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.

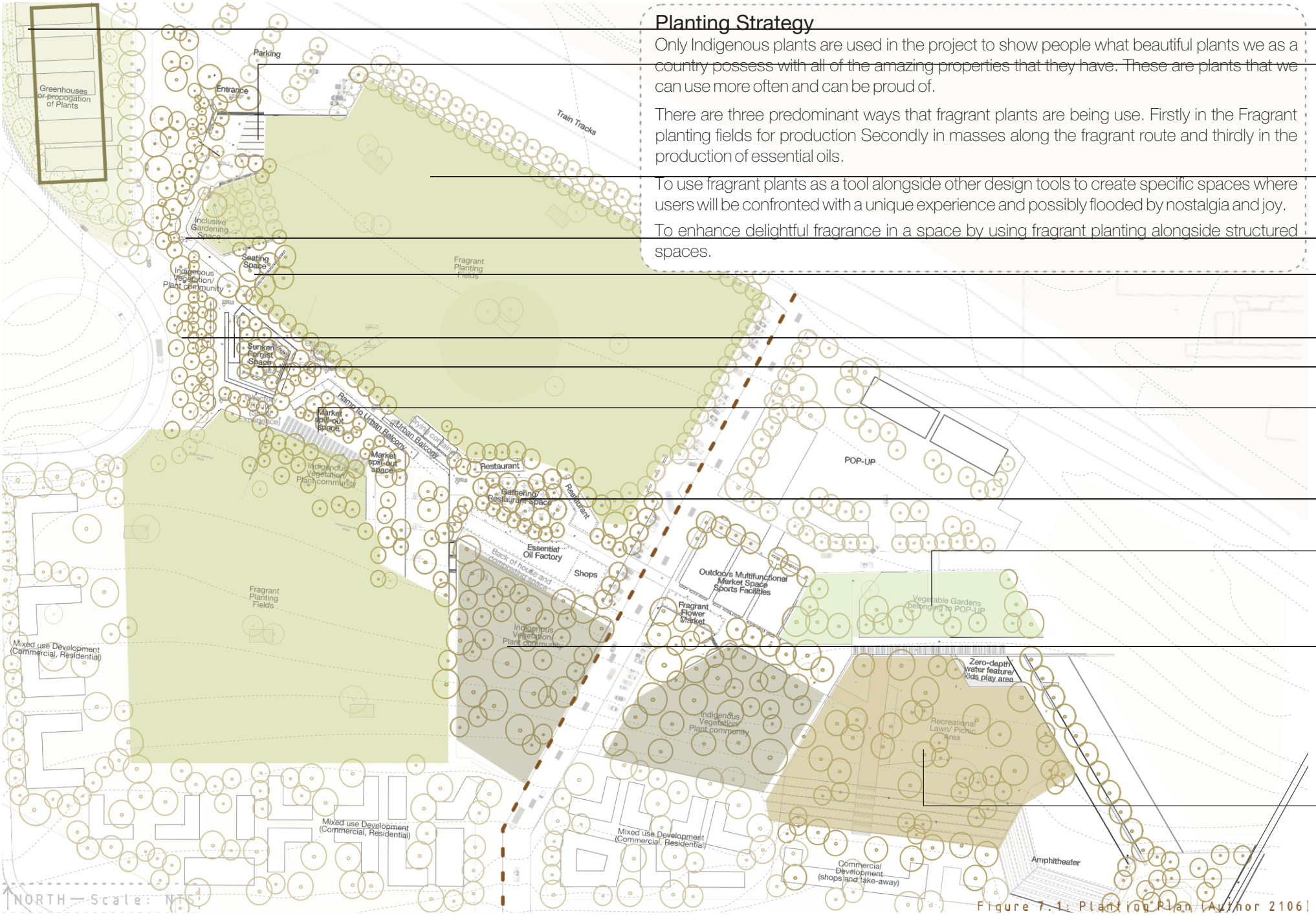


Figure 7.1: Planting Plan (Author 2106)

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

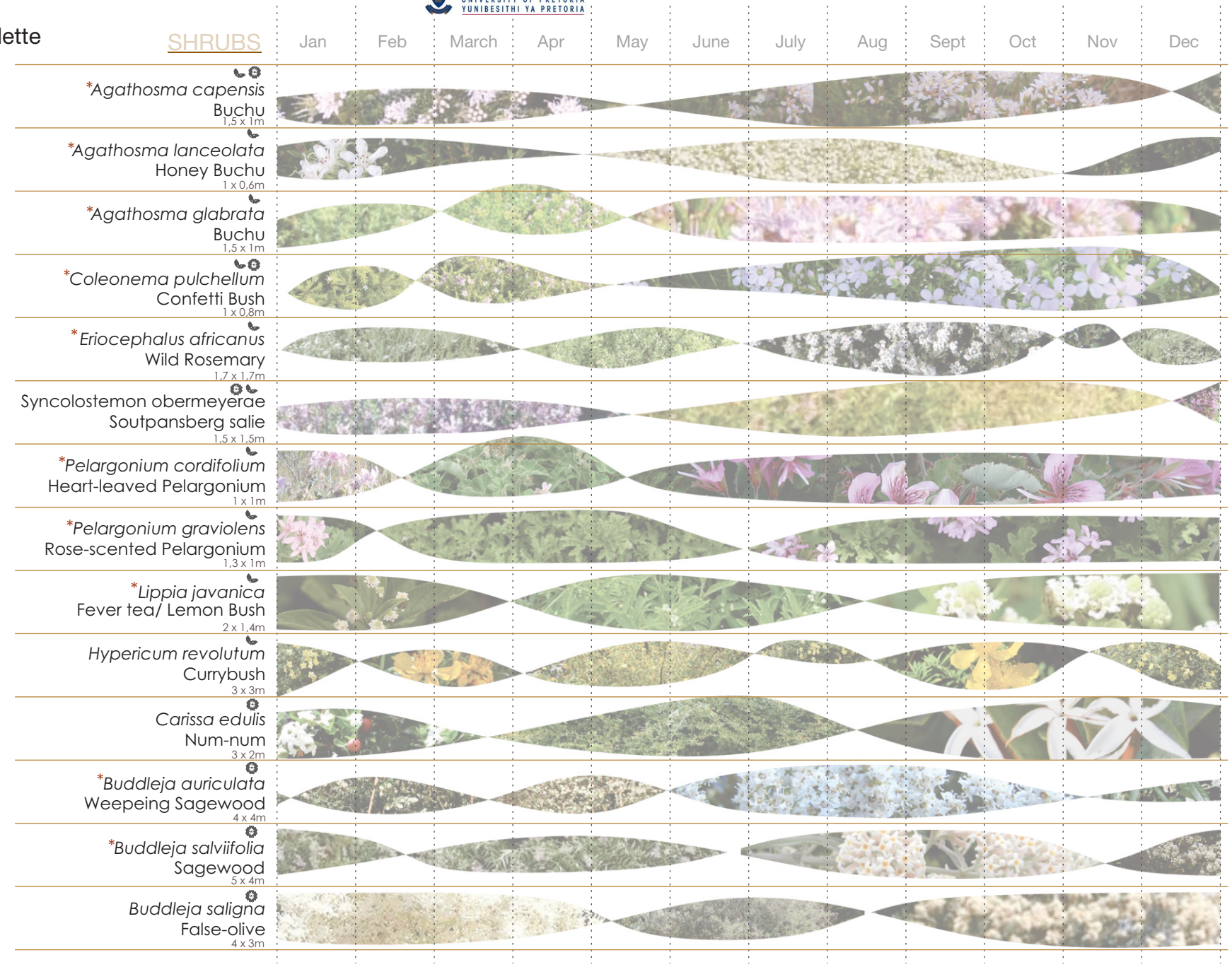
Vegetation without fragrance will be used in the restaurant's social space to allow to natural smell of the different food and of the factory to penetrate the social space. *Celtis africana* will be used to provide shade for the restaurant seating areas in the summer losing its leaves in winter allowing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

