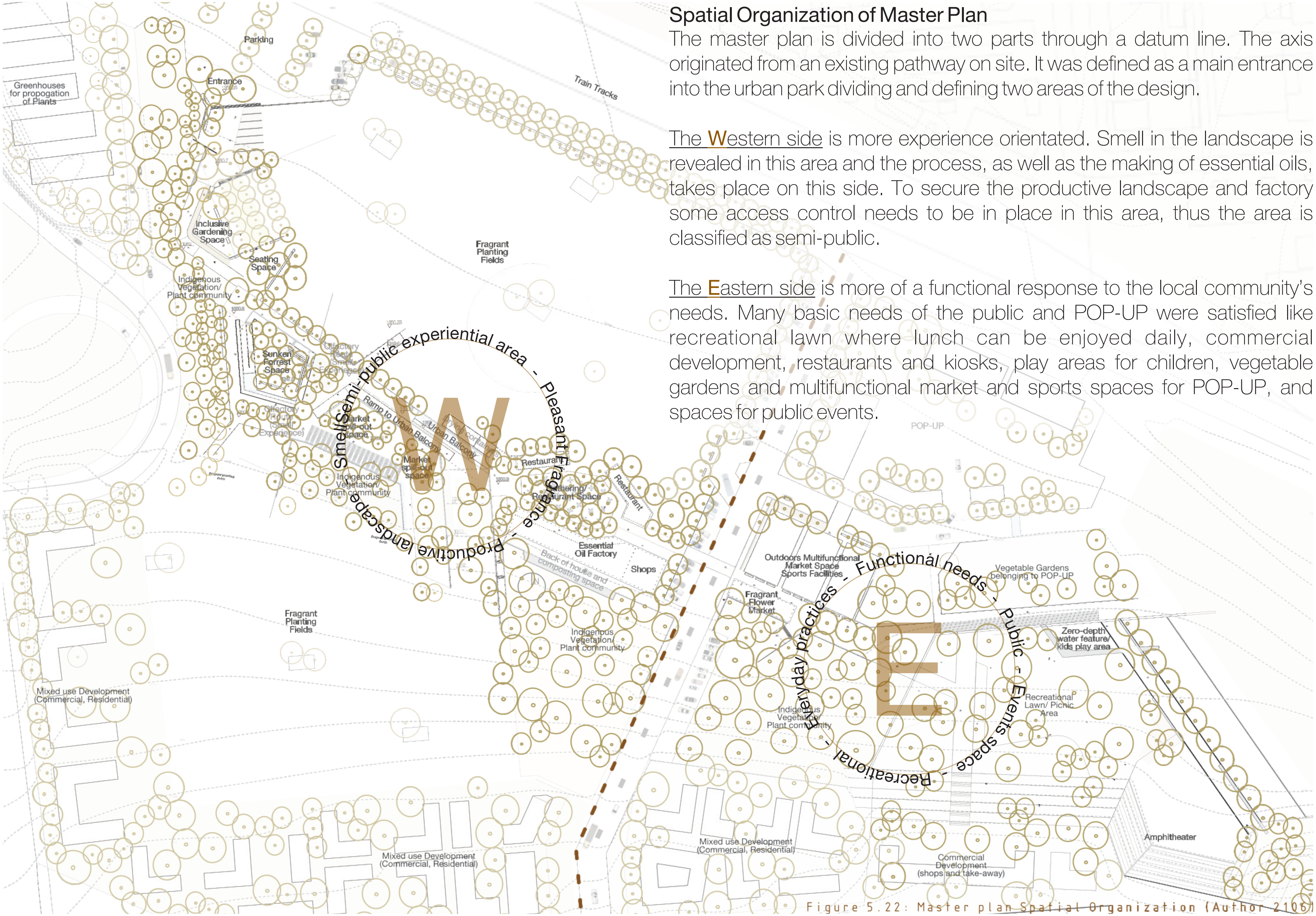
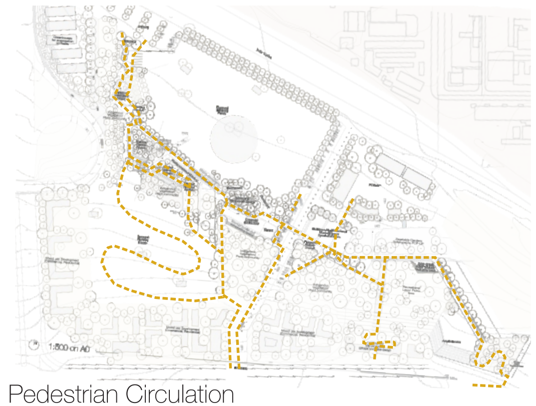


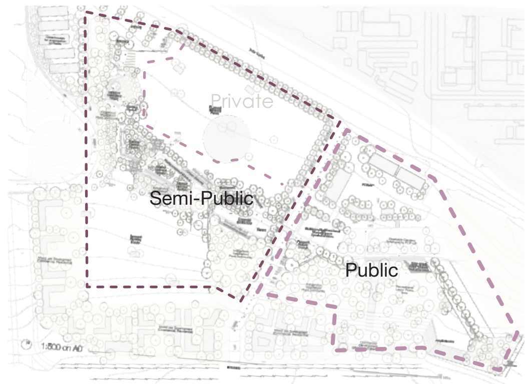

Figure 5.22: Master plan Spatial Organization (Author 2106)

Access and Choice
Illustrating the vehicular circulation and entrances on site


Vegetation Zones
Illustrating the different vegetation types in certain areas



Pedestrian Circulation
Illustrating the main pedestrian circulation options on site




Spatial Organization
As explained on previous page

Proposed new Buildings
Illustrating the all of the proposed new buildings on site

Olfactory Interventions
All of the main moments of smell (explained in detail in next chapter)

NORTH — Scale: NTS

Figure 5.24: Master plan assessed (Author 2016)

## Function and Use of Master Plan

Daily use:

Management:

- Harvest fields
- Manage café
- Manage restaurant
- Fragrant Flower market
- Oversee markets
- Security

Weekday use:

Visitor:

- Experience Olfactory Route
- Utilize Recreational Lunch areas
- Take Kids to kids play areas
- Schools visit site to learn about productive landscapes and urban agriculture at POP-UP
- Socializing
- Commute to work
- Use restaurant and coffee shops
- Take a late afternoon stroll with friends
- Exercise (Jogging route & stationary exercises on lawn)
- Meditate in more private spaces
- Enjoy the sunset from the urban balcony
- POP-UP uses multifunctional space for sport activities

Weekend use: (all of above plus these extras)

Visitor:

- Buy fragrant flowers from fragrant flower market
- Visit weekend market
- Attend events in outdoor theatre space
- Cultural and Heritage tours
- Essential oil tours

## Conclusion

The intention of the final master plan is to firstly satisfy basic human needs (physical and psychological), as discussed in chapter two, being outdoors even if it is just in an urban park and not in first nature, have beneficial effects on humans. It ought to be everyone's right to be able to access comfortable urban parks.

Secondly ecological factors and sustainability played an important part. Thirdly the experience of smell was specifically used as design generator and finally many specific aspects of the theory generated ideas for the final refined master plan.


## Sketch Plan Focus Area

This eastern area outline was chosen to be explored on sketch plan level.

There is a very strong and specific focus on smell and the journey of capturing smell in the form of an oil in this area of the design.

The western part of the design has a stronger focus on practical elements and features so that the urban park successfully functions.

Due to the main research question the eastern part was seen as more appropriate to explore in detail

Figure 5.25: Sketch plan area on master plan (Author 2016)

# CHAPTER SIX

## Development of the Sketch Plan

### Introduction

The sketch plan has a very specific focus on smellscape design and the making of essential oils. The sketch plan is grounded in a resolved master plan and urban framework. The objective of this dissertation could be explored fully in this chapter.

As the concept explains in the previous chapter, the design was driven by specific “moments” of fragrance in the landscape tied together by the journey of smell ending in a tangible product namely essential oil and various other fragrant by-products there off.

In this chapter the intention on the sketch plan will be explained, an overview on the design process will be given ending in the final sketch plan. The final sketch plan will then be explained in detail.

The sketch plan area focused on a heightened experience of the landscape through the sense of smell.

## Sketch Plan Design Intention

The main intention of this chapter would be to illustrate how there can be designed with smell in mind as well as the various benefits urban spaces can gain from designing with fragrance as mentioned in chapter two.

A few main components of the design will be an olfactory route on which different pleasant fragrances can be experienced, an urban balcony overlooking the city skyline and an essential oil factory as well as restaurants, coffee shops and retail shops.

A multidisciplinary perspective is crucial for the understanding of the contemporary landscape phenomenon, not least because the shifting of ideas across disciplines has traditionally affected design practice, modes of representation and the way the built environment looks (Corner 1999:9). We need to adopt a way of systems thinking in all that we do so that we can be aware of the potential in all that we do. Landscape design has to assume deeper roles of contextualization, heightening experiences and embedding time and nature in the built world. It is increasingly recognized that landscape design harbours a profound environmental and existential promise for architecture and urbanism, provoking new forms of experience, meaning and value (Corner 1999:16).

The author has tried to get input from as many different disciplines as possible, constantly speaking to architects, horticulturist, essential oil farming and essential oil distillation machine specialists.

## Development of the Sketch Plan

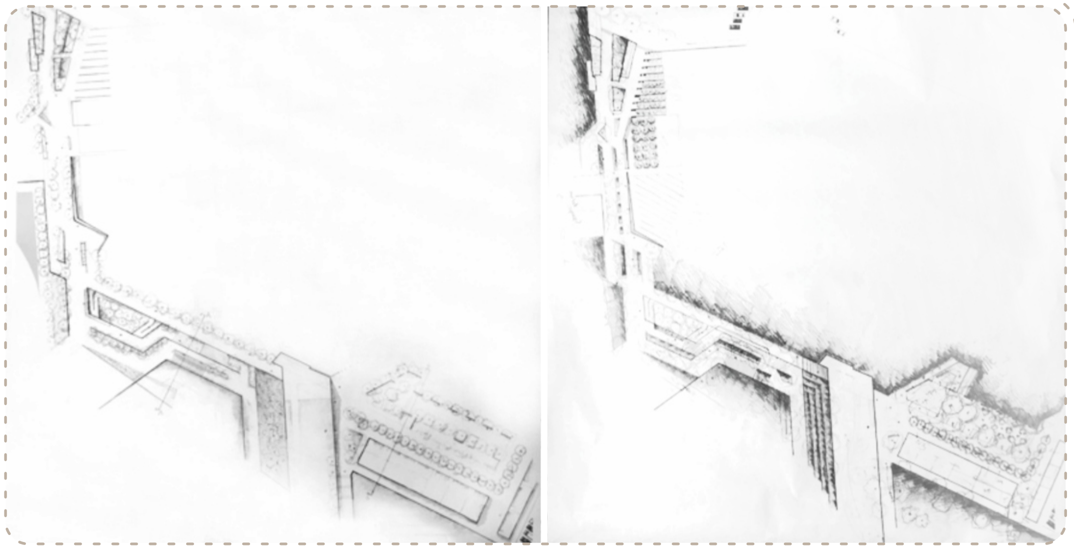


Figure 6.1: Development of the sketch plan through iteration (Author 2106)

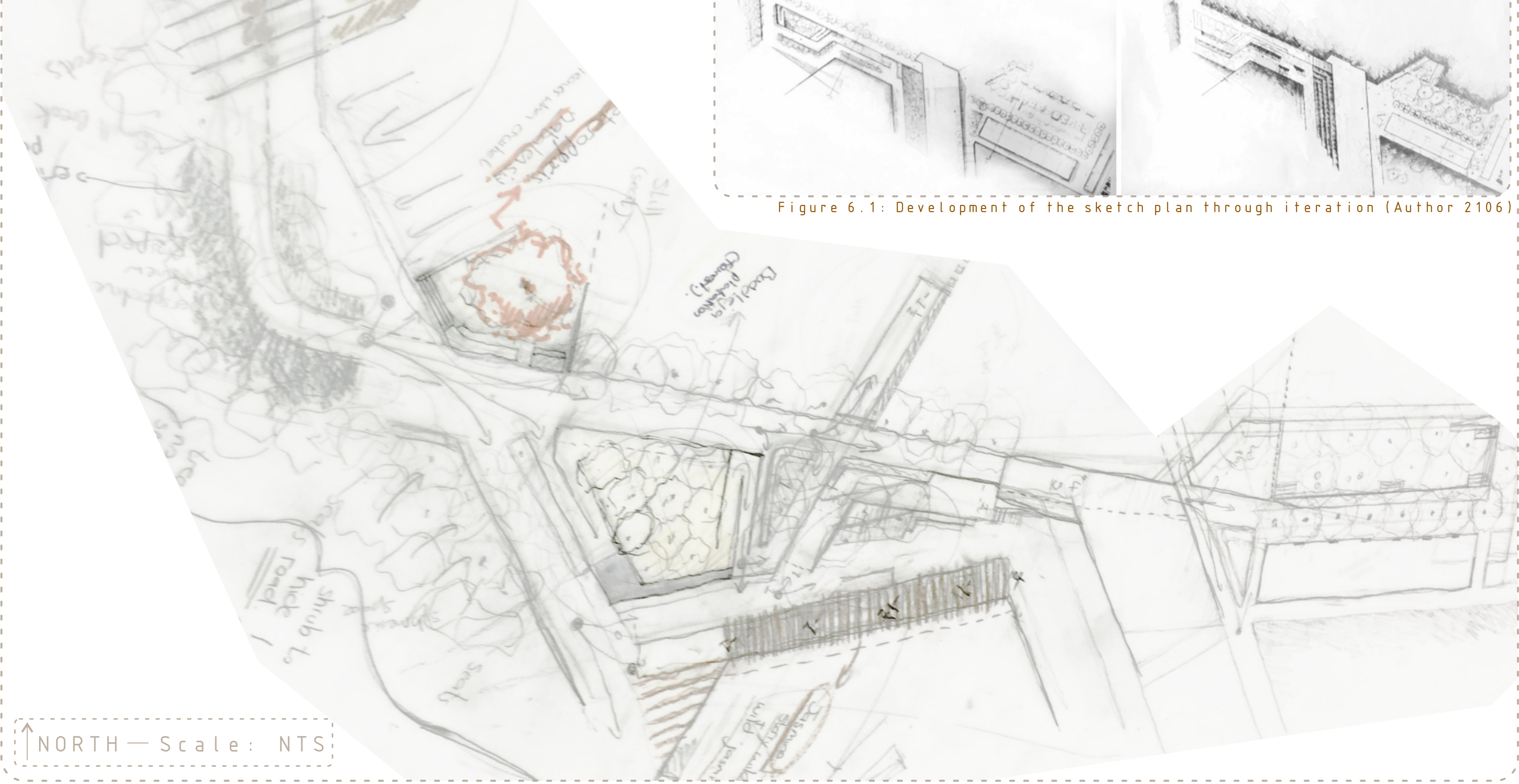
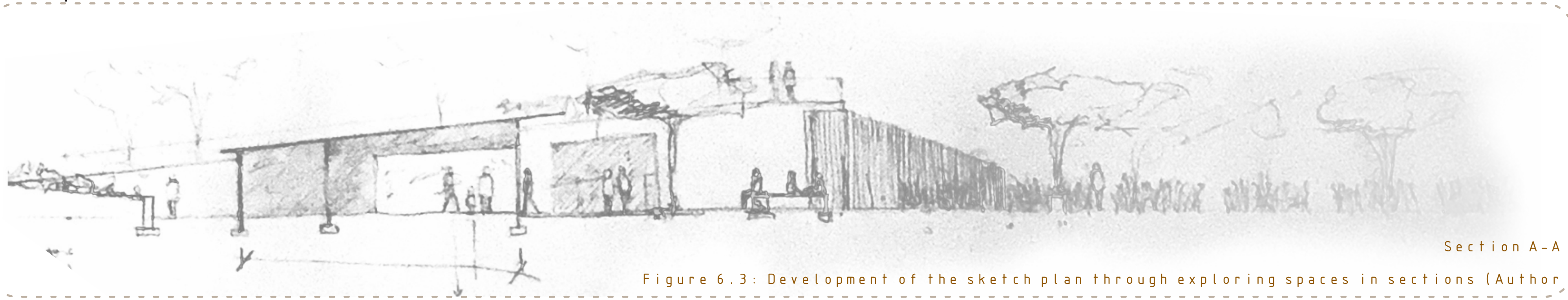



Figure 6.2: Development of the sketch plan through iteration (Author 2016)

# Development of the Sketch Plan



Section A-A

Figure 6.3: Development of the sketch plan through exploring spaces in sections (Author 2106)

Section B-B

Figure 6.4: Development of the sketch plan through exploring spaces in sections (Author 2106)

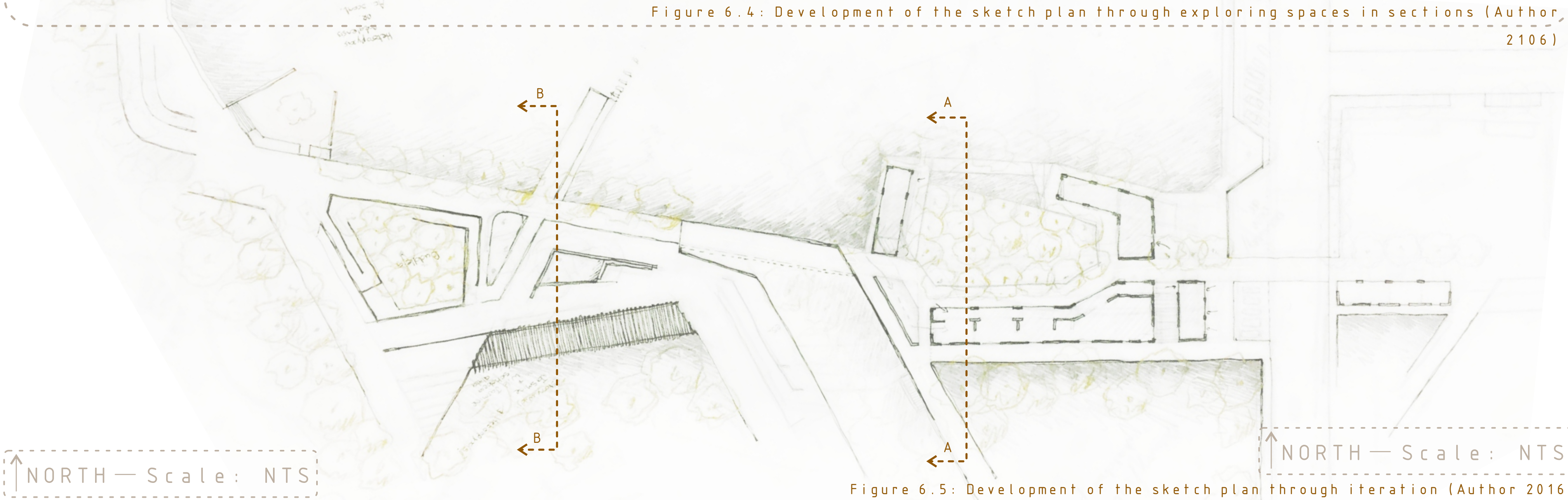



Figure 6.5: Development of the sketch plan through iteration (Author 2016)

