

The [Beak] – oning:

A wetland bird sanctuary and eco centre at Redhouse Village, Gqeberha, Eastern Cape

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DECLARATION

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A wetland bird sanctuary and eco centre at Redhouse Village, Gqeberha, Eastern Cape

By

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Submitted in fulfilment of the requirements for the degree

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in the

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at the

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Keywords: Rehabilitation | Anthropocene | Interface | Symbiotic

DEDICATION

This dissertation is dedicated to my Lord and Savior, Jesus Christ. It is through His divine appointment and mercy that I stand here today, having been placed in this journey and carried through every challenge. As Joshua 1:3 declares, "Every place that you place the soles of your feet, I have already given unto you." It is through His grace that I have walked this path, knowing that He has gone before me and paved the way.

I extend my heartfelt thanks to my family and friends for their unwavering love and support throughout my studies. To "The Table," thank you for your constant love and companionship during both my undergraduate and postgraduate years; you have made this journey bearable and full of joy.

A special note of gratitude to my supervisors and mentors, whose expert advice and guidance helped me navigate this process and for their encouragement and direction, keeping me on course. My gratitude extends to Mr Graeme Eckley for showing me around the site and for all the valuable information shared with me.

Lastly, to you, the reader, thank you for taking the time to engage with my work.

“ What wild creature is more accessible to your eyes and ears,
as close to us and everyone in the world, as universal as a bird?”

(Attenborough, n.d)

ABSTRACT

Humans shape their environment and are also shaped by it. Our activities impact nature, leading to the destruction of habitats and the loss of homes and food sources for many species, causing a decline in biodiversity. The scarred landscape resiliently beckons for healing and renewal, offering a glimmer of hope for positive change. This dissertation highlights the profound parallels between human and avian experiences in our ecological survival, emphasising a symbiotic relationship that determines human and avian behaviours and habitats. It explores a compelling question at the intersection of architecture and ecology: How can an architectural interface, serving as an other space at the convergence of human and natural systems, facilitate interdependent, sympoietic encounters within the rehabilitated ecosystems of the Anthropocene? The approach entails examining the principles of the Anthropocene and dark ecology to understand our shared existence with birds. It positions the building as a mediator and testament to nature's regenerative abilities. Throughout this process, the design not only bears witness to the passage of time but also facilitates eye-to-eye encounters between humans and birds. The design inhabits the interface of the "third space", a heterotopia, created by the tension at the edge of interdependent counterparts. It underscores our shared vulnerability and the importance of an ecological equilibrium, urging responsible stewardship for ecosystem restoration and preservation. This interstitial approach presents "third spaces" as gateways to deeper environmental understanding.

Key words: Rehabilitation | Anthropocene | Interface | Symbiotic

Research Question:

How can an architectural **interface**, serving as an **other space** at the **convergence** of human and natural systems, facilitate interdependent, **sympoietic** encounters within the rehabilitated ecosystems of the **Anthropocene**?

The transition point where two systems or subjects meet and interact.

Space that exists between 'standard' spaces. In this context a space neither fully human nor fully avian.

co-creation emphasizing mutual dependency

The current geological epoch, marked by significant human impact on earth's geology and ecosystems.

The point where different elements or systems meet and interact.

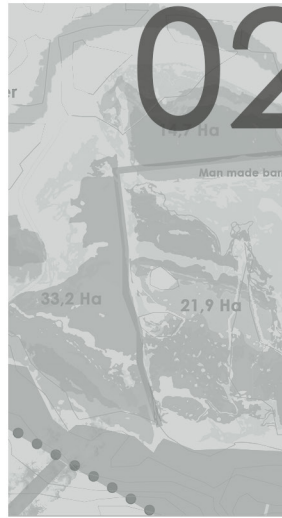
Figure 1: Collage of the Swartkops river at Redhouse village (author, 2024).

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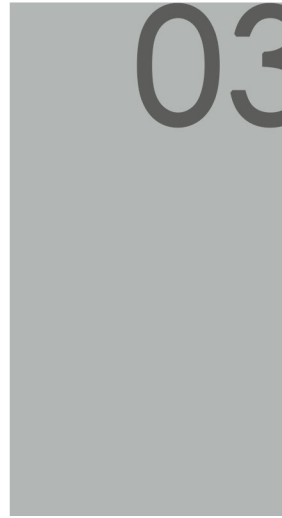
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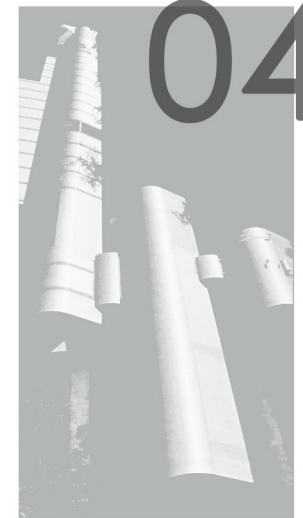
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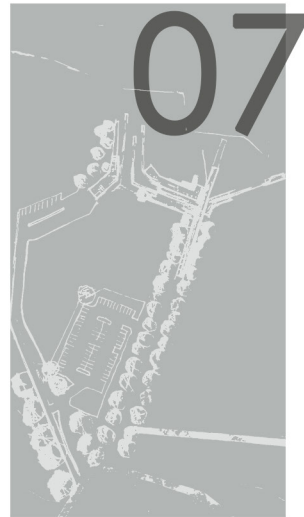
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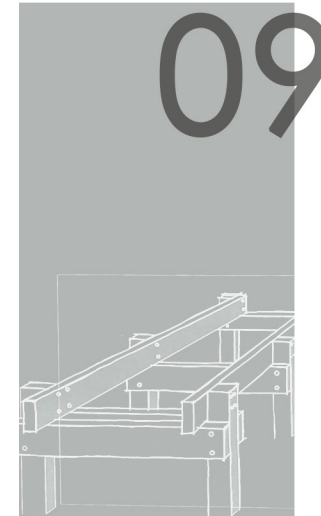
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Figure 2: Design diagram (author,2024).

1.1 INTRODUCTION

The Bird Sanctuary and Eco Center's program can be divided into three interconnected components: the visitor's center and educational facilities, the bird sanctuary, and research. The Zwartkops Conservancy and BirdLife Eastern Cape are potential clients for this project.

The Zwartkops Conservancy, a key stakeholder in the Swartkops Estuary basin, has been operational for several years and is primarily focused on the prudent use and management of the estuary for both nature conservation and human recreation. They are not only committed to the management and conservation of the Swartkops estuary but also environmental

education (BirdLifeSA, 2018).

BirdLife Eastern Cape, formerly the Eastern Cape Wild Bird Society, is a voluntary organization that aims to stimulate interest in birds, enhance knowledge about them, and assist in their protection. Their commitment to bird conservation aligns with the project's goals, making them an ideal collaborator. Their involvement could provide valuable insights and support in creating a thriving habitat for birds and promoting awareness about the importance of bird conservation. This collaboration could contribute significantly to the success of the Bird Sanctuary and Eco Center's program.

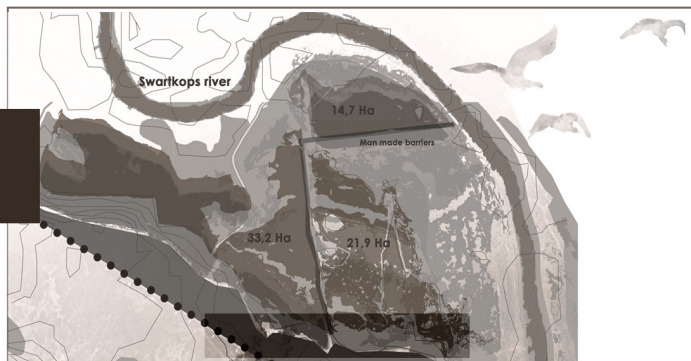
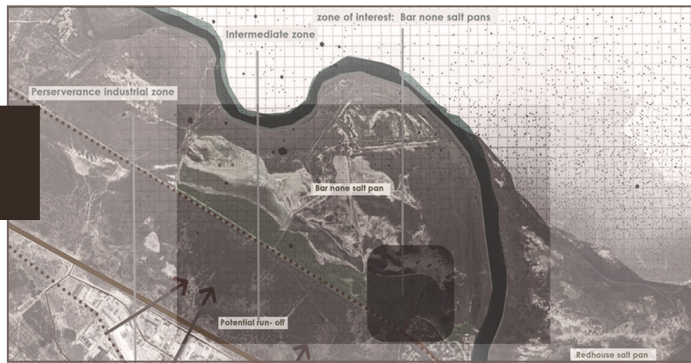
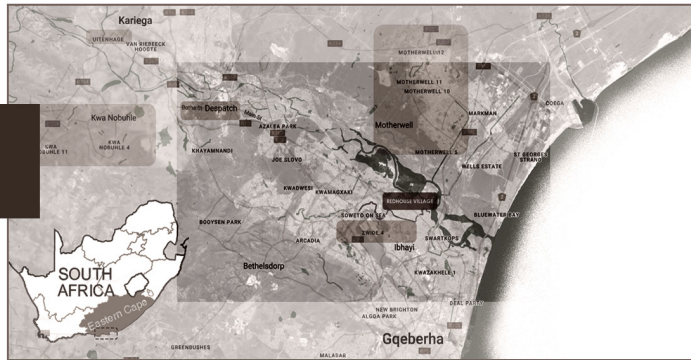


Figure 3: Site locations (author, 2024).

1.2 SITE

The Swartkops River estuary is established as a crucial ecological and recreational resource, coursing through the heavily industrialized and urbanized region of the Eastern Cape. The Bar None Salt Pans and Redhouse Village exemplify the impact of human actions on the landscape, underscoring the importance of conservation efforts as ecosystems face threats from both human activities and natural factors. While operational, the site served a pivotal role in the local ecosystem, offering a habitat for a diverse array of shorebird species and avifauna. However, the scars left on the landscape from past activities serve as a constant reminder of its history.



Figure 4: Design diagram (author,2024).

1.3 THEORY FRAMEWORK

The research explores the relationship between humans and the environment, focusing on the Swartkops River estuary, through a comprehensive theoretical framework. Initiated under the concept of the Anthropocene, as defined by Timothy Gold, it acknowledges the profound impact of human activity on Earth's ecosystems. Employing the foundational principles of dark ecology, the study underscores our mutuality and coexistence with nature, using interpretive lenses of identity and perception. Drawing on Tim Ingold's concept of "Ghostly Lines," the research highlights our dual role as inhabitants and shapers of the environment. Michel Foucault's "Spatial Poetics" is utilized to explore how intimate spaces

shape our environmental perceptions, while Donna Haraway's "Sympoiesis" emphasizes the importance of inter-species collaboration and co-creation. The study aims to create a space that embodies Foucault's notion of heterotopia—a shared interface for coexistence and mutual influence. This 'other' space, neither completely human nor non-human, is designed to foster genuine interaction and mutual understanding between species, promoting introspection and self-awareness. By encouraging a deeper perception of our interconnectedness with nature, the research ultimately seeks to facilitate a more harmonious coexistence with all forms of life.

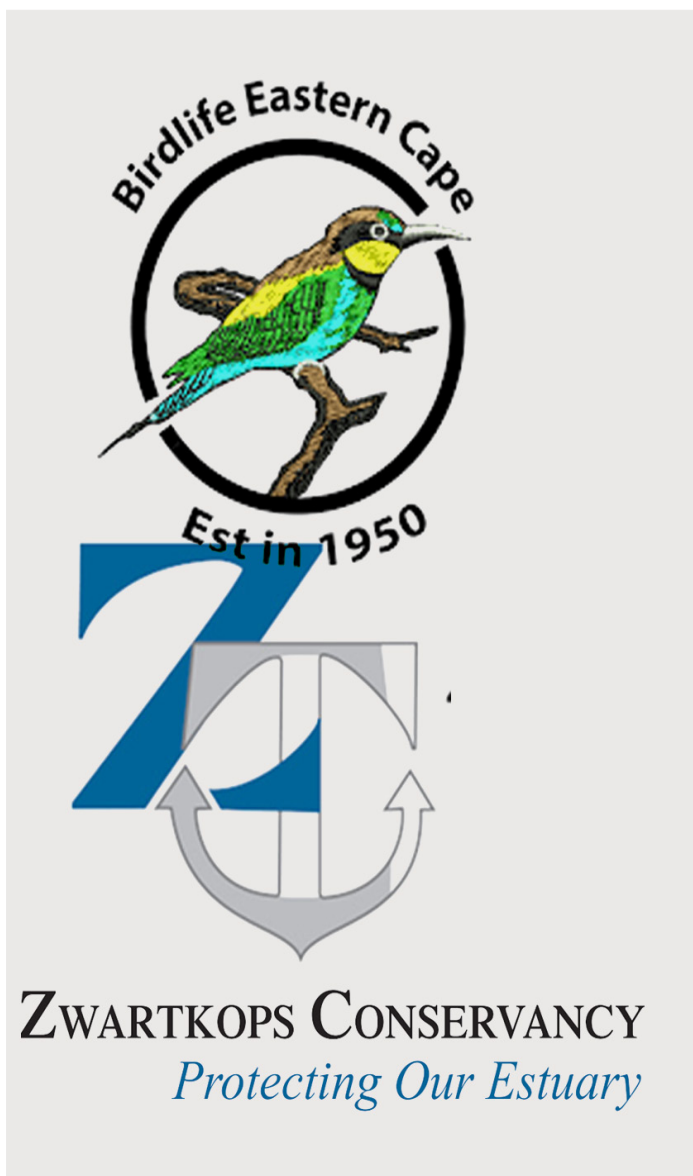


Figure 5: Client logo (author,2024).

1.4 CLIENT AND PROGRAME

The Bird Sanctuary and Eco Center's program can be divided into three interconnected components: the visitor's center and educational facilities, the bird sanctuary, and research. The Zwartkops Conservancy and BirdLife Eastern Cape are potential clients for this project.

The Zwartkops Conservancy, a key stakeholder in the Swartkops Estuary basin, is primarily focused on the prudent use and management of the estuary for both nature conservation and human recreation. BirdLife Eastern Cape, formerly the Eastern Cape Wild Bird Society, is a voluntary organization that aims to stimulate interest in birds, enhance knowledge about them, and assist in their protection (BirdLifeSA, 2018).

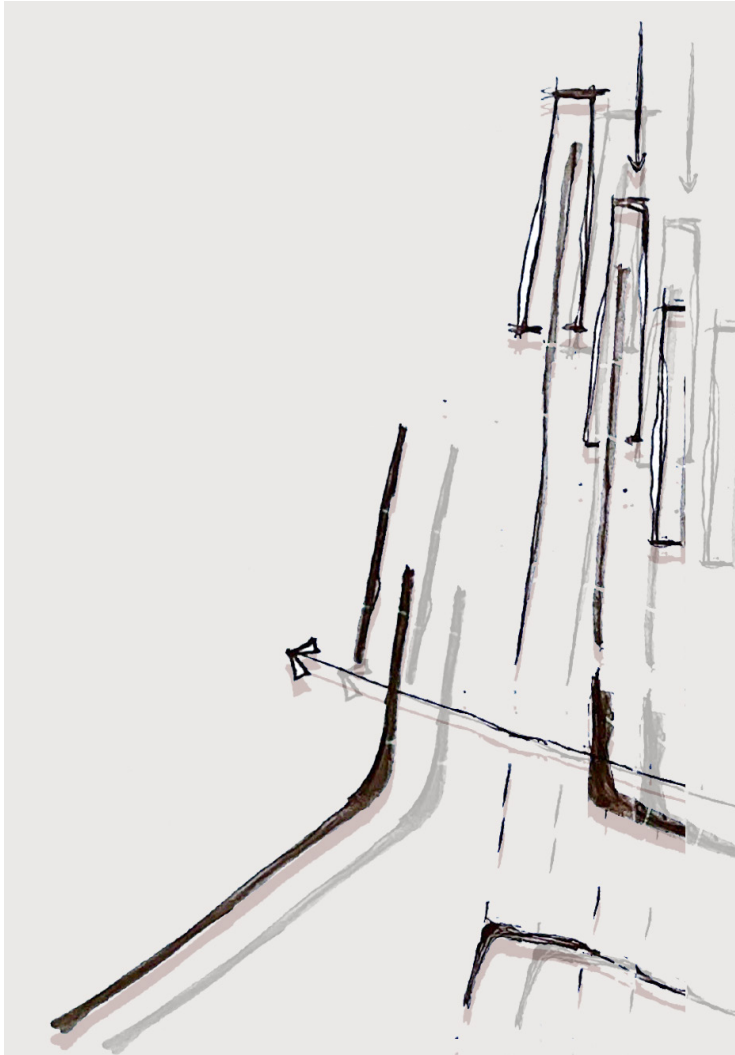


Figure 6: Development sketch (author,2024).

1.5 INFORMED PROCESS AND DEVELOPMENT

The design process begins with the touchstone and conceptual model, laying the foundational ideas to guide the project. These are then translated into sketches and developmental models, allowing for an iterative exploration of form and function. The process also involved a rigorous conceptual integration, where every design decision was weighed against the overarching vision. This approach culminated in the final design synthesis, combining all the explored elements into a coherent and functional architectural design.



Figure 7: Structural diagram (author,2024).

1.7 Technical analysis

This chapter offers a comprehensive overview of the technical investigation, detailing how the design was further developed and resolved. It compiles the explorations, interpretations, and advancements from previous chapters, leading to a cohesive design resolution encompassing functions and structure. The investigation examines the impact of the site and environment on the design, alongside building services, circulation, structural, and experiential approaches. These elements work together in a symbiotic relationship, resonating with the theoretical study.

1.7 CHAPTER LAYOUT

This research explores the complex relationship between humans and the environment. An extensive contextual analysis of the Swartkops River estuary is conducted, considering not only the site conditions and history but also the influences that shape it. The scars left on the landscape from past activities serve as a constant reminder of its history. The project then employs theories such as Bachelard's "The Poetics of Space", the concept of dark ecology, Ingold's "ghostly lines", Haraway's sympoiesis, and Foucault's heterotopias to gain a deeper understanding. Architectural precedents are studied, forming the basis for the envisaged bird sanctuary and eco center. The project aims to collaborate with notable partners such as BirdLife Eastern Cape, aligning with their commitment to bird conservation and education. The research then progresses through three conceptual developments, leading to the design development and synthesis stages. These stages offer a clear depiction of the design, drawing insights from the preceding chapters. Additional details supplement the groundwork for the culmination of this research, highlighting the interdependence and interconnectedness of humans and the environment. The research ultimately seeks to understand how an architectural interface, acting as a shared boundary between humans and avian inhabitants, can promote environmental consciousness, catalyze habitat restoration and conservation, and leave ghostly traces that redefine the landscape's identity. This 'other' space, neither completely human nor non-human, facilitates genuine interaction and mutual understanding between species.

NEITHER HERE NOR THERE

SOMEWHERE IN-BETWEEN

2.1 UNVEILING SWARTKOPS: A PERSONAL INTERLUDE

Growing up in Gqeberha, I was always familiar with the Swartkops area, though I did not fully grasp its significance until much later. My mother resided in Cradock, and my journeys between these two places often led me past the Swartkops estuary, a place that always seemed to exist in the in-between. Residing in KwaMagxaki, a primarily residential township west of Swartkops, I was positioned between the natural and industrial facets of Port Elizabeth. My frequent travels between Gqeberha and Cradock provided a unique vantage point over different parts of the Swartkops estuary, a landscape caught in a perpetual state of flux. Through the car window, I often glimpsed the salt pans, observing the labor and the mounds of salt that lined the landscape.

After moving to Cradock, my visits to Gqeberha became less frequent. It was during one of these visits, just before the holiday preceding my master's year, that I noticed an unexpected stillness over the once lively salt pans. This silence was not just a cessation of activity but seemed to reflect a deeper, less visible transformation. Intrigued, this observation compelled me to delve into the history and ecological significance of the Swartkops Estuary, particularly focusing on the Bar None salt pans at Redhouse village, which I later learned had been abandoned by Cerebos. Although the salt pans I frequently passed were different from those at my study site, their evident decline sparked my curiosity and led me to explore the ones specifically at Redhouse.

Redhouse village revealed itself as an Important Bird and Biodiversity Area (IBA), a hub for numerous Palearctic and migrant birds, thus highlighting the area's ecological importance. The cessation of the salt pans had clearly altered the landscape, prompting me to question the broader implications of human impact on natural settings: What are the long-term effects of such human interventions, and is nature capable of self-recovery in our absence? This line of inquiry not only anchors my dissertation but also challenges us to reconsider our interactions with the natural world.

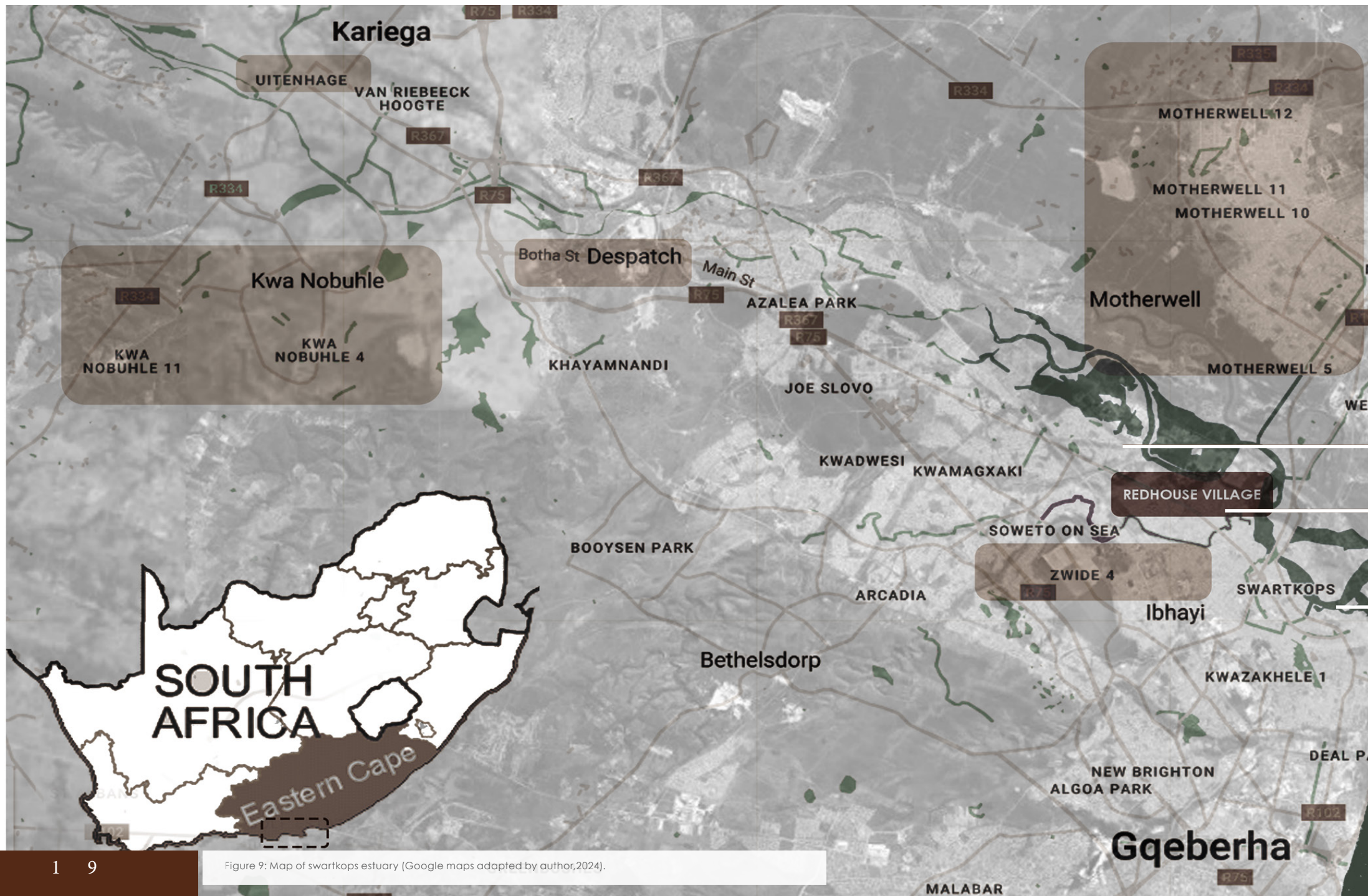


Figure 9: Map of swartkops estuary (Google maps adapted by author,2024).



2.2 INTRODUCTION : THE SWARTKOPS ESTUARY

Located 15km north of the harbour on the outskirts of Port Elizabeth, the Swartkops estuary, recognized as the most significant estuarine and salt flat habitat in the Eastern Cape, flows through a permanently open mouth into the Indian Ocean. Not only is the estuary the most important natural area in Nelson Mandela Bay, but it is also one of the most crucial estuaries in the country. This significance is due to the large number and variety of bird species, as well as the abundance of bait species that serve as food for many fish in the intertidal banks.

SITE

REDHOUSE VILLAGE

SWARTKOPS RIVER



The Swartkops River, a significant ecological and recreational resource, courses through the heavily industrialised and urbanised region of the Eastern Cape, playing a crucial role in the life of Port Elizabeth and its environs. The catchment area of the Swartkops River encompasses nearly the whole municipal region of Uitenhage, Kwanobuhle, Despatch, and Ibhayi, as well as half of the Port Elizabeth municipal area. It is estimated that around a million people currently reside and work within the Swartkops River catchment (Binning & Baird, 2001).

In this dissertation, Potter et al.'s (2010) definition of an "estuary" is adopted, described as a coastal body of water that is partially enclosed and is either permanently or periodically open to the sea. Estuaries receive periodic discharge from rivers,

resulting in salinity levels that are typically lower than natural seawater. Research indicates that Estuarine and Coastal Ecosystems (ECEs) are among the most heavily utilised and threatened natural systems worldwide (Barbier, et al., 2011). A significant proportion of salt marshes, mangroves, coral reefs, and seagrasses are either lost or degraded globally (Valiela et al., 2001; MEA, 2005; Orth et al., 2006; UNEP, 2006; FAO, 2007; Waycott et al. 2009).

South Africa is home to 290 estuaries, including 22 distinct types, with the Swartkops Estuary being one of them. This estuary is one of the few permanently open estuaries with large intertidal salt marshes and is internationally recognized as an Important Bird and Biodiversity Area (IBA).

The Swartkops River originates from the Groot Winterhoek Mountains west of Uitenhage and winds along its tributary, the Elands River, through steep, narrow valleys. The Swartkops and Elands Rivers merge upon entering the floodplain. Tidal influence extends approximately 16 km upstream within the estuary. The upper reaches of the estuary feature narrow, channel-like characteristics with steep banks of muddy sand. The estuary has undergone environmental changes over time, including the disappearance and return of eelgrass beds, as well as shifts in the extent of intertidal mudflats.

Perserverance industrial zone

Intermediate zone

zone of interest: Bar none salt pans



2.3 REDHOUSE: A VILLAGE BETWEEN SPACES

Redhouse, a quaint village nestled on the edge of the Swartkops River, serves as an interesting "in-between" space. The village's name, Redhouse, has two possible origins. One theory suggests that it was named after a small fishing hut, coloured with red ochre, which stood out as a landmark. Another theory proposes that the name is a distortion of "Rooyen se huis", named after the original owner of the area. The village's origins trace back to a farm called Swartkopswagendrift, which was originally owned by Mr. Van Rooyen (McClelland, 2017: online).

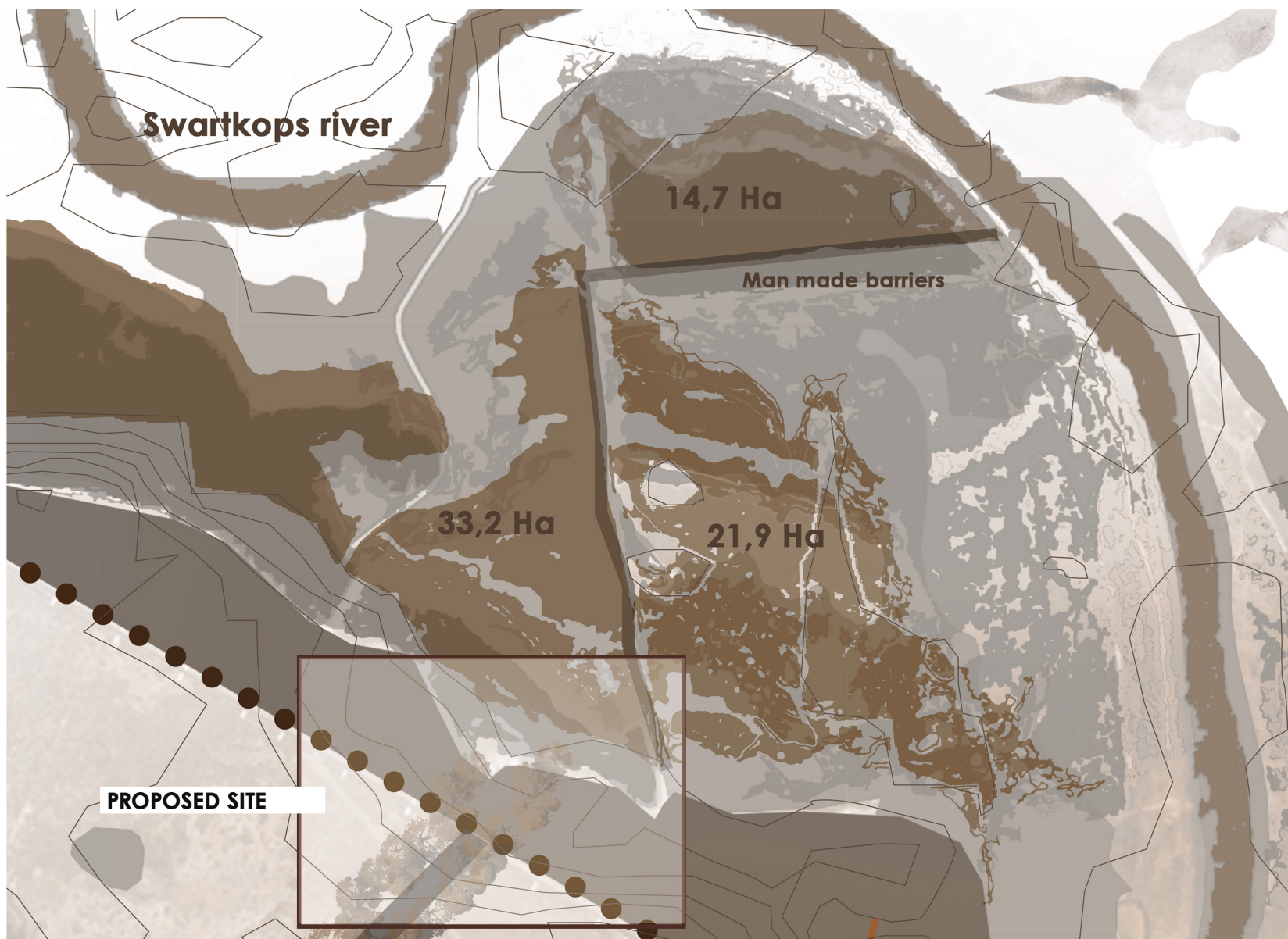
Established around the Redhouse train station, a key stop for trains traveling to and from the Port Elizabeth harbour, the village became accessible and popular among Port Elizabethans when the railway line connected Port Elizabeth and Uitenhage in 1875. This accessibility, coupled with the growing popularity of water sports such as rowing and sailing, led to the village's evolution into a sporting venue and a cherished "outpost of the British Empire" (Collier, 2020).

The village is associated with water activities, such as yachting, rowing, and fishing. Interestingly, while human activities centered around the river, the birds inhabited the inter-spaces, forming a unique human-nature dynamic. Around 1970, primary salt pans were established across the river from Redhouse, attracting thousands of birds and laying the foundation for a future tourism industry. However, significant changes have left the pans deserted and devoid of the birds that once thrived there.



Figure 12: The origins of Redhouse Village ().





2.4 BAR NONE SALT PANS

The Bar None salt pans, previously an active salt-harvesting site operated by Cerebos, now stand as an attestation to the impact of industrial activity and the balance between human activities and ecological health. While operational, Cerebos employed a local brick company, Algoa Brick, to use their excess brick offcuts to create man-made barriers for the salt pans, effectively controlling natural water flow. This disruption of the natural water flow leaves the pans mostly dry and occasionally filled by heavy rains,

presenting an untapped potential as a wetland for avian inhabitants.

However, the site is not forgotten. Ongoing rehabilitation efforts, including initiatives by Cerebos in collaboration with the Zwartkops Conservancy, aim to restore the natural water flow. The aforementioned reinforces the premise that human activities have exerted a significant influence on the environment and the importance of humans in aiding its recovery.

The proposed bird sanctuary aims to serve as a gateway into the natural world, educating visitors about nature and the importance of conservation. It serves as a beckoning, a call to action for humanity to recognize its role in the ecosystem and the ability to transform human-impacted areas into healthy habitats.



Figure 14: Existing procession of trees (author, 2024).



Figure 15: Remnants of the site's past (author, 2024).



Figure 16: Settled salt residue (author, 2024).





2.5 NOTEWORTHY FAUNA AND FLORA

2.5.1 Estuary flora

The inter-tidal zone near the water's edge, where the salt pan meets the land, features an extensive mudflat lined with dried saline sediment and saline-tolerant worms. The adjacent dry land is rich with terrestrial vegetation and desiccated hypersaline sediment, adorned with estuarine plants. Within this area, you'll find an abundance of common cord grass (*Spartina maritima*) and submerged macrophytes such as eelgrass (*Zostera capensis*), which serve as a food source for birds. The landscape also boasts

plenty of *Salicornia pillansii*, primarily found in the hummocks within the salt pan. Other halophytic salt marsh species, including *Suaeda fruticosa*, *Chenolea diffusa*, and *Disphyma crassifolium*, are present in lower abundance, typically inhabiting the periphery of the salt pans, elevated areas, and some hummocks. Additionally, in the elevated regions further from the salt pan, trees such as Mauritius hemp and aloe vera can be found.

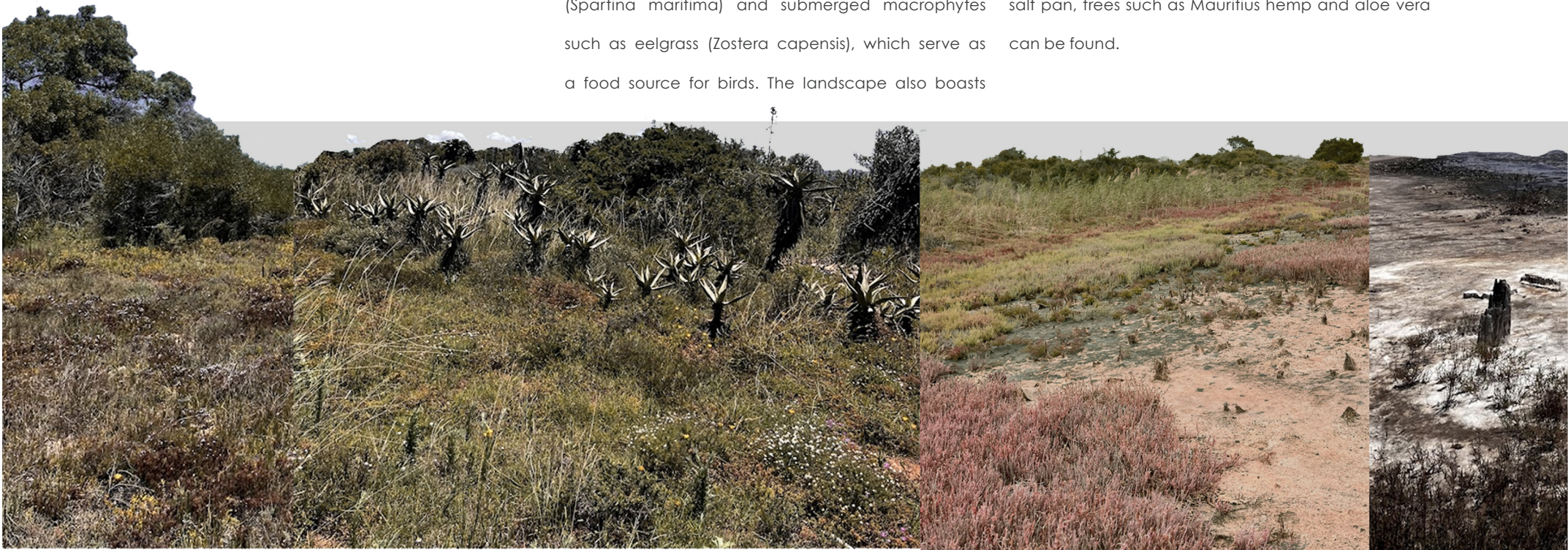


Figure 18: Collage of flora firmly rooted in the landscape (author, 2024).

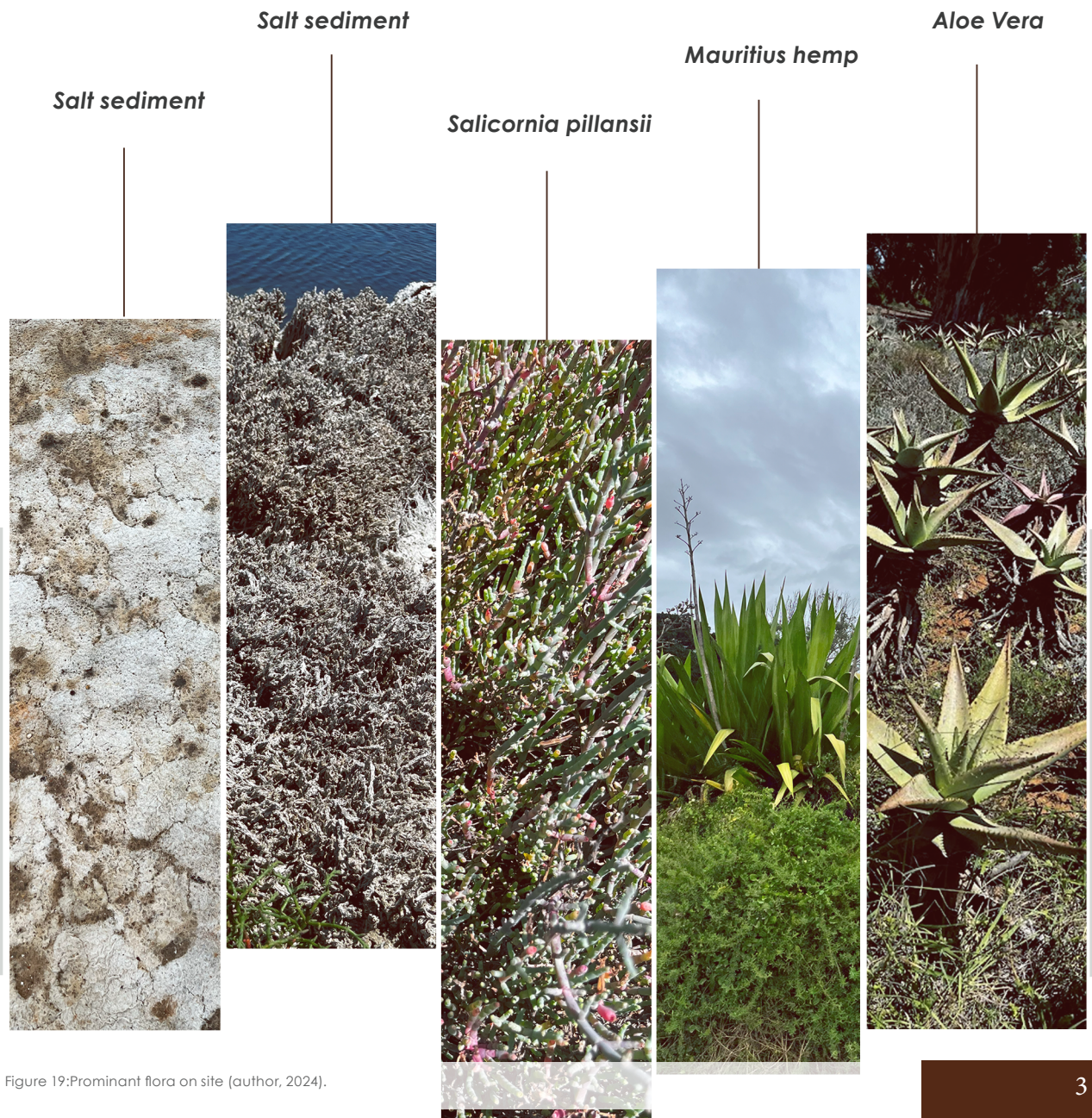


Figure 19: Prominant flora on site (author, 2024).



An analysis by Saudiqa Benjamin as part of the BSc (Hons) Zoology Honours Treatise in 2022, offers valuable insights into the dynamics of avian populations in response to environmental changes. It is noted that between 1996 and 2022 at the Bar None salt pans, distinct patterns were observed in the abundance of water birds when categorised by their

- Waterfowl
- Wading bird
- Wader
- Raptor
- Piscivore
- Diving bird
- Dabbling duck

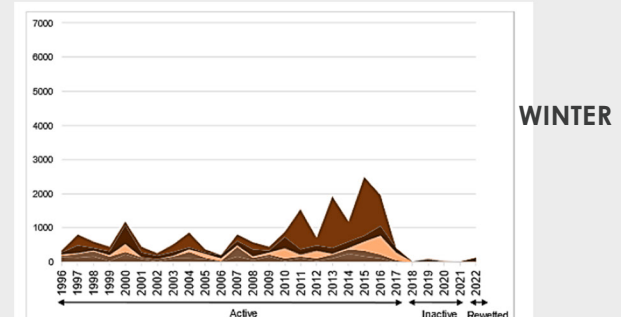
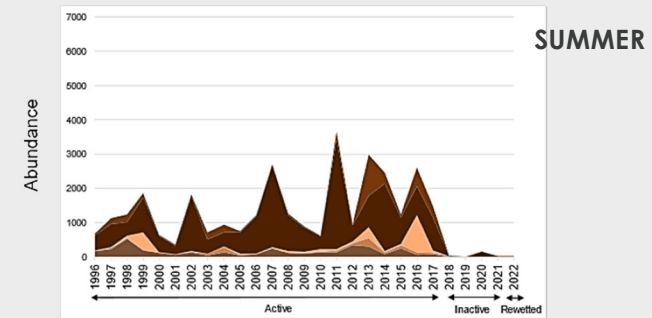


Figure 8: A study of bird abundance across the site (Saudiqa, 2022).

2.5.2 Birdlife

The destruction of freshwater habitats due to industrial development and the construction of salt pans on the floodplain has led to the disappearance of freshwater bird species in the Swartkops Estuary over the past century. This estuary is one of the most important bird habitats in South Africa and has historically supported the highest number of birds between Cape Agulhas and Durban. During the summer, up to 4,000 birds can be present, but this number decreases to less than 1,200 in winter due to the departure of Palaearctic migrant waders and terns (C.A.P.E Estuaries Programme, 2009: ix).

Although the Redhouse Saltworks and the Bar None Salt Works share similarities in the bird species frequenting the areas, the primary focus of this study is the Bar None Salt Works. Following the cessation of salt pan operations at this site, there was a notable decline in the overall bird population. From 1996 to 2022, the most commonly observed species included the blacksmith lapwing, Cape wagtail, Egyptian goose, grey-headed gull, kelp gull, Kittlitz's plover, and little

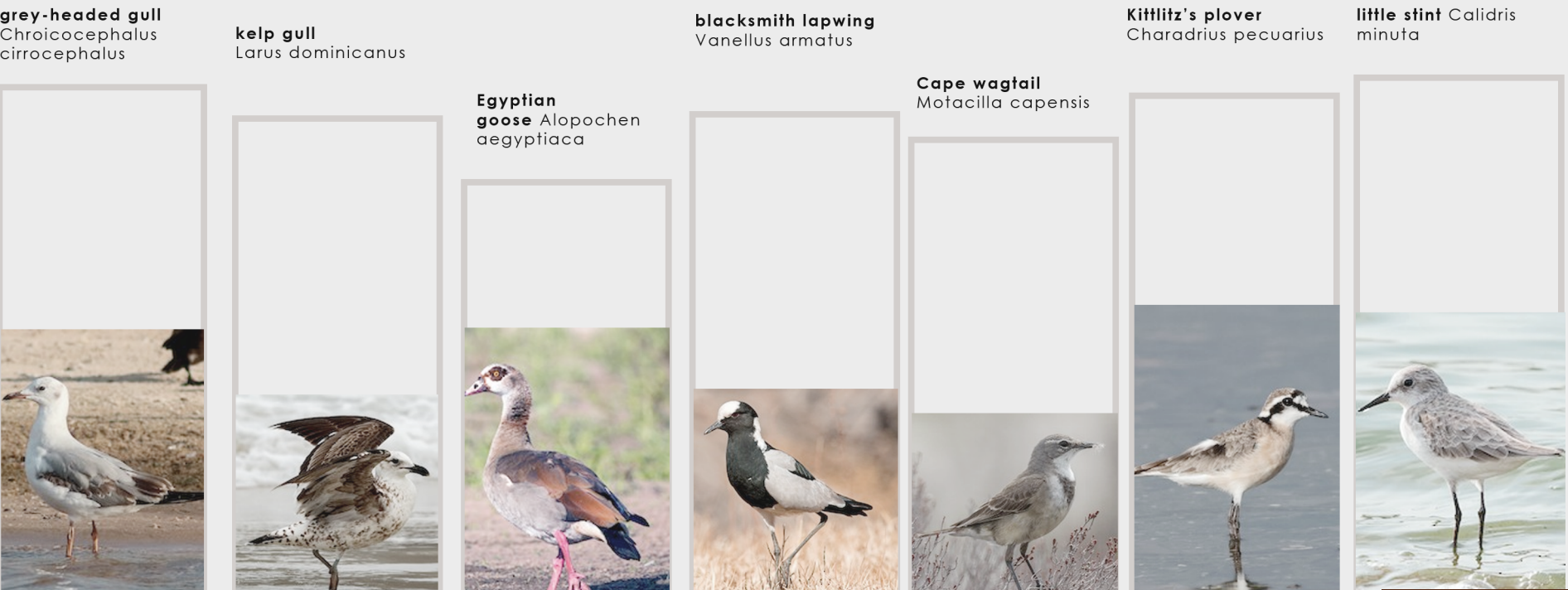


Figure 21: Most prominent birdlife on site ().

