Die/Dye

A liminal mediation between nature and industry in a changing industrial Silverton context

Philippus Johannes Venter

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In accordance with Regulation 4(c) of the General Regulations (G.57) for dissertations and theses, I declare that this dissertation, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been 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.

Philippus Johannes Venter

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A liminal mediation between nature and industry in a changing industrial Silverton context

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November 2021

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Research Field
Memory, Legacy and Identity

Client
Silverton Parks Management

Theoretical Premise
The creation of a theoretical framework that consists of regenerative theory, non-modern theory and weak theory to contextualise a liminal mediator between the natural and industrial conditions found in a changing industrial Silverton context.

Architectural Approach
Industrialising a stagnant Silverton Cemetery through ecological means by introducing new programmes that allow for industrialised processes to be re-aligned to the natural counterparts. In this juxtaposition the mediation and perhaps reconciliation is to occur between nature and industry.

Abstract

Set in industrial Silverton, this project deals with the mediation between nature and industry through the lens of liminality. The site for this investigation is the Silverton Cemetery, connected to the Moreleta Spruit. With access to both natural and industrial processes on the site, a re-alignment of industrial process towards natural processes is proposed. The Silverton Cemetery is to be redeveloped with a resomation route reconnecting the cemetery with the spruit and the re-introduction of the historical leather dyeing process.

Table of contents

Journey to an architectural project

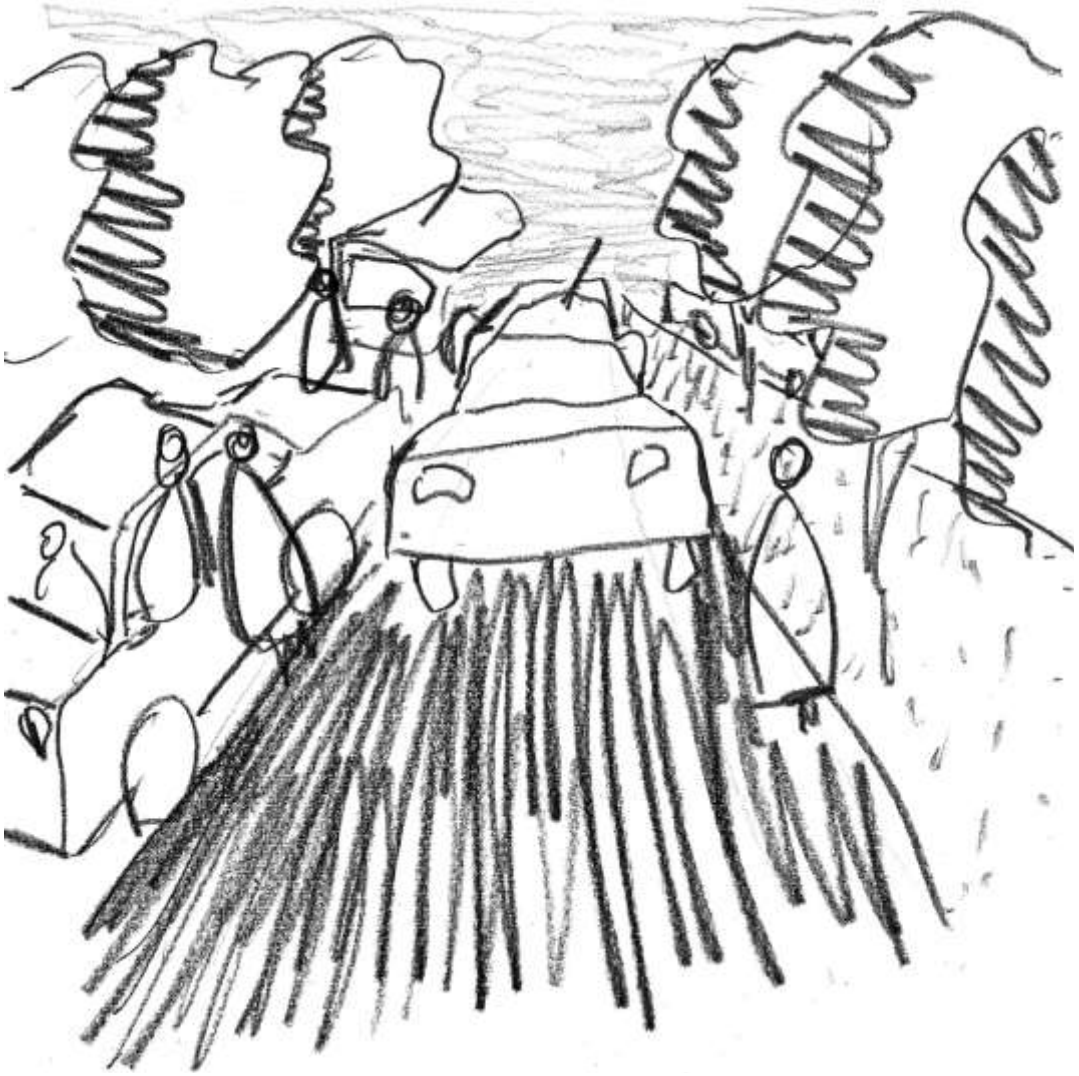


Figure 1: Driving home in traffic and noticing change (Author March 2021)

Driving home in traffic is an event synonymous with living in Sinoville on the periphery of northern Pretoria. Caught between the crowd of cars, I became aware of a slow and unacknowledged process of change has been taking place in Sinoville.

Figure 2: House of a childhood friend (Author March 2021)

I search for a familiar scene amongst the suddenly strange Sinoville, recognising the house of my childhood friend. It beckons me closer into a warm embrace of nostalgic memories coated with laughter and fun. At least some memories tether me to that nostalgic past, resisting the effects that change can bring to a context.

Figure 3: The childhood friend's house changed into a car dealership (Author March 2021)

Even this house is not immune to change, as the once loving home has been renovated into a second-hand car dealership. Those nostalgic memories of a happy childhood are still present but now it is supporting the advertisement board for a new Polo Vivo marked down for a sale.

Interlude

Realising my nostalgic memories tie me to a forgotten past, a new context had to be found. One where I could freely explore the meaning, consequences and possibilities of changing contexts.

Figure 4: A scene of change in Silverton (Author March 2021)

Travelling to Silverton in March, to fix the air-conditioner of my grandfather's car, a strange scene transpired outside the mechanic's workshop: the initial street scene revealed a palimpsest of various isolated layers (Figure 4). This voyeuristic position allowed me to observe and note processes of change happening independently in Silverton, producing a new identity (Figure 4).

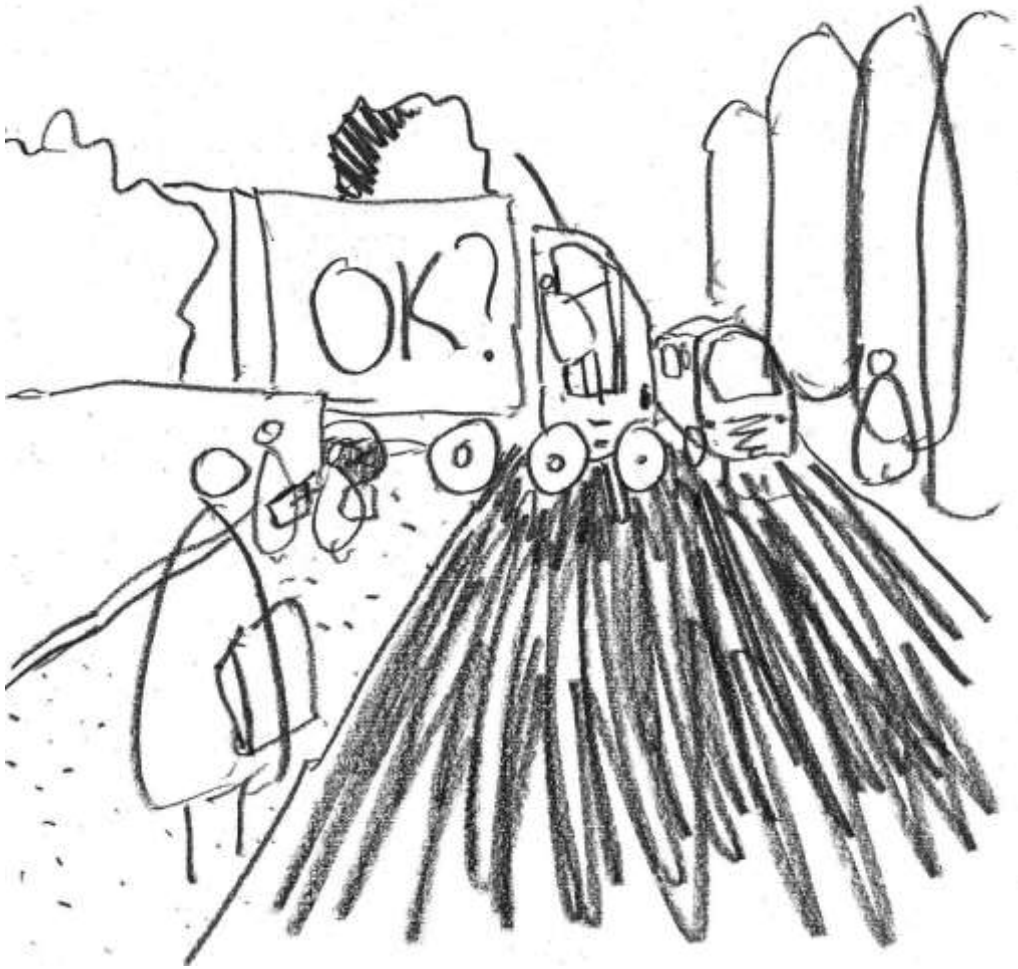


Figure 5: Delivery truck driving out of Silverton cemetery (Author 2021)

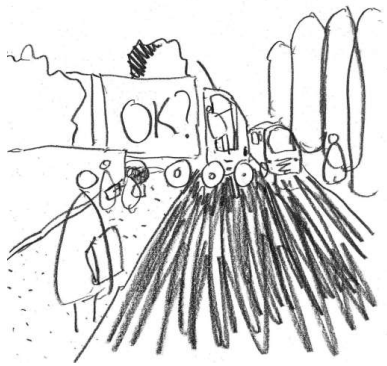
Travelling back to Sinoville, this palimpsest of the change became further apparent as a food delivery truck thundered out of the cemetery, almost running over a pedestrian (the proximity to the cemetery not overlooked). Reflecting on this particular event, it became apparent that the change of industrialisation in Silverton over time has produced a new identity – one that excludes the public realm and public space from the industrial urban fabric.

Change as an ever-present, slow and unacknowledged process in every context.

Nostalgia preventing the system to be able to evolve and adapt.

Through the process of change a new identity is created. But the old memories are still present.

The process of change occurs unevenly across the entire system at varying rates.



Through the process of change a new identity is created.

Figure 6: Devolving the narrative into core themes for the project (Author 2021)

The devolution of the narrative

The personal reflection on the narrative experience of the process of change in Silverton and Sinoville revealed an underlying structure to the process of change that consists of four core themes (Figure 6):

Firstly, change is an ever-present, slow and unacknowledged process, persisting in all contexts (Du Plessis 2012: 15-16)(Landman 2019: 1)(Peres 2016: 97) (Figure 7). Secondly, the acknowledgement and investigation of change enables systems and contexts to fully mature and continually evolve in answering new urban and architectural opportunities (Folke 2006: 258-259)(Mang & Reed 2012: 26) (Figure 8).

Thirdly, processes of change and evolution occur at various rates in the same system due to these processes of change being accounted for but not prescribed (Folke 2006: 258-259) (Figure 9). Lastly, Du Plessis (2012: 18) argues that the existence of continual change maintains, engages and creates identities rather than ignoring or burying it (Broad & Fox 2007).

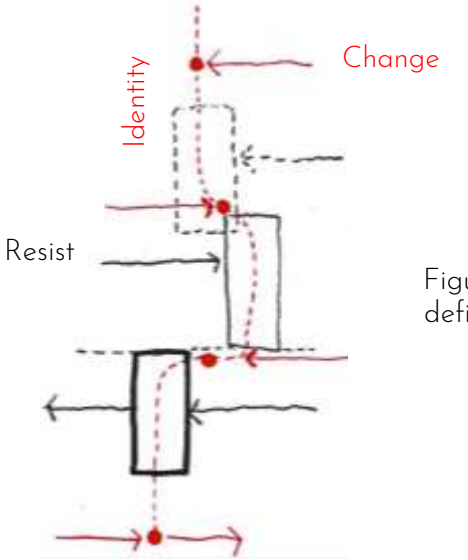


Figure 7: The process of change defines/produces a new identity (Author July 2021)

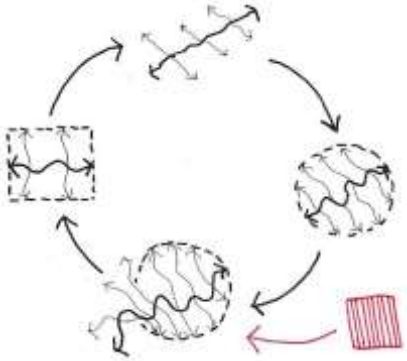


Figure 8: Change as a necessity for the relevance and evolution of the system (Author July 2021)

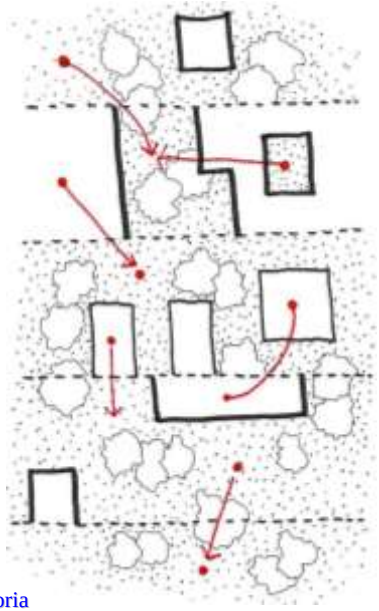


Figure 9: Change over time as an inevitability and should be accommodated for (Author July 2021)

Understanding the journey taken

1 Silverton Introduction

The exploration and investigation of the described narrative identified change as an overarching theme for this project. The changes in industrialisation, specifically for the Silverton context, have slowly excluded and eroded the role of natural systems and environments.

In attempting to fully understand and trace the typological development of industrialisation and its effect on nature, it is important to contextualise changing industrialisation in the global context and how it correlates with industrialisation found in the Pretorian context.

The Global Industrial Change

Wilkinson (2015: 32) suggests that the continuum of change in industrialisation has its origins in the First Industrial Revolution ,1760 – 1840, where steam engines started replaced idiosyncratic residential workshops with homogenous communal industries focussed on efficiency (Schwab 2016: 6-7). Human development became dependant on consuming natural resources to keep enabling industrial developments and process (Schwab 2016: 6-7).

These compact communal industries were again supplanted in the Second Industrial Revolution, late 19th Century – early 20th Century, with more efficient production lines housed in larger horizontal factories capable of containing more industrial processes and machines (Schwab 2016: 6-7)(Wilkinson 2015: 35). On top of the increased natural resource consumption, the natural environment was pushed aside to allow for more space to house the horizontal factory typology and industrial processes (Wilkinson 2015: 35).

The current era of the Third Industrial Revolution (early 1960's – current era) was catalysed by the personal computer and internet connectivity in the 1960's, increasing the pace of human developments and further improving the efficiency of industrial processes consuming natural resources (Schwab 2016: 6-7). This increased efficiency allowed for sustained industrial development over time, creating the illusion that the burden on natural resources and systems had decreased (Reed 2007: 676).

The increased pace of development enables an increased tempo of major technological innovations, decreasing periods between changes in industrialisation (Schwab 2016: 6-9). The Fourth Industrial Revolution (FIR) is slowly manifesting with the introduction of machine learning and inter-connected communication systems, profoundly changing the industrialisation system (Schwab 2016: 6-9).

The FIR is set to reconcile the demands of industrial developments with protecting "nature" however, this is only to achieve future sustained development over time (Du Plessis 2012: 8)(Reed 2007: 377).

Through the increased reliance on finite natural resources and space for further development, nature has taken a subservient role to that of developing human and industrial processes (Schwab 2016: 6-9). Being subservient natural processes and environments have been separated, and eventually excluded, from industrial contexts and industrial processes through the constant change of industrialisation.

Change of Industrialisation in Pretoria

For the industrial development of Silverton to be investigated and critiqued, it is necessary to explore the political, historical and cultural context of Pretoria against which industrial development took place. Four stages will be investigated deemed integral to the industrial development of Pretoria: the settlement of Pretoria (1855), the First Anglo-Boer War (1880–1881), the formation of the South African Union (1910) and the First World War (1914-1918) (Naude & Naude 2007: 48).

Anecdotally, the Bakwena tribe (eastern Sotho people) was dispersed in 1825 with the arrival of Mzilikzi, the chief of the Matabele empire, migrating from Zululand (Potgieter 1953) (Naude & Naude 2007: 45). The Voortrekkers occupied the abandoned valley of the Apies River in 1837, with the church village named Pretoria on 16 November 1855 (Potgieter 1953)(Naude & Naude 2007: 45). The 1866 Pretorian economy consisted mainly of ivory trade as Pretoria, forcing the industrialisation of basic construction materials required to construct warehouses and supporting facilities (Naude & Naude 2007: 45).

After the First Anglo-Boer War, the South African Republic bolstered its treasury by granting a concession to Alois Hugo Nellmapius, a pioneering businessman, to open the Eerste Fabrieken in 1883 (Naude & Naude 2007: 48). Other industries were subsequently developed, namely: the Kirkness Brickfields situated south of UNISA in Groenkloof in 1888 and the Portland Cement Company located at Daspoort (1892) (Naude & Naude 2007: 48).

During the First World War, Pretorian engineer Cornelius Delfos (21 June 1868 – 23 October 1933), with the support of his brother Johan, capitalised on the lack of steel supply in South Africa constructing his first steel factory, later forming the Iron and Steel Corporation Limited (ISCOR) in 1928, officially opening in 1931 (Naude & Naude 2007: 51). With the steel production from ISCOR, Pretoria was able to increasingly develop independently from the rest of South Africa (Naude and Naude 2007: 48).

Naude and Naude (2007: 51) note that Pretoria has historically been a bustling economic and trading node in an otherwise rural landscape. Three key features allowed Pretoria's industrial development: firstly, a road structure that connected Pretoria to a larger network of trade, secondly, the construction of the NZASM (Nederlandsche Zuid-Afrikaanse Spoorweg-Maatschappij, or translated, Netherlands-South African Railway Company) railway system in 1894 expanding Pretoria's economic reach towards major harbours and industries in South Africa and Delgoa Bay (today Maputo) (Naude and Naude 2007: 47). Lastly, in the 1890's, Pretoria was the first town in South Africa to receive electricity, increasing its industrial efficiency and independence (Naude and Naude 2007: 51).

Change of industry in Silverton

Silverton is located on the historical farm, Hartebeespoort 308, owned by D.A. Botha in 1848 (Naude & Naude 2007: 52). H. Mundt purchased the farm in 1869 and sold a portion of the farm that would become Silverton to a silver trading company (Naude & Naude 2007: 52).
Situated within the industrial development of Pretoria after the formation of the South African Union, Silverton developed from a small agricultural village on the periphery of Pretoria to a major leather tanning industrial suburb (Naude & Naude 2007: 52).

By 1890, erven were already occupying the landscape of the Silverton town with electricity being supplied to the town in 1936 (Naude & Naude 2007: 52). The town of Silverton was a separate municipality before its incorporation into the Pretoria municipality in 1964 (Naude & Naude 2007: 52). Four main elements of the "original" Silverton still exist today, namely, the Moreleta Spruit, the Silverton Cemetery(since 1910's), the Silverton Tannery, opened in 1915, and the NZASM railway ruins. What is curious with these spaces are that they are untouched and excluded from the industrial developments of Silverton. In a sense they have become static features in an otherwise dynamically changing industrial context.

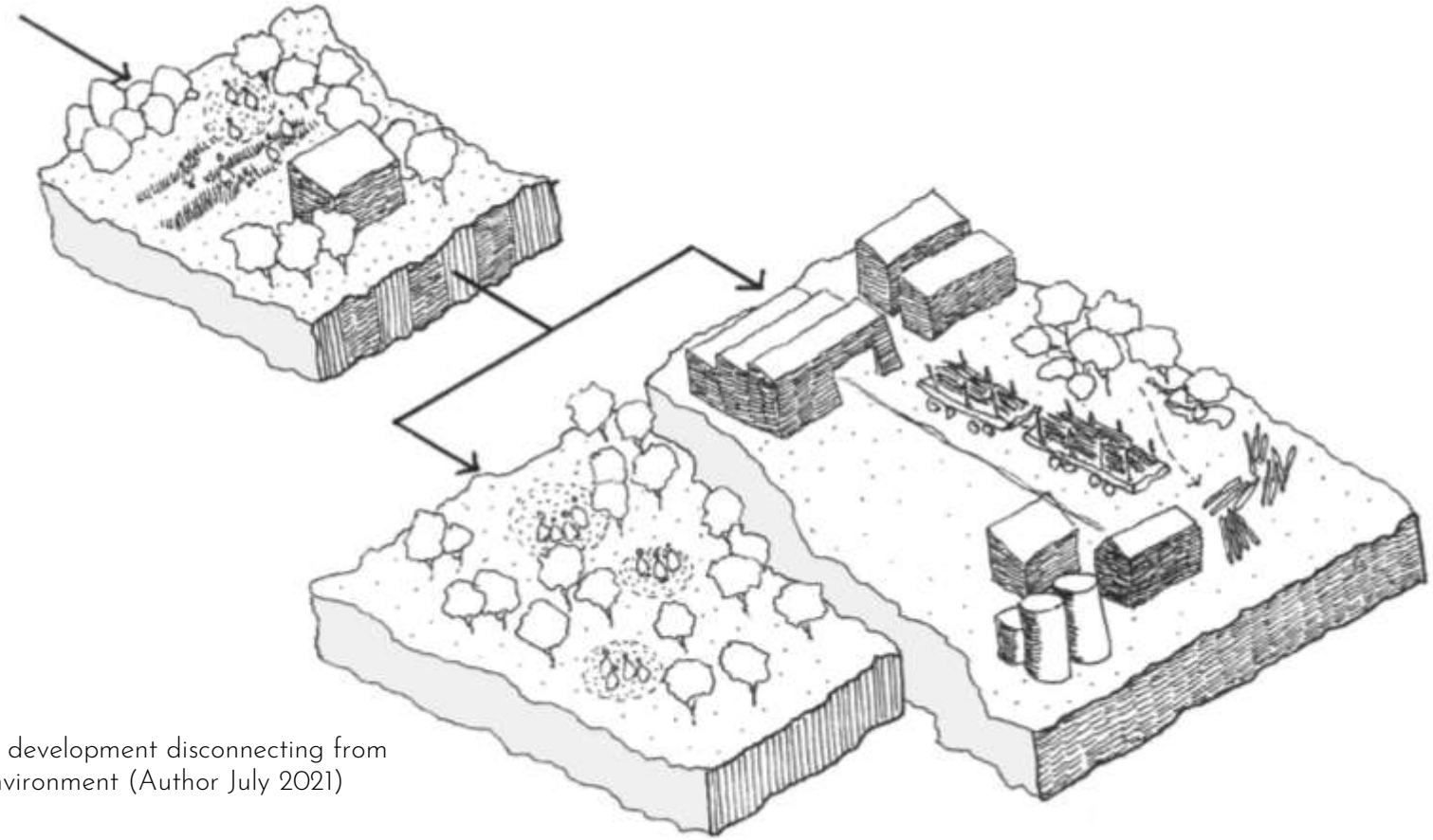


Figure 1.1: Human development disconnecting from the natural environment (Author July 2021)

General Issue

Due to the nature of changing industry, natural processes and environments have been excluded from the industrial context of Silverton. This has caused human development and industry to become separated from the surrounding natural environments and processes, allowing industry to continue exploiting natural systems.

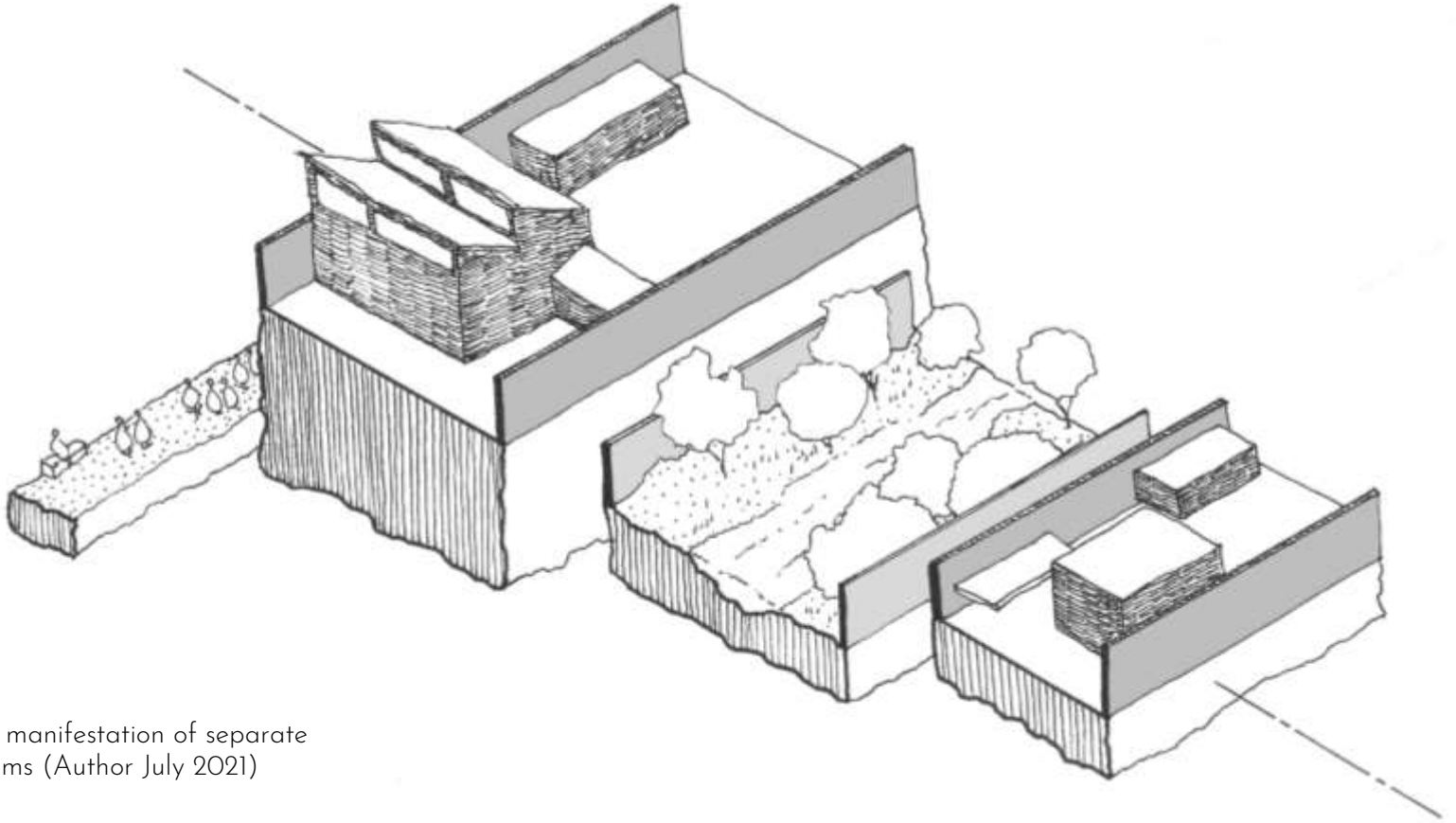


Figure 1.2: The manifestation of separate urban realms (Author July 2021)

Urban Issue

This disconnection of human development from the natural environment has created various separate realms, each mutually inaccessible. As such, future connections and potential opportunities for integrated human and natural development are disregarded and overlooked.

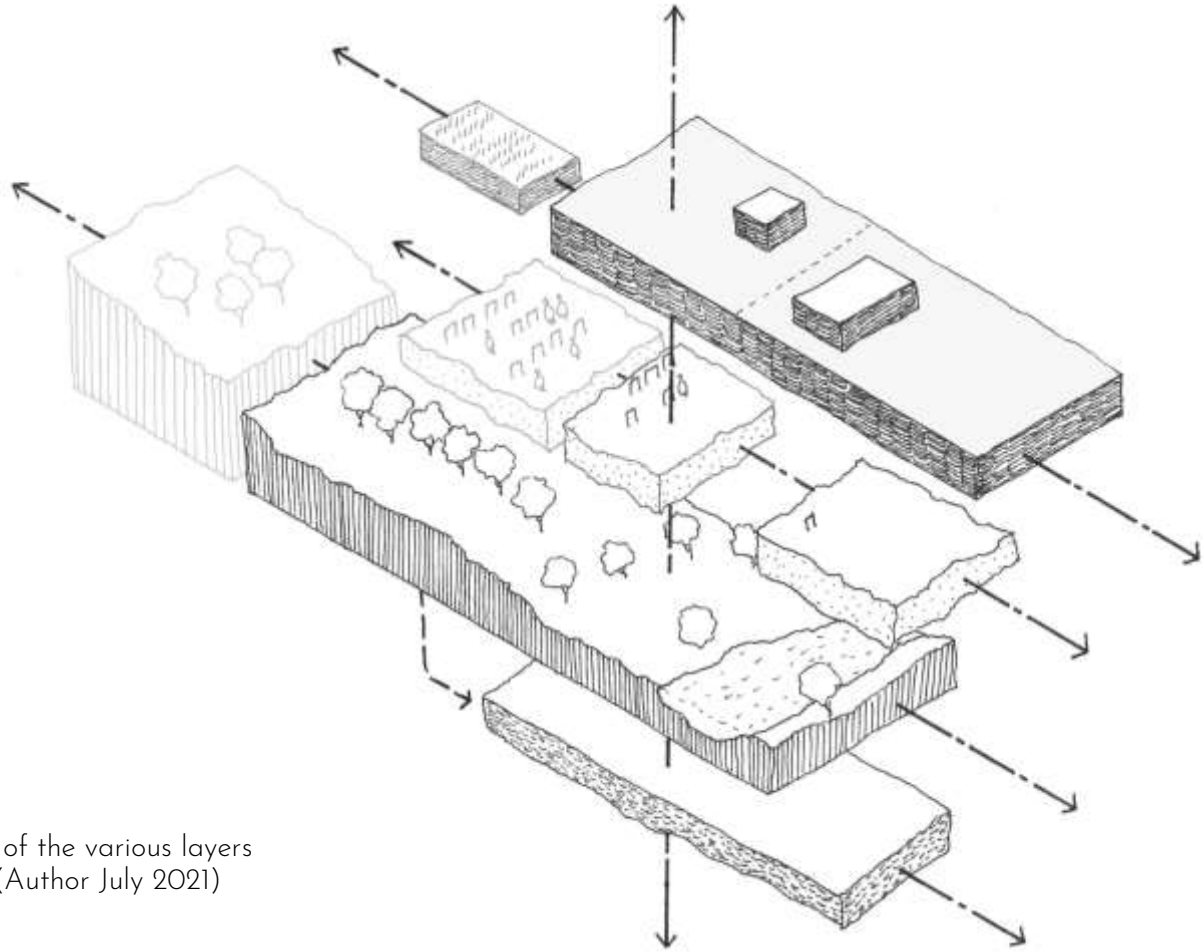


Figure 1.3: The disconnection of the various layers of the Silverton cemetery (Author July 2021)

Architectural Issue

A process of continuous industrialisation surrounds, but never intervenes with, the Silverton Cemetery, ultimately changing the ecological, cultural and historical layers of the cemetery to become disconnected, undefined and underutilised as compared to the industrial context.

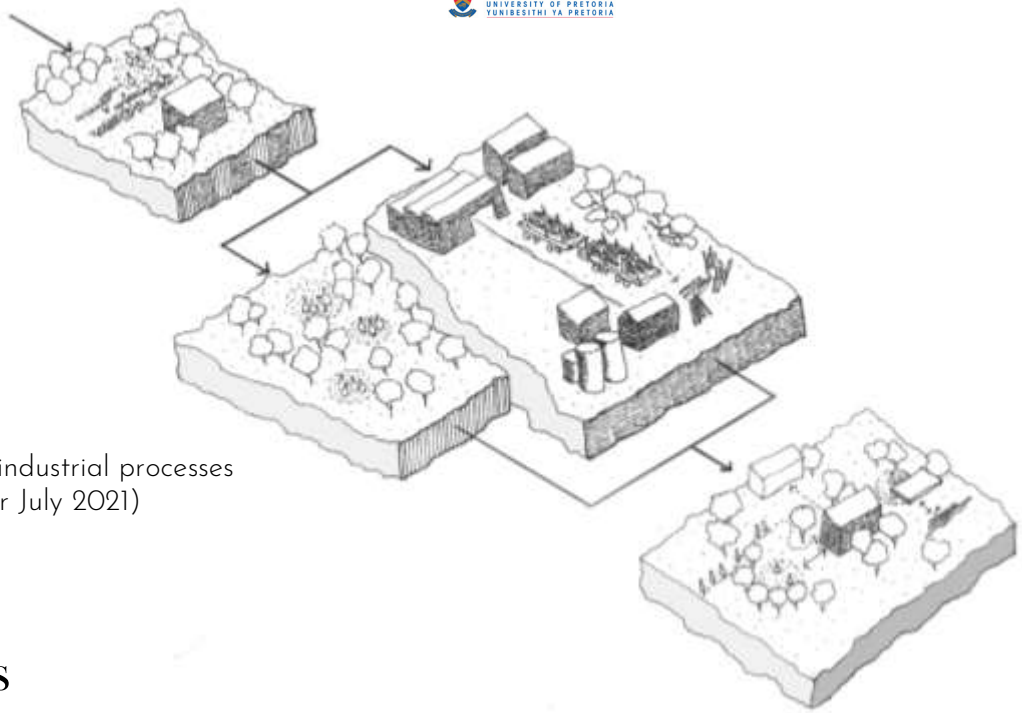


Figure 1.4: The re-alignment of the industrial processes to natural processes (Author July 2021)

Research Questions

Main Research Question

Which mediation strategies are appropriate and necessary to achieve reconciliation between the currently incompatible industries and industrial processes of Silverton with the natural processes found in the natural Silverton context?

Sub-questions

How can this emergent mediation be used to as a catalyst for other locations and situations where natural processes have been excluded from industrial Silverton?

What formal, programmatic and spatial solutions are required to integrate two opposing and separate conditions into one architecture?

Which alternative methods can be used to integrate and include natural systems and environments into industrial and architectural processes?

What are appropriate responses to regenerate and evolve existing, historical and cultural programmes and rituals found in industrial Silverton.

Architectural Contribution

This architectural project seeks to contribute to the wider architectural discourse of South Africa by questioning and exploring the seemingly incompatible relationship between nature and industry through the lens of liminality. A deeper, parallel subliminal investigation is simultaneously occurring between the sacred and profane that underpins and defines the dichotomous relationship between nature with natural processes and industry with industrial processes.