## Development of the Sketch Plan

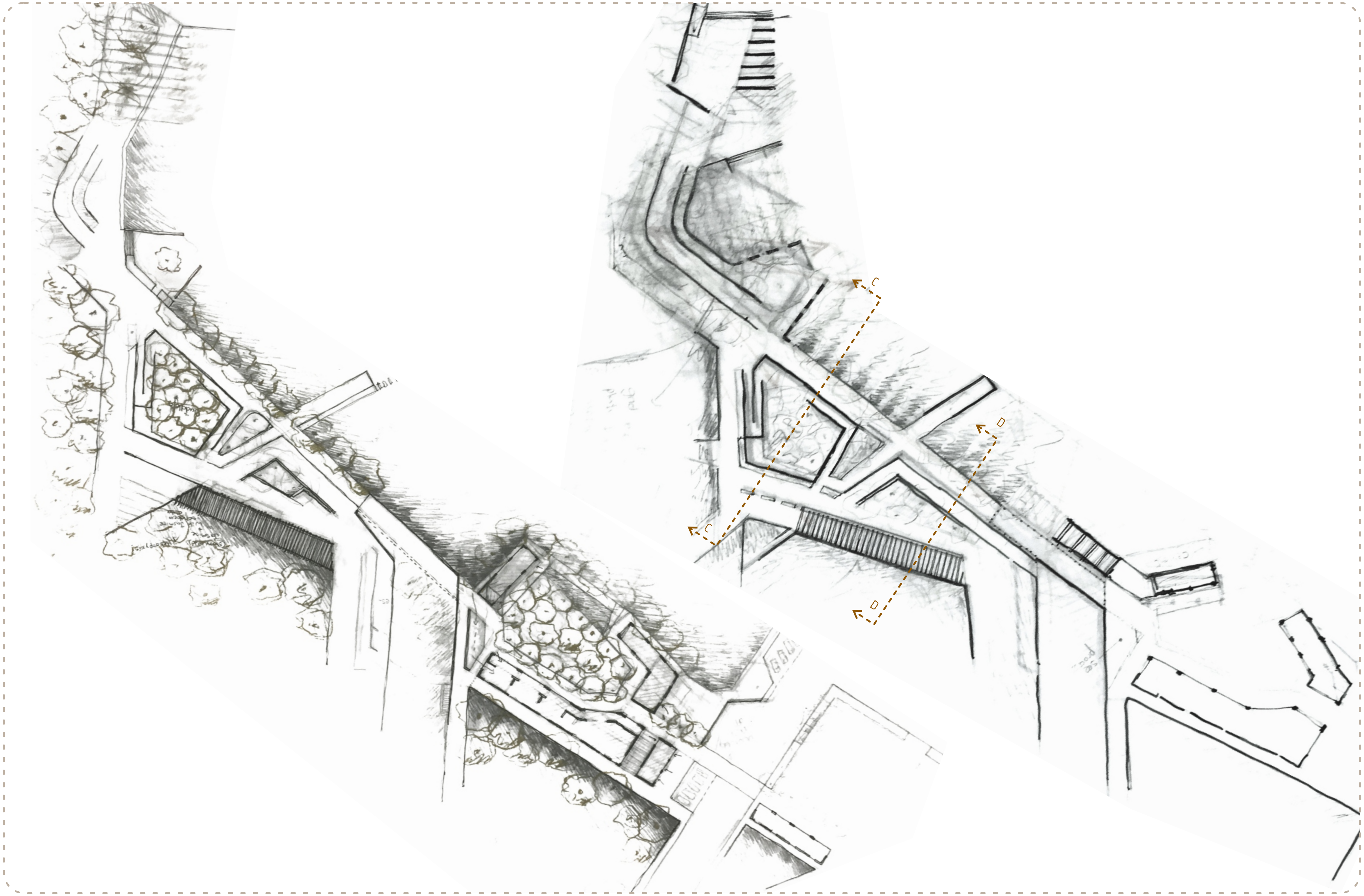
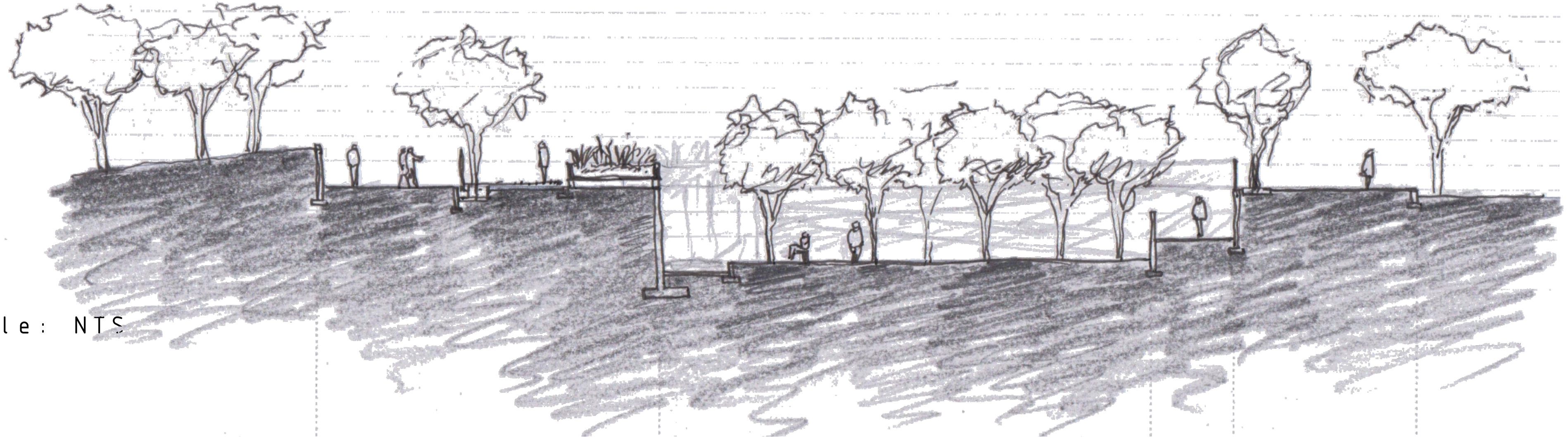


Figure 6.6: Development of the sketch plan through iteration (Author 2016)

## Spatial Exploration - Sections



Scale: NTS

Figure 6.7: Section C-C (Author 2016)

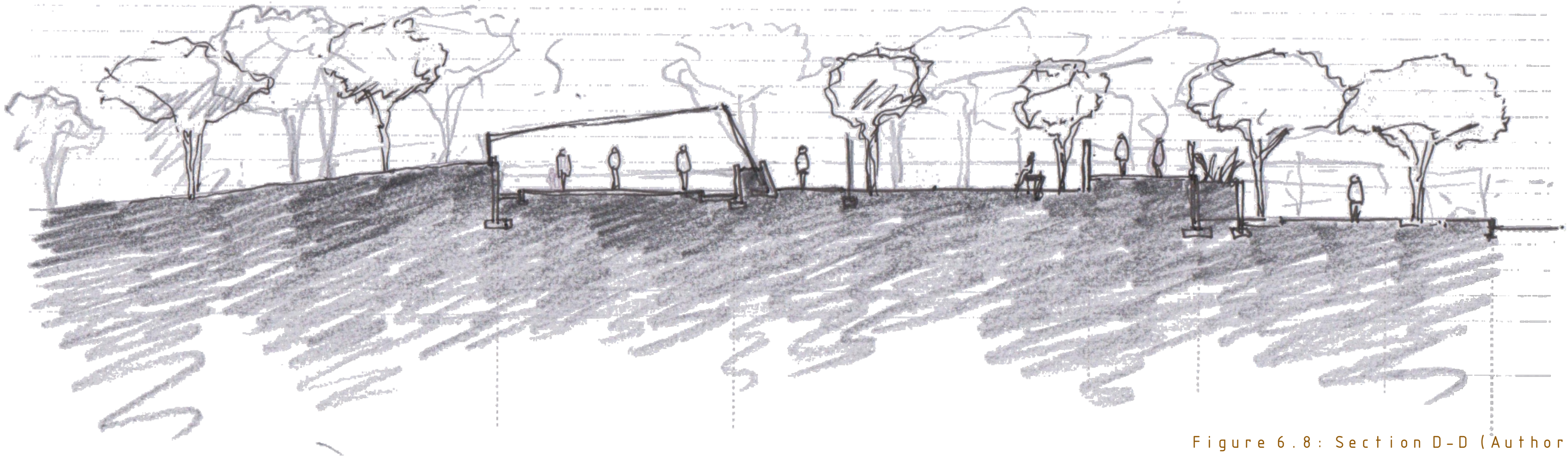


Figure 6.8: Section D-D (Author 2016)

The Essential Oil Process

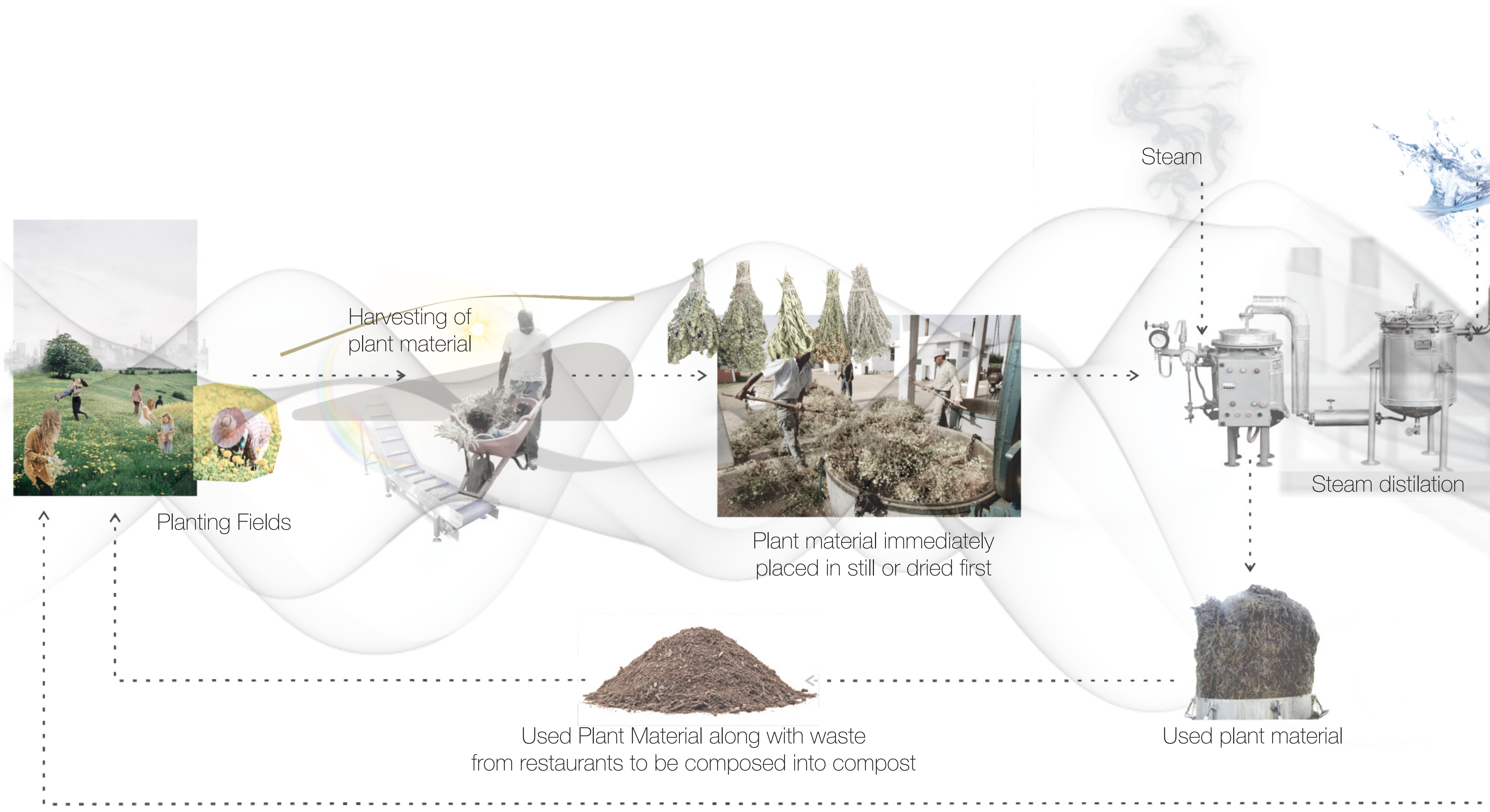



Figure 6.9: Essential Oil Process (Author 2016)

The process of the making of essential oil is revealed through the design and the outputs are recycles back into the system.

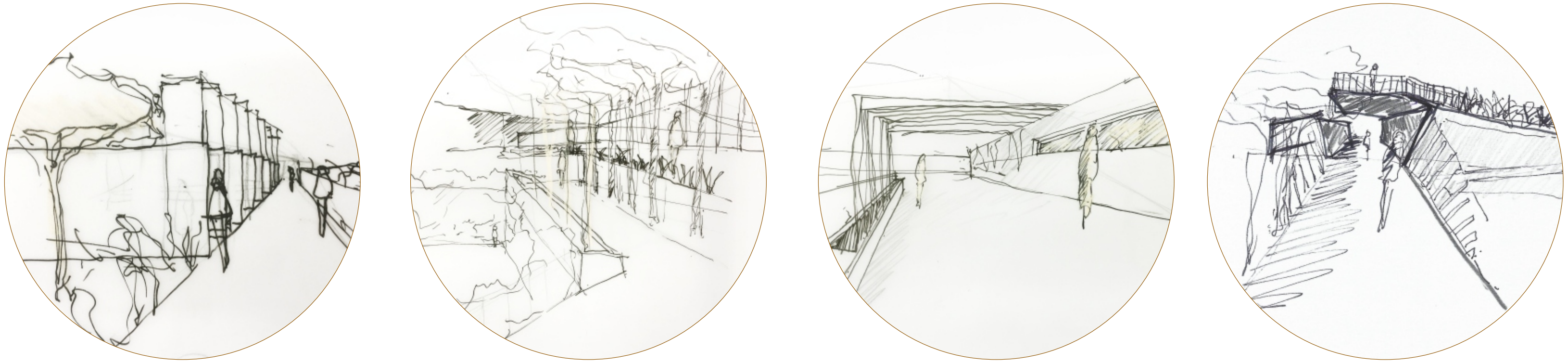


Figure 6.10: Sketches of spaces and moments in design (Author 2016)

## Final Sketch Plan

The final sketch plan is an accumulation of an in depth understanding of the seven factors that influence smellscape design discussed in chapter two, the plant palette and the site.

The sketch plan will be discussed in detail on the following pages.

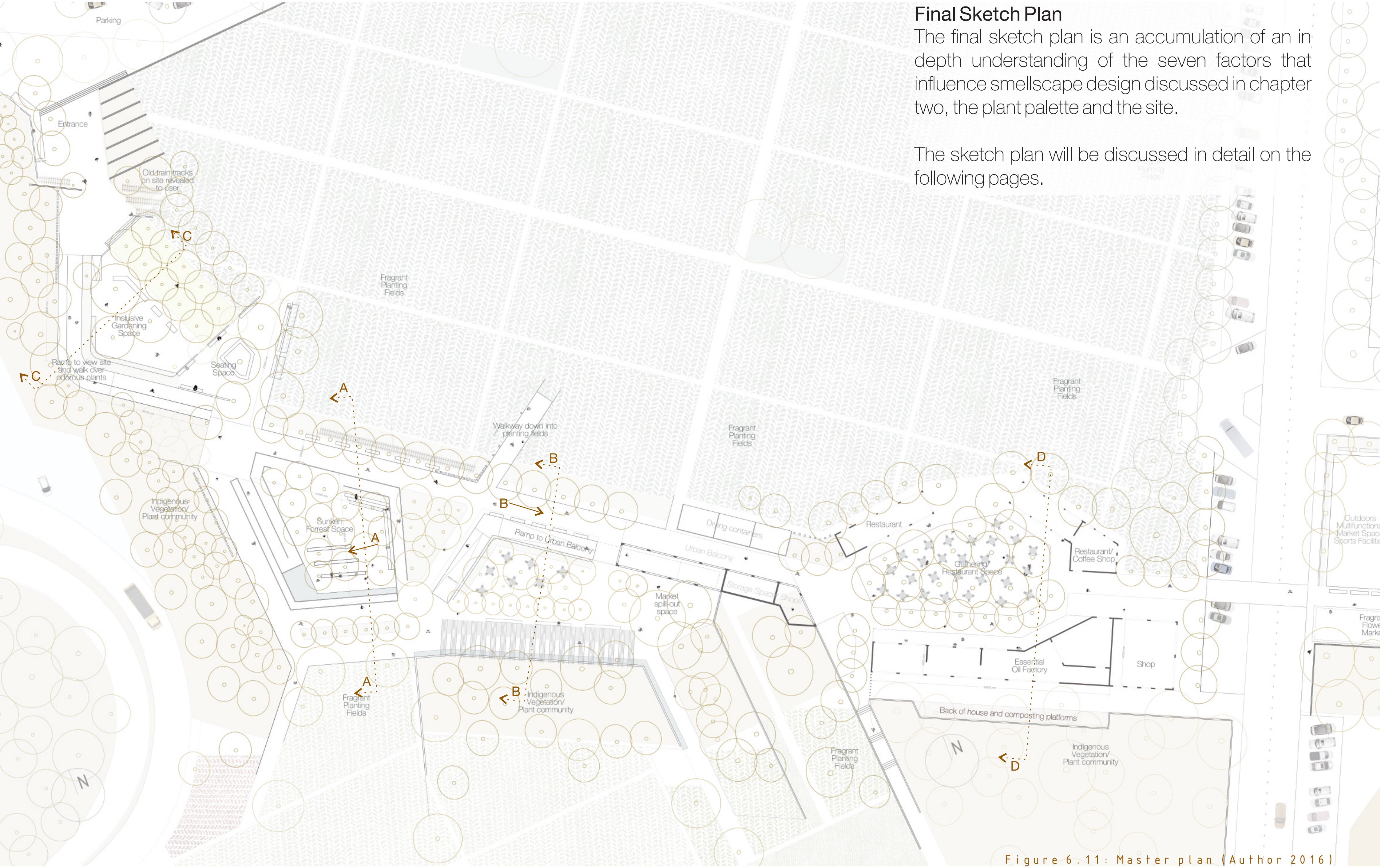



Figure 6.11: Master plan (Author 2016)

## Section A - A

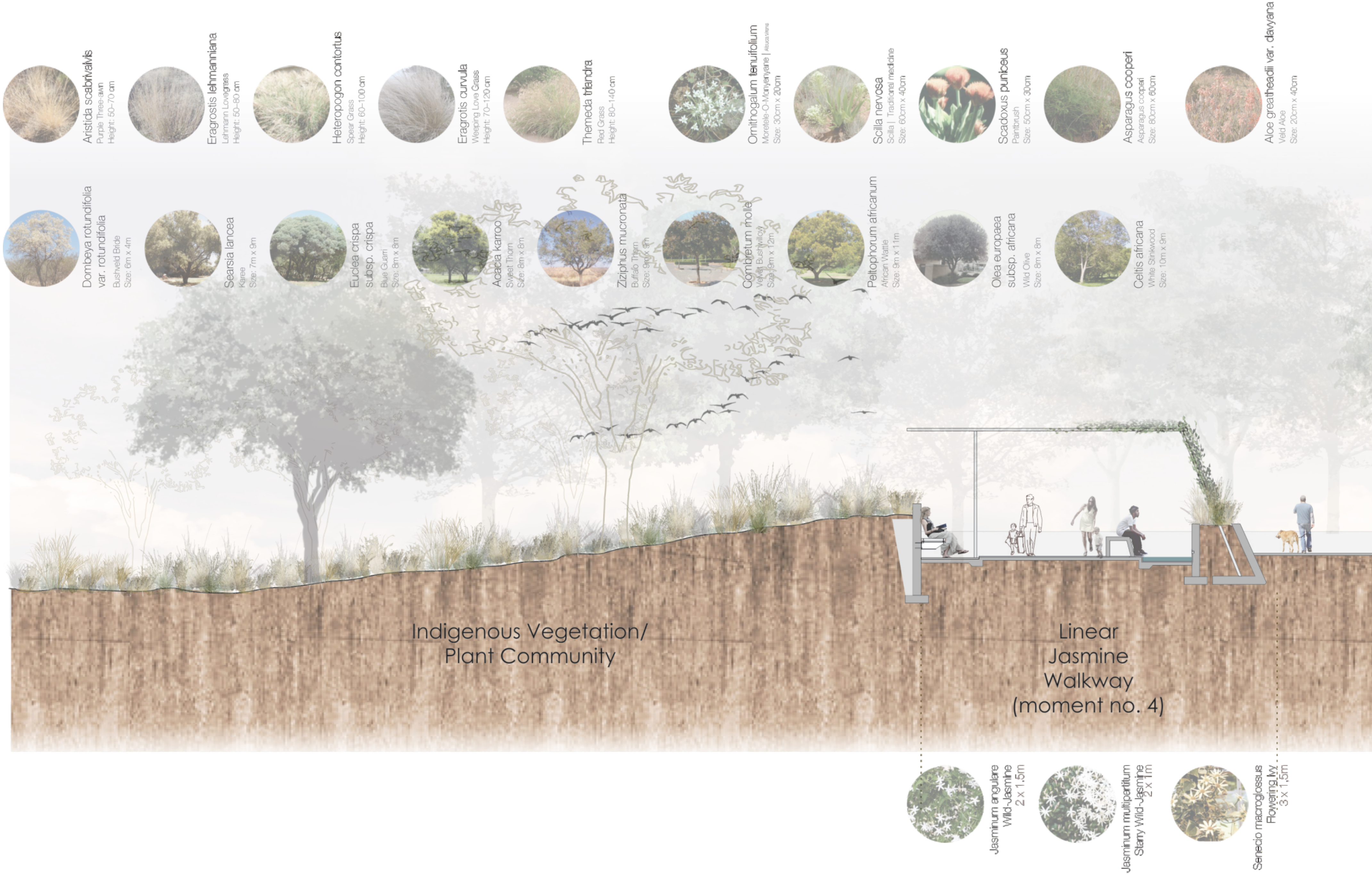

Aristida scabrivalvis
Purple Three-awn
Height: 50–70 cm
Eragrostis lehmanniana
Lehmann Lovegrass
Height: 50–80 cm
Heteropogon contortus
Spear Grass
Height: 60–100 cm
Eragrotis curvula
Weeping Love Grass
Height: 70–120 cm
Themeda triandra
Red Grass
Height: 80–140 cm
Ornithogalum tenuifolium
Moretele-O-Monyenyane | Albuca sillenia
Size: 30cm x 20cm
Scilla nervosa
Scilla | Traditional medicine
Size: 60cm x 40cm
Scadoxus puniceus
Paintbrush
Size: 50cm x 30cm
Asparagus cooperi
Asparagus cooperi
Size: 80cm x 60cm
Aloe greatheadii var. davyana
Veld Aloe
Size: 20cm x 40cm
Dombeya rotundifolia
var. rotundifolia
Bushveld Bride
Size: 6m x 4m
Searsia lancea
Karee
Size: 7m x 9m
Euclea crispa
subsp. crispa
Blue Guarri
Size: 8m x 8m
Acacia karroo
Sweet Thorn
Size: 8m x 8m
Ziziphus mucronata
Buffalo Thorn
Combretum molle
Velvet Bushwillow
Size: 9m x 12m
Peltophorum africanum
African Wattle
Size: 9m x 11m
Olea europaea
subsp. africana
Wild Olive
Size: 8m x 8m
Celtis africana
White Stinkwood
Size: 10m x 9m
Indigenous Vegetation/
Plant Community
Linear
Jasmine
Walkway
(moment no. 4)
Jasminum angulare
Wild-Jasmine
2 x 1.5m
Jasminum multipartitum
Starry Wild-Jasmine
2 x 1m
Senecio macroglossus
Flowering Ivy
3 x 1.5m