The landscape is not just a passive background for human activity or a symbolic arrangement of space. It is a dynamic process, constantly transformed by the activities of matter and living organisms (Anon, 2020: online). Memories, intertwined with physical spaces, become tangible through the paths we trace (Ingold, 2007: 43).

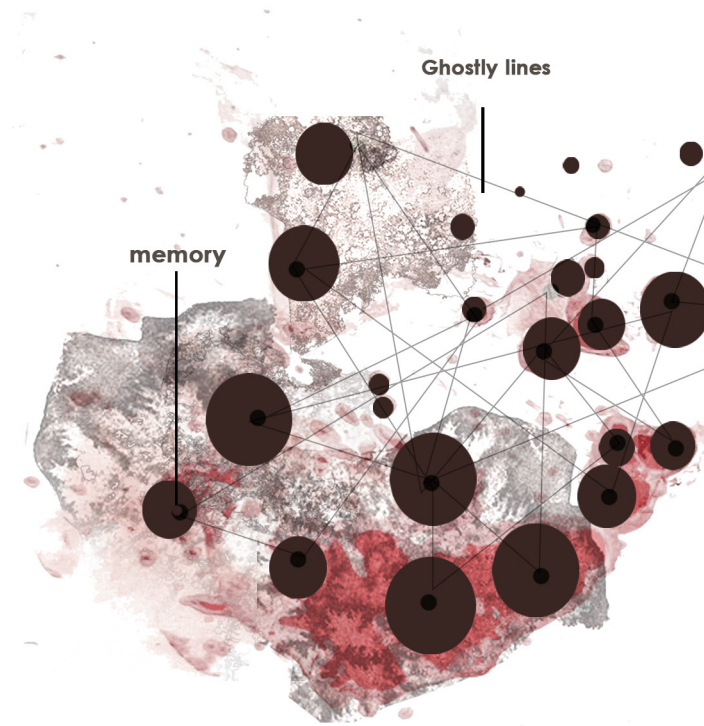
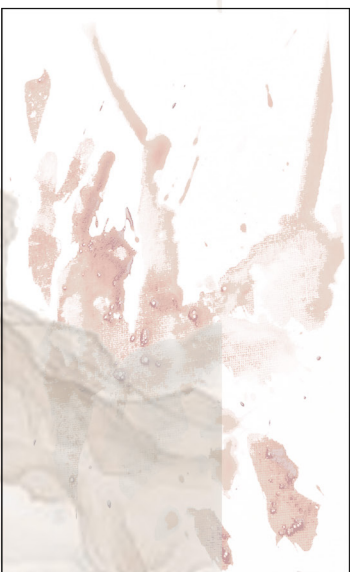
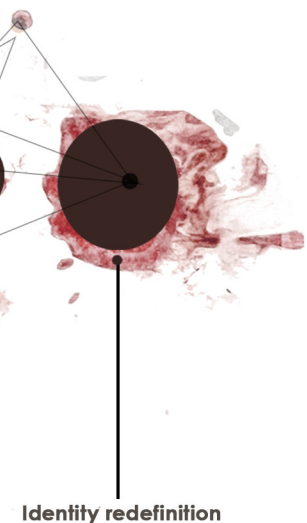


Figure 22: Making alongside the site (author, 2024).



2.6 ALTERNATIVE SITE ANALYSIS: GHOSTLY LINES

Initially, a piece of fabric is dry and devoid of any pattern or colour. Watercolour is dripped onto the fabric, which is then dragged towards the water, tracing the landscape. The immersion of the fabric in saline water, intended to evoke rebirth, is expected to wash away the colours, returning the fabric to a state closer to its original. Instead, it leaves traces and lines etched into the fabric, creating new, unexpected patterns that embody the site's memory attaching itself to the fabric. Some of these patterns only fully reveal themselves once the fabric has dried.

Ghostly lines, metaphysical representations of our environment's invisible connections, progress along everything we do (Ingold, 2007: 47-49). As the fabric transforms, these lines create something new, distinct from the original. The site's ghostly lines attached themselves to the fabric and left an imprint, demonstrating the impact of our interactions and the lasting traces we leave, both seen and unseen. Similarly, the site will likely never revert to its original state due to the ghostly lines ingrained within it. These ghostly lines of memory have redefined its identity, giving it a new identity that carries the weight of its past while also embracing its present and future.



NATURAL LANDSCAPE

RESIDENTIAL AND
INDUSTRIAL

SALT PANS

Figure 23: Swartkops estuary in the liminal (author, 2024).

2.7 CONCLUSION

Perhaps it is in the contrasts between untouched and the disturbed, the natural and the industrial, that the Swartkops estuary truly reveals its liminal essence. Proceeding to the theoretical explorations, the estuary's distinctive position, straddling the thresholds of human and nature beckon the reflection of coexistence and mutual adaptation. This sets the stage for a broader discussion on how such spaces challenge and redefine our understanding of boundary and belonging in the subsequent chapters.

3.1 THEORY DIAGRAM

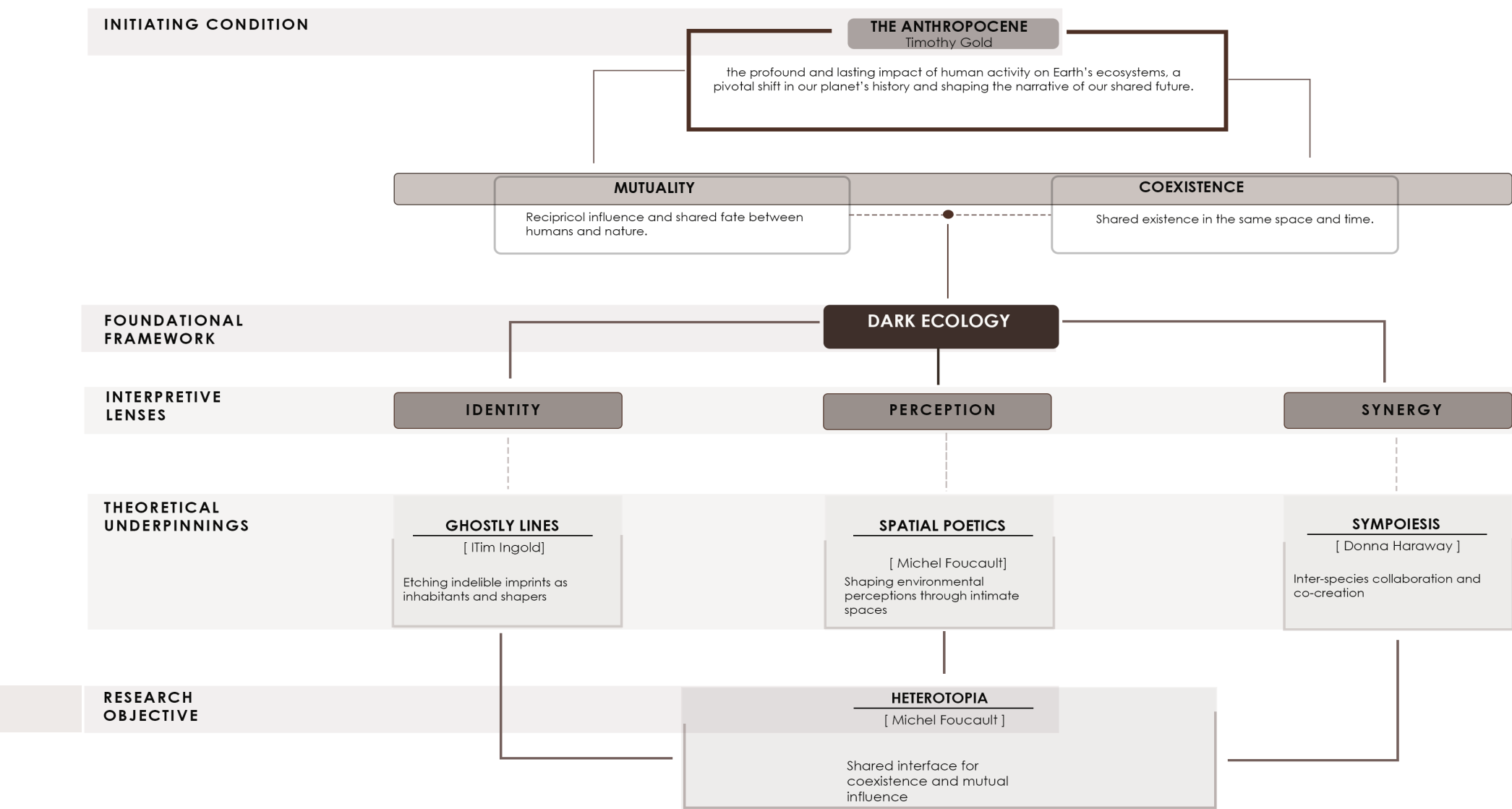


Figure 24: Theory diagram (author, 2024).

3.2 Introduction

“We must lose our earthly paradise in order actually to live in it, to experience it in the reality of its images, in the absolute sublimation that transcends all passion” (Bachelard, 1994: 33).

Imagine standing by a tranquil wetland, the air filled with the calls of water birds and the gentle ripple of water, while the blue-gum trees rustle their leaves in an act of quiet greeting. This serene scene, often romanticised as an untouched paradise, is far from static. Beneath the surface, lies a multi-faceted, ever- adapting network of beings, influenced by both natural processes and human actions. How can we truly appreciate and engage with the earth if we cling to an idealised vision of perfection?

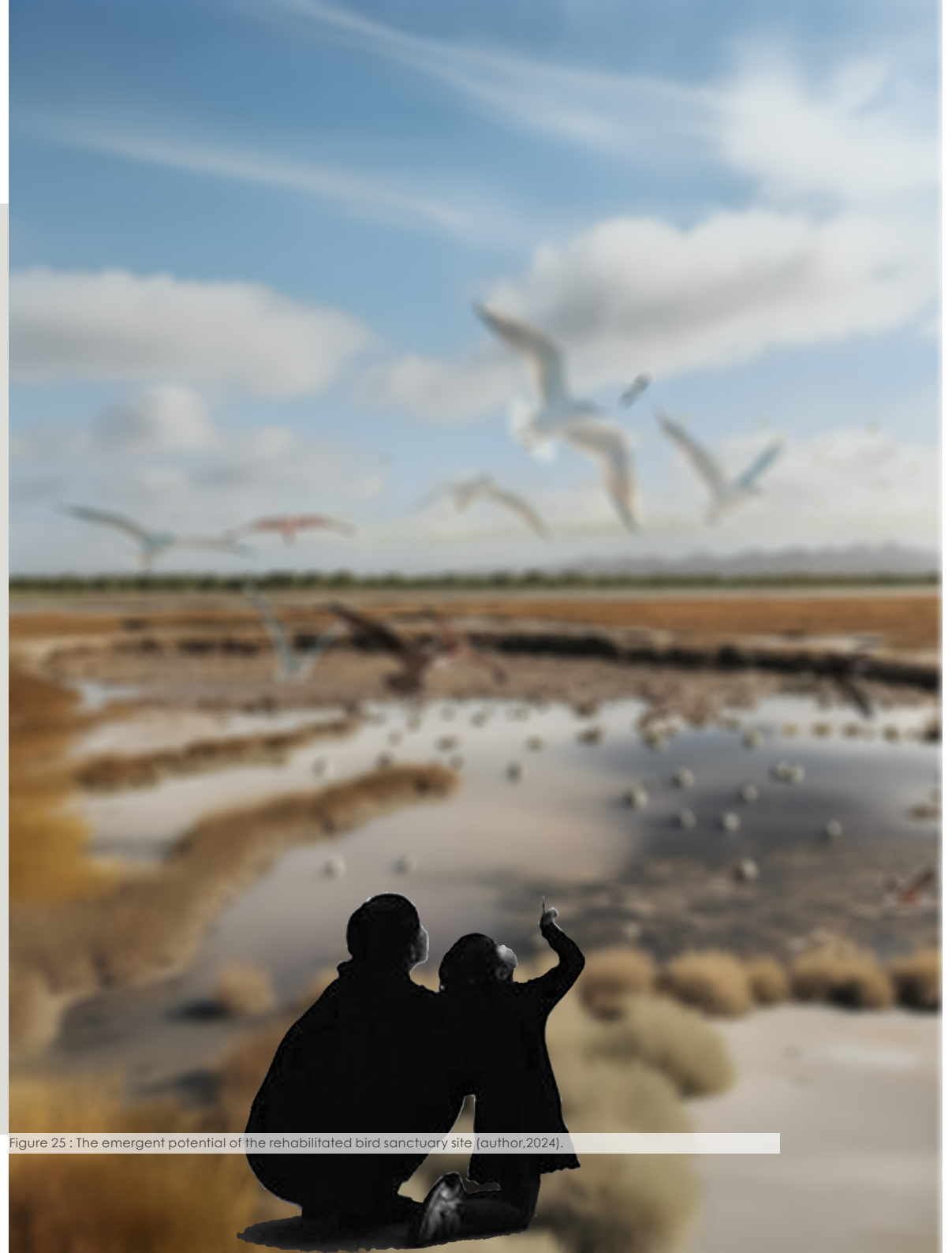


Figure 25 : The emergent potential of the rehabilitated bird sanctuary site (author,2024).

The reality of our planet is far richer and more complex than any utopian dream. Acknowledging this complexity allows for a deeper understanding of the true depth of the relationship with the environment. Exploring how perceptions shape and are shaped by the world, this chapter investigates the principles of the Anthropocene and the concept of dark ecology as proposed by philosopher and ecologist Timothy Morton. Dark ecology challenges traditional views that separate humans from nature, emphasising instead the interdependence and coexistence of all entities on earth. It proposes a reimagining of the world and a revision of how humans perceive their place within it (Morton, 2016: 209). It urges recognition of humanity's interconnected existence with all beings, promoting the reclamation and reinterpretation of the site's narrative.

Additionally, the chapter explores the concepts of "ghostly lines" by British anthropologist Tim Ingold and "sympoiesis" by American science and technology studies scholar Donna J. Haraway.

Ingold's "ghostly lines" represent subtle, often unseen connections between humans and nature that trace the imprints or memories left behind (Ingold, 2007: 47- 49). These could be the traces left on the environment through human actions, impacts that might not be immediately visible but are nonetheless real and significant. They also signify the interconnectedness and interdependence of all beings, central to the Anthropocene and dark ecology. Haraway's "sympoiesis", defined as "making- with," speaks to the complex, dynamic, responsive, situated, and historical systems that humans inhabit (Haraway, 2016: 59). It is within this context that Michel Foucault's concept of the heterotopia is introduced. Heterotopias are "other" spaces that exist outside the standard confines of society. They disrupt traditional boundaries and definitions, facilitating new ways of seeing and being in the world (Foucault, 1984). The site at Redhouse Village epitomises such a heterotopia, existing as a liminal space that blurs the lines between human

and avian, natural and industrial, past and present. This unique characteristic of the site as a liminal space between human and avian habitats will be expanded upon in the final section of the discourse.

The examination of the human-environment relationship seeks to understand humanity's interconnectedness with nature, starting from intimate spaces and extending into the Anthropocene. By presenting these theories sequentially, the discourse transitions from personal and psychological dimensions to broader ecological and social implications, and finally to practical applications to reinterpret and rescript the site's narrative. Throughout this exploration, Bachelard's "Poetics of Space" assertion remains pertinent: "The house shelters daydreaming, the house protects the dreamer, the house allows one to dream in peace" (Bachelard, 1994: 6). May this exploration afford a similar sanctuary, a space to reflect, contemplate, and envision a future where humans and nature coexist in harmony.

3.3 THE POETICS OF SPACE: AN INTIMATE BEGINNING

Earth, the collective home, shelters dreams, protects its inhabitants, and allows all life to flourish in peace. This home is not a solitary space but one shared with countless other beings. More than a mere physical space, the earth becomes a manifestation of collective experiences and interactions, a space that has been deeply lived in and continuously shaped by all its inhabitants.

Bachelard's exploration of intimate spaces, particularly the home, can provide a unique perspective to examine the human relationship with the environment. He posits that the home transcends being merely a physical structure; it is a manifestation of the human psyche, a space that is both a product of the imagination and a catalyst for it (Bachelard, 1994: 3-9). Similarly, the earth transcends its physical form and is a manifestation of the actions and interactions of all life forms. It is a space where the cumulative effects of all living beings shape its ecosystems and landscapes.

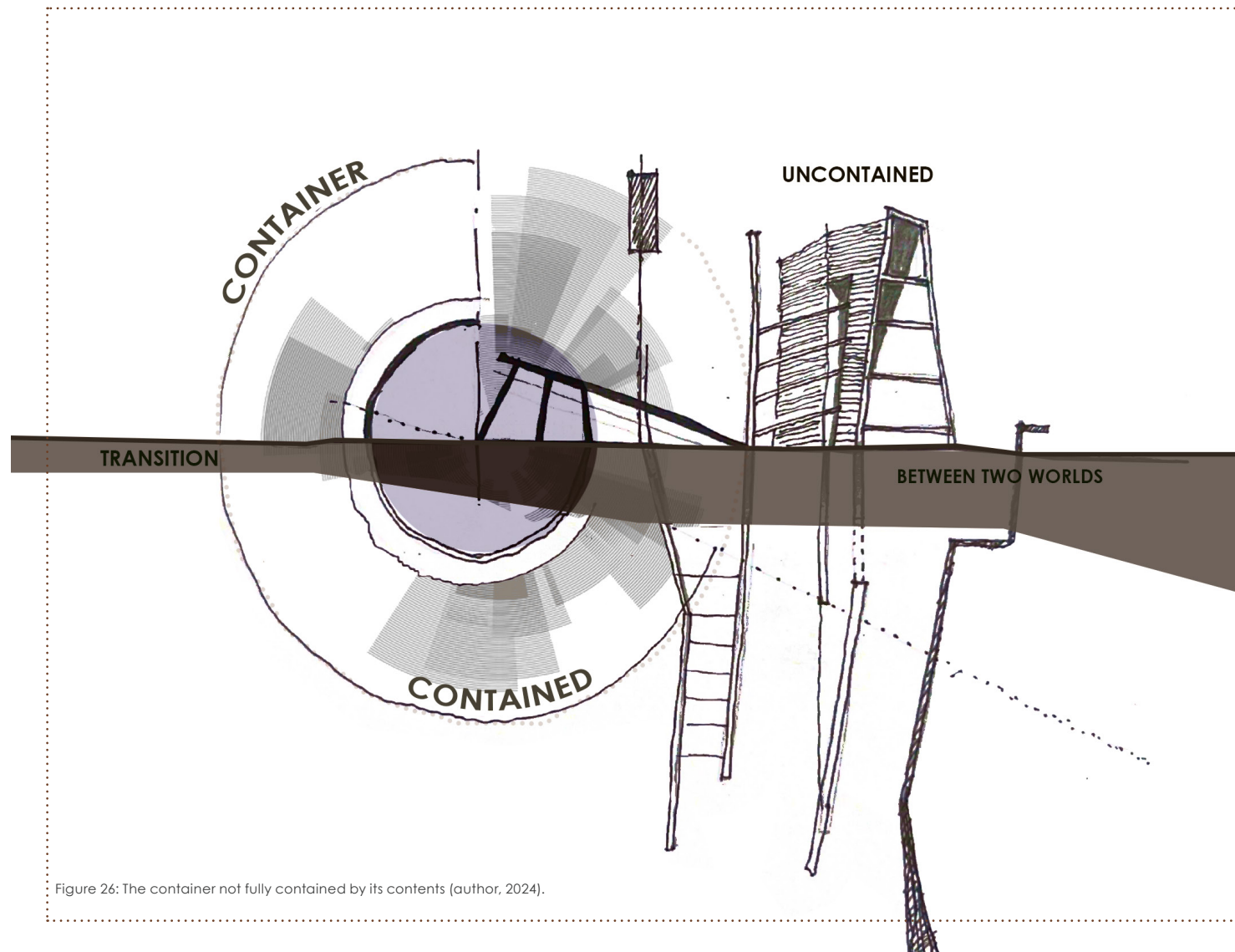


Figure 26: The container not fully contained by its contents (author, 2024).

"Always container, sometimes contained" (Bachelard, 1994: viii), the house serves Bachelard as the portal to metaphors of imagination. He uses the metaphor of the house as a container for all intimate spaces, suggesting that while the house contains the experiences and memories of its inhabitants, it is never fully contained by them. Reflecting more deeply on Bachelard's concept within the context of my own life, my experiences of home oscillated between Cradock, where my mother resided, and Gqeberha, where I grew up under my grandmother's care. This duality of spaces shaped my understanding of home as both a container and a passage between two worlds, neither fully containing me nor completely releasing me. The houses were more than structures; they held my memories and formed my identity, emphasising how spaces hold us and how we, in turn, shape those spaces. Building on this narrative of a house as a container not being fully contained, the metaphor can be extended to understand the broader ecological environment.

Just as a home can shape and be shaped by its occupants, the Earth acts as a living container, delicate and robust, it houses diverse life forms and ecosystems. The earth sustains and nurtures life while remaining vulnerable to the impacts of human activity.

Bachelard furthermore marvels at the instinctive perfection with which animals construct their homes or nests, surpassing all human masons, carpenters, and builders (Bachelard, 1994: 92). This is encapsulated in the proverb that men can do everything except build a bird's nest, emphasising that despite humanity's vast capabilities, there are aspects of nature's design and simplicity that surpass human efforts. This proverb underscores the humility and respect humans should have towards the natural world, recognising that some elements of nature's intricacy remain beyond human reach. However, Bachelard also acknowledges the imperfections inherent in this process. For instance, the golden eagle, when nesting in a tree, sometimes

constructs an enormous pile of branches, adding to it each year, until one day the entire structure collapses under its weight (Bachelard, 1994: 92). Though Bachelard does not explicitly mention the consequences of unchecked human actions here, I do wonder whether this distinct collapse, to a significant extent, mirrors how Earth's systems and environments could falter under the weight of human activities. This scenario vividly underscores the fragility of the environment and highlights the urgent need to acknowledge the interconnectedness with nature and the responsibility towards it.

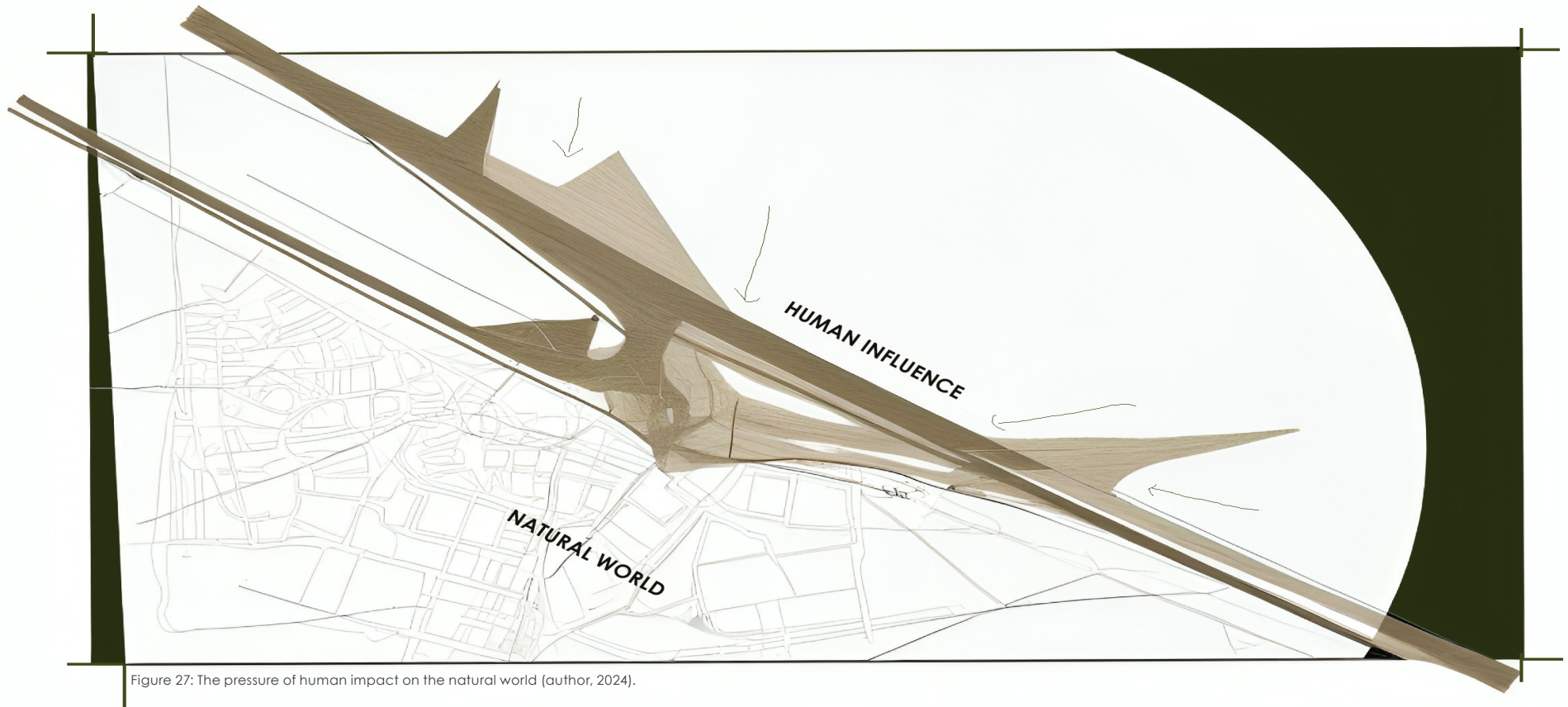


Figure 27: The pressure of human impact on the natural world (author, 2024).

"The hostile attitude of conquering nature ignores the basic interdependence of all things and events, that the world beyond the skin is an extension of our bodies, and will end in destroying the very environment from which we emerge and upon which our whole life depends"

(Watts, 1966: 13)

3.4 DARK ECOLOGY: EMBRACING INTERCONNECTEDNESS

Humanity's interaction with the earth has frequently been marked by exploitation and lack of concern for its long-term well-being. Earth's resources are often treated as limitless, with extraction occurring without considering the repercussions. Activities such as mining, deforestation, damming rivers, and burning fossil fuels are often carried out without fully accounting for the environmental costs, sometimes leaving the earth barren and leading to a loss of biodiversity.

Human influence on the world around us is now more pronounced than ever. The impact is so significant that many scientists argue we have ushered in a new geological epoch: the Anthropocene, meaning "the recent age of man". Regrettably, this "age of man" is far from a golden era (Gollbo, 2024: 5). The Anthropocene has precipitated not only ecological crises and challenges but has also permanently transformed Earth's conditions, leading to ongoing negative impacts on various ecosystems and human societies well into a future that may seem

almost unimaginable (Gollbo, 2024: 5). Modern human activity has fundamentally transformed Earth's natural systems. The Anthropocene highlights that our actions now wield a dominant influence over multiple facets of the natural world and the functioning of Earth's systems. This pervasive impact is so normalised that we often overlook it. However, the consequences are profound and far-reaching. With great power comes great responsibility, and the responsibility of managing this influence is one that many are ill-equipped to handle. It underscores our crucial role not just as passive observers but as active participants in Earth's ecological balance.

The Anthropocene calls for a paradigm shift in the human-nature relationship within the environment. It urges humanity to move beyond viewing the environment as a separate entity, and instead to see ourselves as an integral part of Earth's systems. Recognising that actions have far-reaching consequences, it challenges humanity to take responsibility and work towards a more sustainable and equitable future for all inhabitants of the planet. This is where the concept of dark ecology comes into play. Grounded in an object-oriented ontology, dark ecology posits that the world is composed of various objects existing on an equal ontological plane. American philosopher and ecologist Timothy Morton describes this perspective as presenting a "logic of future coexistence" (Morton, 2016: 1), where humans are not considered superior to other entities but are viewed as just another object among many. This viewpoint eliminates the distinction between "subject/object" and "human/nature", suggesting that such logic could transform humanity's

relationship with the environment into a less harmful one (Gollbo, 2024: 5-6). The breaking down of the distinction between the observer (subject) and the observed (object) is a key aspect of dark ecology. This concept challenges the traditional views of humans (subjects) being seen as separate from and often superior to the natural world (objects). Dark ecology argues that this separation is artificial and that everything is interconnected. Humans are not just observers of nature but participants within it.

Complementing this perspective is deep ecology, a philosophical approach to ecology introduced by Norwegian philosopher Arne Naess in 1972, which posits that nature has inherent value, independent of its usefulness to human beings (Gollbo, 2024: 7). Dark ecology, as presented by Morton, is not intended to be antagonistic towards deep ecology but rather to extend it, offering an even deeper understanding of ecology (Morton, 2016: 78). The goal of dark ecology as a theoretical framework is to improve

humanity's relationship with the environment through the proposed worldview that eliminates the dichotomy between humans and nature, as well as between subject and object. Dark ecology introduces a logic based on ecological awareness, which acknowledges the world's darkness and strangeness and involves "letting oneself become more susceptible", or as Morton calls it "ecognosis recognising" (Morton, 2016: 129). This means allowing oneself to be more open, sensitive, and responsive to the complexities and subtleties of ecological relationships and the natural world, allowing oneself to feel at multiple scales.

Furthermore, dark ecology rejects the false notion of a smooth, homogeneous universality or space, emphasising that the whole is greater than the sum of its parts (Morton, 2016: 12). Earth is not merely a blank canvas for human desires; the desired loop involves entities like earth, coral, and clouds being interconnected, also with humans (Morton, 2007: 65). The bird sanctuary and eco centre represents a crucial initiative for fostering a deeper human-nature connection. Grounded in the principles of dark ecology, the project views humans and birds as integral components of Earth's

ecosystems. This perspective can be seamlessly applied to understanding and communicating environmental issues. When addressing these topics, the interconnectedness of all elements is just as important as their significance. A comprehensive approach explores both viewpoints. By creating a space for harmonious coexistence, the sanctuary promotes ecological awareness and responsibility. It serves as a tangible manifestation of theoretical perspectives, providing a practical space for education, reflection, and action.

Instead of succumbing to the despair of ecological degradation, this perspective invites us to confront the complexities of our interconnectedness with nature head-on and find meaning in our actions. It poses the question: What lasting impacts do our actions leave on the world?

3.5 GHOSTLY LINES: TRACES OF HUMAN IMPACT

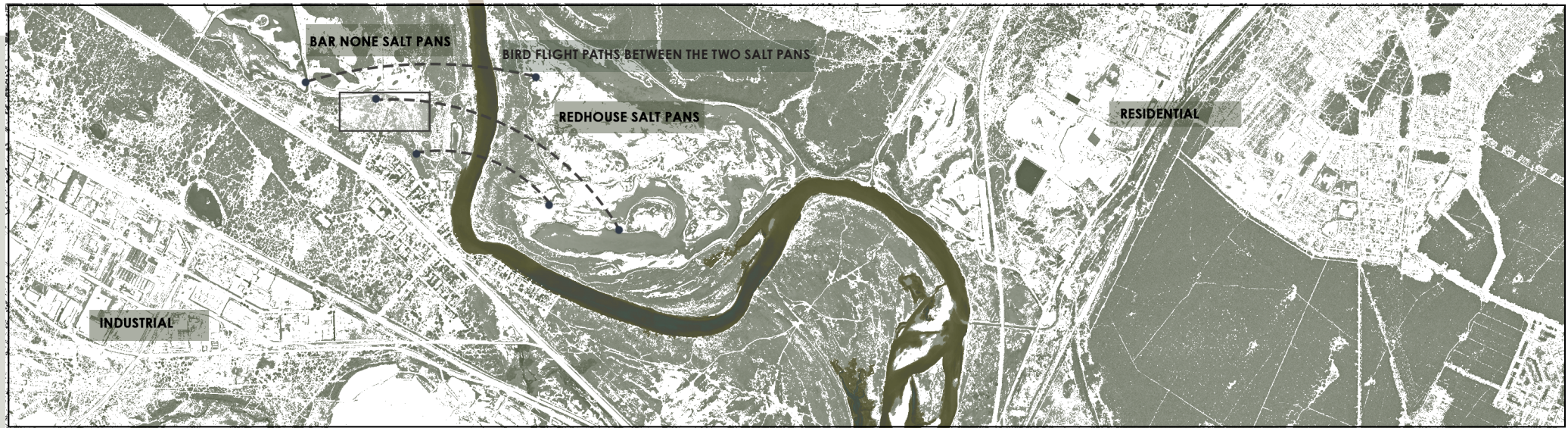


Figure 28: The gradient of human impact on natural landscapes (Google maps adapted by author, 2024).

Across the world, people build homes, cultivate the land, seek food, nourish their bodies, and create their lives. Life flourishes on this planet's horizontal plane, anchored by the unyielding pull of gravity. This space serves as a canvas, etched with the indelible marks of human and non-human presence. These remnants, both physical and ethereal, testify to lived experiences. They are the silent echoes of existence, the subtle imprints of human and non-human actions.

Figure 28 illustrates the ever-changing interaction between human activity and natural landscapes in the Swartkops Estuary area. The map abstraction highlights the gradient of human impact, with industrial and residential developments and influences marked in whiter tones indicating significant human presence, and greener areas depicting less disturbed natural environments. This visual representation shows the tangible yet often unseen influences shaping this region, a critical tool for understanding the ecological interplay at the site.

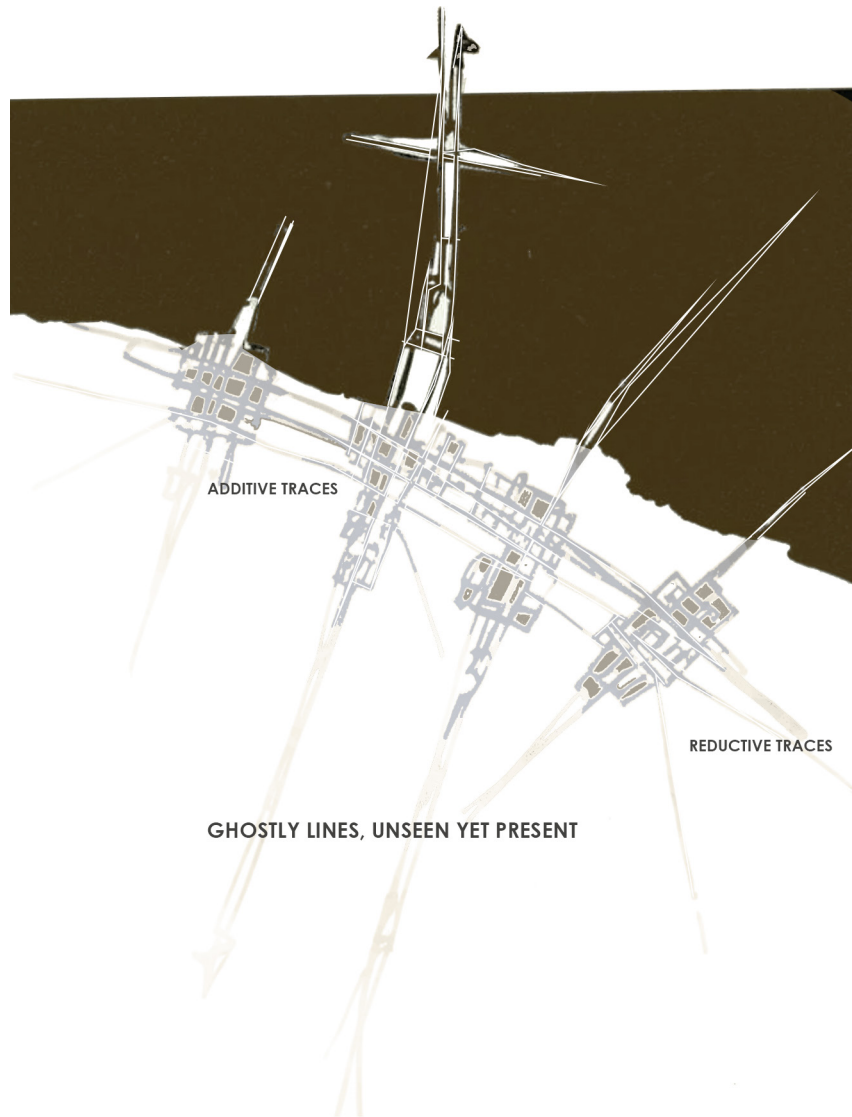


Figure 28: Subtle presence of human impact (author,2024).

In this section, "ghostly lines", a term coined by anthropologist Tim Ingold in his work *Lines: A Brief History* (2007), is explored. Ingold defines these as subtle, often invisible, connections that exist between beings and places, and the subtle impacts of human activity on the environment (Ingold, 2007: 48-49). Ghostly lines embody the unseen yet undeniable ties that connect us to the natural world. These lines may not be physically tangible, but they are no less real. They manifest as the migratory paths of birds, the invisible trails of the wind, and the silent footprints of time etched into the landscape. They are the echoes of our actions, reverberating through the ecosystem, subtly shaping and being shaped by the world around us.

In his work, Ingold distinguishes between two categories of traces in both the human and non-human world: additive and reductive. Additive traces involve the addition of material to a surface, while reductive traces result from the removal of material (Ingold, 2007: 43). The migratory paths of birds, which influence the distribution of plant species by carrying seeds

over vast distances, exemplify additive traces. The movement of birds adds new elements to the environment. Similarly, the daily movements of birds can affect insect populations and contribute to the pollination of flowers (Anon., 2014), leaving behind "ghostly lines" that subtly yet significantly shape the environment. Human activities, such as construction, agriculture, and recreation, also leave "ghostly lines" in the environment. These activities often result in reductive traces, altering the landscape, influencing local ecosystems, and having lasting impacts on biodiversity. For instance, the industrialisation and salt harvesting on the proposed site have not only harmed the environment but also displaced birds from their habitats. The damage extends beyond the immediate area of human activity, disrupting habitats and compelling birds to leave their homes. The ghostly lines left by birds represent the understated, often unnoticed, interconnections within our surroundings.

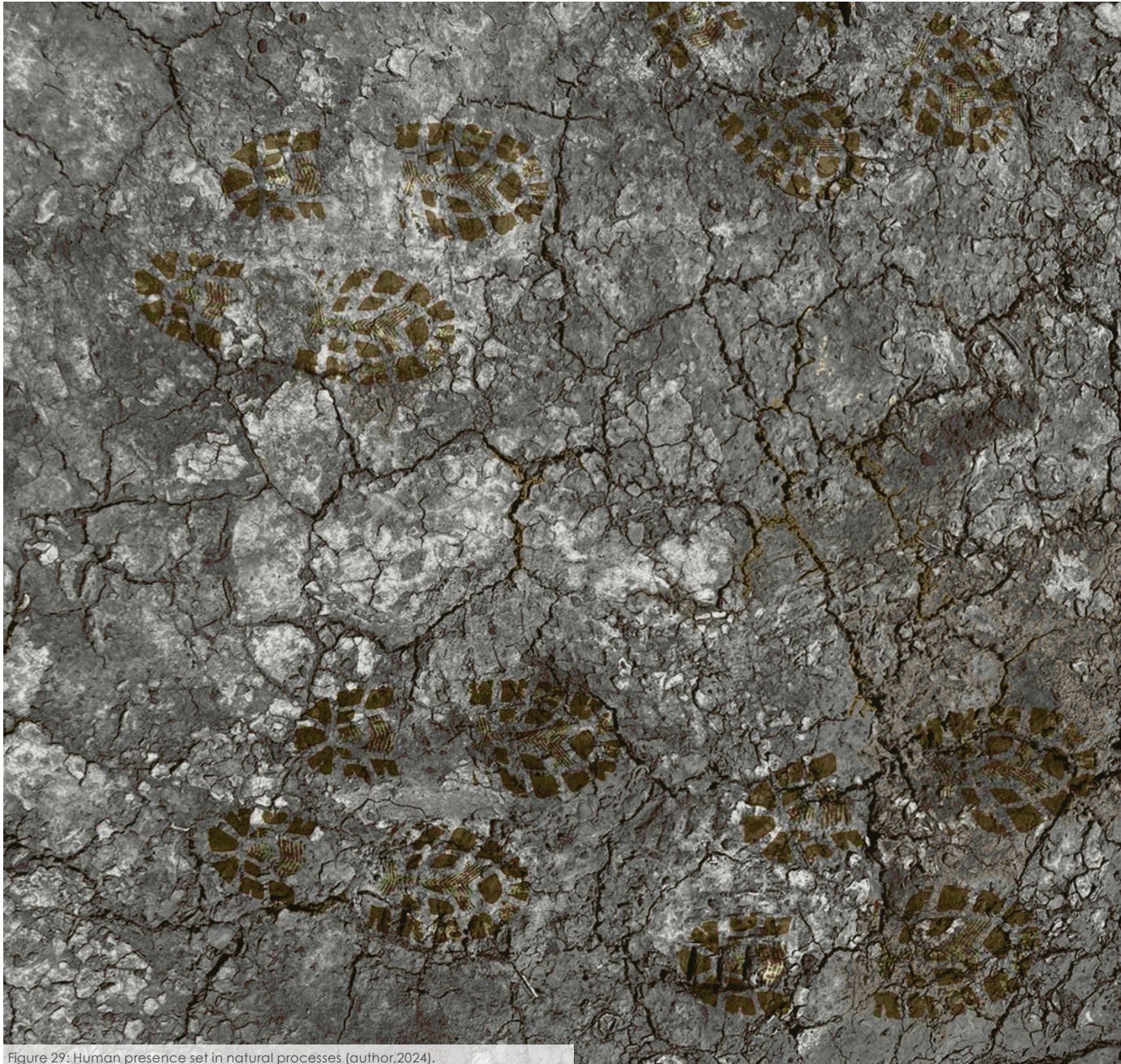


Figure 29: Human presence set in natural processes (author,2024).

Figure 29 showcases the ground surface of the desolate clay soil at the salt pan site, marked by dry salt residue, imprints of past activity now set in the cracked and parched earth. This image of human presence and natural response highlights how as life develops, it leaves indelible marks on the planet.

Through the study of the proposed site as part of the alternative site analysis in Chapter 2, the presence of ghostly lines became apparent, emphasising the significant influence of various interactions on the landscape. The site's salinity interacting with materials over time demonstrates how the environment imprints itself on physical objects, reflecting the reciprocal relationship between landscapes and human experiences. These ghostly lines give the site a new identity, carrying the weight of its past while embracing its present and future. This transformation also underscores nature's regenerative nature. As the landscape evolves, nature may reclaim or attach itself to built structures, turning them into archives of memory that silently witness the passage of time and embody the collective memory of the ever-changing site. These entities, whether objects, spaces, or landscapes, serve as tangible reminders of the past, illustrating the lasting traces of human presence and actions.

3.6 SYMPOIESIS: MAKING WITH NATURE



Figure 30: Human presence set in natural processes (author,2024).

Our identity as humans has never been isolated because our existence has always been intertwined with other species that live within us or around us. American author Richard Grusin in his work *The Nonhuman Turn* states, "... we have never been solely human" because "the human has perpetually coevolved, coexisted, or cooperated with the nonhuman—and it is this inseparability from the nonhuman that precisely defines the human" (Žukauskaitė, 2022: online).

Multispecies feminist theorist Donna J. Haraway's notion of sympoiesis examines different modes of cohabitation or hybridisation between humans and non-human species. In *Staying with the Trouble* (2016), Donna Haraway advocates for confronting systematic environmental challenges directly, acknowledging that "... we require each other in unexpected collaborations and combinations ... we

become- with each other or not at all" (Haraway, 2016: 4). She emphasises the importance of forming connections not just with other humans, but crucially with non-human entities as well. Haraway envisions a reimagined existence on this planet, one that leads us towards a future that narrowly evades our current trajectory towards ruin. The concept

of sympoiesis, coined by Donna Haraway and translated to "making with", emphasises that nothing exists in isolation; everything is interdependent and co-creative. Unlike the notion of autopoiesis, which suggests self-creation and self-organisation, sympoiesis highlights that all beings and systems are formed and sustained through interactions and relationships with others. This concept underscores

the interconnectedness and collaborative nature of life, where the development and survival of any entity are reliant on its connections and interactions with the wider ecological and social web.

In her work *Symbiotic Planet* (1998), American evolutionary biologist Lynn Margulis, demonstrated

that life originated from the interaction between different life forms. Haraway also agrees that symbiosis is the fundamental law of life. However, she questions Margulis's idea of these life processes being autopoietic and proposes the term "sympoietic", arguing that nothing can truly create itself and that organisms and environments are essential for their development (Haraway, 2016).