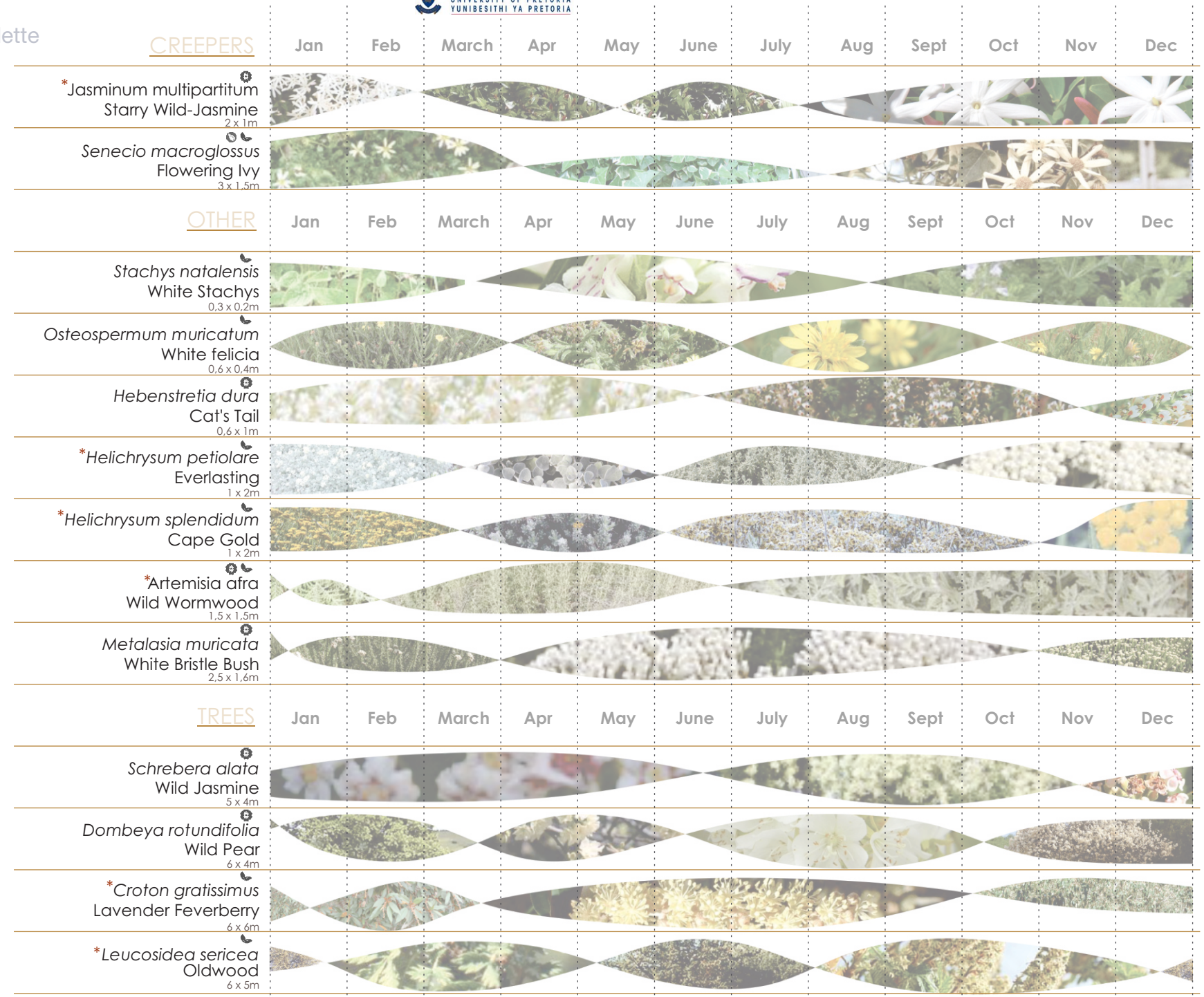
The Open Woodland community of the Svcb 6 Marikana Thornveld will be recreated in these areas. The plant choice from the community will be based on the position of the plants in the design. The species of this community will be used together to benefit from the ecological functions already existing within 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