Figure 7.12: Section A-A

Section B - B


Pelargonium graveolens
Rose-scented Pelargonium
1,3 x 1m
Helichrysum odoratissimum
Kooigoed, Imphepho
1 x 1,5m
Artemisia afra
Wild Wormwood
1,5 x 1,5m
Eriocephalus africanus
Wild Rosemary
1,7 x 1,7m
Jogging Route
Fragrant Planting Fields
Walkway to
Linear Jasmine
space
(moment no. 4)

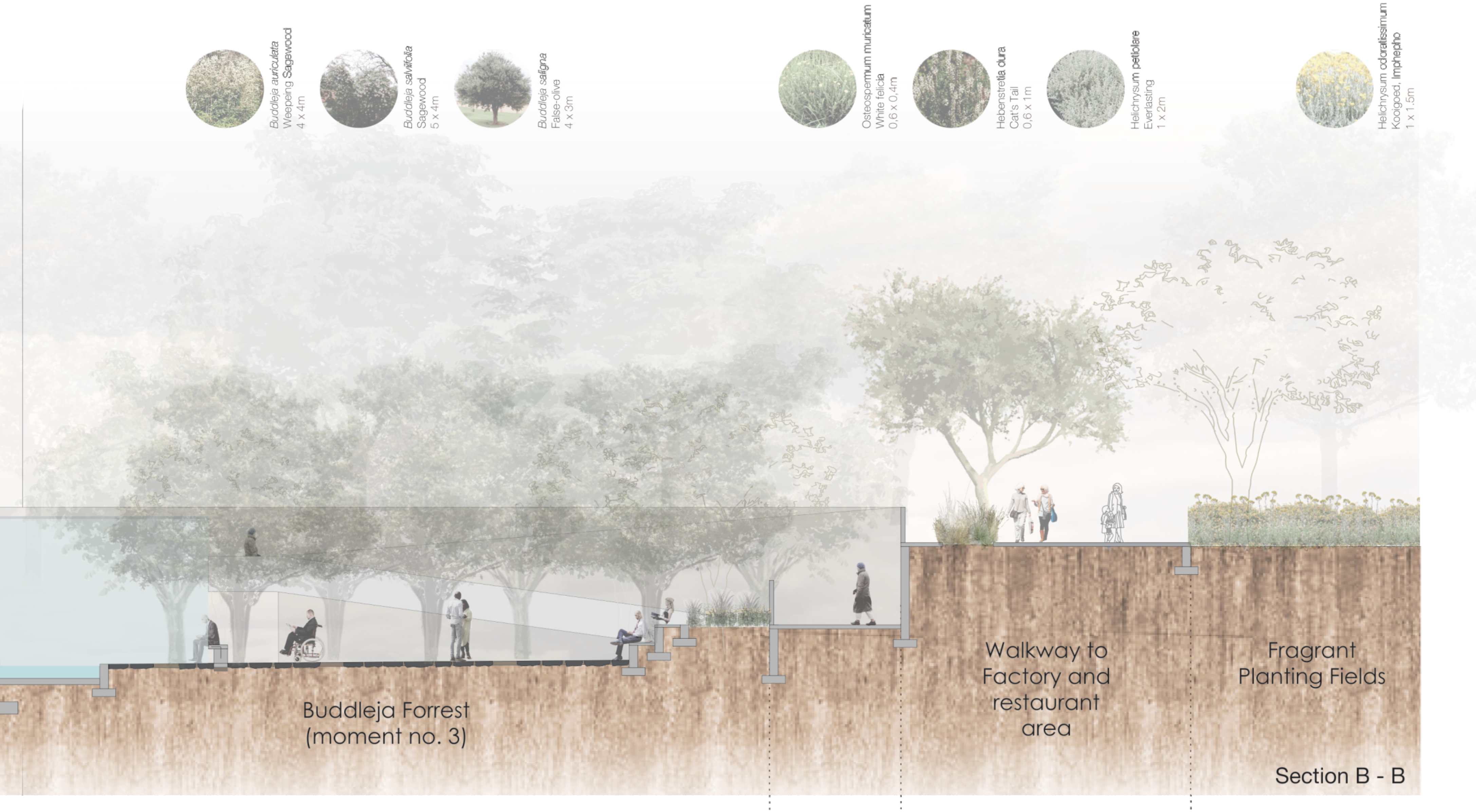



Figure 7.13: Section B-B

Perspective A

Figure 6.14: Perspective A (Author 2016)

The Sunken Buddleja Forrest

## Perspective B

Figure 6.15: Perspective B (Author 2016)

Perspective looking towards the urban balcony, drying boxes on the left and multifuctional storage or market/shop space on the right underneath the urban balcony

## The Olfactory Route

The Olfactory route is a specific route in the park designed to reveal the beauty of specifically pleasant fragrance to the user. Fragrance will be revealed in two ways:

Firstly, through process; the process of making essential oil. As the visitor to the site strolls along the olfactory route indicated on this plan he/she will be overwhelmed by the vast fragrant planting fields(1), the user will then start to see field workers plucking vegetation (2) and smell the result of this specific action as the plant material gets bruised by the workers cutting it off and collecting it. The workers will then take the plant material to drying containers or directly to the factory (3), depending on the specific plant, the user will then see as the plant material is taken to these points and be able to stroll past these containers and smell the piles of plant material. Lastly the user will be allowed to experience the process taking place within the essential oil factory (4) and then ultimately be lead into a shop where they can smell and see the final product - the essential oil - in its raw form as well in various other products (5) (process seen in figure 6.17).

Secondly through experience - the user will experience moments of intense fragrance in its natural form throughout the olfactory route explained in detail in the next few pages.

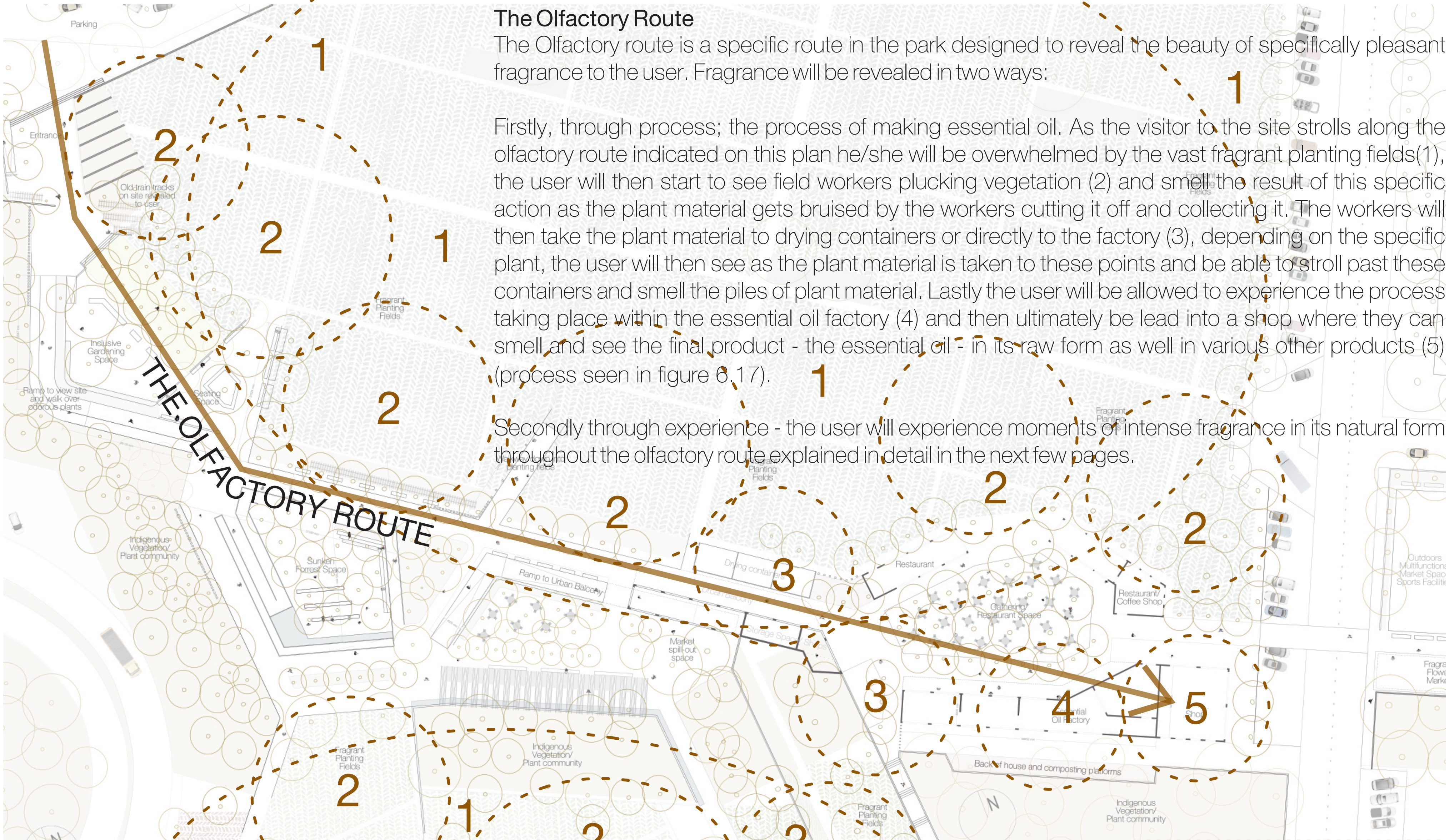




Figure 6.16: The olfactory route presented on sketch plan to show the process of making essential oil (Author 2016)

Figure 6.17: Photo presentation of steps indicated on plan (Author 2016)


Figure 6.18: An overview of the moments of smell (Author 2016)

## Moments of Smell Overview

Along the Olfactory Route there are strong moments of smell/fragrance. These are specific spaces and places where vegetation will be used in mass along with topography and space defining elements.

These moments of fragrance will be very specific where one plant with a very strong fragrance will be used in mass or two plants with the same kind of fragrance or two plants which flower in different seasons to assure pleasant fragrance in a space throughout the year.

Too many fragrant plants could not be used at the same time in one area or space as it could become overpowering. The intention of the project is also to focus the visitor to the site on one specific smell at a time for it to be captured in their memory and processed through an experience.

The design and placement of these moments along the olfactory route has been part of the design process from the beginning, taking into account the plant palette along with the properties of each individual plant: What time of the year their fragrance is released; What part of the plant smells good; and whether the plant needs to be crushed for its pleasant fragrance to be released. The scale of all of the plants were also taken into account to define spaces.

Fragrant plants are not the only source of fragrance that will be experienced in the design; the smell of water, the smell of wet soil, the smell of fresh air and the smell of coffee and food have also been exploited.

As ones nose can be overwhelmed by too much smell 'palette cleansers' are provided throughout the design.

**Moment of Smell** | Along the Olfactory Route there are strong moments of fragrance. These are specific spaces and places where vegetation will be used in mass along with topography, micro-climates and space defining elements. These moments of fragrance will be very specific where one plant with a very strong fragrance will be used in mass or two plants with the same kind of fragrance or two plants which flower in different seasons.

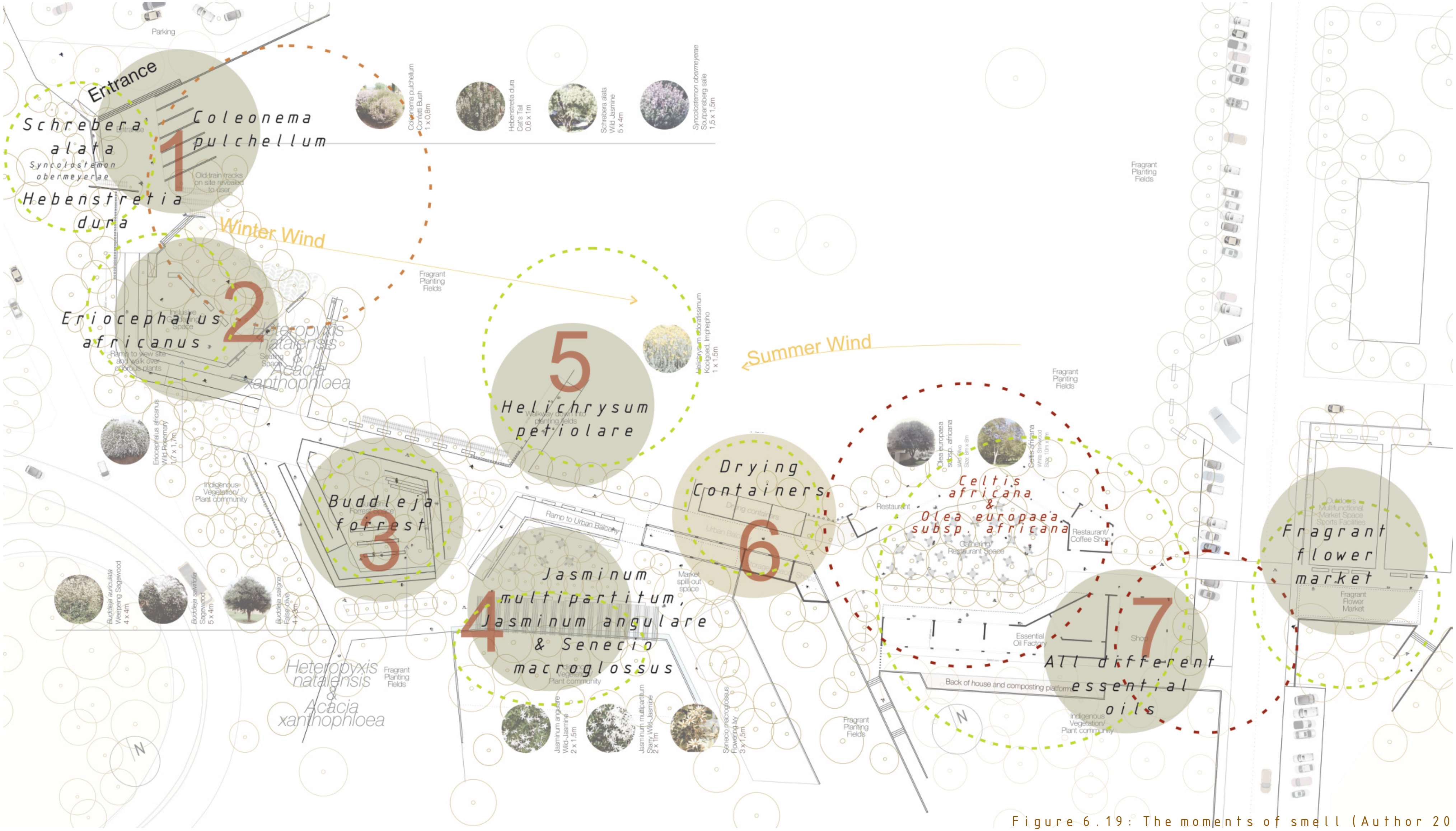
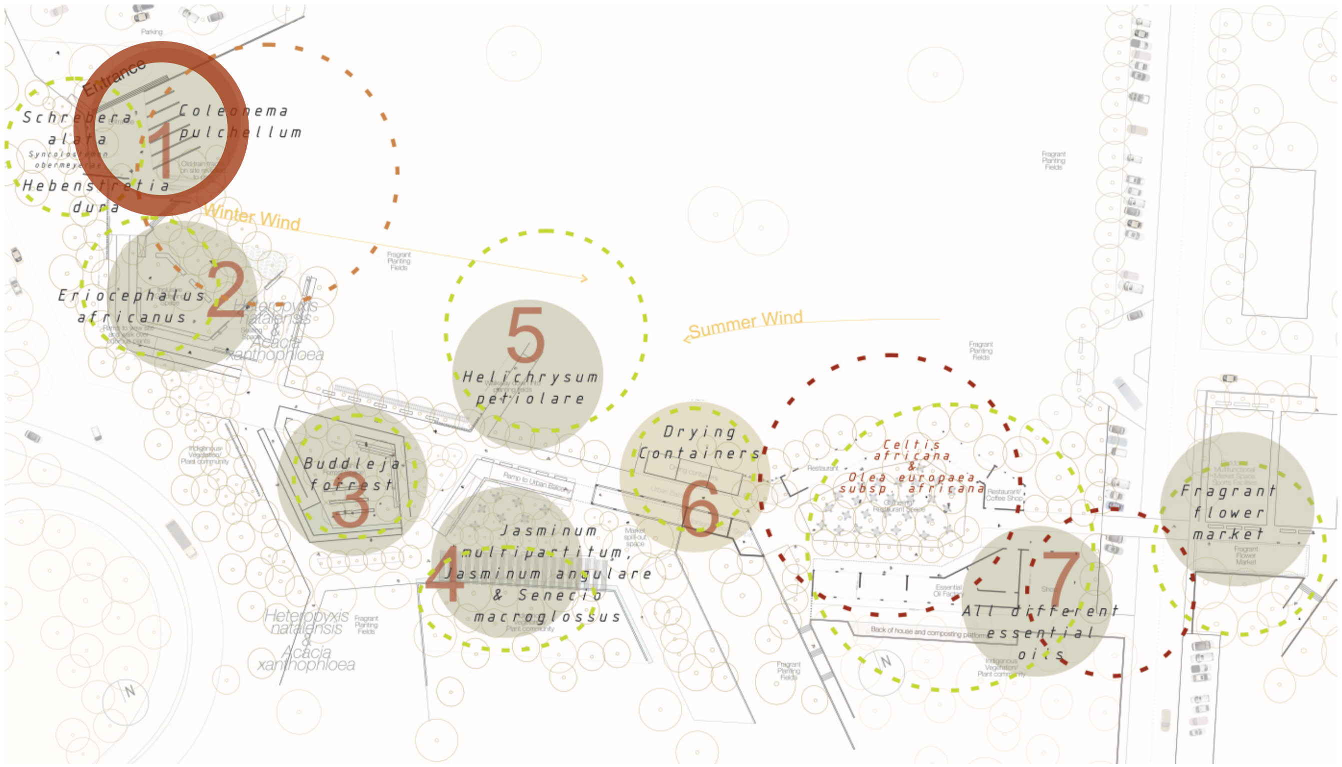



Figure 6.19: The moments of smell (Author 2016)

The numbers indicating the different moments of fragrance will be used to explain these specific moments in detail on the following pages.

## The Moments of Fragrance




### Moment 1: Threshold - Reception to Park

Serving as a threshold as one enters the urban park, large vertical structures guide the smell molecules of masses of fragrant planting to the visitor of the site. Introducing the smell experience that is about to be undertaken.

Due to the position of this space almost perpendicular to the wind direction in summer and winter (see figure 6.20), the plant selection in this space has to reflect an understanding of wind. *Coleonema pulchellum* is planted on the eastern side of this space as it flowers in the summer and the predominant summer wind direction is western. Plants that bloom in the winter and plants whose leaves are aromatic will be planted on the westerns side as the opposite then counts.

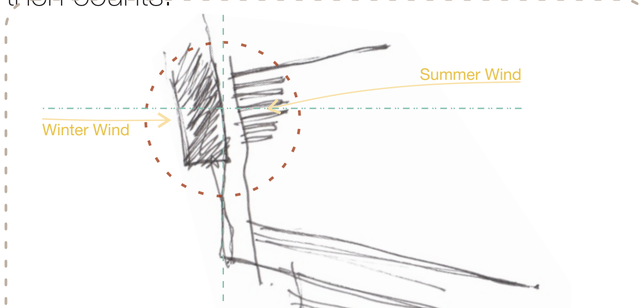
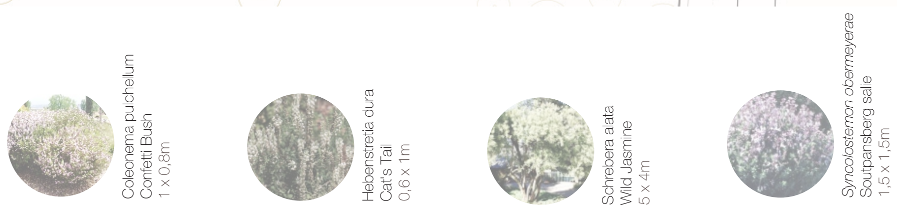



Figure 6.20: Wind direction in relation to moment 1 (Author 2016)




Plant Palette for Moment 1

*Coleonema pulchellum*
Confetti Bush
1 x 0,8m

*Syncolostemon obermeyerae*
Soutpansberg salie
1,5 x 1,5m

*Hebenstretia dura*
Cat's Tail
0,6 x 1m


Figure 6.21: Plant palette for moment 1 (Author 2016)

<u>Moment 2: Releasing the smells of aromatic leaves</u>

Before entering moment number 2 there are two options, the user either take a ramp leading up inti tree canopies and then revealing a view over the whole site or the user can move through the planting fields.

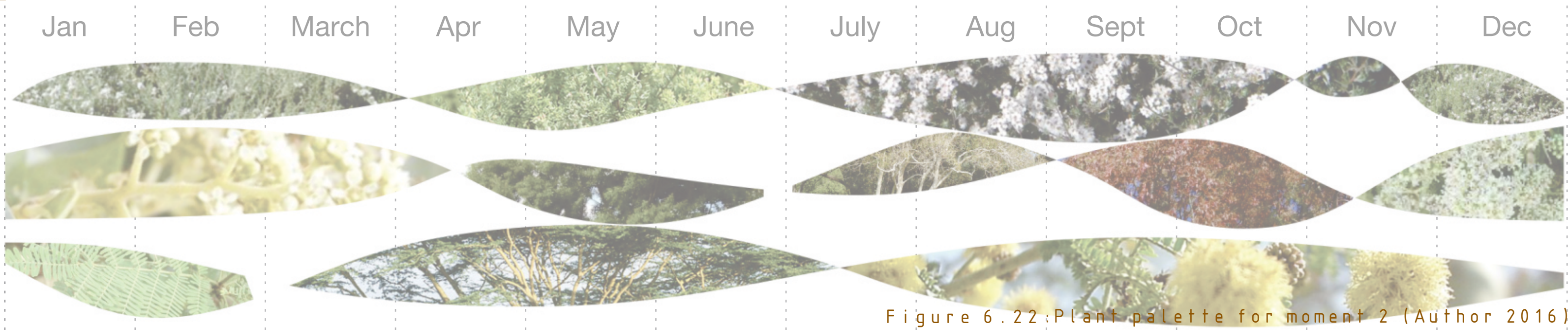
The ramp is made out of galvanized steel grating and *Eriocephalus africanus* is planted just underneath the ramp in some areas thus it will grow through the ramp and be crushed by users walking on the ramp releasing its smell.