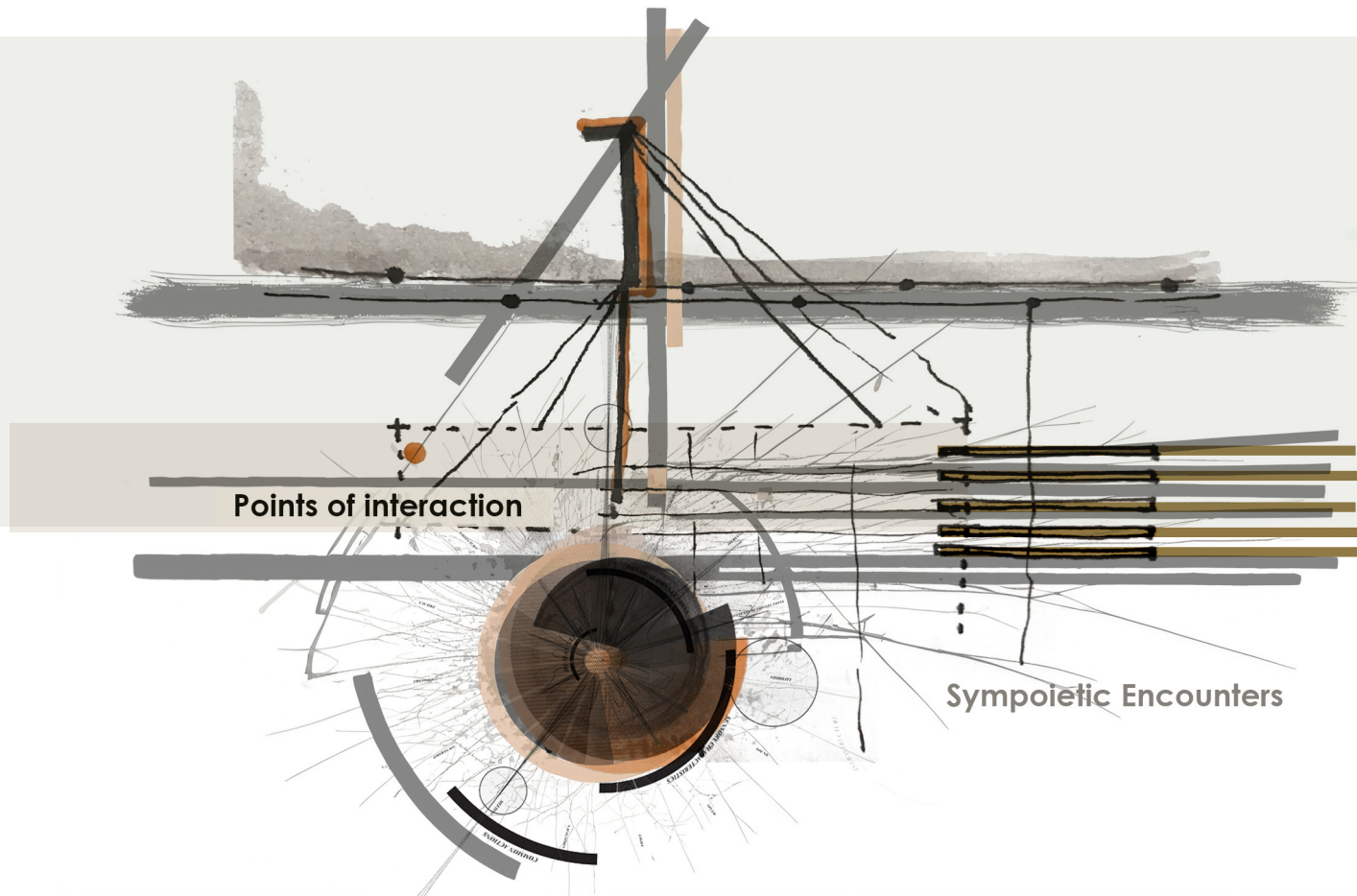


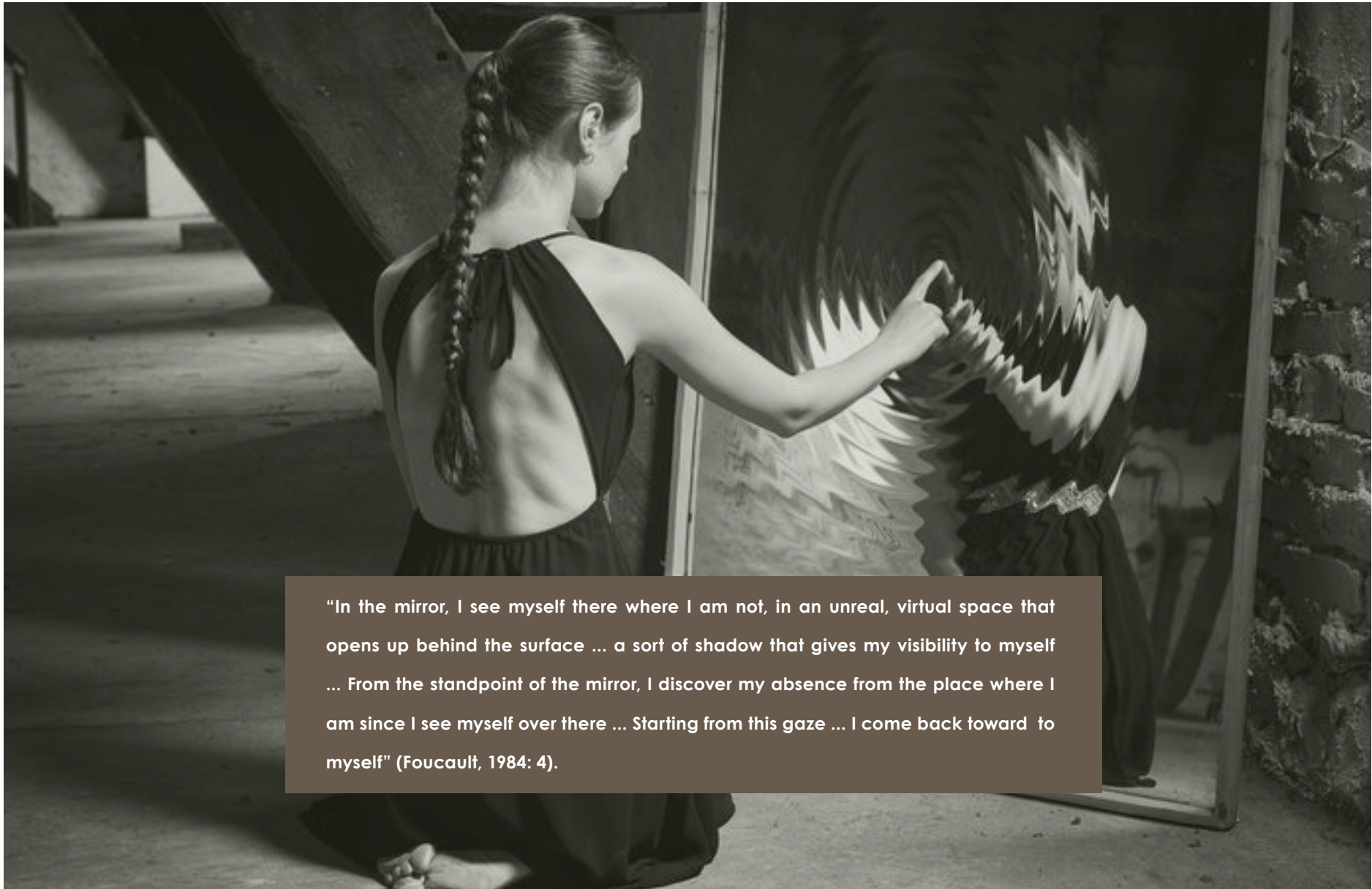
Figure 31: Point of making-with (author,2024).

This theory of sympoiesis resonates deeply with the relationships observed in the natural world, particularly among birds and humans as they coexist within a mutually influential paradigm. Birds' reliance on ecosystems for food, nesting, and migration demonstrates this interconnectedness, while human activities like agriculture and urban planning underscore human dependence on and impact on these systems. The proposed bird sanctuary and ecology centre exemplifies this concept by creating a space where humans and birds coexist within a complex, responsive system. It serves as a tangible representation of "making with", showcasing how human efforts to protect bird habitats lead to mutual benefits, enhancing biodiversity and ecological

health. This sanctuary becomes a microcosm of sympoiesis, illustrating how cooperative relationships between species can create a more harmonious and sustainable world for all.

To facilitate sympoiesis, there must be a mediating space where both humans and non-humans can interact and "make with." This calls for the creation of an "other" space—neither fully human nor fully non-human—a heterotopia. French philosopher Michel Foucault describes heterotopias as "other" spaces that disrupt traditional boundaries, fostering new ways of perceiving and existing in the world. This begs the question: What role do heterotopias play in facilitating self-awareness and introspection within the context of human and non-human interactions?

3.7 HETEROTOPIA: INTERMEDIARY DIALOUGES



"In the mirror, I see myself there where I am not, in an unreal, virtual space that opens up behind the surface ... a sort of shadow that gives my visibility to myself ... From the standpoint of the mirror, I discover my absence from the place where I am since I see myself over there ... Starting from this gaze ... I come back toward to myself" (Foucault, 1984: 4).

Foucault describes the space between utopias and heterotopias as a "joint experience", best illustrated by the mirror. A mirror acts as a utopia by displaying an unreal, virtual space where one sees their reflection in an alternate dimension. Concurrently, it functions as a heterotopia because it has a physical presence, making the observer aware of their absence from the real space they occupy. This duality is key to understanding heterotopias, as it helps individuals reflect on their presence and absence, promoting self-awareness and introspection. This duality captures the contradiction of being both present and absent, allowing for self-reflection and a deeper understanding of one's position within the world (Foucault, 1984: 4). Drawing on these principles, I find this concept profoundly illuminating when considering the design of spaces that foster self-awareness and introspection. The

reciprocity between the real and the unreal, as seen in the mirror analogy, offers a powerful tool for creating environments where individuals can confront and reflect on their presence and impact from an external perspective, promoting a deeper understanding of their relationship with their surroundings.

Foucault's concept of heterotopia is ingeniously applied in the bird sanctuary's design, creating a space that mirrors the utopic and the real. By functioning as a heterotopia, the sanctuary allows people to see themselves as part of the landscape they are not physically in, helping them understand their impact on the environment. This setup underscores the simultaneous presence and absence, urging visitors to contemplate the invisible effects of their actions. By interacting with this space,

visitors not only see themselves in a 'different world', that of the birds and the natural environment, but also reflects on the dual process of nature's degradation and rehabilitation. Inside, visitors become part of a landscape they can't physically enter, outside, direct engagement with the environment and birdlife fosters tangible interactions, reinforces their connection to the natural world and highlighting the importance of conservation and rehabilitation. The proposed building will exist in reality and exert a counteraction on the position we occupy. From the standpoint of the building, visitors will discover their absence from the place where they are, as they see themselves "over there" (Foucault, 1967: 4). This is a form of self-awareness and introspection facilitated by a shared boundary or interface.



Figure 33: Existence of a space between two realms (author, 2024).

Rather than denying the existence of contrasting realities, Foucault's concept of heterotopia emphasises the possibility of a space where relationships between elements coexist dynamically. The emphasis on this duality allows for the existence of a space between two realms, a meeting point where distinct spaces and entities converge. Within this framework, the building itself functions as a mediator, strategically positioned to bridge the natural and human-made environments. It stands as a physical and conceptual intermediary, facilitating a dialogue between the contrasting realms and allowing an integrated experience of both.

3.8 THEORETICAL PRECEDENT

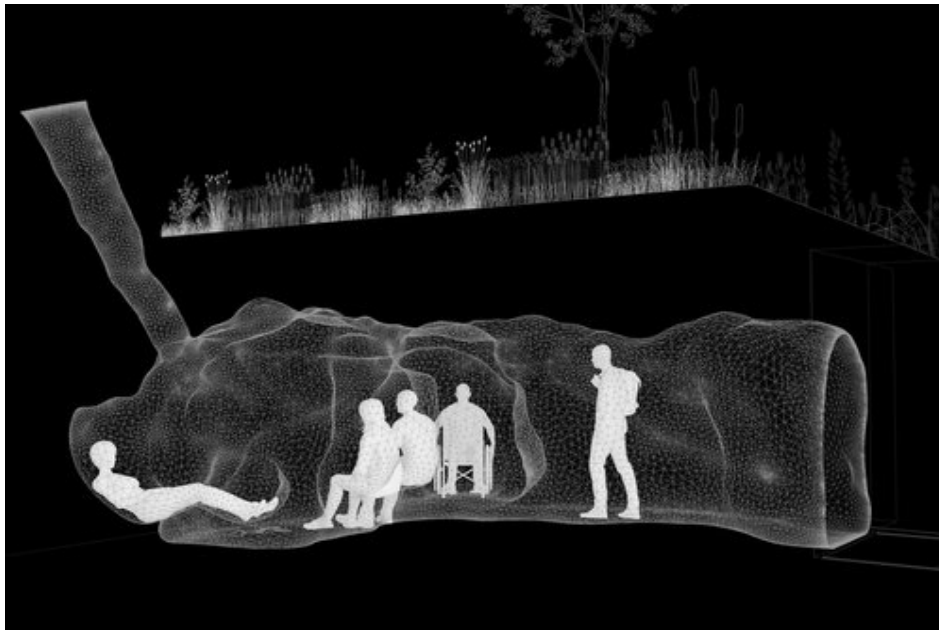


Figure 34: The human burrow below ground (Sharpe, 2021: online).



Figure 35: The human burrow above ground (Sharpe, 2021: online).

“the human burrow, is a sculpture that offers a totally new way for visitors experience kielder's unique landscape {...}
the way that its structure removes visitors from their everyday experience to sensitise them to a specific experience...”
(Sharpe, 2021: online)



"The Human Burrow" engages with notions of heterotopia and the experiential dialogue between humans and the natural environment. The installation draws visitors into an intimate interaction with space, requiring them to crouch or stoop as they navigate its descending, winding pathways, mimicking the burrowing habits of animals (Anon, 2021: online). Such physical engagement can be interpreted metaphorically as an act of bowing to nature, symbolizing a gesture of respect or submission to the natural world that envelops them. As visitors descend, they transition from the vast openness of the forest into the confined, introspective space of the burrow. This shift not only alters their physical posture but also their auditory perception. The installation amplifies the subtle sounds of nature creating a soundscape that encourages a deep listening experience.

In Sharpe's installation, the burrow represents an 'other' space that exists in contrast to the open landscape above, offering a place of refuge and introspection. It stands as an in-between space, where the boundaries between the external natural world and the internal personal experience blur, allowing for a unique exploration of self in relation to the encompassing environment.

3.9 CONCLUSION

The aim of this discourse is not to claim that humans and nature are irrevocably separate or wholly unified, but rather to illustrate the interconnectedness and mutual influence between them. It compels the acknowledgment of humanity's coexistence with all beings in the same way that dark ecology emphasizes interdependence. The exploration of architectural interfaces and heterotopias throughout this project has demonstrated physical and conceptual spaces that mediate human and natural systems. Heterotopias, embodying layered or alternate realities, both mirror and distort the spaces they reflect or represent. This discourse prompts at spaces that facilitate interdependent, sympoietic encounters, directly responding to the research question: How can an architectural interface, serving as an 'other space' at the convergence of human and natural systems, facilitate interdependent, sympoietic encounters within the rehabilitated ecosystems of the Anthropocene? This dissertation asserts that such spaces, through their design and function, encourage a redefinition of boundaries and interactions, highlighting the essential role of architecture in shaping and reflecting the evolving dynamics between humanity and the natural world.

04

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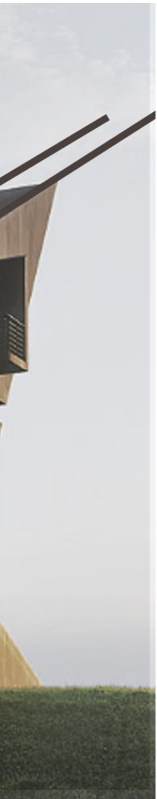
4.1

Olympic archery range



4.2

Tower of dreams
longing



s and



4.3

Coromandel estate



4.4

Evoo centre



4.5

Bowali visitor centre

ARCHITECTURAL PRECEDENTS

4.1 PRECEDENT ANALYSIS: GEOMETRIC AND SPATIAL DESIGN

Olympic archery range

Enric Miralles and Carme Pinós | La Valle d'Hebron, Barcelona

The Olympic Archery Range, employs soft lines and subtle geometry to define the boundaries and spaces within the building. The plan features a variety of overlaid lines and an organic flow of spatial composition, seamlessly connecting different parts of the design. The section reveals roofs that appear to lift off, supported by the structure below, evoking a sense of flight. This makes the Olympic Archery Range an excellent precedent for analyzing and inspiring a design focused on themes of flight and birds for the bird sanctuary and ecology centre.

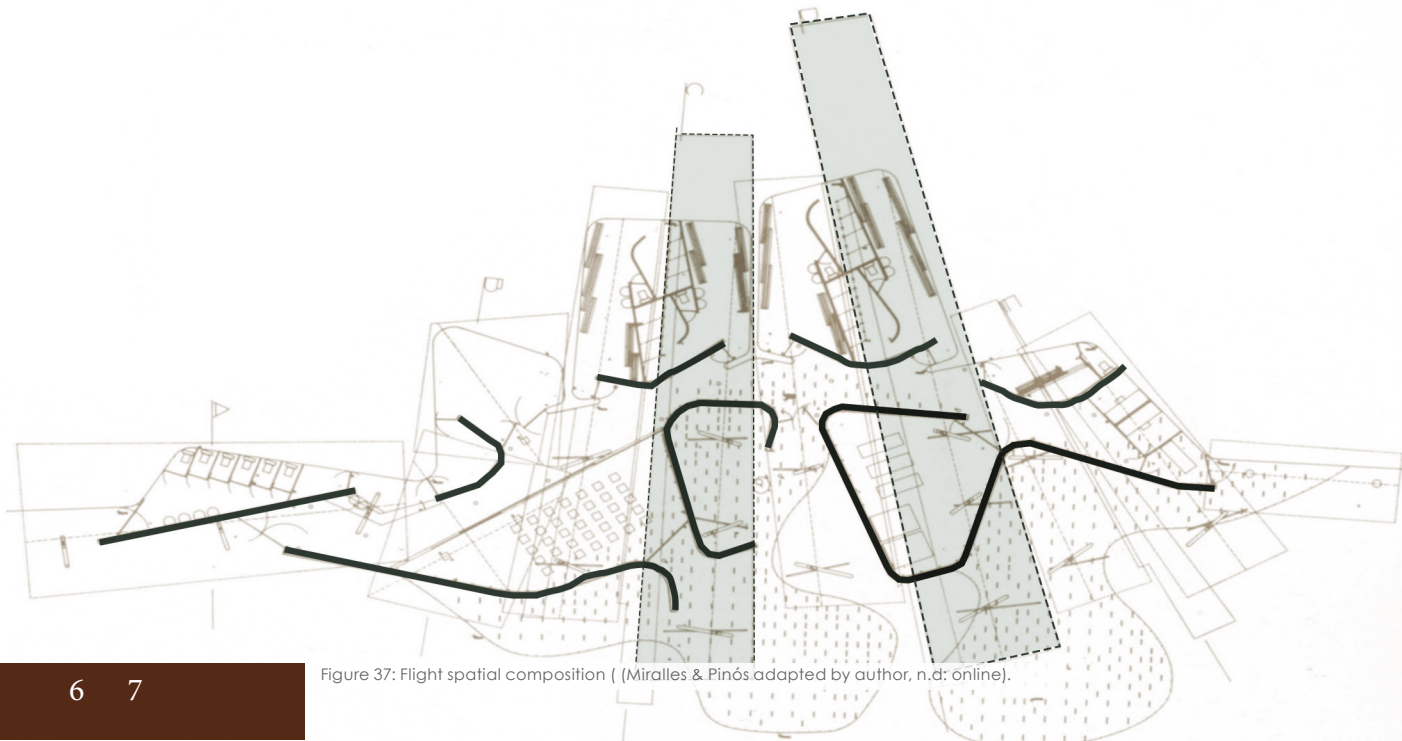


Figure 37: Flight spatial composition (Miralles & Pinós adapted by author, n.d; online).

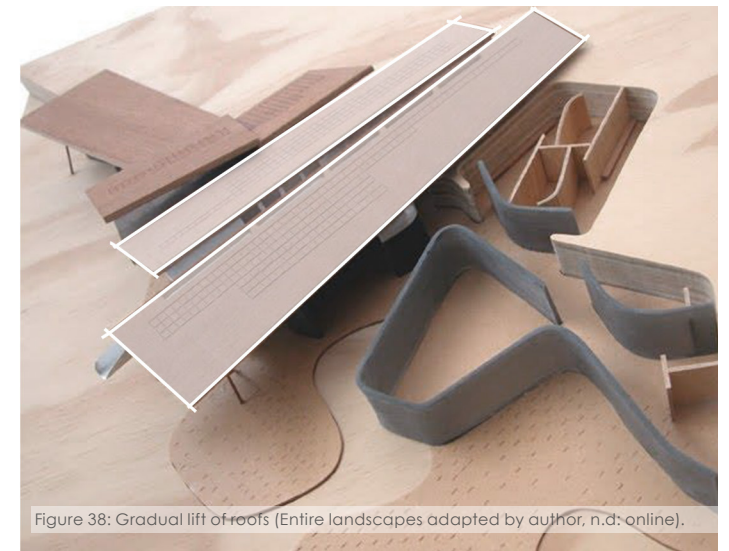


Figure 38: Gradual lift of roofs (Entire landscapes adapted by author, n.d; online).



Figure 39: Spatial conception of lift (Entire landscapes adapted by author, n.d; online).

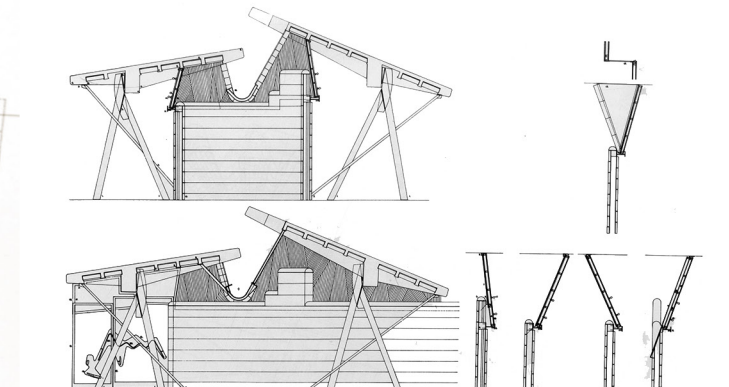


Figure 40: The flight of the architecture (Miralles & Pinós adapted by author, n.d; online).

4.2 PRECEDENT ANALYSIS: THEORY PRECEDENTS

ELEVATING THE SILLOUETTE: Tower of dreams and longing

VALENTINY hyp architects | Trier, Germany

The Tower of Dreams and Longings stands tall against the backdrop of the landscape, its silhouette etched against the horizon like a bird in flight. The corten steel suggests an affinity with the earth and natural processes. As one climbs the tower, ascending to its summit, they transcend the earthly realm and are elevated to a place where they are on the same level as the birds, experiencing a sense of freedom and connection with the natural world.



Figure 41: The flight of the architecture (Architizer adapted by author, n.d: online)

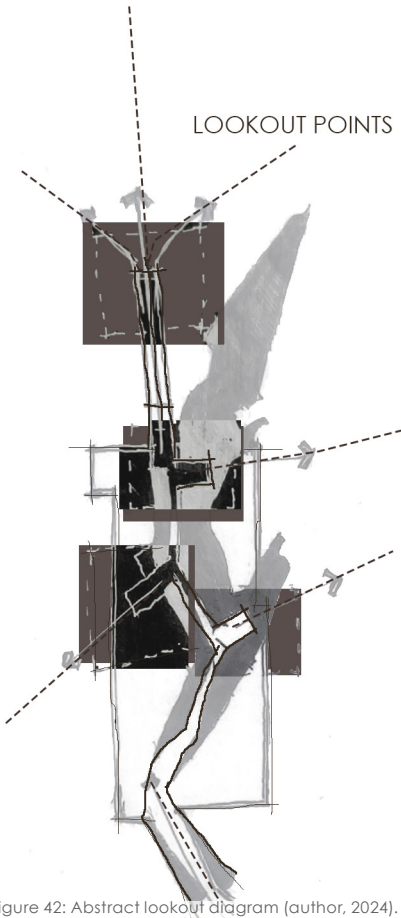


Figure 42: Abstract lookout diagram (author, 2024).



Figure 43: Affinity with earth and sky (Architizer, n.d: online).

4.3 PRECEDENT ANALYSIS: LOCAL PRECEDENTS

A RUIN IN THE LANDSCAPE: Coromandel estate

Marco Zanuso | Mpumalanga

The Coromandel Estate, with its dolerite stone walls and concealed architecture, serves as a significant precedent for the materiality of the bird sanctuary. The materials used, form a natural palette that evolves with time, leaving ghostly traces that redefine the landscape's identity. It embodies the concept of a building dissolving into the landscape, aligning the design's aim of creating a seamless interface.



Figure 44: Symmetrical spatial formation (Architizer adapted by author, 2014: online).

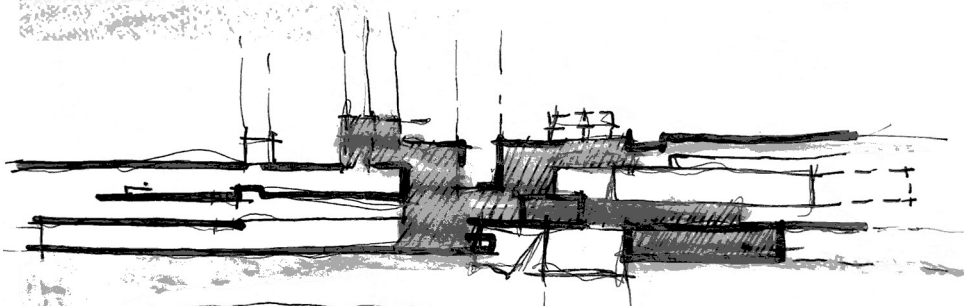


Figure 45: Line and spatial composition (author, 2024).



Figure 46: Disappearing into the natural backdrop (Architizer, 2014: online).



Figure 47: Use of natural materials (Architizer, 2014: online).



Figure 48: Becoming one with nature (Architizer, 2014: online).

4.4 PRECEDENT ANALYSIS: INTERNATIONAL PRECEDENTS

CONTEXT-SENSITIVE DESIGN: EVOA enviromental interpretation centre

Maisr arquitetos | Lezíria

The center serving as a museum and a bird observation area. The contemporary architectural solution employs an organic visual language, integrating seamlessly with the surroundings. The use of wood as a natural element in the building's skin further enhances this integration. Over time, the wood's exposure to the environment modifies its natural tone, aligning it with the color of the surrounding environment.



Figure 49: Lightly touching the ground (Gaete, 2019; online)



Figure 50: Disappearing into the landscape (Gaete, 2019; online)

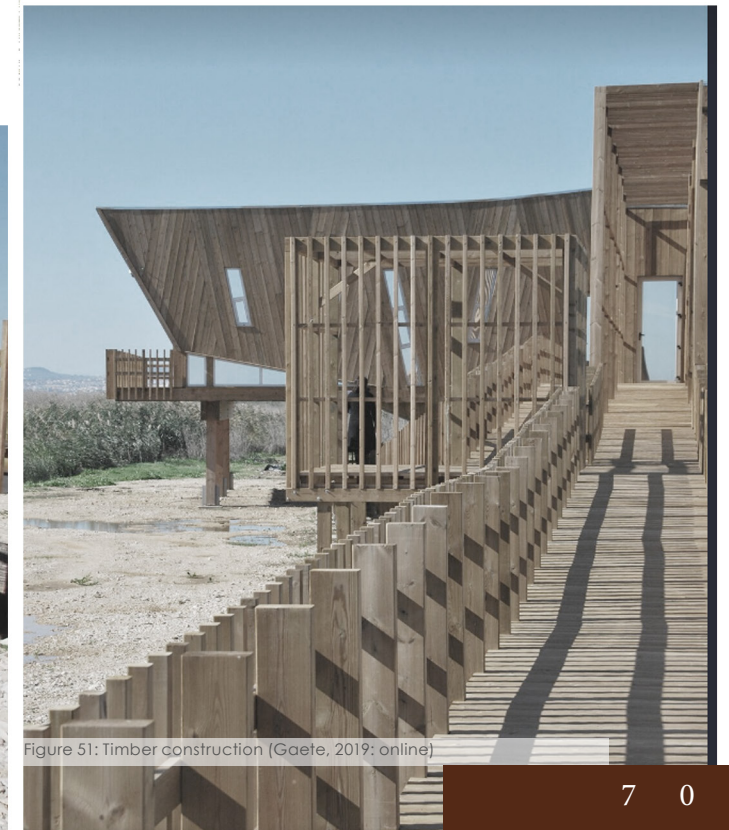


Figure 51: Timber construction (Gaete, 2019; online)

4.4 PRECEDENT ANALYSIS: LOCAL PRECEDENTS

PERMEABILITY OF NATURE'S INTERFACE: Bowali visitor center /Glenn Murcutt and Troppo architects

Glenn Murcutt and Troppo architects | Australia

The architecture of the center is designed to respond to the dramatic Kakadu landscape, interweaving stories of the place. Its circular route design, rammed earth walls, and a planted pond reflect the changing seasons. Through the use of materiality and permeability of the design nature is allowed to permeate the building, but in a controlled manner, making it essential to understand the nature of the place where one intervenes. The large windows and unique angular roof design allow natural light to fill the interior spaces while providing shade and shelter to the outdoor areas.



Figure 52: Roof lifting off of building (RSD Profile, n.d : online).

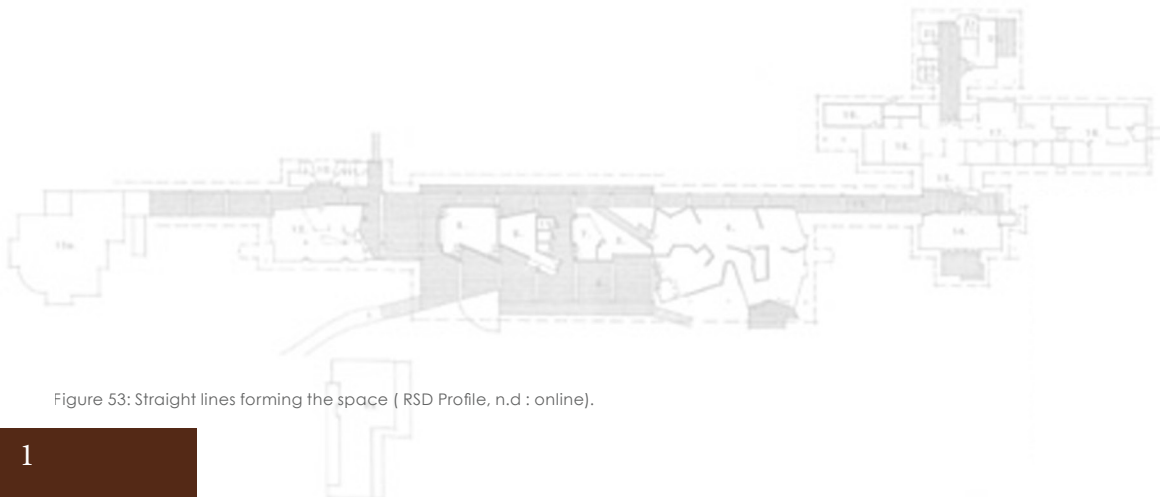


Figure 53: Straight lines forming the space (RSD Profile, n.d : online).

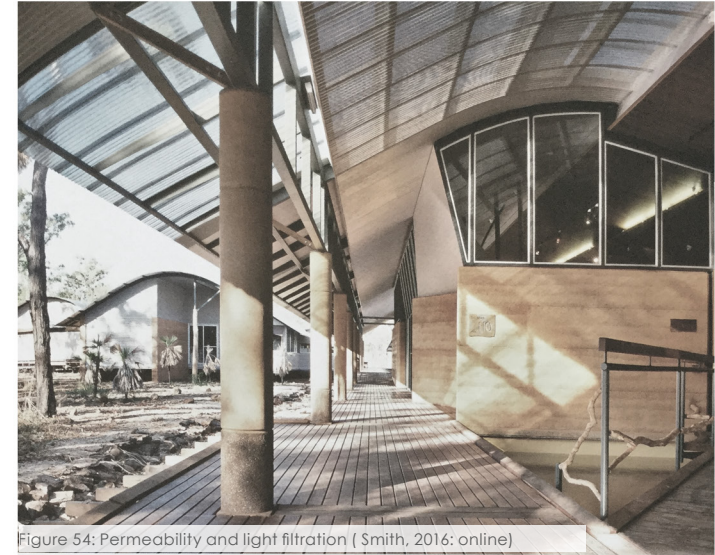


Figure 54: Permeability and light filtration (Smith, 2016: online)



Figure 55: Delicate use of lines and forms(Smith, 2016: online)

4.6 DESIGN APPLICATION

Key words, features, and aspects from the studied precedents have been thoughtfully integrated into the design, influencing the architecture across various dimensions. Both the layout and structure have been designed to reflect these influences, embodying them spatially, conceptually, and functionally to create a cohesive and informed architectural expression.

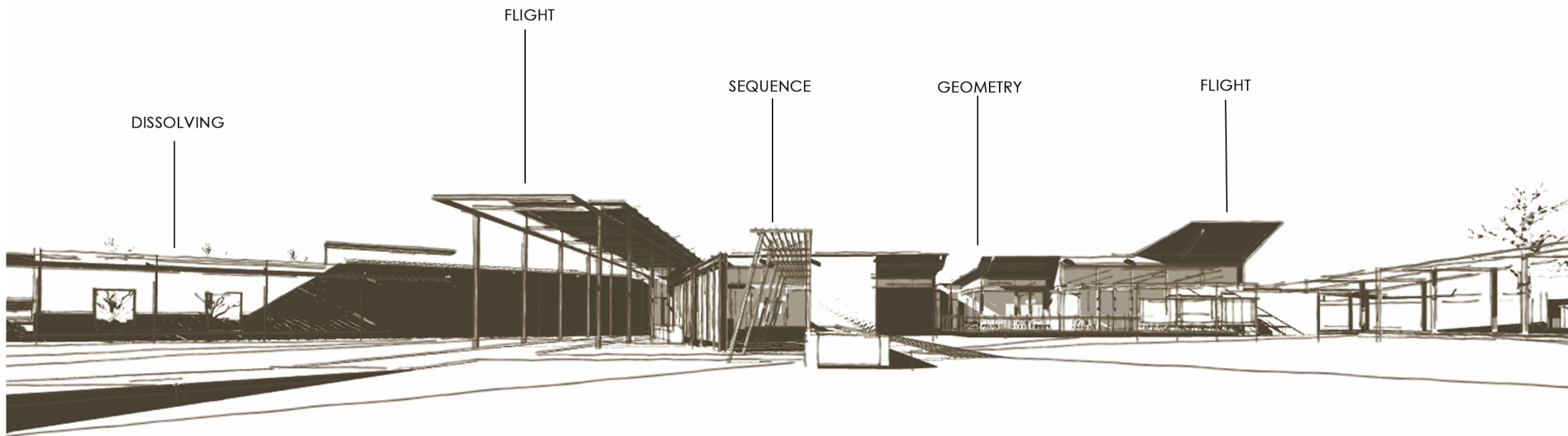


Figure 56: Application of key aspects on design (author, 2024).

5.1 ZWARTKOPS CONSERVANCY

The Zwartkops Conservancy, formed over 50 years ago, is one of the oldest environmental organizations in the country. The Conservancy is dedicated to fighting for the ecological survival of the Swartkops River, the estuary, and the surrounding valley, which is now regarded as the 11th most important estuary in the country (Zwartkops conservancy, n.d: online) . They also lead various Environmental Education initiatives and conservation efforts, aiming to raise awareness and engage the community in protecting this vital ecosystem. The conservancy is primarily focused on the prudent use and management of the estuary for both nature conservation and human recreation.



Figure 57: Zwartkops conservancy logo (Zwartkops Conservancy, n.d : online).

The conservancy employs a part-time environmental officer and supervises cleaners, whose salaries are funded by the municipality's Expanded Public Works Programme. It also owns a boat, which is likely used for various conservation activities. One of the significant contributions of the Zwartkops Conservancy is its commitment to environmental education. It conducts regular classes for schoolchildren, fostering an understanding and

appreciation of the estuary's ecological importance among the younger generation. Additionally, the conservancy is supported by seven honorary marine control officers, four of whom are qualified. These officers likely play a crucial role in maintaining the ecological balance of the estuary and ensuring compliance with conservation regulations (Zwartkops conservancy, n.d: online).

Given its active role in the management and conservation of the Swartkops Estuary, the Zwartkops Conservancy would be an ideal client for this project. Their involvement would ensure that the project aligns with the conservancy's goals and contributes positively to the estuary's ecological health.



Figure 58, 59 and 60: Members of Zwartkops conservancy hiking, educating scholars and birding(Zwartkops, 2023:

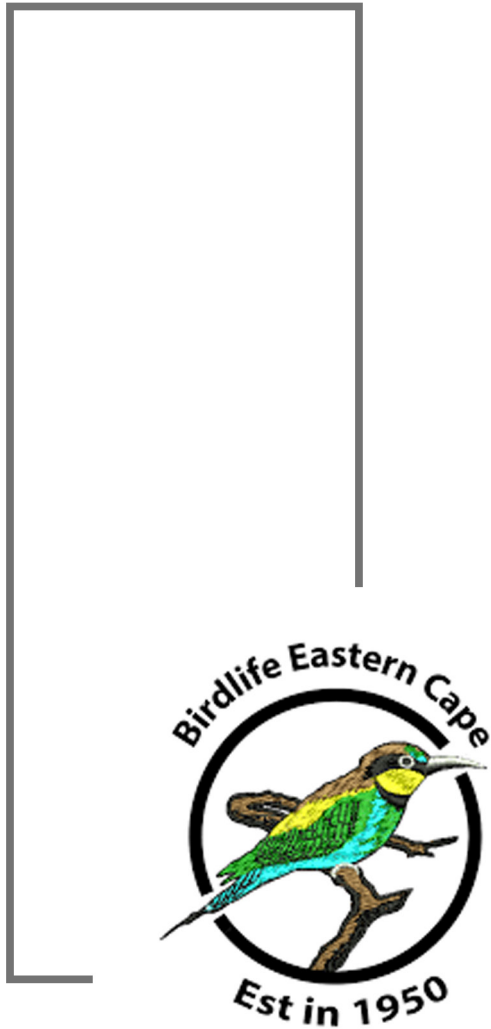


Figure 61: Birdlife EC logo (Birdlife EC n.d : online).

5.2 BIRDLIFE EASTERN CAPE

BirdLife Eastern Cape, formerly known as the Eastern Cape Wild Bird Society (ECWBS), was formed on 21 April 1950 after a short period as part of the Wildlife Society. It is an organization dedicated to stimulating interest in birds, enhancing knowledge about birds and their role in nature, and assisting in their protection (BirdlifeEC, n.d. online). Situated in Port Elizabeth, the organization's activities extend across the Eastern Cape, particularly within the Karoo and Noorsveld region. The Eastern Cape is home to hundreds of different bird species, making it an ideal destination for keen birders and birdwatching enthusiasts. BirdLife Eastern Cape could serve as a valuable client for this project, given their established mission and extensive experience in bird conservation and education.



Figure 62 and 63: Group of birders at Trankei coast (Birdlife EC, 2024).

3.2 PROGRAM

The Bird Sanctuary and Eco Center's program is designed to foster a deeper connection with nature and promote conservation through three interconnected components: the visitor's center and educational facilities, the bird sanctuary, and research.

1

The visitor's center will serve as a gateway to the natural world, providing educational resources and interactive exhibits about the importance of conservation and the unique biodiversity of the Swartkops Estuary. It will host workshops, seminars, and classes for schoolchildren and the general public, fostering a greater understanding and appreciation of the environment.

2

The bird sanctuary will be a dedicated space for the conservation of various bird species, particularly those that are migratory and endangered. This sanctuary aims to create a safe haven for birds, promoting biodiversity and supporting the needs of the fauna that inhabit the Swartkops River ecosystem. It will also offer opportunities for birdwatching enthusiasts to observe and enjoy the rich avian diversity

3

The research component of the program will focus on studying the avian and ecological dynamics of the Swartkops Estuary and its surroundings. This research will inform conservation strategies and provide valuable data to support the preservation efforts. The center will collaborate with environmental scientists, universities, and conservation organizations to advance the understanding of this vital ecosystem.

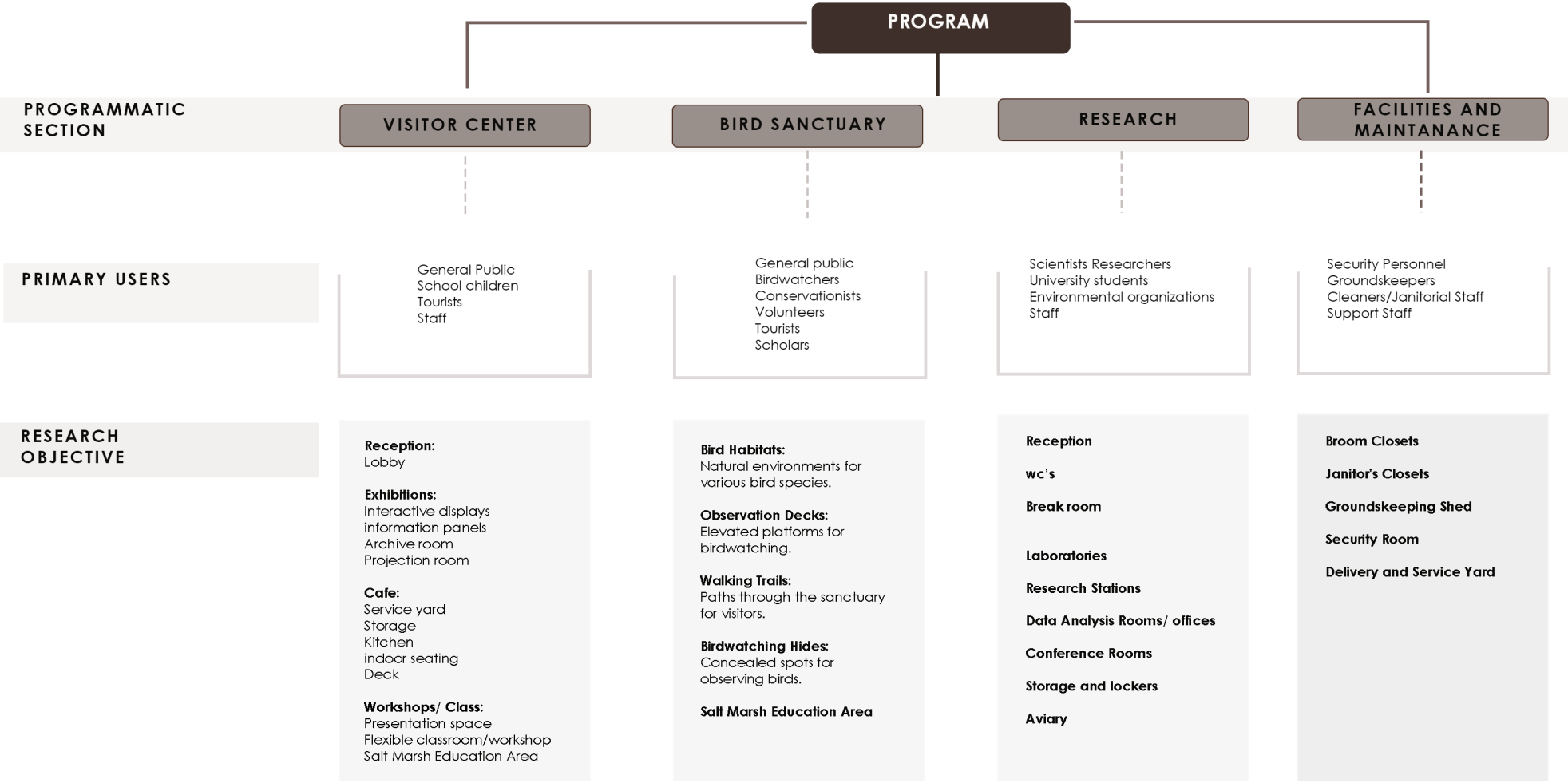


Figure 64: User mapping (author, 2024).

06

PROCESS

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6.3. Concepts: parallel habitats.....	87
6.3.1 The interstitial interface.....	89
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6.3.3 In transit	93

6.1 INTRODUCTION

The process positions architecture as a witness and mediator, recognizing humans as integral to the natural world. It explores how architecture can facilitate their coming together, fostering meaningful interactions and mutual understanding—not through words, but through shared moments of stillness and coexistence. Here the architect assumes a role beyond that of a mere creator of structures, they become a translator of empathy and intention. This encompasses a consideration not only of how a space functions, but also how it connects people, birds and nature.