Research Methodology

This project is situated in the interpretivist research paradigm allowing subjectivity, personal experiences and personal discoveries to permeate into the design-led research (Kivunja & Kuyini 2017). The design methodology that was followed attempts to work from the general to the specific. Applied to this project, a general understanding of the industrialisation process led to an understanding of Silverton. These multi-scalar design explorations enrich the design by constantly rechecking and re-investigating the same element on various levels and scales.

In finding a methodology that can mediate and integrate nature with industry, multiple design-led research tools and methods were consulted in completing the required research. The main aspects that the methodology should elucidate is namely, the spatial, formal and programmatic requirements of this mediation, possible alternatives in integrating nature with industry and whether mediation is even an appropriate response to between nature and industry.

In achieving the outlined issues and architectural contribution, a series of possible design-led research tools have been identified to aid in the process:

Historical Research

Investigating and exploring the historical value and development of the industrial Silverton area reveals that the natural processes and environment have been slowly eroded and excluded from the industrial context. Furthermore, this investigation leads to possible programmes and relationships that can be revised into the present to enrich the project.

Mapping

This tool allows for the context of Silverton to be better understood and seen in relation to the site and the greater context. This also allows for the site to be layered to include past, present and possible future activities and relationships.

Qualitative Research

This method involves the immersion of the researcher into the context to understand it as a living and changing system that has specific demands and concerns.

Precedent Analysis

Through the research it is apparent that the project is located in a wider discourse of architecture, where similar problems and solutions have been discussed. The reason for including precedent studies is to situate this project among the other, similar, projects to gauge its worth and contribution.

Theoretical Framework Exploration

As the result of this project is largely unknown due to the design-led research process, theoretical explorations and framework constructions allow for various approaches and ideas to be tested before committing to one.

Environmental Software Modelling

To determine the daylighting effectiveness of the design, the Sefaira environmental assessment tool is used. Utilising software modelling allows for fairly accurate and quick design iterations and explorations, as

well as what the impacts of these explorations and iterations are.

Physical Models for theoretical and design application

Translating the theoretical framework into a design solution or approach is challenging, however multiple physical model explorations allow for the identification of the most appropriate translation to be identified. Furthermore, the size and the scale of the model allow for a quick investigation into the formal language of the architecture without too much commitment and effort.

Assumptions

The site features a series of currently utilised freestanding structures that has been deemed to have no unique and contributable heritage value. As such, it has been assumed that these structures are safe for demolition, with their materials re-used in the new architectural intervention.

It is also assumed that the programme and functionality of the current Silverton Cemetery will continue, with the new architectural intervention acting as an addition and extension.

Limitations

The Moreleta Spruit is currently inaccessible for site visits and closer inspection due to palisades and fences. This was not a detriment as it allowed alternative methods of visualisation and qualitative analysis to be used, namely: photos, aerial photography and electronic maps.

Delimitations

Due to the vastness and size of the chosen site, only one specific section of the site will be developed into an architectural intervention. For the rest of the site, the intent is be conveyed by indicating and describing the general programmatic and qualitative aspects but not fully developed.

Figure 2.1: Collection of maquettes depicting the translation of theory into architecture (Author August 2021)

The creation of a robust and flexible theoretical framework allows for certain relations and interactions to be made between theories, informing the architectural approach at multiple scales and situations. As such, the investigation into possible theories that could potentially relate, or possibly provide a solution for, the multiple raised issues, research questions and intentions, allowed a criterion to emerge that could facilitate the identification of the most applicable and appropriate theories, namely:

- Has the theory provided a perspective on changing contexts that could be applied to the context of Silverton (Figure 1.1)?
- How appropriately does the theory relate to the already identified intentions, issues and contributions (Figure 1.2)?
- Does the theory attempt to provide a mediation between nature and industry that can be applied to Silverton (Figure 1.3)?

Through this criterion, the suitable theories for mediating between nature and industry were identified, namely: regenerative theory (Du Plessis 2012: 1,15)(Mang *et al* 2014), non-modern theory (Moore 2010) and weak theory (Pallasmaa 1999: 86). Through the interactions of these three theories, an in-between theory emerged that defined the spatial theory of the project – liminality (Ng & Lim 2018) (Turner 1969).

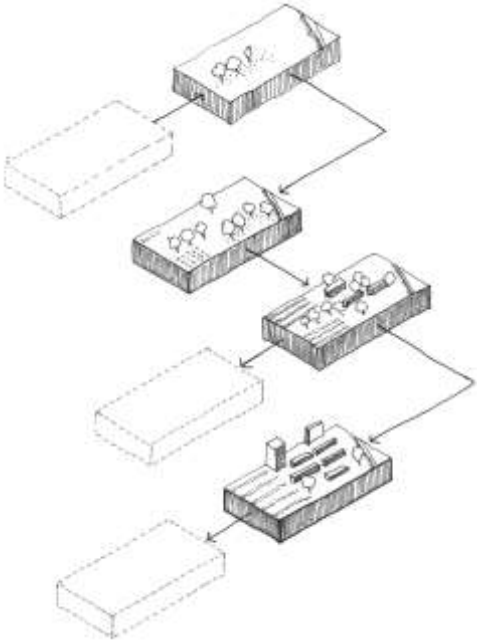


Figure 2.2: Theory providing a perspective on changing contexts (Author November 2021)

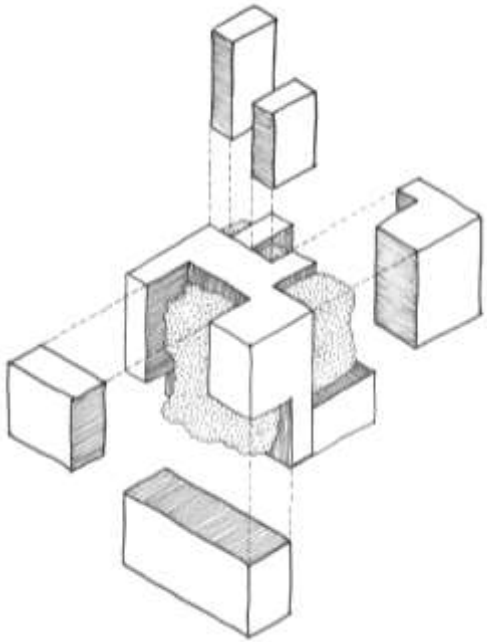


Figure 2.3: Theory relating to the already established intentions (Author November 2021)

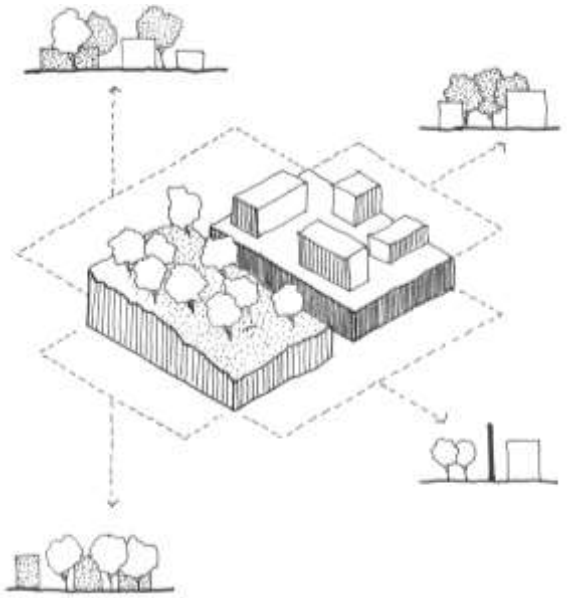


Figure 2.4: Theory attempting to mediate between nature and industry (Author November 2021)

From sustainability to regenerative theory

The current trend of the Silverton context is that of excluding nature for the sake of development, creating a divide between industrial developments and natural systems and environments. A shift in worldview is necessary that would start an engagement with natural environments and challenge the perceived status quo and distinction between nature and industry (Du Plessis 2012: 8)(Landman 2019: 160). Landman (2019: 160) argues for a departure from a mechanistic worldview acting *on* nature (sustainability) towards an ecological worldview that *participates in* nature (regenerative theory) (Reed 2007: 676).

Regenerative Theory

With a global awareness of limited natural resources, a reconciliation between industrial developments and the exploitation of natural resources created an illusion that a static equilibrium in nature had to be protected (Du Plessis 2012)(Landman 2009: 160)(Reed 2007: 676-677). In attempting to define an approach to repair living systems, Reed (2007:678) and Du Plessis (2012:6) argue that sustainability alone is not enough as it merely sustains development by reconciling industrial demands with the need to protect ecologies and nature. In this way, human activities and ecological processes are seen as two separate systems that can be managed independently (Reed 2007:678).

In Silverton, this translated to the illusion of protecting the Moreleta Spruit from industrial dumping and waste pollution but only managed to fencing it in and exclude it from the public realm and the rest of Silverton. Du Plessis (2012: 15) challenges this perceived static equilibrium by proposing a dynamic equilibrium model where periods of change are undertaken in the ecological system.

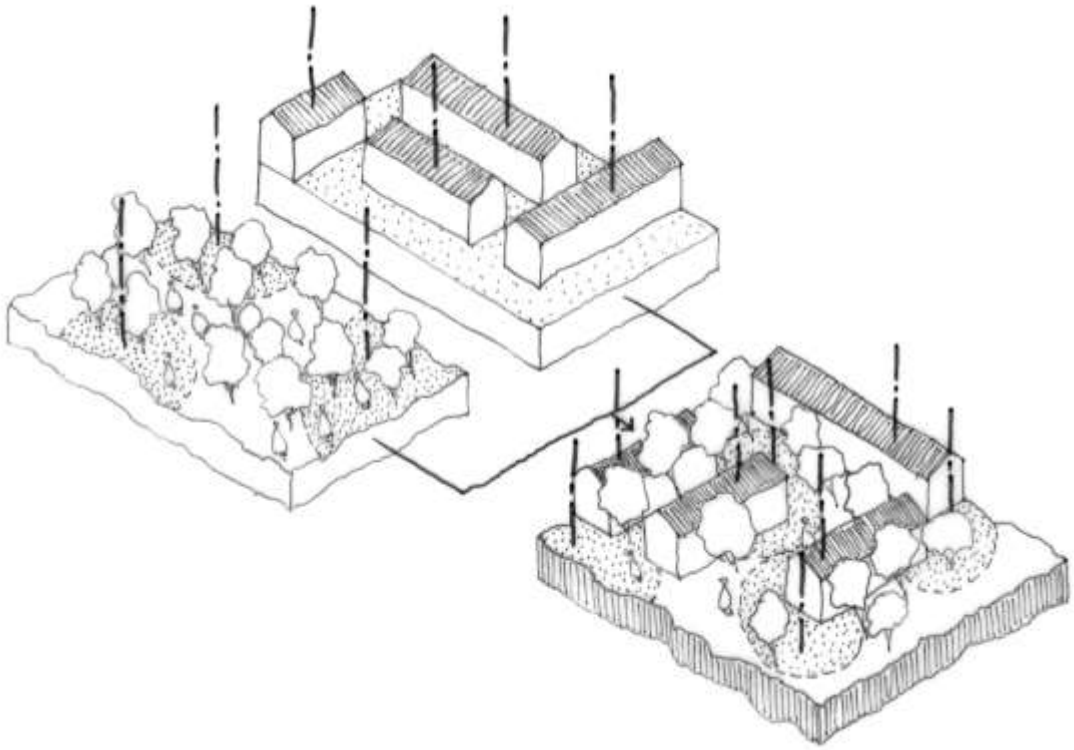


Figure 2.5: From human development as separate from nature, to a model that sees human development as part of nature (Author November 2021)

This suggests a further re-orientation of sustainability where human development is seen as taking part in the inter-connected processes of ecological systems (Hes & Du Plessis 2014: 112-113)(Mang *et al*/ 2014)(Reed 2007:676). This proposed shift in sustainability thinking forms the foundation of regenerative thinking theory (Du Plessis 2012))(Mang *et al*/ 2014).

Du Plessis (2012) outlines three core principles of regenerative thinking theory:

> Firstly, nature is to be co-developed along with human development by designing individual systems that engage with the inter-connected system as a whole (Du Plessis 2012:15)(Hes & Du Plessis 2014: 113).
> Secondly, the inter-connected whole is ever-changing and dynamic and lastly, human development is part of the same system as ecology, each impacting the development of the other (Du Plessis 2012:15).

As regenerative design theory predominantly resides in legislation (land use management, implementation of green architecture principles and environmental assessments etc.) and esoteric theoretical thinking, translating the identified regenerative principles into architecture challenges the conventional relationship between human development and ecological systems by promoting a mediation between the seemingly disparate systems (Landman 2019: 9).

Regenerative Theory Application

A paradigm shift is proposed from sustained development that promotes the process of change to evolve a system, as well as the participation of humans in natural environments and processes.

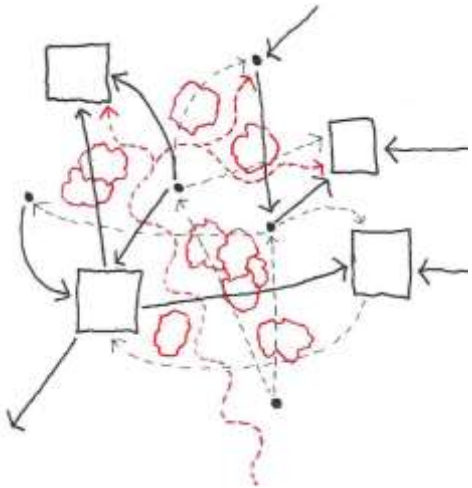


Figure 2.6: Decentralised organisational structure.

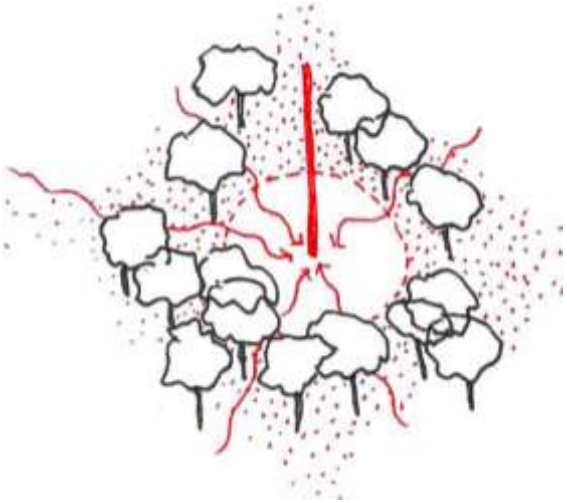


Figure 2.7: Internally read and platially developed architecture.

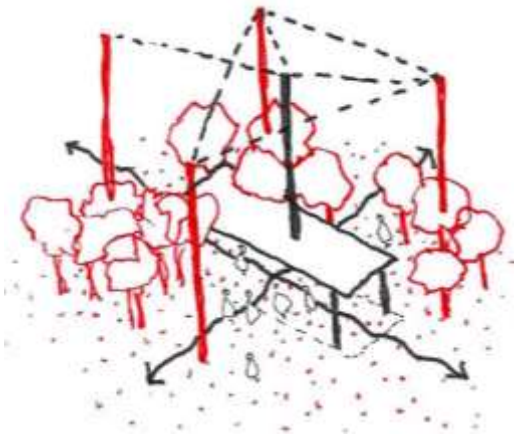


Figure 2.8: Co-evolution of nature (ecology) and technology (human intervention).

Non-Modern Theory

Origins in Critical Regionalism

Although Lefaivre and Tzonis (2003) initially postulated the critical regionalist movement, it was popularized by Frampton (1983) where he defined critical regionalism as existing between various oppositions (Barker 2012: 109-110). Barker (2012: 109-110) notes that Frampton's definition of critical regionalism ultimately promoted the ocular-centric creation of architecture, resulting in the emphasis of critical regionalist architecture as a product rather than a process-driven architecture.

Baker (2012: 110) further states that a true critical regionalism resists universal dogmas and opposes hegemonic power. Moore (2010: 365-366) critiques the aesthetic focus of critical regionalism by suggesting that the debate moved towards the deeper conflict between becoming modern (technology) and a return to place (nature) (Barker 2012: 114)(Moore 2010: 367).

Defining Non-Modern Theory

Furthering the relationship between technology (as a sign of becoming modern) and nature (as a return to place), Moore (2010: 365) proposed a tangential theoretical approach for reviewing the relationship between nature and industry, namely: non-modern theory.

Moore (2010: 374) postulates that non-modern theory is developed from the standpoint that human development has never been modern and as such, has always been intrinsically linked to the ecological systems that constitutes our world.

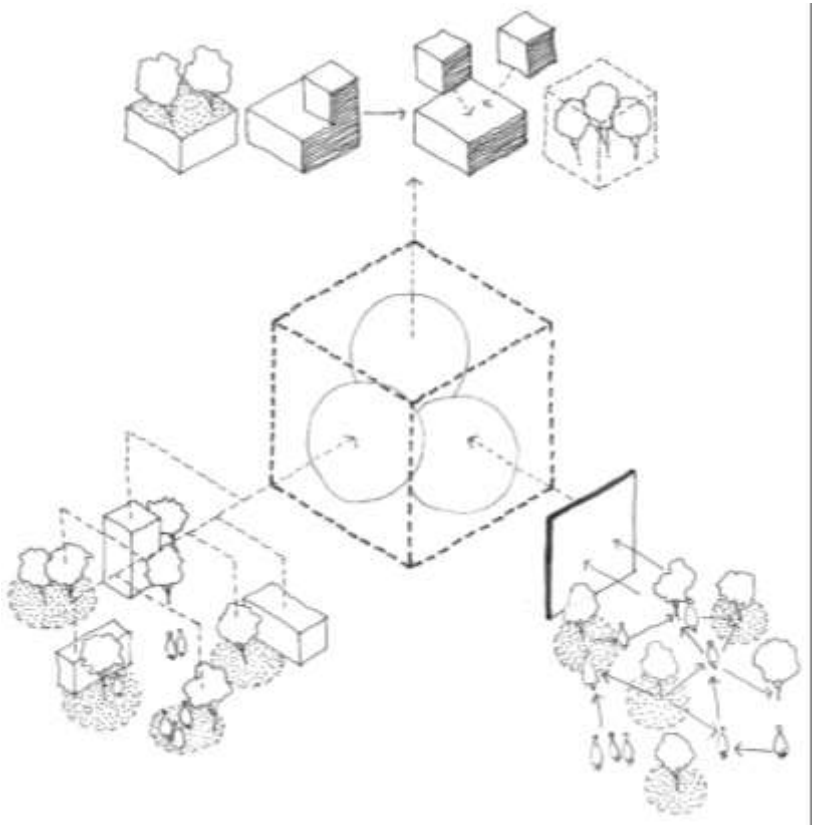


Figure 2.9: A representation of the values that non-modern theory postulates as applied to the relationship between nature and industry (Author November 2021)

This echoes the sentiments of regenerative theory (Du Plessis 2012)(Mang *et al* 2014) but provides three further architectural implications that can aid in mediating the relationship between nature and industry:

Firstly, the acknowledgement that a singular aesthetically-driven solution to align the relationship between human development and nature is less successful than relating the multiplicity of social activities to equally diverse ecological conditions (Moore 2010: 379).

Secondly. the emphasis of architectural production should be placed on the continuous social and ecological processes that create the architecture, instead of seeing the architecture as a static and complete object (Moore 2010: 379).

Lastly, non-modern architecture seeks to facilitate the confluences between social activities (human development) and ecological conditions (nature) (Moore 2010: 381).

To illustrate this dialogic relationship of technology and nature that forms the core of non-modern regionalism, a set of scales (Figure 11) is proposed that mediate between a modern approach and a post-modern approach (Moore 2010: 370). Situated in the middle is the non-modern approach that draws aspects from both approaches to define a new non-modern regionalism (Moore 2010: 370).

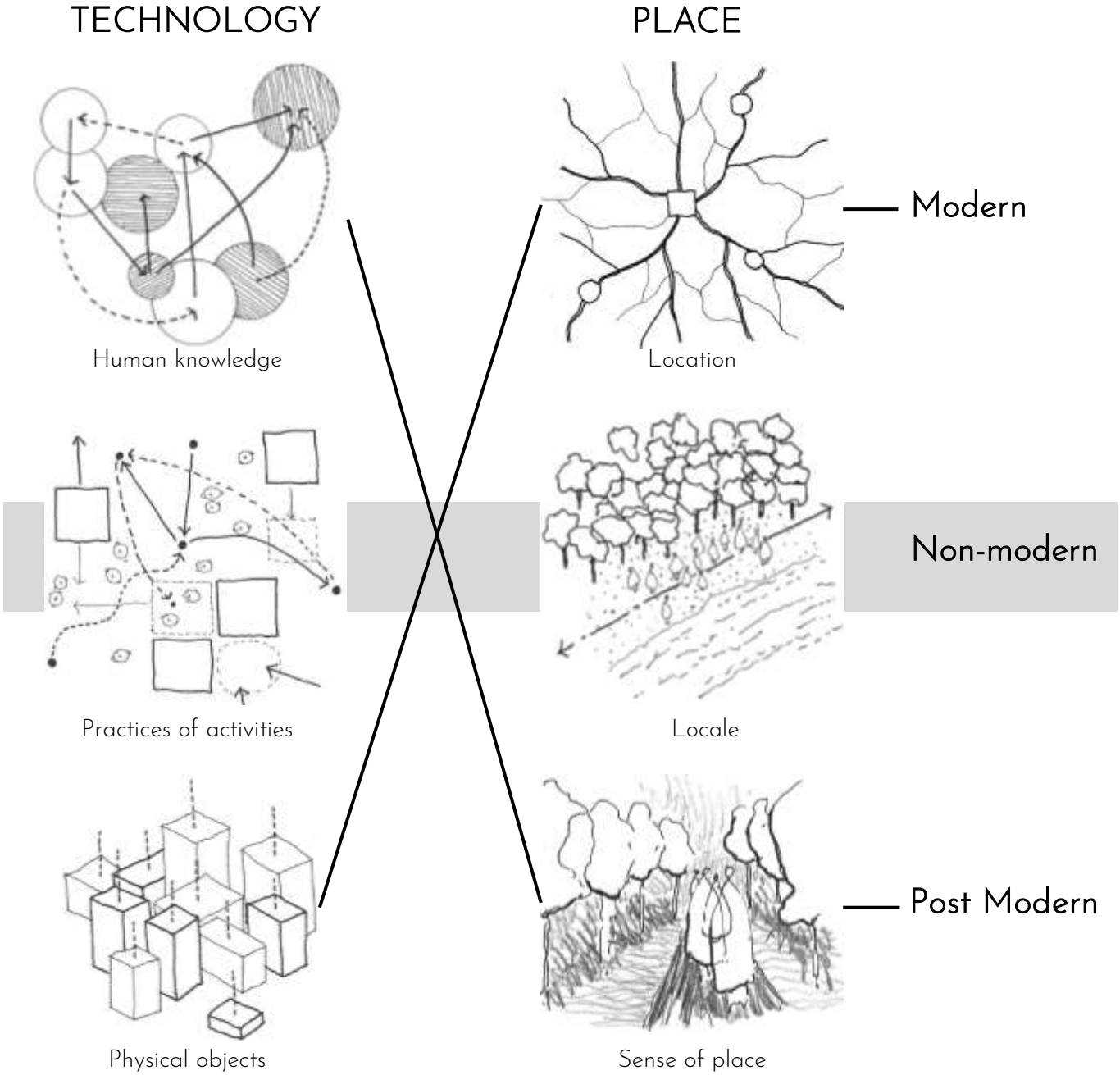


Figure 2.10: Non-modern regionalism scales and developed framework (Author July 2021)

Non-Modern Theory Application

Non-modern proposes an architecture that seeks to be activity and ritual driven rather than ocular-centric and form driven. Furthermore, architectural form is to be used as a method of dissolving the distinction between human developments and natural environments.

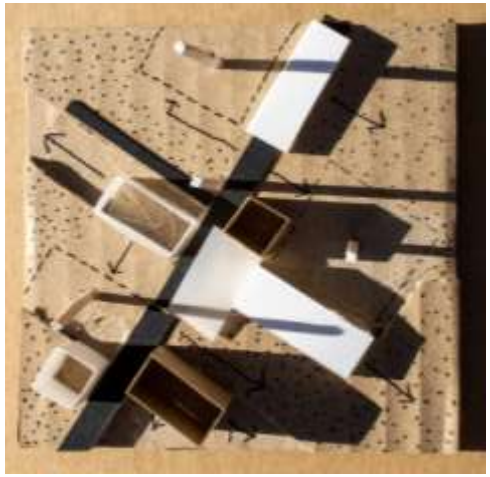


Figure 2.11: Narrative progression of spaces over various scales of interaction (Author July 2021)

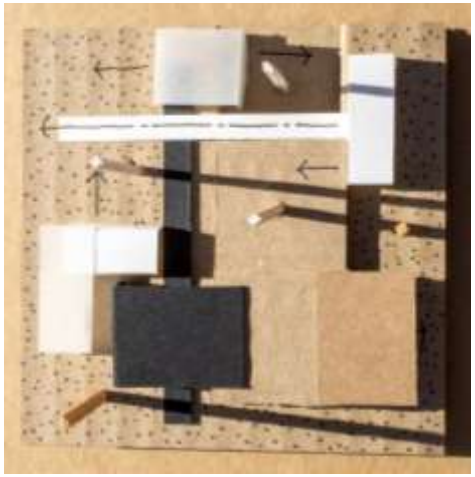


Figure 2.12: Architecture as a means to investigate change in the identity of the context (Author July 2021)

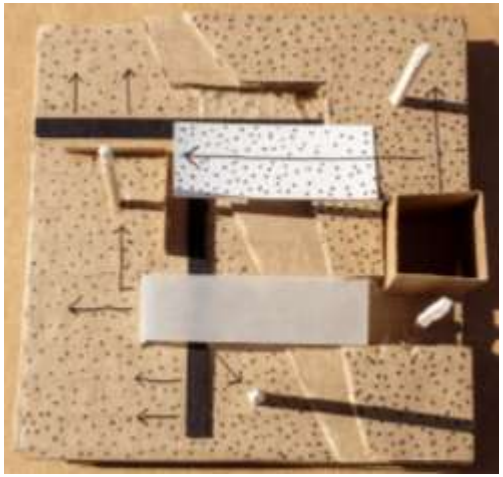


Figure 2.13: Dissolve the perceived distinction between nature and architecture (Author July 2021)

Weak Theory

De Sola-Morales proposes weak architecture, derived from weak theory, as a possible alternative to the contemporary aesthetically-driven culture (in Pallasmaa 1999: 86). An architecture of strong structure/identity attempts to represent a singular identity disregarding the plurality and multiplicity of possible identities and perceptions of users (Pallasmaa 1999: 86).

On the other hand, architecture of weak structure/identity denies aesthetically driven architecture and values the multiplicity of identities and perceptions of users (Pallasmaa 1999: 86). Furthermore, it returns to nature and an architecture of senses to utilise rituals and processes as a form of organisation and formal informants (Pallasmaa 1999: 86).

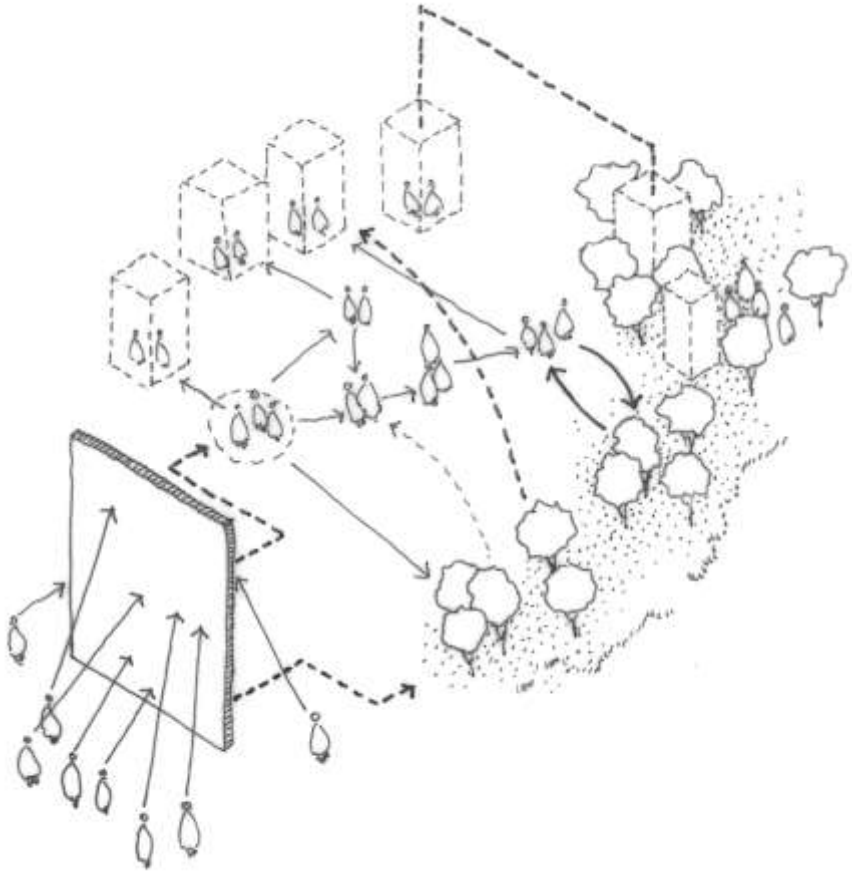


Figure 2.14: Weak theory focussing on the internal organisation rather than external visual form (Author November 2021)

Weak Theory Application

Weak theory argues for the re-alignment of human (strong images) development with natural (weak images) processes. This re-alignment accentuates the haptic and experiential above superficial visual stimulation.

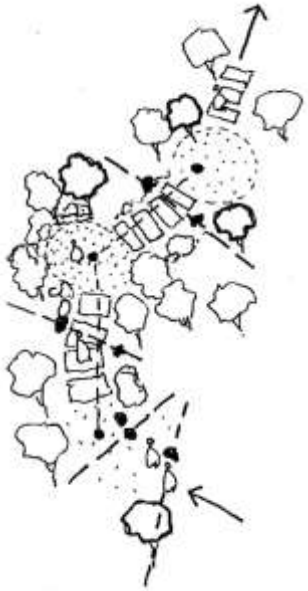


Figure 2.15: Alignment of human development with *slow* processes of nature(Author July 2021)

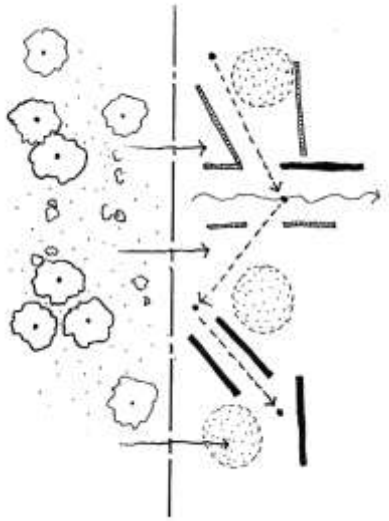


Figure 2.16: Utilisation of nature as an informant in the construction of space and form(Author July 2021)

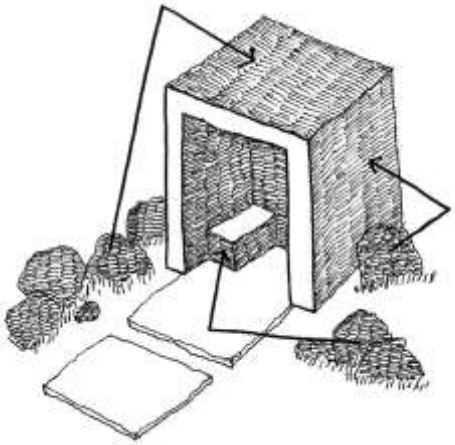


Figure 2.17: Re-introduction of the haptic and the sublime into architecture. It has always been present in the natural environment (Author July 2021)

Theory Interactions

Reflecting on the three theories discussed, certain confluences and overlaps are apparent. Through the analysis and further interrogation of these overlaps in the spatial framework, it is possible to discern a combined architectural and spatial theory comprised of the overlaps between regenerative theory, non-modern theory and weak theory.

Between regenerative theory and weak theory

With the paradigm shift towards regenerative theory that this project suggests, it is acknowledged that the development of human activities and natural processes are intimately tied and exist in the same temporal and locational space (Du Plessis 2015: 15). Pallasmaa (1999: 86) further states this relationship between fragile architecture and the fragile processes of nature as being temporally and contextually bound and in immediate opposition to the strong industrial processes.

As such, an opportunity arises to re-envision and reinterpret the conventional industrial approaches and processes through an ecological lens, altering the prescriptive industrial processes into ecological-industrial processes that engage with ecological systems (Pallasmaa 1999: 86).

Between regenerative theory and non-modern theory

Landman (2019: 167-168) proposes a possible architectural approach concerned learning from existing ecological and social patterns in the site and the context (Reed 2007: 678).

Moore proposes a similar approach, evolving it into a continuous process where the architecture serves to facilitate the confluence of ecological systems and social activities that construct the architecture. Through this facilitation, a dialogic relationship is created between ecological systems and social activities that help inform the architecture (Moore 2010: 377).

Between non-modern theory and weak theory

The confluence between non-modern theory and weak theory lies in the rejection of a stylistic or image-based approach and returning to a contextual and responsive architecture (Moore 2010: 377) (Pallasmaa 1999: 86). Pallasmaa (1999: 85) expands on weak architecture by appropriating it into an architectural approach, namely fragile architecture. Fragile architecture is concerned with sensory interaction and contextual architectural responses that develops from an understanding of the site and the context (Pallasmaa 1999: 86).

The correlation between fragile architecture and non-modern theory is further evident in the sequential and narrative driven processes valued by each theory, instead of formal and prescriptive processes (Moore 2010: 375) (Pallasmaa 1999: 85).

An emergent in-between Theory

The inter-related theories proposed, aim to investigate the relation between nature and industry from various perspectives, creating a theoretical framework to drive the project. However, a subliminal, in-between theory has emerged from the investigations and explorations of how to apply the current theoretical framework. This emergent and in-between theory is liminality and exists as a glue between the components of the already established theoretical framework.

Originally termed by ethnographer Arnold van Gennep, liminality refers to the stage of transition and transformation from one condition to another (Ng & Lim 2018). Van Gennep argued that an incompatibility exists between the profane and the sacred world thus, a transformative, intermediate stage is necessary to facilitate this movement from the profane to the sacred (Ng & Lim 2018). This transformative stage of liminality is most prominent in transitional initiation rituals and ceremonies where the child, being profane and unworthy, would undergo a process of transition, the liminal stage, and emerge worthy and part of a sacred group (Ng & Lim 2018).

Victor Turner would further the understanding of liminality by stating that it was rather a restructuring process, where one condition would be dissolved and disassociated into another condition (Turner 1969). Turner (1969) further stated that this process of dissolution and disassociation acts as the liminal space between the two conditions. The stage of liminality that facilitates the transition from one condition to the next, inherits qualities from both the conditions that it mediates between (Ng & Lim 2018) (Turner 1969).