The second option to walk through the fragrance planting fields in a specific portion of the plantation is where *Heteropyxis natalensis* would be growing. This is a production space after experiencing it the user is guided into another space where seating is provided. In this space focus is placed on *Heteropyxis natalensis* (flowering in late summer to autumn) and *Acacia xanthophloea* (flowering from spring to summer) giving a visual impression of a yellow canopy.

This is a space where focus through the use of man-made elements will emphasize the beautiful detail and seasonal variations these trees provide, as an extra to the pleasant fragrance that they emit into the air. Through the use of vertical and horizontal elements the fragrant blooms will be brought to the attention of the visitor of the space.


Eriocephalus africanus
Wild Rosemary
1,7 x 1,7m

Plant Palette for Moment 2

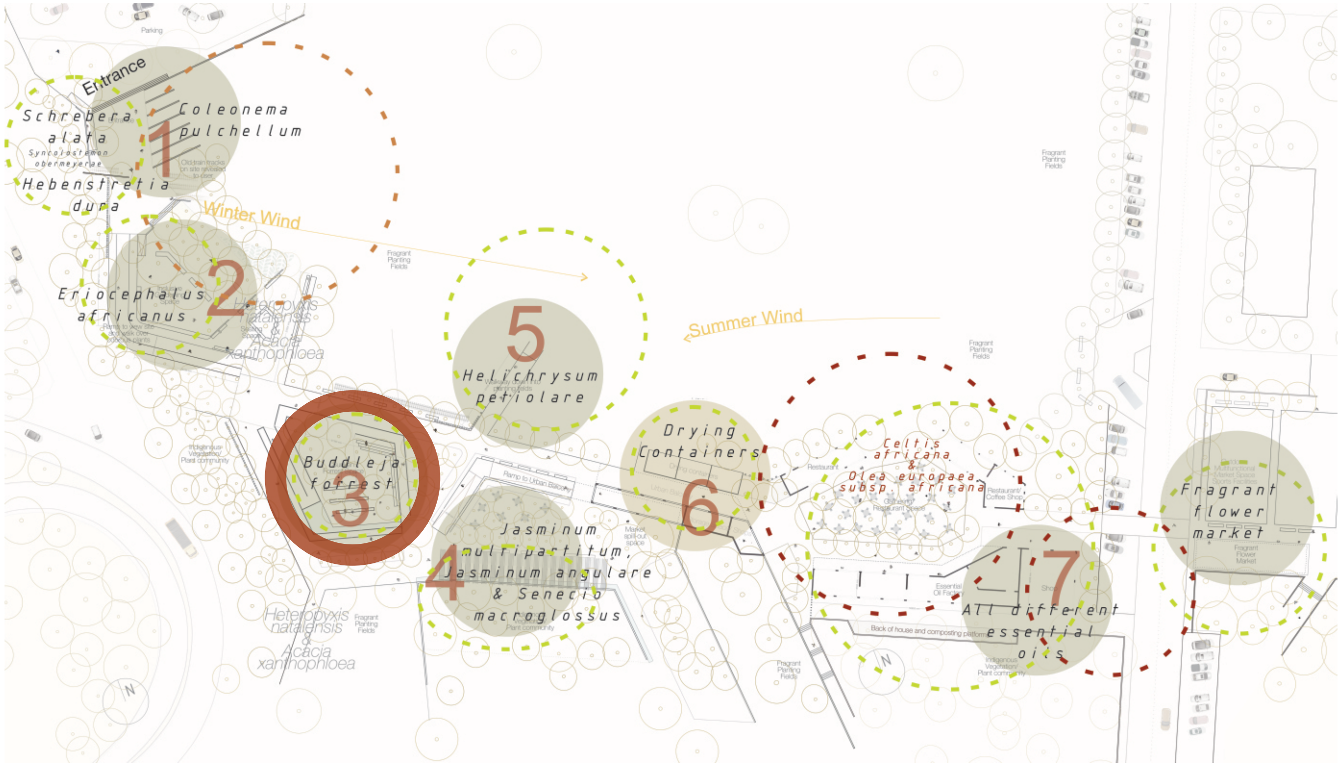



*Eriocephalus africanus
Wild Rosemary
1,7 x 1,7m

*Heteropyxis natalensis
Lavender Tree
6 x 5m

Acacia xanthophloea
Fever Tree
10 x 13m

Figure 6.22: Plant palette for moment 2 (Author 2016)




## Moment 3: The Buddleja Forrest - humid microclimate

In this space the visitor to the site is taken into a submerged space with a slight ramp taking the user from above the Buddleja tree canopies to inside a forest-like space underneath he sweet smell of *Buddleja salviifolia* (blooming from middle winter to early summer) and *Buddleja saligna* (blooming from summer to autumn) will be intensified through the use of a water feature creating a humid environment thus extenuating the odorous molecules in the air (as mentioned in chapter 2).

This is a tranquil space in which the visitor would be allowed to meditate, fully benefiting from the serene space and the many health benefits that the pleasant fragrance has to offer.

Plant Palette for Moment 3

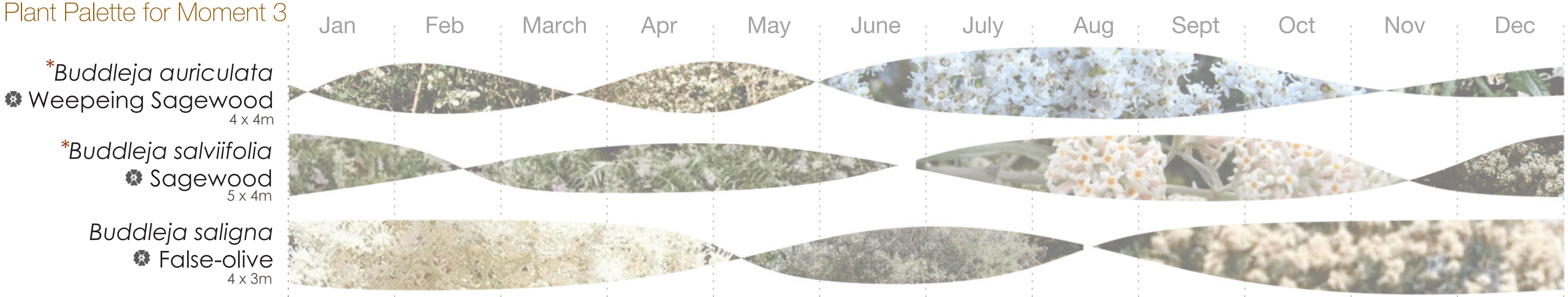
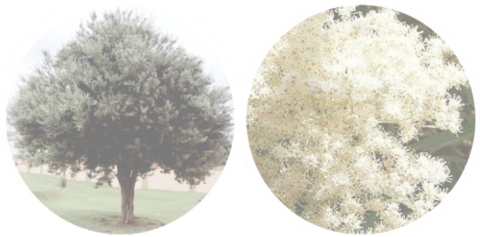



Figure 6.23:Plant palette for moment 3 (Author 2016)

*Buddleja auriculata* Weepeing Sagewood 4 x 4m

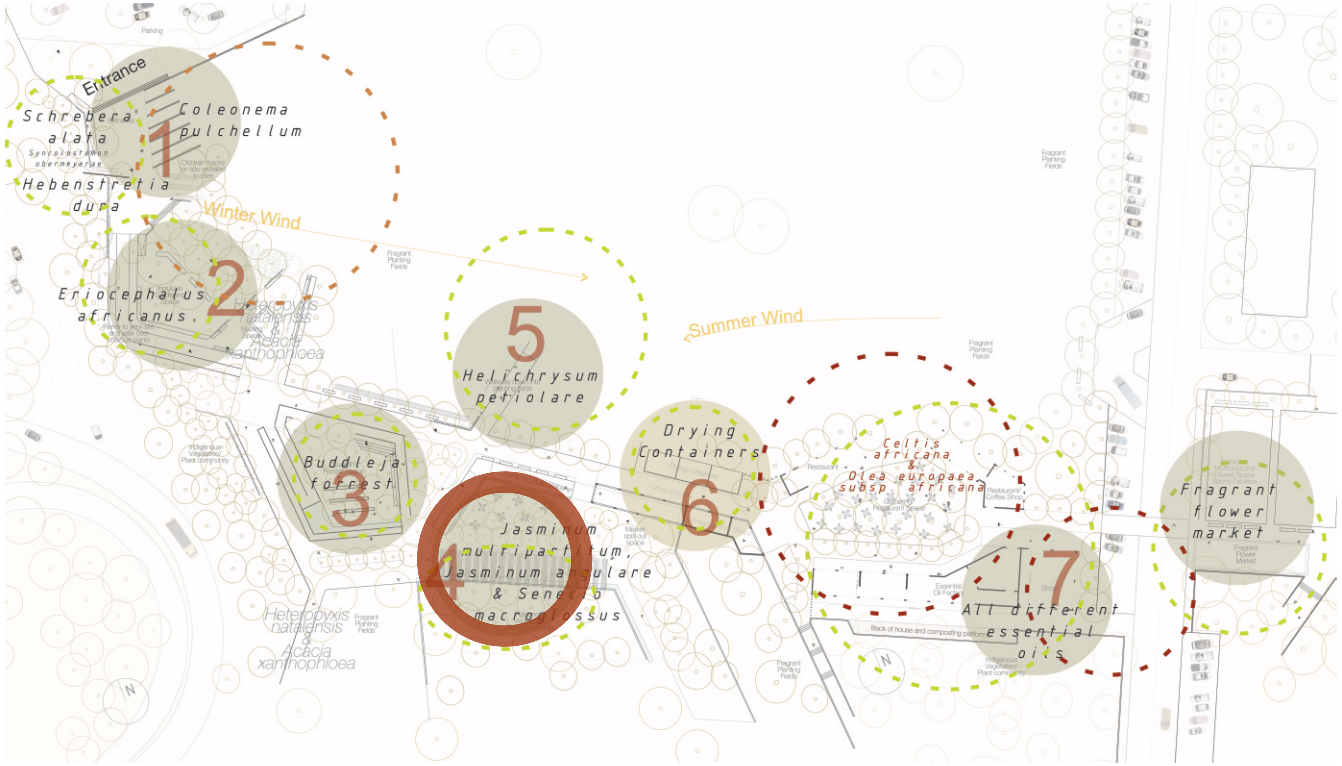
*Buddleja salviifolia* Sagewood 5 x 4m



*Buddleja saligna* False-olive 4 x 3m

## Moment 4: Cool microclimate, water in shade - linear experience

There is something magical about walking under a pergola that has been taken over by flora. The author wants to translate this experience that she knows and remembers into a space combining it with the pleasant fragrance of *Jasminum multipartitum* (flowering from spring to autumn), *Senecio macroglossus* (with fragrant leaves the whole year through) & *Jasminum angulare* (flowering in summer). This will create a linear spatial experience and define and translate the specific linear character of the space. The designer also uses 'palette cleansers' in the landscape to make this a pleasant experience for the user with moments of rest.




### Plant Palette for Moment 4

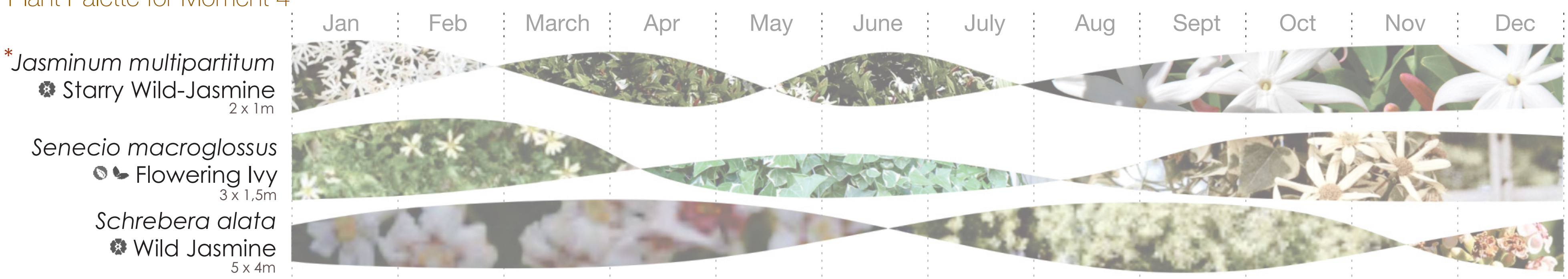
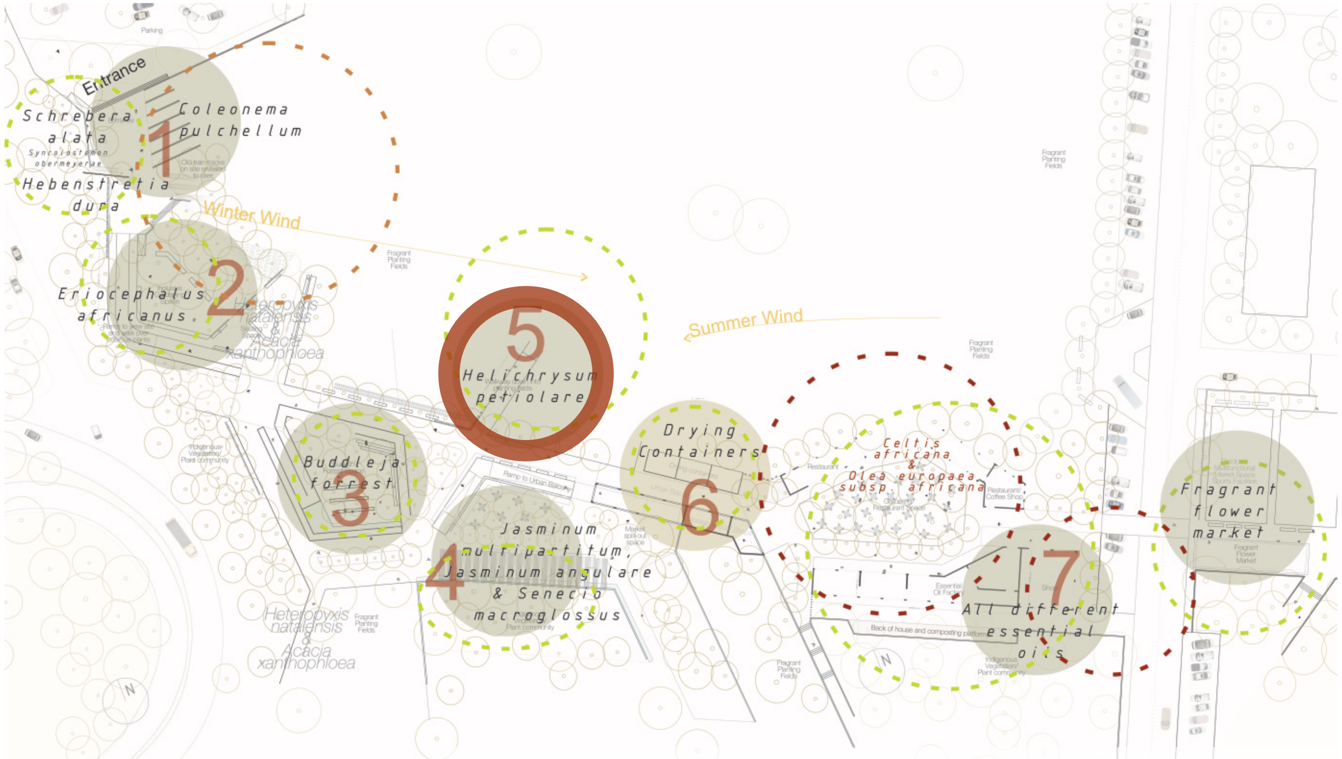



Figure 6.24: Plant palette for moment 4 (Author 2016)

Figure 6.18: Climbers




## Moment 5: Submersion into Fragrance Planting Fields

The visitor to the site is allowed to enter the vast fragrant planting fields in a specific area to arrive at a place where the user would feel totally overwhelmed by the masses of fragrant planting surrounding them. This is also a controlled way to allow the visitor to engage with the planting field without harming the plants that will be used to make essential oil. The purpose of this space is to expose the users to the natural form of the flora before experiencing it as an essential oil.

The plants that will be experience in this area could be between the different plants seen in figure 6, as this is a productive area different plants might be planted in this area on different occasions.

Plant Palette for Moment 5

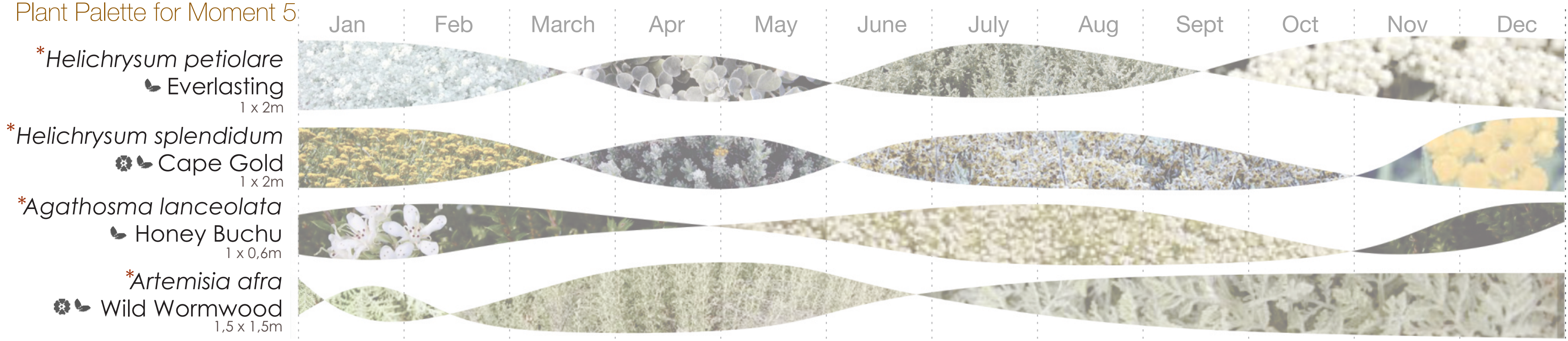



Figure 6.25: Plant palette for moment 5 (Author 2016)

Figure 6.26: Essential oil planting fields

Moment 6: Fragrant planting drying containers

Some of the plants need to be dried before it can be used to make essential oil. These drying containers are placed near the factory for convenience but along the olfactory route to expose this important step in the making of essential oil to the visitor of the site. As some of the plant material starts to dry it releases its unique pleasant smell acting as a massive heap of pot-pourri to the by-passes with pleasant fragrances filling the air.


Plant Palette for Moment 6

*Helichrysum petiolare*
Everlasting *
1 x 2m

Figure 6.27: Helichrysum petiolare (Olivier 2014)

*Helichrysum splendidum*
Cape Gold *
1 x 2m

Figure 6.28: Helichrysum splendidum (Shoot 2004)

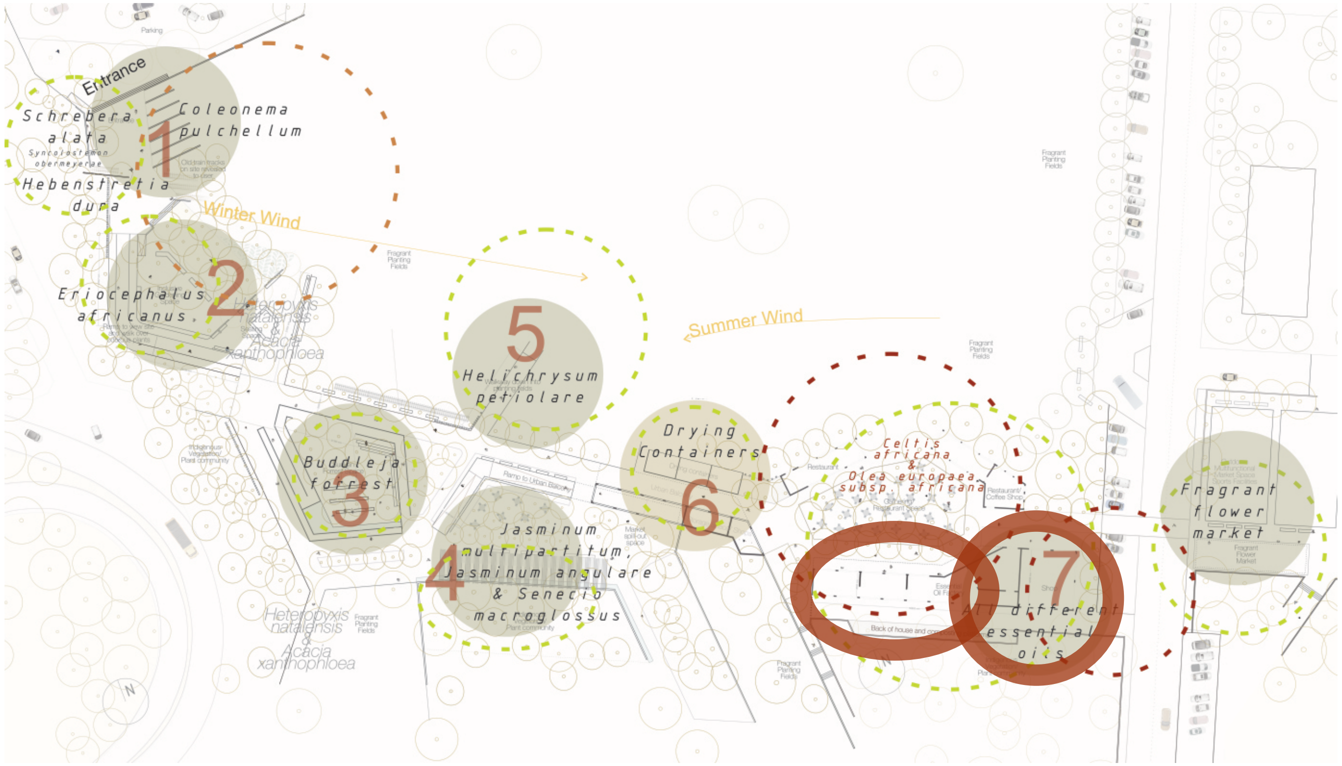
*Pelargonium cordifolium*
Heart-leaved Pelargonium *
1 x 1m

Figure 6.29: Pelargonium cordifolium (Staudenfuehrer)

*Pelargonium graviolens*
Rose-scented Pelargonium *
1,3 x 1m

Figure 6.30: Pelargonium graviolens (NetPS Finder)

Figure 6.31: Dried plants (Adobe 2016)




## Moment 7: Journey through essential oil factory

The visitor to the site will be allowed to walk through a public space in the factory which will be designed to reveal the beautiful proses of making essential oils. An essential oil factory smells lovely and this smell will be revealed at just the right frequency making use of popper ventilation in the process to make sure it does not overpower the user.