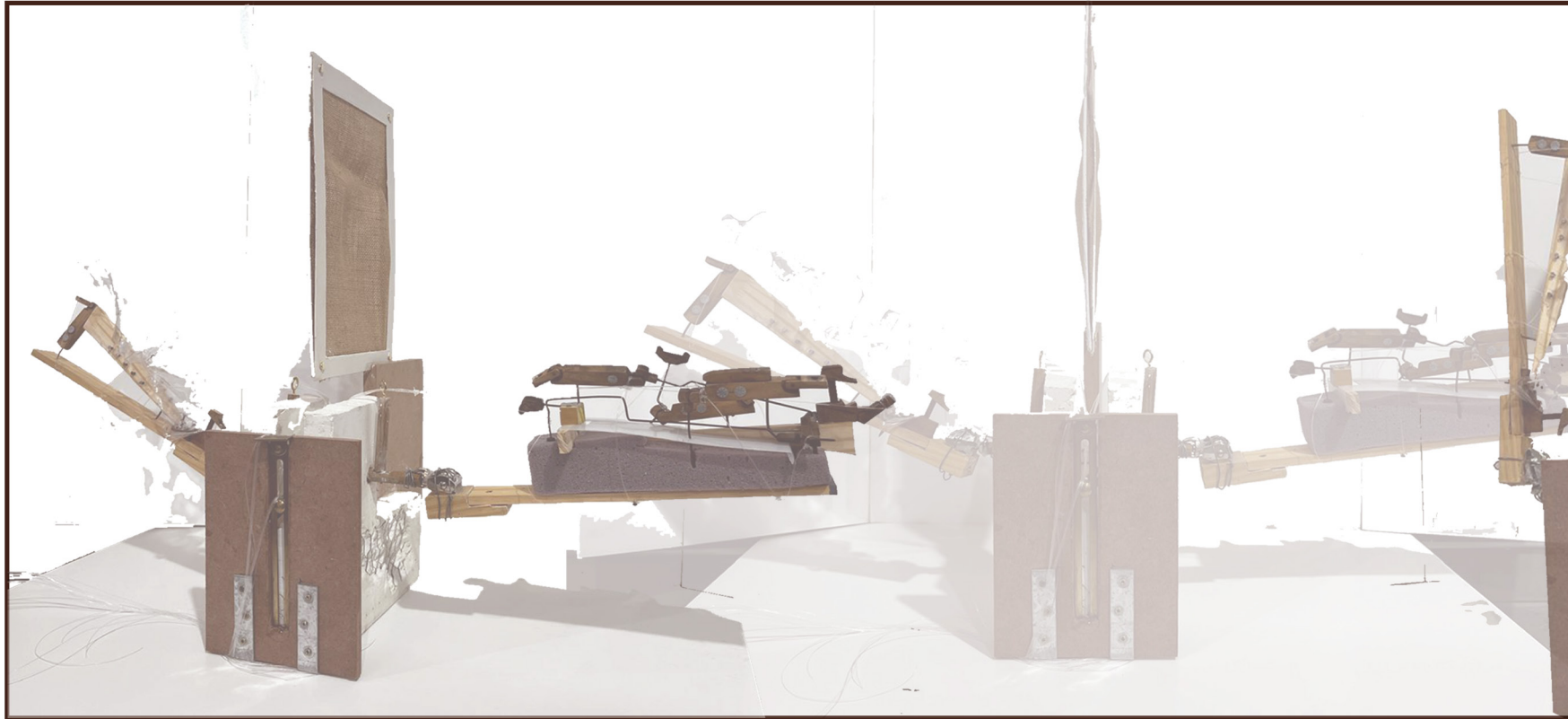
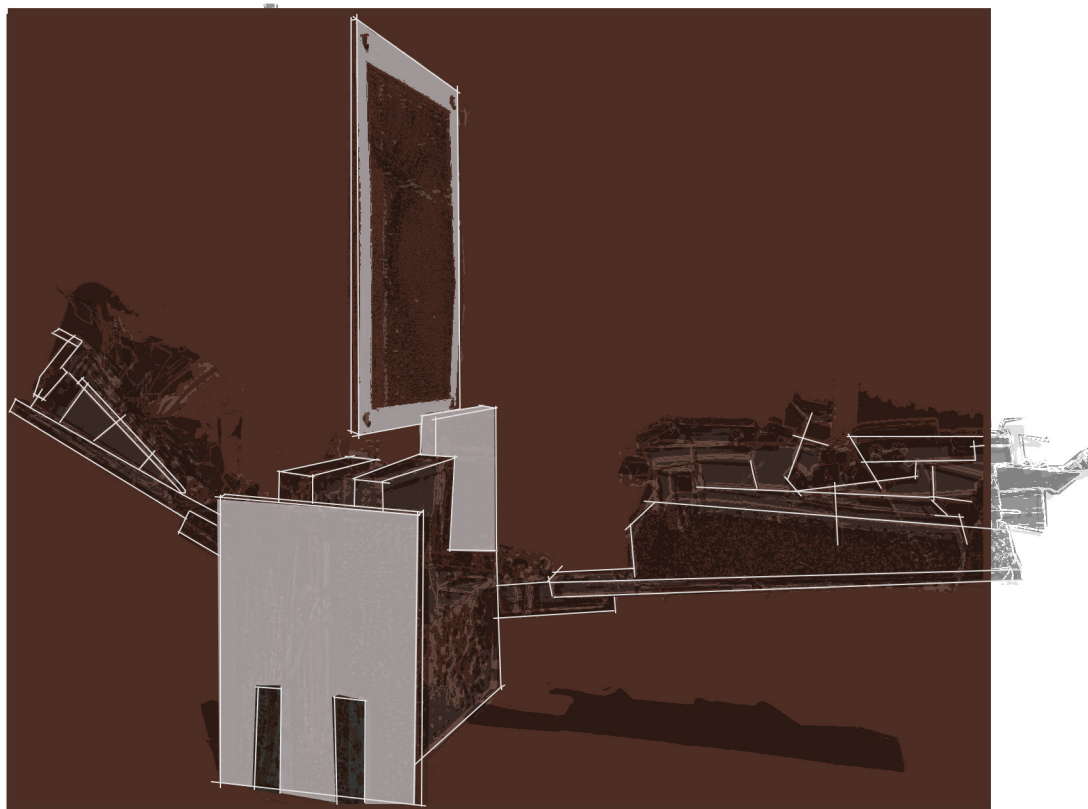


Figure 65: Collage of touchstone showing human action and natural responses (author, 2024).





**“When we try to pick out anything by itself, we find it
hitched to everything else in the Universe.”**

(Muir, 1911: 110)

Figure 66: Touchstone at a standstill (author, 2024).

6.2 TOUCHSTONE: THE STANDSTILL

Nature and humans share a complex symbiotic relationship that proves to be essential for the survival of both. In this symbiotic relationship, changes on one side can significantly impact the other, much like the butterfly effect. Just as according to the butterfly effect, a butterfly flapping its wings can set off a chain of events leading to significant outcomes, human activities, such as deforestation and pollution, can disrupt ecosystems, leading to loss of biodiversity and climate change. Conversely, changes in the environment, such as natural disasters or shifts in climate patterns, can have profound impacts on human societies.

The touchstone embodies the everchanging Swartkops estuary ecosystem. Comprising of two wing-like structures in tension, ready to engage with a central element, the model illustrates the symbiotic and counterpoise relationship between nature and human activity. When the lever is activated, the wing-like structures gracefully flap upward, imprinting the central element. The base, reminiscent of weathered concrete, symbolizes the ecosystem's resilience despite human impact, emphasizing the imperative need for conservation. When the motion comes to a standstill, the central element serves as a reminder of the interconnectedness of these elements and the necessity for their coexistence.

Translating it into architecture, the delicate ecosystem, site and architecture need to find a balance between the order and change. The ecosystem needs stability to support its diverse life forms but also adaptability to withstand environmental pressures. Similarly, the architectural design proposal should provide a sense of permanence while being flexible enough to accommodate changes over time. The proposed building design serves as a gateway or halfway point between natural and human elements, creating an equilibrium that reflects their mutual dependencies and reciprocities. As nature reclaims its place, the proposed bird sanctuary stands as a witness to the past.

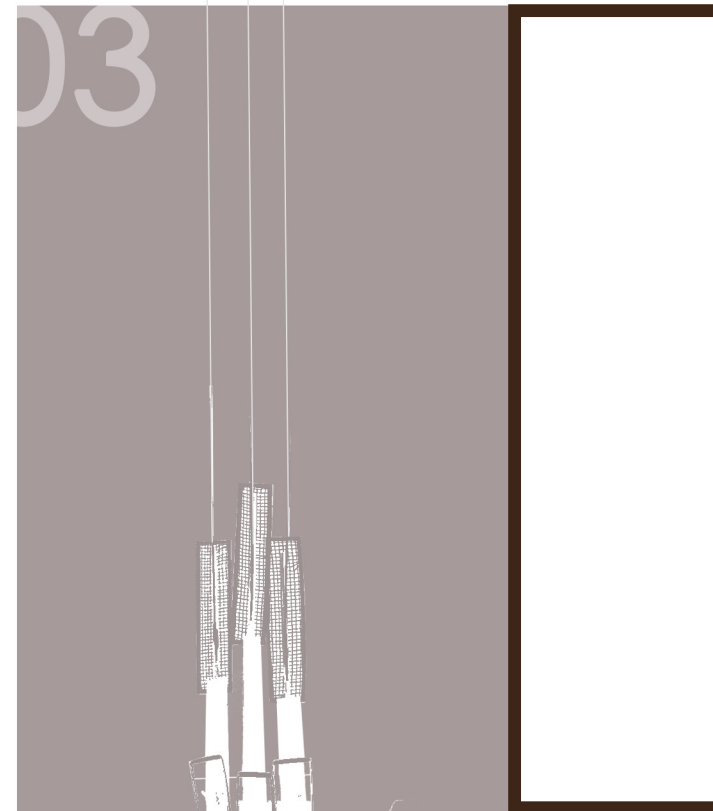
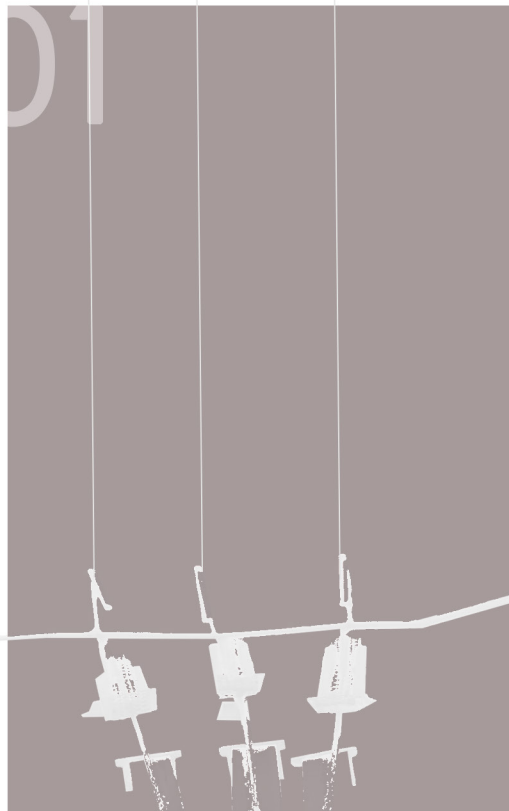


Figure 67: Abstraction of three concepts (author, 2024).

6.3 CONCEPTS: PARALLEL HABITATS

In their distinct ways, both humans and birds create and inhabit spaces that reflect their fundamental needs for survival and growth in this ever-changing world. Nothing exists apart from nature; everything is an indispensable part of it. Every structure humans build reflects the natural world, just as a bird's nest is an extension of the environment it inhabits.

The concepts explore the parallels between human and avian experiences. These ideas are presented in three distinct sections of the site, each offering a unique perspective for examination.

01

6.3.1 The interstitial interface

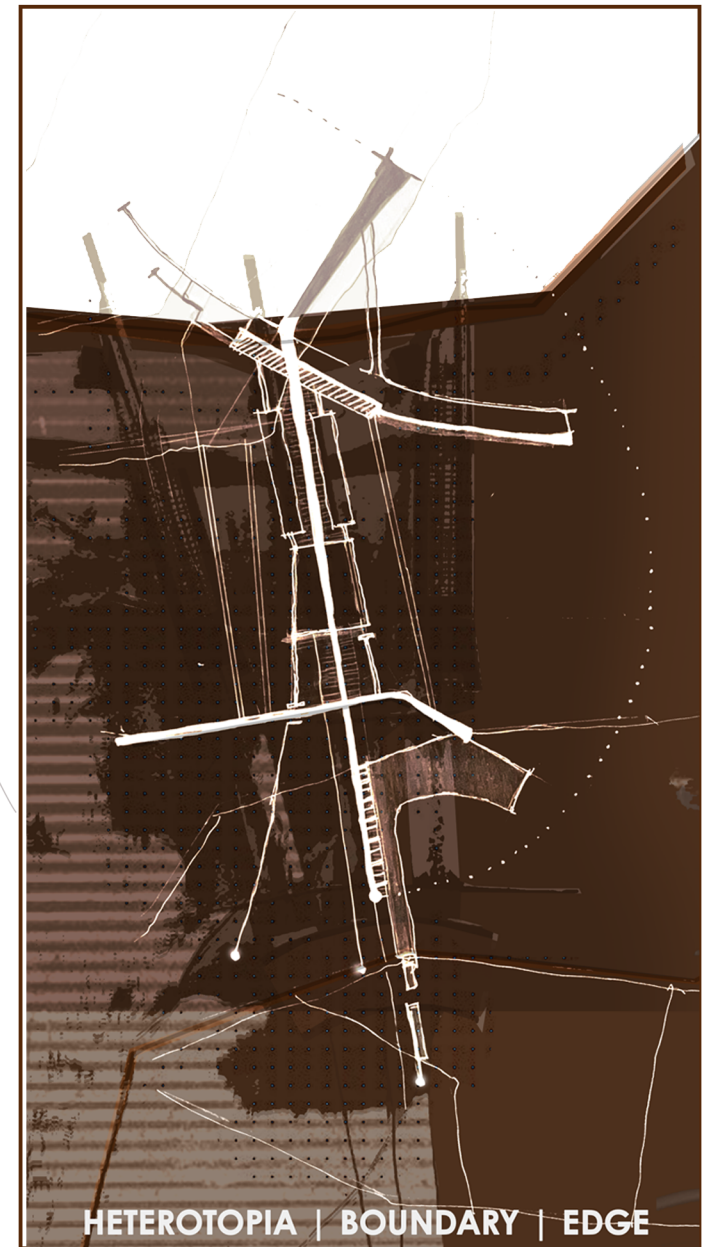


Figure 68: The edges that make the in between (author, 2024).

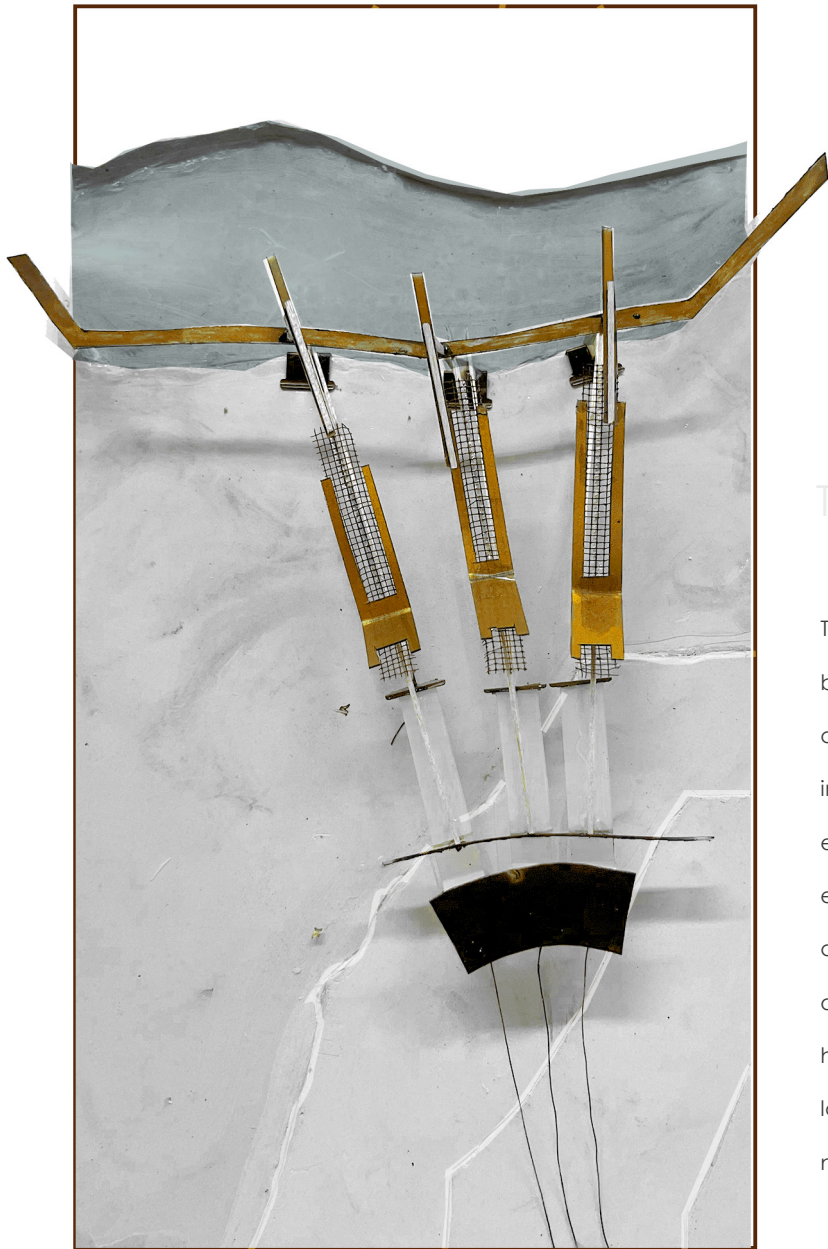


Figure 69: Physical model (author, 2024).

To understand the edges is to embrace the in-between.

The Interstitial interface explores the relationship between edges and the in-between spaces, acknowledging that edges form boundaries for the in-between, which in turn provides a structure for the edges to exist. The core idea is the position these two entities occupy. The concept celebrates an interface, a common boundary between two bodies, spaces, or phases, creating a third, occupiable territory, a heterotopia (a space of otherness), or a third space/landscape (a shared space that is neither wholly one nor the other).

On the site, birds inhabit the in-between, and people inhabit the edges. However, the model in figure 69 proposes an interface for coexistence. This interface is represented by the two solid boundaries and the small rectangular objects attached to the wires. These objects symbolize points of interaction or 'interstices,' which are the intervening spaces within these shared spaces. Essentially, the concept and model visualize a shared space, an interface, that fosters coexistence. It is a unique zone, neither wholly human nor bird, where both can interact and influence each other.

02

6.3.2 The nest

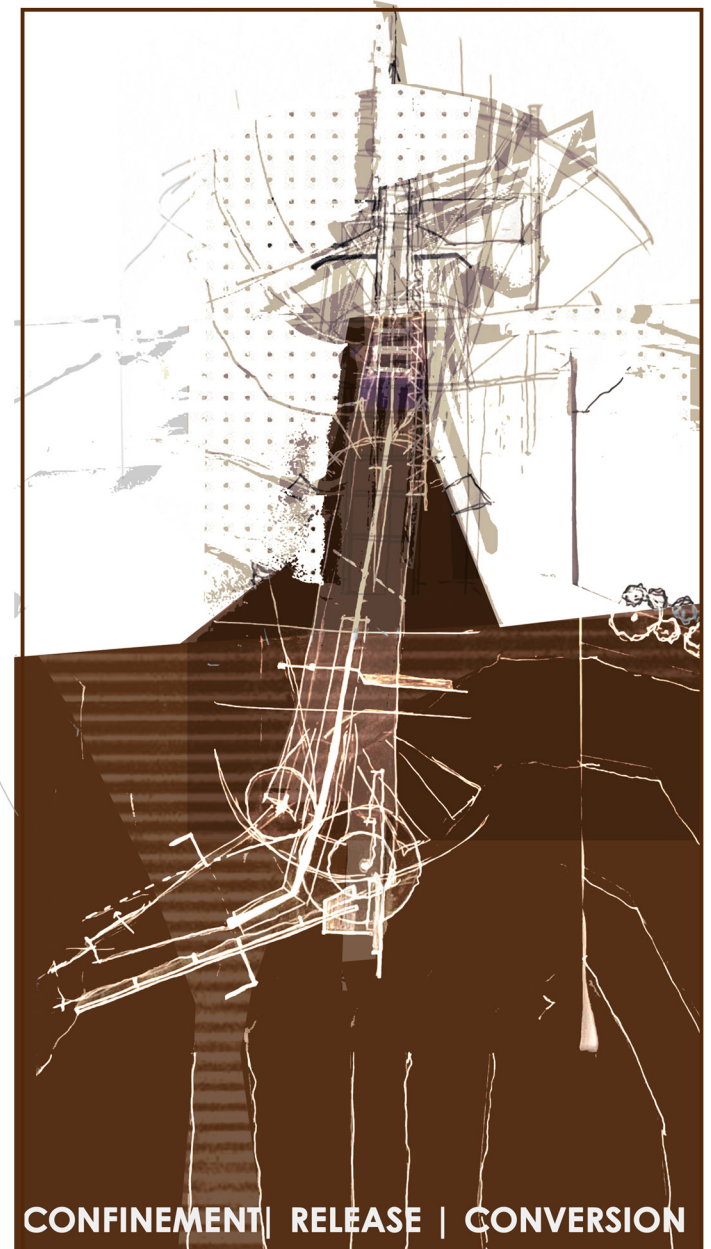


Figure 70: Breaking out of confinement (author, 2024).



To nest is to find both refuge and introspection.

The second concept of this project delves into the idea of nesting. Nests not only serve as shelters providing refuge and rest, but they also function as spaces for contemplation and returning home—to roost. Central to this project is the theme of birds returning home. While the project does not specifically focus on birds in a domestic setting, it prompts consideration of the implications of such a scenario. This concept leads to reflection on birds within domestic environments, where their nests, now cages, become some form of confinement. In this context, birds may appear constrained, while humans seem relatively freer and more expansive. However, what if the roles were reversed? What if birds were perceived as larger and freer, while humans experienced a form of 'confinement'?

The concept of "confinement" in this context does not connote restriction, but rather serves as an invitation for people to deeply engage with the world of birds. The bird sanctuary aims to draw visitors into a state of contemplation within spaces that prompt introspection and self-reflection, urging them to consider their relationship with nature and the wider ecosystem. This project challenges anthropocentric viewpoints by prompting humans to see the world from to view the world from the birds' vantage point.

The inquiry arises: Are we the ones inside or outside? Are we drawing in or breaking free? As birds transcend the constraints of their environment, we are drawn inward, invited to experience their world from a new perspective, one that is clearer and more interconnected.

Figure 71: Physical model (author, 2024).

03

6.3.2 In transit

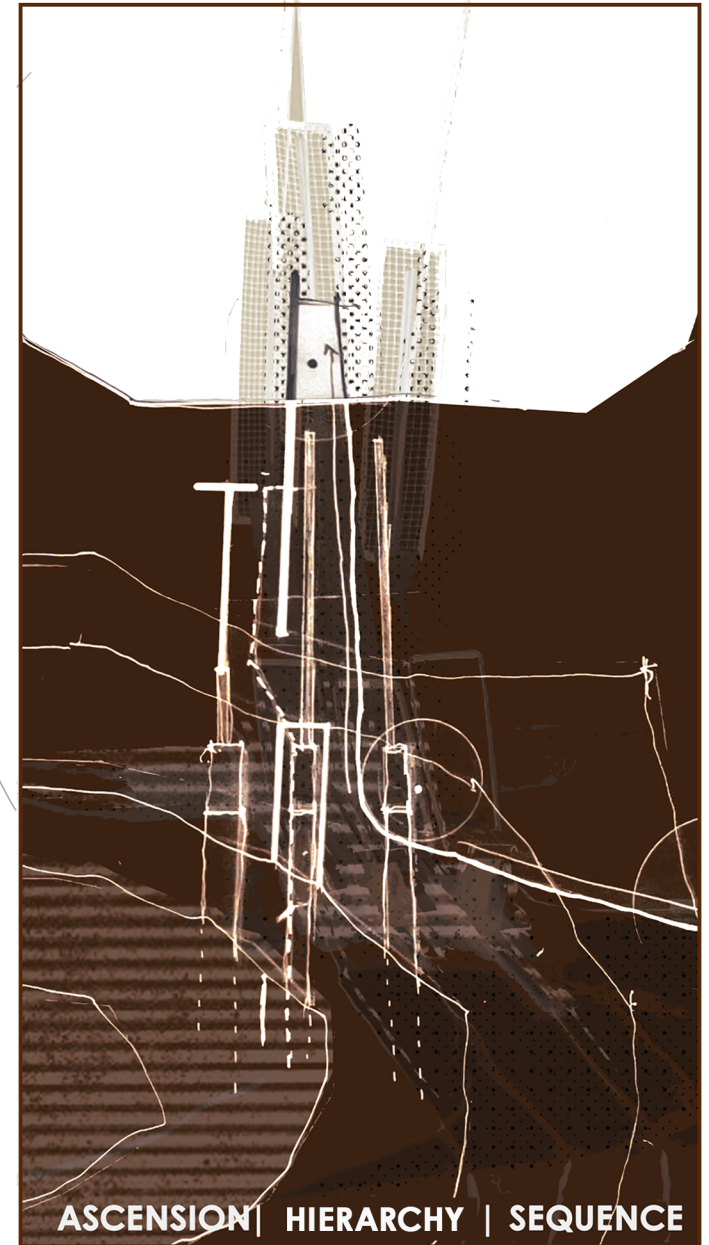
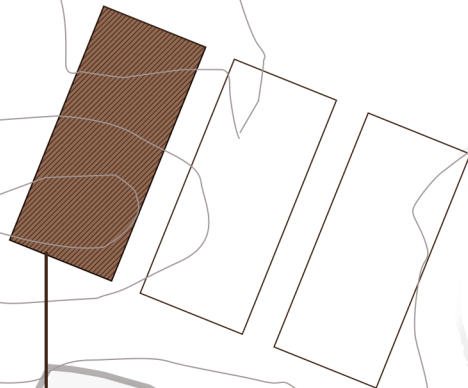


Figure 72: Lifting off the ground (author, 2024).



Figure 73: Physical model (author, 2024).

To meet nature's gaze is to question our supremacy.

The third and final concept boldly challenges traditional spatial hierarchies by exploring the transitional moments of birds moving between the earth and the sky, becoming silhouettes against the horizon. The vertical elements on figure 73 symbolize ascension, with the rising silhouette challenging human dominance. The idea is to bring birds and humans eye to eye in transit, facilitated by the architecture disrupting our understanding of spatial and hierarchical relationships. After drawing in, we break out and meet eye to eye. The sequential arrangement of these frames mirrors the coordinated flight patterns of birds, as they always fly in recognizable patterns such as straight lines. This arrangement also suggests that straight lines create a sense of order, symmetry, direction, and hierarchy.

The concept prompts a design where visitors contemplate their position within the natural world, urging them to reassess their connection with other species. The architecture facilitates encounters that allow visitors to perceive themselves as part of a broader, interrelated system that encompasses not just humanity, but also nature and the birds themselves. This design does not place humanity at the top of a hierarchy but rather in coordination with the natural world, emphasizing the interconnectedness of all life forms.

7.1 CONCEPTUAL INTEGRATION

This part focuses on the combination of design concepts and site influences.

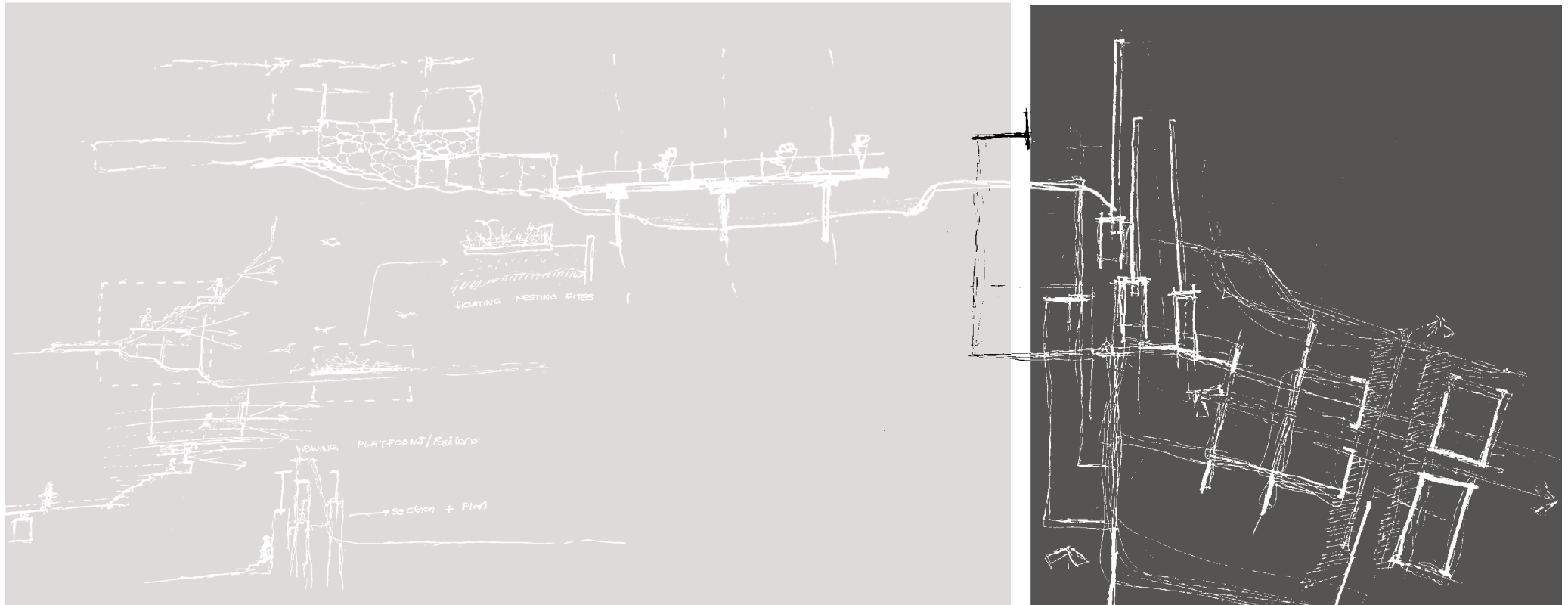


Figure 74: Conceptual sketches (author, 2024).

The conceptual integration exploration combines the previously discussed concepts, manifesting them into a cohesive design plan. Figure 75, illustrates the integration of the design into the natural landscape, highlighting how the path lined with blue gum trees served as a critical anchor point for the entire design. Identified early in the design process, this path established the central axis around which the spaces of the sanctuary and eco-center were organized, giving the design both direction and structure. The building itself stands almost as a mediator between the natural and built environments.

Conceptually, this initial drawing captures the lightness and fluidity intended to reflect the ephemeral nature of birds. The lines and forms are drawn with the idea of creating spaces that seem to lift and flow, much like the flight of birds across the landscape. The sequence of spaces was designed with a bird's movement in mind, as visitors move through the site, breaking out into moments of openness, observation, and interaction with nature. The design emphasizes the gradual unfolding of spaces, much like the experience of birds as they navigate the environment, creating a sense of exploration and discovery for visitors.

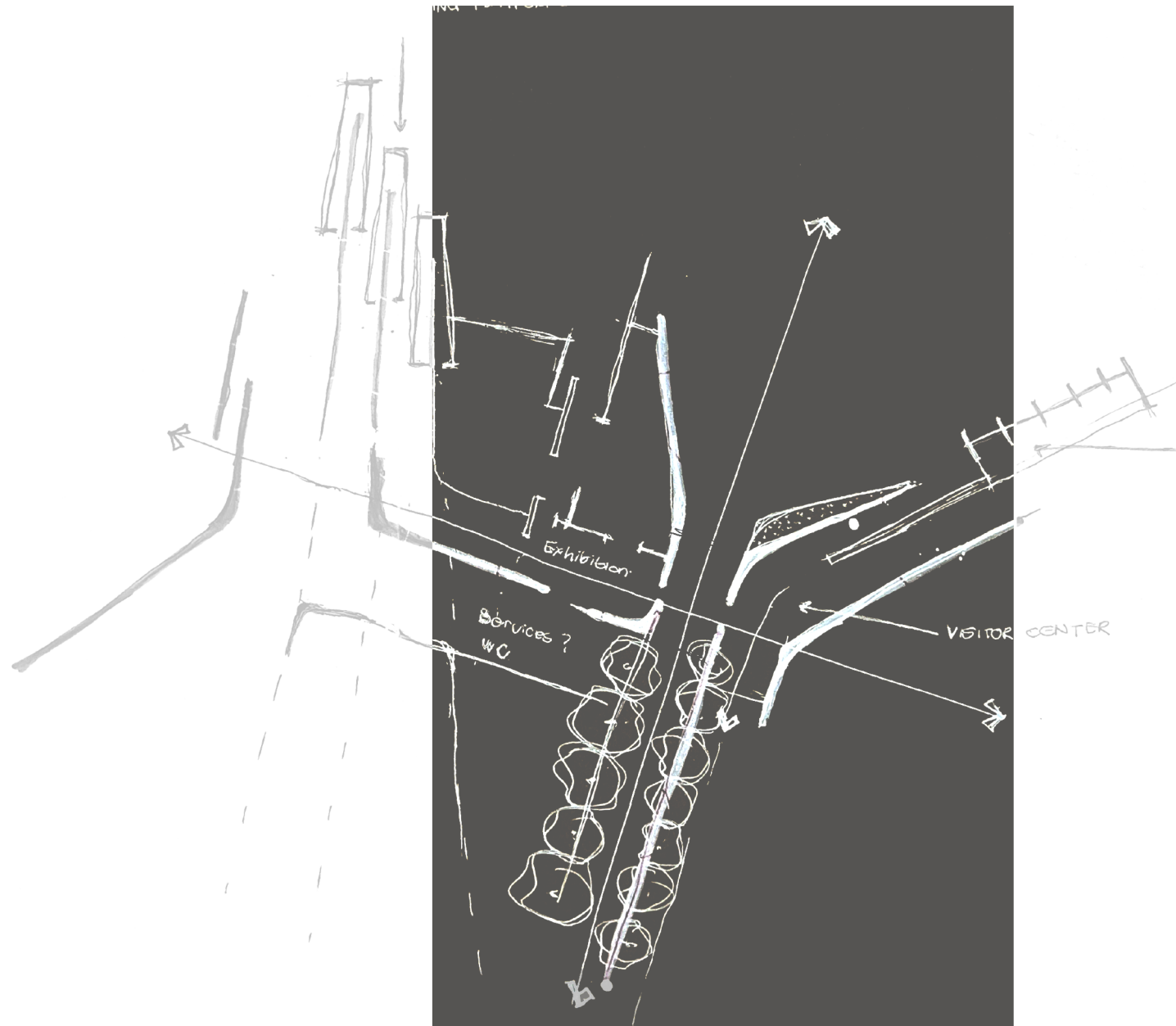


Figure 75: Lines forming the space (author, 2024).

7.2 STRUCTURAL DEVELOPMENT

This part involves developing the drawing into a building structure.

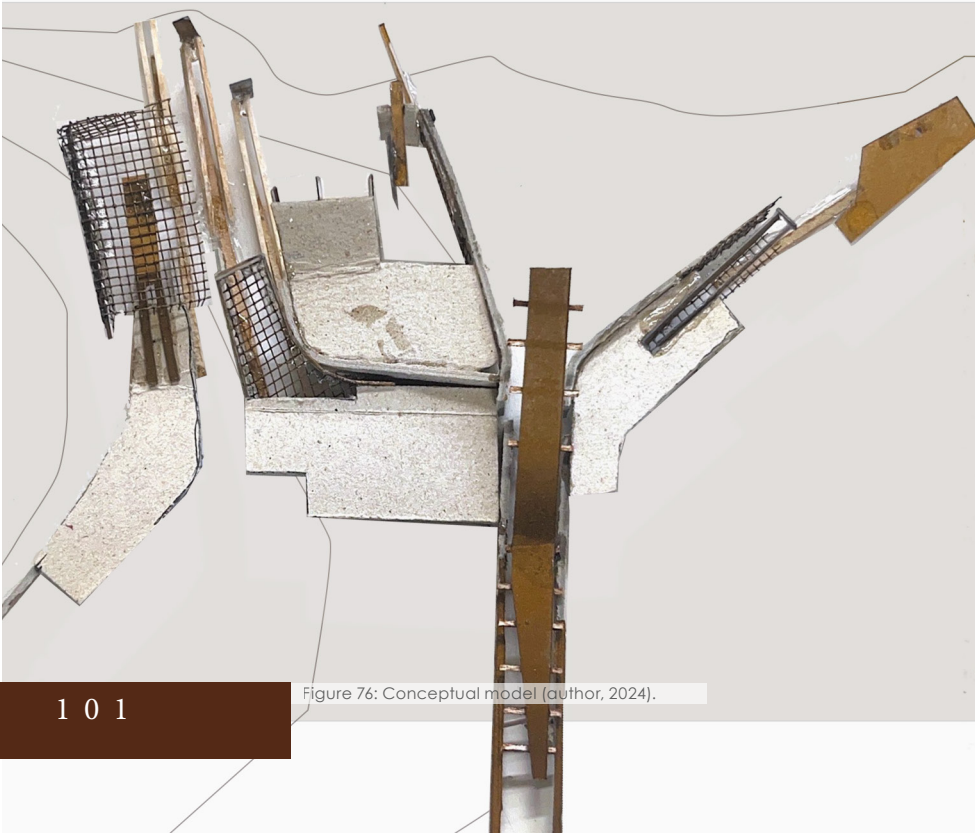


Figure 76: Conceptual model (author, 2024).



Figure 77: Conceptual site planning (author, 2024).

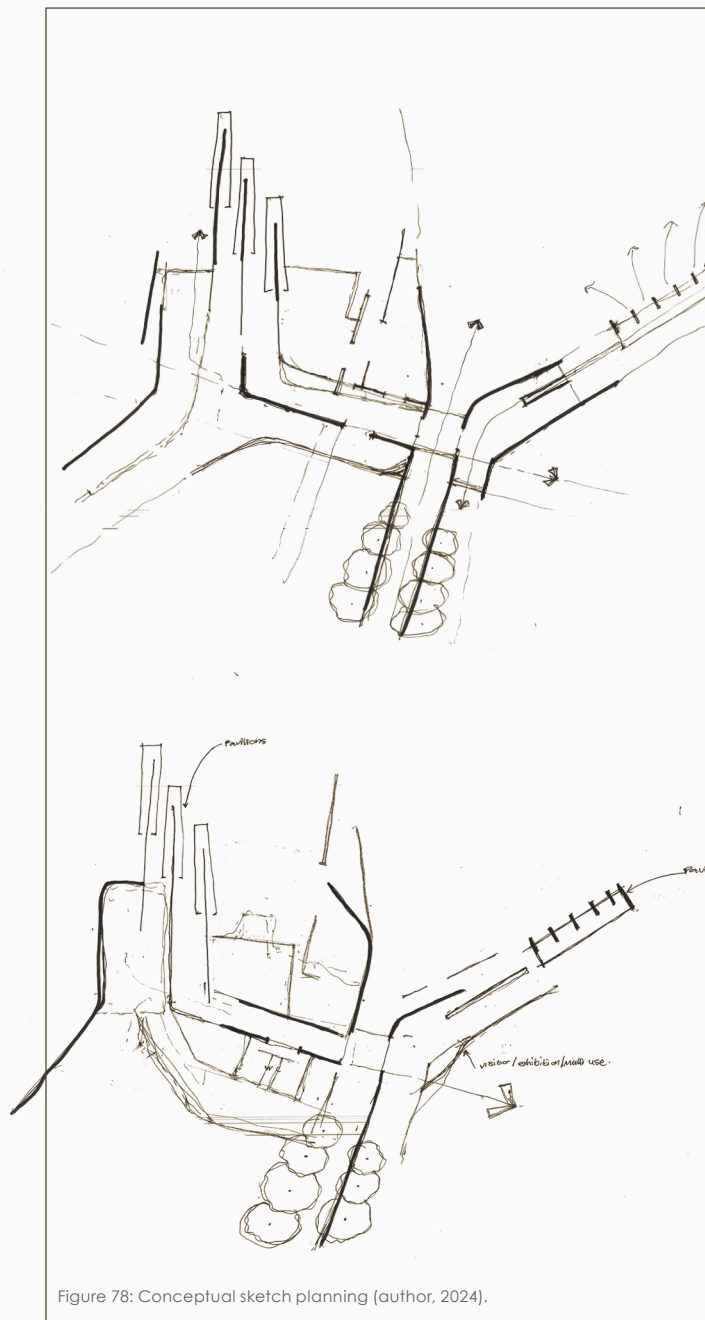


Figure 78: Conceptual sketch planning (author, 2024).

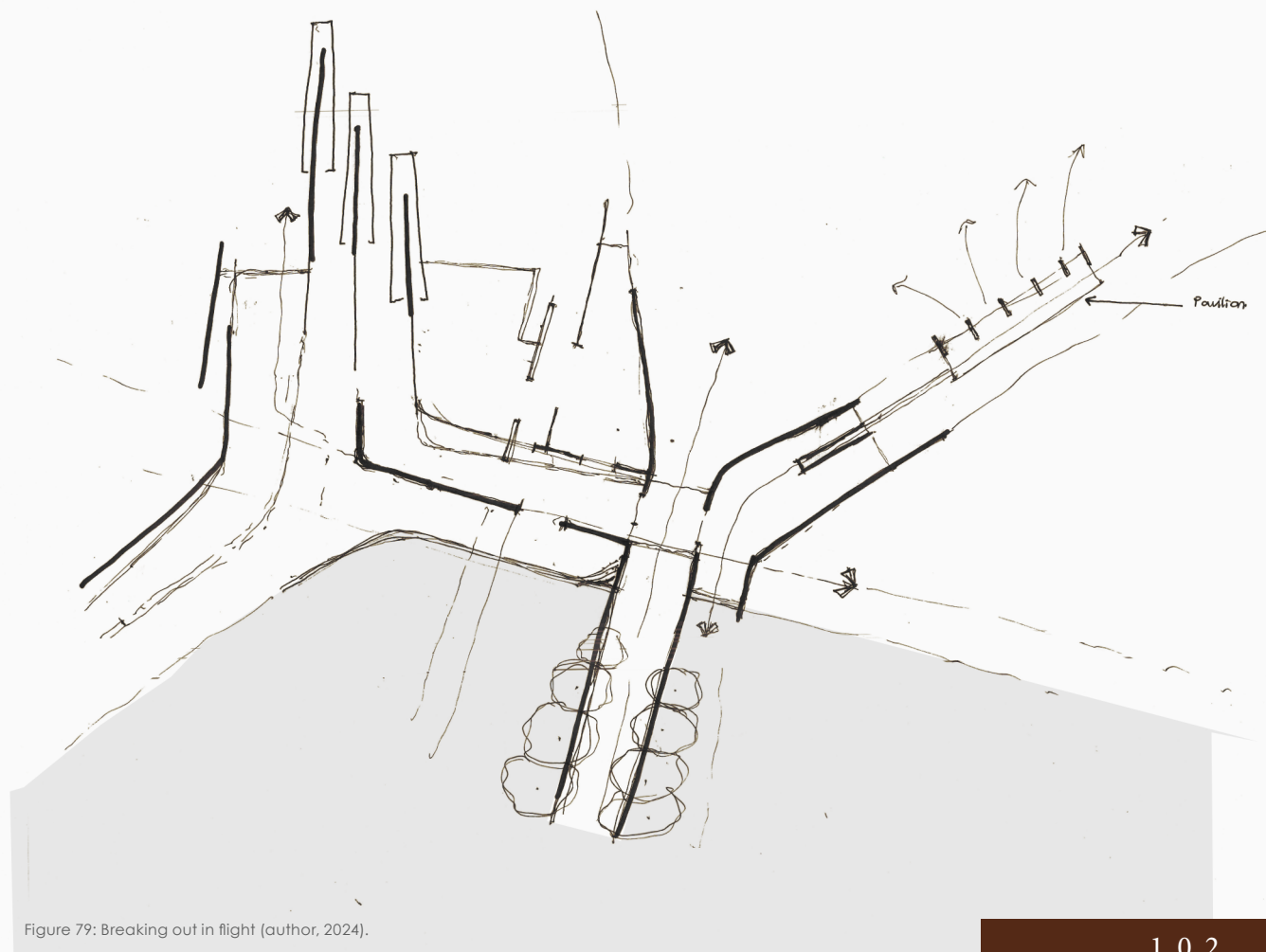
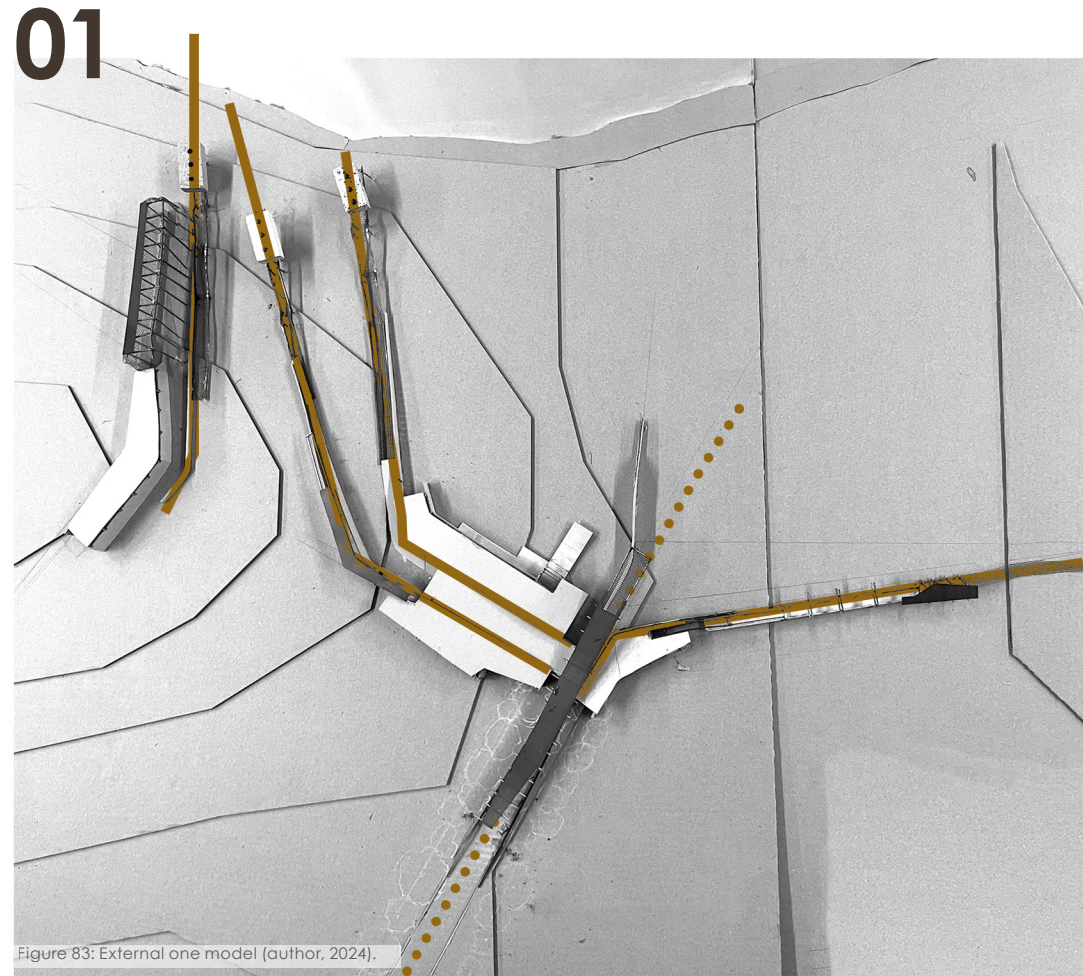
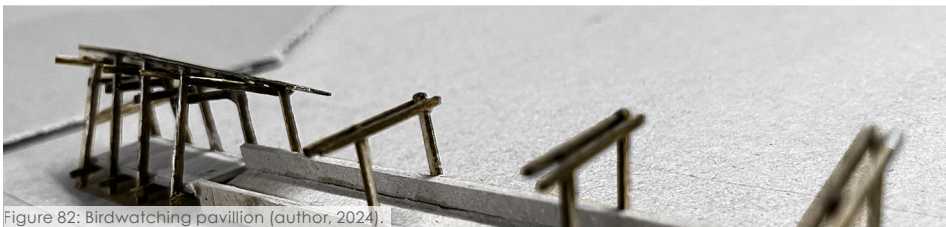
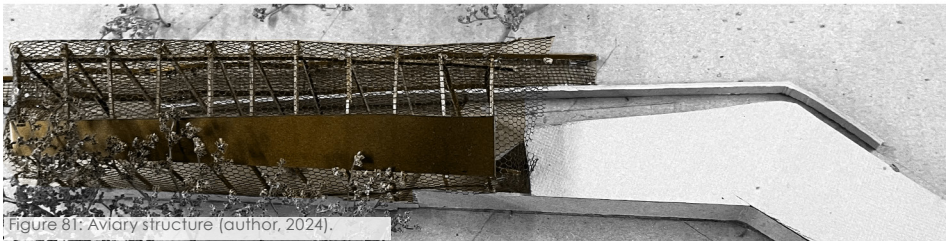


Figure 79: Breaking out in flight (author, 2024).