Fragrant Planting Palette



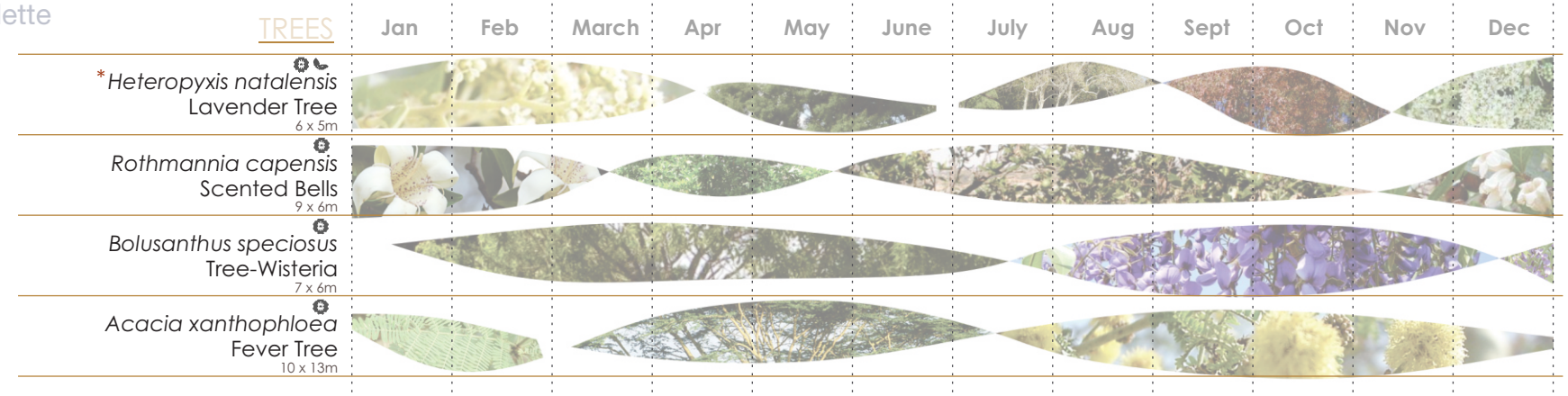


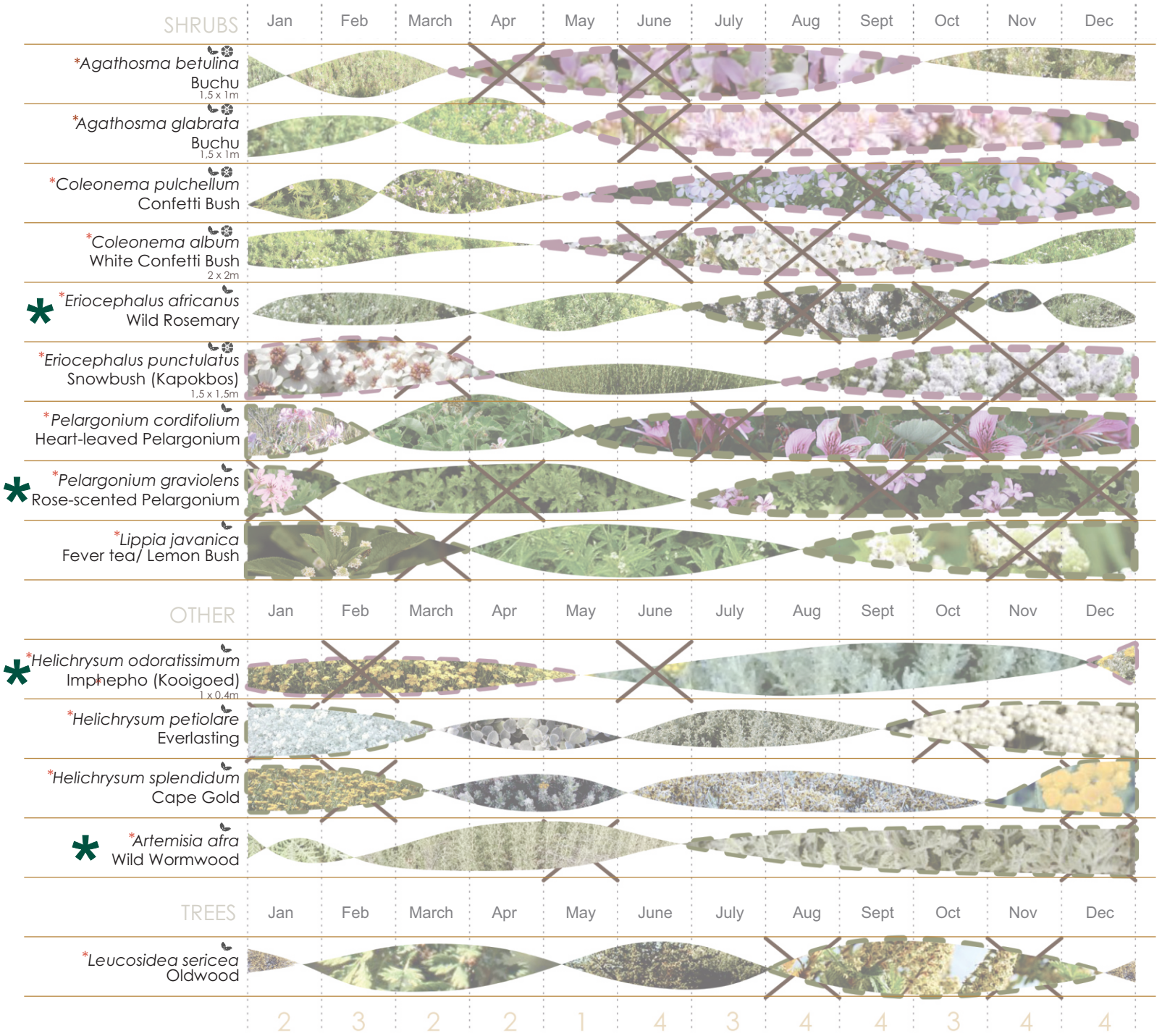
Figure 7.2: Plant Palette (Author 2016)

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



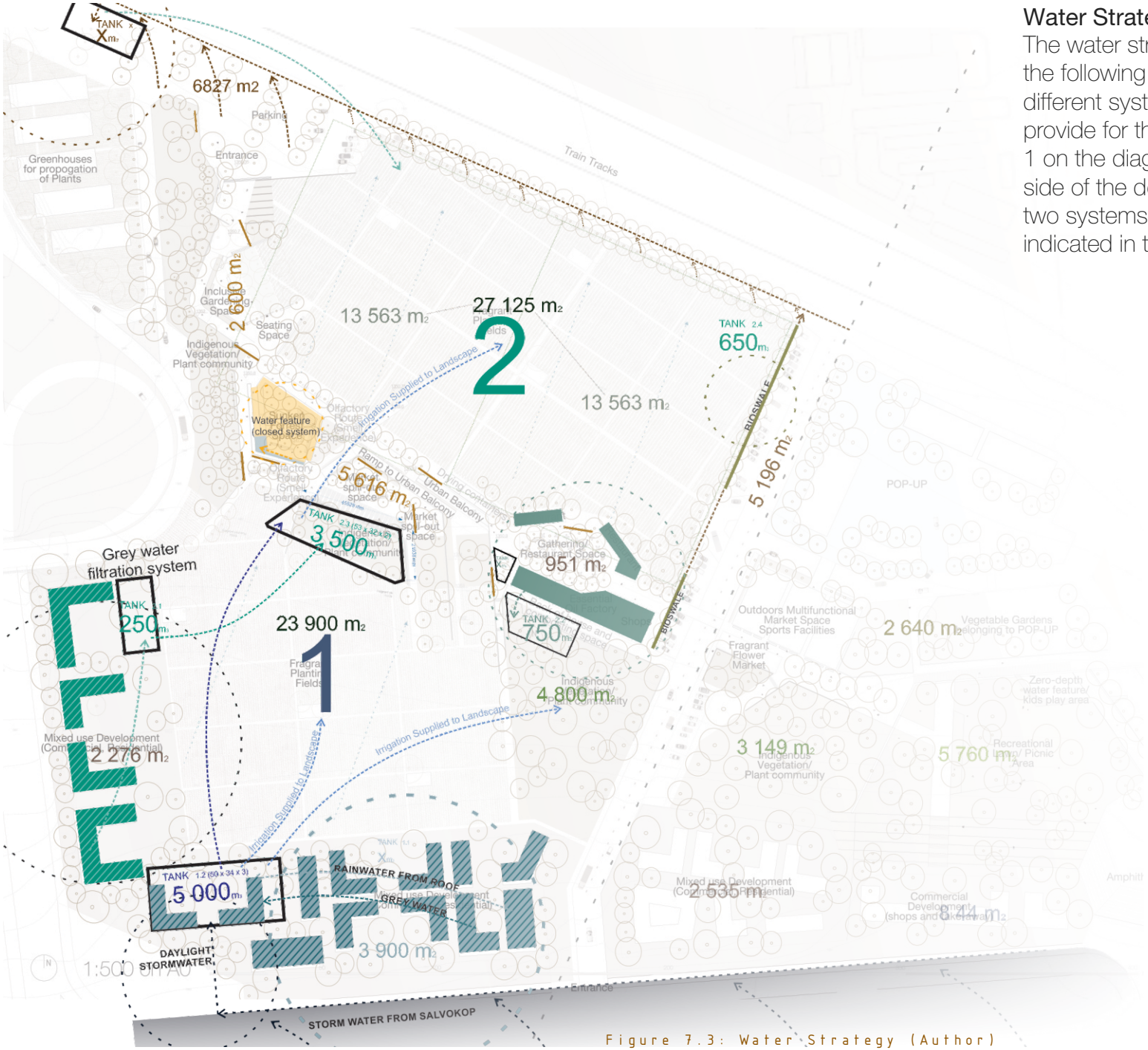


Figure 7.3: Water Strategy (Author)