## The Final Product

After the user has moved through the factory he/she ends up in the factory shop where the different oils can be smelled in its pure oil form or in the form of other products like cream, soap and sprays.

See workers taking plant material to factory from planting fie;d or from drying boxes

Enter factory and see how the plant material is placed throught distellery process smell aroma in factory

End up in Shop where essential oil is sold in its most pure form and in the form of other products


Figure 6.32: The essential oil process

Restaurants and coffee shops

In the space indicated in this figure a few different restaurants and coffee shops exist.

The plants planted in this area will specifically not have any fragrance as to emphasize the smell of the food that will dominate these spaces.

The essential oil plants that are planted in the field right behind the restaurant will not have fragrant flowers but leaves that cannot be smelled unless crushed so floral fragrance does not overpower the smell in this area where food is served.

Plants of the Open Woodland community of the Svcb 6 Marikana Thornveld that should exist within Salvokop will be planted in this area (the full planting palette is discussed in the following chapter.



Figure 6.33: Plant not containing any strong fragrance (Author 2016)

## User (Pedestrian) Movement

This graphic illustrates the many different routes a user can take on site. The different routes may be destination orientated to get to a specific space or to get to the factory or restaurant area or the user can wander taking his/her time in the landscape to truly experience the smell in the landscape.

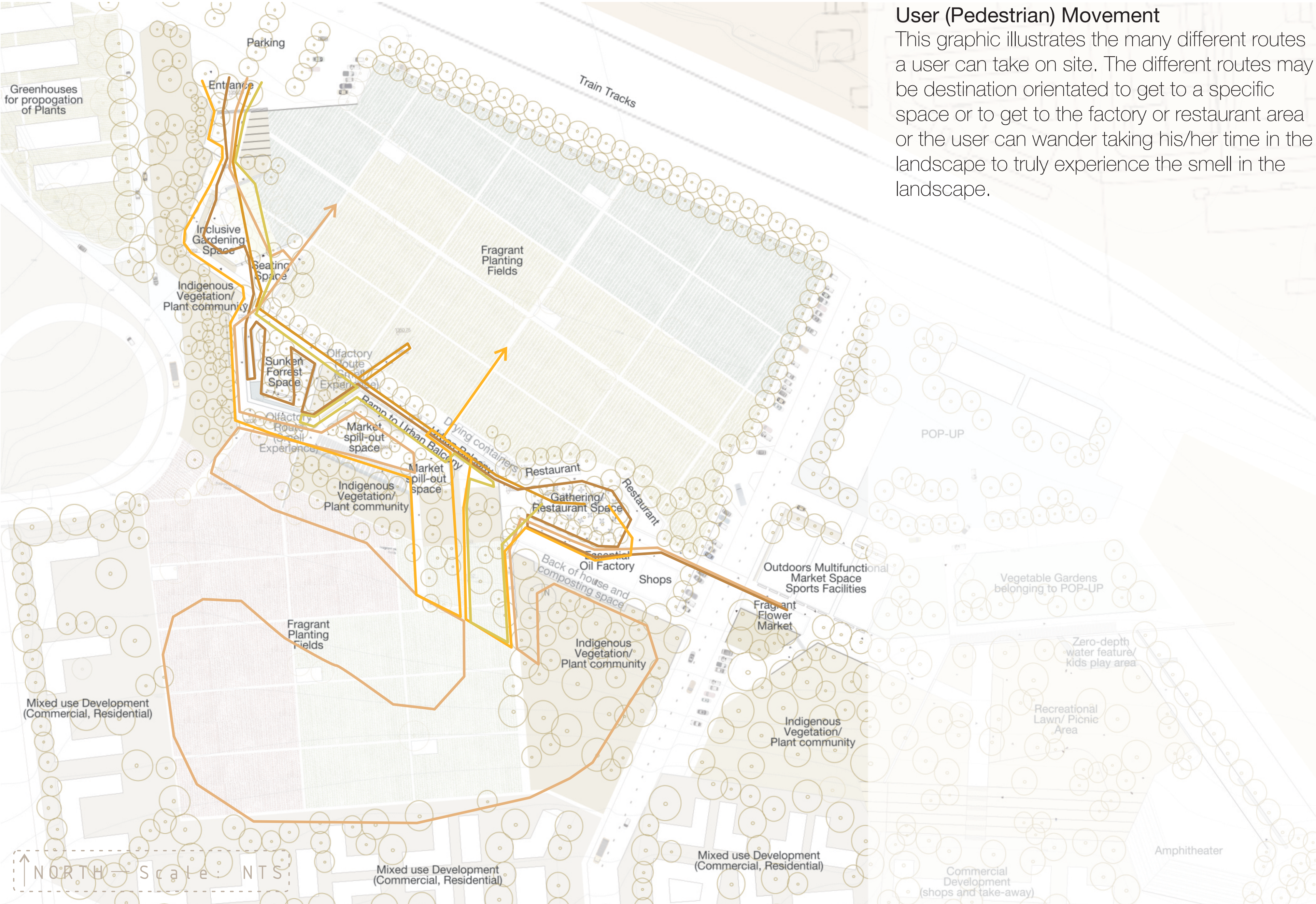



Figure 6.34: Different routes to take indicated on the final sketch plan (Author 2016)

## Experience and Choice

Throughout the Olfactory Route different options are presented to the user. These choices are presented in the design as indicated in figure 2.35.

The users then have more control over the journey that they take through the landscape. As mentioned in Chapter 2 for a visitor of the site to have control over choices has therapeutic benefits.

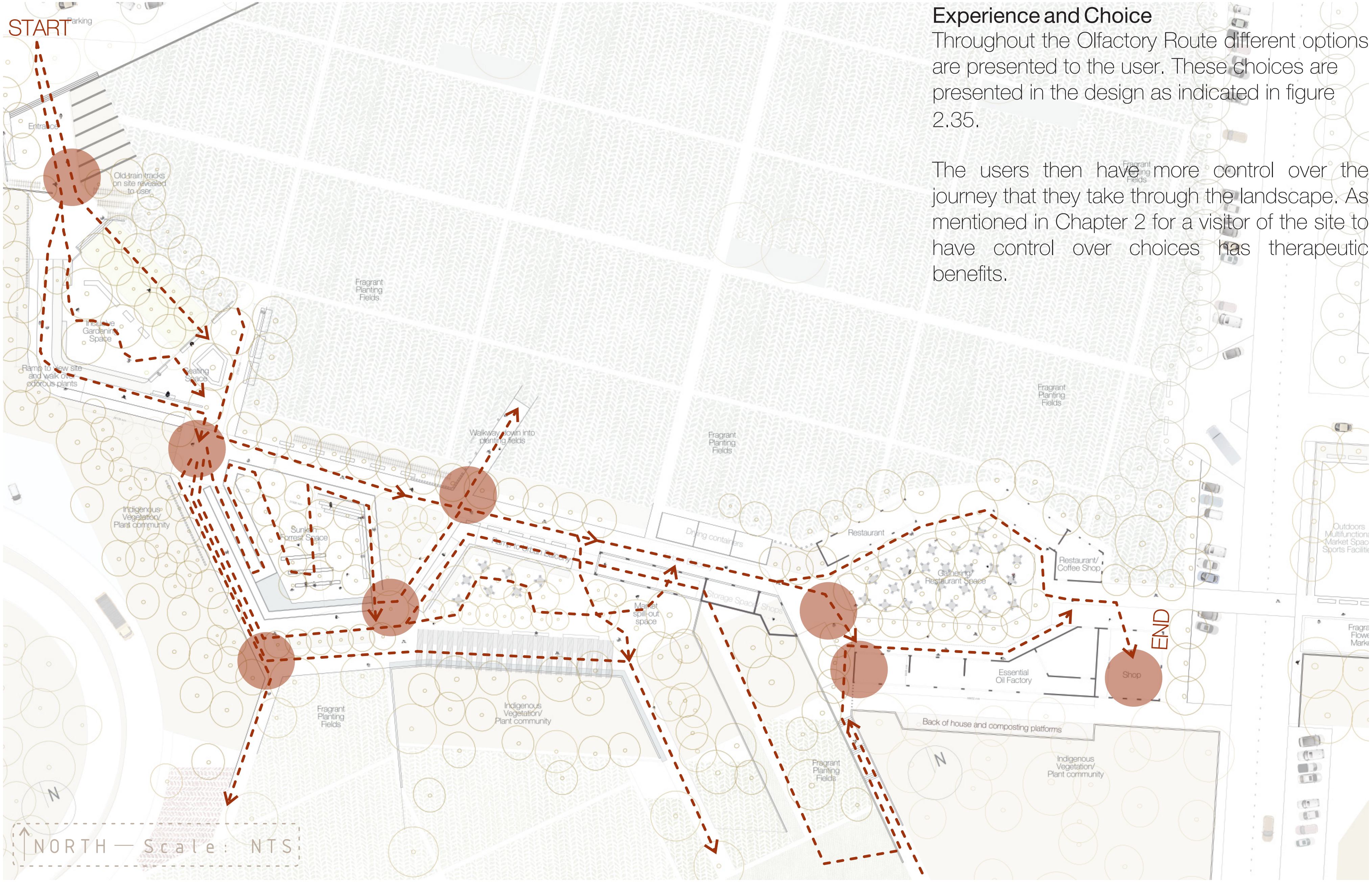



Figure 2.35: Moments of choice indicated on the final sketch plan (Author 2016)

# Spatial Exploration - Model

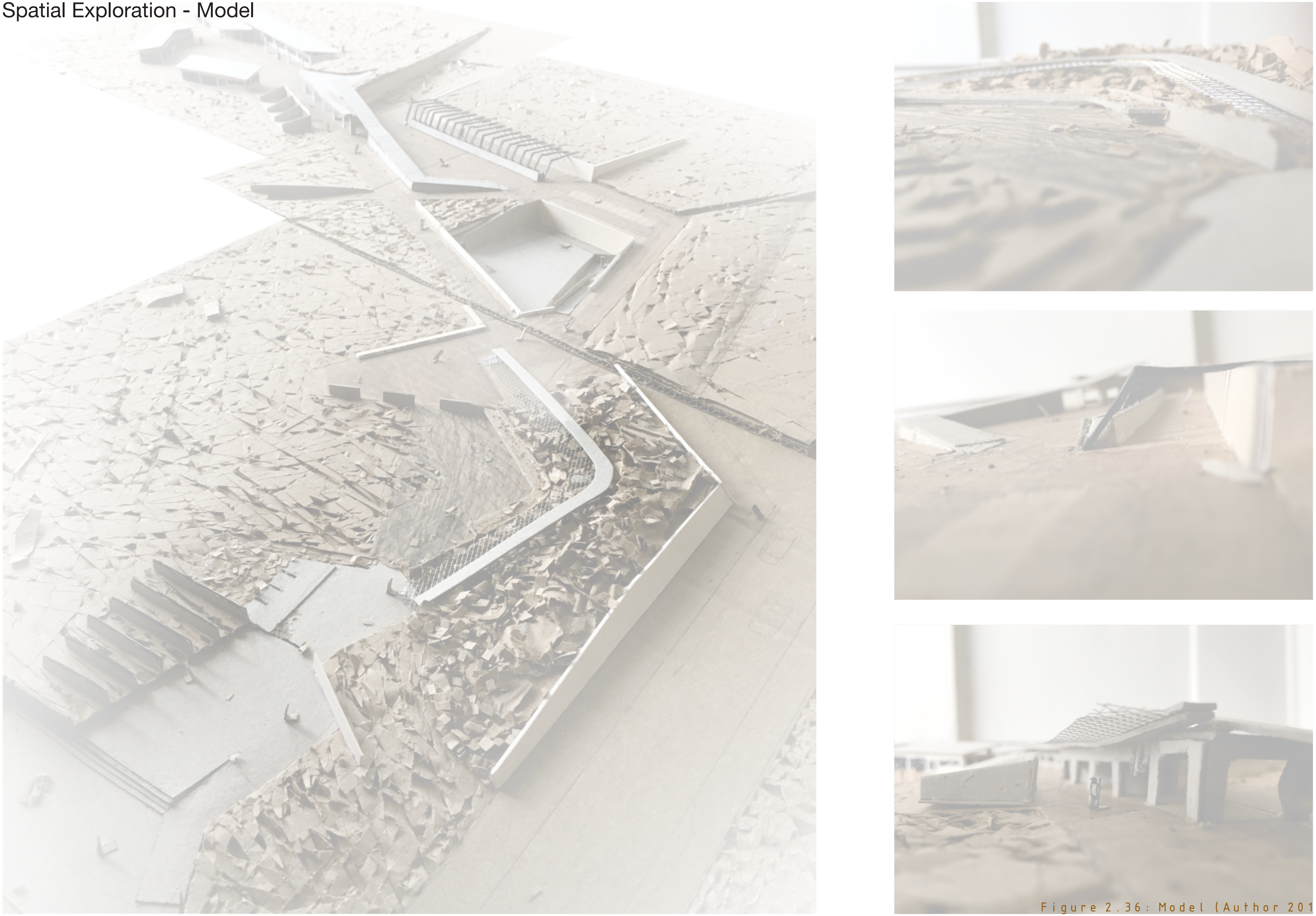


Figure 2.36: Model (Author 2016)

# CHAPTER SEVEN

## Technical Investigation

### Introduction

In the following chapter planting and material choices for the design will be discussed. The water strategy will be illustrated and then certain construction details of the project explored and explained.

## Planting Strategy

Only Indigenous plants are used in the project to show people what beautiful plants we as a country possess with all of the amazing properties that they have. These are plants that we can use more often and can be proud of.

There are three predominant ways that fragrant plants are being use. Firstly in the Fragrant planting fields for production Secondly in masses along the fragrant route and thirdly in the production of essential oils.

To use fragrant plants as a tool alongside other design tools to create specific spaces where users will be confronted with a unique experience and possibly flooded by nostalgia and joy.

To enhance delightful fragrance in a space by using fragrant planting alongside structured spaces.

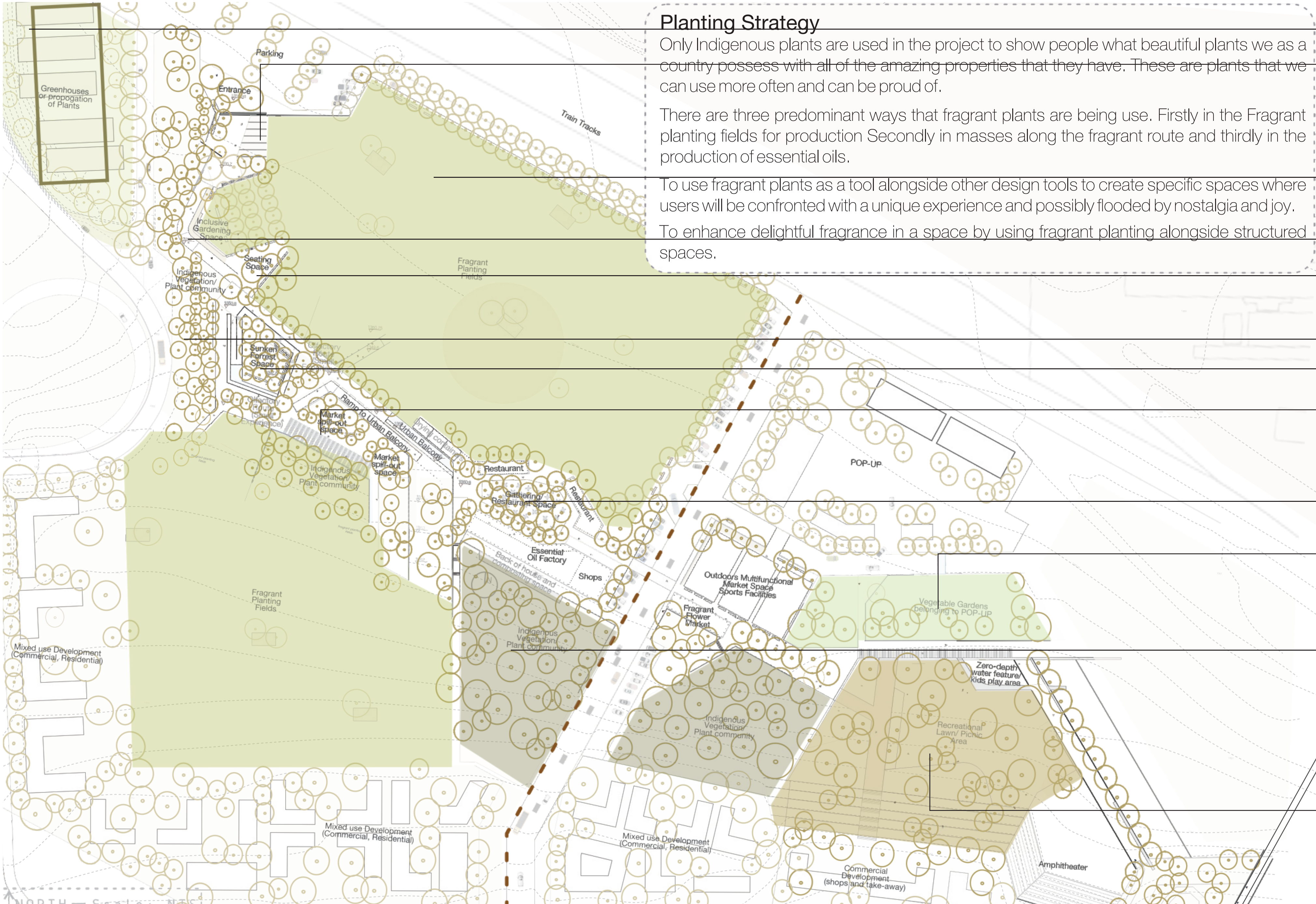



Figure 7.1: Planting Plan (Author 2106)

Propagation of seeds and cuttings will be grown here in this area and greenhouse

*Coleonema pulchellum, Carissa edulis & Metalasi muricata*

Specific fragrant plants are used along the fragrant route in mass to make sure the unique fragrance of the plant is redolent to the user

5 Ha of Fragrant planting will be harvested to be processed into essential oil.
The furrow flood irrigation method will greatly determine the way in which the fragrant plants will be planted

*Eriocephalus africanus & Agathosma glabrata*

*Acacia xanthophloea & Heteropyxis natalensis*

*Screening plants will be used in this section to hide the traffic of the western side of the site.*

*Buddleja auriculata,Buddleja salviifolia &Buddleja saligna*

*Jasminum multipartitum,Jasminum angulare & Senecio macroglossus*

Vegetation without fragrance will be used in the restaurant's social space to allow to natural smell of the different food and of the factory to penetrate the social space. *Celtis africana* will be used to provide shade for the restaurant seating areas in the summer losing its leaves in winter allowing sun to penetrate the area when it is colder outside.