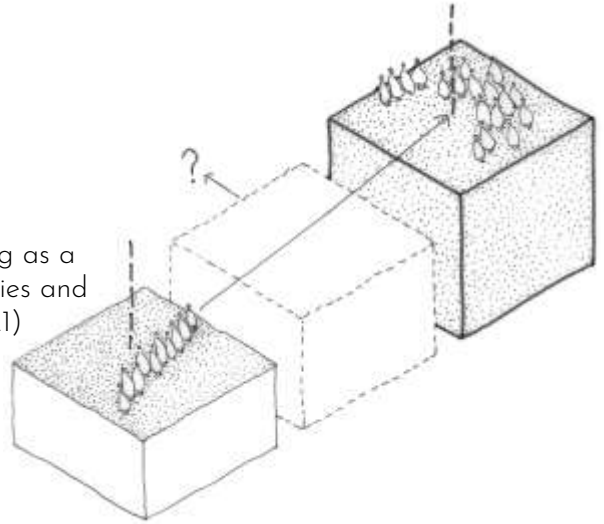


Figure 2.18: Transitional zone acting as a mediation during initiation ceremonies and rituals (Author November 2021)

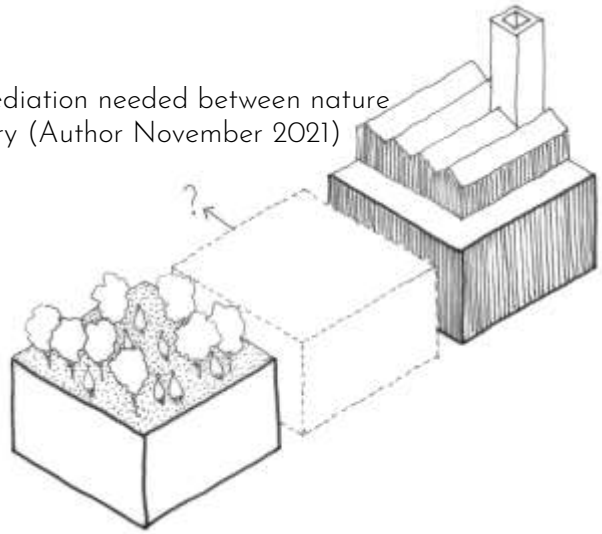


Figure 2.19: Mediation needed between nature and industry (Author November 2021)

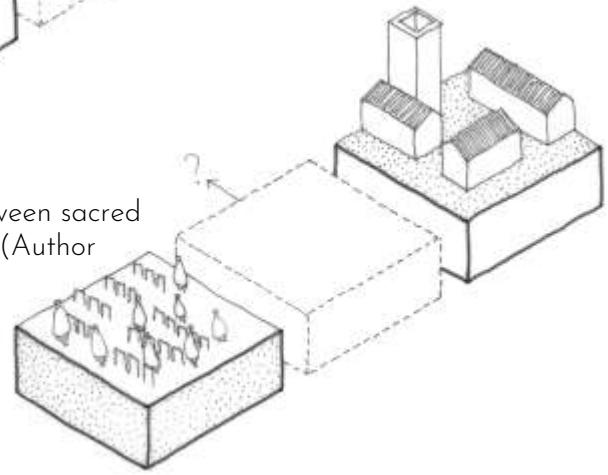


Figure 2.20: Unknown mediation between sacred cemetery and industrial Silverton (Author November 2021)

The identification of the emergent theory of liminality provided new possibilities to translate the currently selected theories into architectural tools that can be used to inform the architectural concept, namely: the sequencing of spaces into liminal relations, "folding" spaces to create liminal conditions, utilising an axis to organise the spaces and lastly, approaches to navigating the slope of the site.

Sequencing spaces into liminal relations

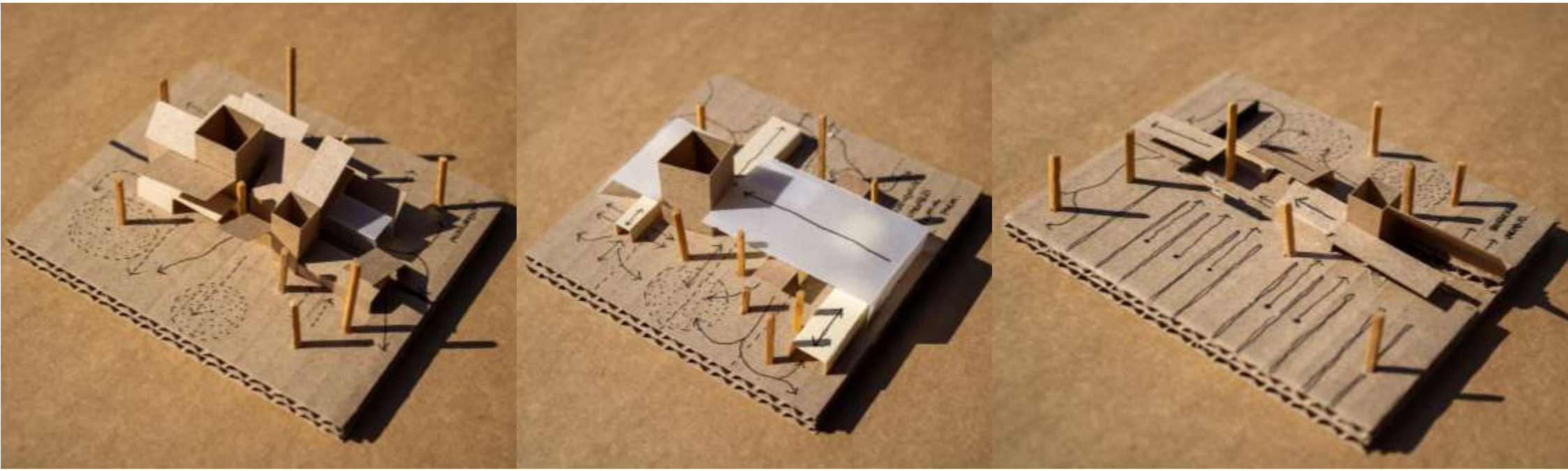


Figure 2.21: A series of maquettes exploring the sequencing of spaces to achieve new processional possibilities (Author August 2021)

Folding spaces to create liminal conditions

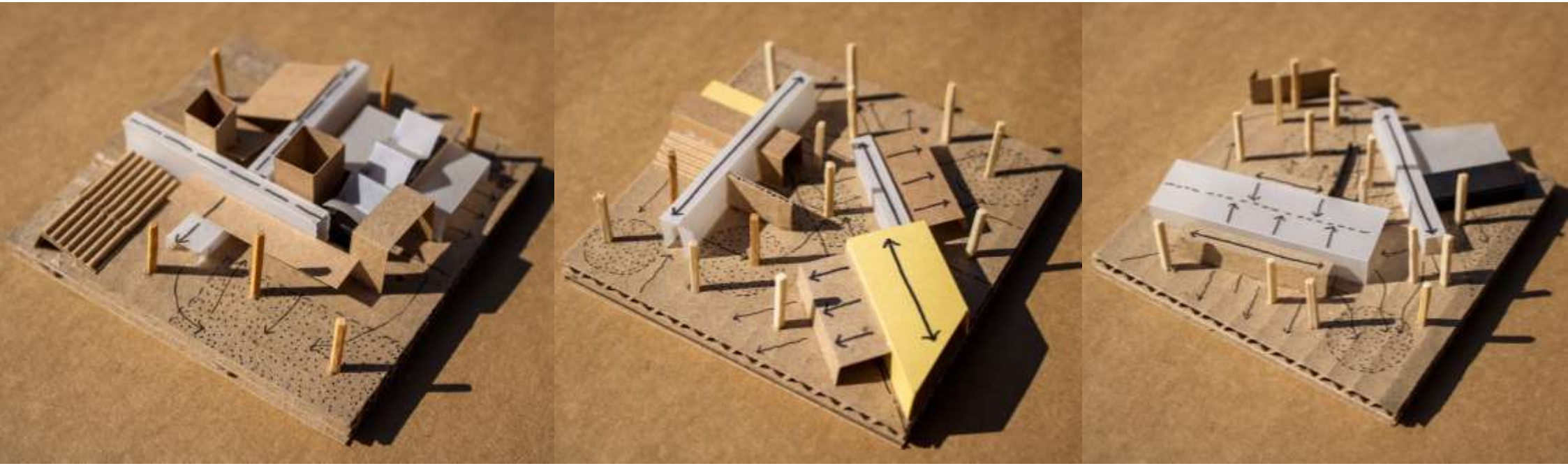


Figure 2.22: A series of maquettes exploring the technique of folding spaces to create new spaces that exist as in-between liminal spaces (Author August 2021)

Spatial ordering around a wetland axis

Figure 2.23: The initial intent was to create an axis on the site. These maquettes explore the organisational opportunities that an axis can provide to the design (Author August 2021)

Navigating a slope

Figure 2.24: With the site featuring a slope. The maquettes explore formal approaches that can help mediate the slope with architecture (Author August 2021)

Figure 3.1: Aerial image of the industrial Silverton context (adapted from Google Earth July 2021)

Figure 3.2: Current industrial development of Silverton (adapted from Google Earth July 2021)

Current Industrialisation in Silverton

Analysing the current context of Silverton (Figure 3.2) reveals three areas that exclude nature and natural systems and negatively affect the industrial Silverton context and the Moreleta Spruit: firstly, the spruit has been entirely excluded from the development of the Silverton context, resulting in a disconnect with its historical role as public gathering node (Figure 3.2).

Secondly, the close proximity of the Silverton cemetery and the various industries allowed leachate pollution to feed into the ground water polluting the Moreleta Spruit and other ecosystems (Figure 3.2). Lastly, as the industries developed in Silverton, the Moreleta Spruit has been slowly channelled and constricted into one belt running through Silverton, reducing ecosystemic diversity and the effectiveness of the river (Figure 3.2).

Globally a trend developed from the first Industrial Revolution that saw the emphasis placed on industrial development at the cost of the natural environment and public engagement. This is defined as non-regenerative thinking as it attempts to place human development outside natural environments and systems.

This is contrasted with the initial stages of industrial development in Pretoria focussing on supporting and processing the surrounding agricultural landscape. However, as economic pressures grew, Pretoria disconnected from the historical role of a node in a landscape and also emphasised industrial development over natural systems and environments (Figure 3.3). With Silverton, a similar trend is identified where the industrial developments initially served the surrounding agricultural activities but with the development of technology and economic pressures, disconnected and excluded natural systems and environments (Figure 3.3).

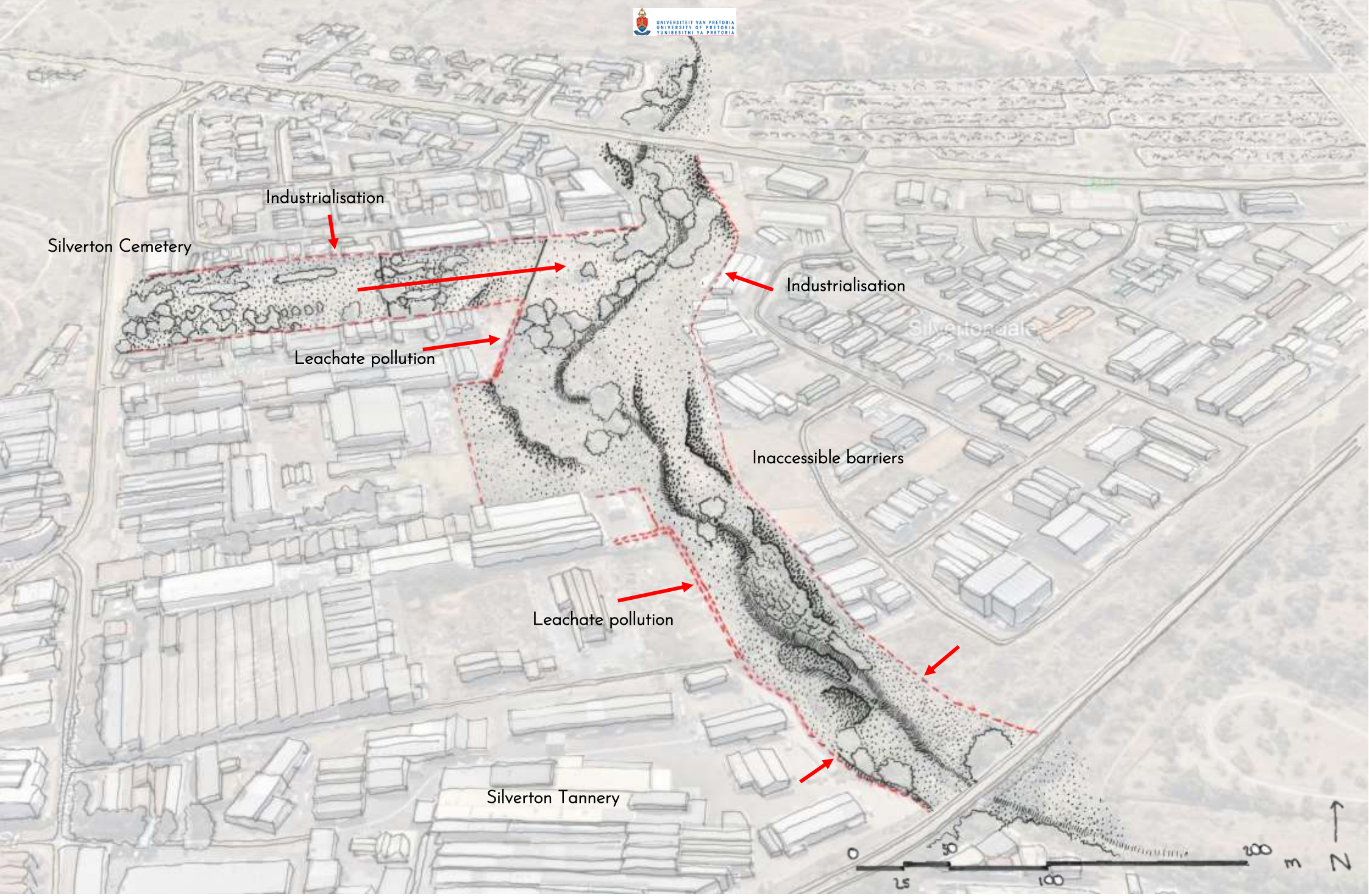


Figure 3.3: Current negative condition of the Moreleta Spruit (adapted from Google Earth July 2021)

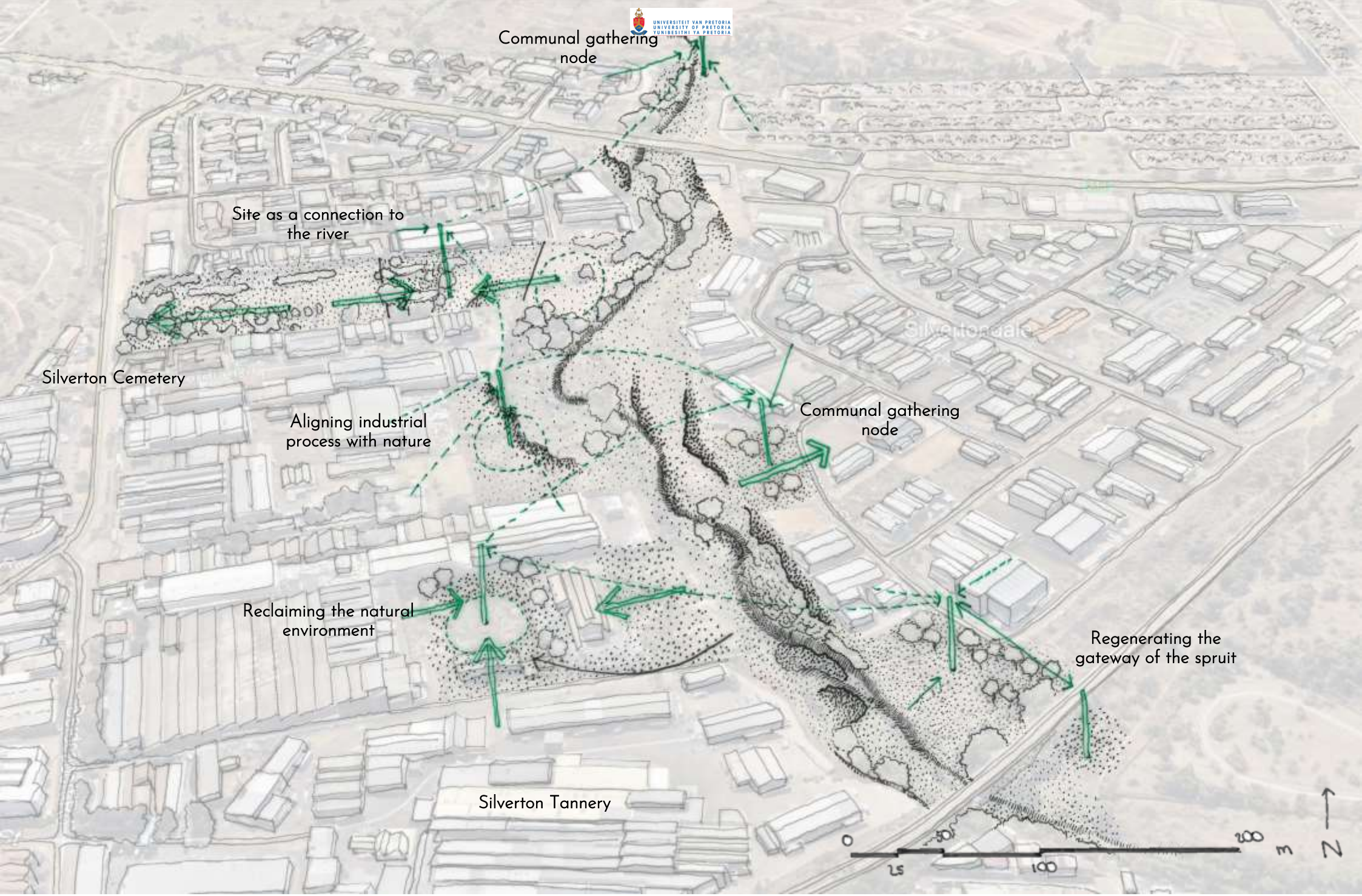


Figure 3.4: The urban vision attempting to change the Silverton context to align to nature (adapted from Google Earth July 2021)

Urban Vision

As a response to the current non-regenerative thinking prevailing in Silverton, a gradual regenerative urban vision was developed, aiming to manifest the developed theoretical framework into the urban fabric.

Analysing the currently inaccessible and excluded Moreleta Spruit, the first stage of the urban vision was the identification of possible nodes, reintroducing the historical identity of the spruit as a public gathering space. Secondly, the alignment between the surrounding industrial developments and the natural systems found at the Moreleta Spruit are encouraged by allowing the spruit and the associated natural systems to permeate into the industrial context of Silverton.

Lastly, it is important to note that the regenerative urban vision is modelled around a gradual process of changing and aligning natural systems with the industrial processes driving industrial development. With the initial intervention at the Silverton Cemetery, a catalytic process will drive change to other sites along the spruit, further exploring methods and mediation strategies between nature and industry.

Site Choice

The chosen site for this architectural intervention is the Silverton Cemetery, nestled in-between the industrial context of Silverton. The Silverton Cemetery is one of the few sites in Silverton that has been untouched and excluded from the changing industrial context, mainly due to the function of the Silverton Cemetery not allowing it to be industrialised or relocated, as well as being the only public space in the area with a connection to the protected natural systems of the Moreleta Spruit. As such, the Silverton Cemetery is a site of juxtapositions between nature and industry, where the points of confluence between nature and industry have not yet been developed or investigated.

Reviewing the theoretical framework, the site can possibly be developed into a mediating site between nature and industry, potentially changing the way industrialisation has occurred in Silverton to include natural processes within industrial processes.

Figure 3.5: Perspective showing the Silverton Cemetery as the chosen site (adapted from Google Earth July 2021)

Site Analysis

The chosen site for this project is a strip nestled in between industrial factories and warehouses, penetrating into the industrial fabric of Silverton, connecting the Derdepoort Road to the west with the Moreleta Spruit in the east.

Figure 3.6: Photographs of the site (Author July 2021)

The site is divided into three main areas: the Silverton Cemetery to the west, the Silverton Parks Management (SPM) and the currently inaccessible undeveloped land towards the Moreleta Spruit. Due to the nature of the private industries and warehouses surrounding the site, it has become isolated and excluded from Silverton. This is evident in the site remaining programmatically and functionally unchanged throughout the course of Silverton's development. Furthermore, the distinction between the natural systems presents in the cemetery, and the rest of the site, with the surrounding industries and warehouses has created a missing liminal condition that can act as a mediator between the two conditions.

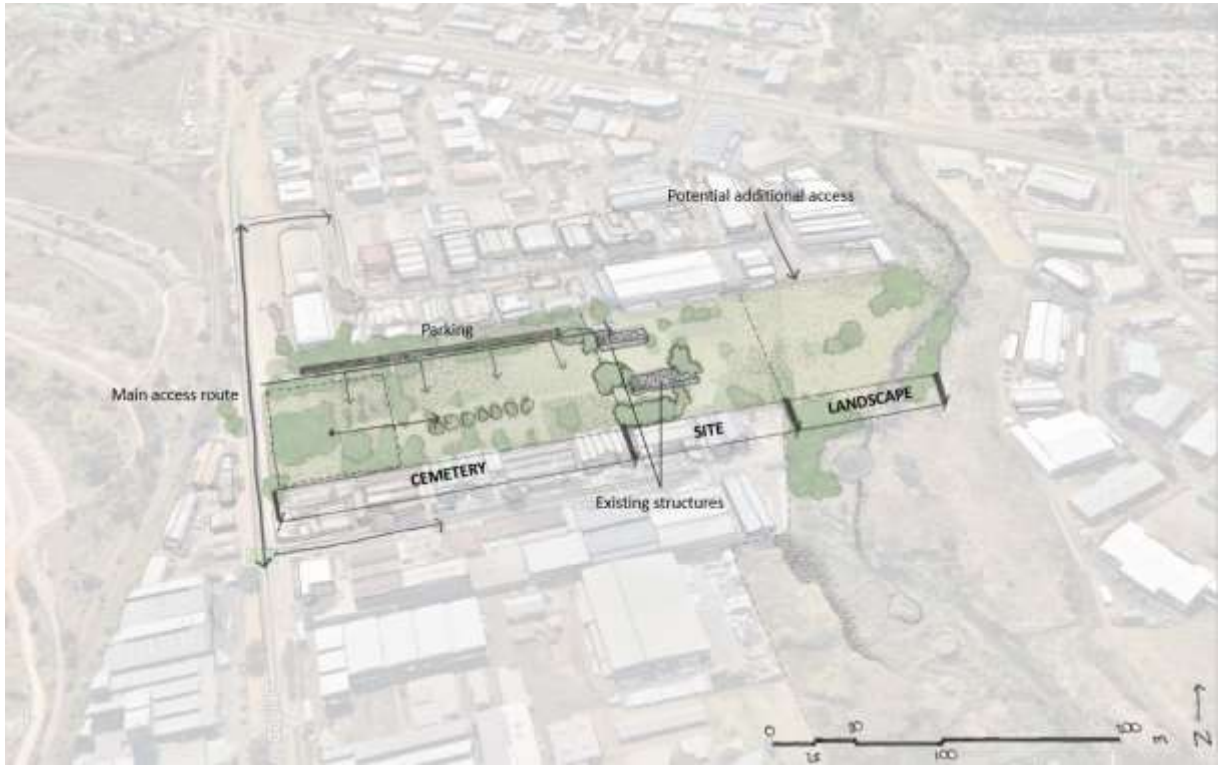


Figure 3.7: Perspective showing the site analysis (adapted from Google Earth July 2021)

Some of the issues that the site face, is the leachate pollution that the cemetery produces as well as the pollution generated from the surrounding industries. The river is also polluted and should be further investigated.

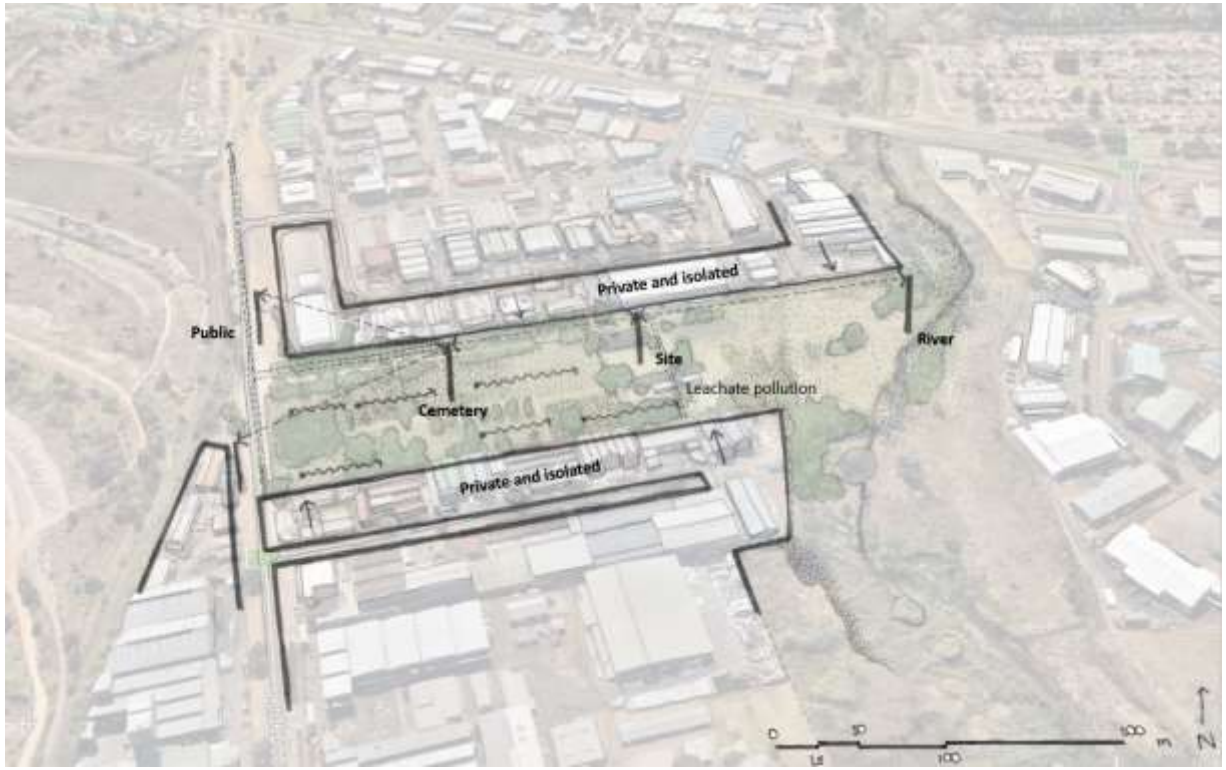


Figure 3.8: Perspective showing the isolation and access of the site (adapted from Google Earth July 2021)

The intention with the site is to firstly realign human developmental processes with that of natural processes. Secondly, to restore a connection to the river through the site for the public to utilise. Lastly, the intervention is to act as a catalyst for the rest of the Silverton context.

For the Silverton Cemetery to be re-introduced into the industrial context, the mono-programmatic nature of the cemetery has to be changed to that of a flexible, synergistic and multi-programmatic intervention that aims to work with the allows future changes in the industrial context of Silverton to be .

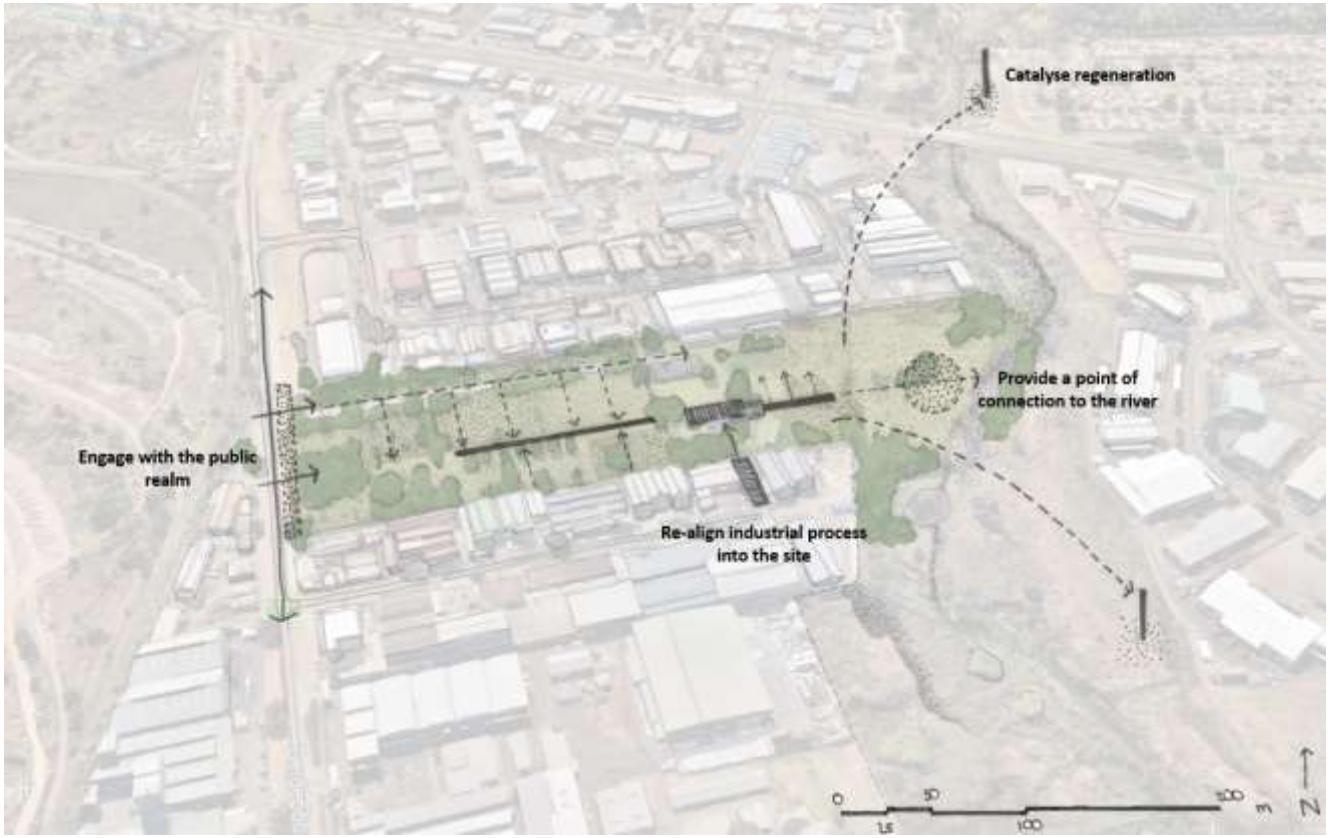
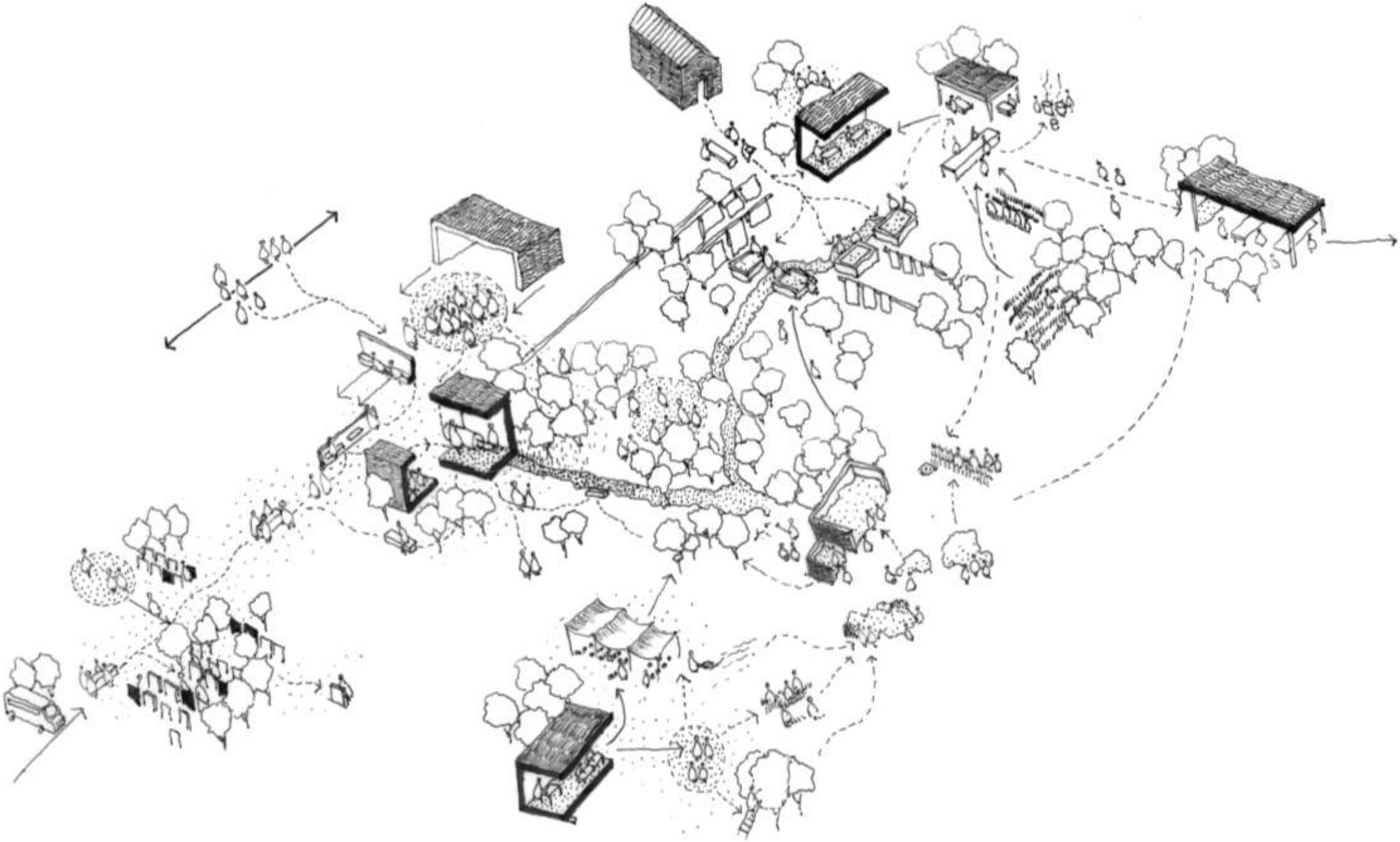


Figure 3.9: Perspective showing the intentions with the site (adapted from Google Earth July 2021)



4 Programme Development

Figure 4.1: Overview of the complete programme (Author July 2021)

Development of the Silverton Tannery

With the establishment of the South African Union in 1910, a newfound nationalism emphasised industrial development in Pretoria as small-scale leather tanning were largely undercut by cheaper imports from Australia (Naude & Naude 2007:53). The supply of imported leather dwindled during the First World War, allowing locally produced and manufactured leather products to be favoured out of necessity (Naude & Naude 2007:53).

With most of the leather tanneries in South Africa residing in the Cape at the time, the Silverton Tannery was opened in 1915 to take advantage of the economic and political opportunity, cementing Silverton (and by extension Pretoria) at the forefront of the leather tanning industry (Naude & Naude 2007:54).

The Silverton Tannery was directly connected to the NZASM eastern railway line towards Maputo and other major harbours enabling it to becoming South Africa's most sophisticated and largest tannery (Naude & Naude 2007:54). Unfortunately, during the 1980's, managerial decline, and environmental pressures, saw the Silverton Tannery converted into the current industrial park consisting of smaller diverse industries (Naude & Naude 2007:56).