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

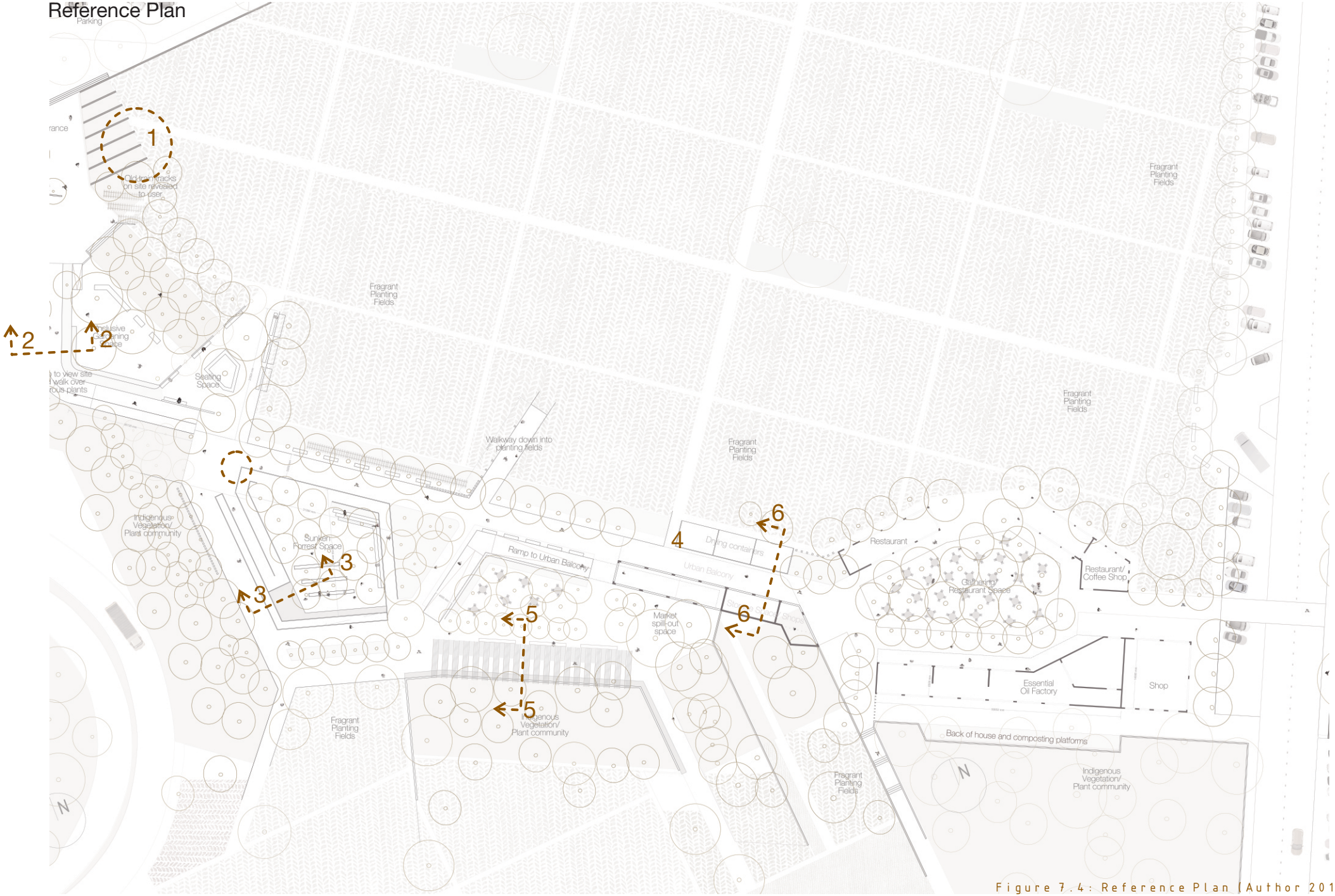
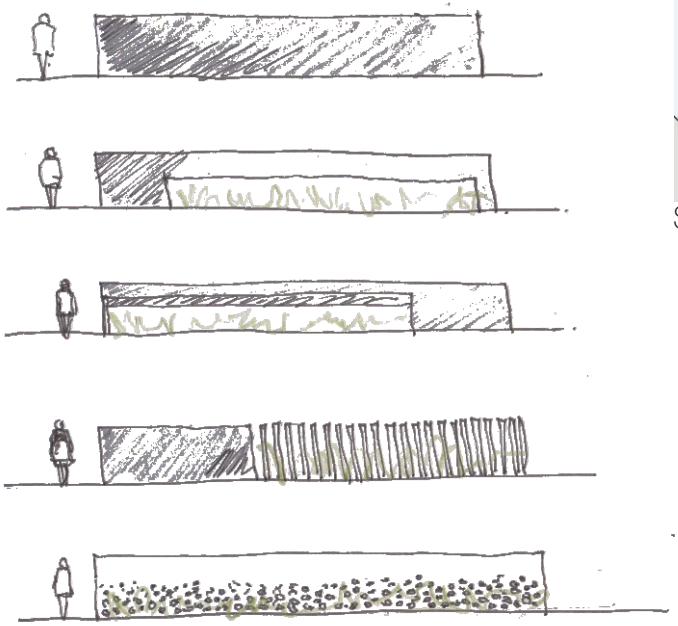
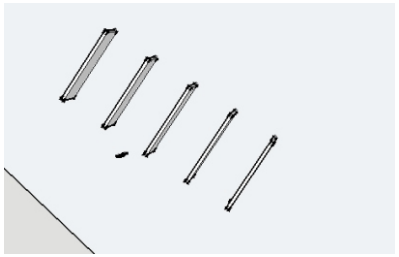


Figure 7.4: Reference Plan (Author 2016)