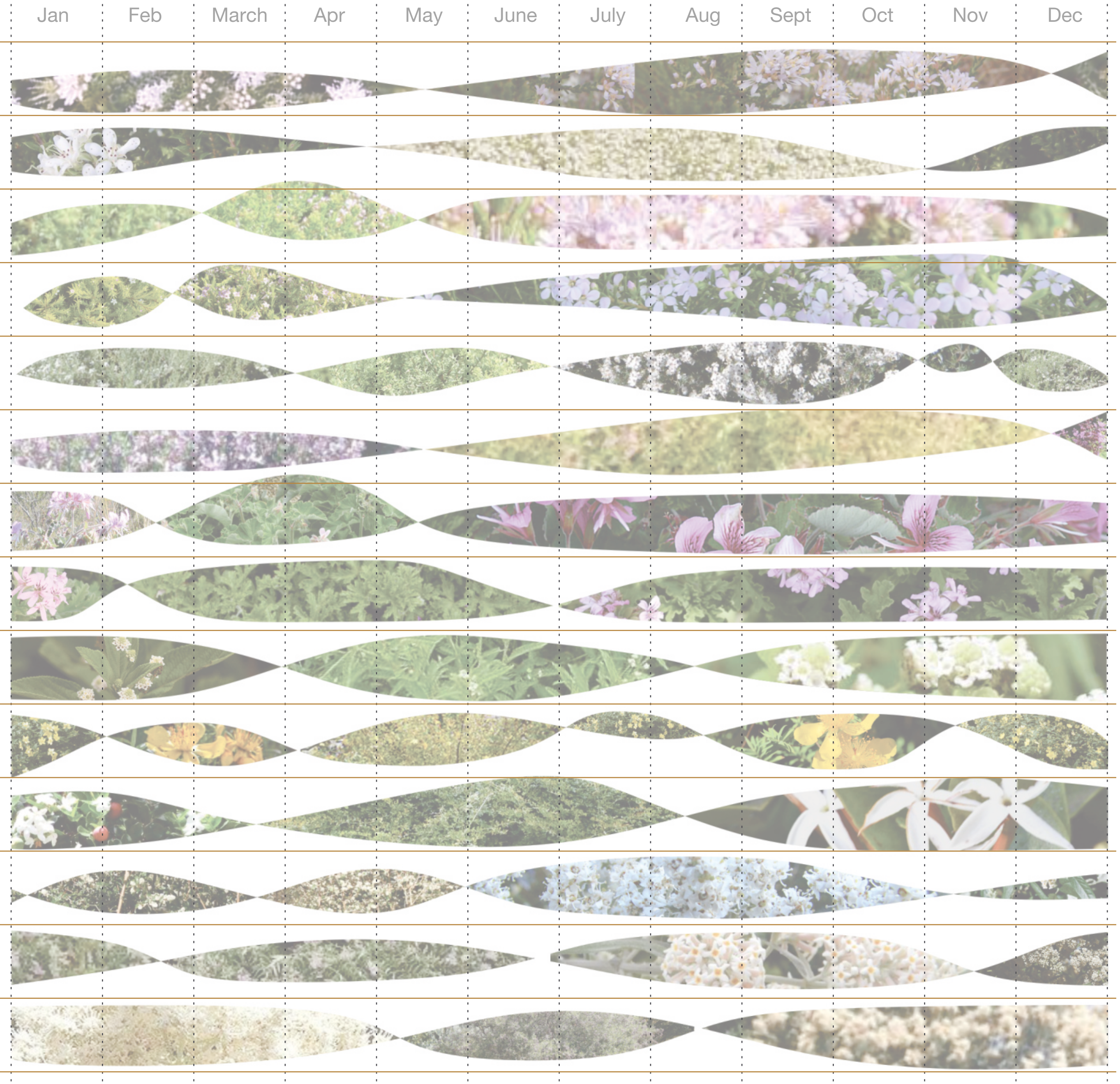
Vegetable gardens will be introduced into the design as a tool to help and promote the empowerment of POP-UP scholars.

The Open Woodland community of the Svcb 6 Marikana Thornveld will be recreated in these areas. The plant choice from the community will be based on the position of the plants in the design. The species of this community will be used together to benefit from the ecological functions already existing within the community; The plants are already well adapted to local conditions. Because the plants are indigenous they will attract indigenous biota. The plants already fulfill particular roles in the local specific pool of species. *Acacia karoo* will be planted in these areas along with varies types of veld grass, geophytes and asparagus to mimic the Open Woodland community.

Recreational lawn areas are a very necessary element in a park. Due to the expected users from the CBD and surrounding commercial entities. The lawn and play areas in the park will ensure that people can enjoy an outdoor environment daily and kids get to daily play outdoors which they need to learn and develop. *Stenotaphrum secundatum* (Buffalo Grass) will be used as it is water wize and requires less mowing, it can also withstand high pedestrian traffic and is shade tolerant.

# Fragrant Planting Palette

## SHRUBS




*Agathosma capensis* *
Buchu
1,5 x 1m

*Agathosma lanceolata* *
Honey Buchu
1 x 0,6m

*Agathosma glabrata* *
Buchu
1,5 x 1m

*Coleonema pulchellum* *
Confetti Bush
1 x 0,8m

*Eriocephalus africanus* *
Wild Rosemary
1,7 x 1,7m

Syncolostemon obermeyerae
Soutpansberg salie
1,5 x 1,5m

*Pelargonium cordifolium* *
Heart-leaved Pelargonium
1 x 1m

*Pelargonium graviolens* *
Rose-scented Pelargonium
1,3 x 1m

*Lippia javanica* *
Fever tea/ Lemon Bush
2 x 1,4m

*Hypericum revolutum*
Currybush
3 x 3m

*Carissa edulis*
Num-num
3 x 2m

*Buddleja auriculata* *
Weepeing Sagewood
4 x 4m

*Buddleja salviifolia* *
Sagewood
5 x 4m

*Buddleja saligna*
False-olive
4 x 3m

# Fragrant Planting Palette

## CREEPERS

Jan | Feb | March | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec

*Jasminum multipartitum
Starry Wild-Jasmine
2 x 1m

*Senecio macroglossus*
Flowering Ivy
3 x 1,5m

## OTHER

Jan | Feb | March | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec

*Stachys natalensis*
White Stachys
0,3 x 0,2m

*Osteospermum muricatum*
White felicia
0,6 x 0,4m

*Hebenstretia dura*
Cat's Tail
0,6 x 1m

**Helichrysum petiolare*
Everlasting
1 x 2m

**Helichrysum splendidum*
Cape Gold
1 x 2m

*Artemisia afra
Wild Wormwood
1,5 x 1,5m

*Metalasia muricata*
White Bristle Bush
2,5 x 1,6m

## TREES

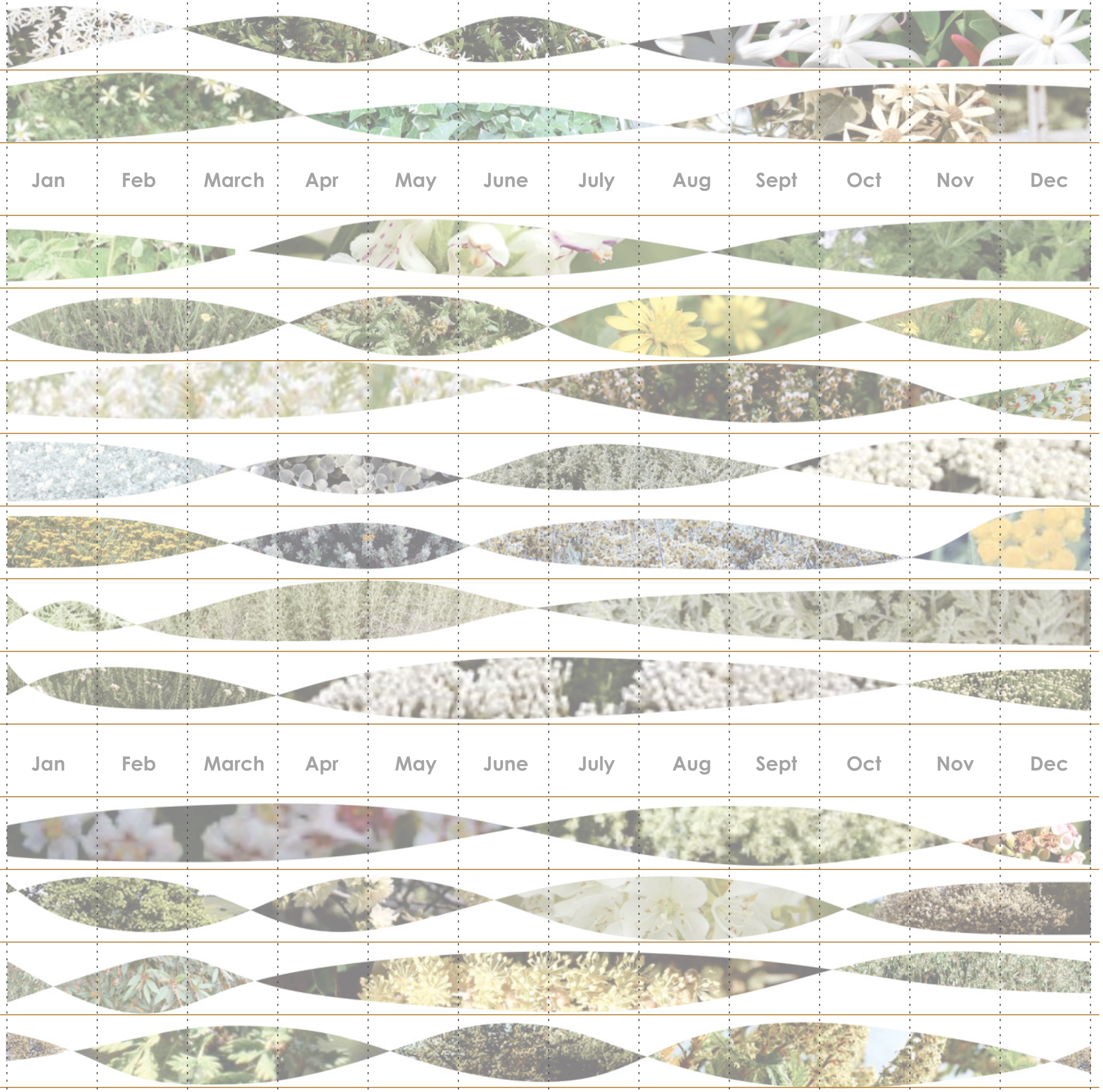
Jan | Feb | March | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec

*Schrebera alata*
Wild Jasmine
5 x 4m

*Dombeya rotundifolia*
Wild Pear
6 x 4m

**Croton gratissimus*
Lavender Feverberry
6 x 6m

**Leucosidea sericea*
Oldwood
6 x 5m



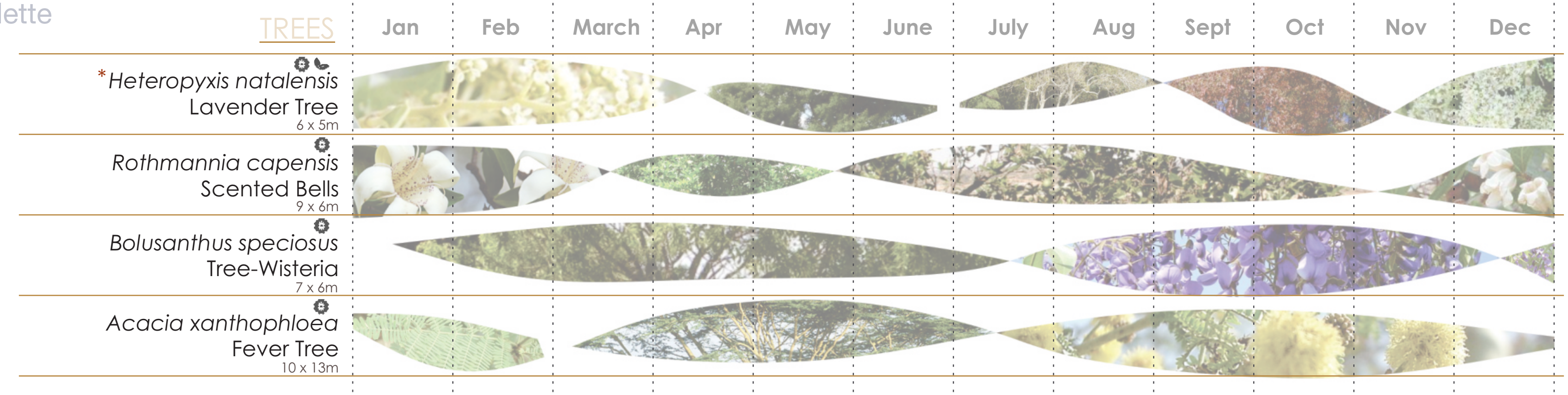



Figure 7.2: Plant Palette (Author 2016)

# Essential Oil Plant Palette and Harvesting Seasons

Flowering season of plant whose flowers ARE used in extraction process

Flowering season of plant whose flowers ARE NOT used in extraction process

(Leaves, stems and other parts of the plant is used in the extraction process)

Month of harvest

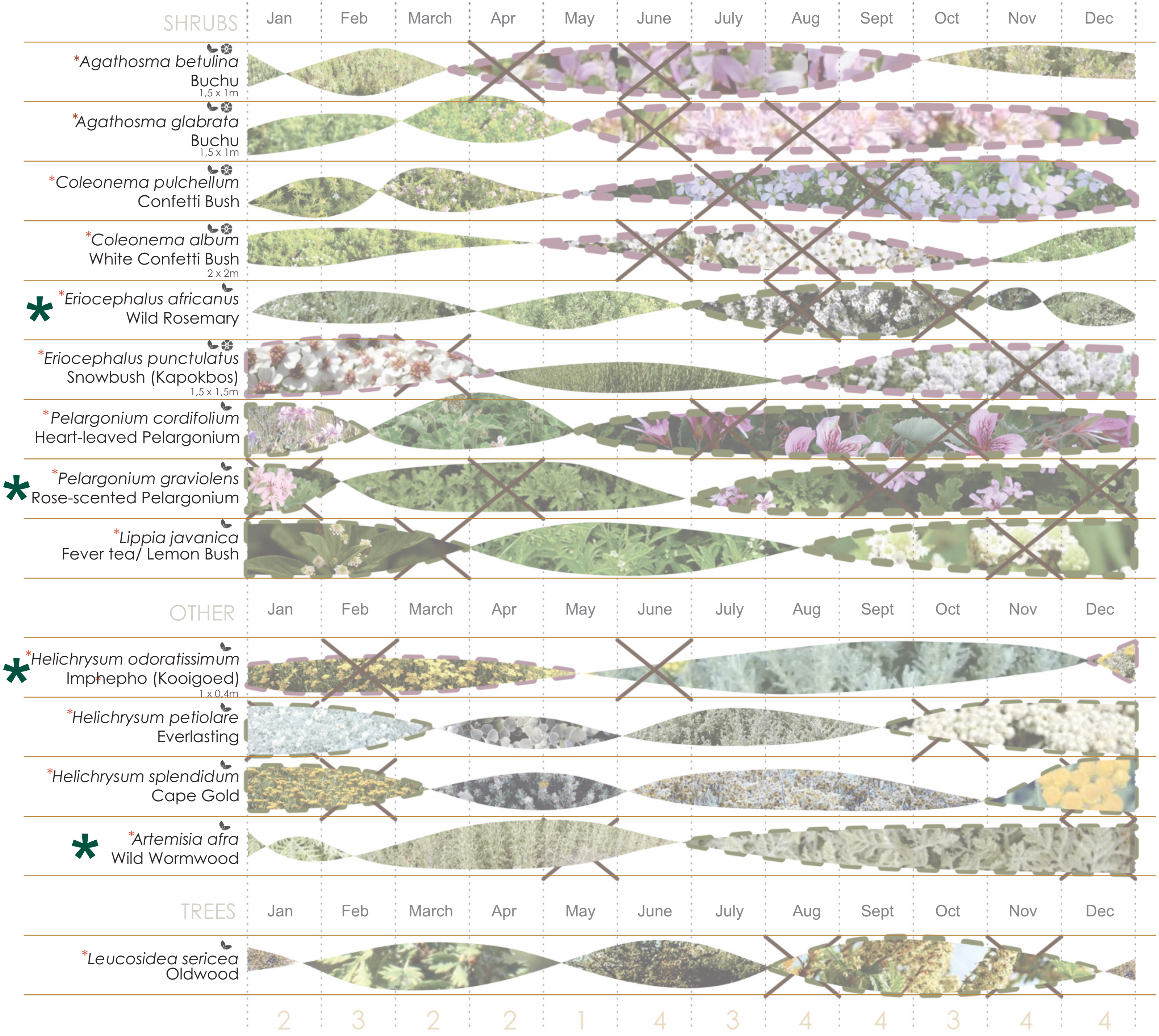
Symbols:

* Known essential oil (advised by specialists and online research)

Flower used in essential oil extraction

Leaves used in essential oil extraction

* Plant used in first phase of project



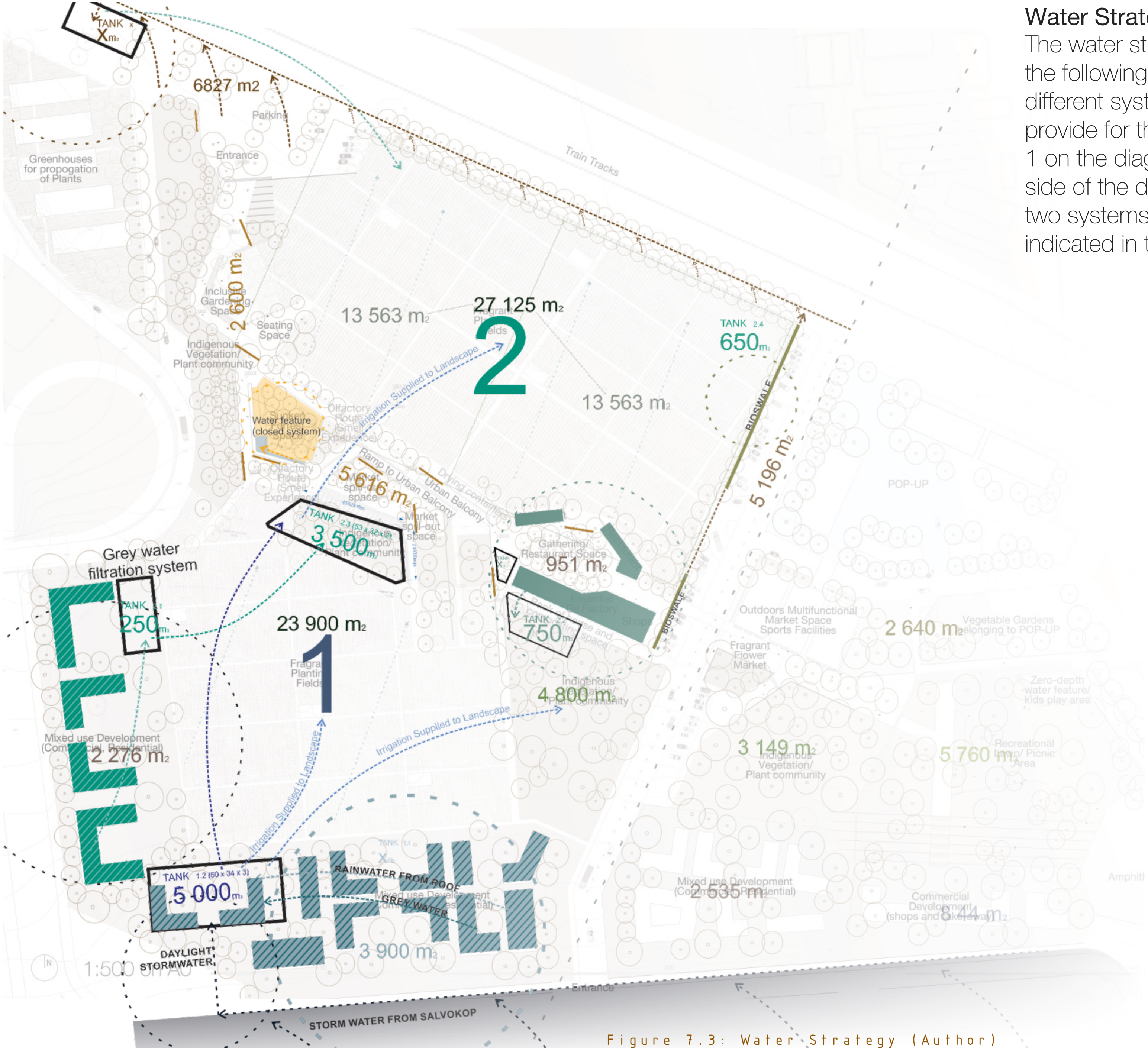



Figure 7.3: Water Strategy (Author)

## Water Strategy

The water strategy for the design is illustrated in the following diagram. It is divided into two different systems, the first in lighter blue will provide for the southern side of the design (no. 1 on the diagram) and the green for the northern side of the design (no. 2 on the diagram). These two systems are also linked to each other as indicated in the diagram.

## Materials


Concrete


Large Concrete Brick


Steel


Galvanised Steel Grating and other permeable metals


Natural Stone

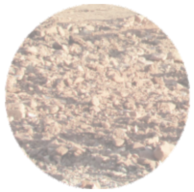
The materiality of the project needed to be robust but also reflects the idea of permeability as to allow odourant molecules to penetrate through materials, for example perforated metal. Permeable metal is also used in a very functional way in walkways to allow plants to grow through the gaps in the metal and be crushed by people as to release their smells.

Concrete is a very robust, durable and widely available material. Its strength, durability and aesthetic appeal is however dependant on the mixture (the ratio of cement, aggregate and water used) as well as the correct method of implementation (thus the quality of the labour used).
All concrete surfaces are to be a minimum of 80mm thick with a two way mesh placed 20-30mm from the top of the slab and constructed from a minimum 15 MPa strength reinforced concrete with expansion joints at 1500mm intervals and joints are to be filled with polyethylene joint filler. They must be cast on suitable compacted ground fill in layers of 150 - 300mm. Concrete surfaces are to be sand-blasted to reveal the aggregate and aid in the slip resistance of the walkways when they are wet.
Al interior concrete floor surfaces must be cast on a 0.25mm polyethylene damp proof membrane. They are to be finished off with a 30mm concrete screed, finished with a [6mm] layer of clear epoxy.
This material has no maintenance requirements (depending on its strength and the above mentioned factors) it is also very light and thus reduces the heat island effect and creates a more favourable microclimate in the area. Many different textures can be created with it by using different shuttering materials. It is very cold to sit on thus any possible position where people may sit; it will be considered to cover those surfaces with timber.

Steel is used in construction because of its hardness, durability and tensile strength.
Using steel can ensure longer spans, thinner columns, and easy alteration (Wegelin 2009:188). It is also recyclable and re-usable although it is made from non-renewable resources.
Although steel is quite expensive and the process of making it takes up a lot of energy and water, this is equalized by its speed of erection due to standardized elements, different shapes and sizes, its length of span and strength.
To protect the steel against corrosion it can be galvanised or painted (with a primer or paint coats) (Wegelin 2009:191). Where desired the steel can also be left to naturally age, thus treating it in such a way to end up with a rusty looking brownish colour for aesthetic reasons without compromising its structural strength.
Steel will be used in the construction of pergolas, in some walkways and in concrete as reinforcement

Timber is a beautiful natural and commonly used construction material. A critical factor when using timber is making sure it is sources from registered plantations who plant new trees if old ones are cut off.
It is biodegradable, re-usable and recyclable for example is composite timber products and mulch and even the production of paper.
Timber especially when used outside does require treatment to prevent moisture, sun and pest damage.
Class H3 CCA treated Saligna can be used. It is usually sealed with penetrating wax (with the option of a sanded finish).