7.3 SPATIAL DEVELOPMENT

This part involves developing the drawing into a building structure.



02

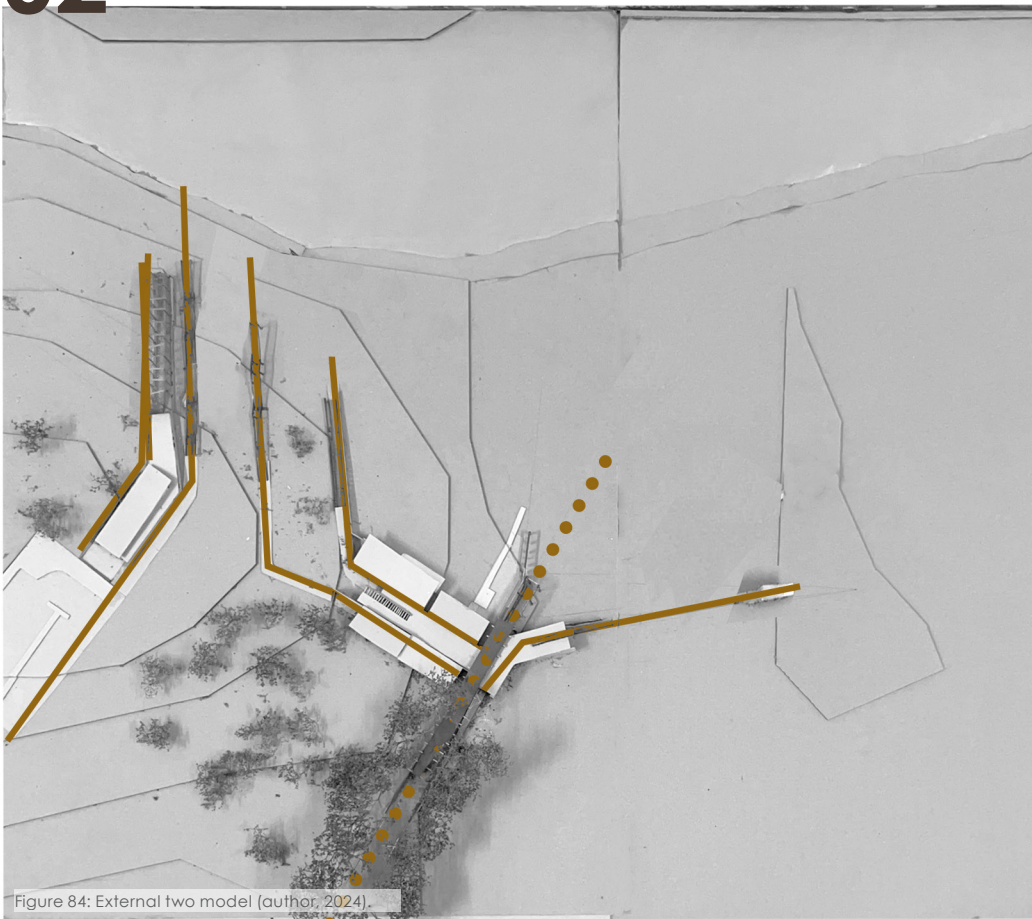


Figure 84: External two model (author, 2024).

03



Figure 85: External three model (author, 2024).

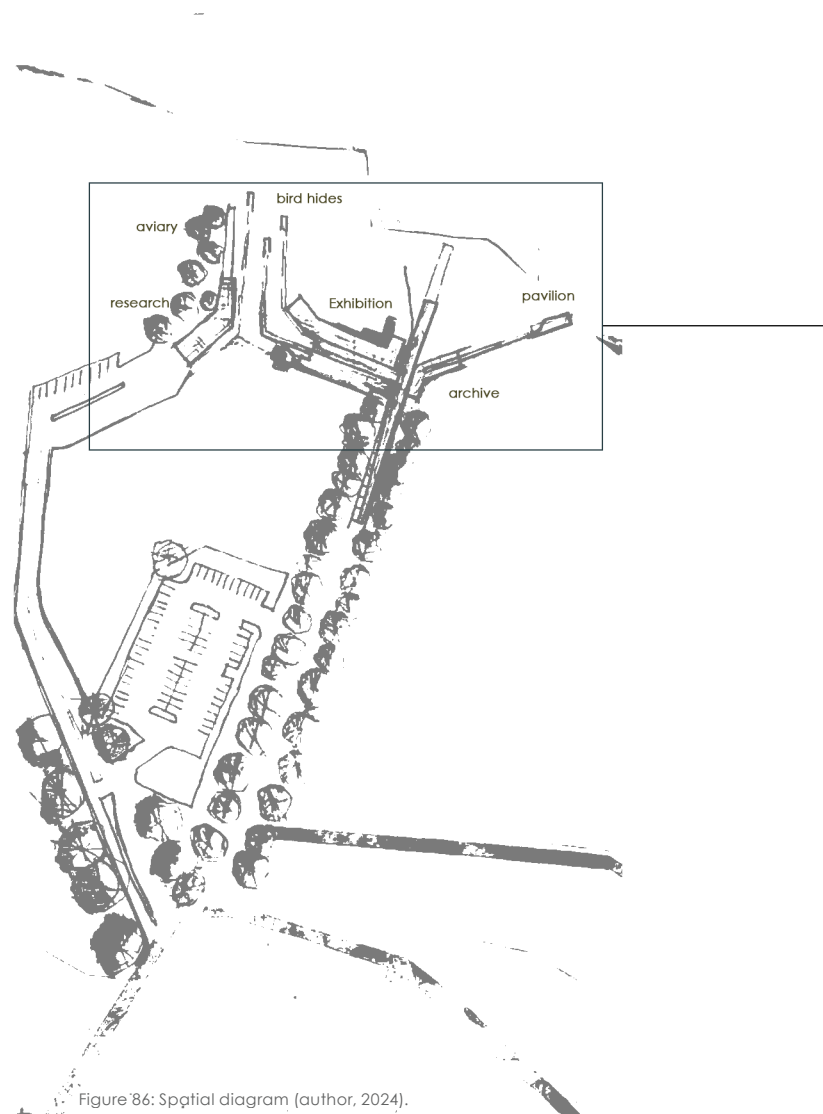


Figure 86: Spatial diagram (author, 2024).

Figure 86, watercolor illustrations explore the materiality and how it integrates with the natural landscape. These reflect an investigation into materials such as stone, timber, and steel, which are intended to blend seamlessly with the surrounding environment, leaving an unobtrusive presence.



Figure 87: Anchored ascent (author, 2024).



Figure 88: Pavilion in flight (author, 2024).



Figure 89: Blending the structure into the landscape(author, 2024).

Figure 90 illustrates the alignment of the spaces along this axis creates a sense of progression, with each area unfolding into the next.

Figures 91 and 92 illustrate the spatial development incorporating the overarching concept of birds and flight. The gradual lift of the roofline and the open, airy interiors reflect the idea of rising into the sky.

Figure 90: Plan development (author, 2024).



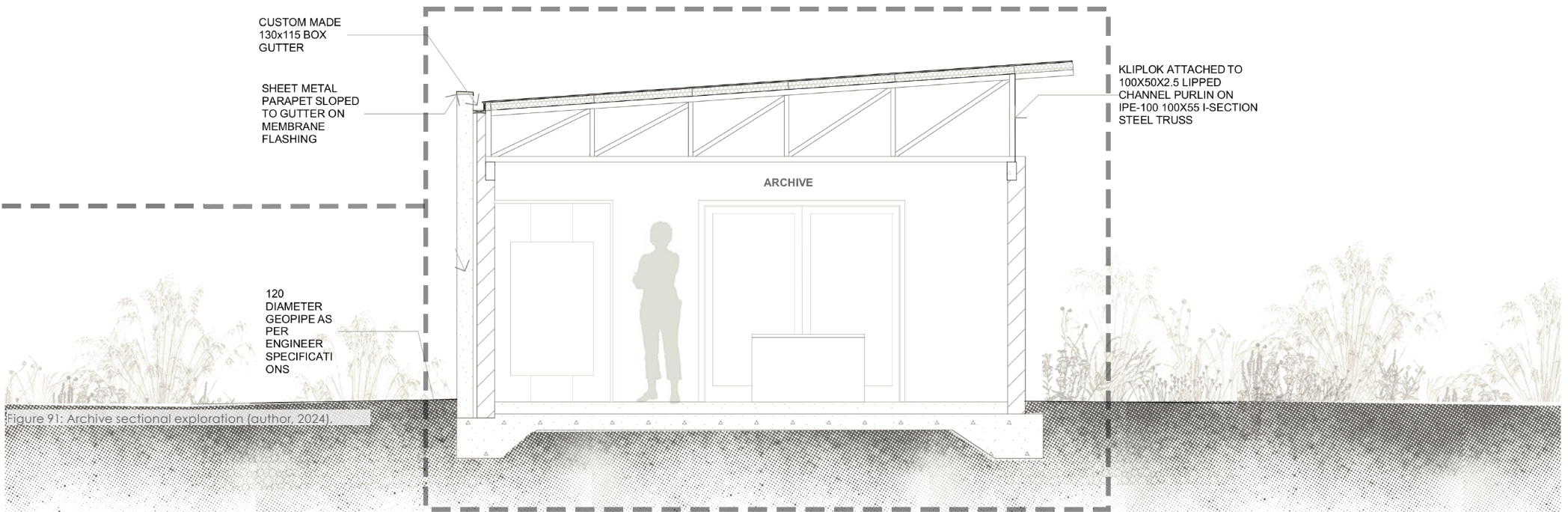


Figure 91: Archive sectional exploration (author, 2024).

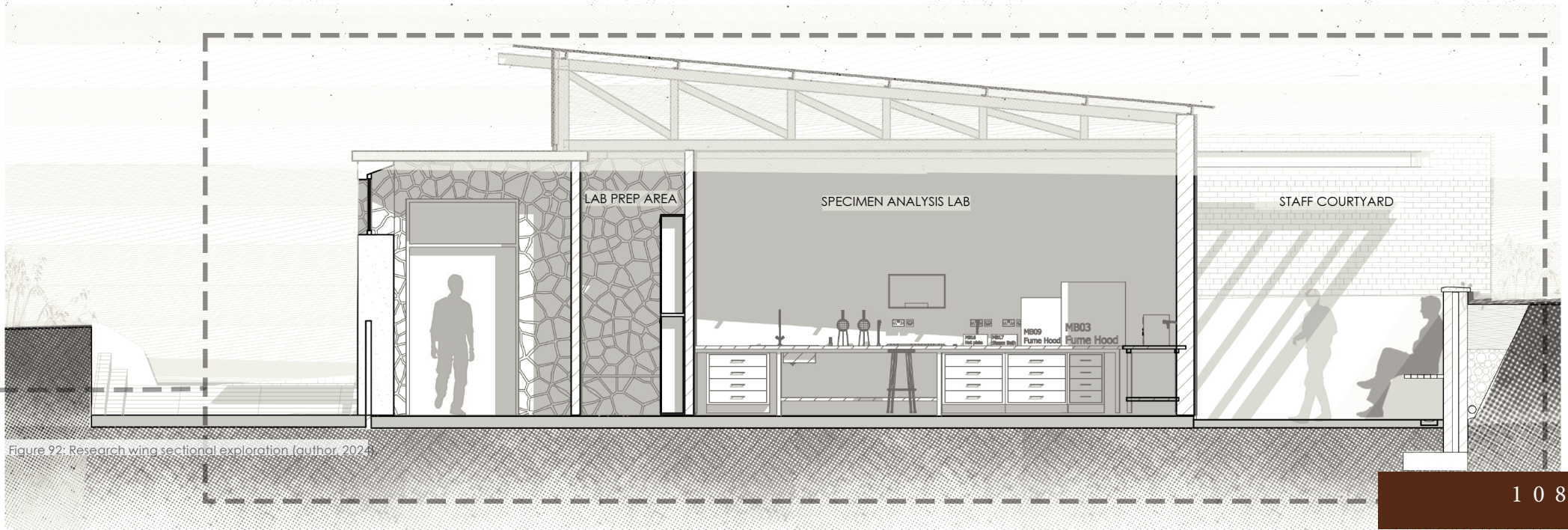


Figure 92: Research wing sectional exploration (author, 2024).

Figures 94 and 95 highlight the development of the aviary structure composed of steel elements. The staff break space located outside serves as a critical midpoint between the aviary and the research facility building. This space acts as a transitional link, connecting the immersive experience of the aviary with the more structured and enclosed environment of the research facility. The aviary also appears to lift from the ground and rise into the sky, reinforcing the idea of flight and freedom, as if the structure itself is an extension of the birds' journey upward.

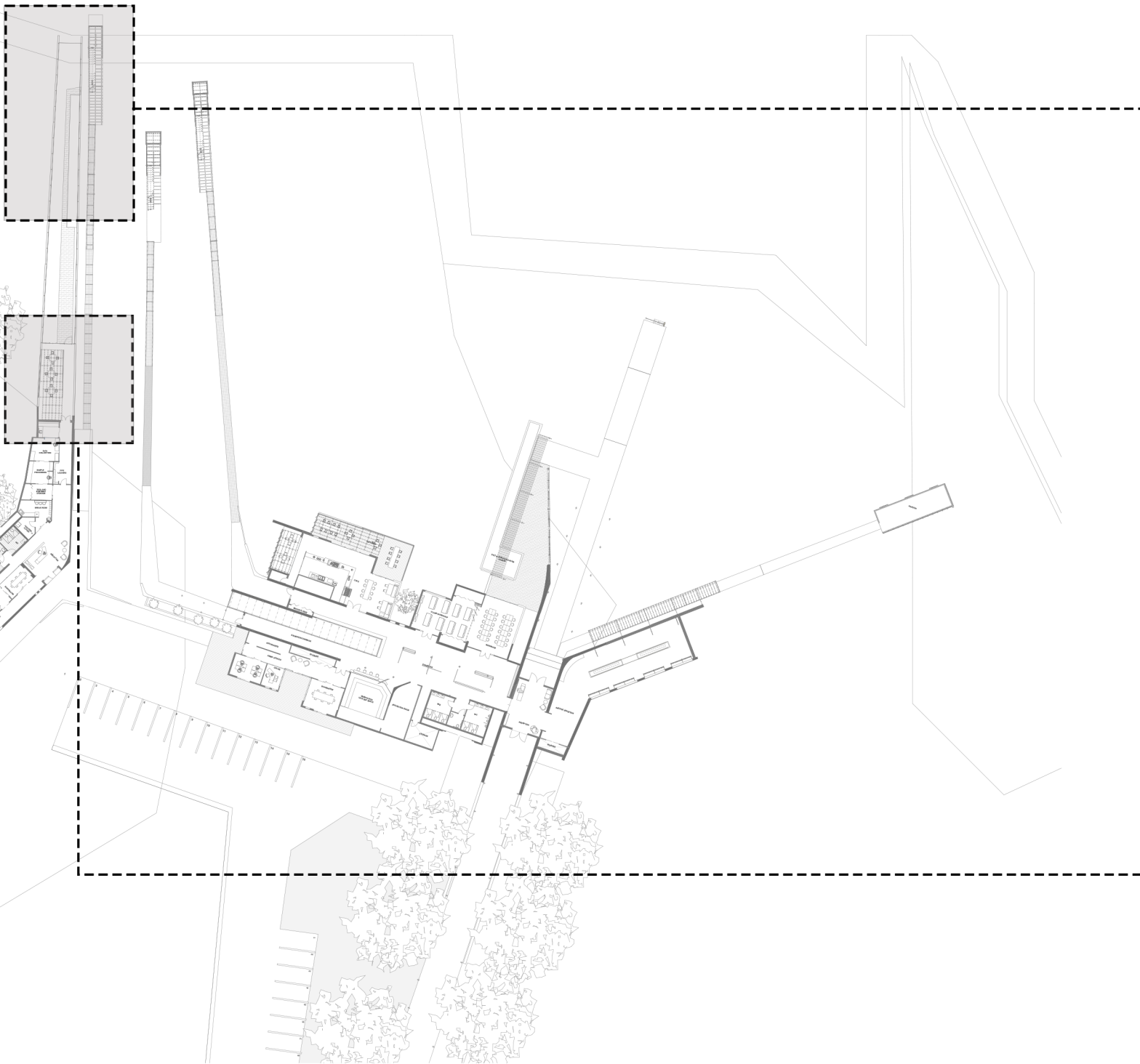


Figure 93: Aviary and plan exploration (author, 2024).

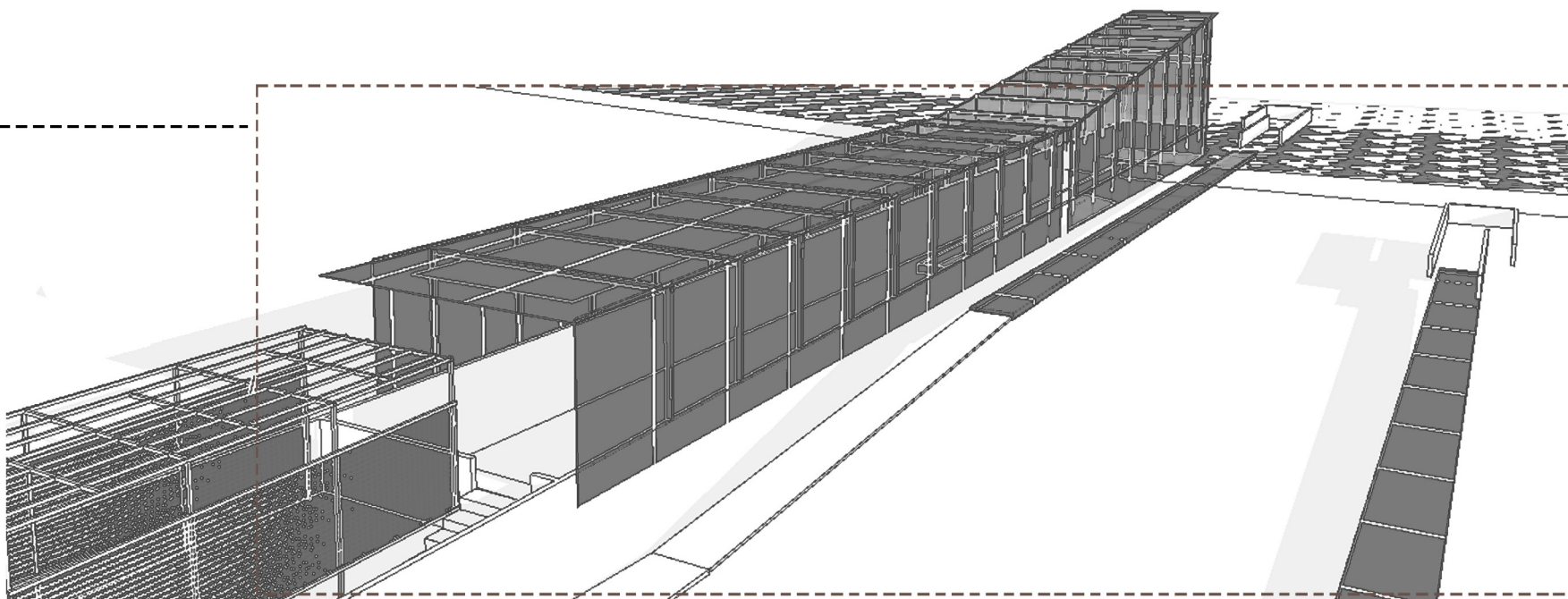


Figure 94: The aviary and the staff break area meeting (author, 2024).

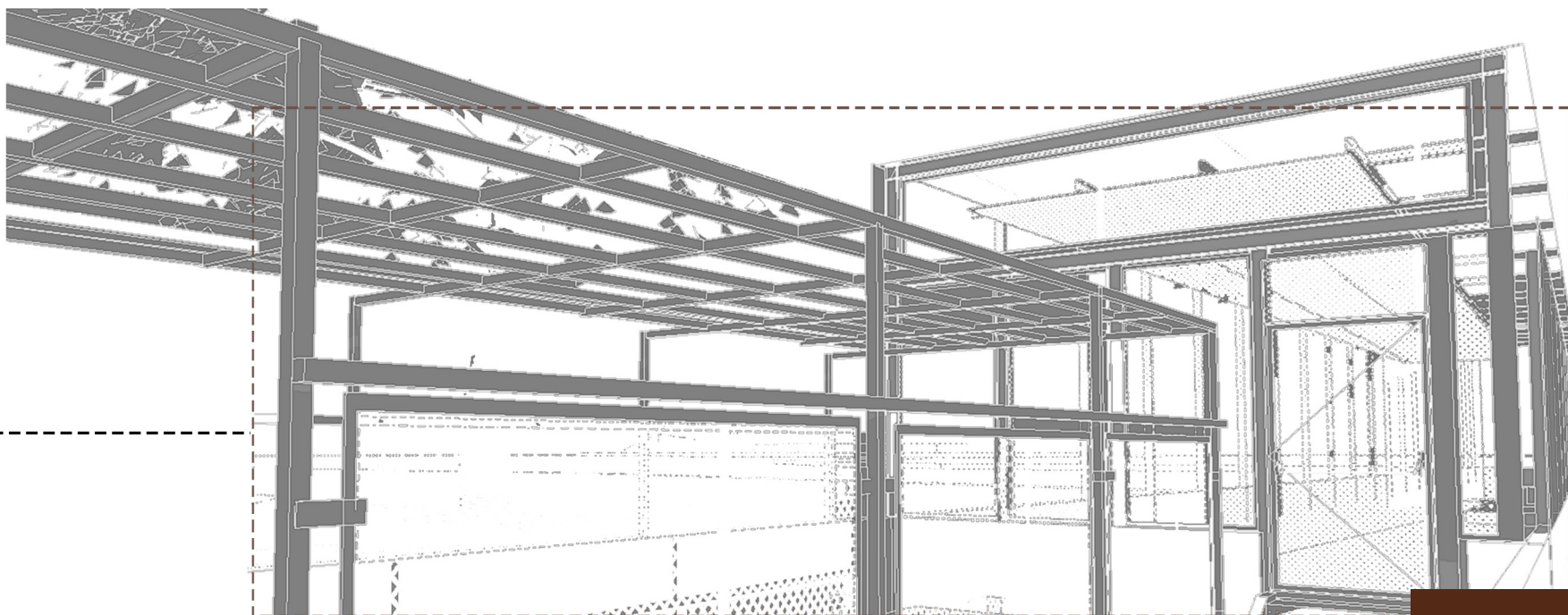


Figure 95: Structural exploration (author, 2024).

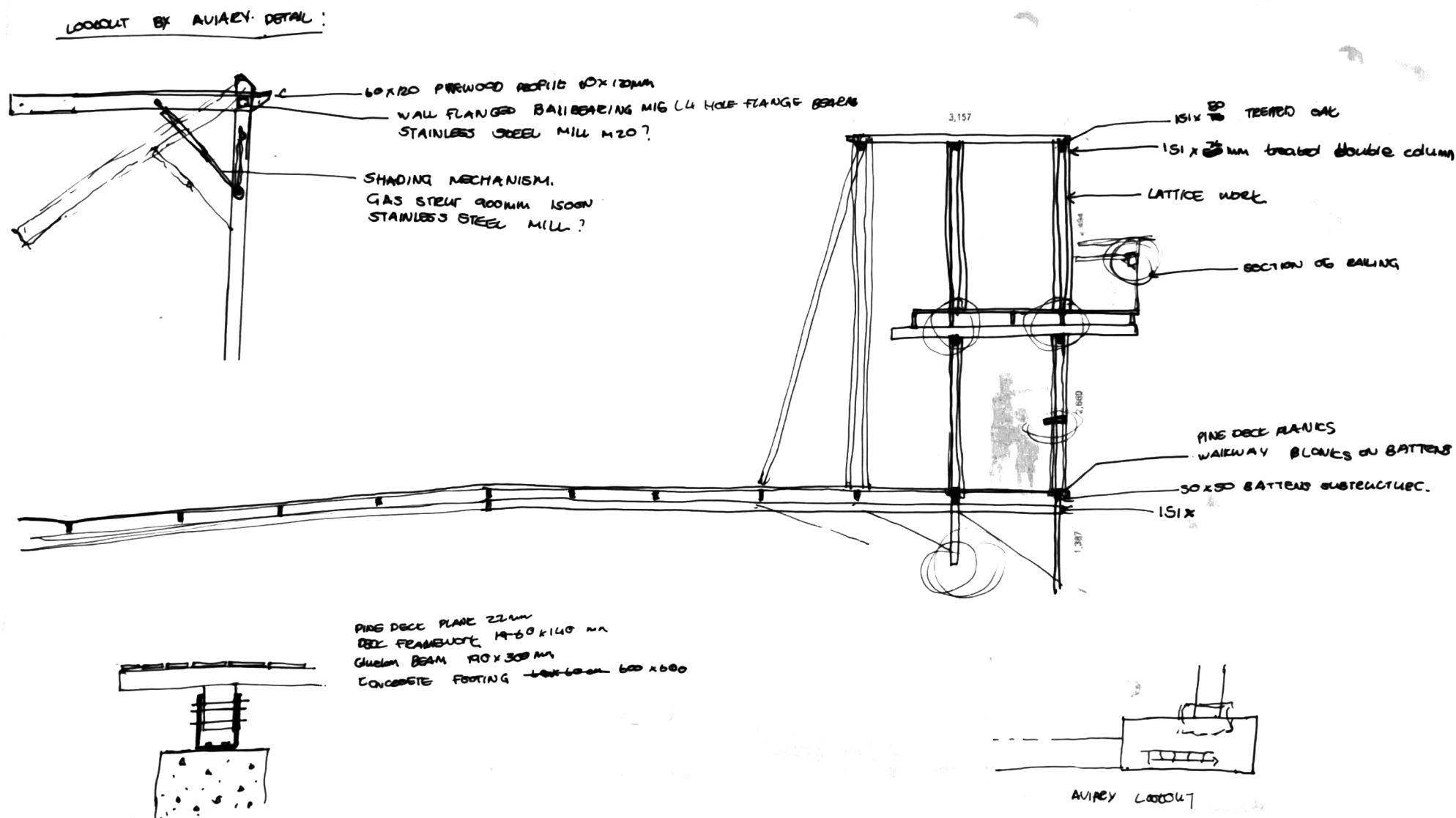


Figure 96: The bird hide structural exploration (author, 2024).

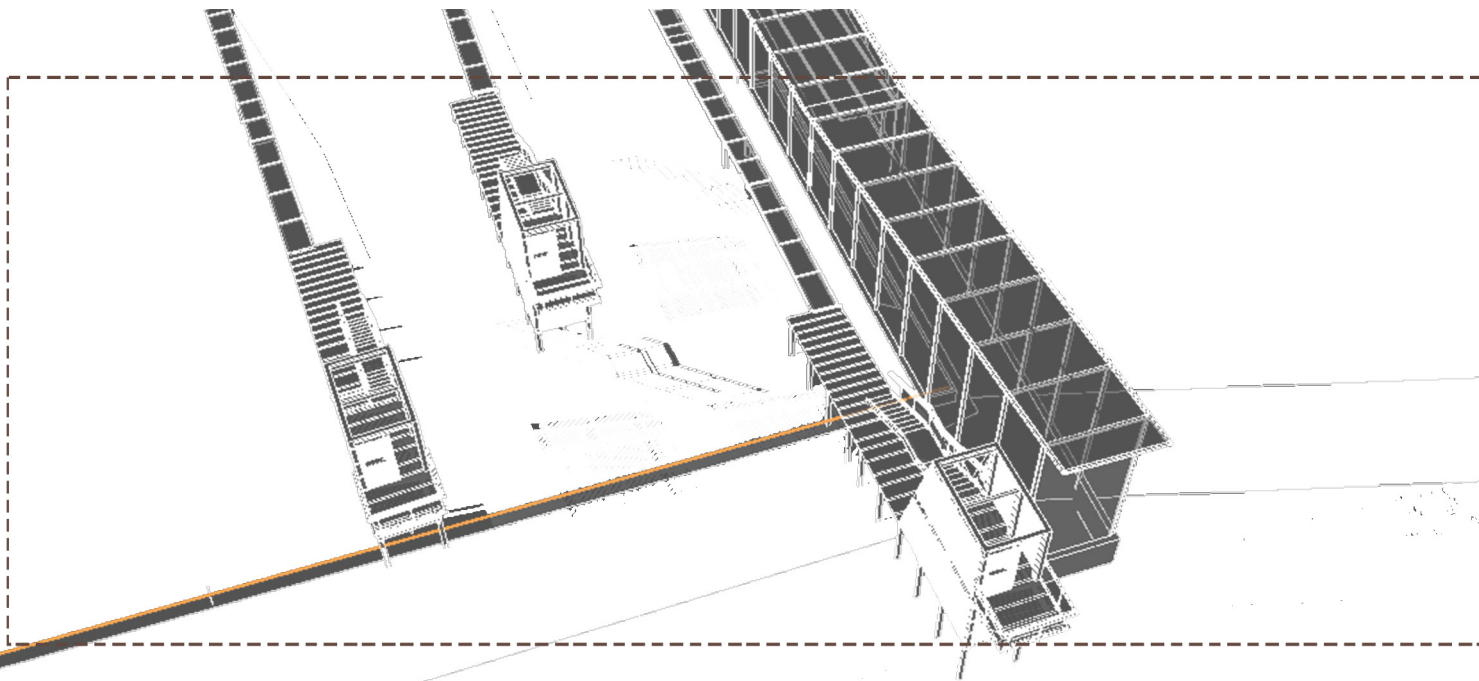


Figure 97: The bird hide pavilions in sequence(author, 2024).

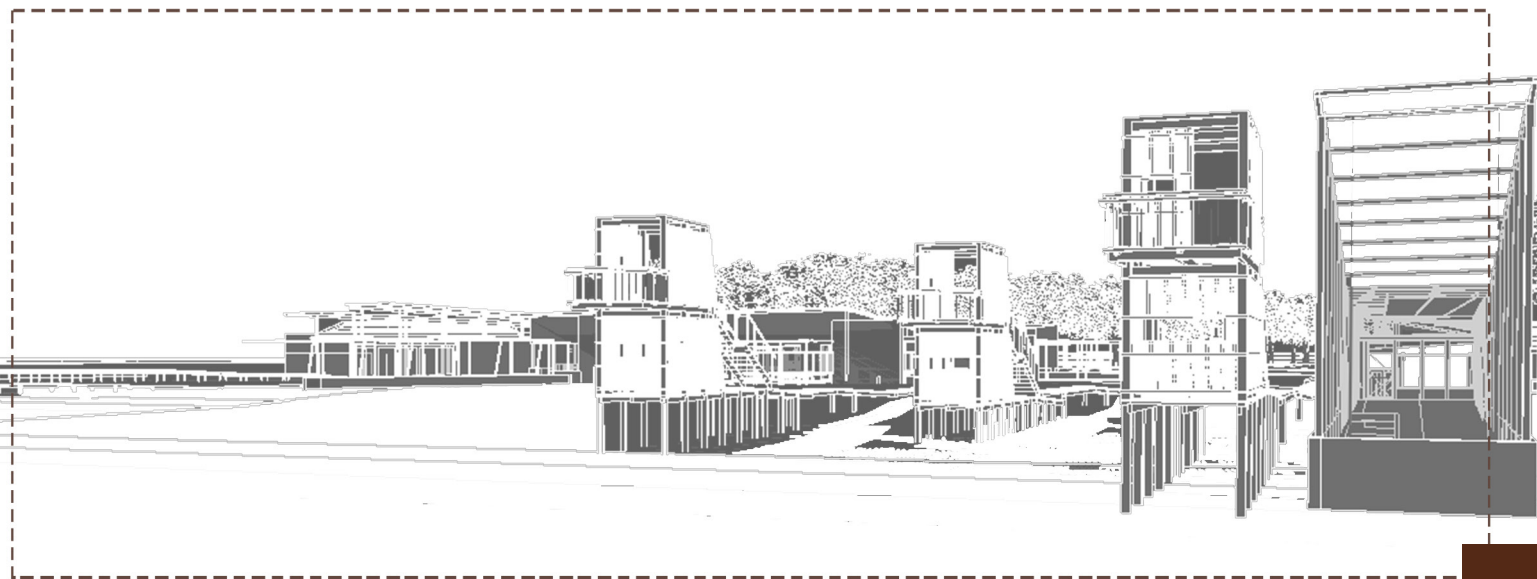


Figure 98: The bird hide pavilions in relation to the aviary(author, 2024).

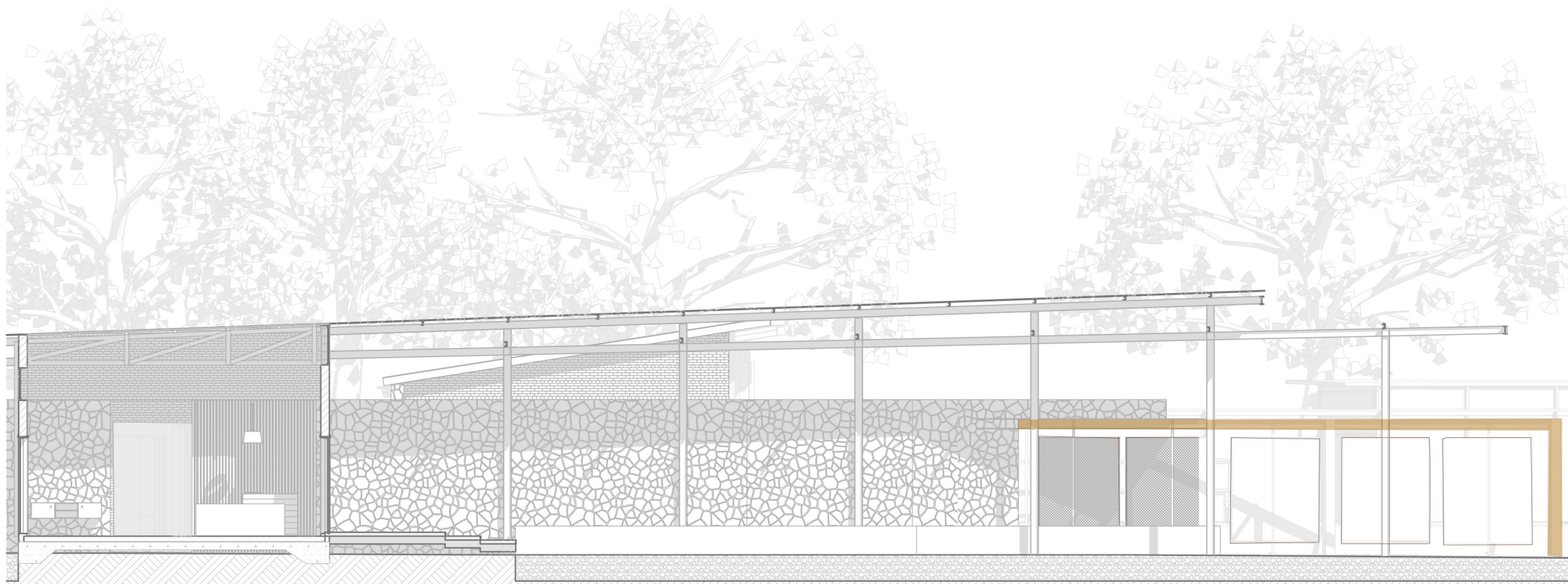
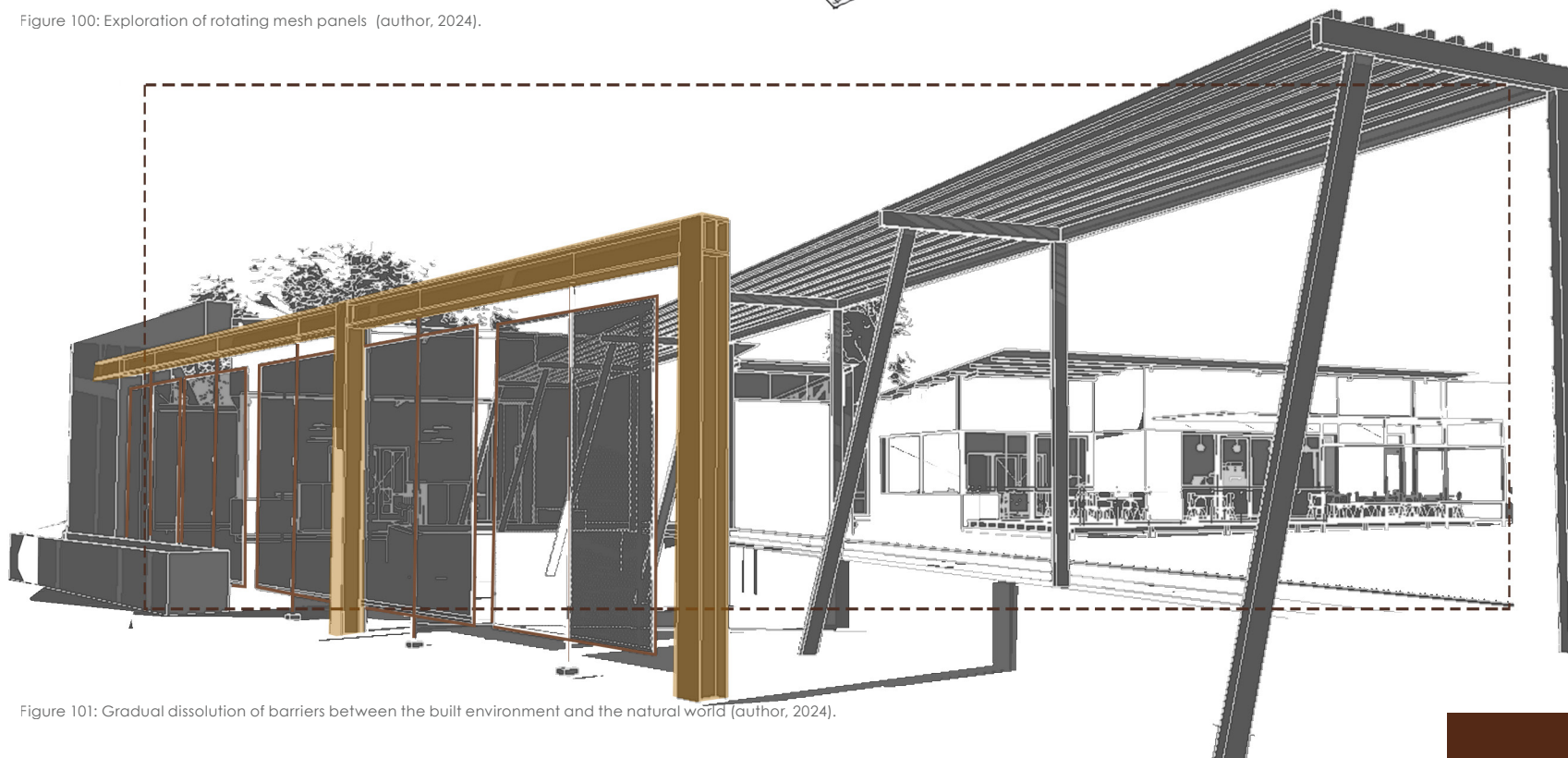
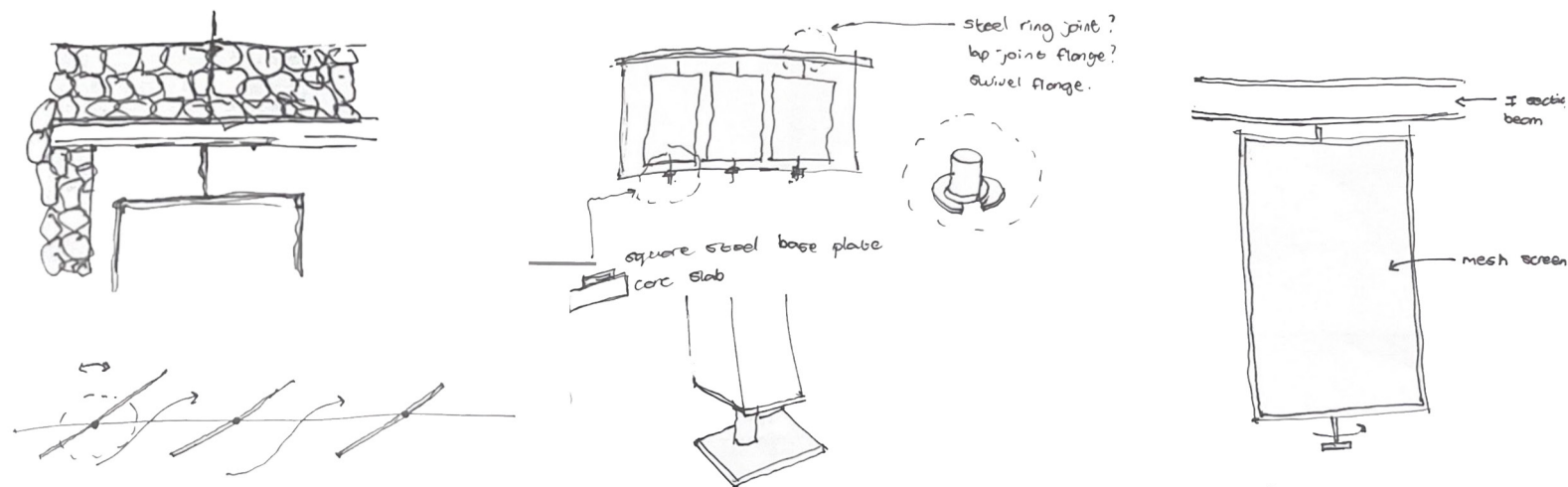


Figure 99: The main roof exploration (author, 2024).