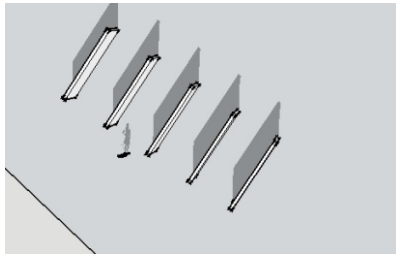
Detail 1



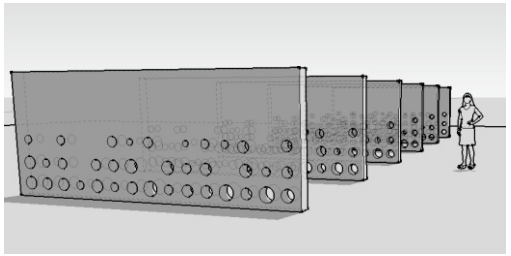
Different versions of fins



Summer Noon Sun



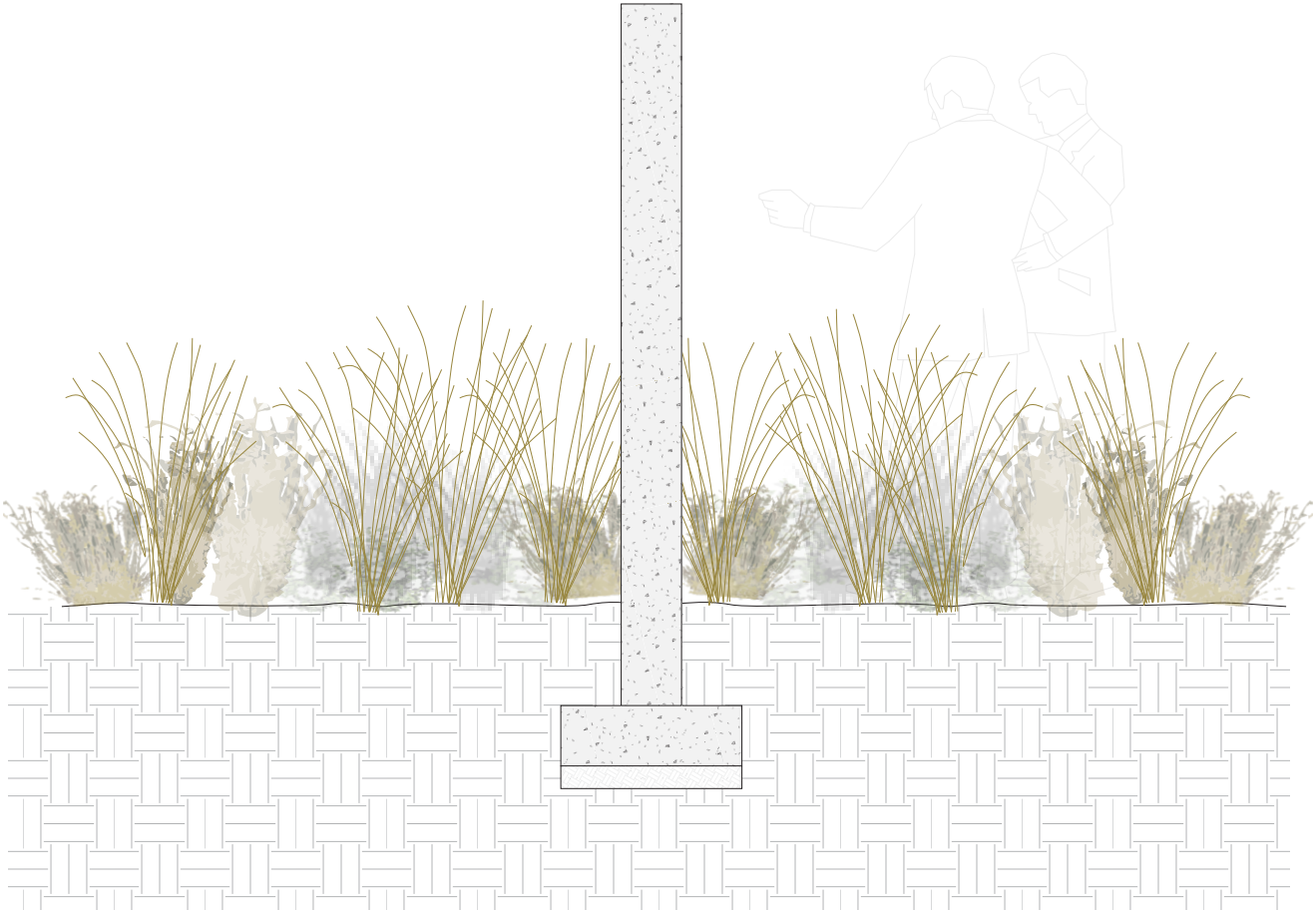
Winter Noon Sun



Perforated Concrete

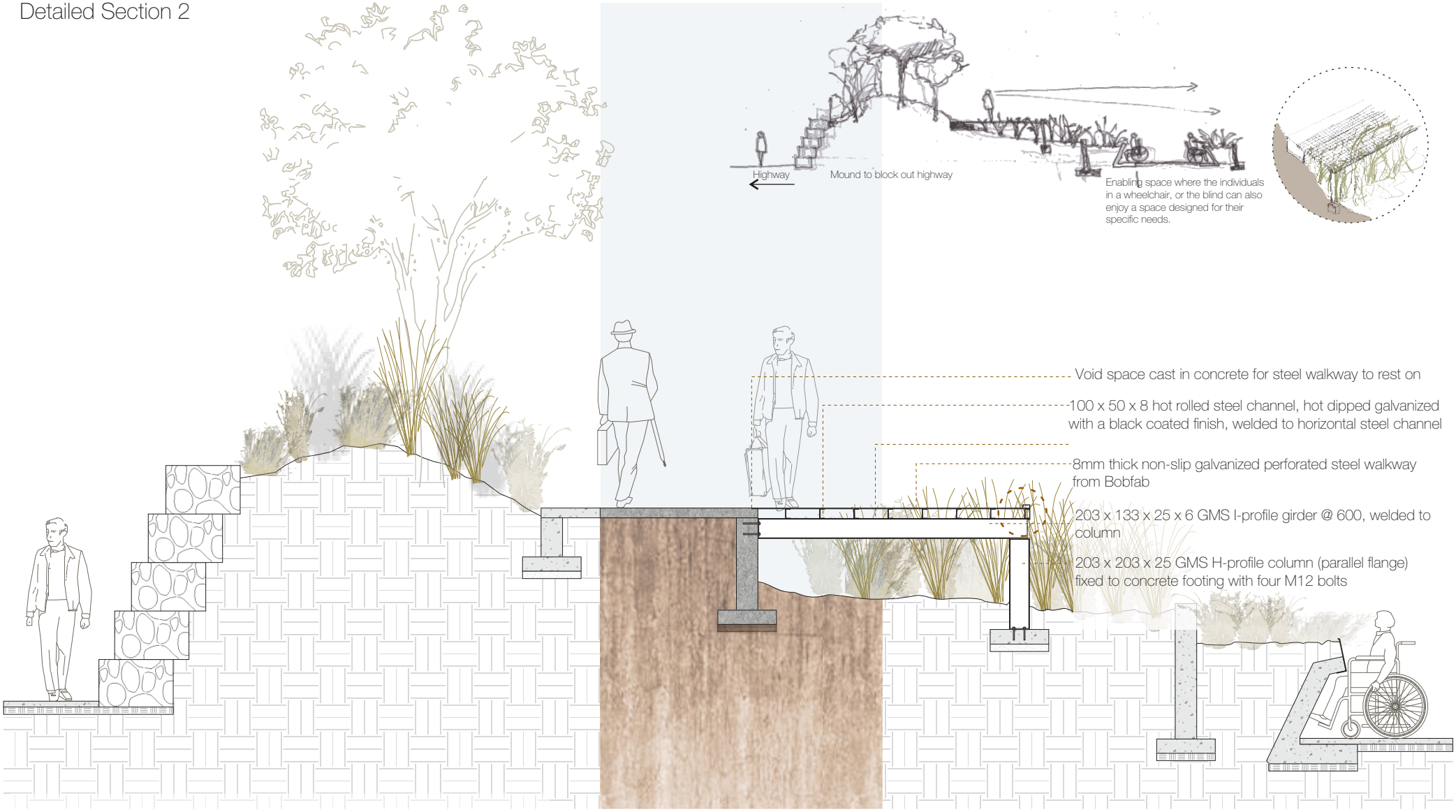
Vegetation is planted in between the fins at the entrance as an attempt to direct the wind and create wind tunnels sweeping the sweet fragrance of the essential oil plant to the nose of the visitor to the site.