Materials found on site


# Reference Plan

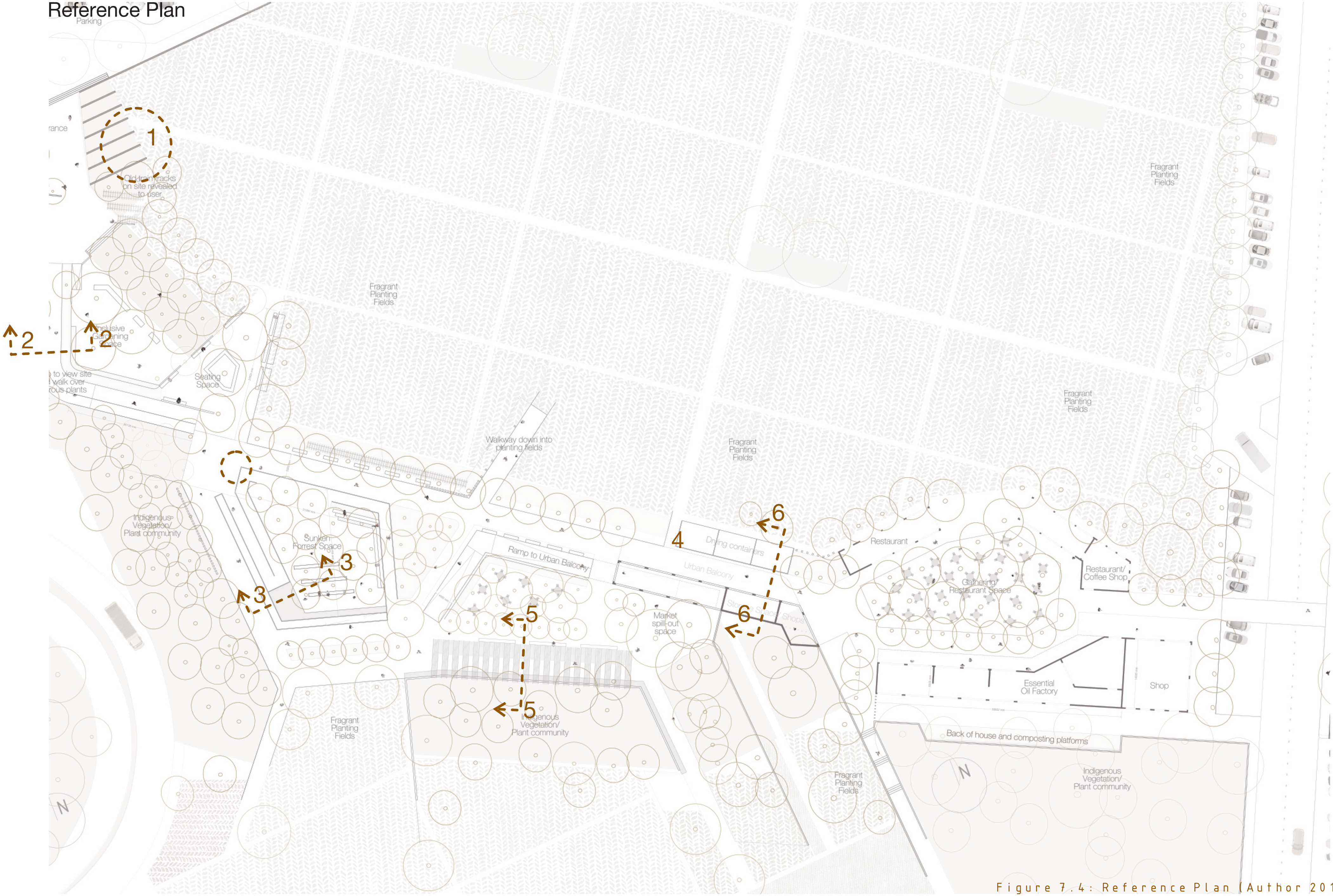
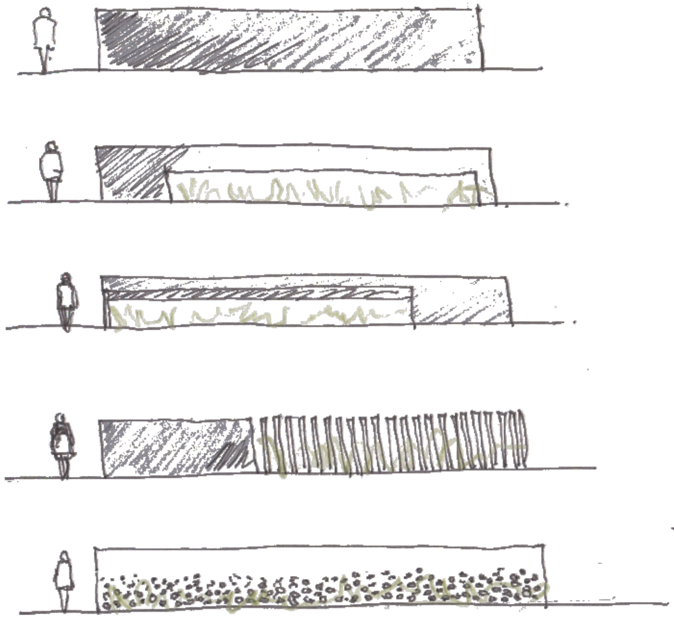
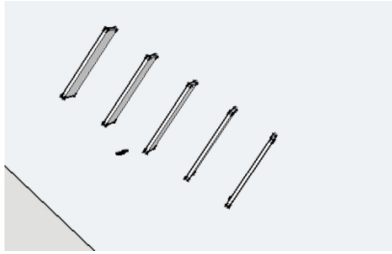



Figure 7.4: Reference Plan (Author 2016)

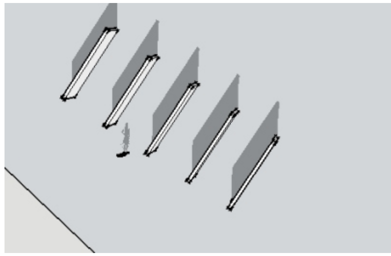
Detail 1



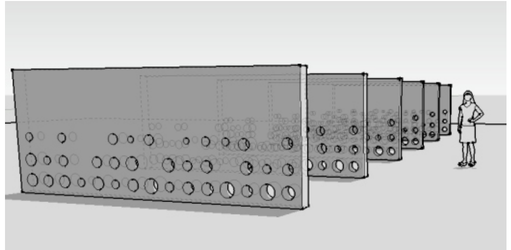
Different versions of fins



Summer Noon Sun



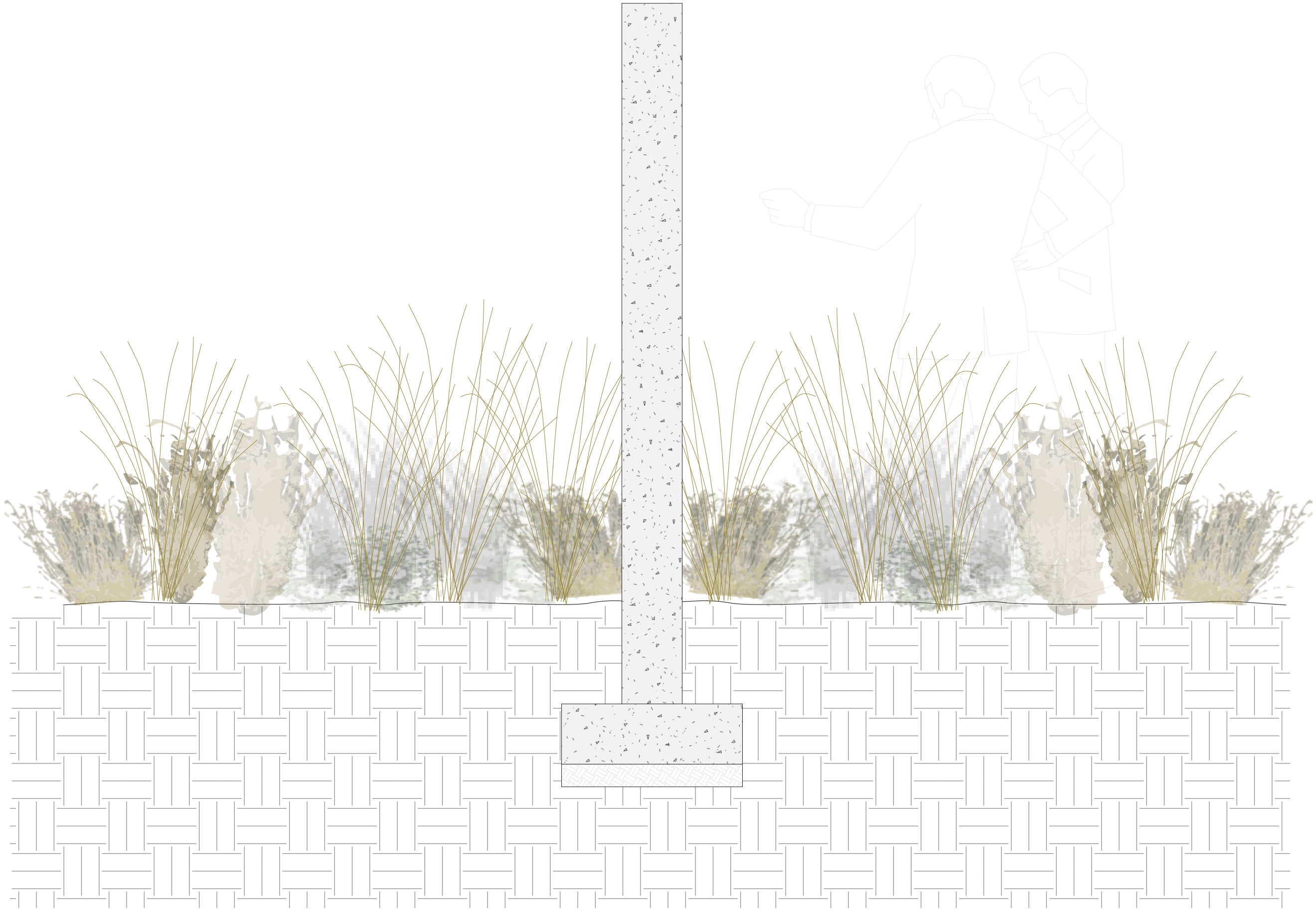
Winter Noon Sun



Perforated Concrete

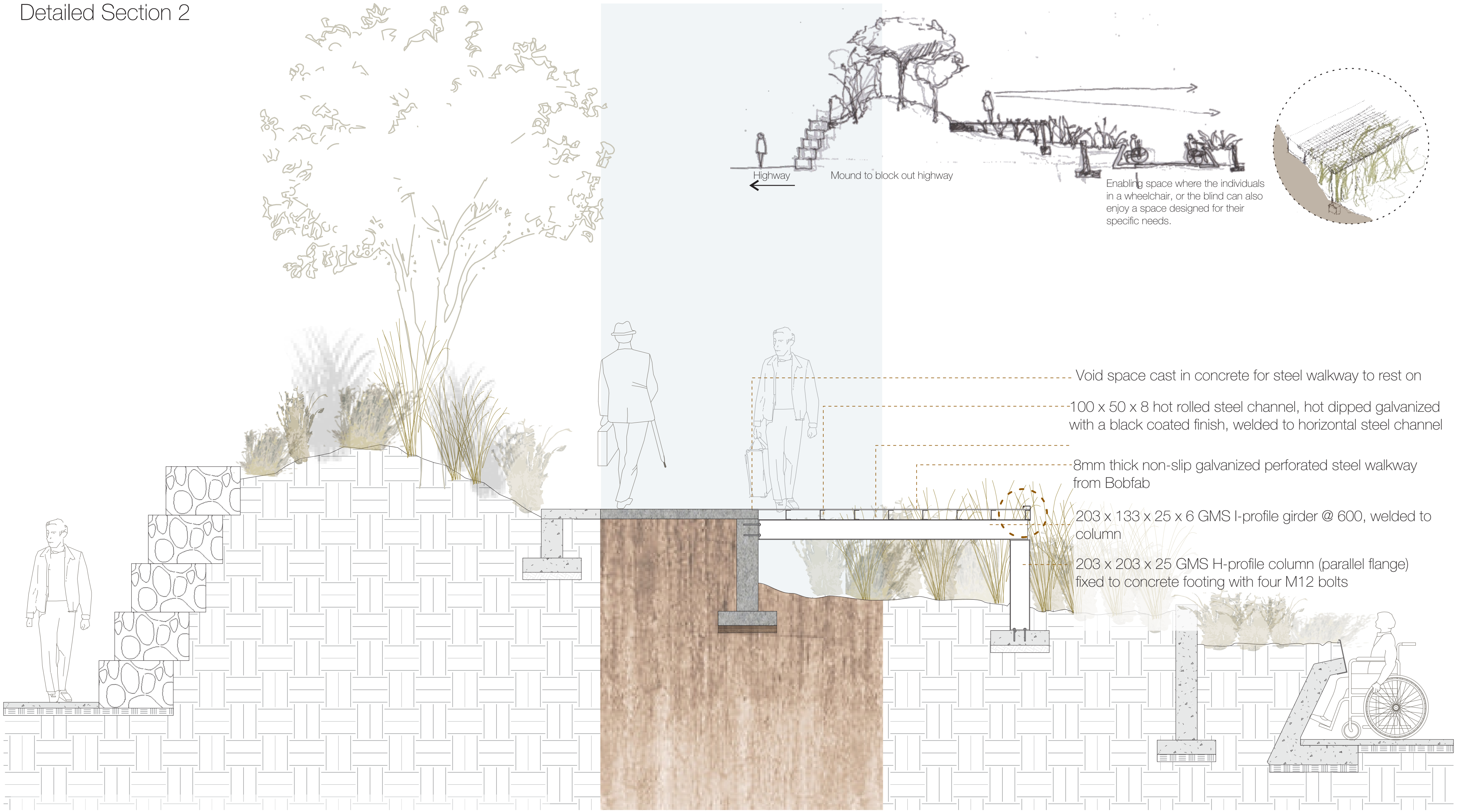
Vegetation is planted in between the fins at the entrance as an attempt to direct the wind and create wind tunnels sweeping the sweet fragrance of the essential oil plant to the nose of the visitor to the site.

To ensure that the plants grow everywhere between these fins the bottom part of them are going to need to be permeable.