Development of new programmes

Historically, the Silverton Tannery played an instrumental part in the development of Silverton, paving the way for technologically advanced leather tanning processes. As the Silverton Tannery no longer exists in function, leather dyeing is to be reintroduced to Silverton by realigning it to natural dye processes.

One of the leading factors leading to the downfall of the Silverton Tannery was the environmentally unsustainable use of chemicals and heavy metals in the tanning and dyeing process. The re-introducing of the leather dyeing programme through ecological processes indicates the possibilities of aligning industrial and natural processes. As a complementary programme, leather dye making will also take place, with the effluent from both programmes feeding into a bio-filter.

The new programme activating the Silverton cemetery mediates between the natural process of decay, mourning and time by introducing the industrial process of resomation. This process reduces the decomposition time of conventional burial to mere hours by utilising water at intense temperatures and pressures, resulting in an industrialised natural process. The programme is proposed as an experiential alternative to the clinical cremation process and as such, does not replace it.

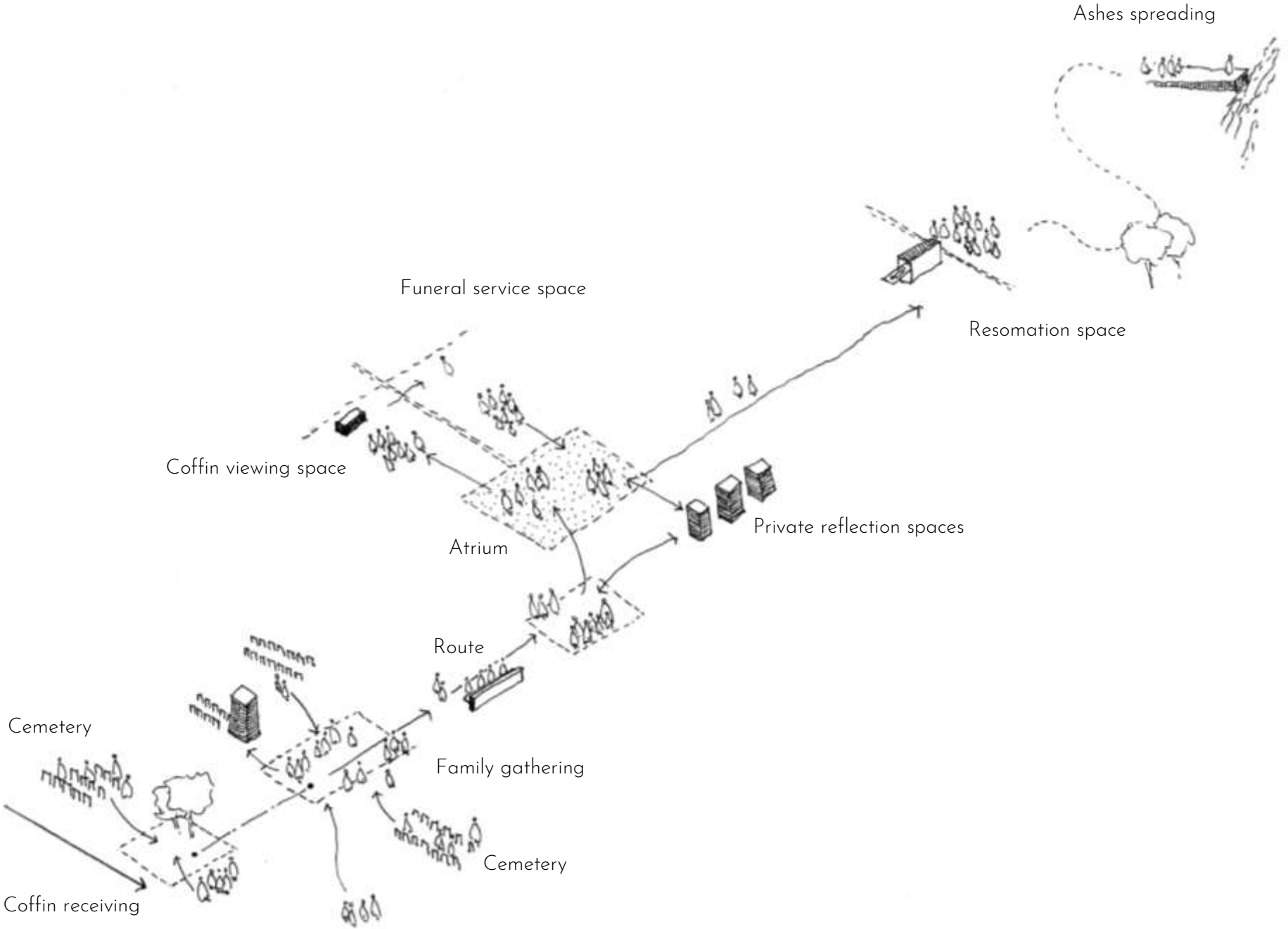


Figure 4.2: Overview of resomation route programme (Author November 2021)

Programme - Resomation Route

Resomation route

Coffin Receiving and family gathering spaces

Connecting to the existing side-road of the Silverton Cemetery, the first space in the resomation route is dedicated to the handover of the coffin from the hearse to the awaiting close family. An additional administration office space is allocated to facilitate the administrative duties for the families.

Broader family gathering space

With the handover of the coffin to the closest family members, the broader family and friends gather in a sperate route, acting as a welcoming party and support for the journey to come.

The route to the funeral spaces and coffin viewing space

The resomation route slowly descends into the ground, simulating the symbolic burial of the loved one, along with the family and friends. Once completely "buried" the procession has the opportunity to cleanse their hands and feet in preparation for the funeral ceremony and coffin viewing.

Funeral and coffin viewing space

As the first main spaces on the route, the funeral service space and coffin viewing space grants the family and friends the spaces to reconcile and confront the loss of their loved one individually or collectively. With the wet leather dripping dye water into the funeral and coffin viewing space, a patina of various colours and textures are stained into the wall, reminding of the hope for colour and vibrance in life after the departure of a loved one.

Atrium space linking to the ground floor leather facility

The central atrium space connects the overhead leather drying space to the resomation route and serves to introduce the smells of the tanned leather (earthy and slightly musty) as a reminder of the process of burial and death. Seeing the leather hanging overhead, metaphorically connects to the death of the cow and possible new growth that can occur after the loss of a loved one.

Resomation space – family side and process side

The next phase of the route leads the procession to the space where the resomation is to happen. Here stainless-steel cylinders house the coffin with the loved one in it and the process of resomation begins. This clinical and mechanistic process is separated from the family and friends through a brick screen that allows glimpses of the process but preserves the sacredness of the procession. With the resomation process done, the family is provided with the ashes, encouraged to see the journey through.

Landscape route towards the river (ash spreading) and the columbarium

Leaving the resomation space, the route quickly devolves into a raw, unkept landscape guiding the procession to the columbarium to bury the ashes or to the Moreleta Spruit to spread the ashes into the river.

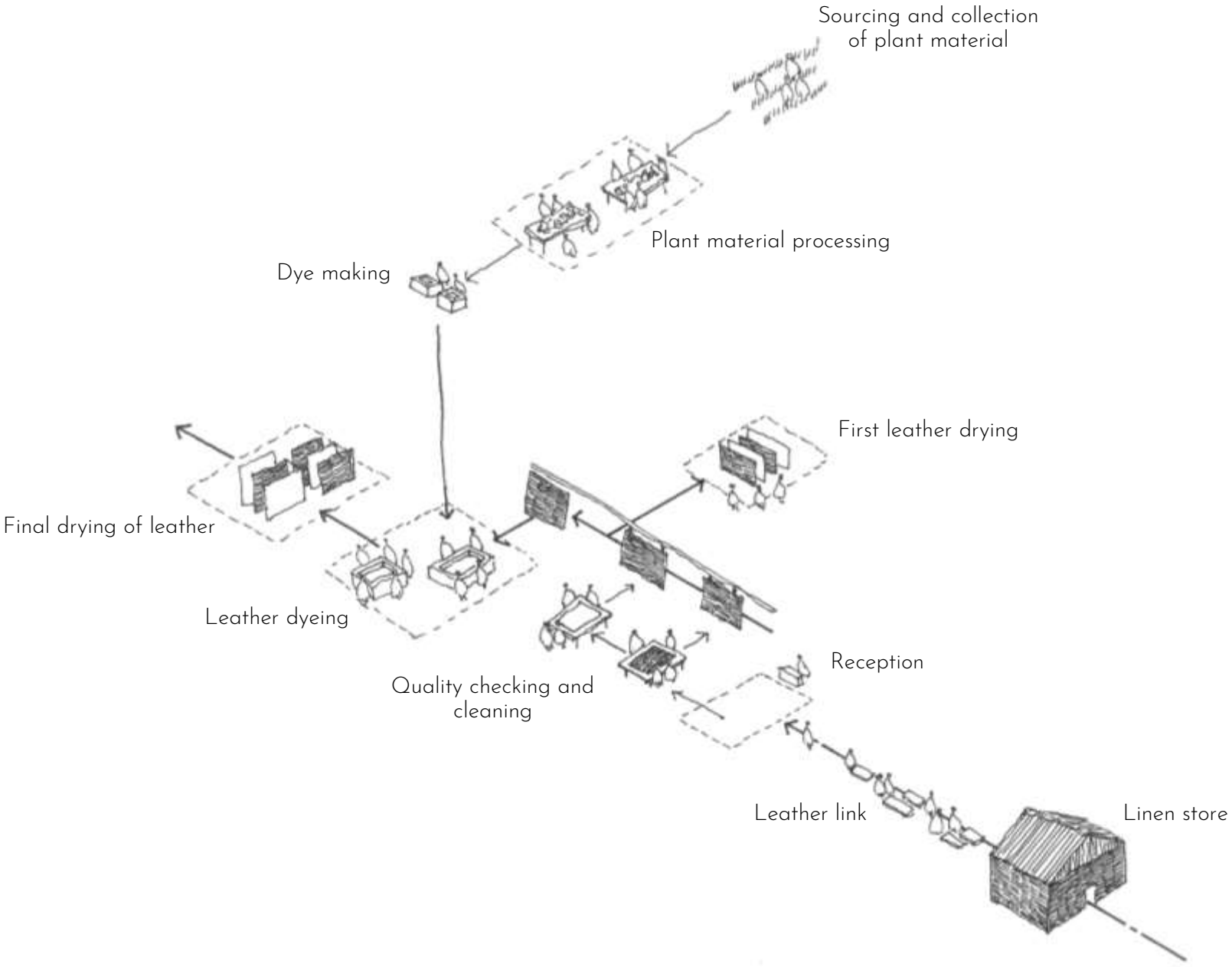


Figure 4.3: Overview of leather dyeing house programme (Author November 2021)

Leather Dyeing House

The redevelopment of the historical Silverton Tannery programme is done by collaborating with existing leather tanners to provide a leather dyeing facility currently not catered for. The historical process of dyeing leather is heavily industrialised and optimised with heavy metals and hazardous chemicals (Naude & Naude 2007:53).
The proposed programme instead leans on the inclusion of natural dyes and natural dye making processes to supplant the industrial dye process. In this way the process acts as a bridge that connects industry/industrial processes and nature/natural processes.

The linen shop

The existing linen shop acts as a vehicle through which the tanned leather can be transported to the leather dyeing house. This route mediates between the context and the new proposed intervention, with the link is defined as a shaded and paved route, allowing for interaction with pause spaces set in the landscape.

Reception and receiving the leather

The tanned leather is received at the reception, allowing the delivery workers to pause, catch their breath and then return to the linen shop. Additionally, the main administration is also handled at the reception of the tanned leather.

Quality checking the leather

With the tanned leather delivered, the quality of the leather is checked on a large inspection table, with the tanned leather not meeting the standards returned to the linen store. The main spatial requirement for the quality checking space is to have even, bright light that can facilitate the scrutiny of the tanned leather.

Cleaning the leather

Following on the quality checking space, the tanned leather is cleaned with a natural acid, in this case vinegar. With the cleaning of the leather finished, the leather is hung from a ceiling mounted railing system that transports the tanned leather to the next stage of the process.

Drying and hanging the leather

With the tanned leather still damp, it is left to dry overnight in the central atrium connecting to the resomation route. This allows the tanned leather to continue stretching and drying in an enclosed environment, with no direct sunlight that can cause a weakened product.

Dyeing the leather

With the leather sufficiently dried and hanged, the tanned leather is submerged with natural dyes in concrete vats and left overnight for the dye to penetrate into the leather. When the leather has been dyed, it is removed and then hung again on the overhead railing system. The excess natural dyes are drained and then recycled to be used again.

Second drying of the leather

The dripping leather is stored in a vertical drying space connected to the funeral space of the resomation route. This allows the excess water dripping from the dyed leather to be collected in the funeral space and then recycled.

Sub-programme - Dye making process

Collecting the plant materials

Plant material is collected by the Parks Management programme and the on-site harvesting of plants. The plant materials are sorted and checked for quality.

Processing the plant materials

The processing of the materials keeps the usable parts of the plants and composts the excess plant material.

Dye storage

The processed plants are boiled with water to produce a natural dye suitable for dyeing leather. This has to be stored overnight to intensify the colour and cool down.

Integration into the leather dyeing house

The cooled natural dye is used in the leather dye house, with the effluent recycled back into the water system.

Interaction between the existing and proposed programmes

Various already established and historical programmes on the site and in the context generate distinct patterns of activity and separate layers of within which the site exists. The Silverton Cemetery is currently one of the only publicly accessible spaces in Silverton, with direct access from Derdepoort Road. Repurposed structures in the centre of the site accommodate the Silverton Parks Management (SPM) maintaining public parks in and around Silverton. Plant materials generated with the public parks' maintenance is utilised in the tree nursery and composting initiative started by the SPM. The undeveloped green space is currently inaccessible by the public and not programmatically activated.

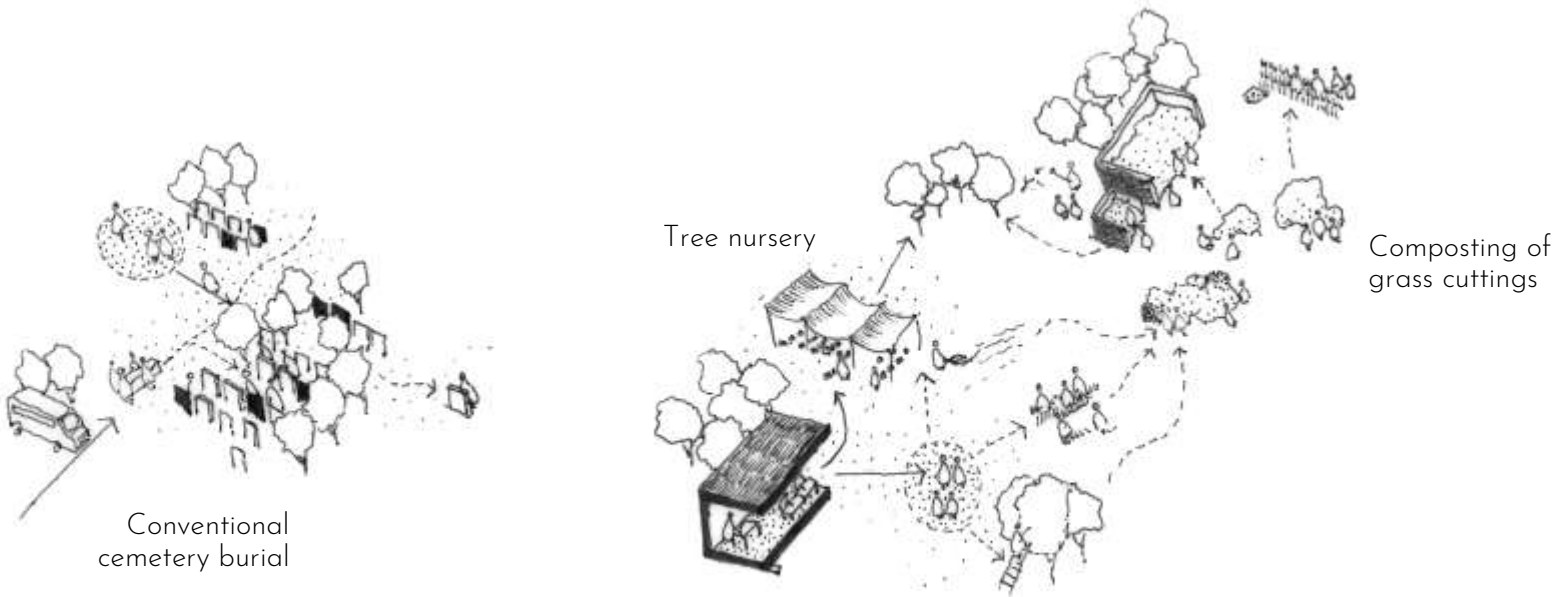


Figure 4.4: Diagram showing the existing programmes (Author July 2021)

The cemetery is to be redeveloped with the addition of the resomation process – an ecological acceleration of the process of decay using water – and additional ritual and sacred spaces for the users (Figure 22).

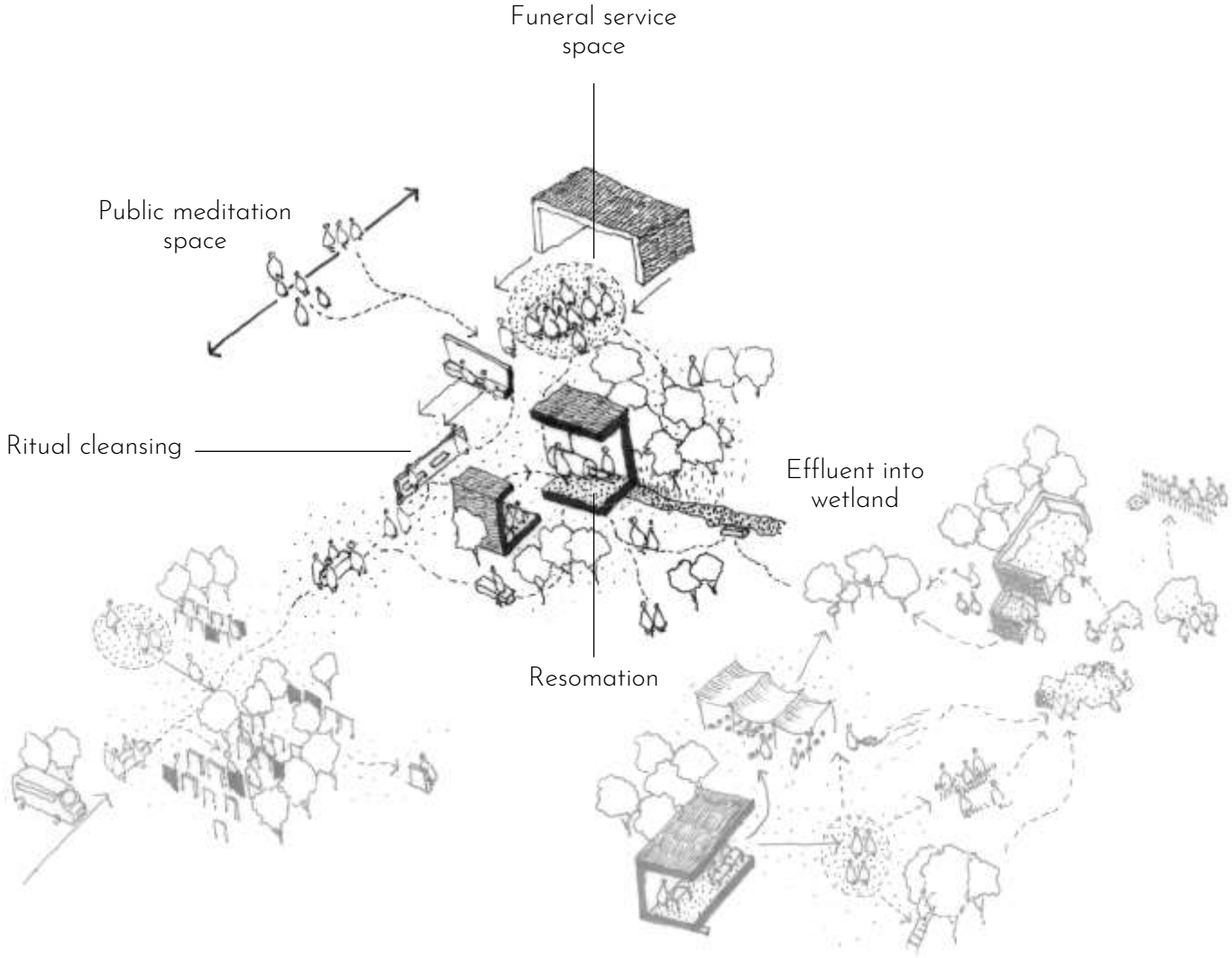


Figure 4.5: Diagram depicting the addition of the resomation process (Author July 2021)

The re-integration of the historical programme of the Silverton Tannery through an ecological lens, allows the previous industrial process to be re-aligned to ecological processes and environments.

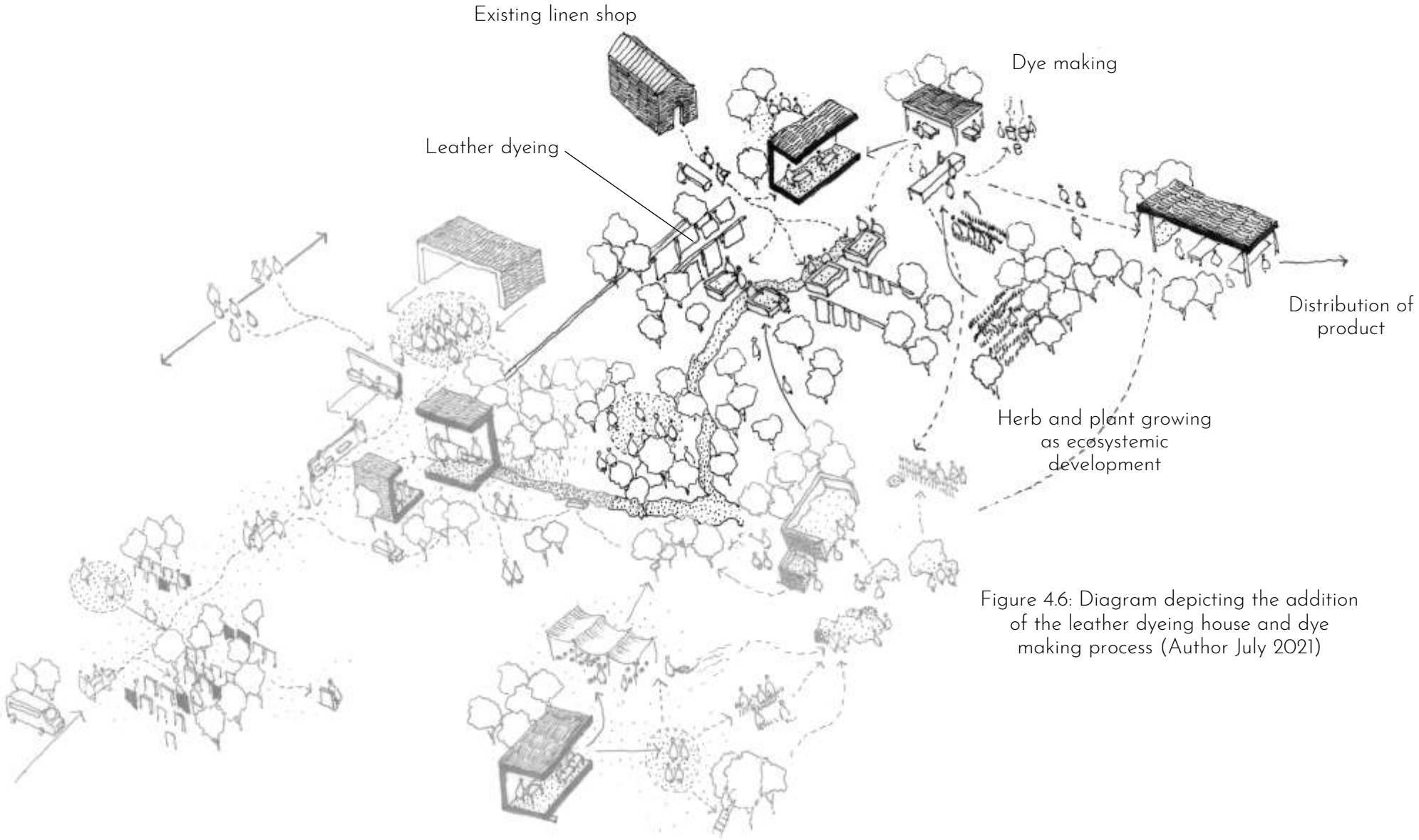


Figure 4.6: Diagram depicting the addition of the leather dyeing house and dye making process (Author July 2021)

The goal with the creation of the programme is to create an ecosystem of smaller programmes that interconnect and create symbiotic relationships. Waste products from one programme are fed into another programme as starting materials (Figure 24).

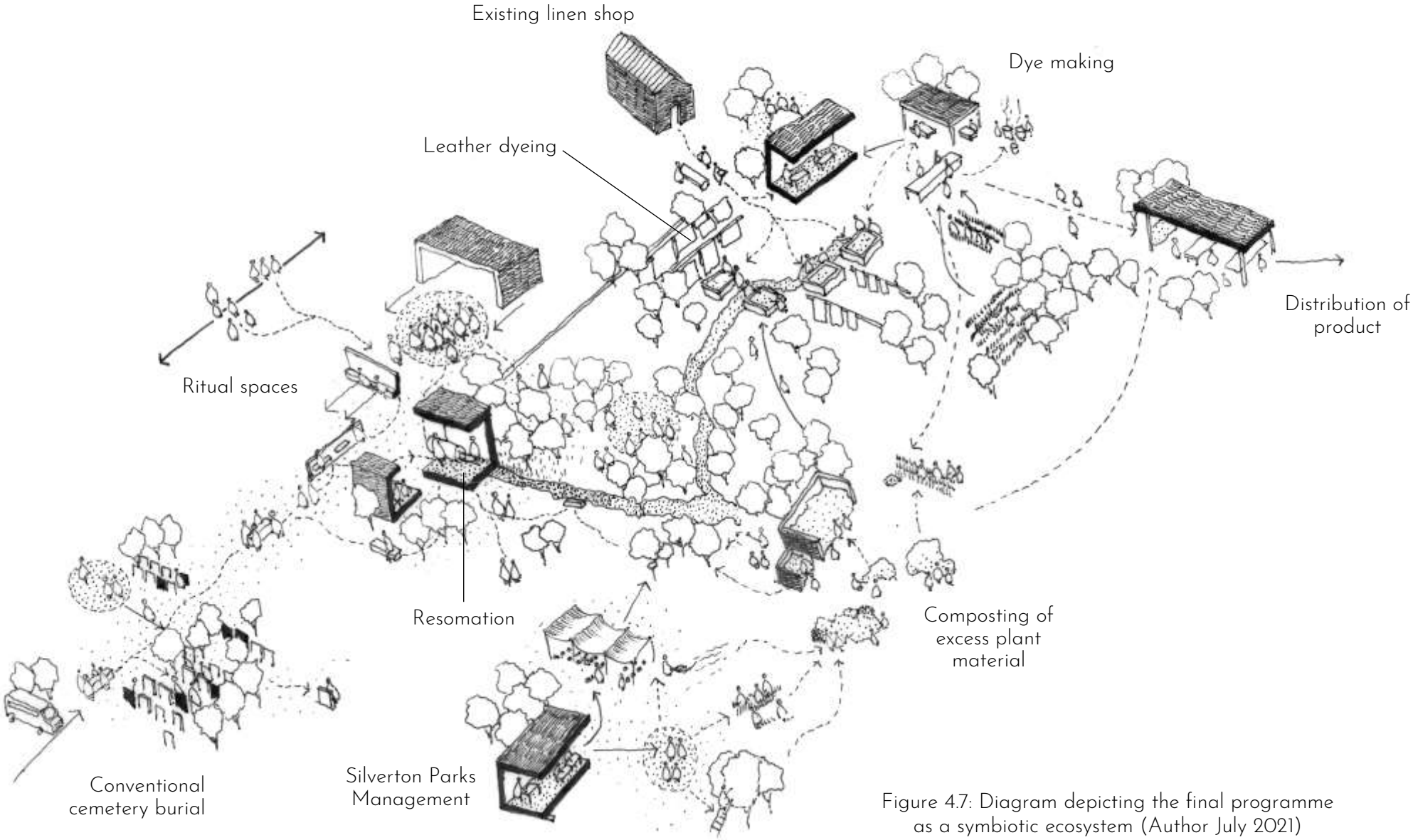


Figure 4.7: Diagram depicting the final programme as a symbiotic ecosystem (Author July 2021)

Walking the path

Figure 5.1: Maquette depicting an early iteration of the design concept applied to site (Author May 2021)

LIMINALITY AS SPATIAL THEORY

From a linked theoretical framework to a spatial theory

The application of the theoretical approach and liminal theory on the site identified four liminal relationships for the architecture to resolve, namely:

- The ecological connection between the Silverton Cemetery and the Moreleta Spruit industrialising the traditional burial process.
- The industrial connection between the existing linen store and the proposed leather dyeing facility reframed through an ecological lens.
- The liminal relationship between natural process, and nature itself, and industrial processes, and the industrial context.
- The internal tension between the two main programmes (Resomation route and the leather dyeing facility) creating a third condition that needs to be defined and articulated.

In defining the use of liminality in this project, two broader spatial conditions were identified, namely: transition spaces and mediating spaces.

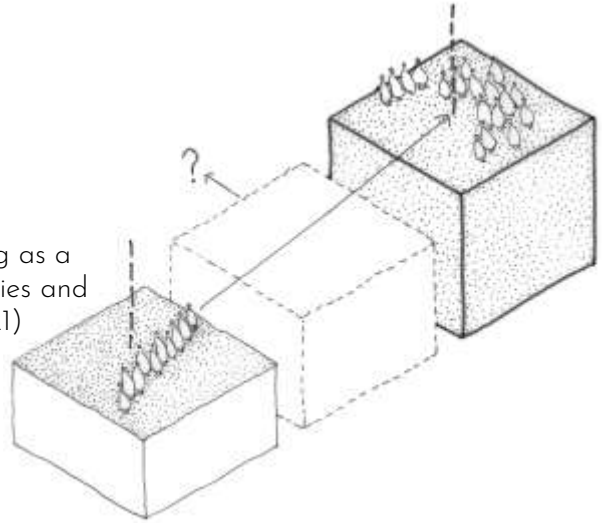


Figure 5.2: Transitional zone acting as a mediation during initiation ceremonies and rituals (Author November 2021)

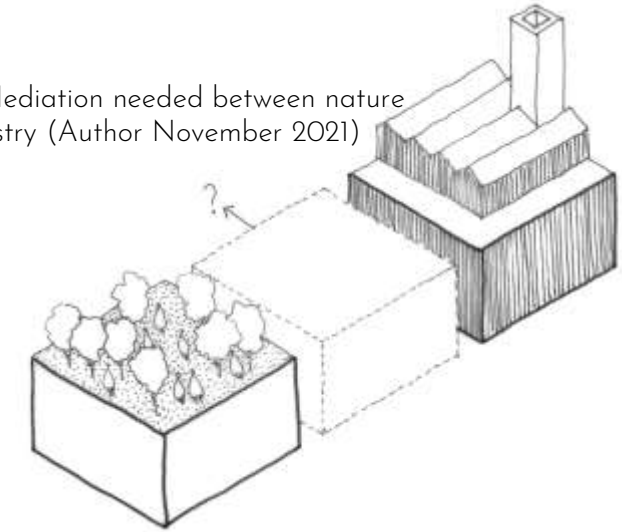


Figure 5.3: Mediation needed between nature and industry (Author November 2021)

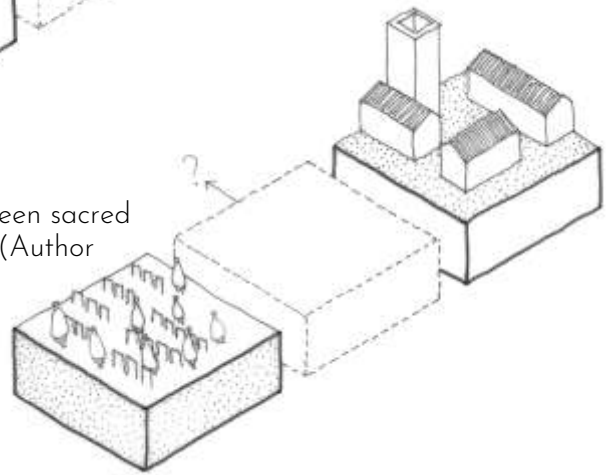


Figure 5.4: Unknown mediation between sacred cemetery and industrial Silverton (Author November 2021)

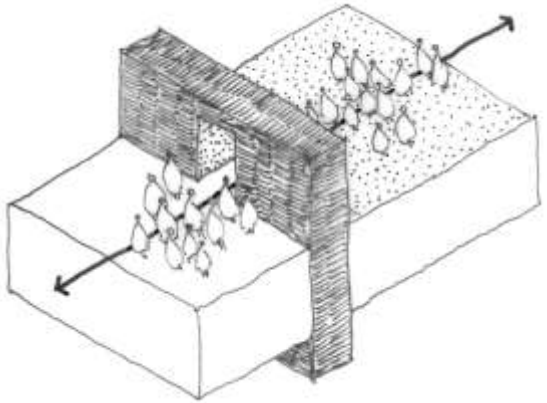


Figure 5.5: Opening through a wall as threshold (Author November 2021)

Transition Spaces

In transition spaces, two opposing or conflicting spatial conditions are directly connected, with the transition space sharing qualities from both of the conditions simultaneously. Transition spaces can further be differentiated into threshold spaces and connecting spaces.

Threshold Spaces

Threshold spaces is singular points between two conditions. For example, a door between outside and inside. Threshold spaces also carry the associated meaning that it condenses both opposing conditions in such a manner that the experience lies in the juxtaposition of the two conditions rather than the transition between the conditions (Ng & Lim 2018).