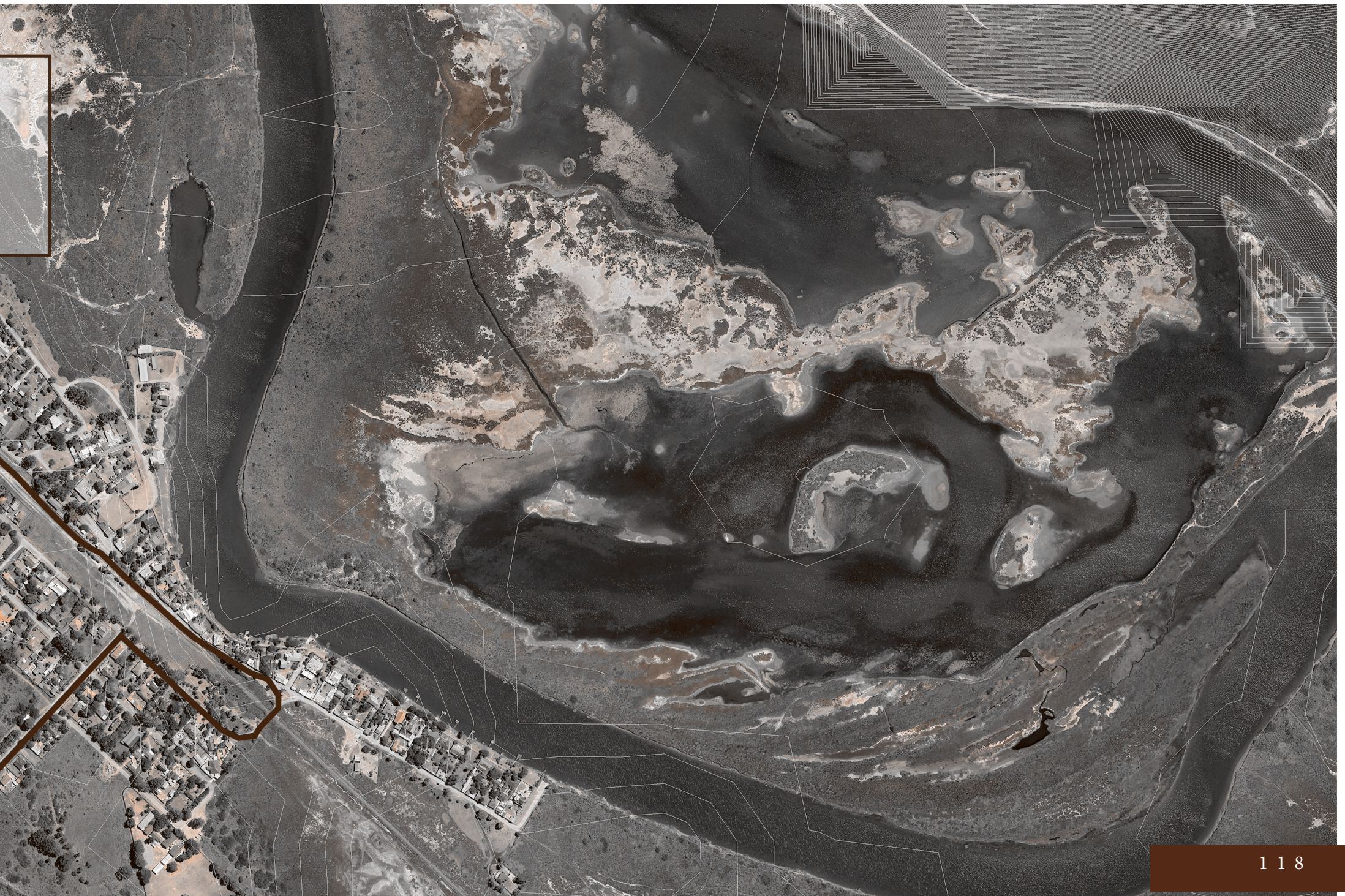
08

DESIGN SYNTHESIS

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Figure 102: Site locality plan (author, 2024).



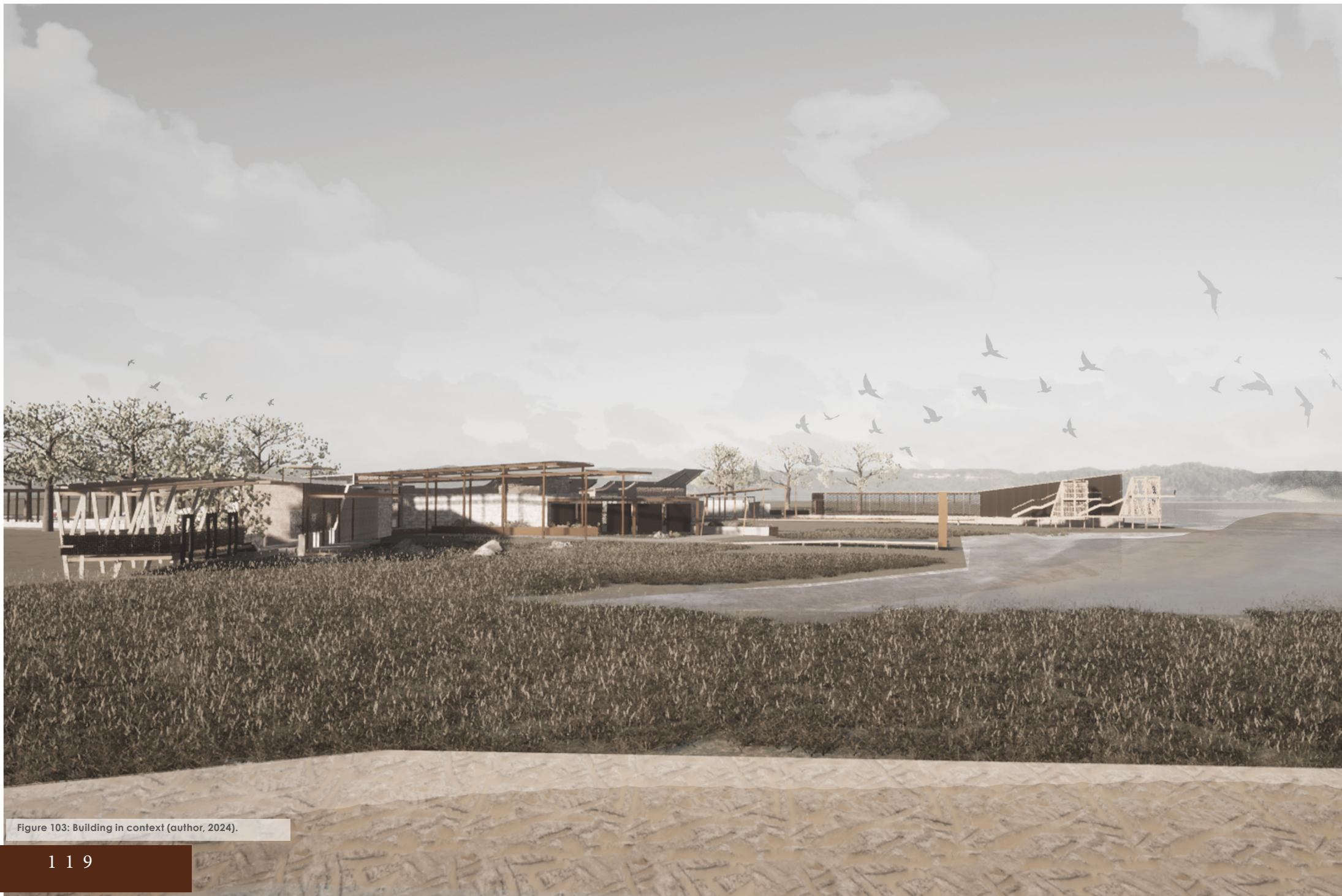
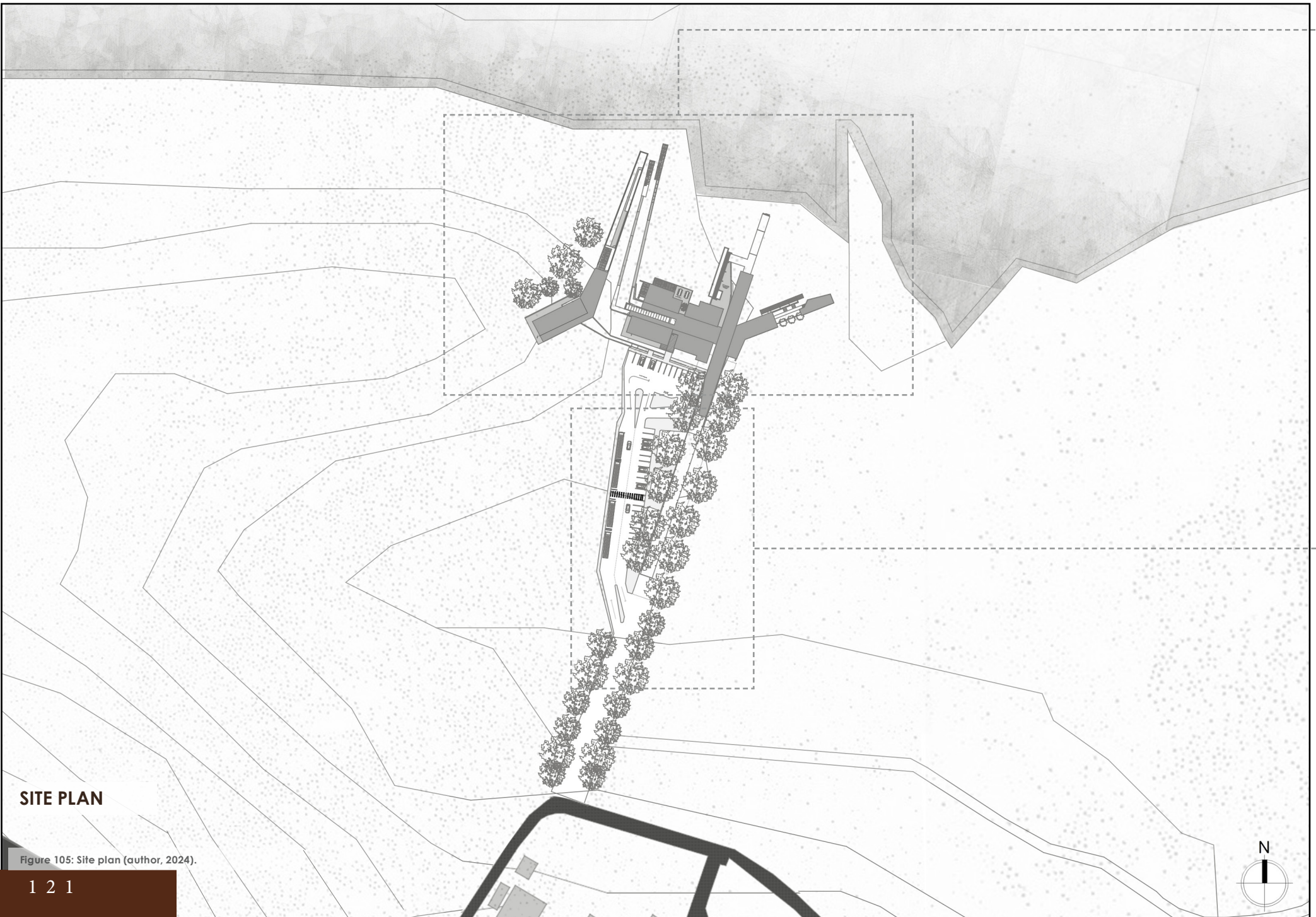


Figure 103: Building in context (author, 2024).

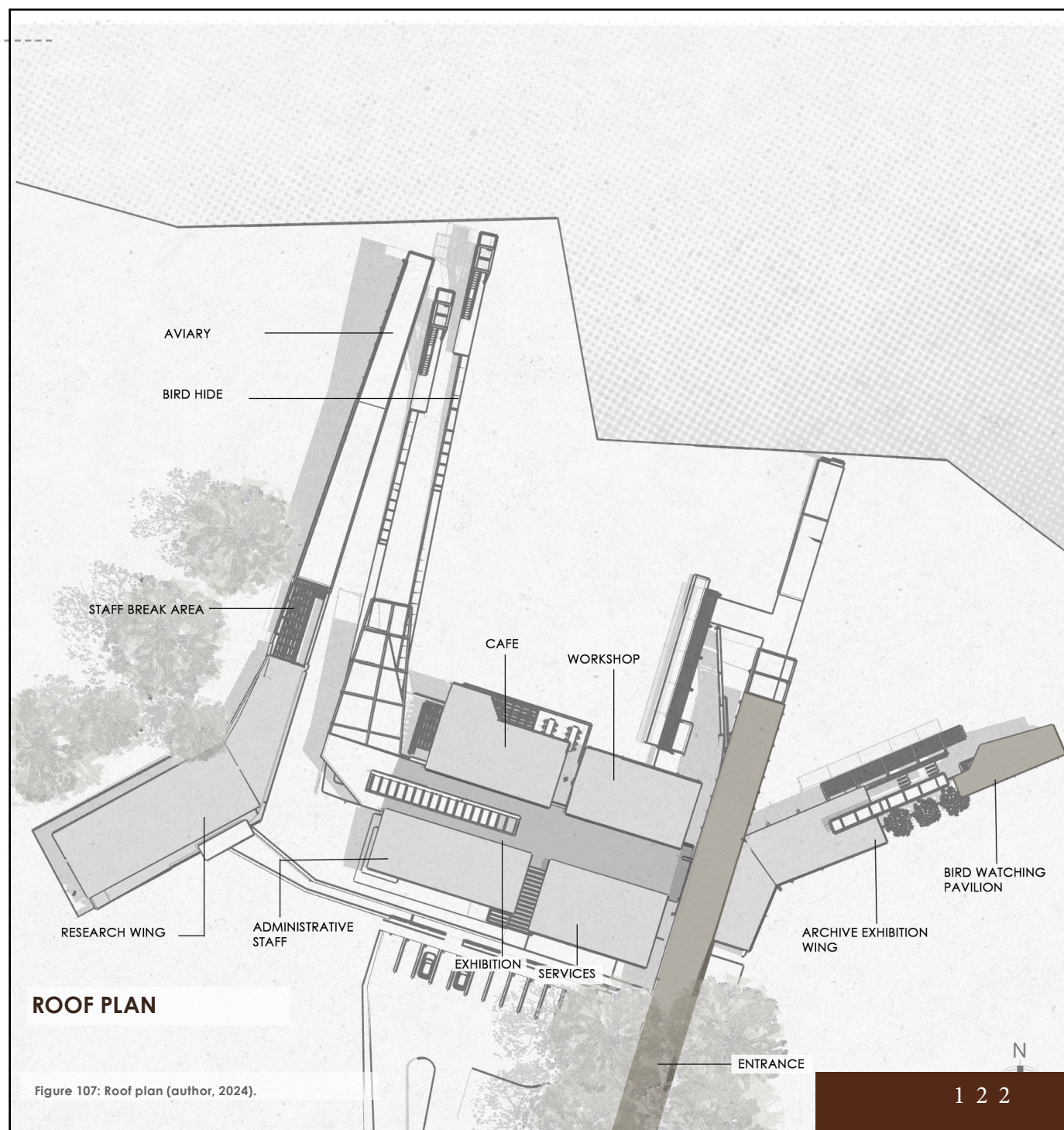
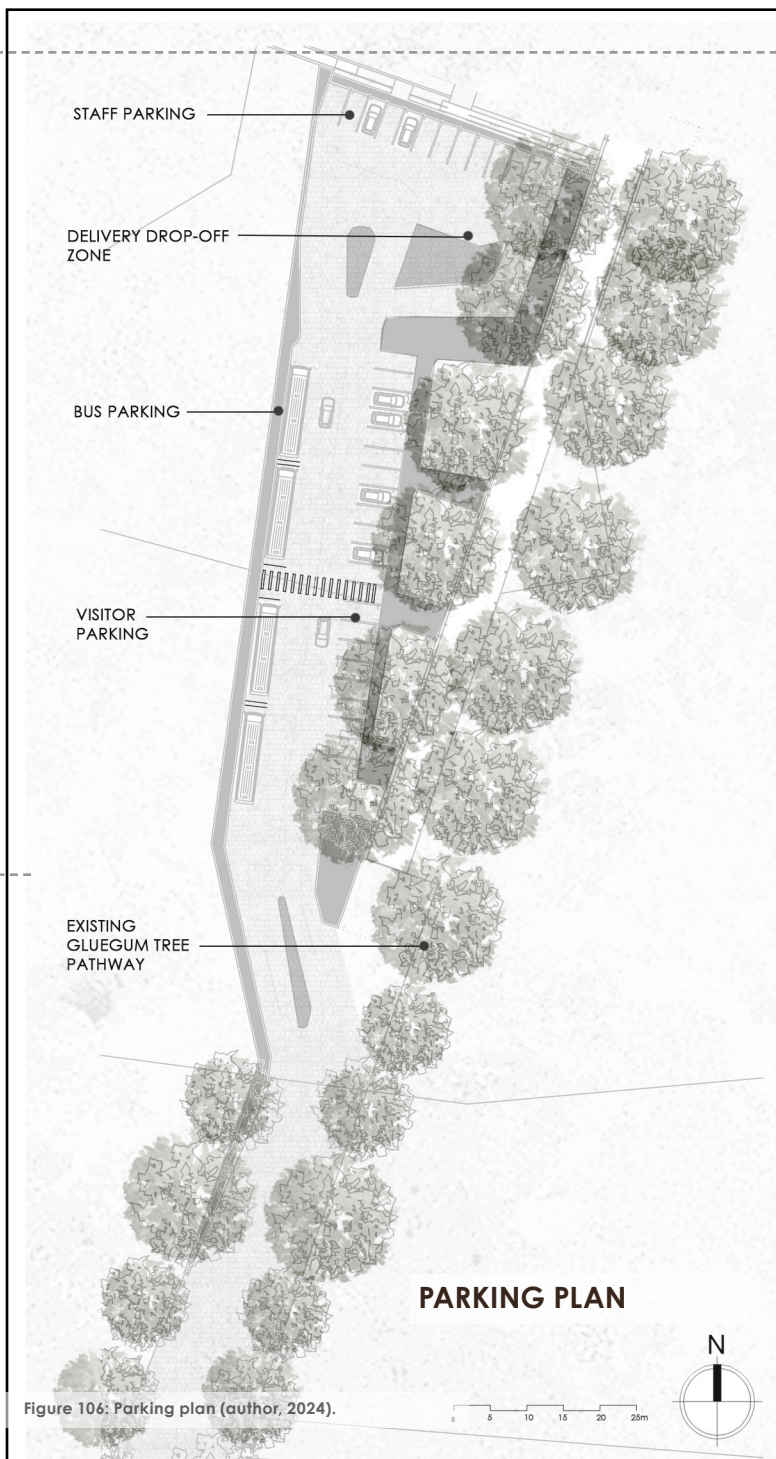


Figure 104: Bird's eye view (author, 2024).



SITE PLAN

Figure 105: Site plan (author, 2024).



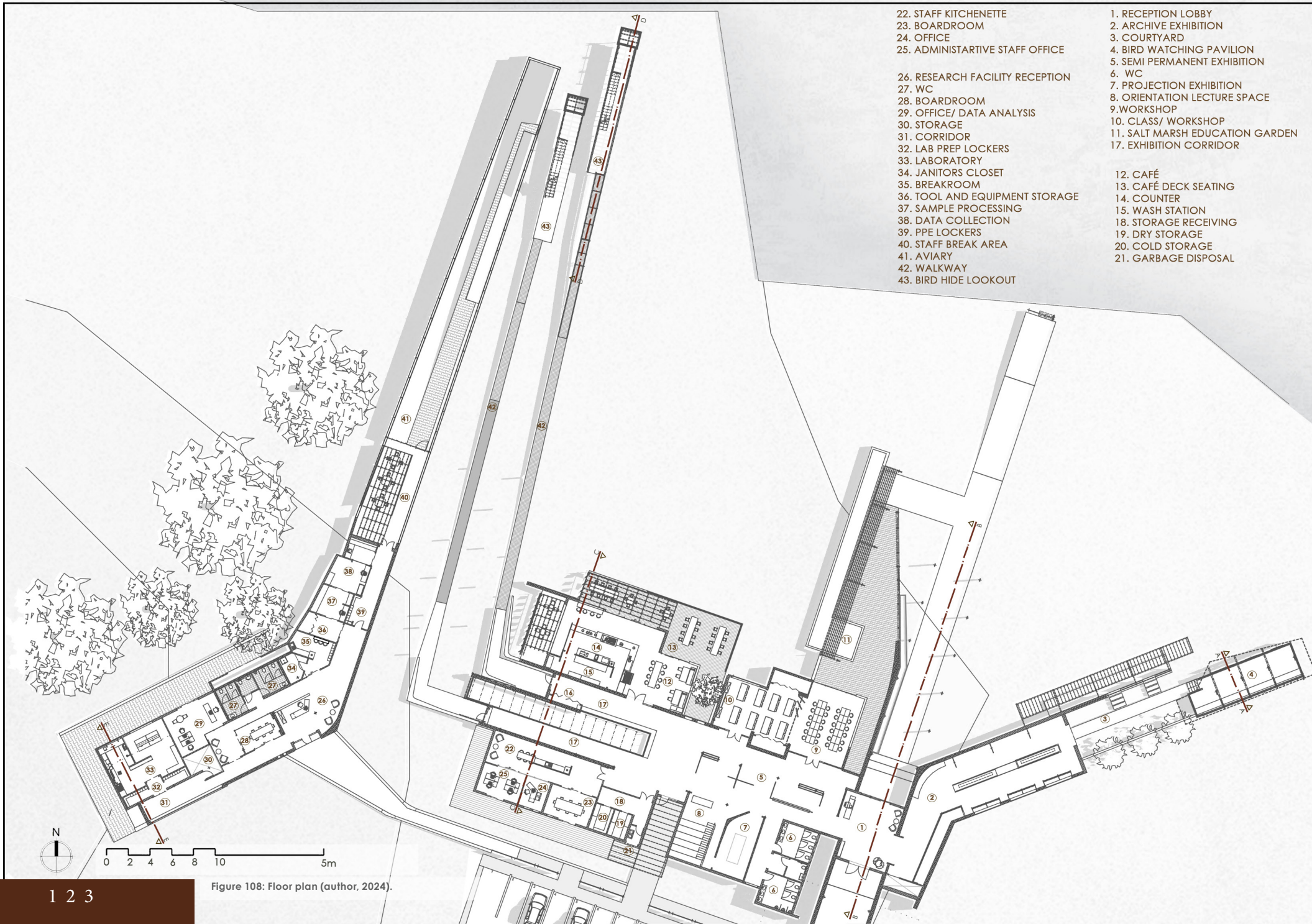


Figure 108: Floor plan (author, 2024).

SPATIAL PLANNING

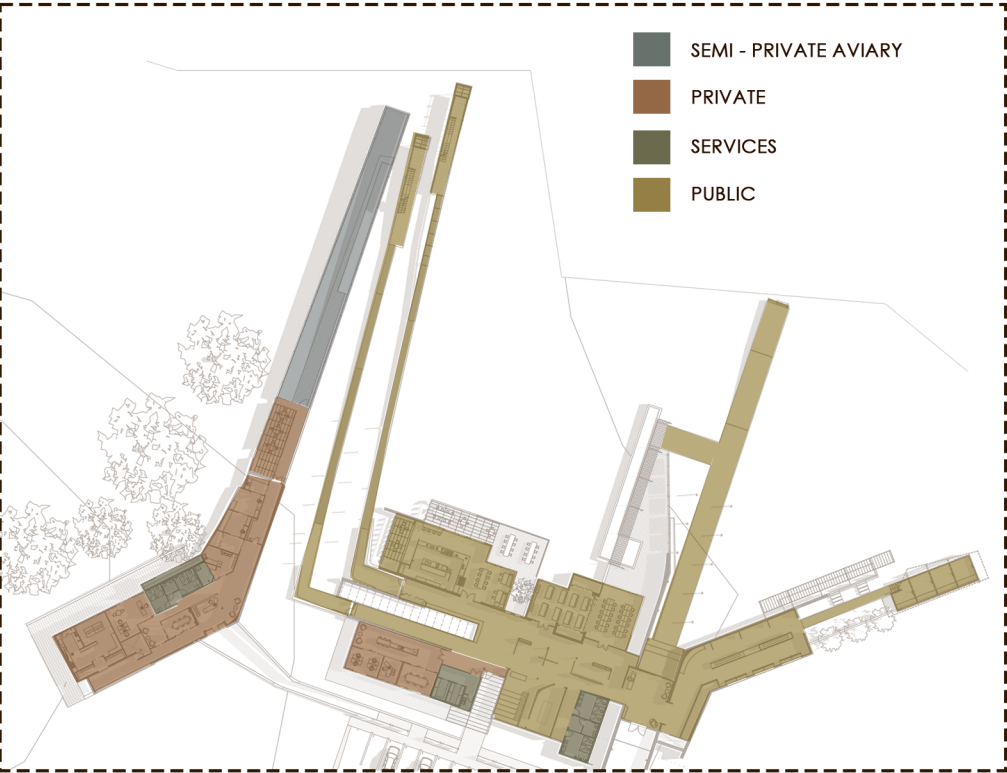


Figure 109: Spatial planning diagram (author, 2024).

ACCESS

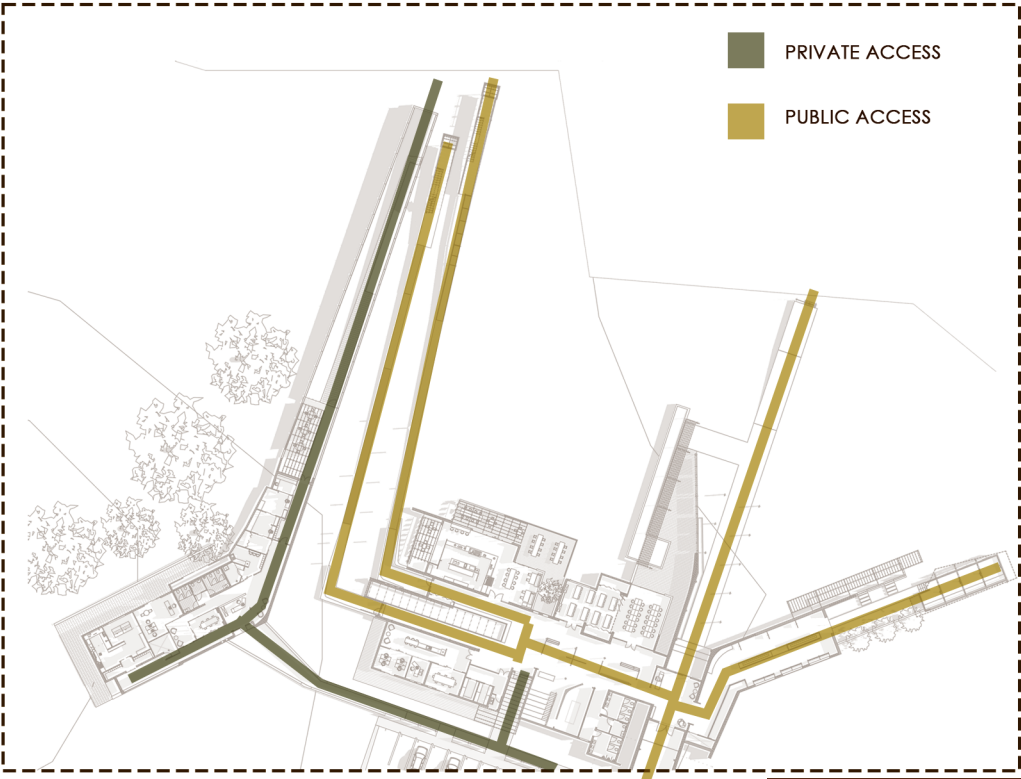
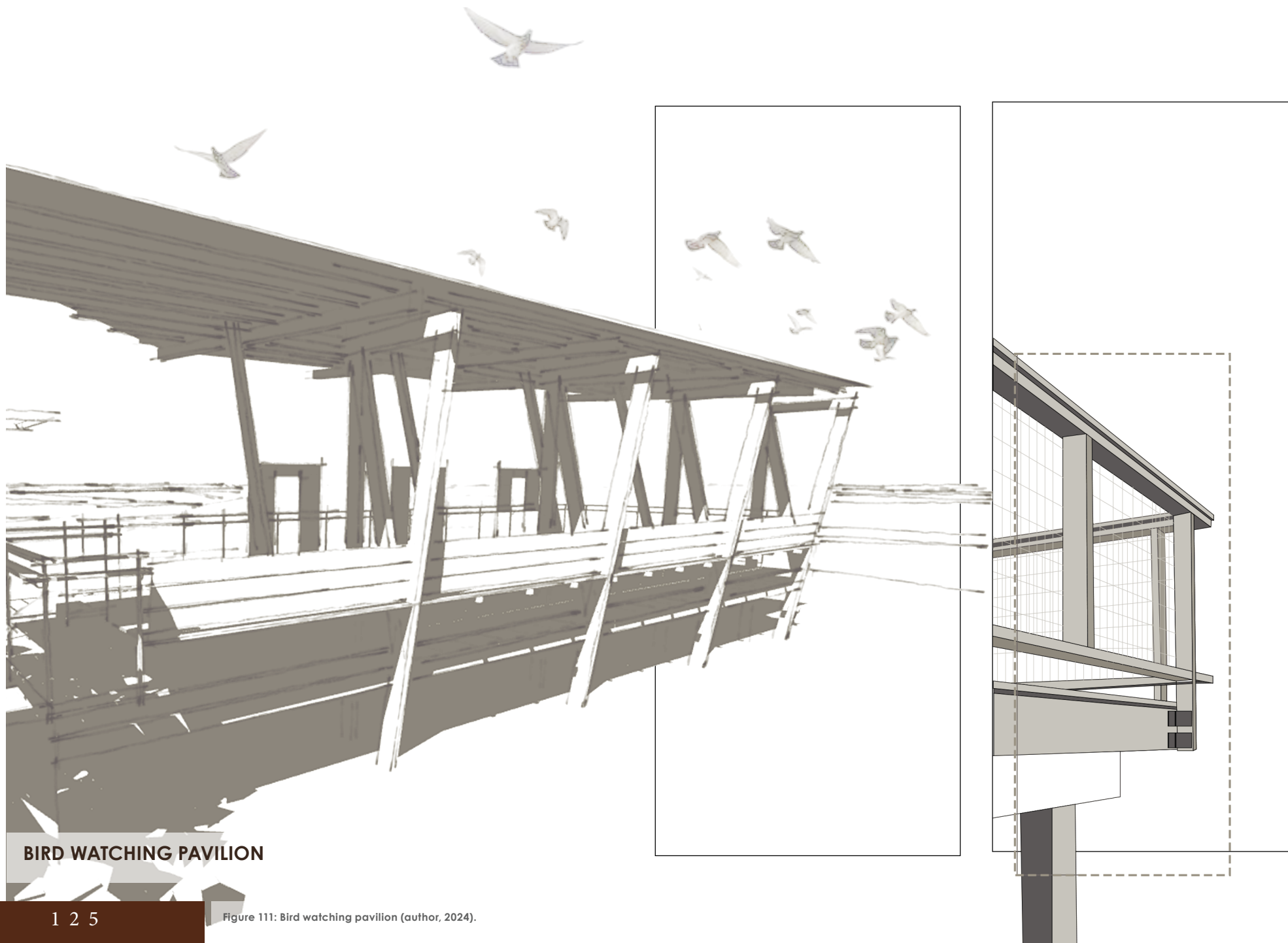
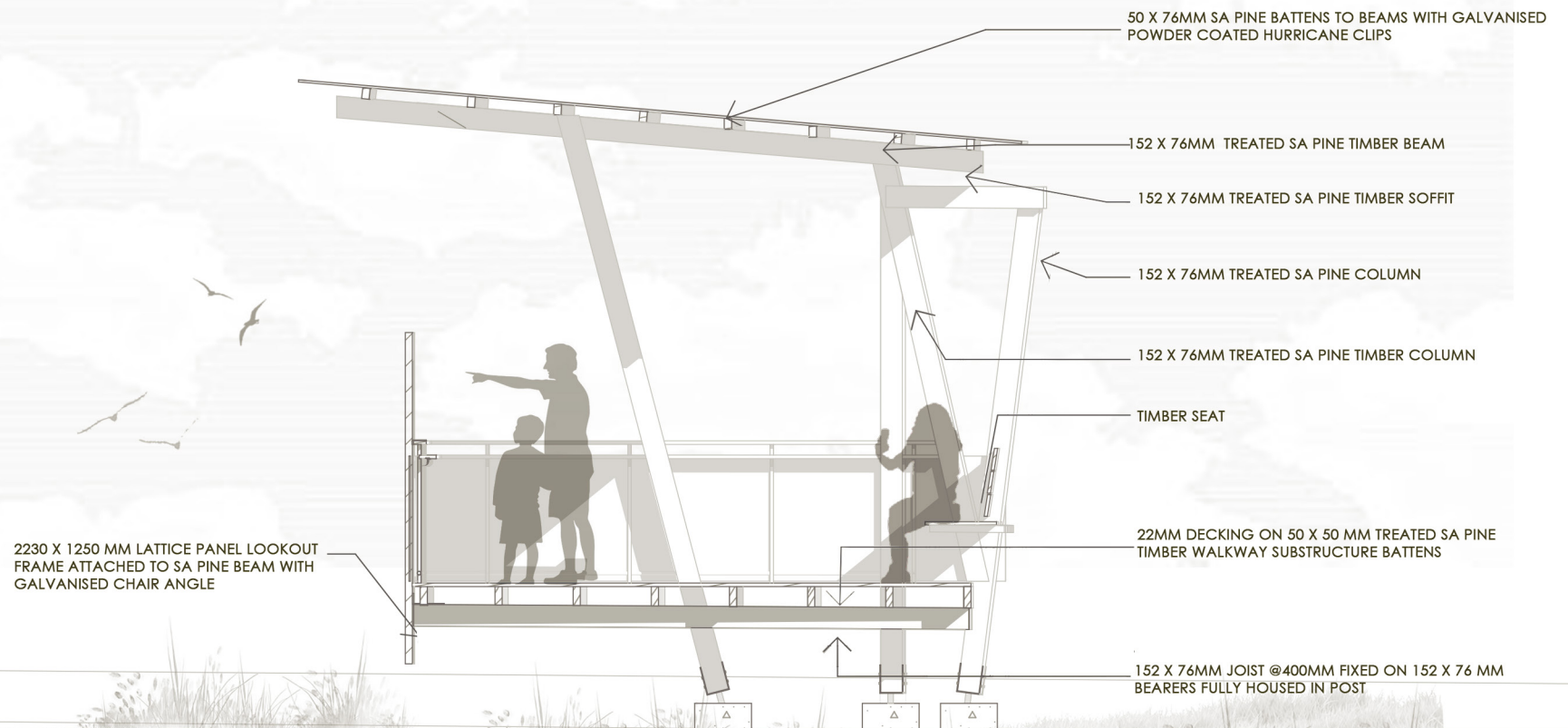


Figure 110: Access diagram (author, 2024).



BIRD WATCHING PAVILION



BIRD - WATCHING PAVILION

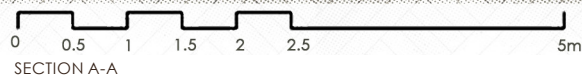


Figure 112: Pavilion section (author, 2024).



BIRD HIDE LOOKOUT

1 2 7

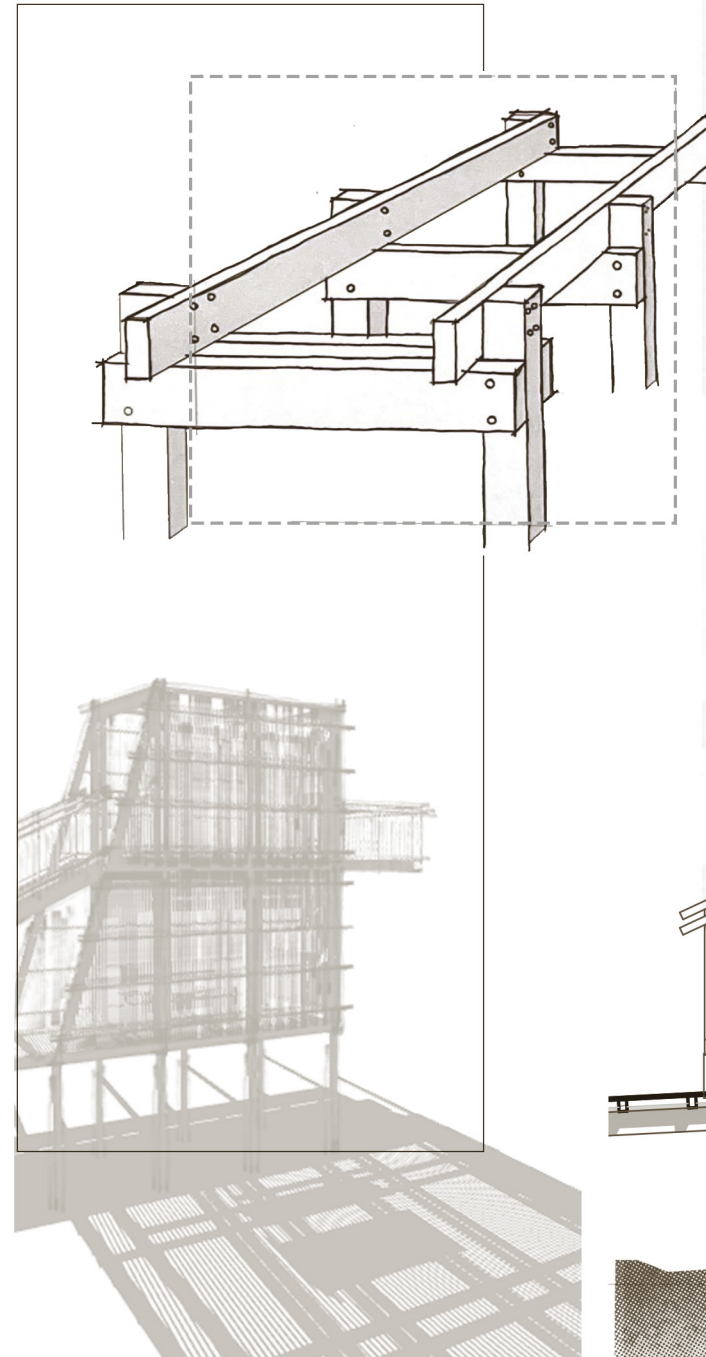
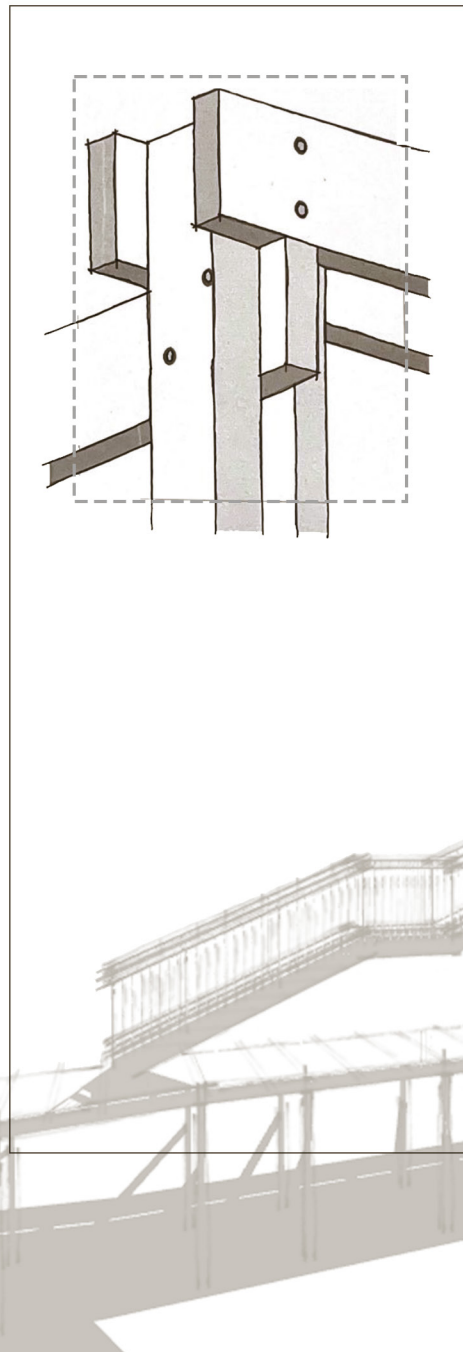


Figure 113: Bird hide sketch diagram (author, 2024).