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

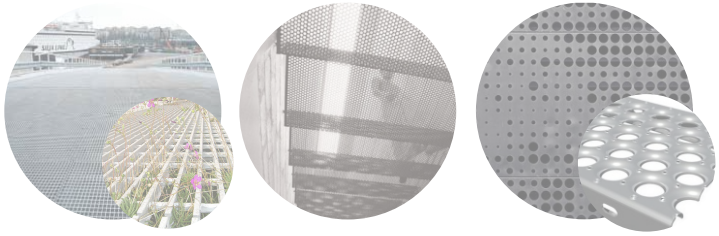


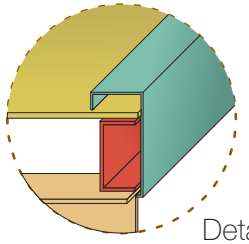
Detail 1: Concrete fins - NTS

Detailed Section 2



Detail 2: Walkway

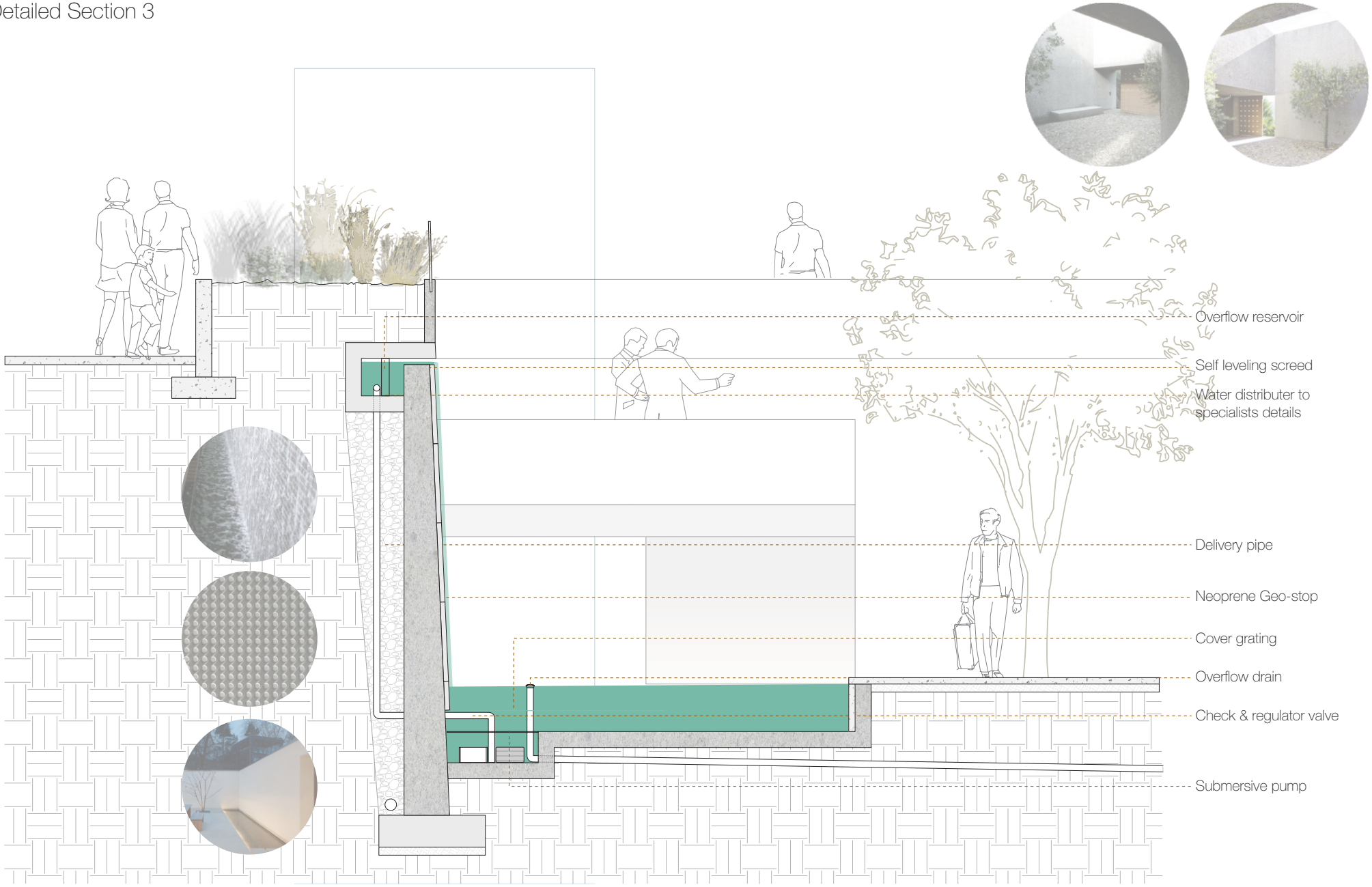




Detail 2.1 NTS

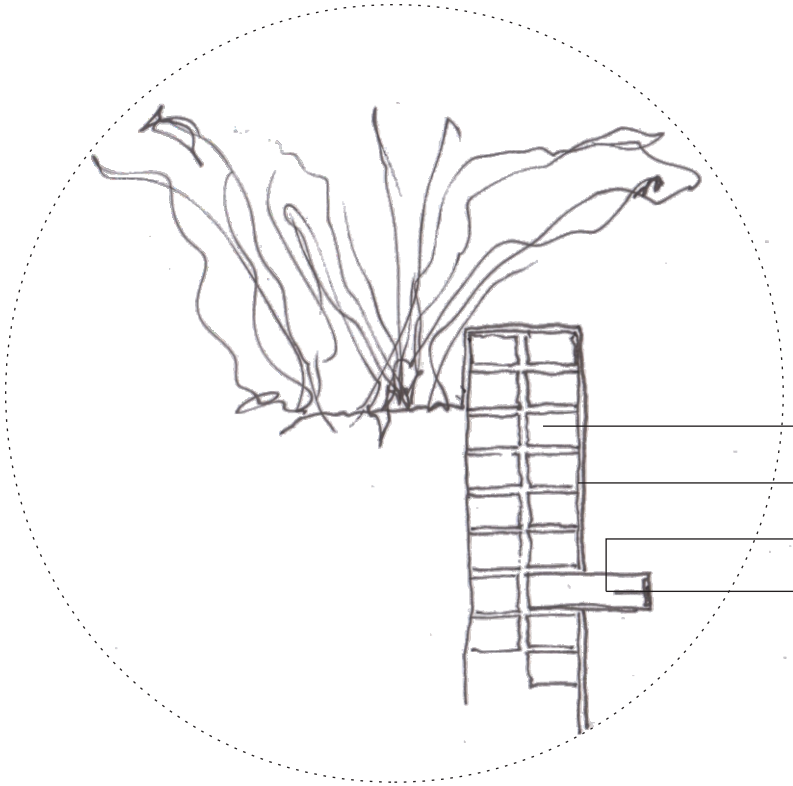
Section 2 NTS

Detailed Section 3



Detail 3: Water feature in sunken Buddleja forest - NTS

Detail 4

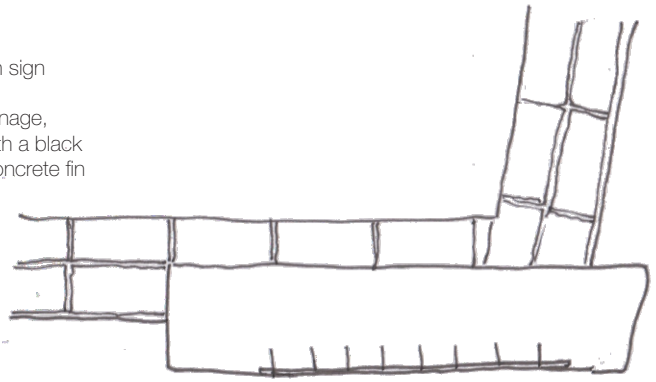


223 x 106 x 73 non-face brick

Plaster

750mm thick concrete fin sign

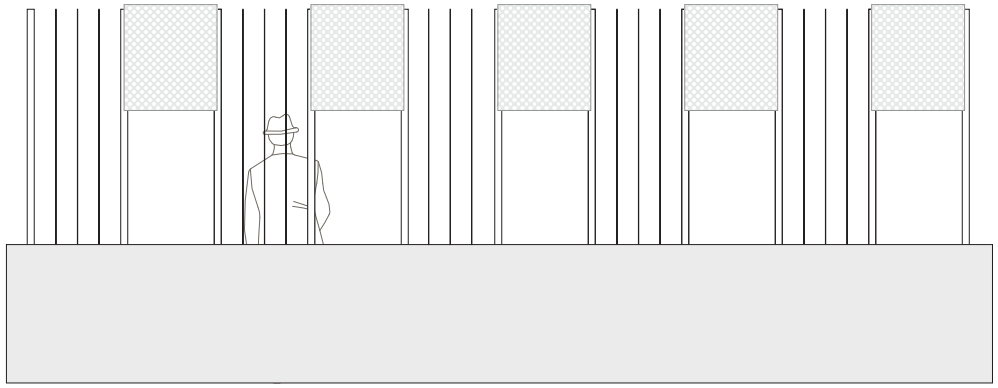
Molded Steel custom signage, hot dipped galvanized with a black coated finish, cast into concrete fin