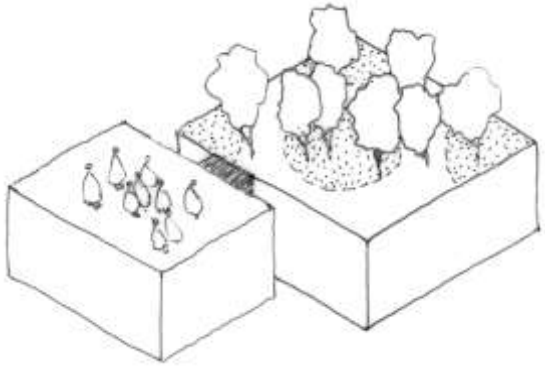


Figure 5.6: Permeable barrier as threshold (Author November 2021)

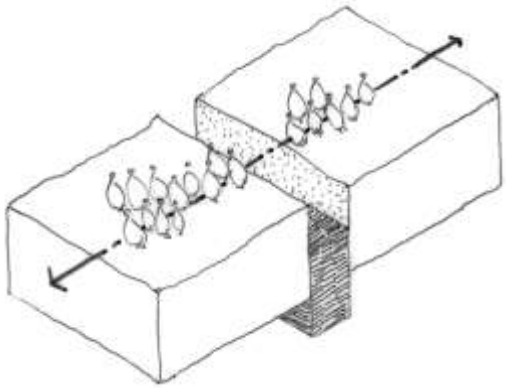


Figure 5.7: Gap acting as a threshold (Author November 2021)

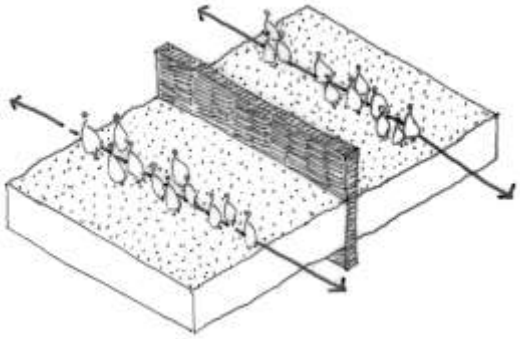


Figure 5.8: Wall blocking movement (Author November 2021)

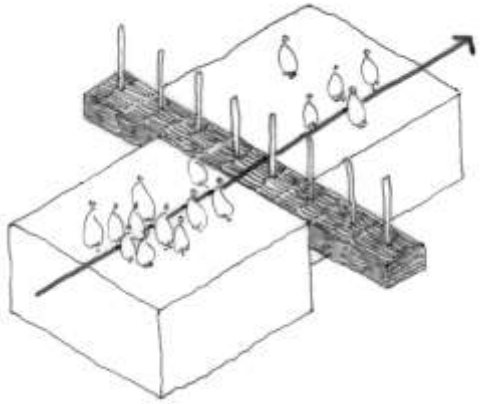


Figure 5.9: A singular point between two conditions (Author November 2021)

Connecting Spaces

In connecting spaces, the condensed threshold is elongated to create a space that can be experienced in itself. Although it carries qualities from both the conditions a new third space is created connecting both the conditions. Here the emphasis is on the newly created spatial condition rather than the juxtaposition between the two conditions.

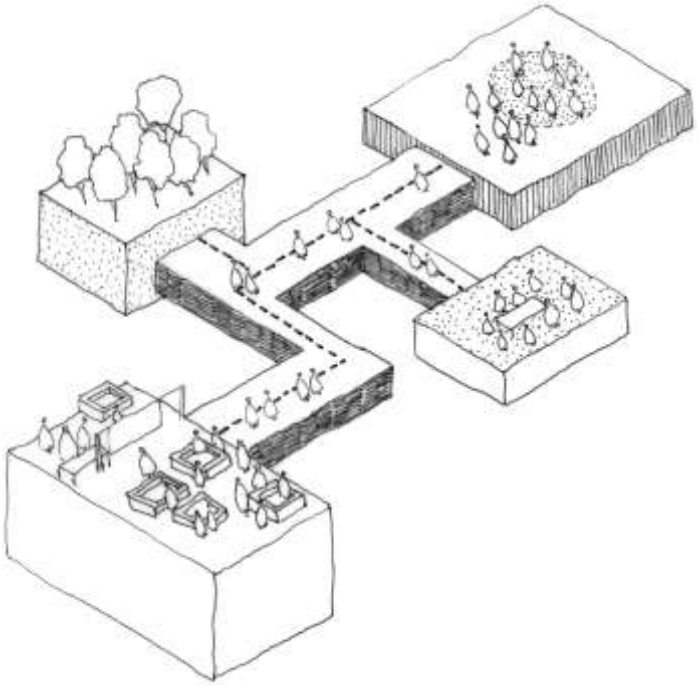


Figure 5.10: A circulation route acting as a connecting space (Author November 2021)

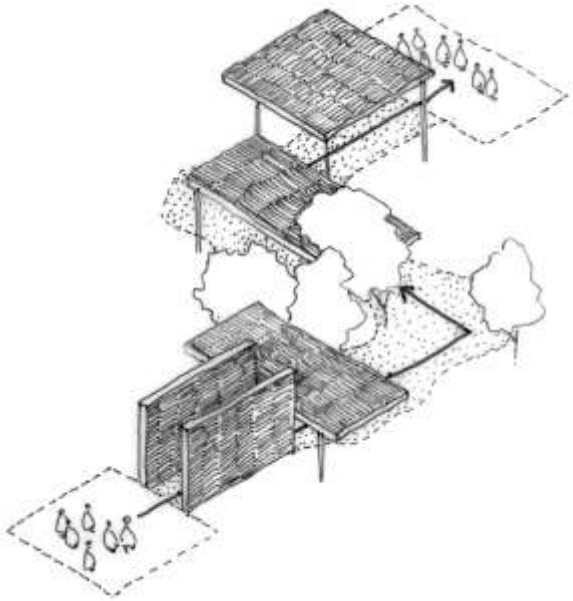


Figure 5.11: A connecting space can be merely experiential (Author November 2021)

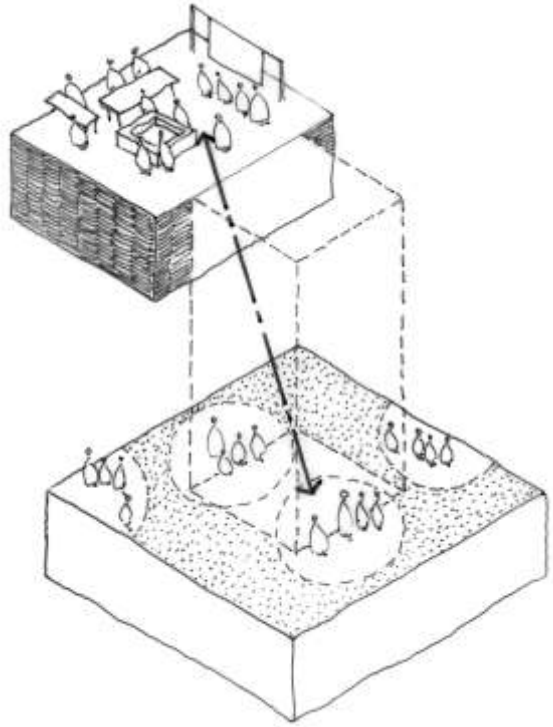


Figure 5.12: A vertical connection point between two conditions (Author November 2021)

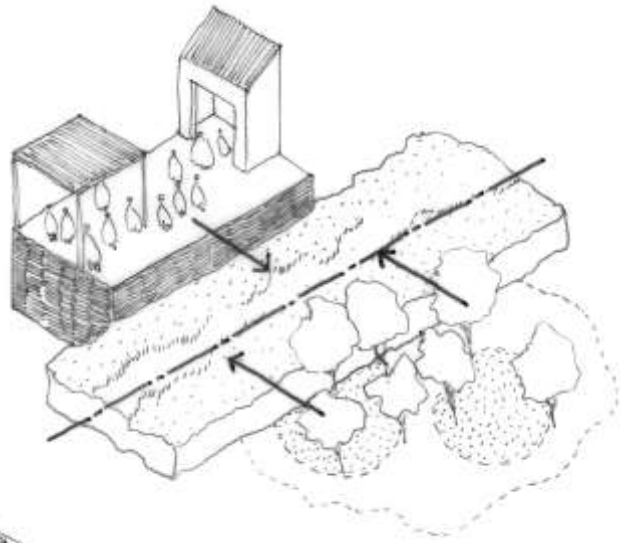


Figure 5.13: A space between nature and industry where mediation can take place (Author November 2021)

Mediating Spaces

Where threshold spaces created a third space to connect two conditions, mediating spaces are spaces that is created when two conditions interact with each other. Occupying space and overlapping space are examples of mediating space that can be utilised in this project.

Occupying Space

Two conditions that exist in close proximity requires a mediating third space to either facilitate the spill out of the programme or to create a space for the users of the conditions to pause and reflect before further engaging with the conditions.

In this sense the occupying space is generally not programmed but gains a programme as a result of people occupying the space between the two conditions. As an extension of a threshold space, the occupying space has the potential to create new programmes and qualities or borrow from the conditions that it mediates between.

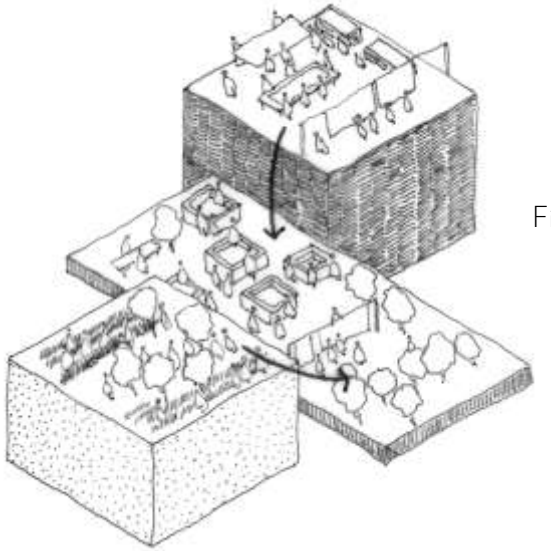


Figure 5.14: A new programme can be created between two conditions (Author November 2021)

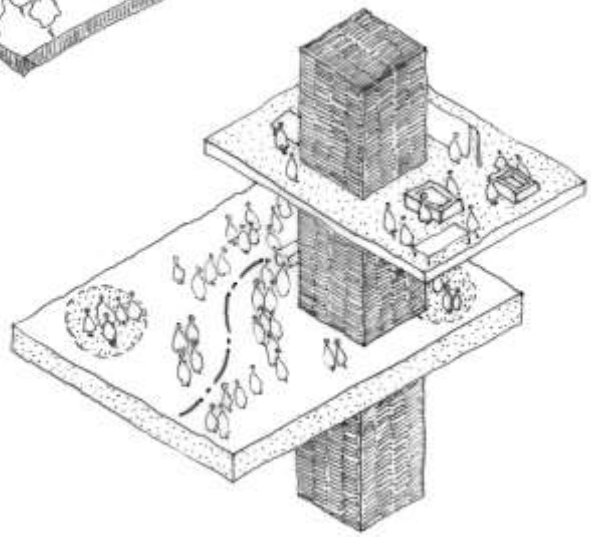


Figure 5.15: A new programme can also be created between two vertical conditions (Author November 2021)

Overlapping Space

With the direct interaction between two conditions, an overlap in function/spatial qualities occur, creating a new third conditions that is inherently part of both the conditions. In this manner, the overlapping space creates an opportunity to cross-programme the conditions, in turn enabling new possibilities and spatial qualities.

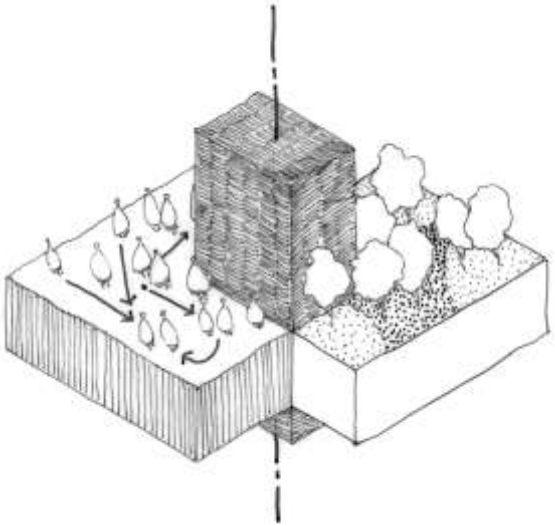


Figure 5.16: Overlapping conditions creating new spaces (Author November 2021)

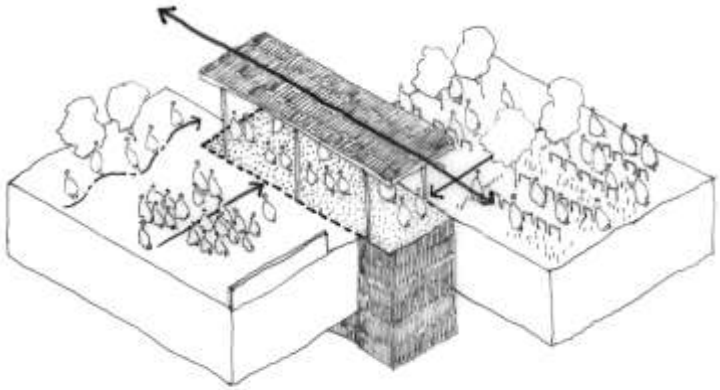


Figure 5.17: These new spaces act as a connecting space between the two conditions (Author November 2021)

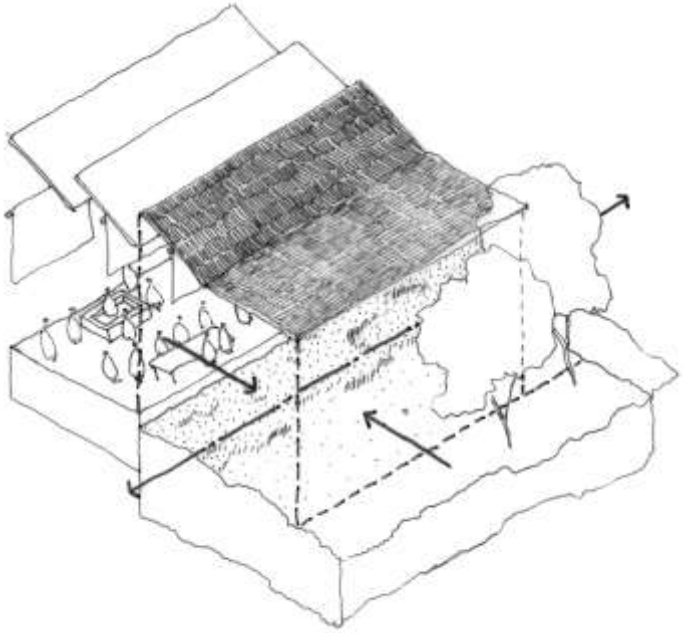


Figure 5.18: Overlapping industry and nature conditions allow for mediation to occur (Author November 2021)

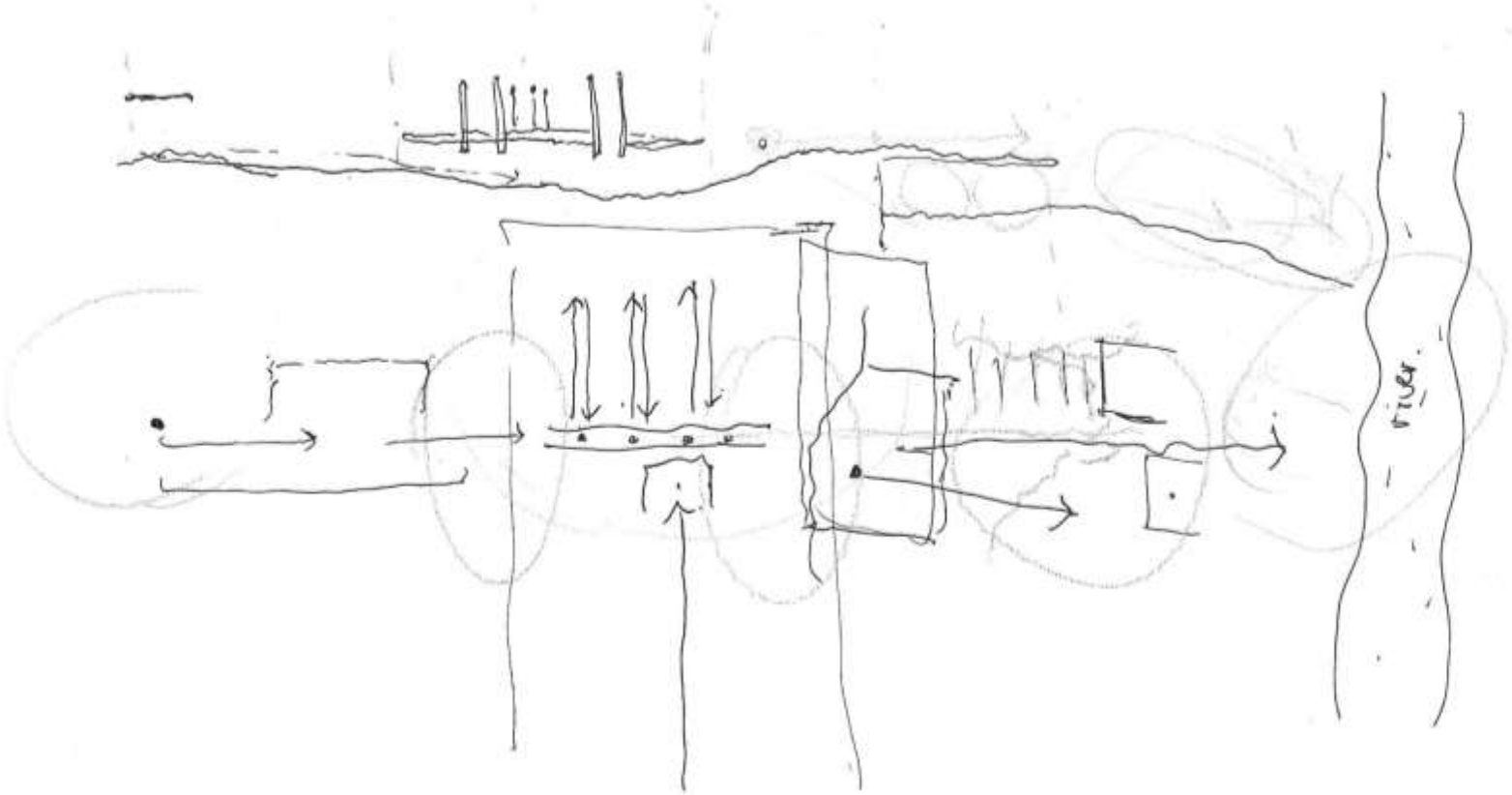


Figure 5.19: Conceptual plan and section depicting the relationship between nature and architecture (Author November 2021)

CONCEPT

Design Concept

The concept of this project is to allow natural processes found on the site and industrialisation found in the context, to inform one another, creating a third, liminal condition that mediates between both the established conditions. The third condition would facilitate the transition from one condition to another by including aspects of both conditions into the third space. It is through the creation of this new third space that the processes of the industrial context can be changed to suit the natural processes found on the site (Figure 5.19).

Figure 5.20: First iteration of applying the concept to site (Author April 2021)

With the first attempt at applying the concept to the site, the result focussed on created a route from the Silverton Cemetery to the Moreleta Spruit with various spaces emerging in-between (Figure 5.20).

Figure 5.21: Second iteration of applying the concept to site (Author April 2021)

The second iteration of the concept investigated how spaces in the landscape can be designed through architecture. The maquette also allowed the exploration of position programmatic organisation and their interaction with the landscape (Figure 5.21).

Constructing the path

Design Development and Technological Integration

As the design concept proposes the investigation of liminal space existing between industrial and natural processes, the technological concept strives to translate this concept further into a technological concept and intent. It is to act as a criterion for decision making and later reflection and critique.

Technological Concept

The design concept of this project attempts to focus on points of change between multiple overlayed and overlapping conditions. Applying this design concept to a technological concept illuminates the liminality that exists between any two elements or conditions that is to be either joined, separated or mediated. The technological concept thus explores the inherent relationship between two elements or conditions that is to be mediated by a third, liminal space. The mediating element however, allows change and transition to occur from one element or condition to the next.

Technological Innovation

In the process of translating design concept into technology, it is clear that two main innovations are present in this project. Firstly, the technological design attempts to move past the formal reference of the surrounding industrial context towards understanding the underlying reason for the formal language of industry in Silverton. Secondly, the translation of the theoretical framework into an appropriate technological language that aims to functionally and experientially serve the spaces and programmes of the intervention.

Technological Contribution

As an extension of the technological innovation, the contribution lies in developing methodologies of alternatively responding to contextual languages and typologies past the formal and superficial. Secondly, the contribution lies in developing a suitable framework that is appropriate to the industrial context of Silverton that can help facilitate the technological design of an architectural project. Lastly, the entire scheme is situated in a changing industrial Silverton, necessitating the need for the technological design to also respond to the general theme of future change.

Technological Intent

Analysing the typology of the surrounding industrial warehouses and light industrial factories, it is clear that the technology used is to facilitate the functional and efficient nature of industrialisation. Therefore, financially and structurally efficient steel structures are predominantly employed to cover large areas that can be easily moulded and added on. Learning from this, the technological intent is to develop a structural system that is both poetic and structurally adaptable, allowing for future expansion and use.

Extending the initial concept of a mediation between nature and industry, the structural system used replicates the symbiotic nature of the natural processes found on the site by being comprised of smaller individual structural elements that together create the structural system.

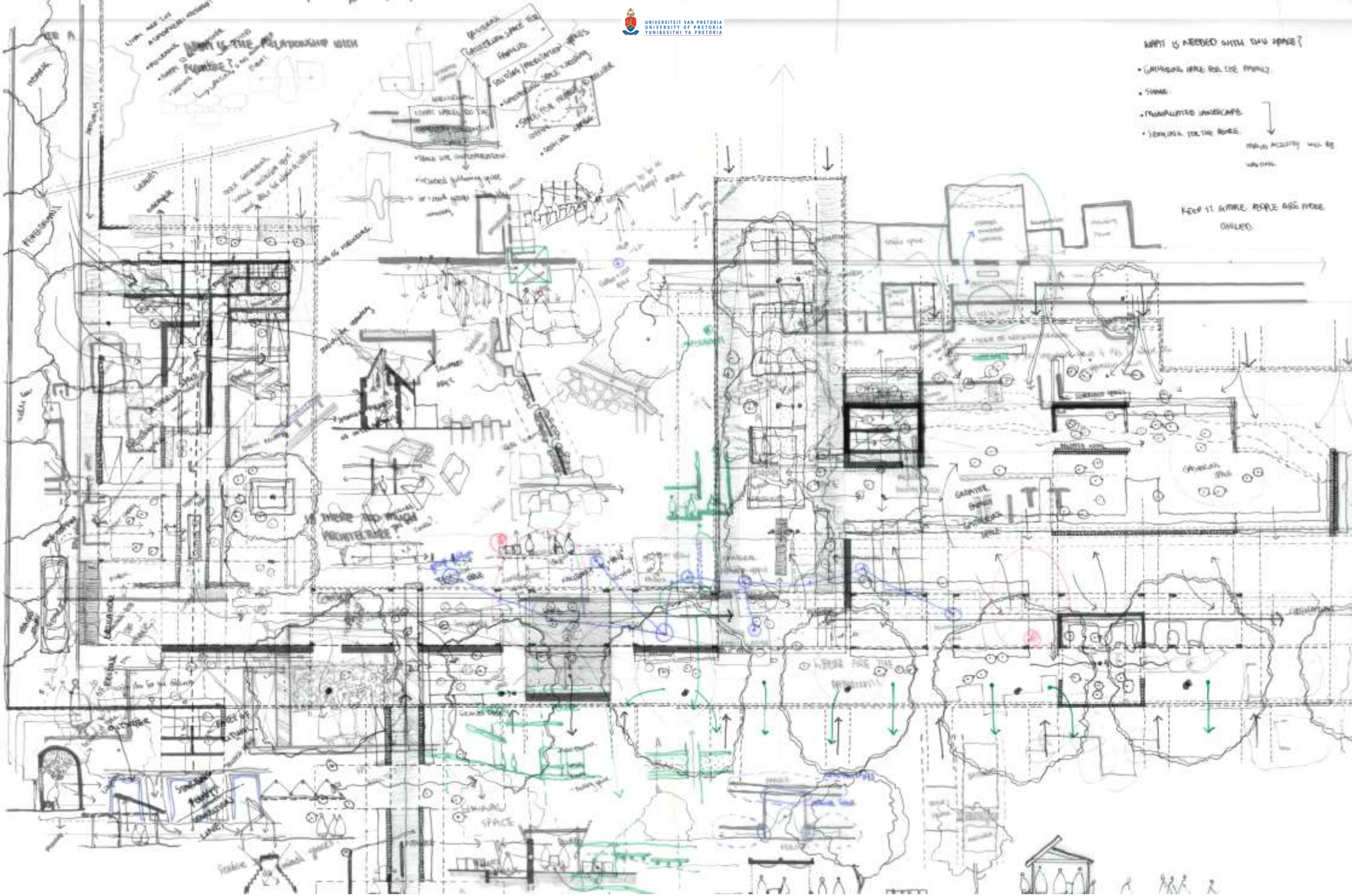


Figure 6.1: Collage of development drawings (Author November 2021)

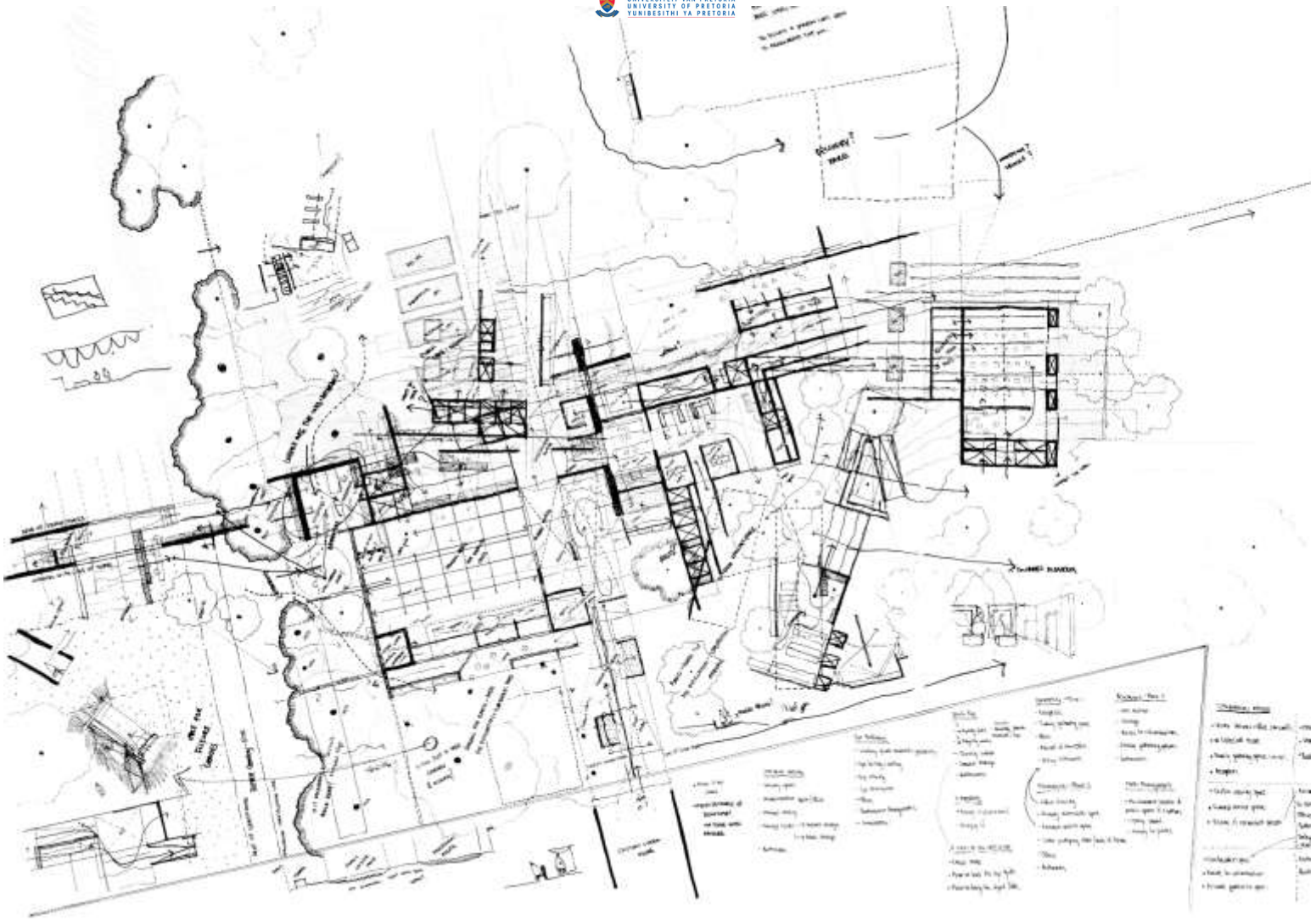


Figure 6.2: First design iteration drawing (Author July 2021)

At the first design iteration (Figure 6.2), the programme was sequentially organised with the leather dyeing facility linking the project with the existing linen store and the resomation route connecting the Silverton Cemetery and the Moreleta Spruit. The two programmes intersecting in overlapping and cross-programmed spaces that allowed the users of each programme to interact with the other programme.

Figure 6.3: Second design iteration drawing (Author July 2021)

A refinement of the original intention to intersect and cross-programme the spaces between the leather dyeing facility and the resomation route streamlined the sequential organisation of both programmes. However, the spaces that was forming did not allow the resomation route to elongate across the site as it was hampered by the spaces created for the leather dyeing facility.

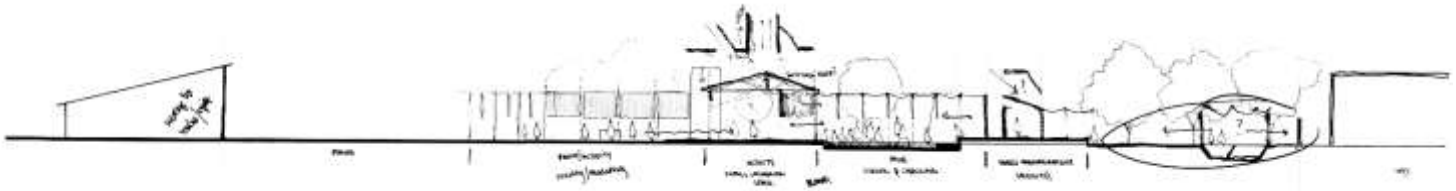


Figure 6.4: First design section iteration (Author July 2021)

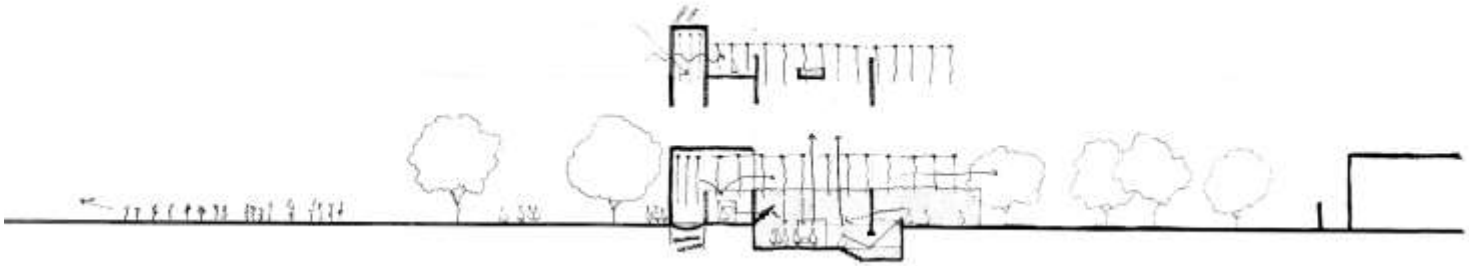


Figure 6.5: Second design section iteration (Author July 2021)

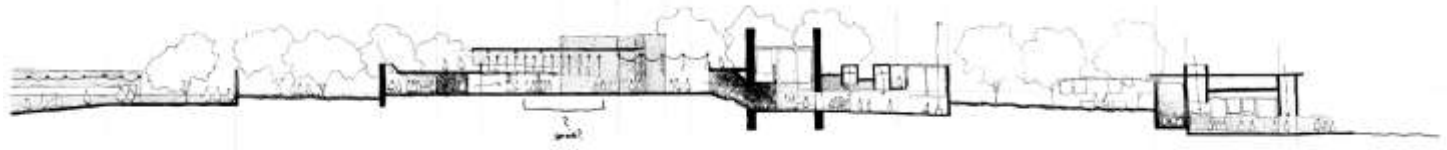


Figure 6.6: Third design section iteration (Author July 2021)

The exploration of the sections showed that the horizontal organisation of programmes limited the explorations of various spatial, formal and structural possibilities. As a project that is situated in and om the landscape of the site, more interaction with the ground plane and landscape of the site was necessary to convey the concept that the industrial and natural processes are changing.

Although the intersection and cross-programming of spaces is conceptually a rich exploration of spatial liminality, the programmatic requirements for each of the programmes were not being met with the horizontal organisation. The resomation route needed private gathering spaces that could function as funeral service spaces and meditation spaces, whereas the leather dyeing facility needed an unimpeded floor surface to move the leather from one station to the next.

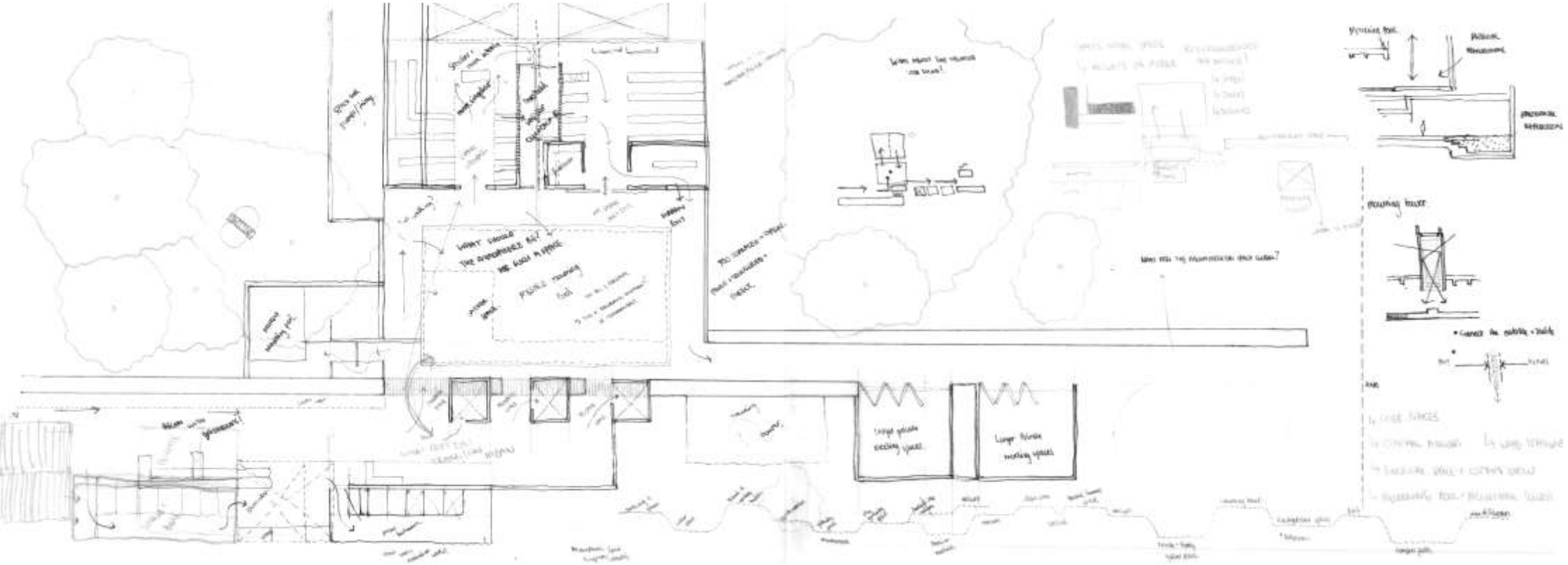


Figure 6.7: First iteration of the underground resomation route (Author September 2021)

Ground Floor Plan –Resomation

In order to separate the two programmes but still integrate them into one whole, the resomation route was pushed below the ground and under the leather dyeing facility. However, this required the underground resomation route to be re-explored for spatial possibilities and spatial sequencing (Figure 6.7).