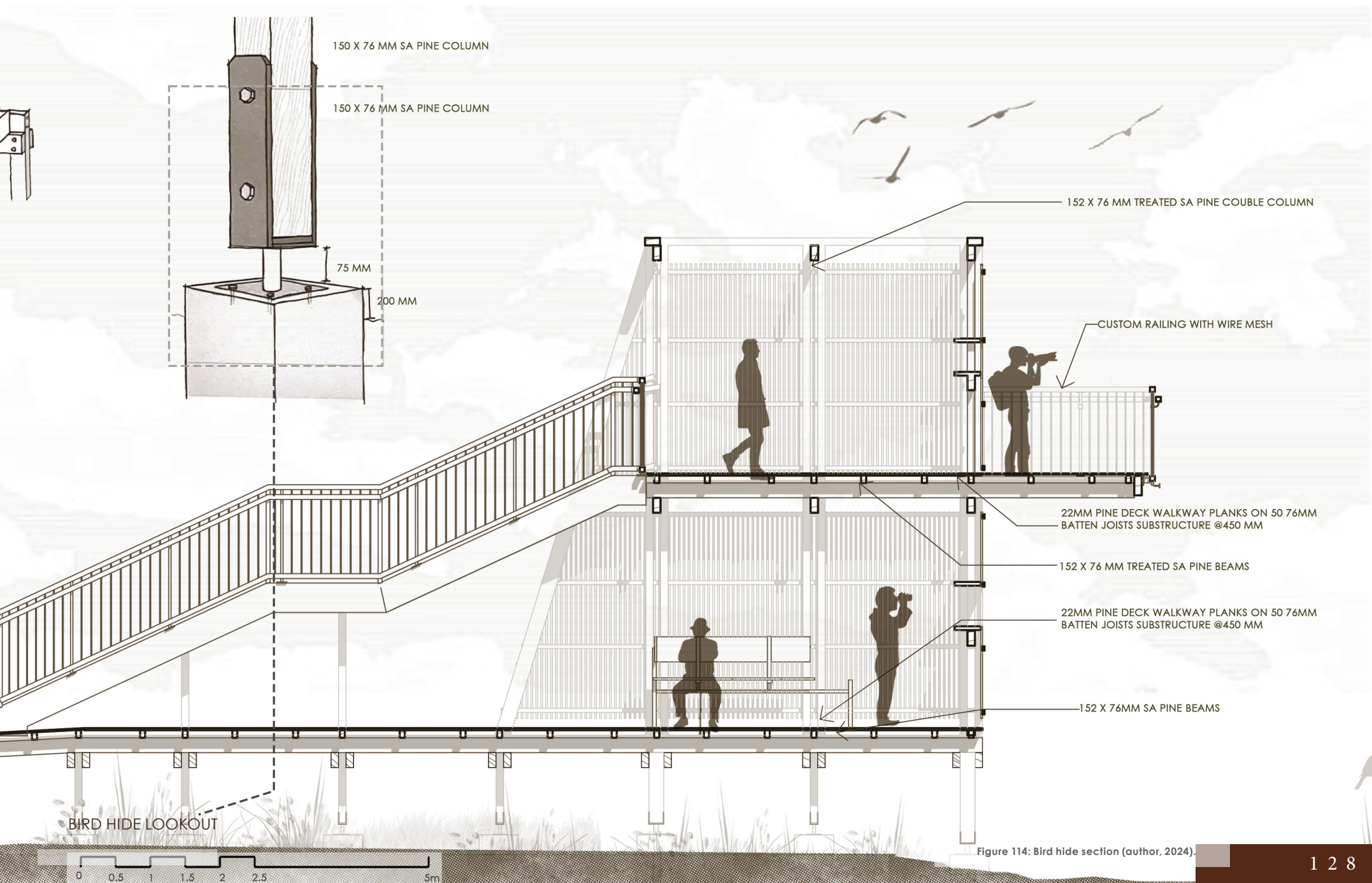
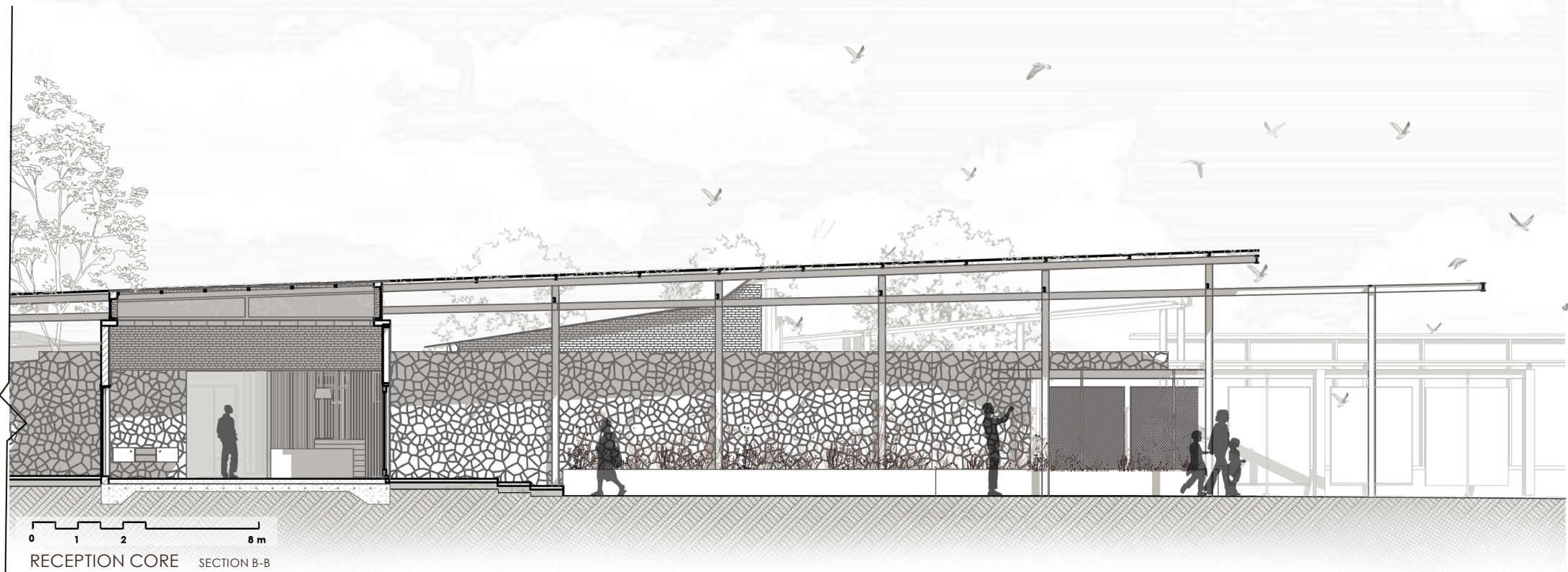
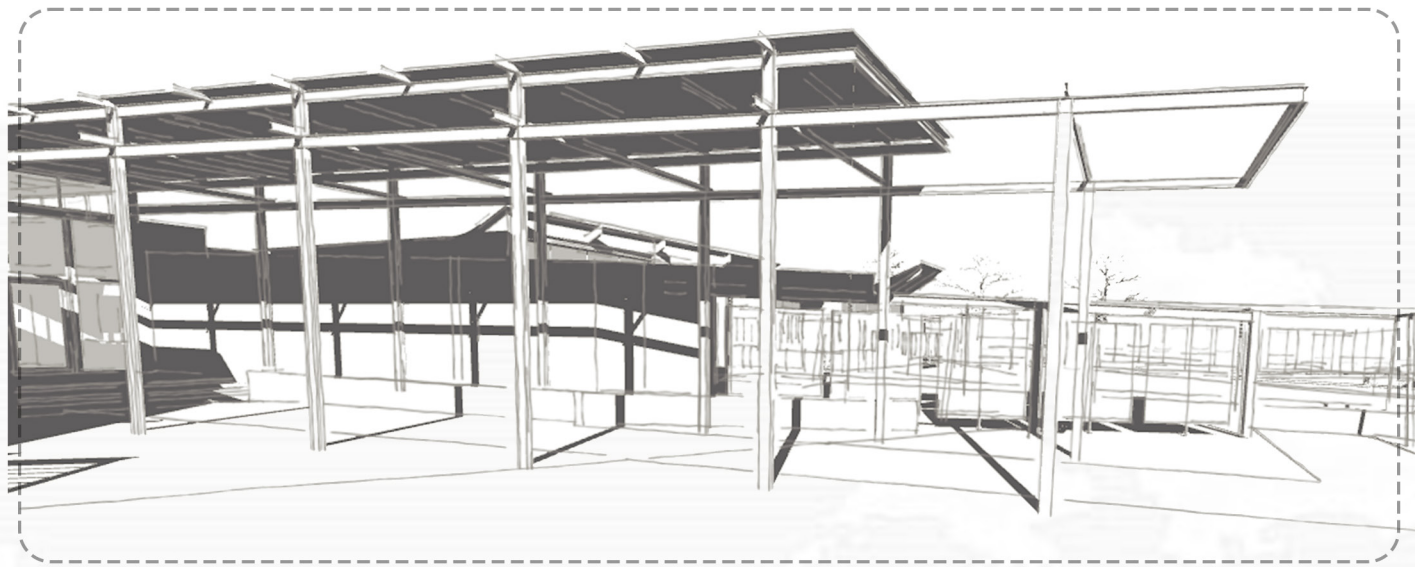
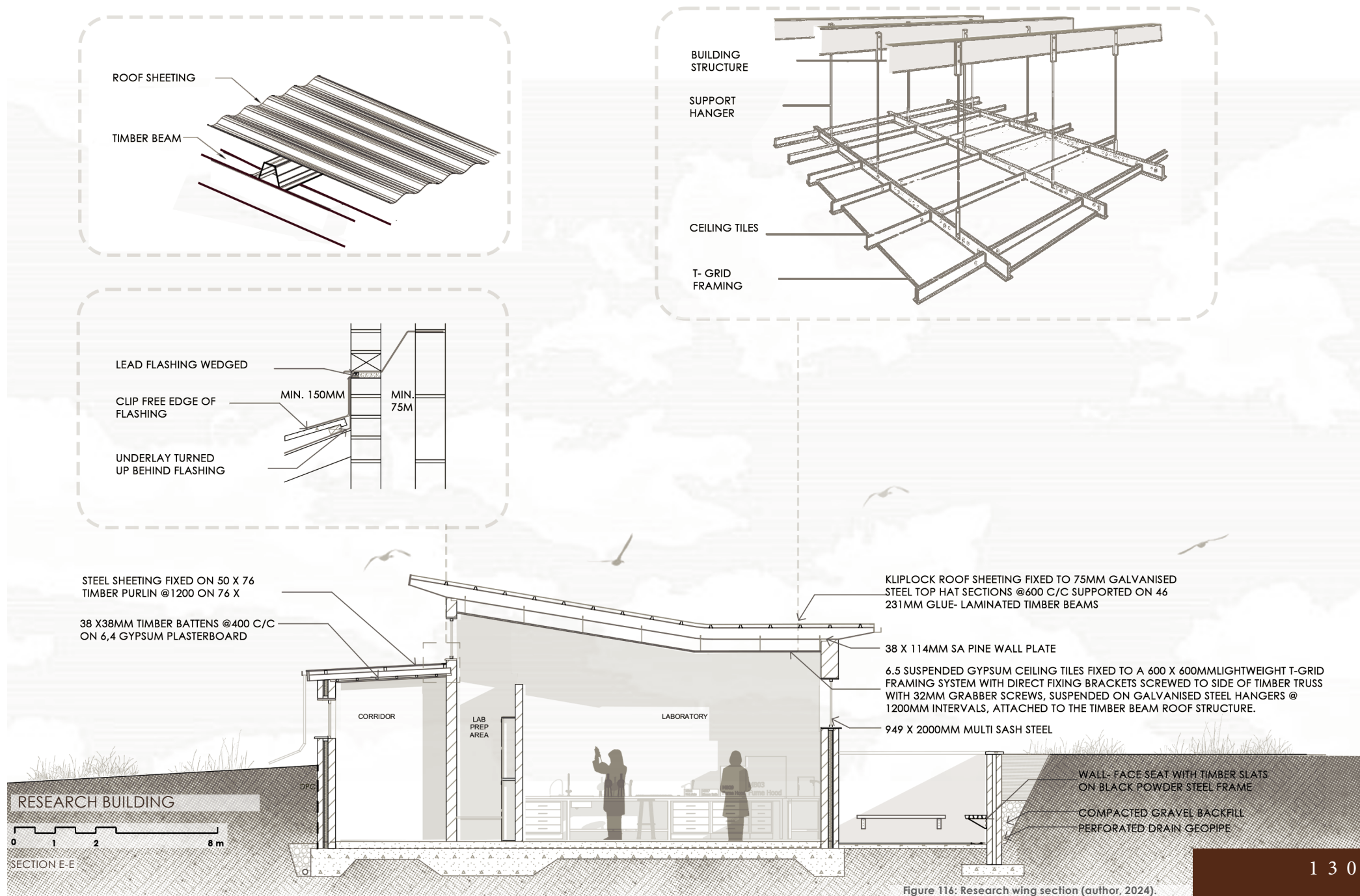
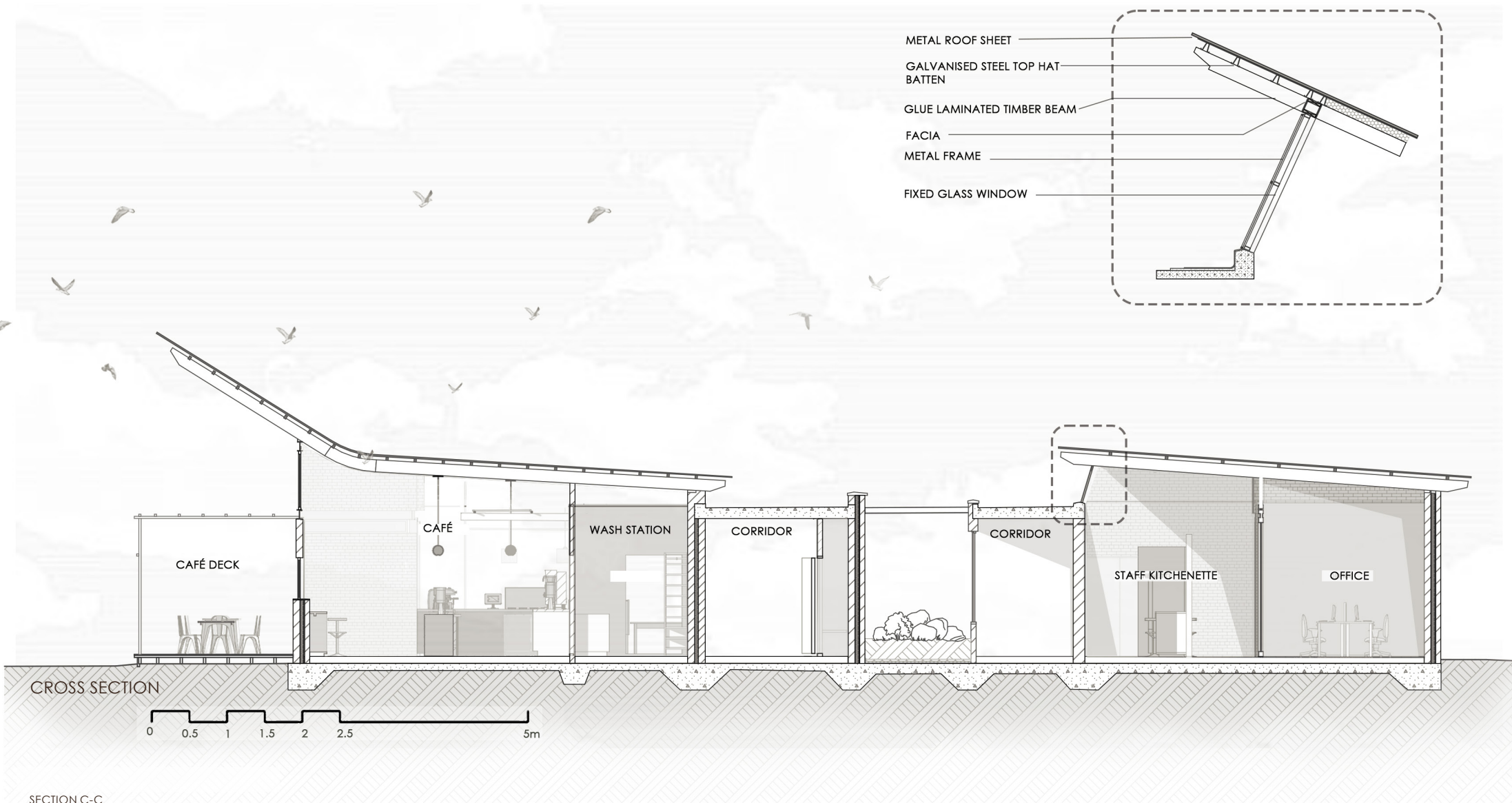


Figure 114: Bird hide section (author, 2024).



RECEPTION CORE SECTION B-B





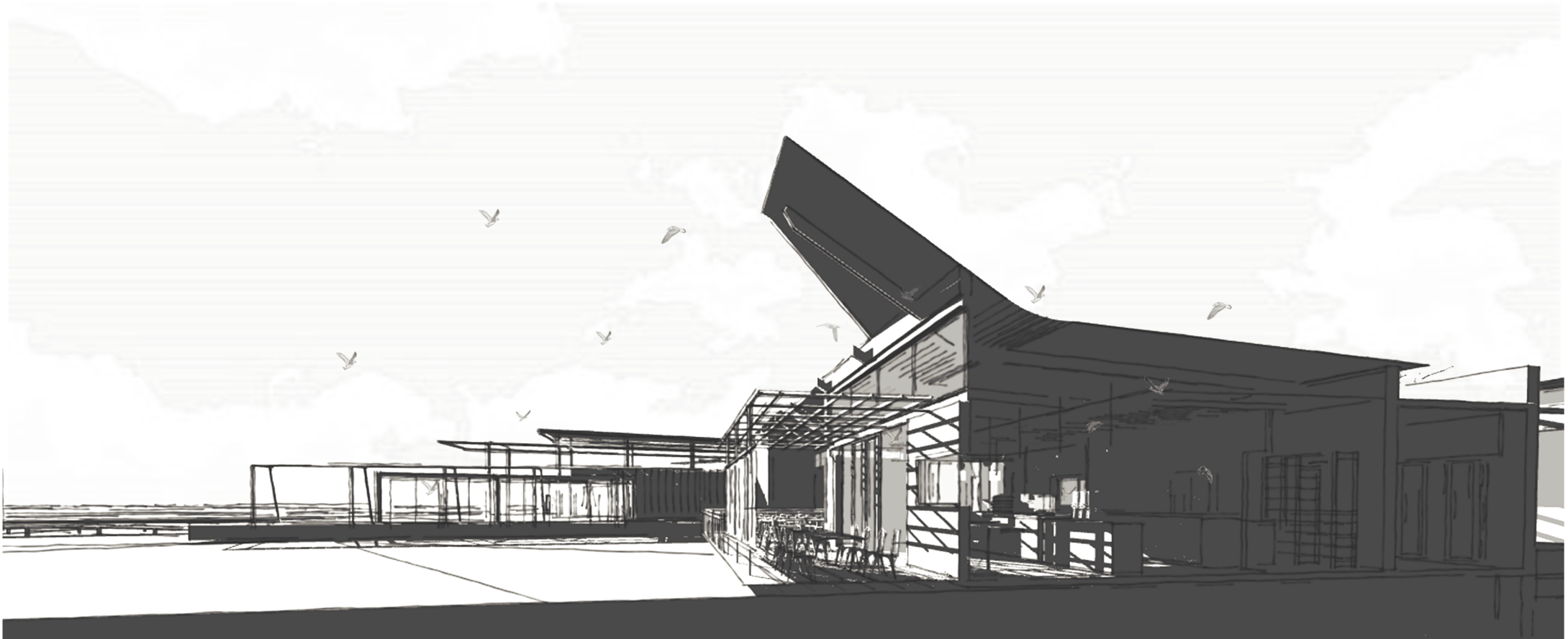
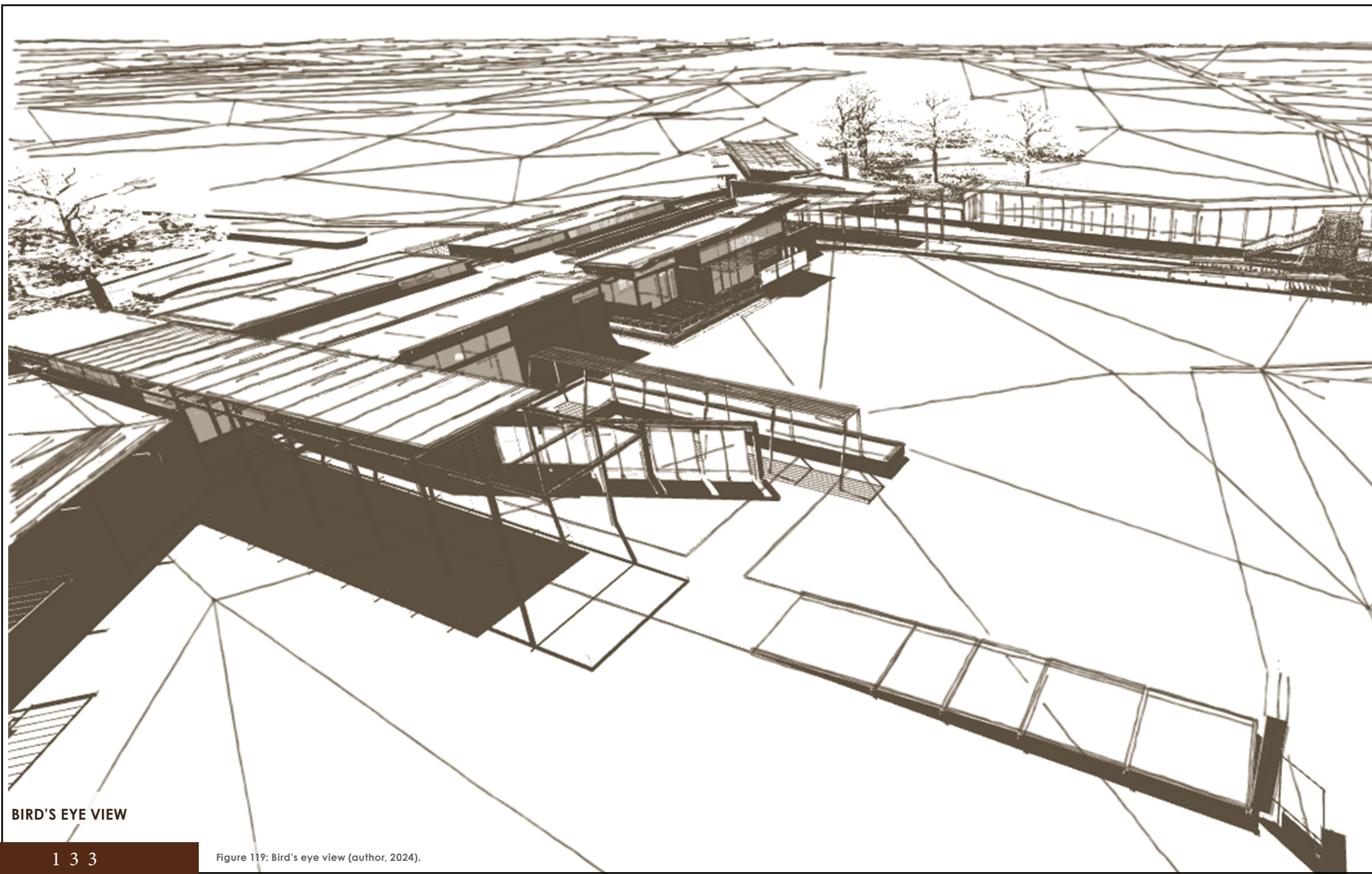


Figure 118: Roof in flight (author, 2024).



BIRD'S EYE VIEW

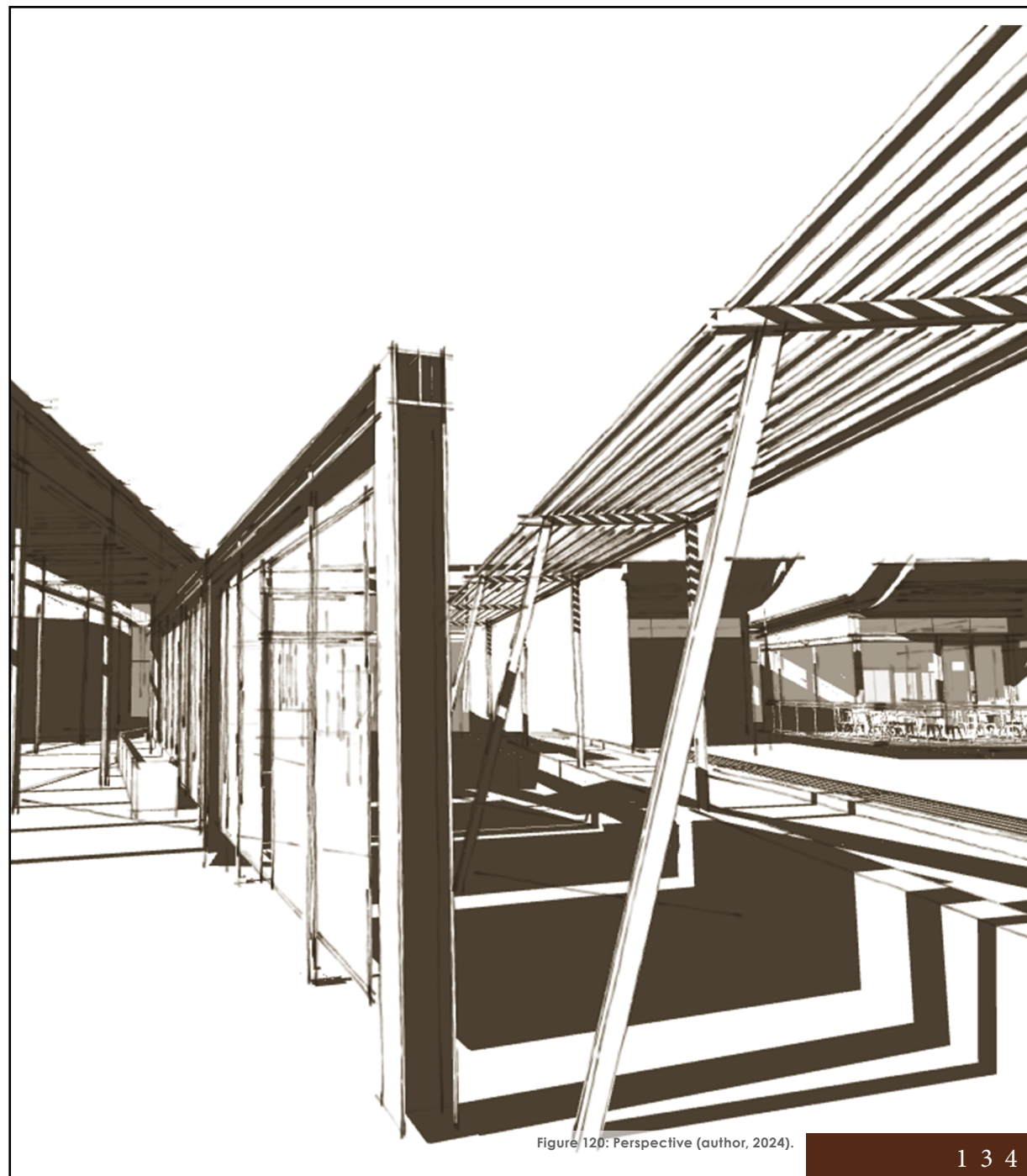
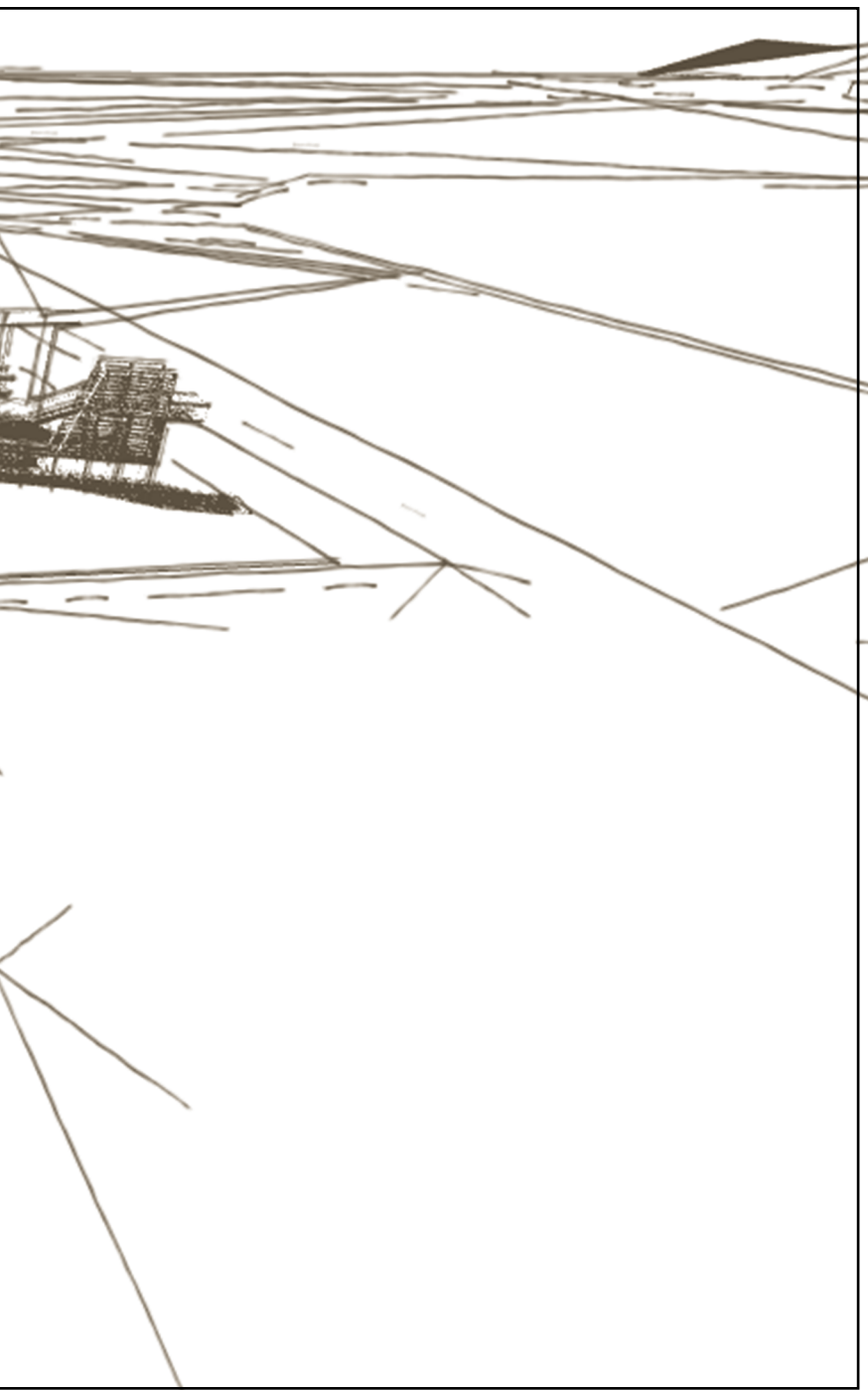


Figure 120: Perspective (author, 2024).

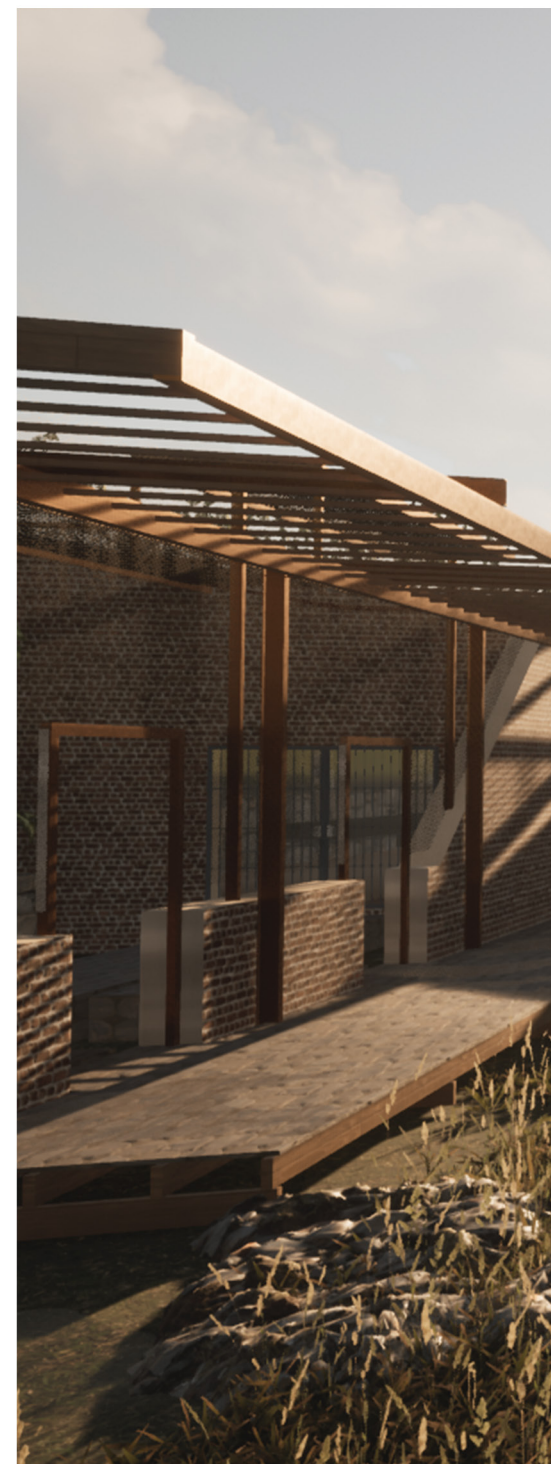






Figure 121, 122, 123: Interior renders (author, 2024).









PROJECTION ROOM EXHIBITION

1 4 1

Figure 126: Project room exhibition (author, 2024).





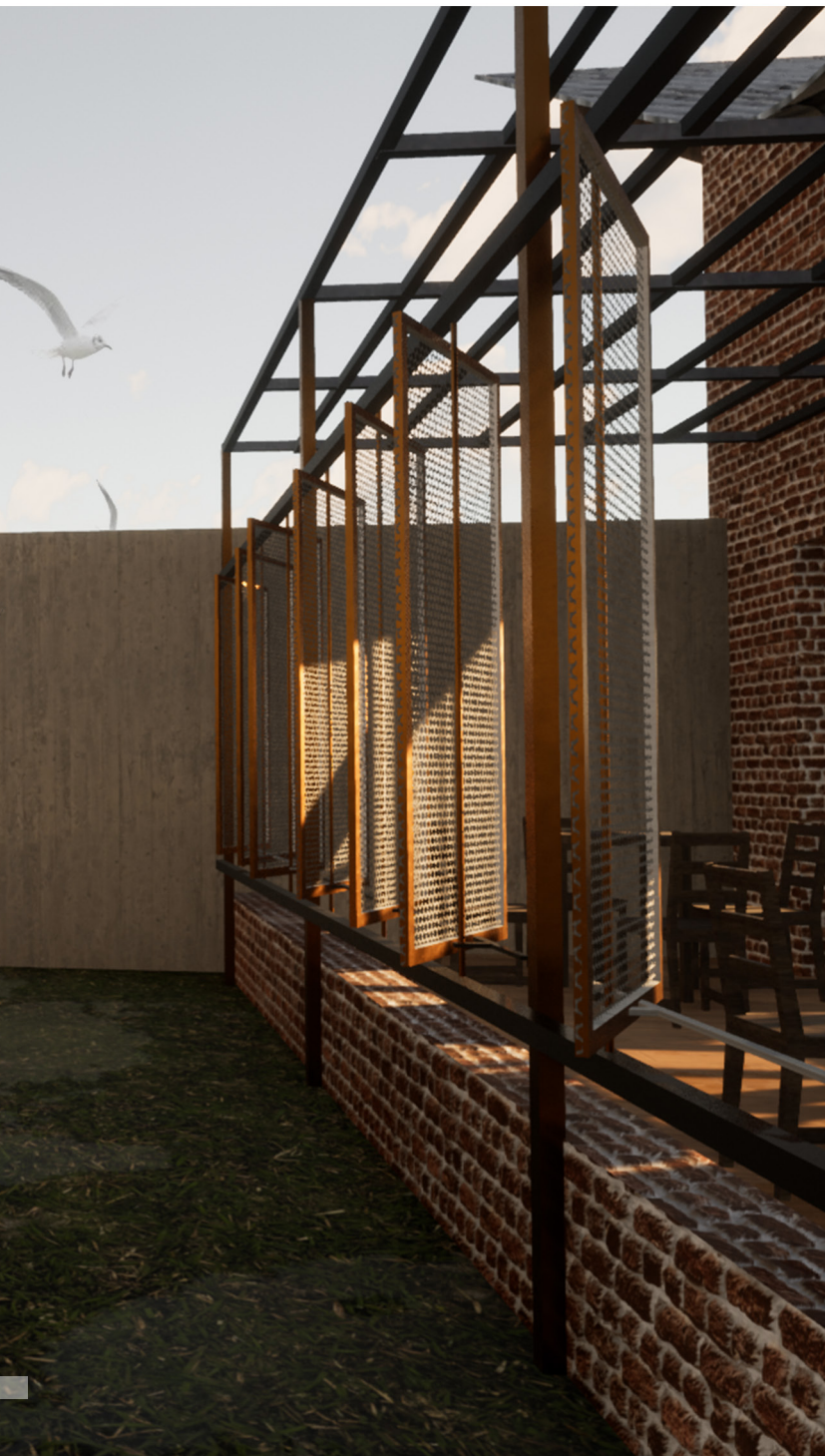
STAFF BREAK ROOM AND AVIARY EXPERIENCE

Figure 129: Bird sanctuary experience (author, 2024).



SANCTUARY EXPERIENCE

Figure 130: Bird sanctuary experience (author, 2024).



ATRIUM

Figure 131: Atrium render (author, 2024).



COURTYARD AND PAVILION

Figure 132: Courtyard render (author, 2024).



Figure 133: Bird aviary (author, 2024).

AVIARY



EXTERIOR

1 4 7

Figure 134: Bird sanctuary experience (author, 2024).



Figure 135: Bird hide and aviary (author, 2024).

09

TECHNICAL DEVELOPMENT

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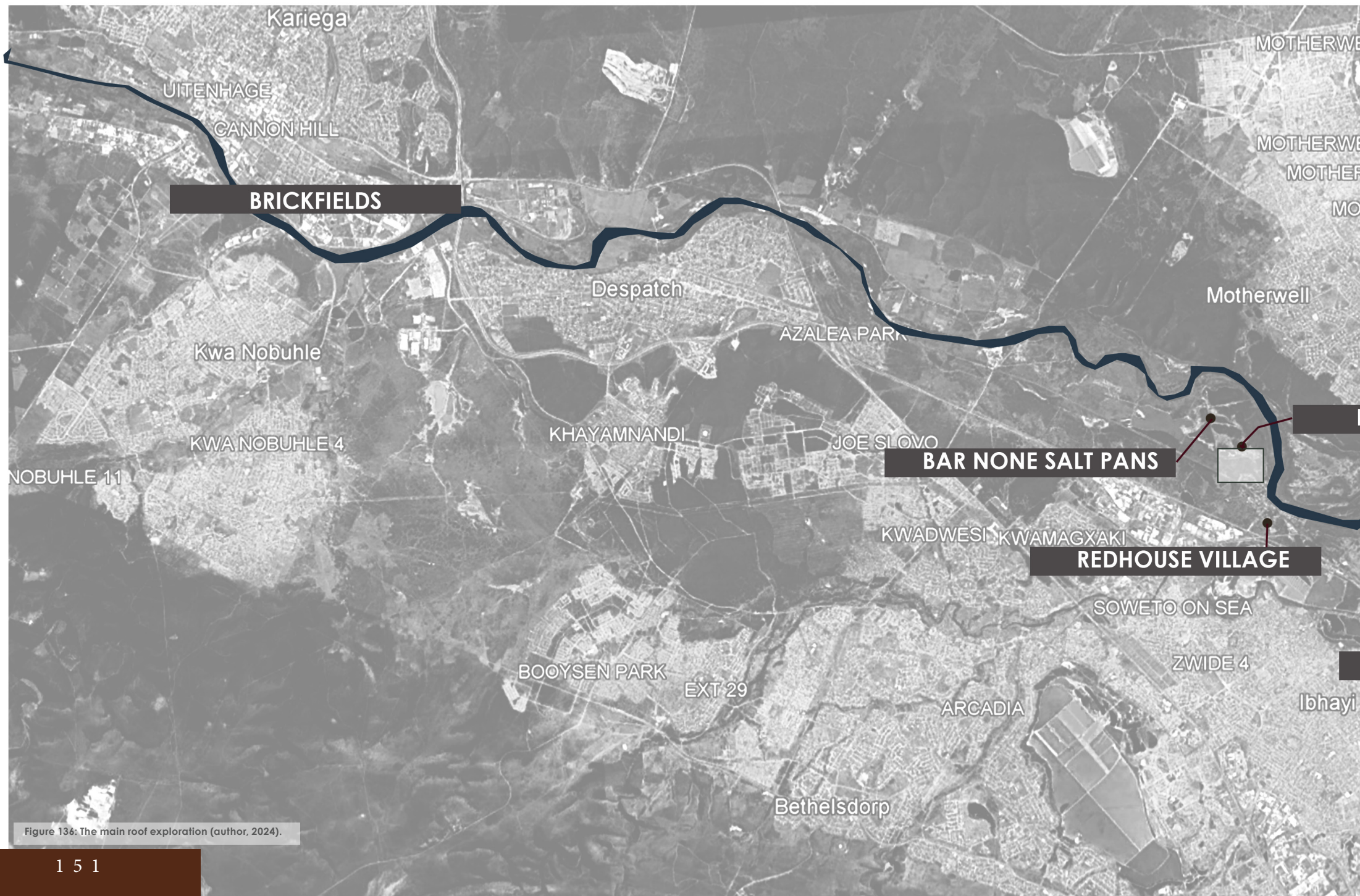


Figure 136: The main roof exploration (author, 2024).



9.1 SITE INTRODUCTION

The proposed site is located at a perennial, open basin situated in a semi-arid region, receiving water primarily from the Swartkops River and its tributaries. Positioned below an industrial area, the need for rehabilitating this site lies in its role as a buffer between the industrial zone and the Swartkops River. This rehabilitation is crucial for reducing the influx of water into the system (flood attenuation) and minimizing inputs into the river (Schael et al., 2015).

The Swartkops River, which borders these salt pans, flows from its catchment in the Groot Winterhoek Mountains and is tidal for approximately 16 km upstream. The river's upper reaches are narrow and channel-like, twisting through steep banks of muddy sand. Between the Bar None salt pans and Brickfields, the estuary widens and becomes less convoluted. The Swartkops River is not a relic channel with oxbows but rather a tidal estuary with significant mudflats and salt marshes.



HIGLY VEGETATED AREAS



SPARSE PATCHY VEGETATION



EDGE OF SALTPAN



Figure 137: Vegetated landscape (author, 2024).

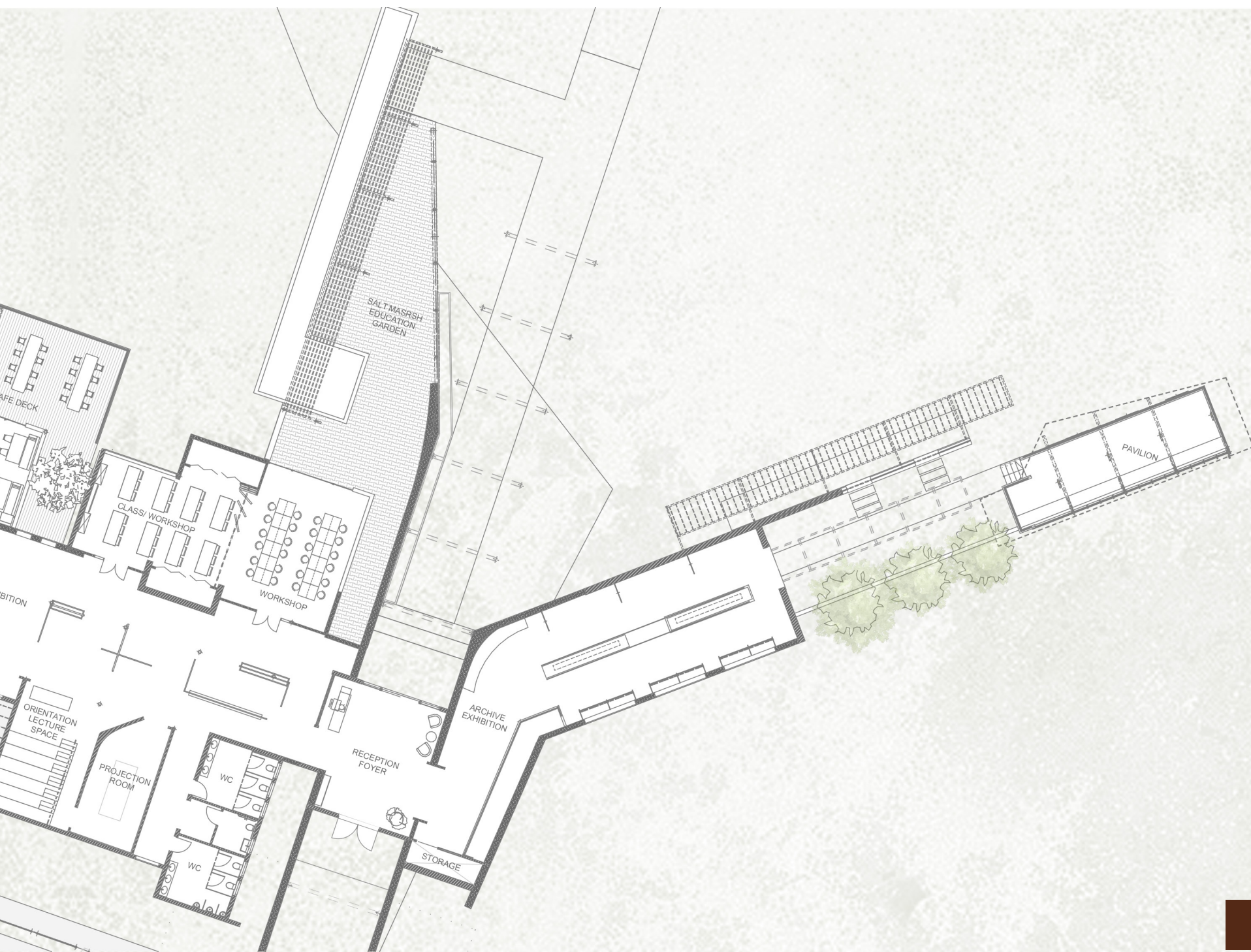
9.2 SOIL CONDITIONS

The soil conditions on site are marked by sparse and patchy vegetation, primarily dominated by monospecific stands of *Salicornia pillansii*, which are mostly confined to hummocks within the defunct saltpan. Other halophytic species, such as *Suaeda fruticosa*, *Chenolea diffusa*, and *Disphyma crassifolium*, are present in lower densities, typically found around the periphery of the saltpans, in elevated areas, and on some of the hummocks. The abandonment of the saltworks has led to extensive areas of dried hypersaline sediment, with mean salinity levels of approximately 65.5 ± 6.6 in the surface sediments and 64.7 ± 4.7 in the underlying groundwater. In the year following the saltworks' abandonment, less than 18% of the saltpan area was vegetated, with vegetation cover initially declining but showing slight recovery in the subsequent year. This indicates a fluctuating but overall low level of vegetation reestablishment in this hypersaline environment (Wasserman, et al., 2022: 4-5).

9.3 PLAN



Figure 138: Floor plan (author, 2024).



9.4 SITE PLANNING

9.4.1 Site restrictions, flooding and water management considerations

Water Restrictions and Management: The hypersaline conditions of the site, coupled with its history as a saltworks, mean that water management is critical. High salinity levels in both groundwater and surface sediments require specific materials and construction techniques to avoid corrosion and degradation. Water management practices should aim to control runoff and prevent further contamination of the estuarine environment, ensuring the natural habitat is preserved and that development does not contribute to additional environmental stress.

Flooding: The Bar None Salt Pan is located in the middle reaches of the estuary, where the estuary widens and becomes less convoluted, leading to more stable water conditions compared to the upper reaches (Anon., 2009). This area commonly features salt marshes, such as those with *Spartina maritima*, which help stabilize the area and provide important ecological functions. Although flooding can still occur in severe conditions, the wider and less convoluted nature of the middle reaches helps in better water distribution, making it less prone to severe flooding compared to the narrow upper reaches. The presence of salt

marshes and wider water channels contributes to a more stable and resilient ecosystem, and the middle reaches might experience better water mixing and less severe stratification, helping to maintain better water quality (Adams, et al., 2019).

9.4.2 Water control

The bird sanctuary and eco-centre's design incorporates drainage swales, shallow vegetated channels that effectively direct water toward the street on the high side of the site, rather than allowing it to flow into the sensitive estuarine environment as seen in figure 139.

These swales, along with permeable paving throughout the site, including in the parking areas, allow water to naturally infiltrate the ground, reducing runoff and promoting sustainable water management. This connection reinforces the visitor's relationship with the surrounding ecosystem, making water management an integral part of the visitor experience. A vegetated buffer, created by both the existing flora and the additional vegetation, further enhances the site's ability to manage water sustainably while preserving and even enhancing the natural beauty and ecological function of the area. This thoughtful integration of natural and built elements not only manages water effectively but also contributes to the overall aesthetic and ecological goals of the project.

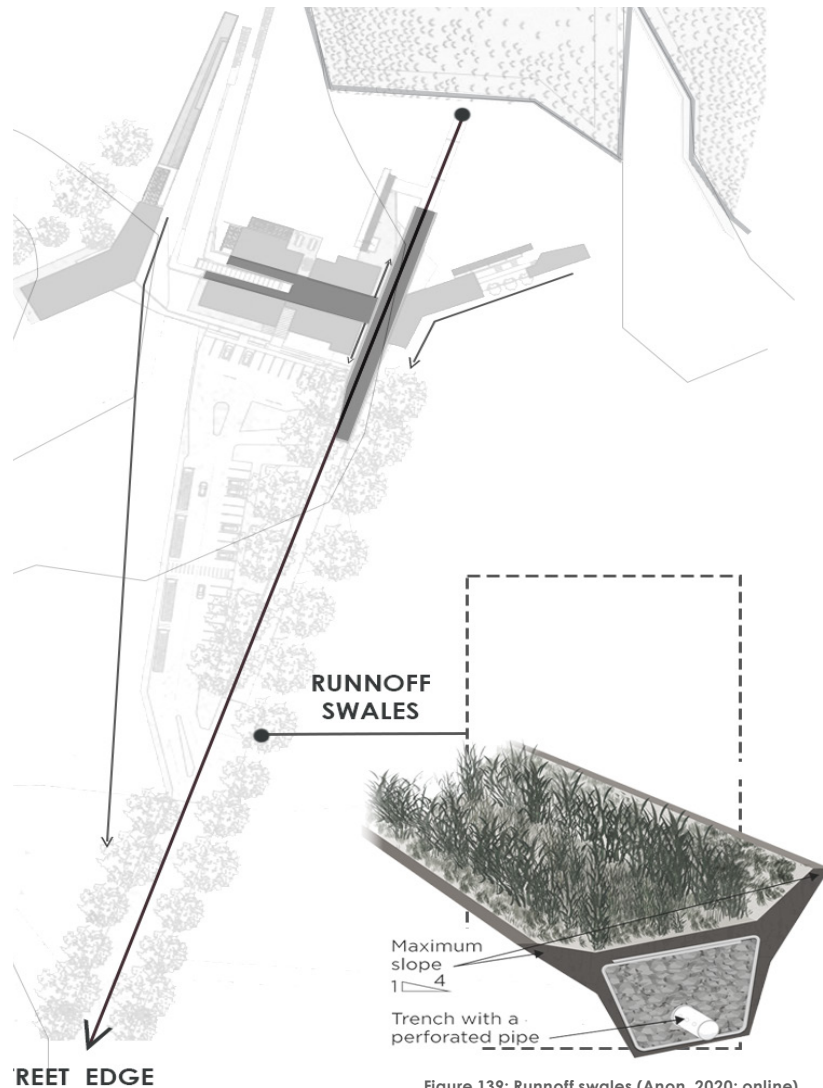


Figure 139: Runoff swales (Anon, 2020: online).