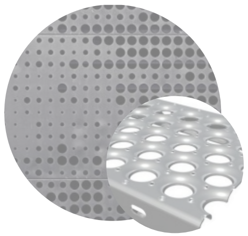


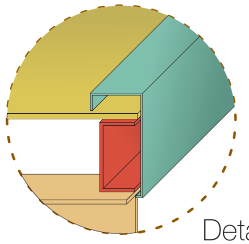
Detail 1: Concrete fins - NTS

# Detailed Section 2




Detail 2: Walkway

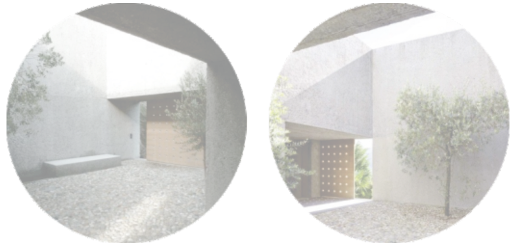


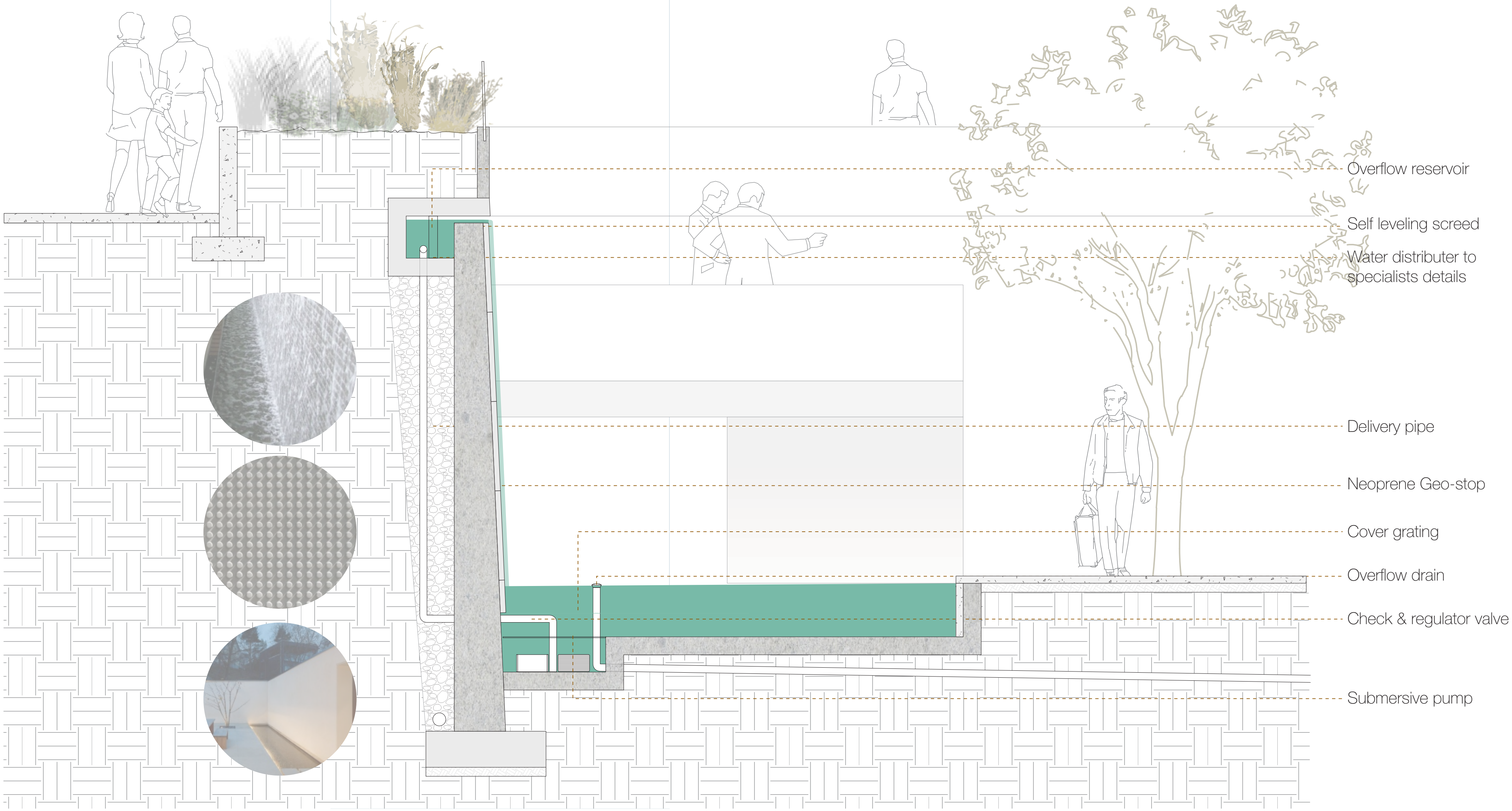


Detail 2.1 NTS

Section 2 NTS

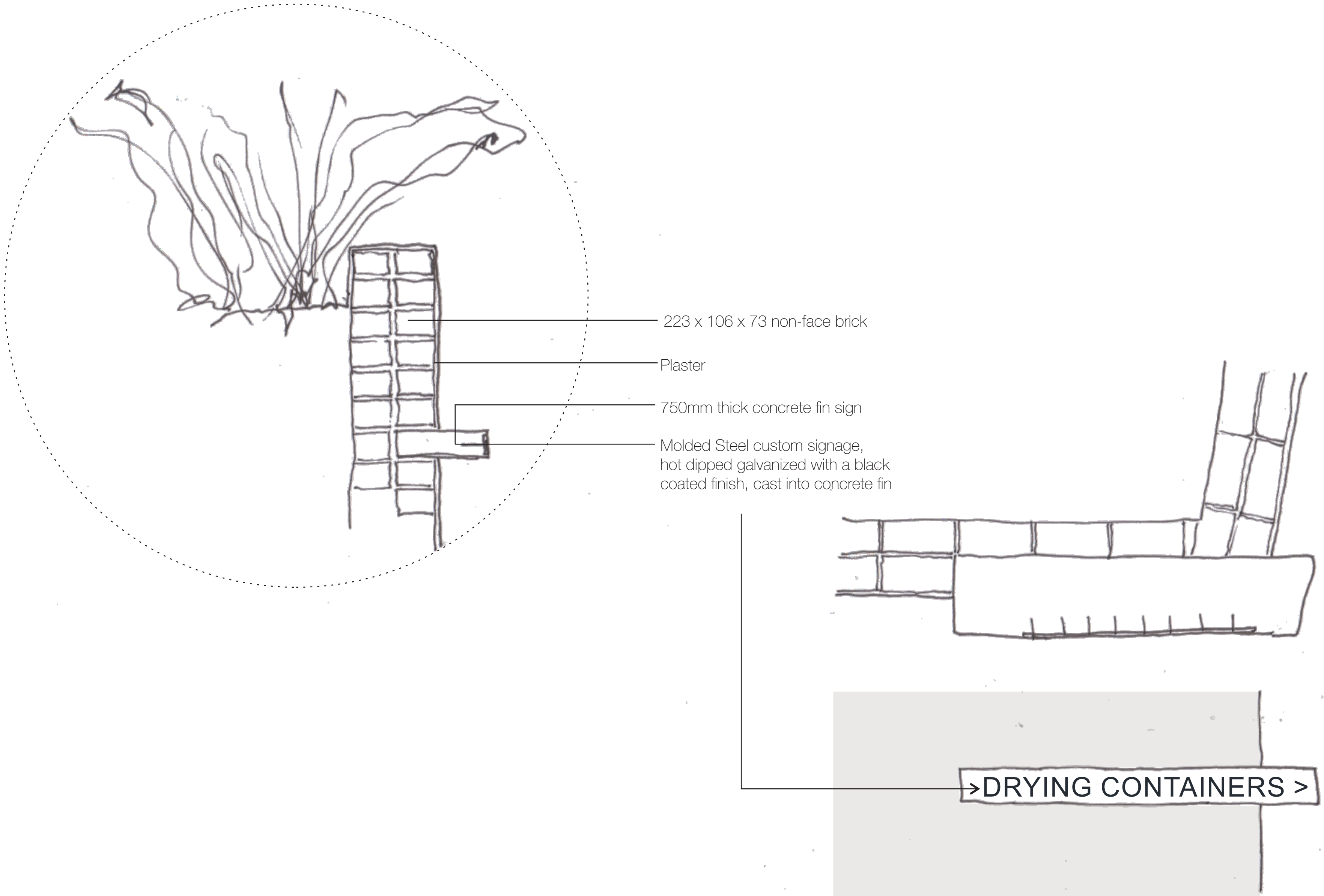
Detailed Section 3





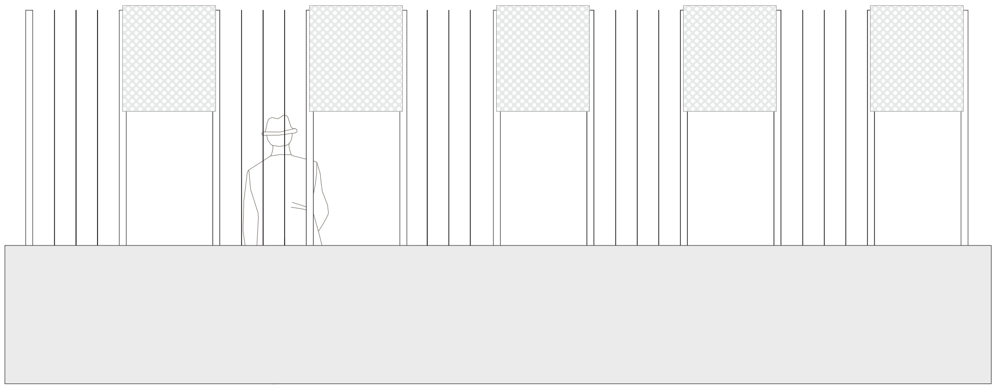

Detail 3: Water feature in sunken Buddleja forest - NTS

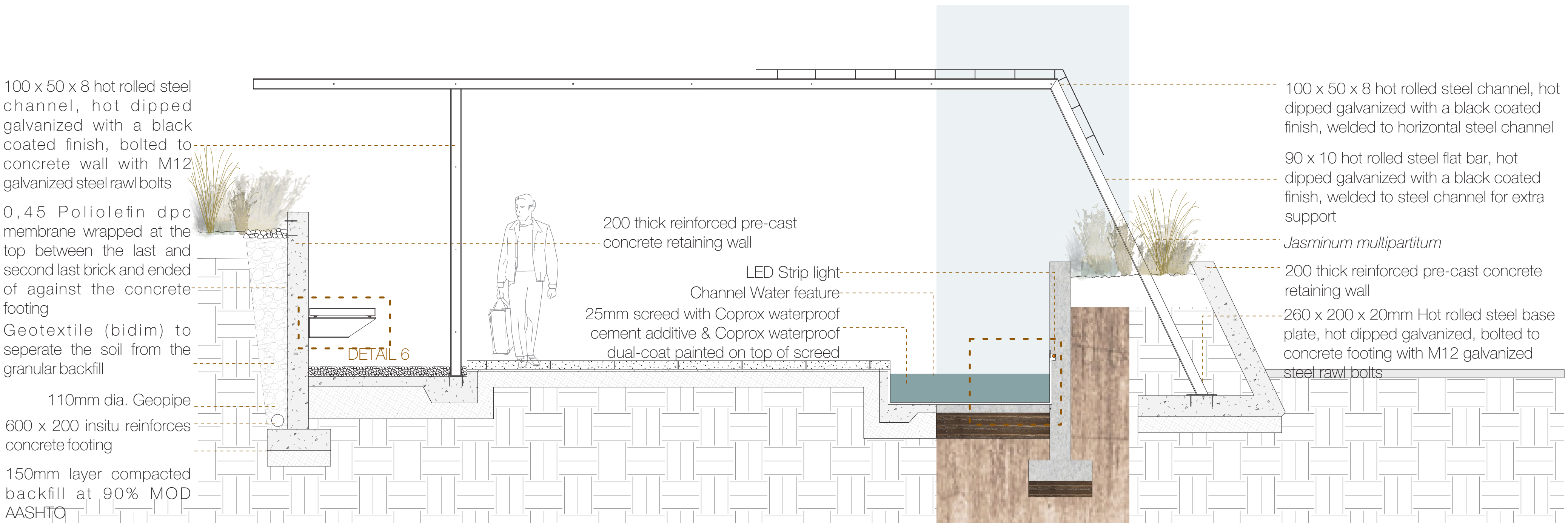
Detail 4




Detail 4 NTS

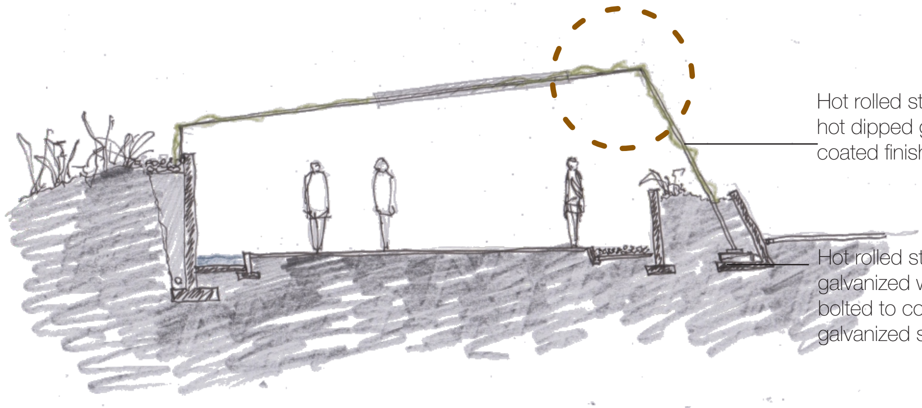
Detailed Section 5





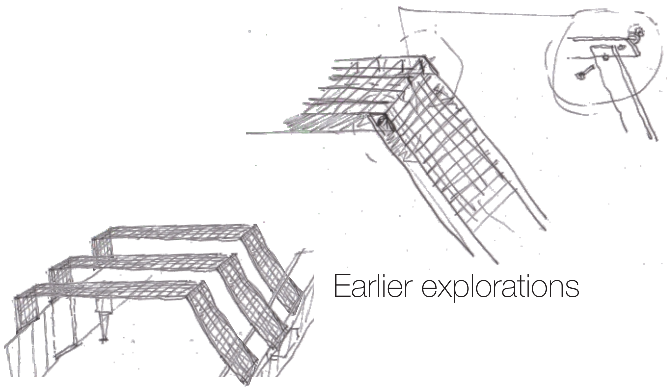

Detail 5: Jasmine Pergola NTS

# Detail 5.1

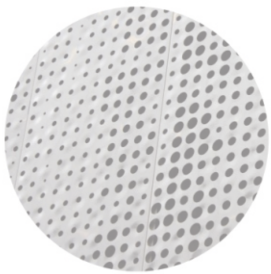


Hot rolled steel square hollow tube, hot dipped galvanized with a black coated finish, welded to base plate

Hot rolled steel base plate, hot dipped galvanized with a black coated finish, bolted to concrete footing with M12 galvanized steel rawl bolts



Earlier explorations

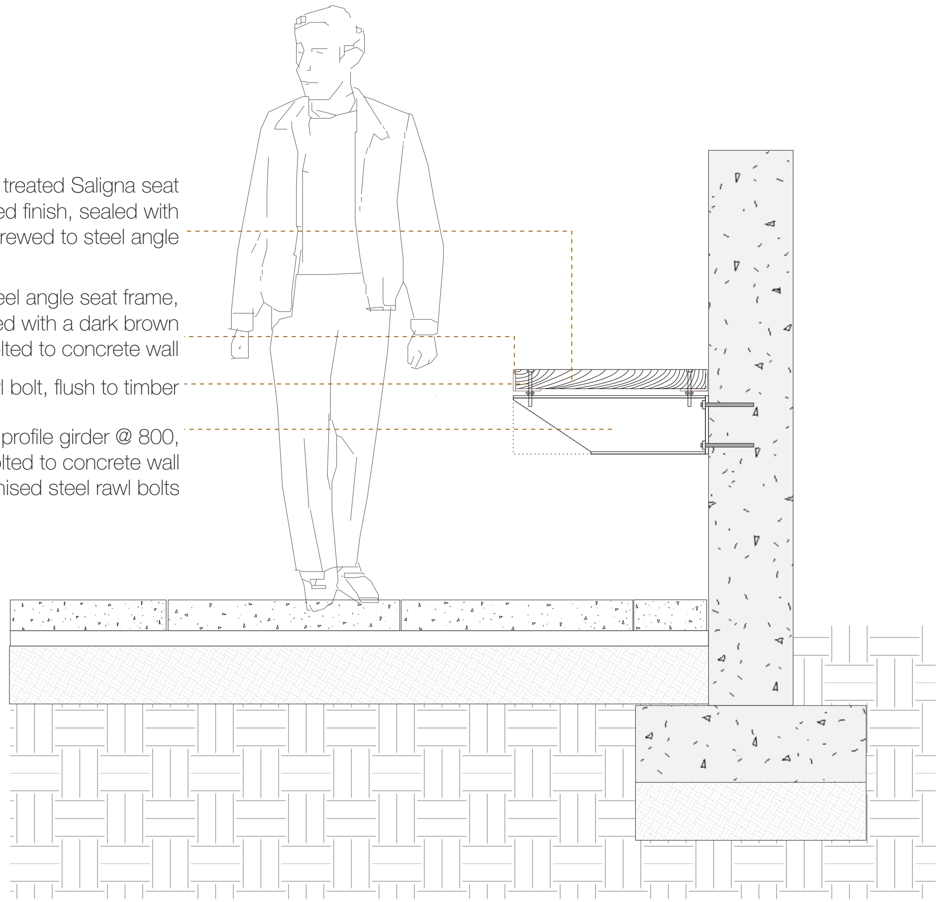


50x75 class h3 CCA treated Saligna seat surface with sanded finish, sealed with penetrating wax and screwed to steel angle

66x80x6mm hot rolled steel angle seat frame, hot dipped galvanized with a dark brown coated finish, bolted to concrete wall

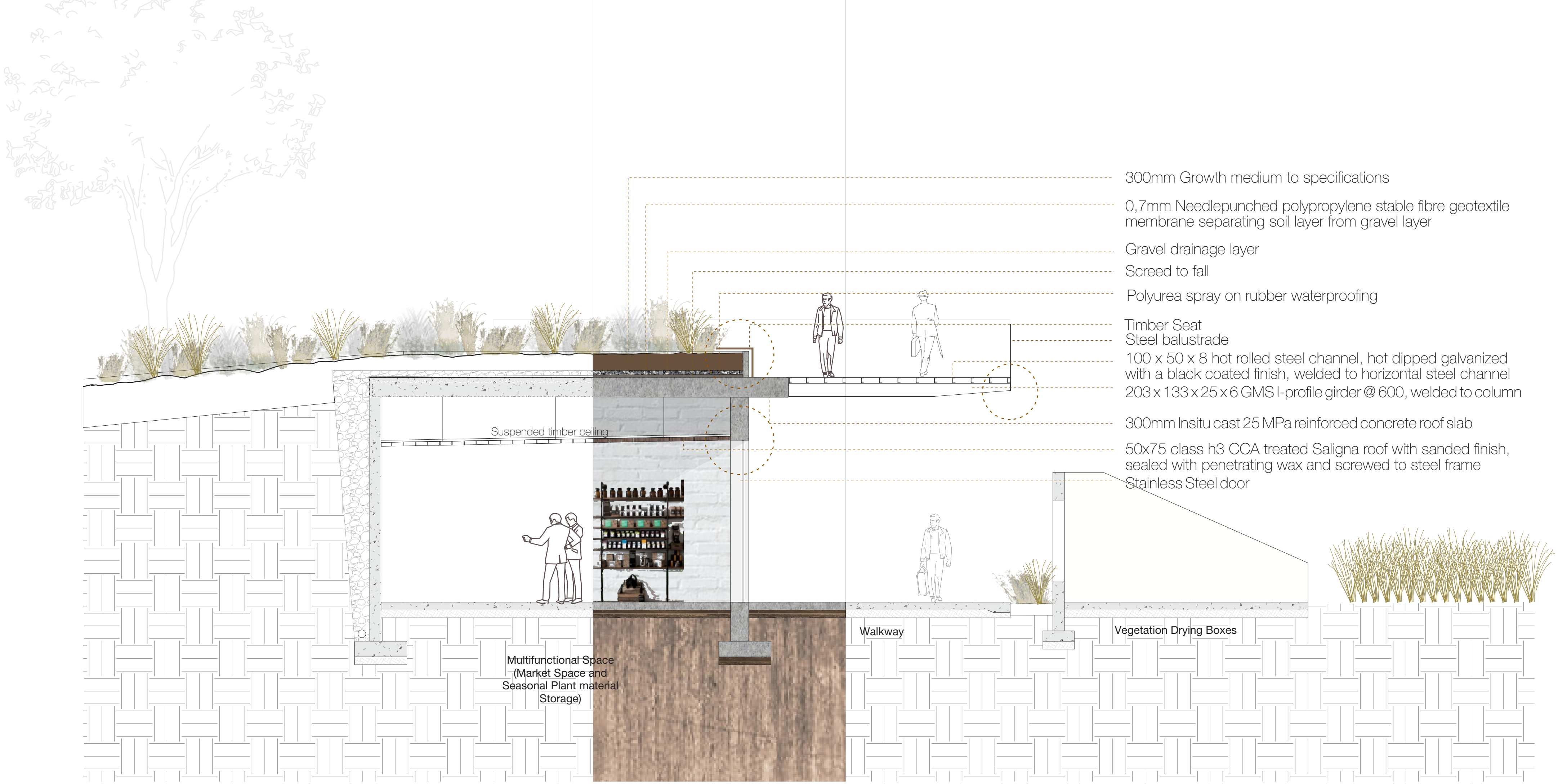
M12 class 8,8 steel rowl bolt, flush to timber

203 x 133 x 25 GMS I-profile girder @ 800, welded to base plate, bolted to concrete wall with M12 galvanised steel rawl bolts



Detail 6: Timber Seat - NTS

Detailed Section 6






Detail 7: Urban balcony - NTS

# List of Figures

# Bibliography

American Planning Association. 2016. City Parks Forum. Internet: https://www.planning.org/cityparks/. Accessed 27 August 2016.

Bowring, J. 2006. The Smell of Memory: Sensorial Mnemonics. IFLA Conference Papers: Environment, Society and Design Division.

Cattaneo, A. 2003. A Polysensitive method for qualitative sociological research. IULM University, Milan.

Choudhury, D. 2015. Sustainable Architecture and Human Senses: International Conference On Sustainable Technologies In Buildingand Environment. Budha College of Architecture, Karnal, Haryana-132001, India.

City of Tshwane. 2005. Tshwane Open Space Framework: Volume Three.

Dr Woods, G. 2015. How Humidity Affects Your Scent Control Strategy in hunting. Internet: http://www.bowhuntingmag.com/tactics/humidity-can-impact-scent-control-strategy/#ixzz4NSVTQJFA, Accessed 25 Aug 2016.

Dr. Mercola, J. 2015. Why Smells Can Trigger Strong Memories. Internet: http://articles.mercola.com/sites/articles/archive/2015/08/06/smells-trigger-memories.aspx. Accessed 13 June.

Eyben, R., Kabeer, N., Cornwall, A., 2008, 'Conceptualising Empowerment and the Implications for Pro-Poor Growth', Paper prepared for the DAC Poverty Network by the Institute of Development Studies, Brighton

Fox, K. 2002. The Smell Report: The psychology and anthropology of scent. Social Issues Research Centre, United Kingdom.

Gainsley, S. 2012. Extensions Highscope: The Importance of Sensory Play. HighScope Press.

Giesw, E. 2006. The Health Benefits of Parks: How Parks Help Keep Americans and Their Communities Fit and Healthy. http://www.eastshorepark.org/HealthBenefitsReport_FINAL_010307.pdf

GSDRC. 2016. Social and economic empowerment. Internet: http://www.gsdrc.org/topic-guides/voice-empowerment-and-accountability/supplements/social-and-economic-empowerment/#ec. Accessed 22 July 2016.

Helen Keller, 2004. The World I Live In . Main Edition. NYRB Classics, New York.

Henshaw, V. 2013. Urban Smellscapes: Understanding and Designing City Smell Environments. Routledge, United Kingdom.

Howes, D & Claassen, C. 2006. The Sensescape of the Museum: Western Sensibilities and Indigenous Artifacts" in Elizabeth Edwards, et al. (eds.). Sensible Objects: Colonialism, Museums and Material Culture. Oxford: Berg Publishers.

Landscape Architecture Foundation. 2014. Conversations with Leaders in Landscape Architecture: Steven Spears. Internet: https://lafoundation.org/leadership/conversations/steven-spears/. Accessed. 30 July 2016.

Landscape Architecture Foundation. 2014. Five Questions with Steven Spears. Internet: https://lafoundation.org/leadership/conversations/steven-spears/. Accessed 5 September 2016.

Mathrani, V. 2008. The power of Smell. Internet: http://serendip.brynmawr.edu/exchange/serendipupdate/power-smell.Accessed 15 April 2016.

Meyer, E. K. 2008. Sustaining Beauty: The performance of appearance – A manifesto in three parts. Internet: http://www.arch.utah.edu/cgi-bin/wordpress-cmp/wp-content/uploads/2012/09/meyer2008sustaining-beauty.pdf. Accessed 10 May 2014.

Meyer, W. 2007. Persistence Of Memory: Scent Gardens for Therapeutic Life Review In Communities for The Elderly. The University of Texas at Arlington, United States.

Naddeo, V et al. 2013. Odour Impact Assessment Handbook. 1 Edition. John Wiley & Sons: New Jersey, United States.

Nishimura, K, 2011. The Aesthetics of Smell and Taste For The Appreciation Of Landscape. Journal Of The Faculty Of Letters, The University Of Tokyo, Aesthetics, Vol 36, 28.

Noar Foundation. 2010. Economic Empowerment. Internet: http://noarfoundation.org/economic-empowerment.cfm. Accessed 22 July.

Palmer, A. 2013. Mirror Online: 20 Fascinating Facts about Our Sense of Smell. Internet: http://www.mirror.co.uk/lifestyle/health/20-fascinating-facts-sense-smell-1977351. Accessed 24 March 2016.

Pines, M. 2004. The Mystery of Smell. Chevy Chase, Maryland: The Howard Hughes Medical Institute. Internet: www.hhmi.org/senses/d110.html . Accessed 21 April 2016.

Recovering Landscape: Essays in Contemporary Landscape Architecture, Edited by James Corner, Princeton Architectural Press, New York.

Ryan, R. 2010. University of Rochester: Spending Time in Nature Makes People Feel More Alive, Study Shows. Internet: http://www.rochester.edu/news/show.php?id=3639. Accessed 12 March 2016.

Stone, C. n.d. Studies Show These 8 Smells Make People Happy. Internet: http://www.rd.com/health/wellness/happy-smells/2/

Swaffield, S. 2002. Theory in landscape architecture: A Reader. University of Pennsylvania Press. Philadelphia.

Ward, C.,Roe, J., Aspinall, P., Mitchell, R., Clow, A. & Miller, D., 2012. More green space is linked to less stress in deprived communities: evidence from salivary cortisol patterns. Landscape and Urban Planning 105(3), 221-229.

Wyatt, T. 2014. TED Talks: 10 Fun Facts About Your Sense Of Smell. Internet: http://ted.tumblr.com/post/85827458470/10-fun-facts-about-your-sense-of-smell. Accessed 5 July.

All glory and honour to God, my Heavenly Father. Thank you for leading and guiding every single part of this dissertation. Thank You that I can call myself a daughter of the Most High King.

Aan Ida Breed, baie dankie vir al die wysheid, leiding, raad en jou vertroue in my. Dit was 'n plesier en 'n voorreg om jou as studie leier te gehad het.

Aan Johan en Amanda, my geliefde ouers asook Suné, my liewe sussie, baie dankie vir julle oneindige ondersteuning, liefde, gebede en oproepe reg deur die jaar.

Aan André, baie dankie vir jou ondersteuning, moed in praat, gebede en mooiste hart. Jy is my rots.

Aan Johan Prinsloo, baie dankie vir die rigting en inspirasie. Jou passie vir die dissipline is waarlik inspireerend.

Aan Anne, Anieta, Stephanie en Kayli, baie dankie vir julle ondersteuning, gebede, koffie aandra, laat aande op speld dat ons duim blou is en onverdeelde hulp op die dag van my eksamen.

"But seek first the kingdom of God and his righteousness, and all these things will be added to you." - Matthew 6:33