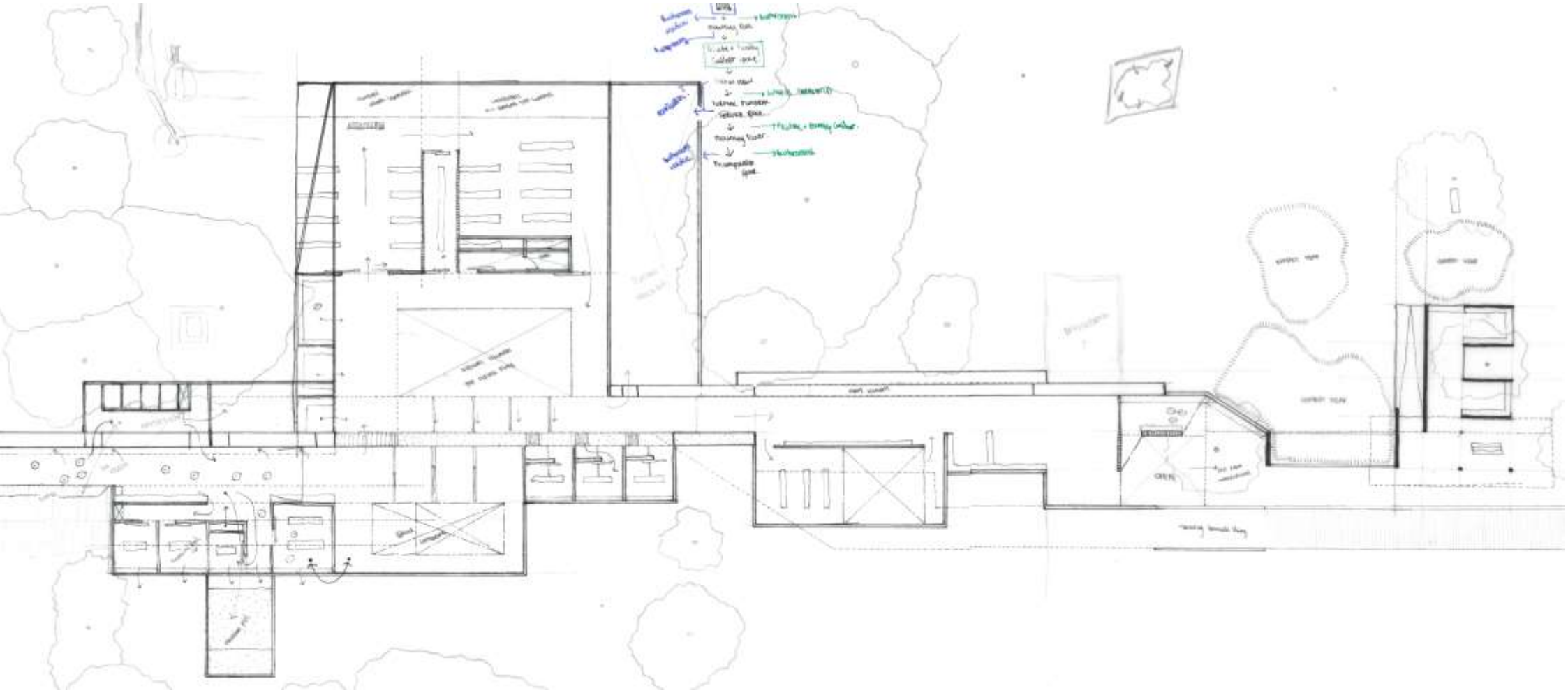


Figure 6.8: Second iteration of the underground resomation route (Author September 2021)

With the resomation route organised, it can function independently as per the programmatic and spatial requirements from the leather dyeing facility, creating two conditions to be mediated by a third liminal space. The third liminal space integrating the two overlayed programmes is formed by the puncturing and disruption of the leather dyeing facility in order to vertically integrate the two programmes.

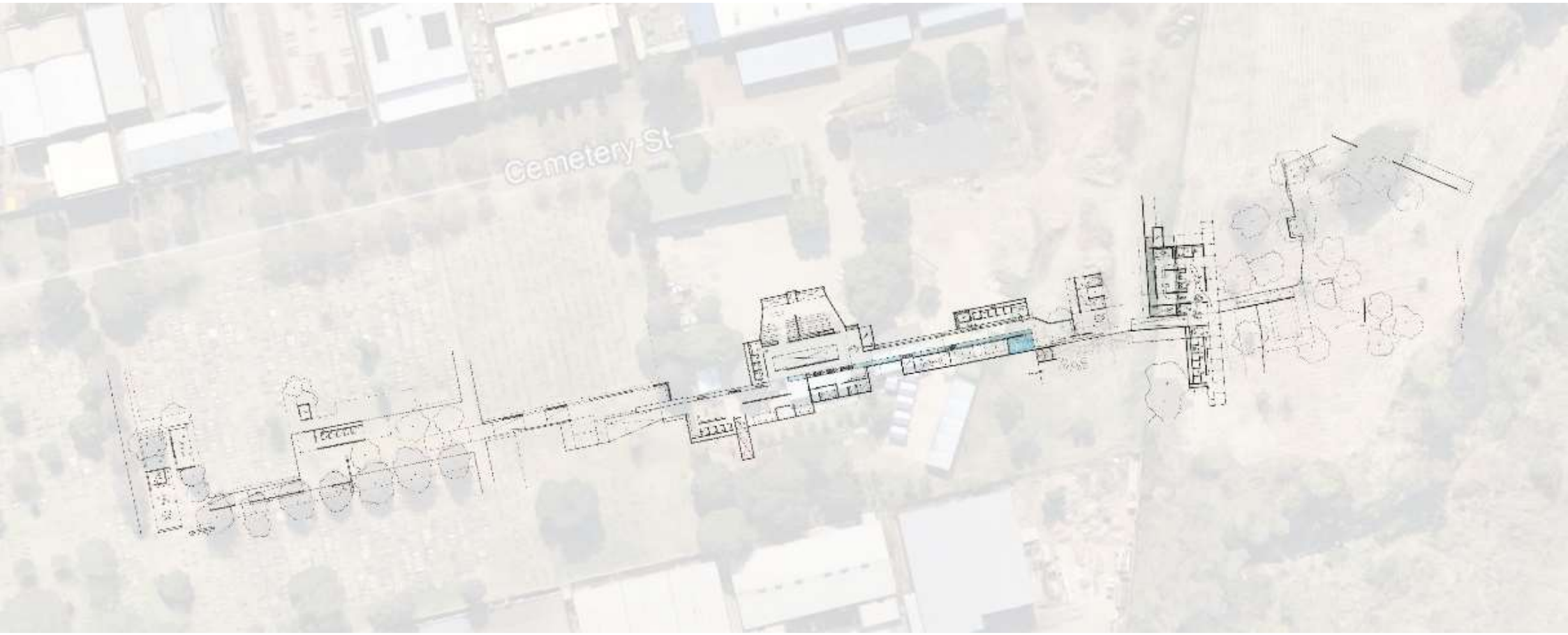


Figure 6.9: Latest iteration of the underground resomation route (Author September 2021)

The revision and relocation of the resomation route called into question the manner in which liminality is to be handled on a programmatic and spatial organisational level. A sequential spatial development is proposed that allows for a third liminal space to develop between each programmed space, creating the final route from the Silverton Cemetery to the Moreleta Spruit where the ashes are to be scattered.

Figure 6.10: Sequencing iteration of the leather dyeing house (Author September 2021)

Ground Floor Plan – Leather Dye

After the separation of the two programmes, a similar sequencing process had to be undertaken with the leather dyeing house. The sequencing focussed on the development of the manifestation of the industrial process of leather dyeing, whilst simultaneously attempting to create outdoor spaces in nature.

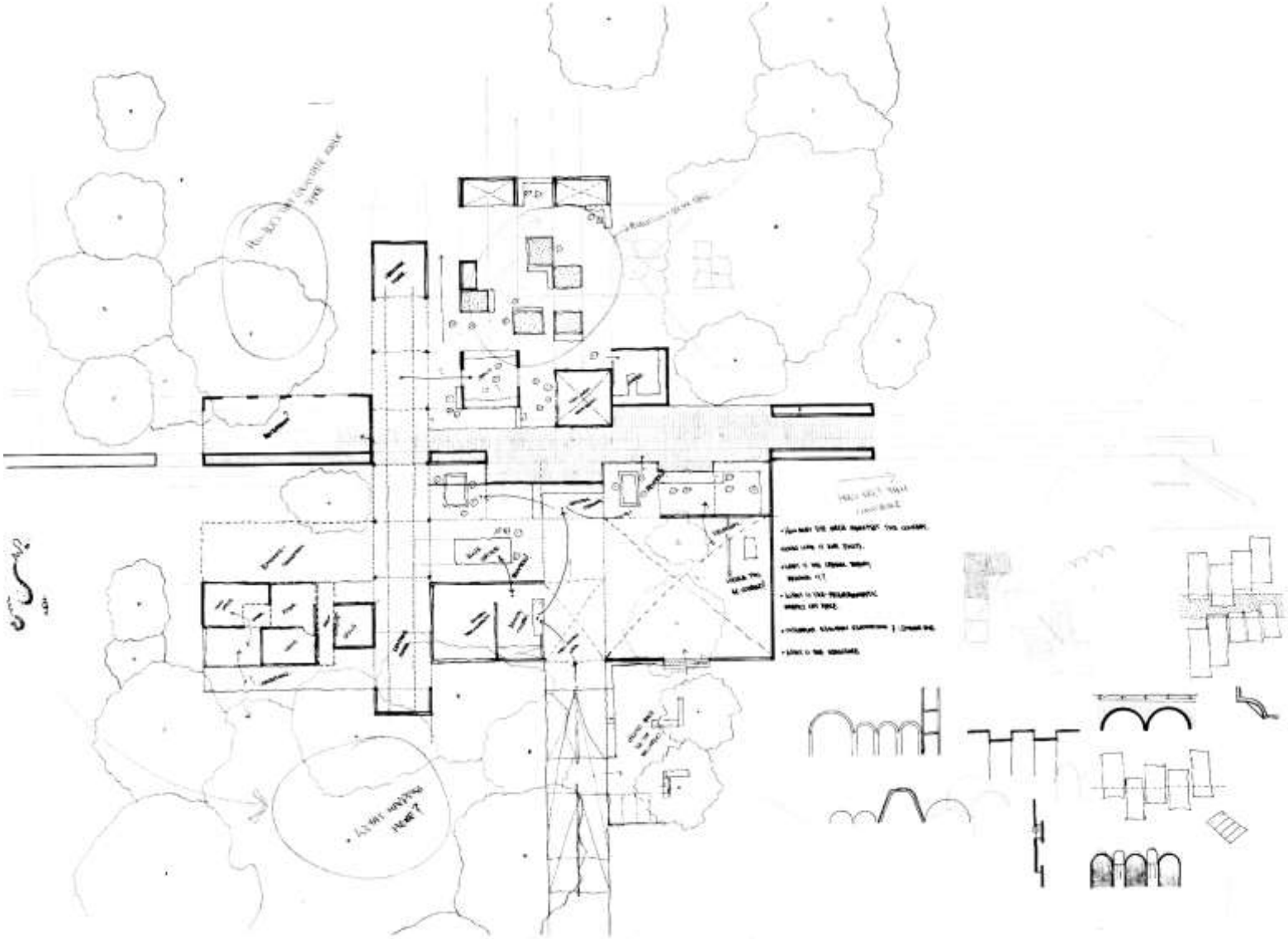


Figure 6.11: First design plan of the leather dyeing house implementing the sequencing of processes (Author September 2021)

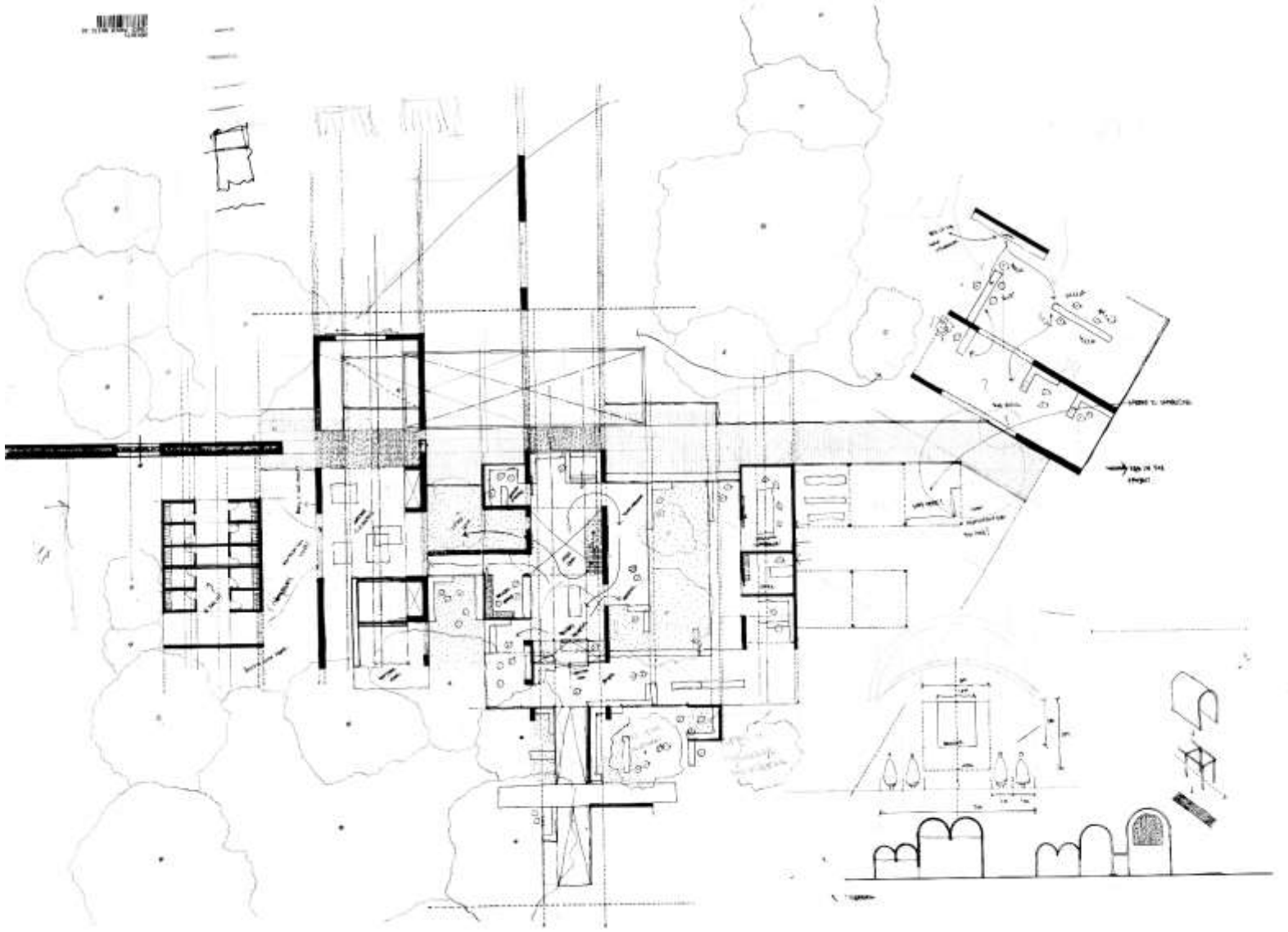


Figure 6.12: Second design iteration attempting the organisation of the plan around the industrial processes (Author September 2021)

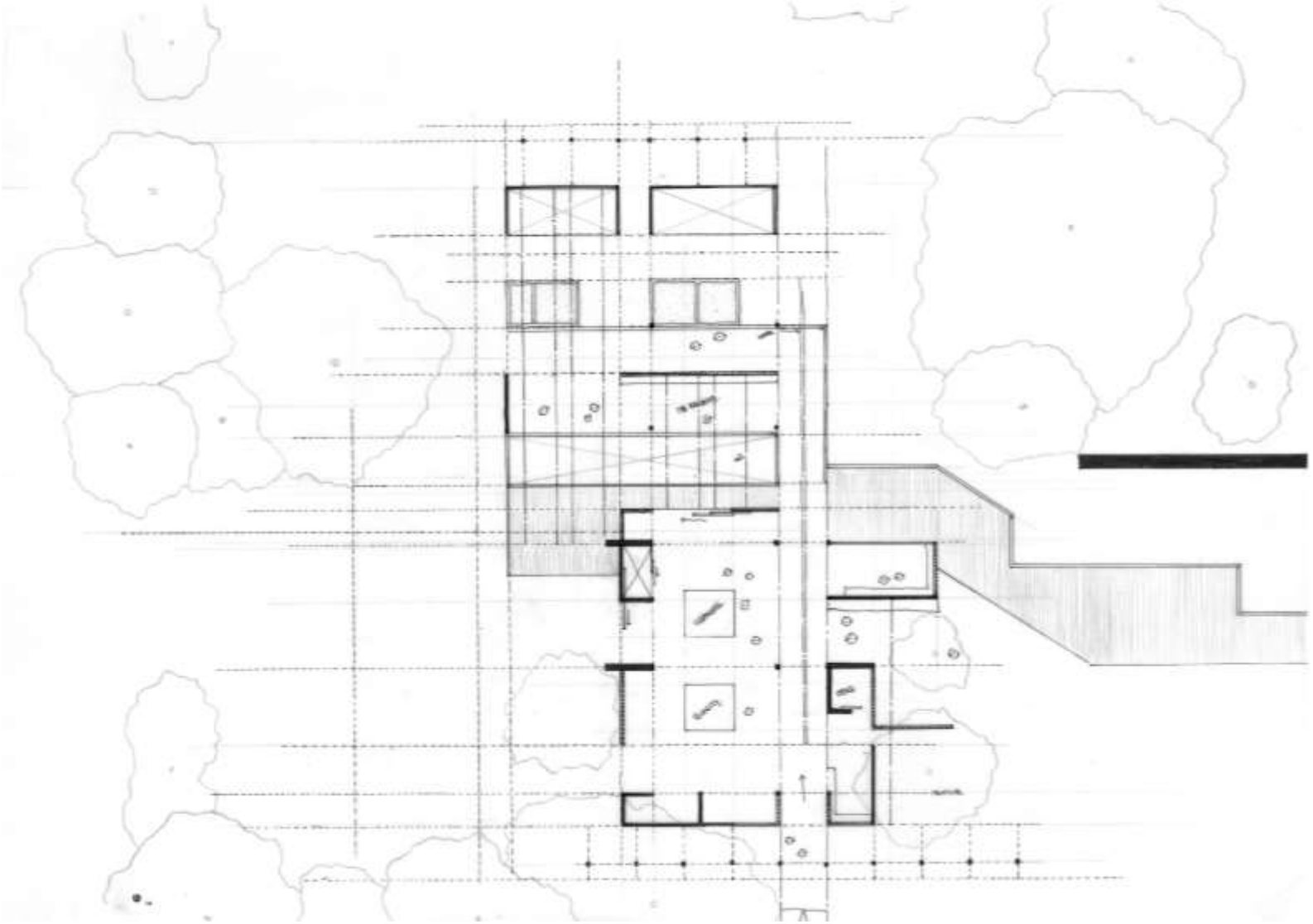


Figure 6.13: Third design iteration showcasing the implementation of the leather dyeing process spatially (Author September 2021)

Figure 6.14: Latest iteration of the leather dyeing house (Author September 2021)

As the resomation route was moved below ground, more space was allocated for the organisation of the leather dyeing facility. A central line mimics the route taken by the resomation route and acts as the ordering principle for the leather dyeing process. Sequentially, the programmatic organisation resembles a factory with various separate stations housing a specific programmatic and spatial requirement. The sequence moves from the linen store adjacent to the site, to the delivery and quality checking are and then to the leather dyeing facility.

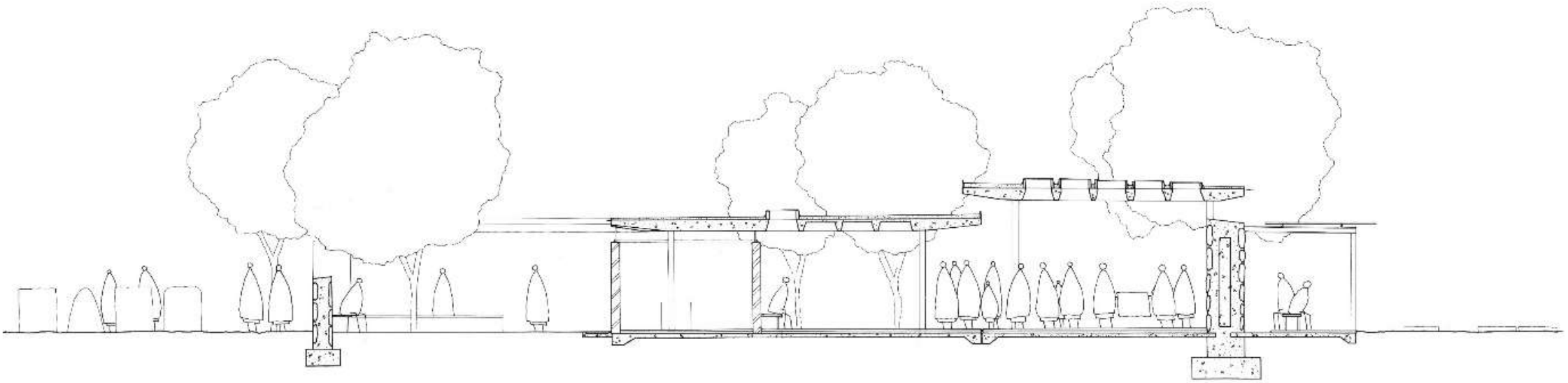


Figure 6.15: 1:50 Section of the coffin receiving space (Author September 2021)

Technological Integration

1:50 Section – Coffin Receiving

With the development of the coffin receiving space, it became important to establish a language of architecture that responds to the gravestones and nature that surrounds this design. As such, a gradient of responses was created, namely: an enclosed courtyard providing private space for the families visiting the cemetery, an administration office, a shaded space for receiving the coffin and, finally, a steel roof to, delicately, relate to the graves of children.

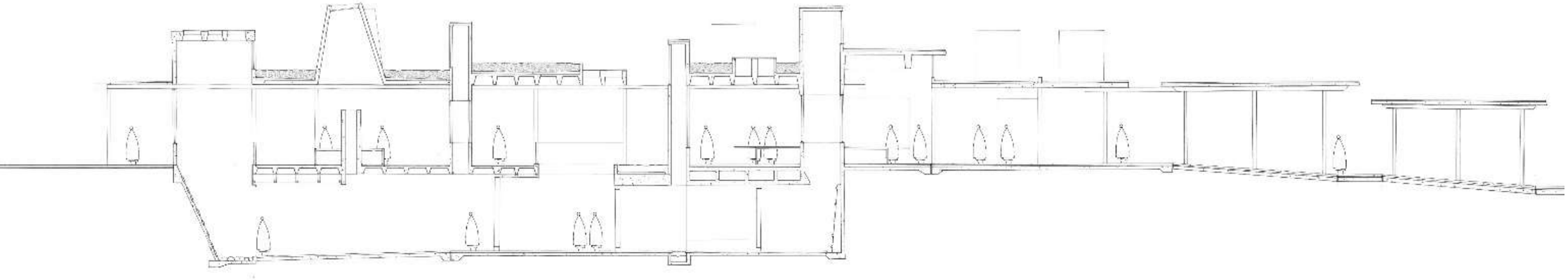


Figure 6.16: 1:50 Lateral section through the project (Author September 2021)

1:50 Section – Main Section

Cutting laterally through the site, the section showcases the relationship between the resomation route and the leather dyeing facility , as well as the bridging, puncturing, disrupting and sliding methods employed to connect the horizontal and vertical spaces together.

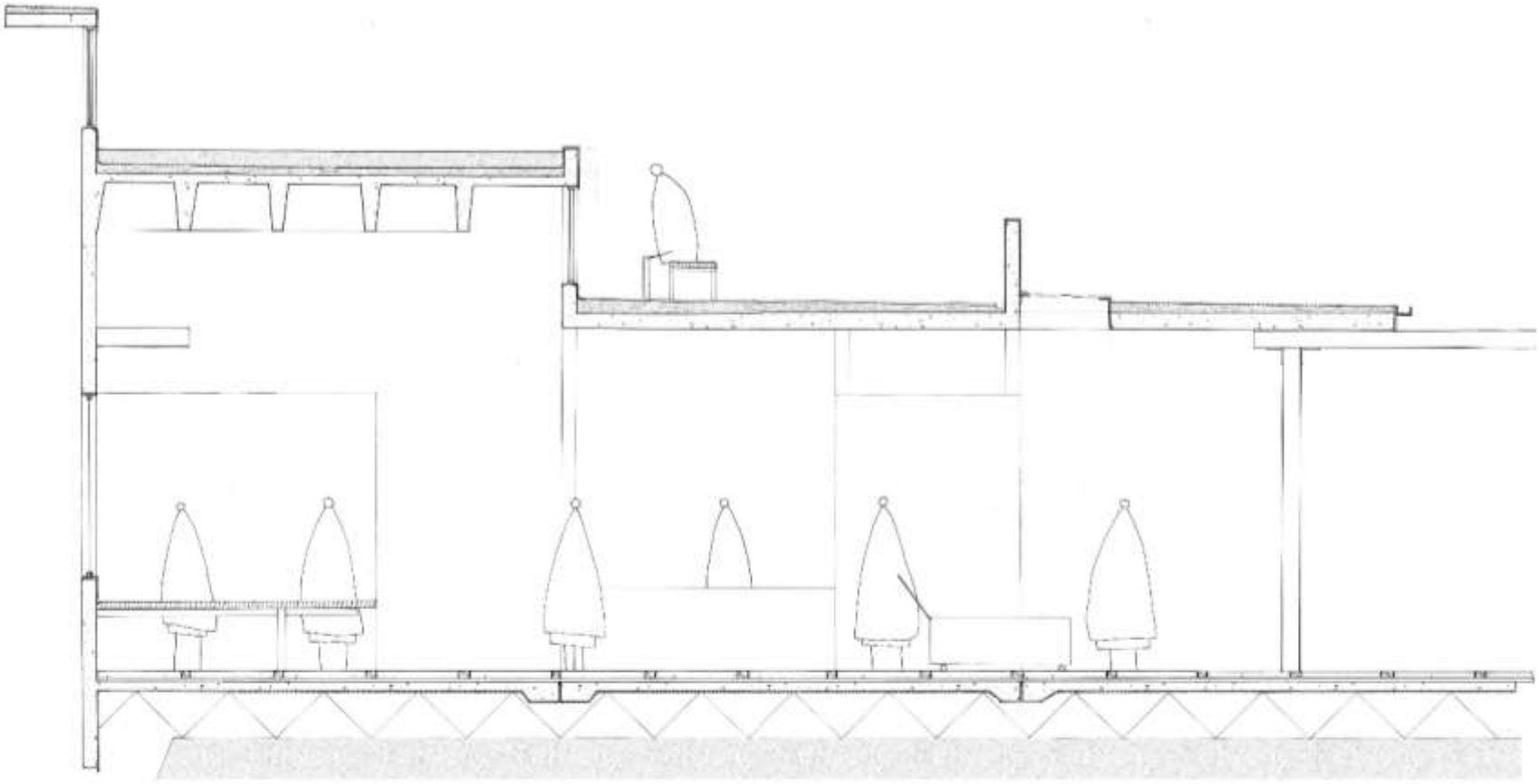


Figure 6.17: 1:50 Lateral section through the project (Author September 2021)

1:20 Section – Reception and Quality Checking space

Focussing on the connection between the linen store and the delivery and quality checking spaces, this section employs sliding and bridging of horizontal roof planes to define and articulate the connection from the linen store. This space will also be the main focus of the daylighting study.

Structural System

The initial exploration of the project was done in brick to firstly, re-use the bricks of the existing structures that is to be demolished. Secondly, ERA Bricks is located close to the site, allowing for the structure of the architecture to link to the quarry that is currently run-down and depleted. Although it metaphorically linked to the context of Silverton, it was unresponsive to the typologies of industries and light factories as found in the direct context of the site.

Revising the concept showed possibilities for the structural system and material finishing to be articulated as one element to further define the concept of liminality already present in the project. In this case, the internal and external condition of the architecture is defined as two opposing conditions, with the concrete structural system mediating in between. Furthermore, methods such as bridging, puncturing, disrupting and sliding can manipulate the structural system to enhance and further develop the internal condition of the architecture.

Concrete is a suitable material as it can act as both a structural system and a finishing material that is also pliable to the methods of bridging, puncturing, disrupting and sliding, imperative to the liminal concept articulation of the architecture.

The structural system consists of four cumulative stages, namely: an initial stage where the ground plane is manipulated to define the Resomation Route from the Silverton Cemetery to the Moreleta Spruit. Secondly, a horizontal concrete structural system separates the Resomation Route from the leather dyeing facility to create clear boundaries between sacred and profane. Thirdly, an overhead

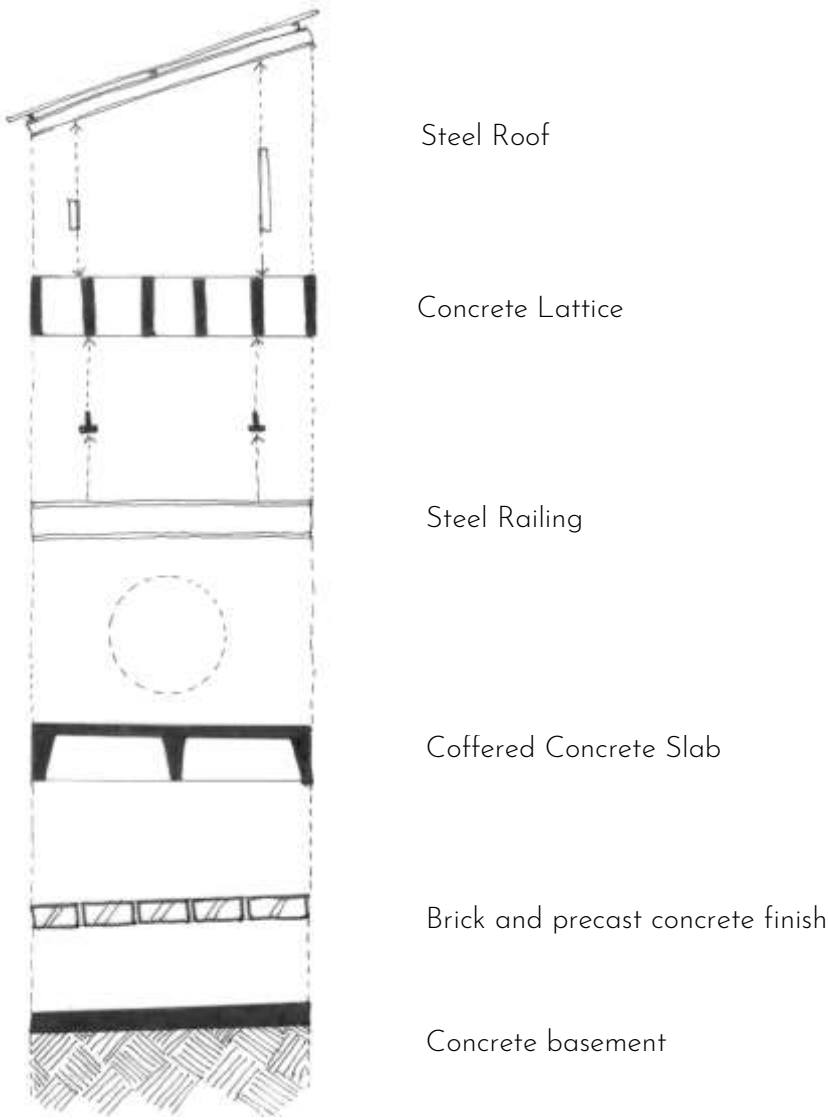


Figure 6.18: General structural system in the project
(Author September 2021)

concrete plane articulates the leather dyeing facilities' internal condition and connects it to the existing linen store, whilst also defining the external spaces of the Resomation Route. Lastly, the concrete structural system is manipulated to integrate the Resomation Route with the leather dyeing facility by means of bridging, puncturing, disrupting and sliding.

Learning from the natural symbiotic relationships of the site, the structural system consists of various smaller and individual structural systems, namely: a concrete basement structure, a two-way spanning waffle-slab, a structural steel member for supporting the leather dyeing house, a concrete lattice-beam structure acting as the main backbone of the leather dye house and lastly, a steel roof responding to the context. In this way, each structural system supports the other, creating a tiny symbiotic eco-system that form one larger structure.

Materials

The application and choice of materials is seen as an extension of the design and technology concept. The choice of materials stem from the mediation between industry and nature, with the act of mediation being done through the introduction of a third element that has characteristics of both nature and industry.

Concrete

The main structure of the architecture consists of a concrete column and lattice-beam system. Given the unsustainability of concrete, mainly the usage of Portland cement, certain strategies are being followed to increase the sustainability of the concrete in the project, namely: substituting 50% of the Portland cement used with fly-ash and decreasing the volume of concrete needed by increasing the amount of recycled aggregate, such as reclaimed bricks, and larger pieces of stone from the site.

Structural steel members

A galvanisation factory is located close to the site, allowing for the reduction in transport costs of the structural steel members that are to be galvanised. The structural steel members are mainly used as a mediating element between nature as the site and the intervention as industry.

Non-ferrous metal sheeting

Recyclable non-ferrous metal sheeting is a pliable material that can be used as a flashing and capping material. As such the material can be used as a mediating element between two conditions that needs to be bridged.

Brick

Reclaimed from the demolition of the existing structures on the site, the recycled bricks are to be mainly used as a floor pattern finish. Newly acquired bricks are to be used as infill material in the construction of bricks screens.

Stone

Dug from the site, the stone is to be used in the construction of concrete walls as aggregate, with larger pieces of stone exposed from the concrete walls. This is done to align the industrial concrete process to the natural site the project is located in.

Recycled granite

A similar process to the stone is to be followed however, the granite is gained from the nearby stone warehouse. Offcuts and excess pieces of granite is to exposed from the concrete walls as a textural and experiential element.

Glass

Double-glazed glass is to be used as a means to improve the thermal efficiency of the intervention whilst gaining a visual connection to the natural site surrounding the intervention.

Technological Detail

Technological Detail concept

The development of the concept for the technical detail is a further extension of the technological concept by exploring methods of articulating the way that two elements are related to one another through methods such as bridging, puncturing, disrupting and sliding.

Technical Detail Development

The two details that is to be discussed is focussed on the methods of bridging and sliding. The mediating material is the copper and brass sheeting that is folded and shaped to slide over the in-situ cast concrete and bridge the internal and external conditions together.