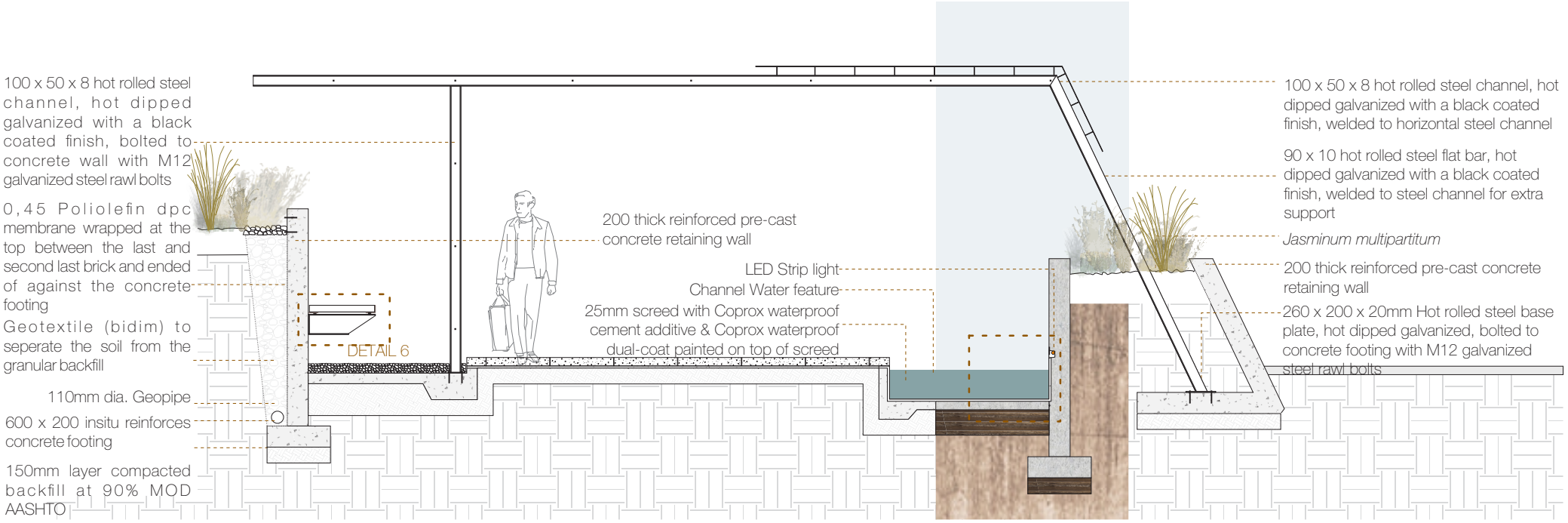


>DRYING CONTAINERS >

Detail 4 NTS

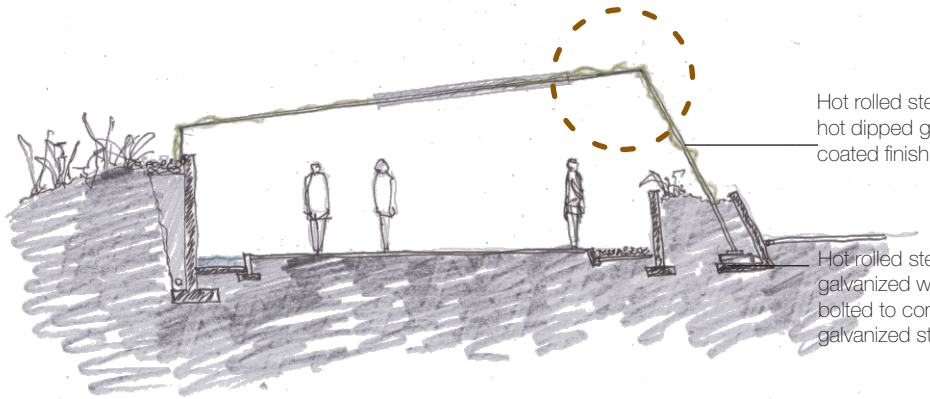
Detailed Section 5





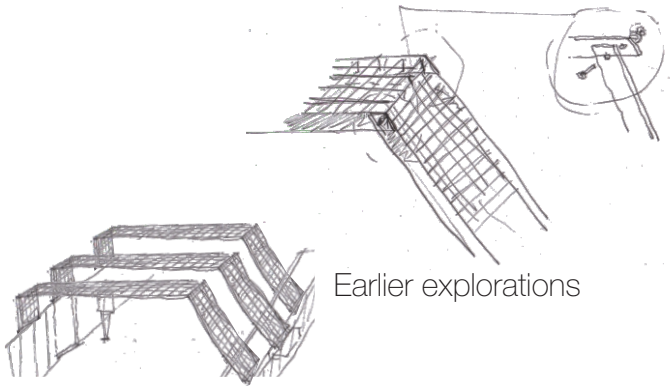
Detail 5: Jasmine Pergola NTS

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



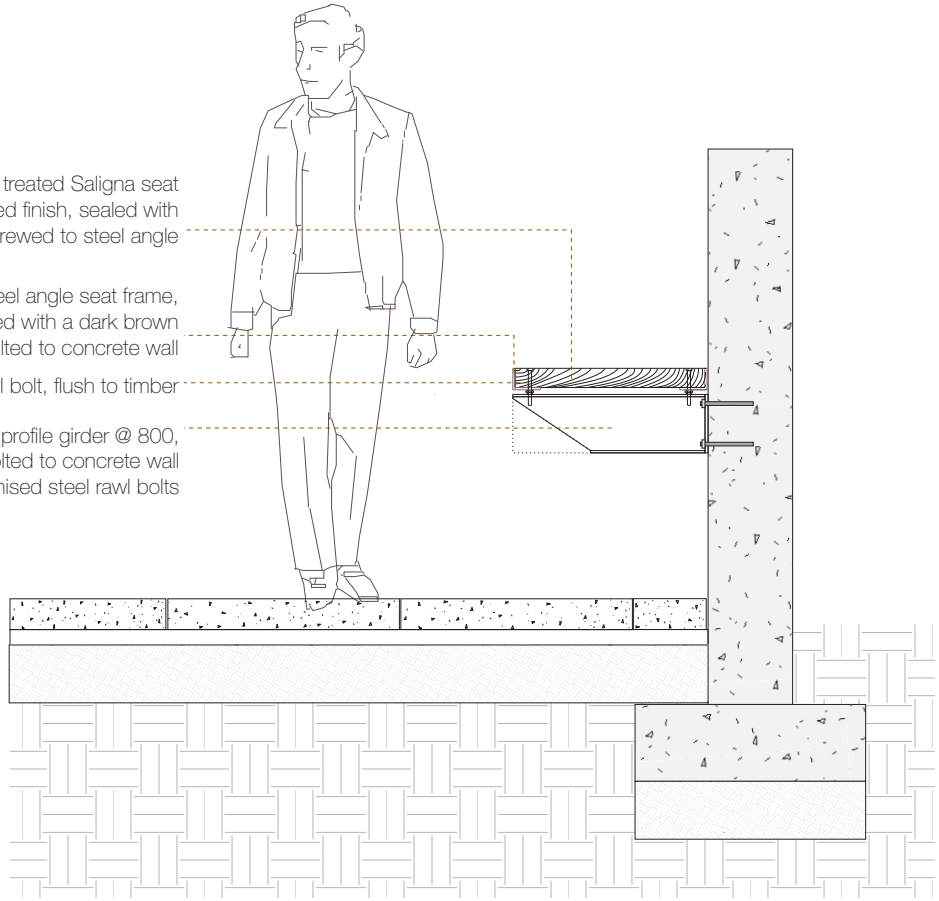