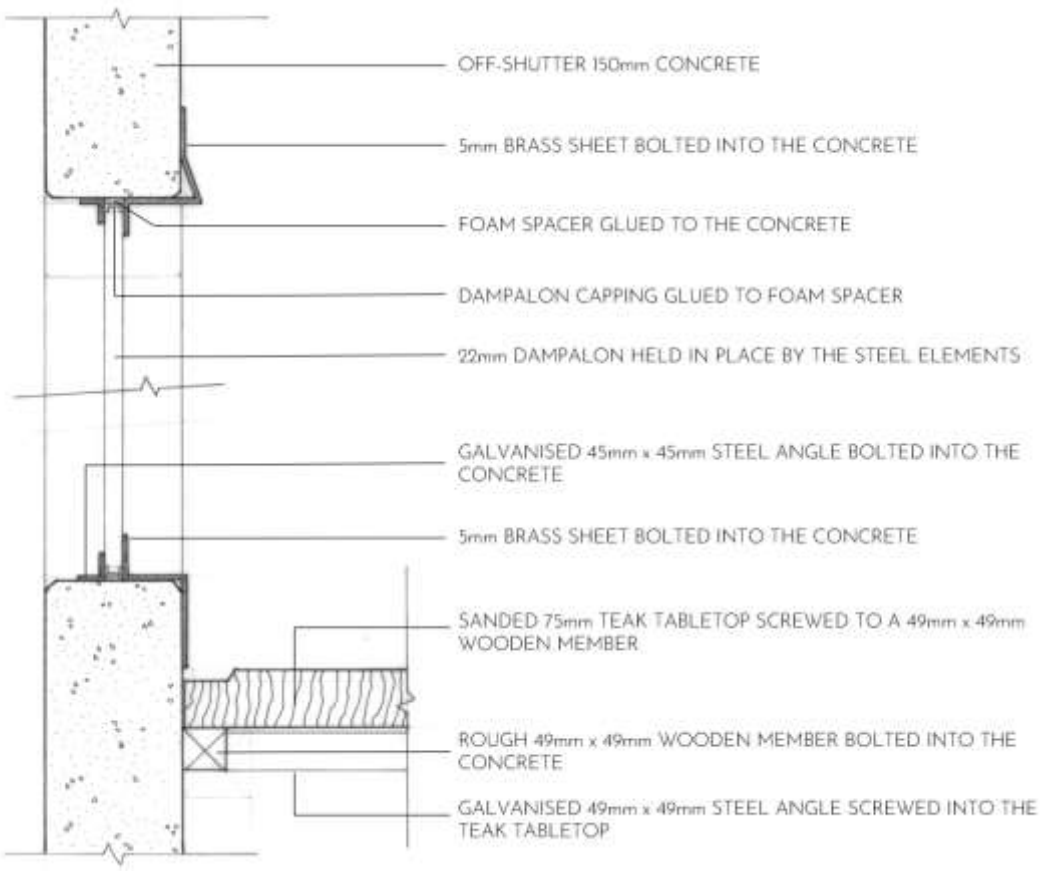


Figure 6.19: Danpalon window detail (Author September 2021)

Detail 1 – Danpalon Window

With the need to introduce even and consistent light at the quality checking desk, Dampalon, an opaque material, was identified. However, this created two conditions: one is the highly technological and synthetic Dampalon and the other is the natural wooden quality checking desk. The Dampalon window was bridged to relate to the wooden desk by introducing a third element, the brass sheeting that could be slid over the concrete to mediate between the Dampalon window and the wooden quality checking desk.

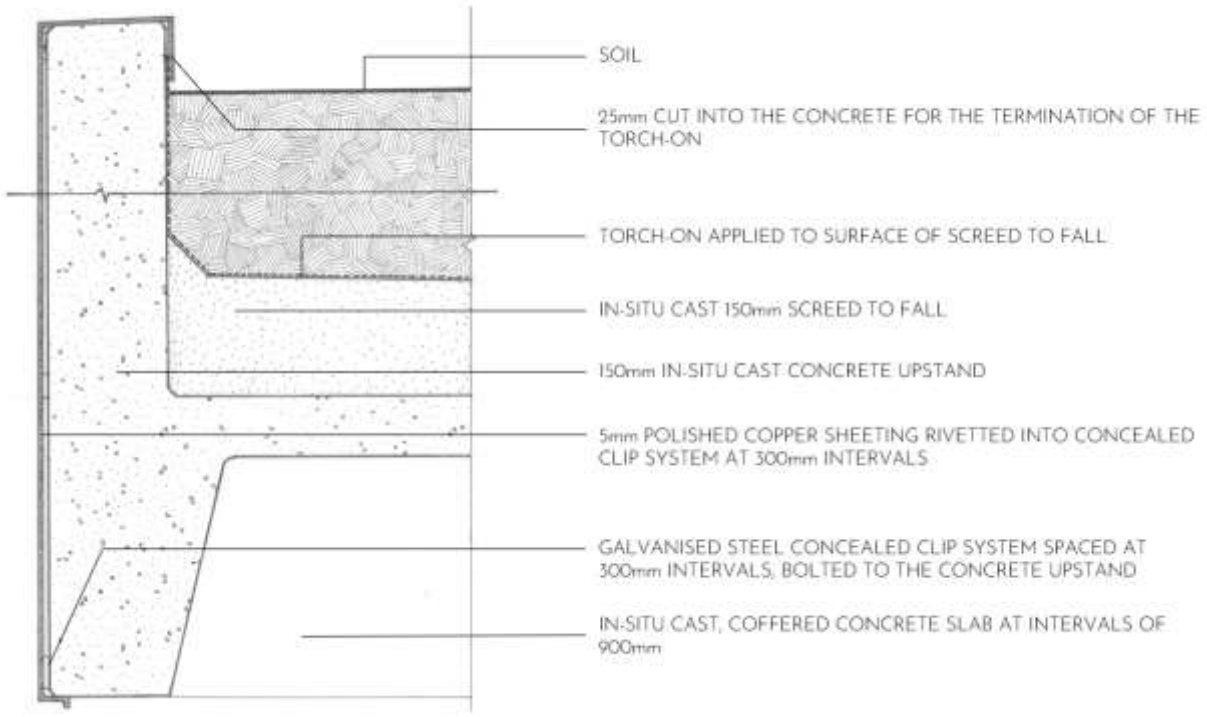


Figure 6.20: Concrete upstand detail (Author September 2021)

Detail 2 – Concrete Upstand

Located at the green roof cantilevering over the central atrium, a way of connecting and articulating the central atrium and the green roof into one space was achieved on a detail level by bridging and sliding a third element of copper sheeting over the upstand and into the central atrium space. With the copper sheeting sliding over the torch on waterproofing it acts as flashing, continuing to cap the upstand and clad the external side of the upstand beam finally, sliding onto the ceiling of the central atrium space.

Environmental systems

This project deals with the changing of natural and industrial processes to work more efficiently with water. As most of the programmes in the project deal with water on some level, the efficient collection, cleaning and distribution of the water is essential.

Disrupting the sequential organisation of the leather dyeing factory and the resomation route is a central water collection point, in the form of a green roof acting as a bio-swale ,that allows water to be captured and then re-distributed to the rest of the project. The sustainable system is seen as a third space that is introduced into the project to mediate between the defined spaces of the physical leather dyeing facility as well as conceptually bridging the gap between the industrial programme and the natural processes.

Most aspects of the leather dyeing facility utilise water to clean and dye the leather. As such a system is required that will circulate the dye water back into the system for future use in the leather dyeing facility. Looking at the resomation process, the water used is again usable after the process has been concluded, allowing the water to be immediately recycled back into the system.

Water Systems

Roof collection

To maximise the amount of water gathered by the intervention, the roof is to act as the main method of collecting water. With the water runoff from the roof, it is gathered in a green roof acting as a bio-filter that filters the debris and sediment from the water. Afterwards it is stored in water tanks and circulated through UV filters, to be either used in the bathrooms for flushing or for supplementing the water used in the dye making or the leather dyeing house.

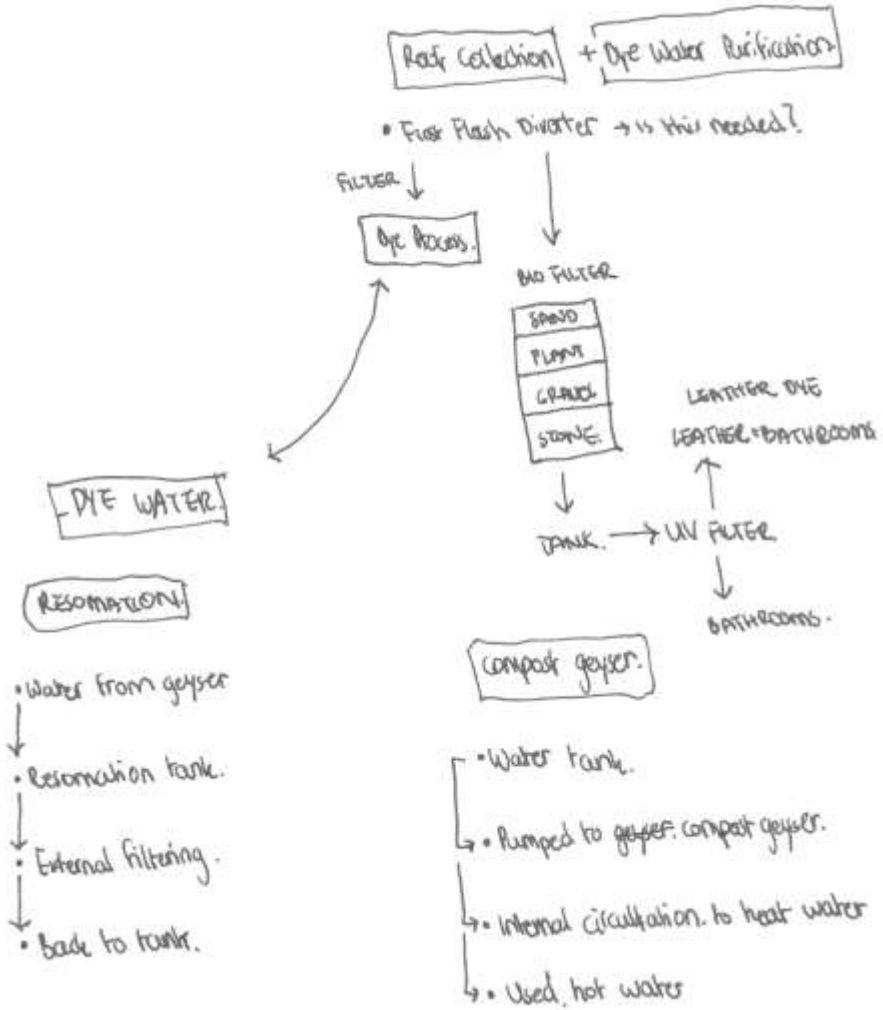


Figure 6.21: Diagram of the water system concrete upstand detail (Author November 2021)

Resomation
Hot water circulated through the compost geyser is used in the resomation process. Given the intense heat and pressure that the resomation process supplies, bacteria, DNA and viruses are completely destroyed, leaving behind nutrient-rich distilled water. This is then filtered through a bio-filter in the form of a green roof where it can either be used for irrigation or recycled back into the system to be used in either dye making or leather dyeing.

Compost geyser heating the water
An alternative to the conventional geyser, the compost geyser provides a method of utilising the heat created from the natural process of decomposition to heat water. This is done by circulating water through an internal water tank in the compost mound. Over time, this becomes a sustainable method of extracting heat from the decomposition process.

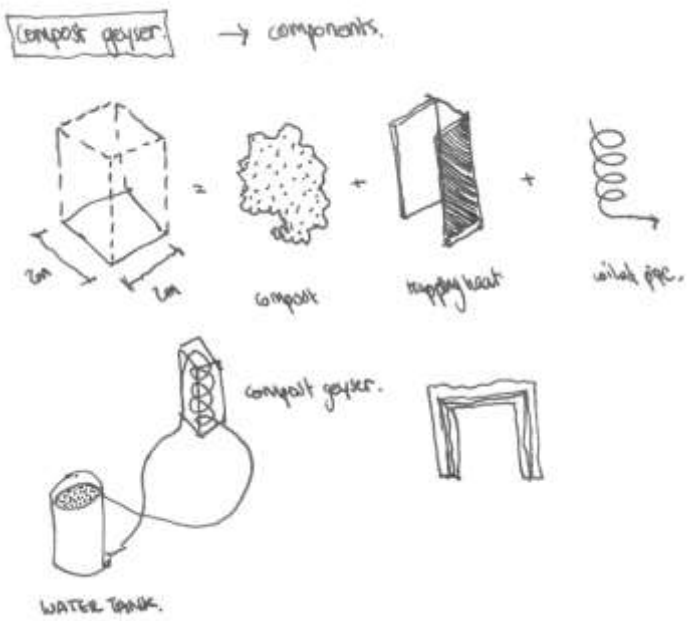


Figure 6.23: Diagram of the compost geyser process (Author November 2021)

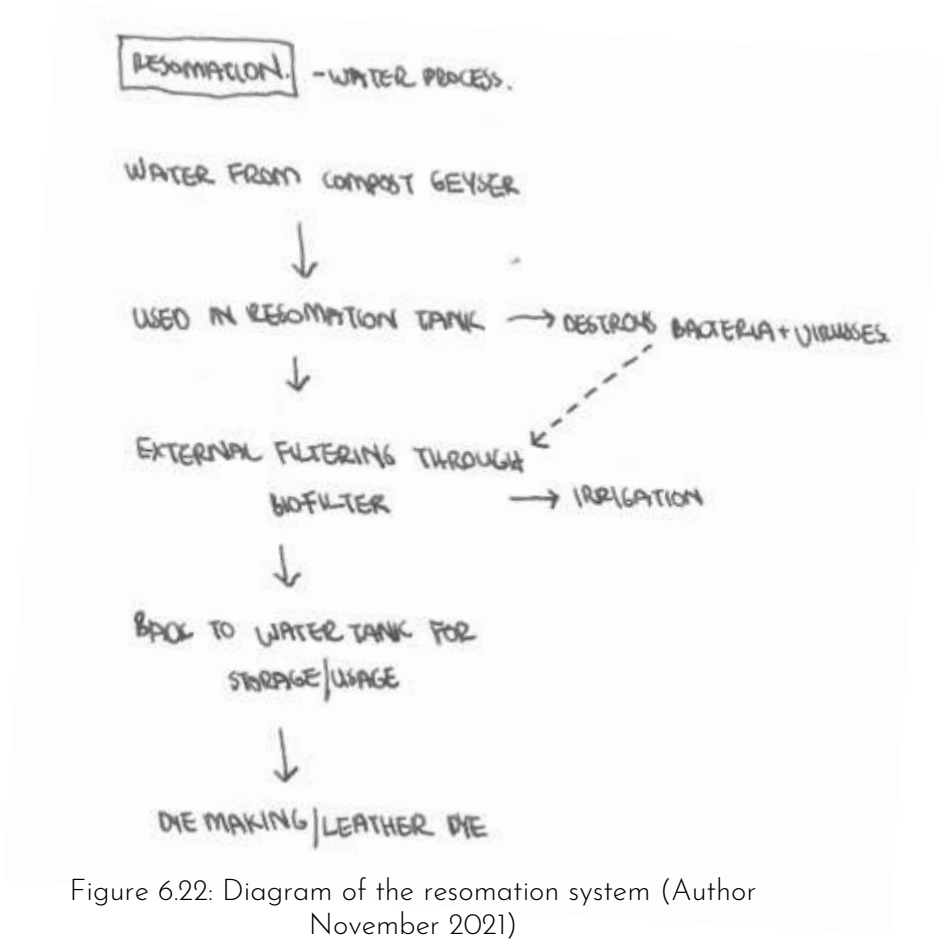


Figure 6.22: Diagram of the resomation system (Author November 2021)

Biodegradable System

Composting

With the Silverton Parks Management maintaining the public spaces of Silverton, the plant material can be collected and sorted into type to be composted in mounds. These mounds are further supplemented by the by-products of the dye making. This is where the compost geyser can be utilised to extract hot water. When the composting process has finished, the product can be used again in the public spaces of Silverton for fertilizer and compost.

Dye Making

With suitable plant material gathered, the plant material is boiled and strained, with the excess plant material integrated into the compost system. The strained dye is to be used in the leather dyeing house.

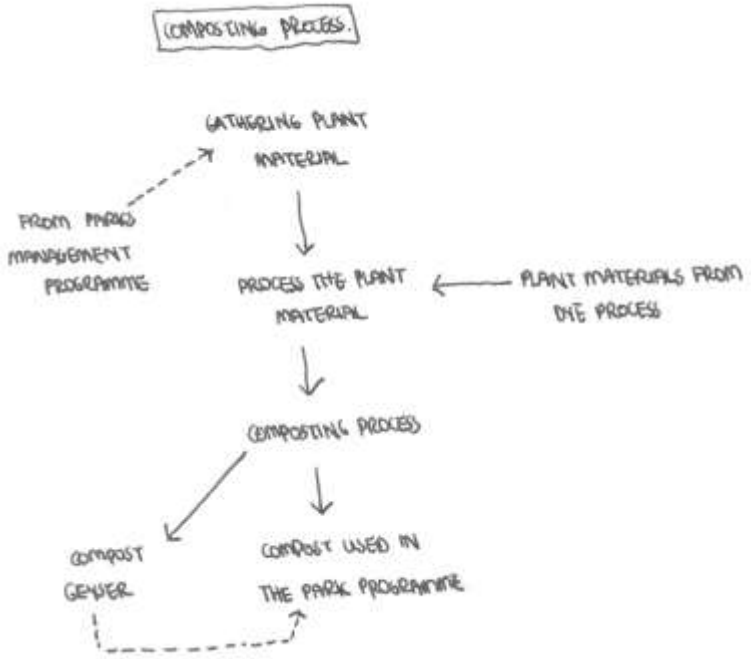


Figure 6.25: Diagram of the composting process (Author November 2021)

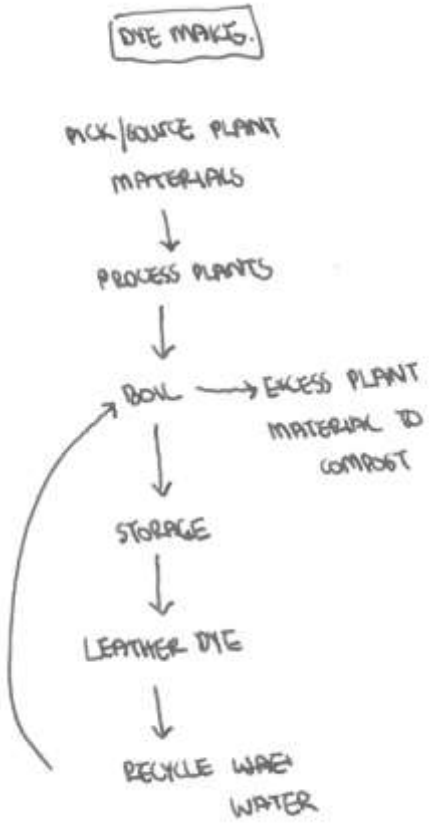


Figure 6.24: Diagram of the dye making process (Author November 2021)

Environmental Strategies

The structural system consists of various horizontal planes that define the internal spaces. Methods for introducing adequate daylight into the intervention had to be developed as to support particular functions and experiences. In particular, the quality checking space in the leather dyeing house requires adequately bright daylighting to service the space.

The aim of this investigating the daylighting of this space is to achieve an even 1000 lumen at workspace level. The analysis has been done in Sefaira, with the simulation measuring the illuminance and the daylight factor of the spatial iterations. The metrics used in determining the viability of each iteration is illuminance and daylighting factor. The illuminance of the space measures the amount of light reaching a specific height level, whilst the daylight factor provides a ratio that compares the internal and external conditions as a measurement of brightness.

Daylighting

Iteration 1

With only a flat slab, not enough light was allowed to enter the quality checking space, only managing an average of 100 - 200 lumens, not nearly enough to facilitate the quality checking space.

Looking at the daylighting factor, at 2,61%, it is clear that the space is not well lit, neccessitating the additional use of electrical lighting, negating the attempt to include daylight in the design.

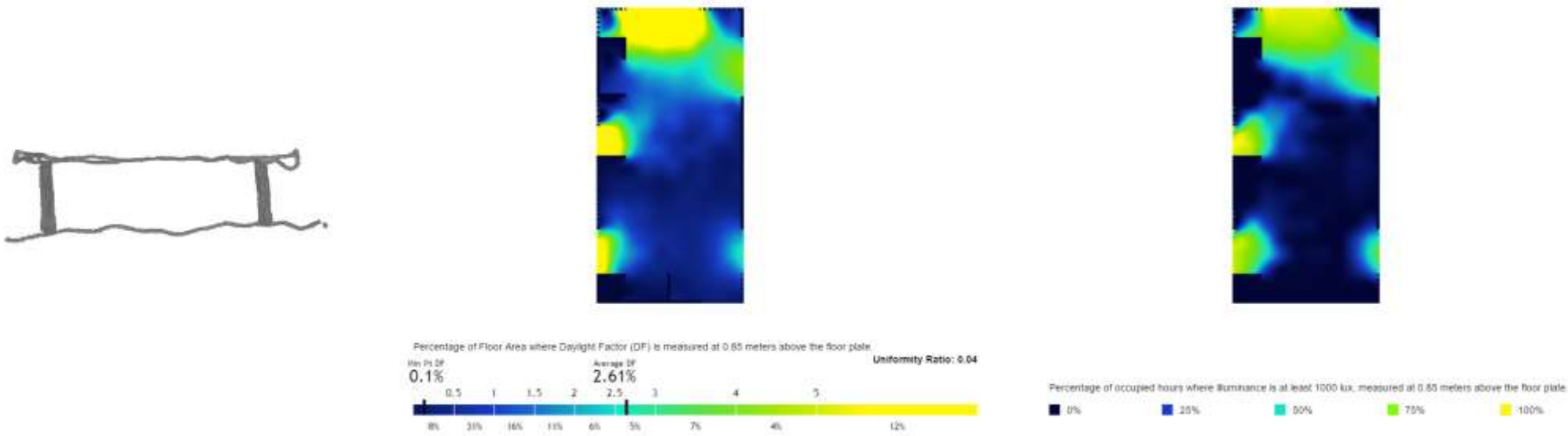


Figure 6.26: First iteration of the daylighting design (adapted from Sefaira November 2021)

Iteration 2

Following on the method of including more light into the quality check space, the roofs were angled upwards to emulate the contextual industrial sawtooth typology. This allows for more southern daylight to be introduced into the space. The result was a very evenly lit space that ranged between 700-800 lumens. Although this is slightly below the required amount of daylight, the even distribution is more important to the experience and functionality of the space.

The daylighting factor was reduced to 4,79% from the previous iteration, showcasing that the space is bright and well lit as compared to the external condition.

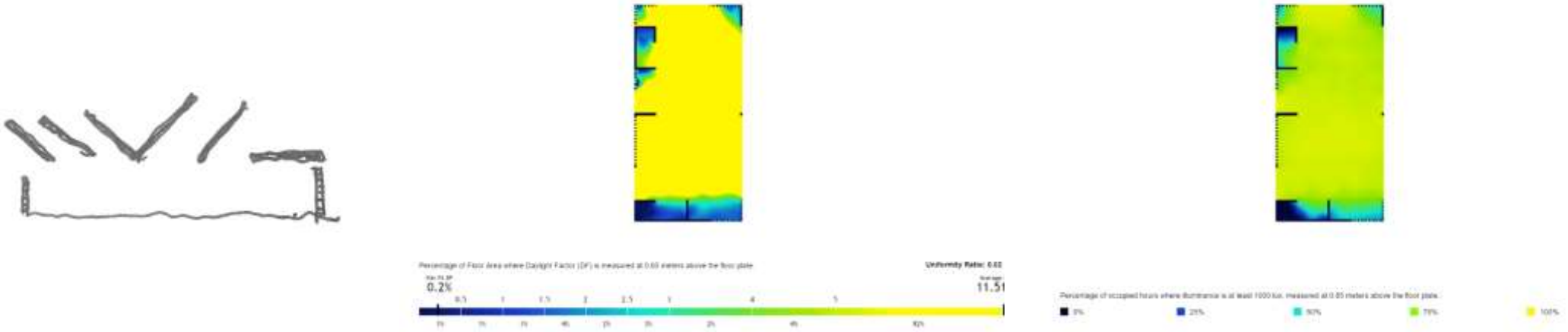


Figure 6.27: Second iteration of the daylighting design
(adapted from Sefaira November 2021)

Iteration 3

The continued iteration of the scheme introduced a lattice beam structure that acts as the support to the roof structure. This allowed the roofs to be independently shifted vertically, introducing more light to the quality checking space. In this iteration the illuminance increased to 850 – 950 due to the increased amount of light that was entering the space. Importantly again, is that the light is evenly distributed in the space.

Shifting the heights of the roofs independently allowed for each part of the space to be tailored to the function and experience that is needed. As such the daylight factor increased to 5,5%, pointing towards a bright space, with the brightest space at the quality checking space.

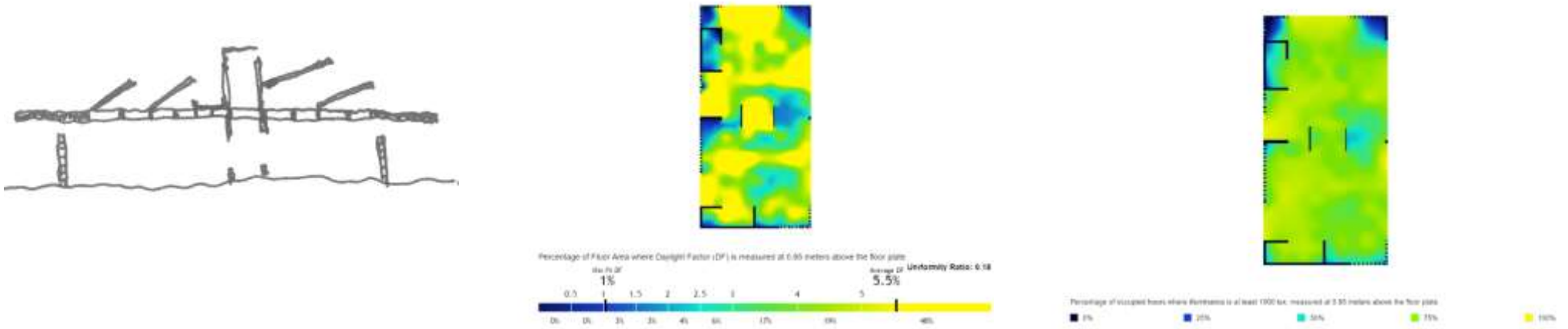
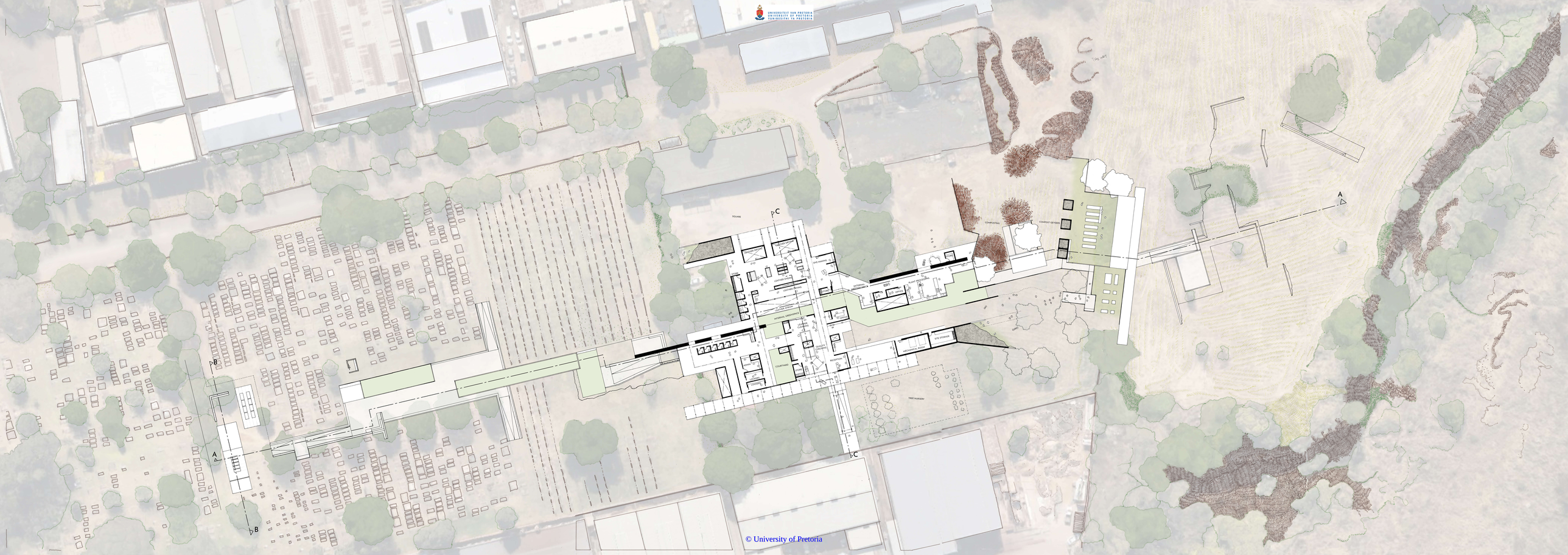
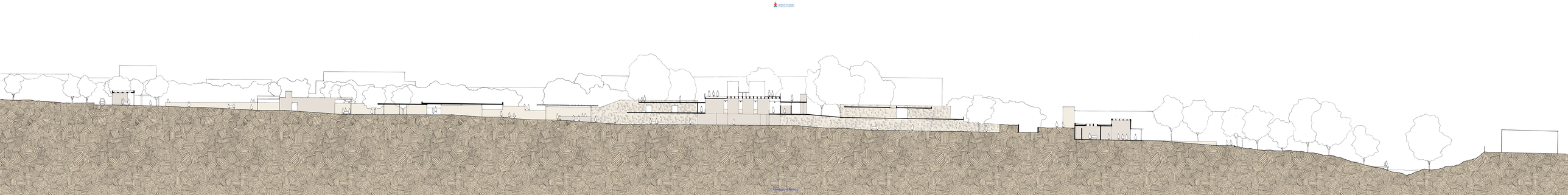
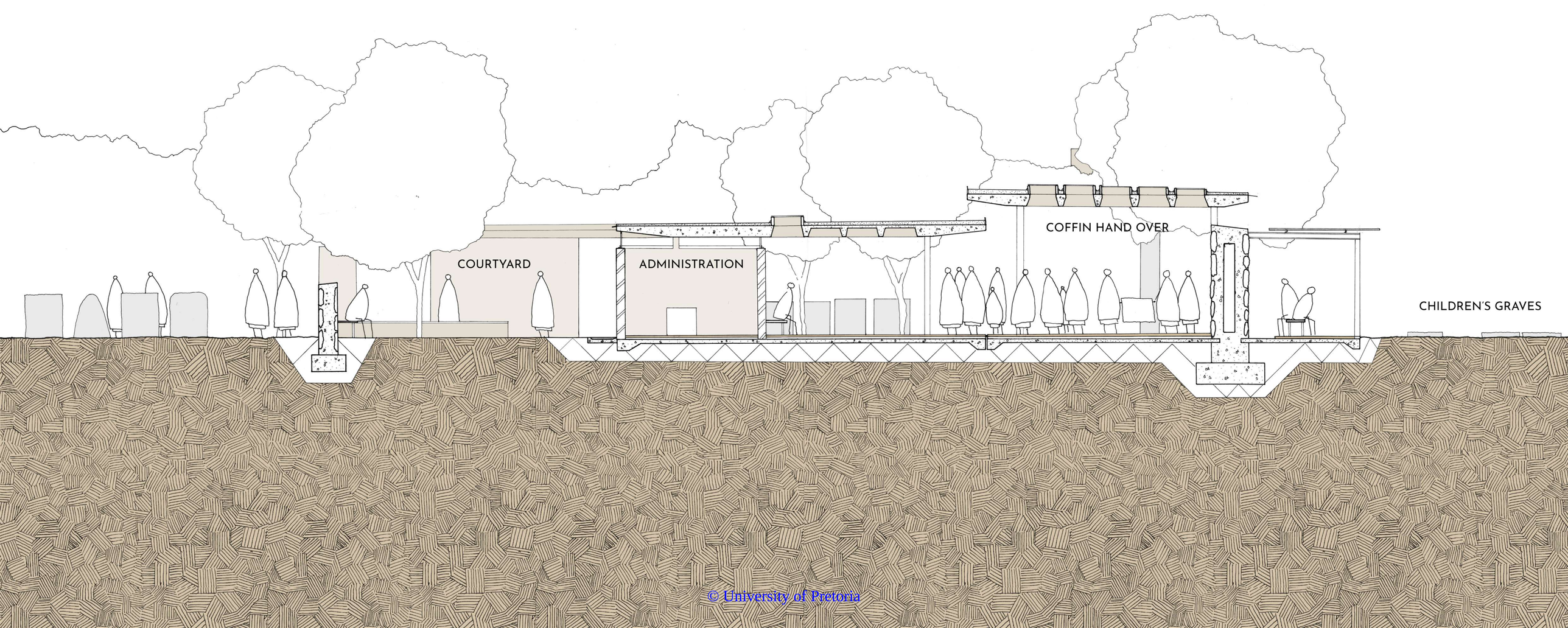
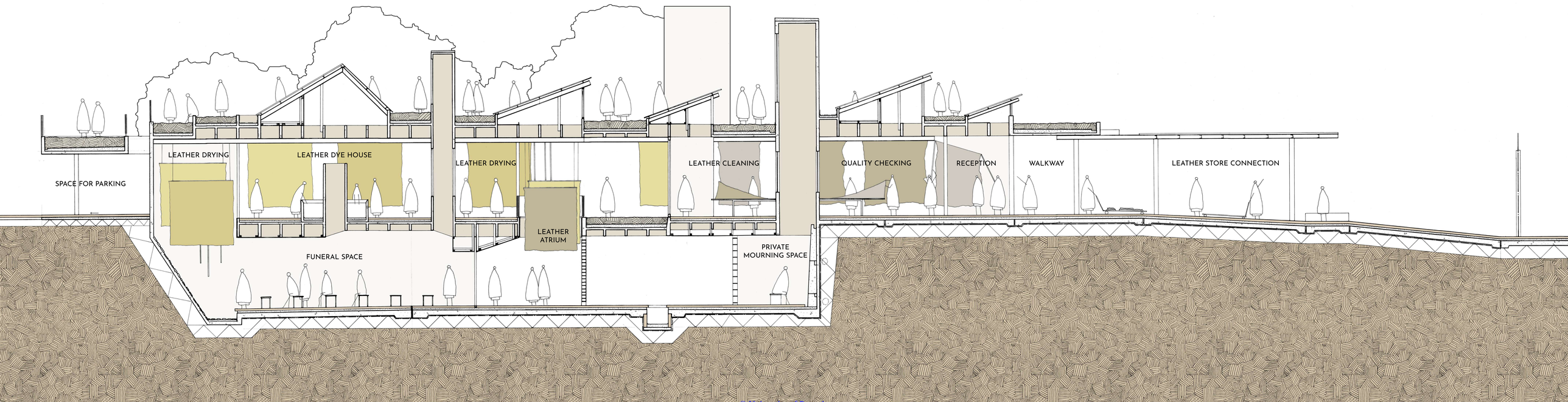