Earlier explorations

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

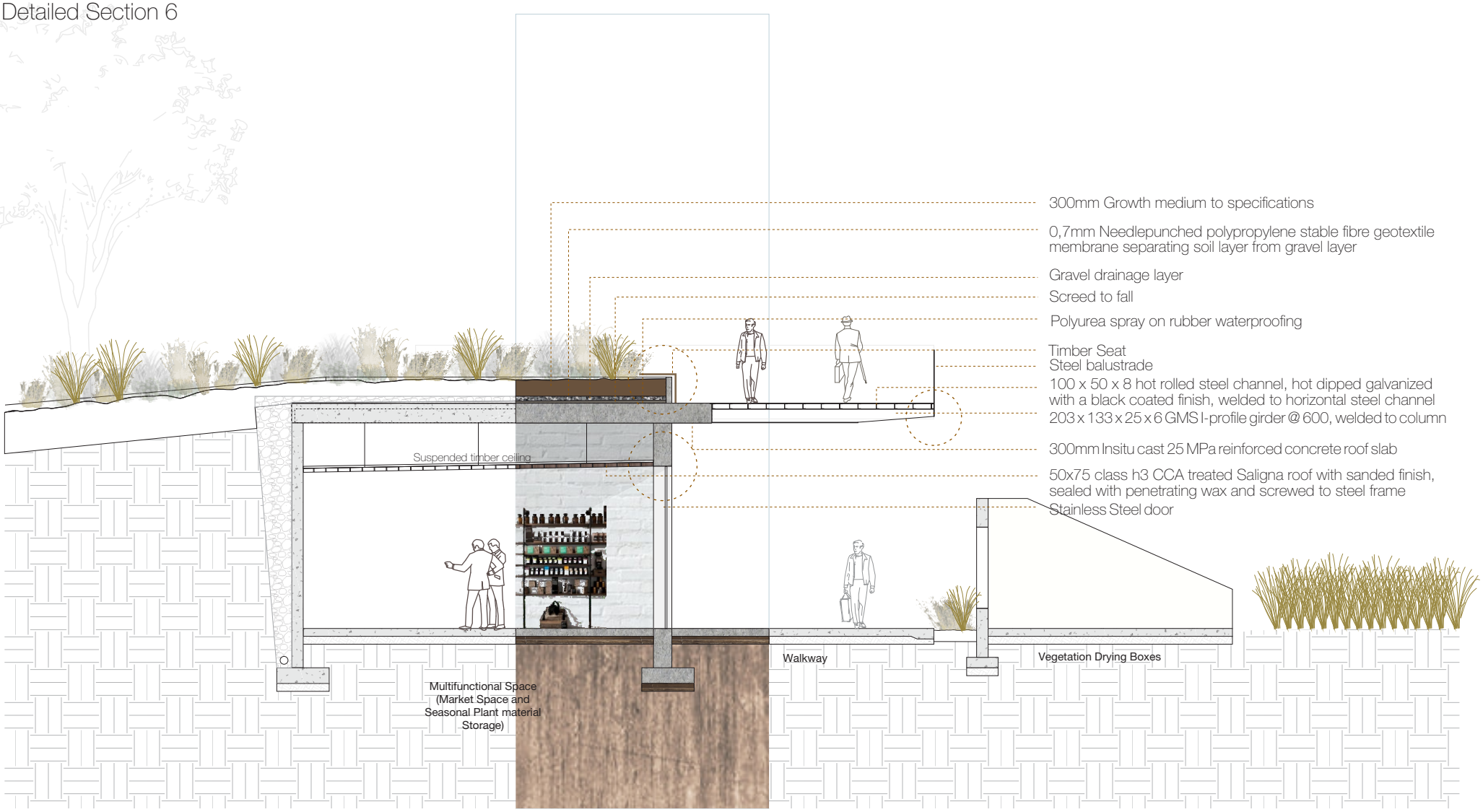
M12 class 8,8 steel rowl bolt, flush to timber

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

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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