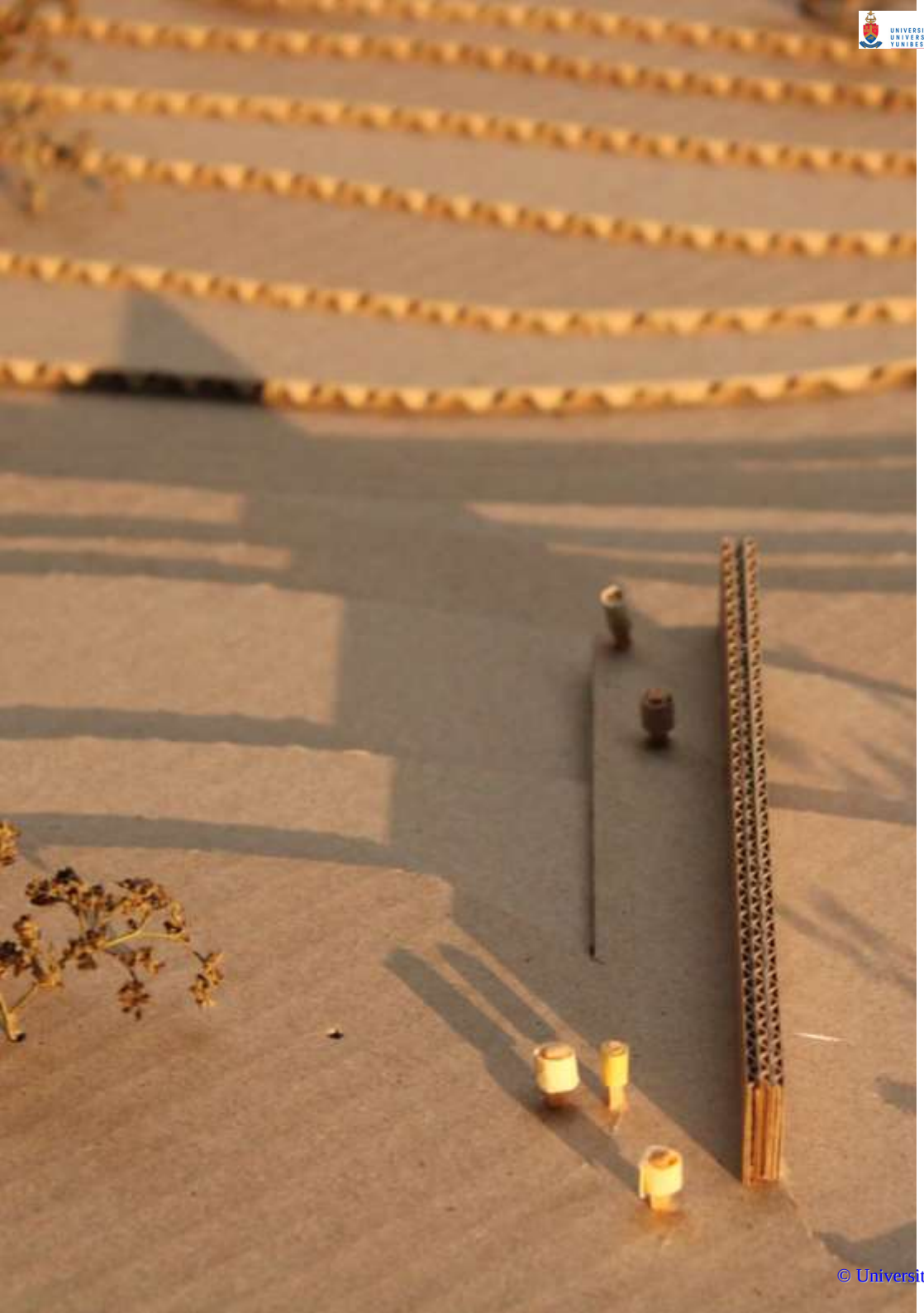
Figure 6.27: Final iteration of the daylighting design (adapted from Sefaira November 2021)

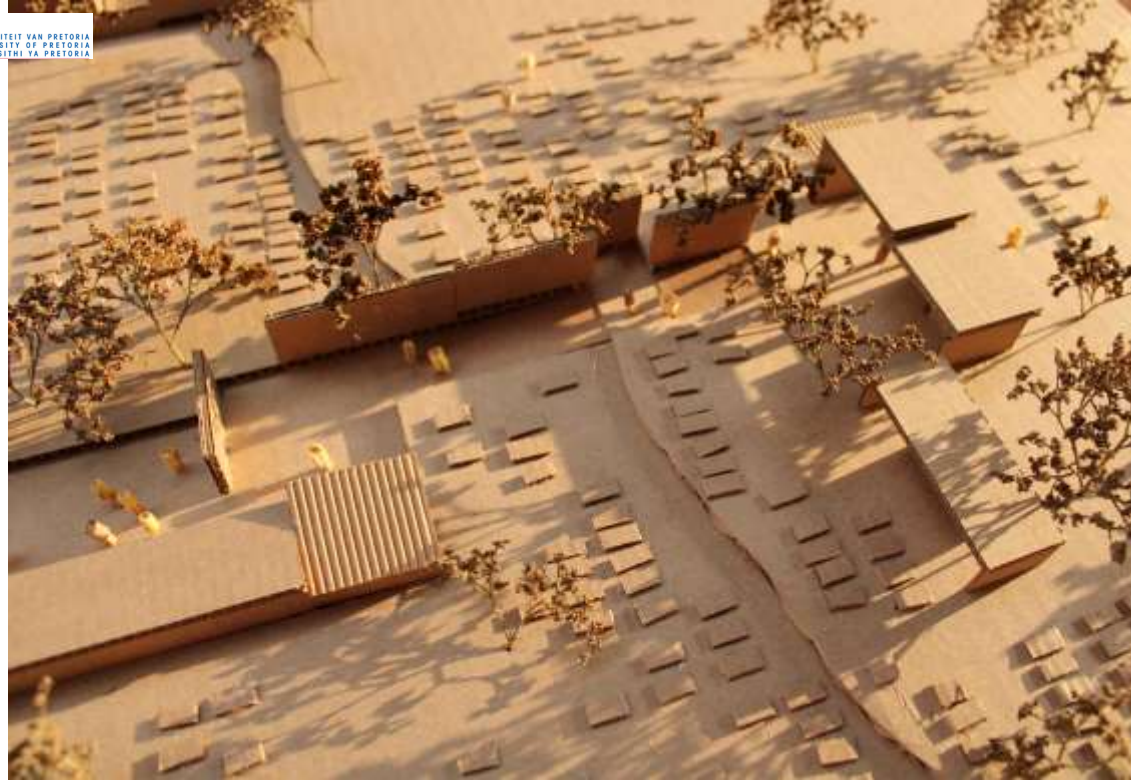


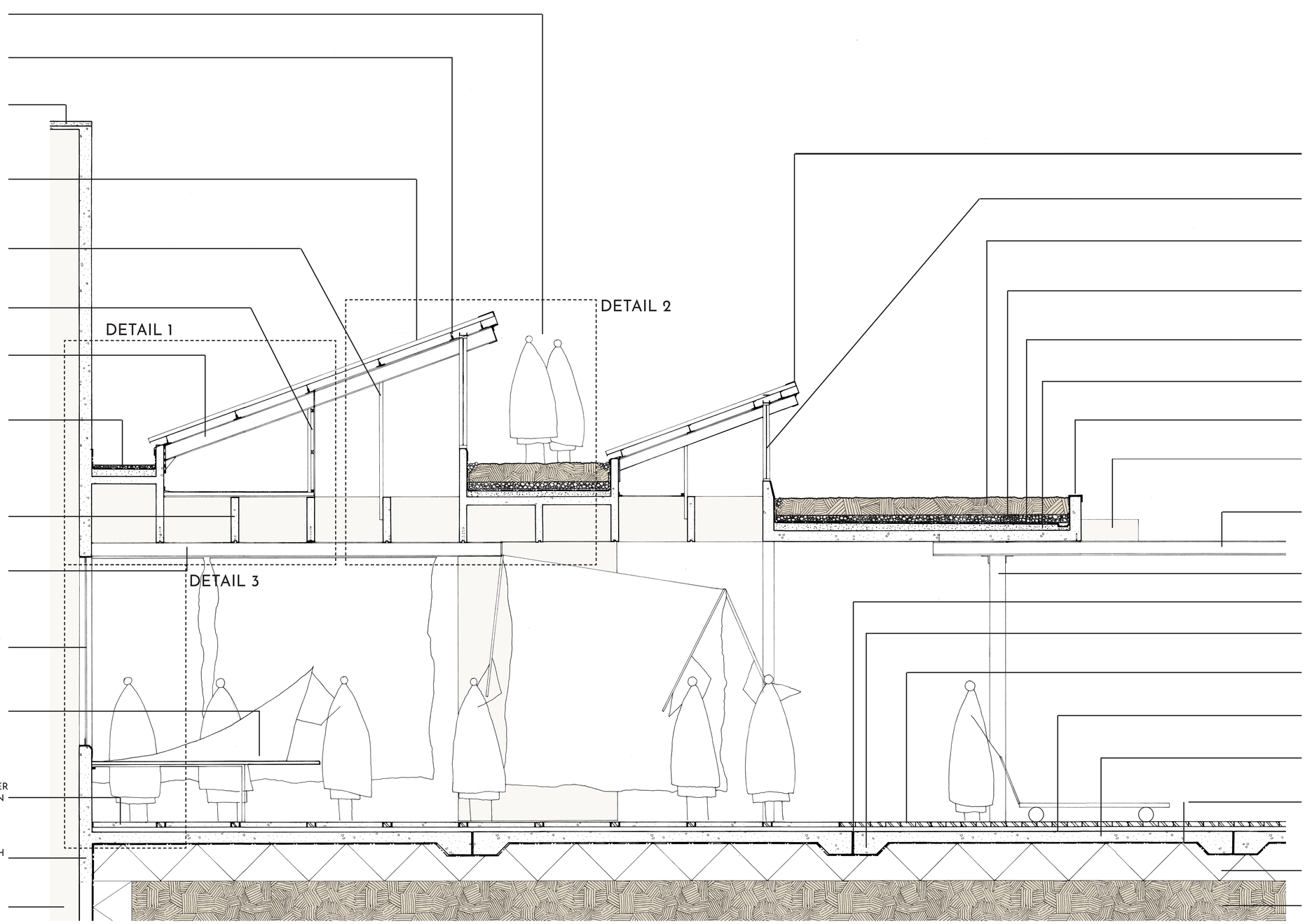












ACCESSIBLE GREENROOF FOR LOOKING INTO THE QUALITY CHECKING SPACE

GALVANISED 100 X 50 X 20mm COLD FORMED LIPPED CHANNEL AT 1200mm INTERVALS

100mm SCREED TO FALL AT A MINIMUM ANGLE OF 1:50

POWDER COATED 50mm NULOCK STANDING SEAM ROOF SHEETING, CRIMPED TO SUPPORTING CLIPS

GALVANISED 100 x 50mm STEEL PARALLEL FLANGE MEMBER BOLTED INTO THE CONCRETE LATTICE STRUCTURE THROUGH AN INTERMEDIARY WHITE PAINTED PLYWOOD PIECE

GYPSUM BOARD CEILING FIXED TO A TIMBER SUBSTRUCTURE TO HOUSE SERVICES

GALVANISED AND POWDER COATED 152 X 89 X 16 mm I-BEAM BOLTED WELDED TO A GALVANISED STEEL WALL PLATE

REINFORCED CONCRETE GUTTER WATERPROOFED WITH TORCH-ON AND PROTECTED WITH BALLAST WITH A MINIMUM DIAMETER OF 10mm

OFF-SHUTTER 600 x 100 mm REINFORCED CONCRETE LATTICE STRUCTURE

GALVANISED AND POWDER COATED 182 x 95 x 18 mm STEEL I-BEAM BOLTED INTO THE IN-SITU CAST CONCRETE LATTICE STRUCTURE

22mm DANPALON WINDOW SUPPORTED BY STEEL MEMBERS

QUALITY CHECKING TABLE AND LEATHER CHECKING SPACE

PRECAST 900 x 900 x 75mm CONCRETE PAVER LAID INTO THE SCREED LAYER IN A TARTAN PATTERN WITH THE RECYCLED BRICKS

150mm REINFORCED CONCRETE WALL WITH INTEGRATED DANPALON WINDOW

SECTION OF A LIGHT SHAFT

FLASHING BENT OVER THE NULOCK METAL SHEETING

ALUMINUM WINDOW FIXED TO CONCRETE LATTICE STRUCTURE

SOIL FILLING

150mm GRAVEL LAYER LAID OVER A WATERPROOF PROTECTION LAYER FOR DRAINAGE WITH A MINIMUM DIAMETER OF 10mm

TORCH-ON WATERPROOFING APPLIED TO THE SCREED LAYER

150mm SCREED TO FALL AT A MINIMUM ANGLE OF 1:50

FLASHING COVERING THE PARAPET AND INTERNAL TORCH-ON WATERPROOFING

GUTTER IN ELAVATION

GALVANISED AND POWDER COATED 182 x 95 x 18 mm STEEL I-BEAM BOLTED INTO THE IN-SITU CAST CONCRETE LATTICE STRUCTURE

COLUMN IN ELAVATION

SLAB JOINT FILLED WITH SEALANT AND AN EXPANSION BOARD

150mm THICKENED REINFORCED CONCRETE SLAB EDGE

RECYCLED BRICKS LAID INTO THE SCREED LAYER IN A TARTAN PATTERN WITH THE PRECAST CONCRETE PAVERS

50mm SCREED OVER REINFORCED CONCRETE FLOORSLAB

150mm REINFORCED CONCRETE FLOOR SLAB LAID ON 1mm POLYOLEFIN WATERPROOFING SHEET

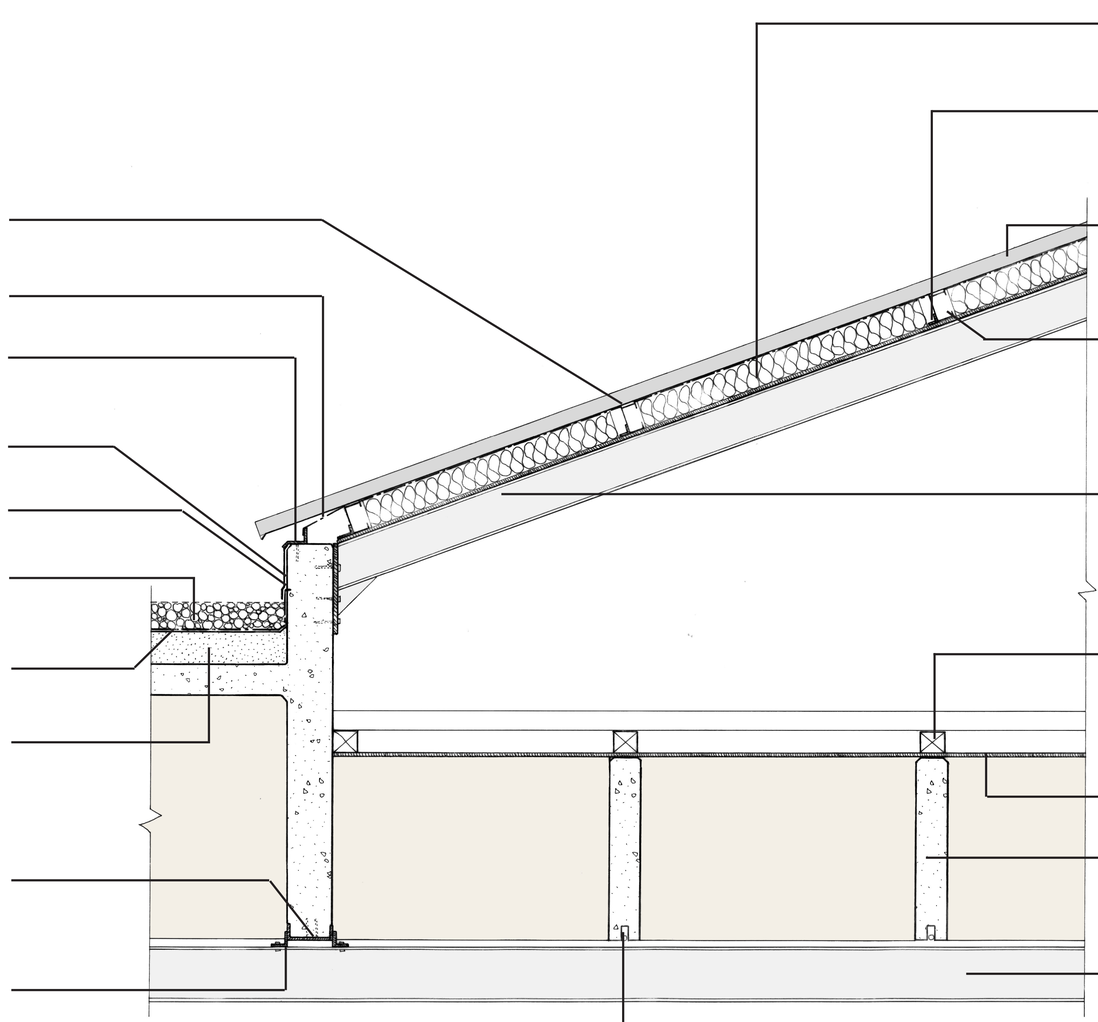
1mm POLYOLEFIN WATERPROOFING SHEET LAID OVER COMPACTED SOIL FILLING

SOIL FILLING COMPACTED IN LAYERS OF 300mm

EARTH FILLING

CONSTRUCTION SECTION - LEATHER QUALITY CHECKING

SCALE 1:20



PATENTED NULOCK CLIP, SCREWED INTO THE COLD FORMED LIPPED CHANNEL

SISALATION LAID UNDER THE NULOCK STANDING SEAM SHEETING

GALVANISED 49 x 49mm STEEL ANGLE CAST INTO THE CONCRETE LATTICE STRUCTURE

FLASHING FROM UNDER THE GALVANISED STEEL ANGLE, OVERLAPPING THE TORCH-ON WATERPROOFING

25mm CUT IN CONCRETE TO END TORCH-ON WATERPROOFING

100mm STONE BALLAST WITH A DIAMETER OF 10mm LAID OVER THE WATERPROOFING

TORCH-ON WATERPROOFING APPLIED TO THE SCREED LAYER

100mm SCREED TO A MINIMUM FALL OF 1:50

GALVANISED AND POWDER-COATED 100 x 50 mm STEEL PARALLEL FLANGE SECTION CAST INTO THE CONCRETE LATTICE STRUCTURE

GALVANISED AND POWDER-COATED 49 x 49 mm STEEL ANGLES WELDED TO THE PARALLEL FLANGE SECTION AND BOLTED TO THE GALVANISED AND POWDER-COATED STEEL I-BEAM

ALUMINUM LIGHTING AND CABLE SYSTEM CAST INTO THE REINFORCED CONCRETE LATTICE SYSTEM

50mm ISOLAM INSULATION SECURED UNDER THE PURLIN STRUCTURE

GALVANISED 49 x 49 mm STEEL ANGLE BOLTED TO THE COLD FORMED LIPPED CHANNEL AND THE GALVANISED STEEL I-BEAM, SECURING THE ISOLAM UNDERNEATH

POWDER-COATED 50mm NULOCK STANDING SEAM ROOF SHEETING, CRIMPED TO SUPPORTING CLIPS

GALVANISED 100 X 50 X 20mm COLD FORMED LIPPED CHANNEL AT 1200mm INTERVALS. THE SECTIONS ARE TO BE SCREWED TO GALVANISED 45 X 45mm STEEL ANGLE.

GALVANISED AND POWDER-COATED 152 X 89 X 16 mm I-BEAM BOLTED WELDED TO A GALVANISED STEEL WALL PLATE

ROUGH 49mm x 49mm TIMBER MEMBER AS PURLIN STRUCTURE IN SUPPORTING THE CEILING AND SERVICES

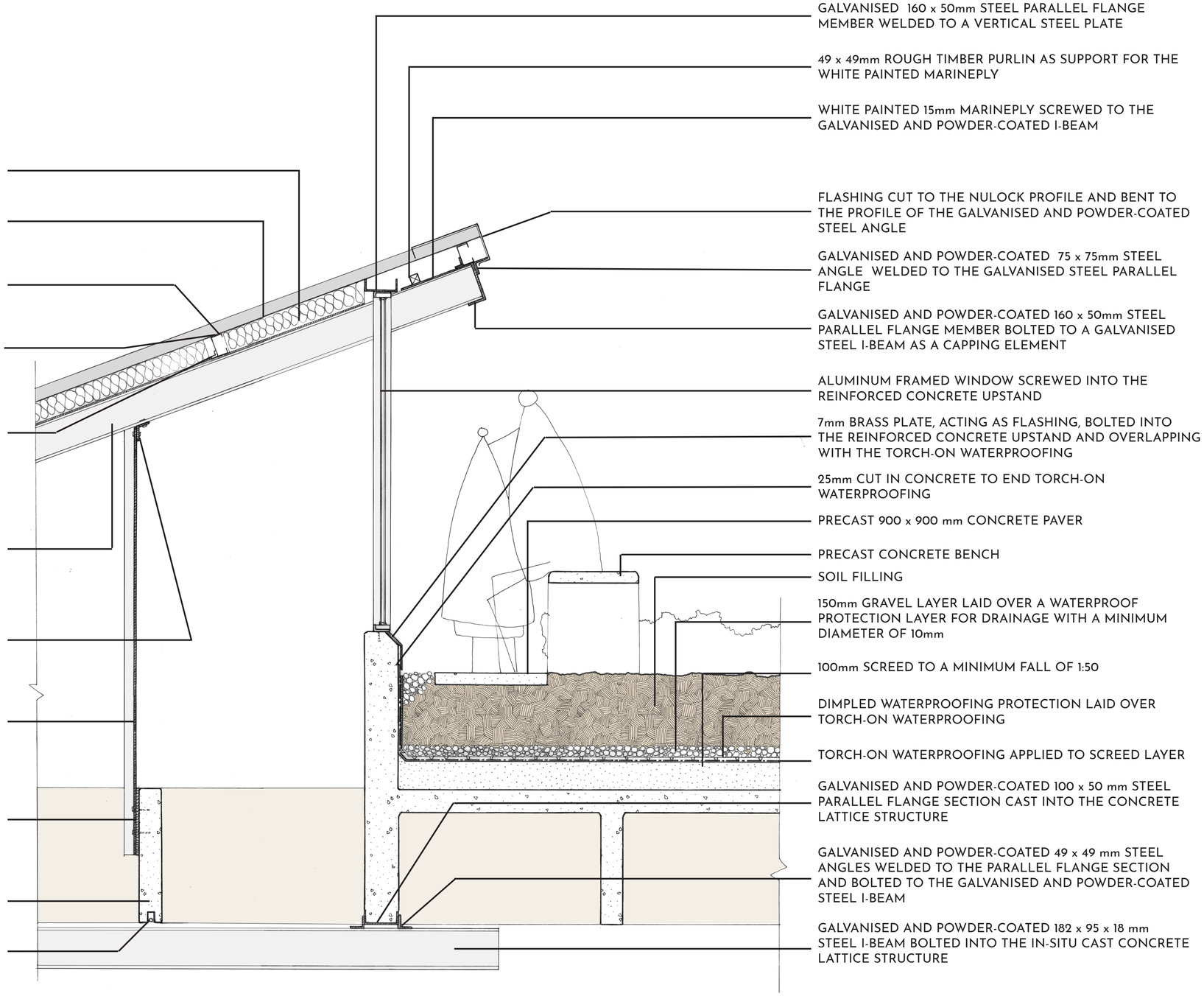
GYPSUM BOARD CEILING FIXED TO A TIMBER SUBSTRUCTURE TO HOUSE SERVICES

100mm x 600mm CONCRETE LATTICE STRUCTURE

GALVANISED AND POWDER-COATED 182 x 95 x 18 mm STEEL I-BEAM BOLTED INTO THE IN-SITU CAST CONCRETE LATTICE STRUCTURE

DETAIL 1 - ROOF MEETING GUTTER

SCALE 1:10



50mm ISOLAM INSULATION SECURED UNDER THE PURLIN STRUCTURE

POWDER-COATED 50mm NULOCK STANDING SEAM ROOF SHEETING, CRIMPED TO SUPPORTING CLIPS

GALVANISED 100 X 50 X 20mm COLD FORMED LIPPED CHANNEL AT 1200mm INTERVALS. THE SECTIONS ARE TO BE SCREWED TO GALVANISED 45 X 45mm STEEL ANGLE

PATENTED NULOCK CLIP, SCREWED INTO THE COLD FORMED LIPPED CHANNEL

GALVANISED 49 x 49 mm STEEL ANGLE BOLTED TO THE COLD FORMED LIPPED CHANNEL AND THE GALVANISED STEEL I-BEAM, SECURING THE ISOLAM UNDERNEATH

GALVANISED AND POWDER-COATED 152 X 89 X 16 mm I-BEAM BOLTED WELDED TO A GALVANISED STEEL WALL PLATE

GALVANISED 75 x 75mm STEEL ANGLE BOLTED TO THE GALVANISED STEEL PARALLEL FLANGE AND GALVANISED STEEL I-BEAM

GALVANISED 100 x 50mm STEEL PARALLEL FLANGE MEMBER BOLTED INTO THE CONCRETE LATTICE STRUCTURE THROUGH AN INTERMEDIARY WHITE PAINTED PLYWOOD PIECE

WHITE PAINTED PLYWOOD SHEET MEDIATING BETWEEN THE STEEL PARALLEL FLANGE SECTION AND THE REINFORCED CONCRETE LATTICE STRUCTURE

100mm x 600mm CONCRETE LATTICE STRUCTURE

ALUMINUM LIGHTING AND CABLE SYSTEM CAST INTO THE REINFORCED CONCRETE LATTICE SYSTEM

GALVANISED 160 x 50mm STEEL PARALLEL FLANGE MEMBER WELDED TO A VERTICAL STEEL PLATE

49 x 49mm ROUGH TIMBER PURLIN AS SUPPORT FOR THE WHITE PAINTED MARINEPLY

WHITE PAINTED 15mm MARINEPLY SCREWED TO THE GALVANISED AND POWDER-COATED I-BEAM

FLASHING CUT TO THE NULOCK PROFILE AND BENT TO THE PROFILE OF THE GALVANISED AND POWDER-COATED STEEL ANGLE

GALVANISED AND POWDER-COATED 75 x 75mm STEEL ANGLE WELDED TO THE GALVANISED STEEL PARALLEL FLANGE

GALVANISED AND POWDER-COATED 160 x 50mm STEEL PARALLEL FLANGE MEMBER BOLTED TO A GALVANISED STEEL I-BEAM AS A CAPPING ELEMENT

ALUMINUM FRAMED WINDOW SCREWED INTO THE REINFORCED CONCRETE UPSTAND

7mm BRASS PLATE, ACTING AS FLASHING, BOLTED INTO THE REINFORCED CONCRETE UPSTAND AND OVERLAPPING WITH THE TORCH-ON WATERPROOFING

25mm CUT IN CONCRETE TO END TORCH-ON WATERPROOFING

PRECAST 900 x 900 mm CONCRETE PAVER

PRECAST CONCRETE BENCH

SOIL FILLING

150mm GRAVEL LAYER LAID OVER A WATERPROOF PROTECTION LAYER FOR DRAINAGE WITH A MINIMUM DIAMETER OF 10mm

100mm SCREED TO A MINIMUM FALL OF 1:50

DIMPLED WATERPROOFING PROTECTION LAID OVER TORCH-ON WATERPROOFING

TORCH-ON WATERPROOFING APPLIED TO SCREED LAYER

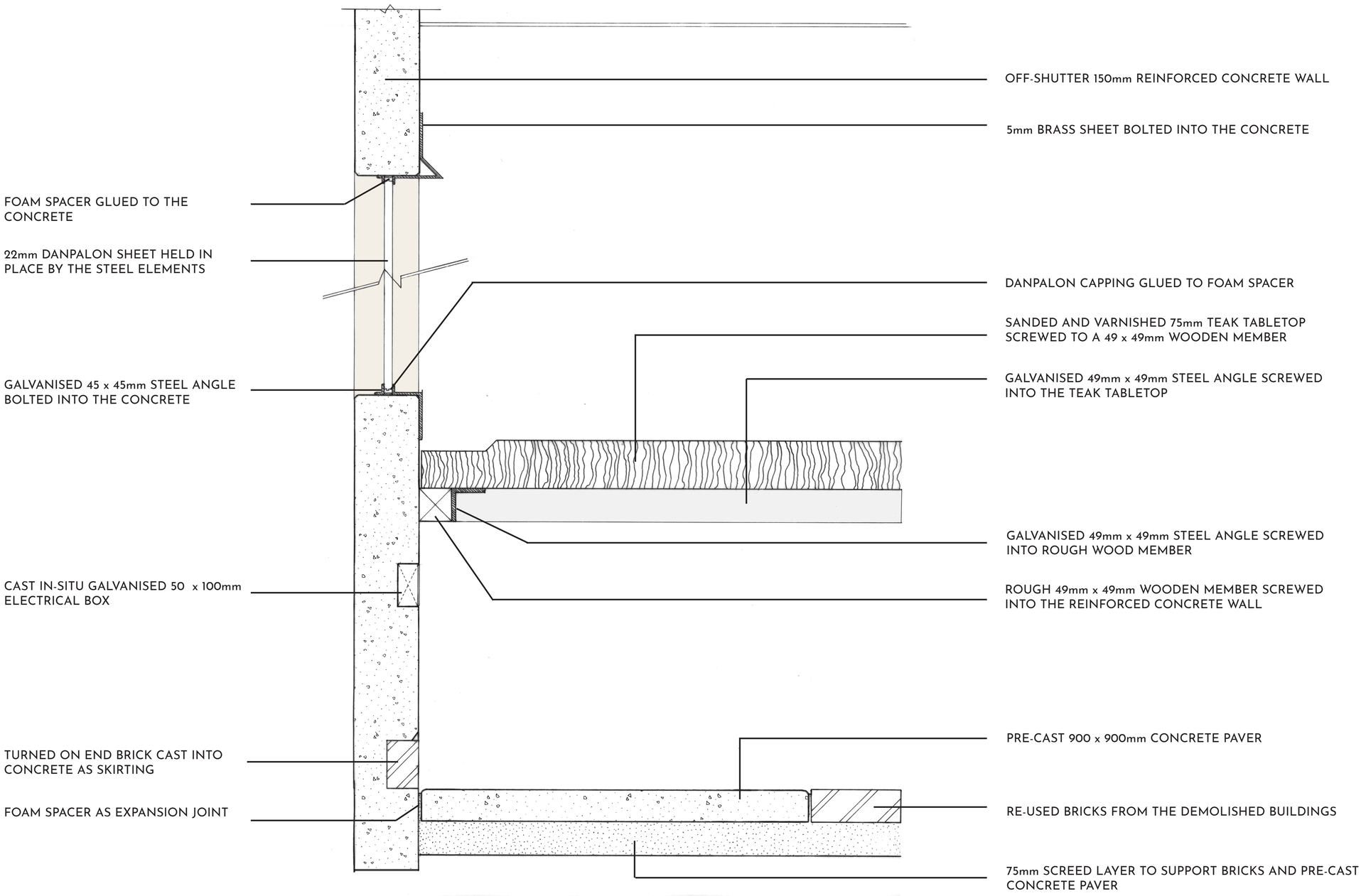
GALVANISED AND POWDER-COATED 100 x 50 mm STEEL PARALLEL FLANGE SECTION CAST INTO THE CONCRETE LATTICE STRUCTURE

GALVANISED AND POWDER-COATED 49 x 49 mm STEEL ANGLES WELDED TO THE PARALLEL FLANGE SECTION AND BOLTED TO THE GALVANISED AND POWDER-COATED STEEL I-BEAM

GALVANISED AND POWDER-COATED 182 x 95 x 18 mm STEEL I-BEAM BOLTED INTO THE IN-SITU CAST CONCRETE LATTICE STRUCTURE

DETAIL 2 - ROOF WINDOW

SCALE 1:10



DETAIL 3 - DANPALON WINDOW

SCALE 1:5

Reflecting on the journey

7 Reflection

The project initially set out to investigate the current antagonistic relationship between the natural and the industrial in Silverton. Through the analysis of this relationship, it was revealed that a layered, solution was needed that engaged with the site, context and culture of Silverton on multiple levels and in multiple areas. The project became more than a mere physical expression of the relationship between nature and industry, instead beginning to question the core rituals and processes that define, create and articulate industrial and natural spaces in Silverton.

Conceptual and theoretical reflection

The idiosyncratic architectural approach and theoretical lenses contextualising this project was developed as part of the process of architectural design. As Silverton is deceivingly diverse and complex, a combination of theories, each exploring key aspect of Silverton, forming a framework was deemed appropriate, allowing the architectural approach to mirror the complexity of the context.

In the theoretical research and projection phase, regenerative theory, non-modern theory and weak theory were identified as standalone and separate theories, each informing an aspect of the project on a different scale, namely: regenerative theory informing the broader concept and urban systems and responses, non-modern theory outlining the architectural approach and lastly, weak theory defining the spatial intent and the manner in which the user would interact with the space.

However, it quickly became clear that the theories were never meant to be completely separate and standalone but that the important aspects of the theories lie in the confluences between each theory where the liminal space was created. Further investigations into the implications of the liminality between the theories added richness and added layers and depth that could be explored in the architectural manifestation of this project.

As a reflection on the research and design methodology, a pattern emerges from the process that was followed, namely: with the identification of the site, problems were explored with possible solutions, however, those solutions would later prove to be inappropriate and had to be reconsidered. This cycle would be repeated until enough depth and richness were uncovered that could inform an appropriate solution to the problem, and the site and context.

Design and technology iterations and conclusions

The project set out to establish physical links and connections to the various layers surrounding the chosen site, namely: the Silverton Cemetery, the Moreleta Spruit, the industries of Silverton and the site itself. Relating and connecting these seemingly disparate layers of the site and the context with a mediating and liminal element of the architectural manifestation. This further allowed the architectural and programmatic explorations to continue the vein of connecting incompatible processes and rituals with a mediating liminal element, seen in the overlapping two main programmes of resomation and a leather dyeing facility mediated with the architecture.

The architectural and technological approach, informed by regenerative theory, non-modern theory and weak theory, became a process of layering, overlapping, disjointing and elongating the programmes and spaces in the architecture, developing the resultant design decisions.

Contribution to the architectural discourse

This architectural project contributes to the wider architectural discourse by questioning and exploring the relationship of nature and industry through the lens of liminality investigating the relationship between the profane and the sacred. This relationship between nature and industry is present in most, if not all, industrial areas of

South Africa where the pressures of environmental sustainability and regenerative design is not yet explored or integrated.

This project seeks to highlight that this relationship can be approached from more than one perspective and that the spatial and ritual/process driven perspective proposed in this project is just one of the myriads of ways. Although the outlined design, architectural and technology methodology is incredibly specific to this particular site and context, lessons can be learned to apply and inform other design projects of similar complexity and scope in the future.

Observing, refining and learning from the systems and the processes found on the site and in the context, a key aspect of regenerative theory, serves as a valuable method to start understanding the site and the problems that the project will deal with. This allows the designer to start with the known problems and solutions of the project and slowly delve into the more complex and, essentially, unknown problems and solutions.

Complex problems with multiple shareholder and implications, such as the relationship between nature and industry, cannot be solved with singular gestures and perspectives. In the tangential approach of this project, multiple perspectives are considered and incorporated, leading to a richer project with a greater understanding of the problems it is dealing with.

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