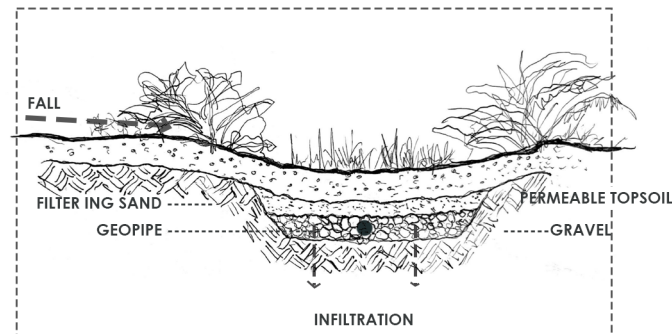


Figure 140: Runoff management (author, 2024).

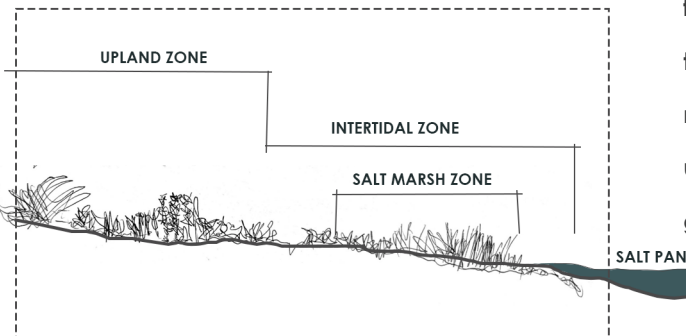


Figure 141: Runoff zoning (author, 2024).

9.4.3 FLOATING WETLAND

The abandonment of the saltworks has resulted in the depletion of vital ecosystem services provided by these unique semi-natural wetlands. The desolation of the saltworks at the proposed site has left behind a substantial area of desiccated hypersaline sediment, leading to a notable decrease in the abundance and diversity of waterbirds (Wasserman, et al., 2022: 1). In an effort to restore the site, a proposal includes the installation of floating wetlands on the desiccated area. These floating

wetlands have the potential to provide critical habitat for birds and other wildlife on the salt pans, creating a distinctive ecosystem that is capable of capturing nutrients and converting common pollutants into safe by-products. The wetlands not only aim to revitalize the site as a flourishing wetland but also seek to reinstate the avifauna and ecosystems that were lost or disrupted during the abandonment of the saltworks.

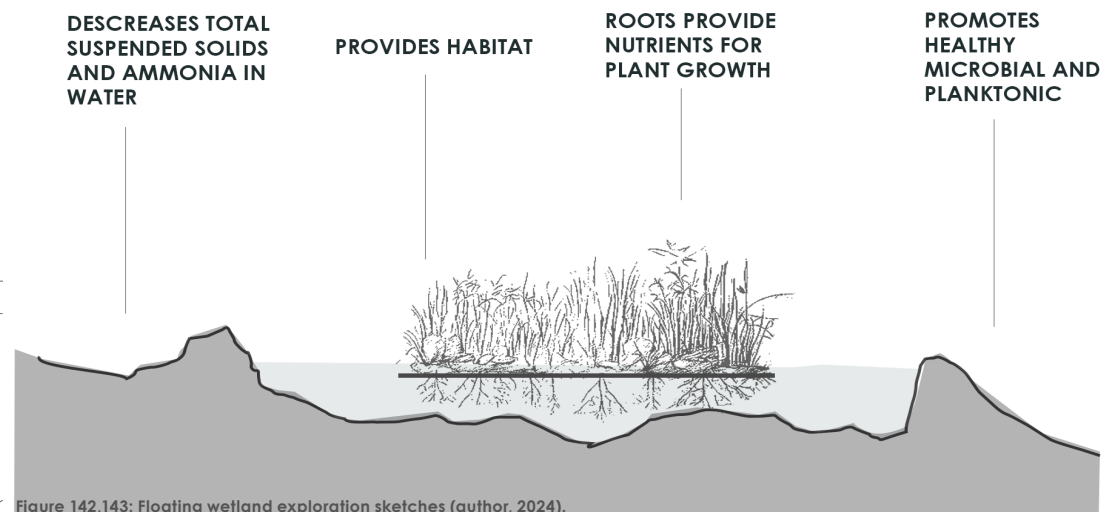
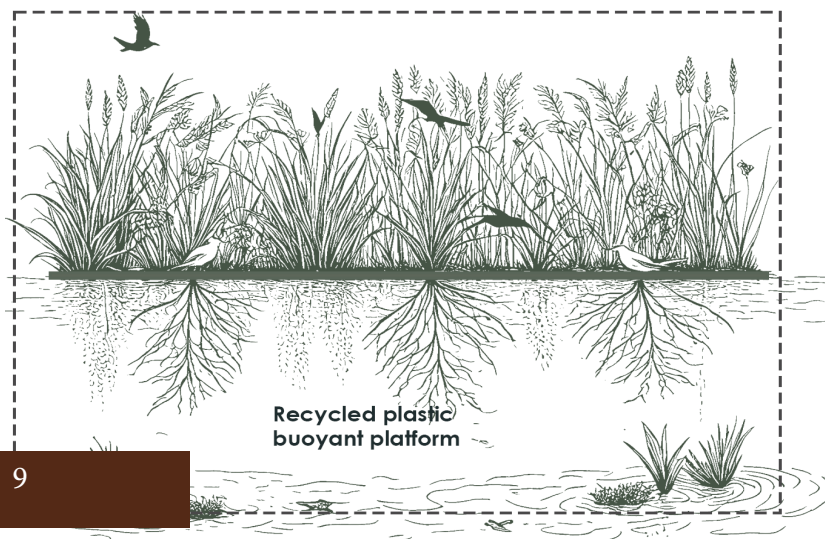


Figure 142,143: Floating wetland exploration sketches (author, 2024).

9.5 IDENTIFIED SITE CHALLENGES

Access Pathway: Blue Gum Tree Lined Access:

The access to the site is marked by a row of blue gum trees, which provides a natural avenue leading to the project. This feature creates a sense of hierarchy and a clear central access point to the sanctuary, emphasizing the importance of the entrance.

Center Point and Wayfinding: The row of blue gum trees naturally guides visitors towards the building, creating a processional approach and wayfinding, making the entrance easily identifiable and providing a focal point for the site.

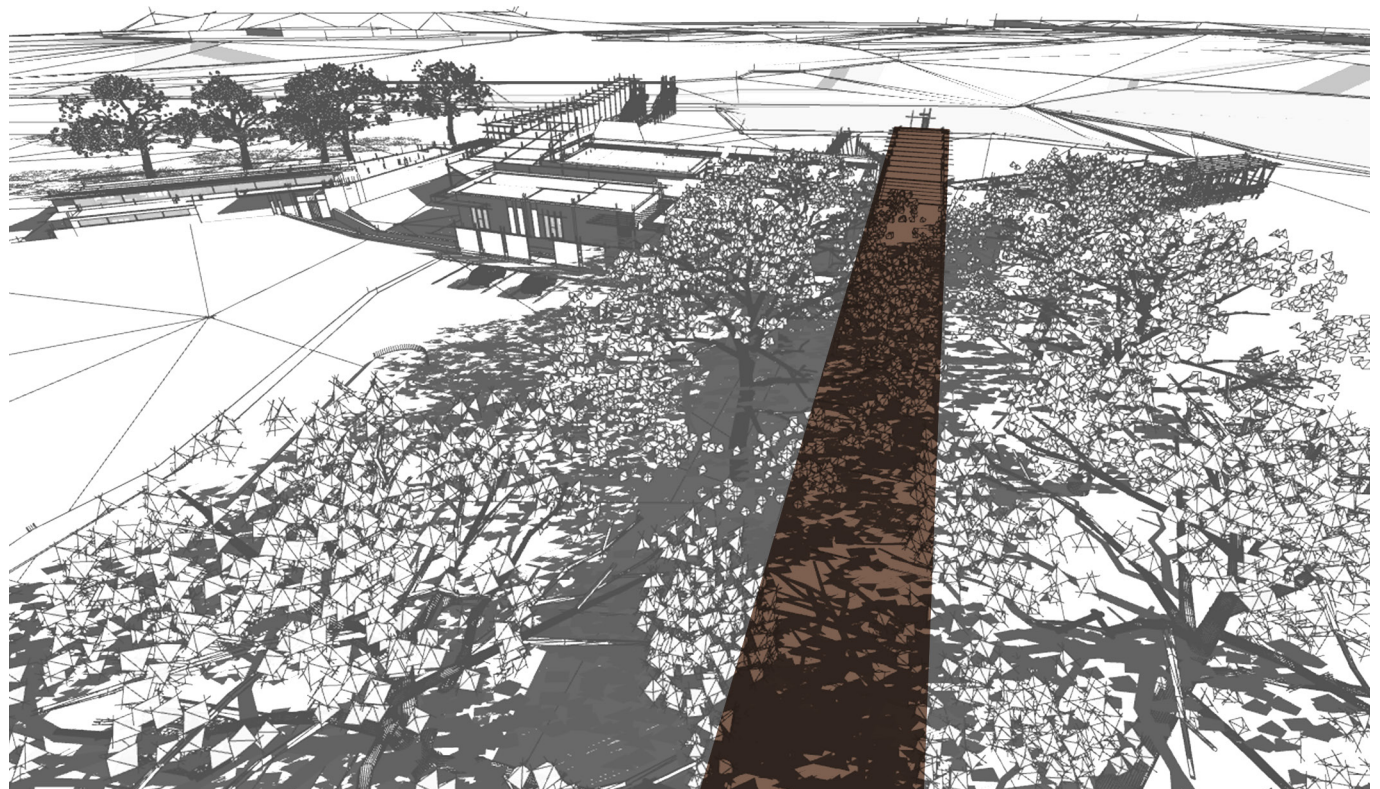


Figure 144: Building approach pathway (author, 2024).

9.6 CONSTRUCTION CONSIDERATIONS

Soil Stabilization: Due to the clay soil and high salinity, it will be essential to implement soil stabilization techniques. This might include the use of geotextiles, soil conditioning, or deep foundations to ensure the stability of structures. Ensuring proper drainage is also critical to prevent waterlogging.

Material Selection: Given the high salinity, materials resistant to corrosion, such as treated timber, stainless steel, or coated metals, should be used for the structural elements. This will ensure longevity and reduce maintenance requirements.

Vegetation Management: Careful planning is required to manage and preserve the existing vegetation. The construction process should avoid unnecessary clearing of vegetation, and where possible, work should be done around significant trees and plant life to maintain the natural habitat.

9.7 ENVIRONMENTAL CONSIDERATIONS

Minimizing Impact: To preserve the site's natural environment, construction activities must be well planned and executed with a focus on reducing ecological disturbance. Key measures include protecting the root zones of the blue gum trees, effectively managing construction runoff to prevent soil erosion and water contamination, and employing eco-friendly construction practices. For instance, the pavilions will be designed for easy on-site assembly, minimizing the need for heavy machinery or welding, thereby reducing noise, pollution, and disruption to the sensitive areas near the salt pans.

Integration with the Landscape: The design and construction process should prioritize harmony with the natural surroundings, carefully blending the built structures into the existing landscape. This approach leverages the site's unique features,

such as the alignment of the blue gum trees and the natural topography, to create a seamless transition between the built and natural environments. By minimizing disruption to the existing ecosystem, the project not only respects but also enhances the ecological balance of the area, ensuring that the sanctuary and eco-center are truly in tune with their environment.



Figure 145: Harmonious blend with landscape (author, 2024).

9.8 CONSTRUCTION MATERIAL CONSIDERATIONS

Clay brick	Stone cladding
The primary construction material for the project is clay brick, sourced from Algoa Brick. Located near the site in the Eastern Cape region, Algoa Brick has been a reliable supplier for over 60 years. The close proximity of this supplier reduces transportation costs and the associated carbon footprint, making it a sustainable choice. Additionally, the historical connection of Algoa Brick to the site's previous use (providing bricks for salt pan barriers) further strengthens the cultural and environmental relevance of this material.	Stone cladding can be locally sourced from quarries in the Eastern Cape region, providing a natural aesthetic that blend with the surrounding environment. This material is not only durable and low-maintenance but also reduces the embodied energy associated with transportation (Natural stone institute, 2024: online). Glendore Sand & Stone, the largest supplier of sand and stone products to the construction and civils market in the Eastern Cape, focuses on the Nelson Mandela Bay Metropole, where the project is located. They can be relied upon to source this stone cladding.
	

Figure 146: Qunu travertine (Algoa brick, 2024)

Figure 147: Natural stone wall (Italtile, 2024)

Borax treated timber

Timber, sourced from sustainable plantations within the region, will be used for interior elements and potentially for structural components. Treated timber offers longevity in the high-salinity environment and contributes to a warm, organic feel within the sanctuary (SAWPA, 2004). Local sourcing of timber ensures that the material is readily available, supports regional economies, and minimizes transportation-related energy use.



Figure148: SA pine timber()

Oxide- painted steel

Chosen for its corrosion resistance and suitability for the high-salinity environment of the project site, oxide-painted steel offers both durability and aesthetic appeal. This type of steel, with its protective oxide layer, blends into the natural landscape. Additionally, it is a more cost-effective option than Corten steel (Dawe, 2022: online), with easier local availability in Port Elizabeth. The finish can be periodically refreshed, ensuring a long-lasting and visually cohesive appearance throughout the life of the project.



Figure 149: Oxide painted steel (Monning, 2020)

Stainless steel welded wire mesh

This can be sourced from local suppliers in the Gqeberha region. Mesh panels will be placed in areas where the building is designed to "dissolve," seamlessly blending with the environment. Additionally, the same stainless steel welded wire mesh will be used for the aviary enclosure. The mesh, with a 0.6mm wire diameter and 12.5mm x 12.5mm aperture size, will prevent birds from escaping while allowing proper ventilation and visibility. There is evidence that birds can ingest potentially harmful heavy metals such as zinc from galvanized coated wire. Stainless steel is considered a safer alternative, though it is more expensive (Profence, 2017: online).

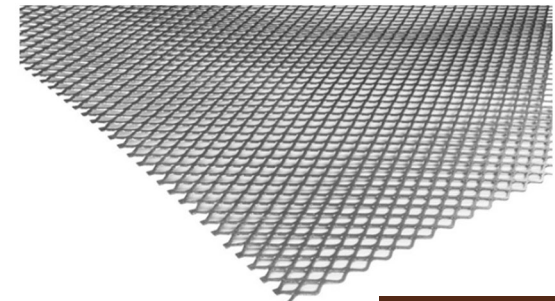


Figure 150: Steel mesh (Builders, 2024)

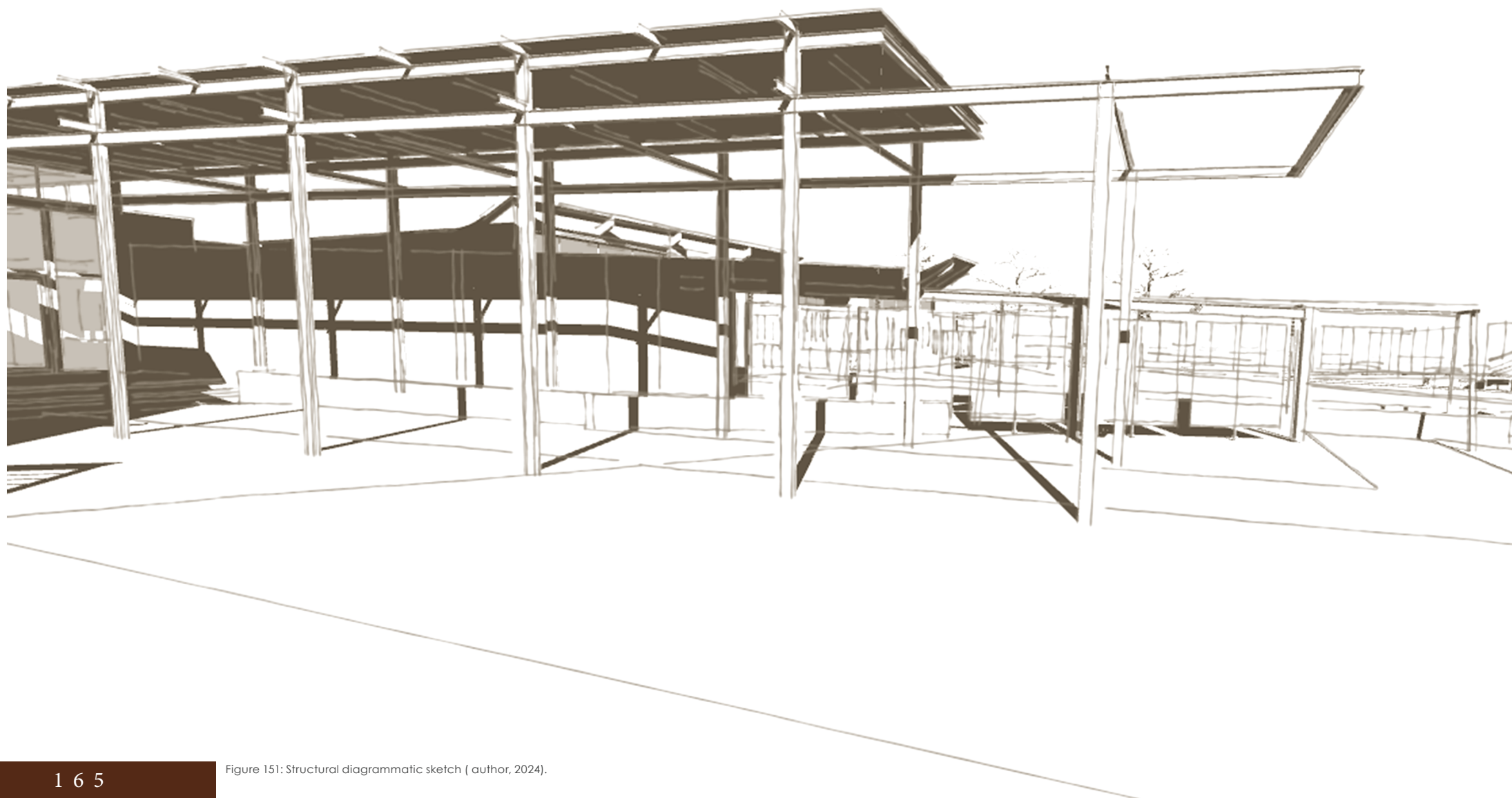


Figure 151: Structural diagrammatic sketch (author, 2024).

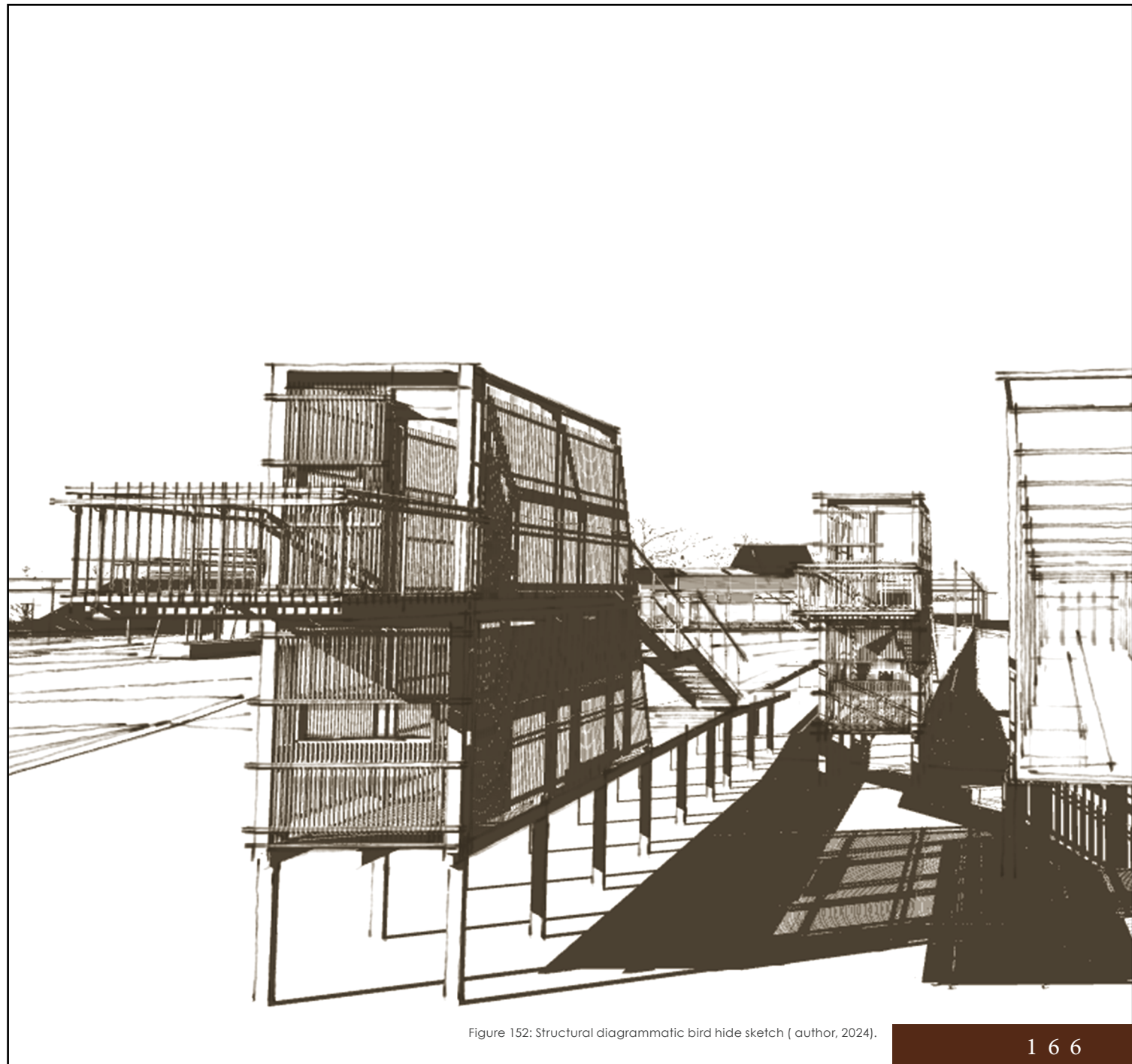
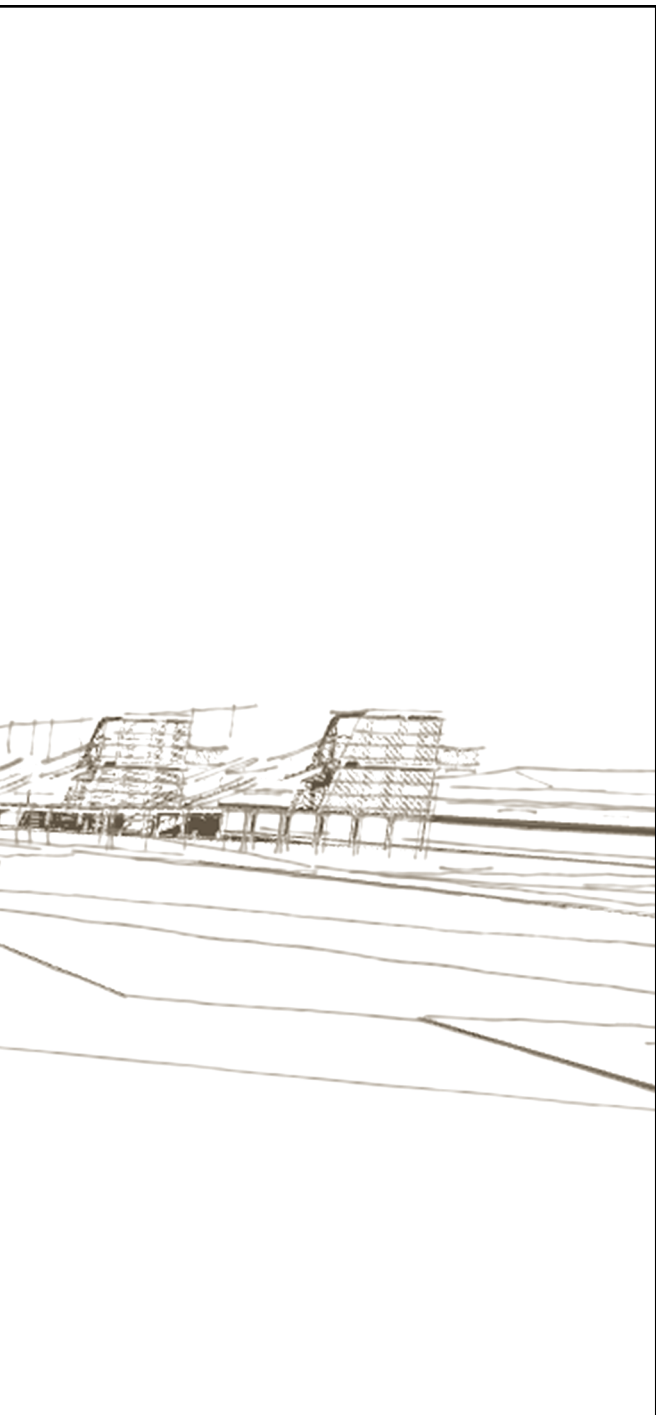


Figure 152: Structural diagrammatic bird hide sketch (author, 2024).

9.9 STRUCTURAL SYSTEMS

9.9.1 Pavilion and bird hides

Foundation and Stability: The foundation for the 228 x76mm columns of the pavilion, are anchored securely into concrete footings. These footings are designed to provide stability on the clay soil, which is known for its potential instability due to moisture retention. The timber posts sit in steel post anchors that are embedded into the concrete footings, ensuring a strong and stable base that can withstand environmental stresses.

Framework Construction: The pavilion structure is framed with 228x76 mm treated SA pine beams and columns. The treated timber not only provides structural integrity but also offers resistance to decay and pests. The timber elements are bolted together with M10 galvanised nuts and bolts. The components will be pre-cut and pre-drilled off-site, allowing for quick and efficient assembly on-site. This approach minimizes disruption to the natural environment and streamlines the construction process.

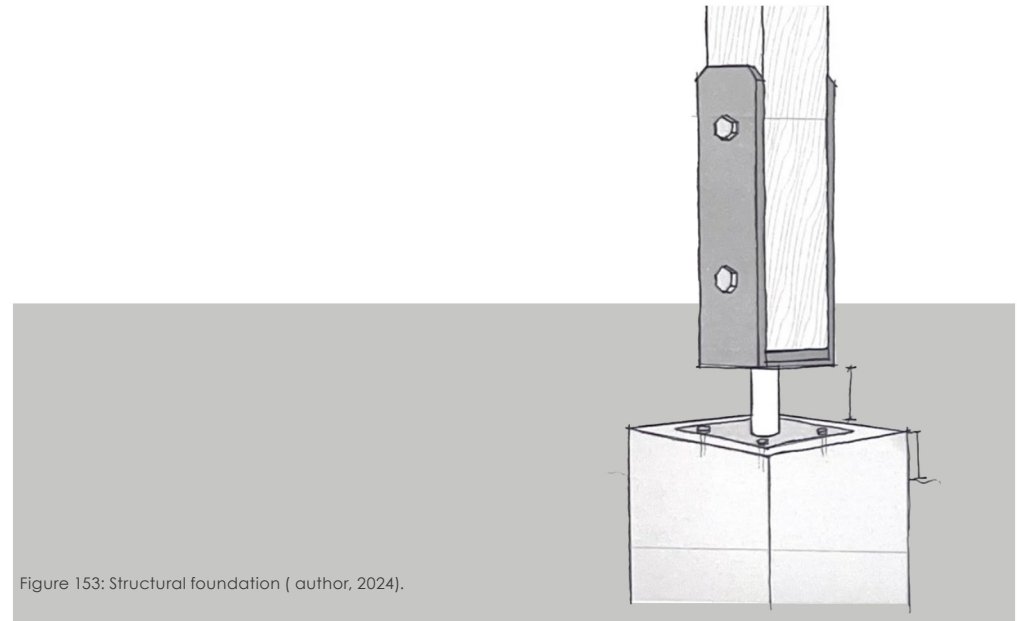


Figure 153: Structural foundation (author, 2024).

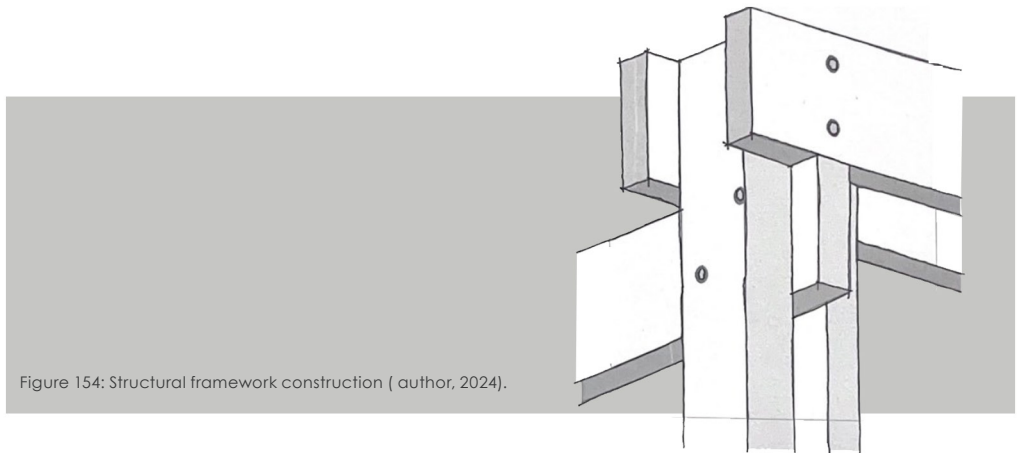


Figure 154: Structural framework construction (author, 2024).

Decking and Superstructure: The deck of the pavilion is constructed using 22 mm pine deck planks laid on a framework of 50 x 50 mm and 50 x 76 mm batten substructures. These planks are spaced at 600 mm c/c and supported by a series of joists, ensuring that the decking is strong enough to support foot traffic and offers a stable and level walking surface.

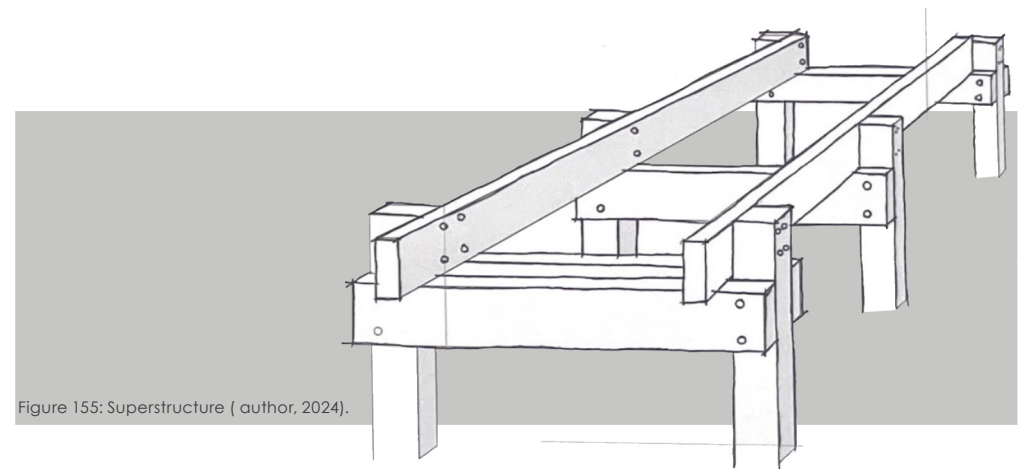


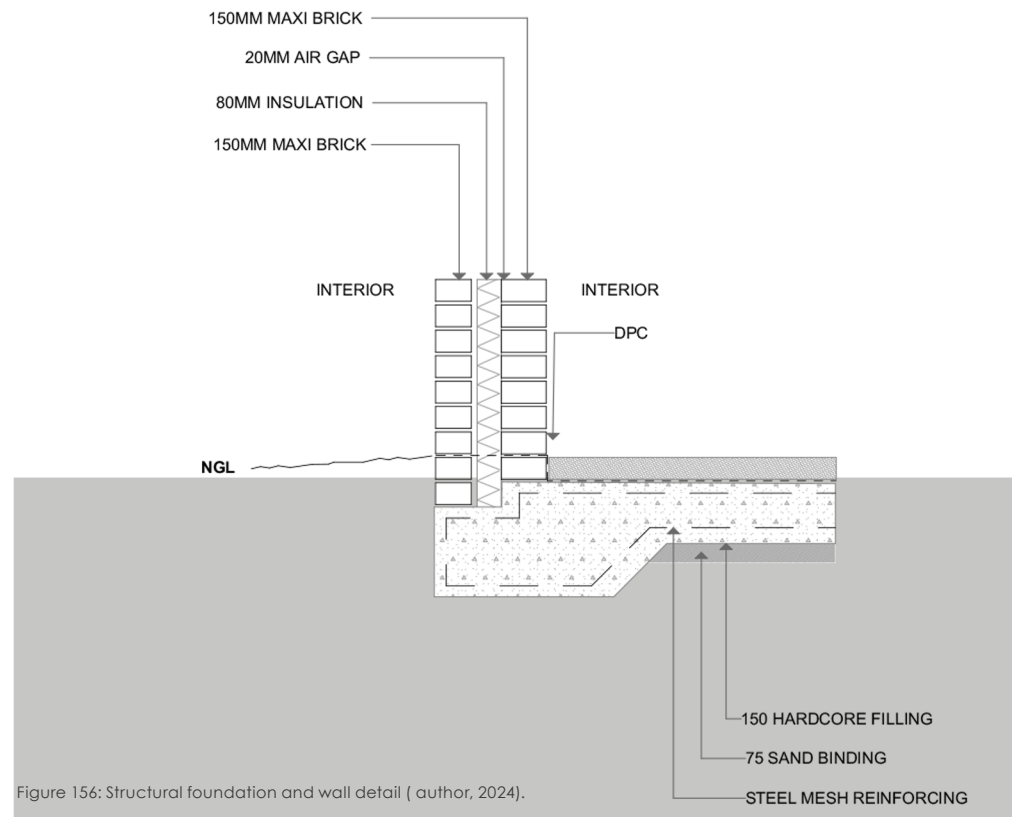
Figure 155: Superstructure (author, 2024).

9.9.2 Building

The main structural system of the building design consists of a composite of masonry and steel, with certain walls cladded in stone to enhance the connection with the natural environment. This combination of materials provides both structural integrity and a strong aesthetic link to the surrounding landscape.

Foundation and Stability: The foundation system uses pad foundations, which are well-suited to the site's clay soil. These foundations provide the necessary support and stability for the building, preventing any potential shifting or settling of the structure due to soil conditions. The masonry structure includes a cavity wall system, which is crucial for both thermal insulation and moisture control.

Wall Composition: The exterior walls are built with clay brick, chosen for its durability and weather resistance, forming the outer layer of the cavity wall system. This is complemented by an 80 mm insulation layer, boosting energy efficiency, and a 20 mm air gap that prevents moisture and enhances thermal performance. The interior layer is composed of 150 mm maxi bricks, providing structural strength and allowing for a smooth surface for plaster finishes.



Roof: The roof is constructed using Kliplock roof sheeting, fixed to 75 mm galvanized steel top hat battens spaced at 600 mm centers. These battens are supported by 46 x 231 mm glue-laminated timber beams, with secondary C-channel supports installed between the beams for additional stability. A timber ceiling is fixed between the battens and beams, creating a clean and natural finish to the interior space.



Figure 157: Building roof composition (author, 2024).

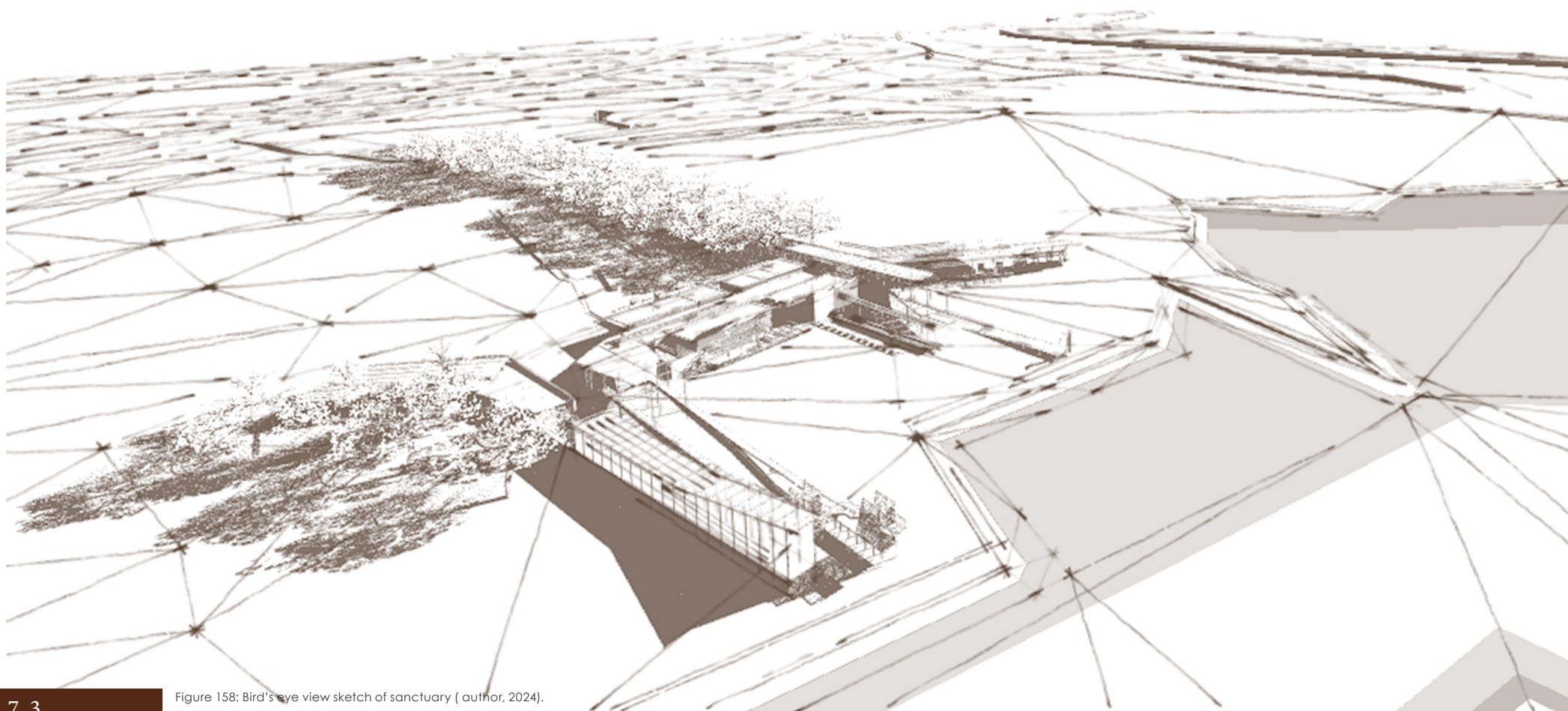
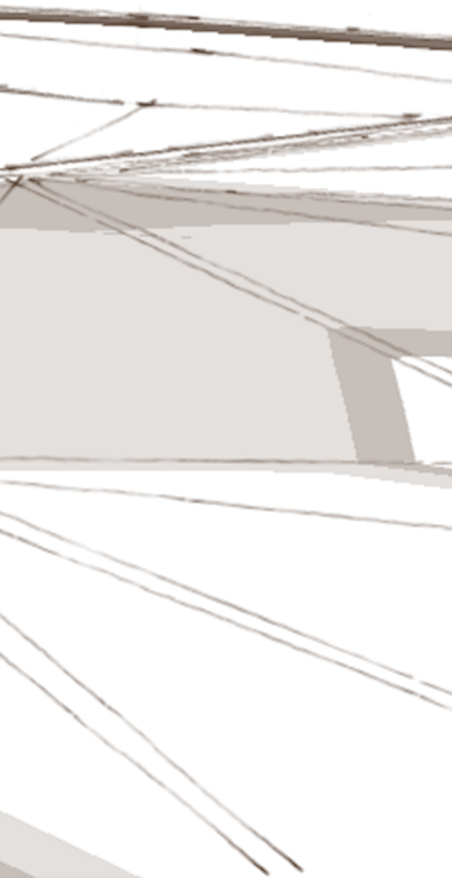


Figure 158: Bird's eye view sketch of sanctuary (author, 2024).

CONCLUSION



In an attempt to answer the research question, "How can an architectural interface, serving as an other space at the convergence of human and natural systems, facilitate interdependent, sympoietic encounters within the rehabilitated ecosystems of the Anthropocene?" this dissertation integrates concepts of sympoiesis, heterotopia, and ecological stewardship. It demonstrates the pivotal role architecture can play in mediating the complex relationship between humans and nature. The architectural designs presented serve as dynamic interfaces, blending the boundaries between the built environment and the natural world, effectively creating spaces where interdependent interactions can flourish. The structures not only accommodate human activities but also support avian habitats, embodying the principles of sympoiesis through their co-creative and mutually beneficial features. Ultimately, this research articulates a compelling vision for the future of ecological architecture, one that is responsive to the needs of the human population while actively contributing to the sustainability and rehabilitation of the ecosystems it inhabits.

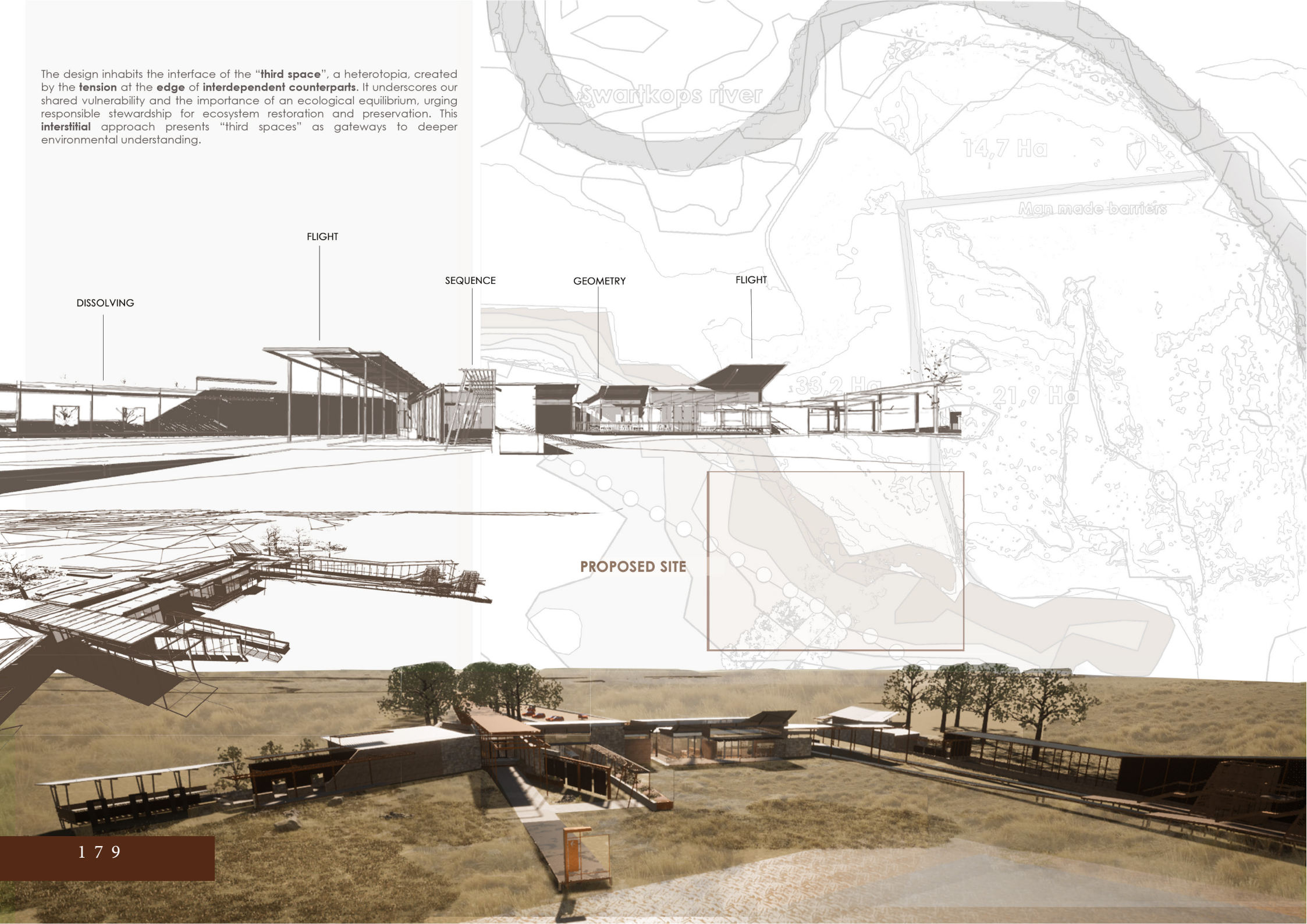
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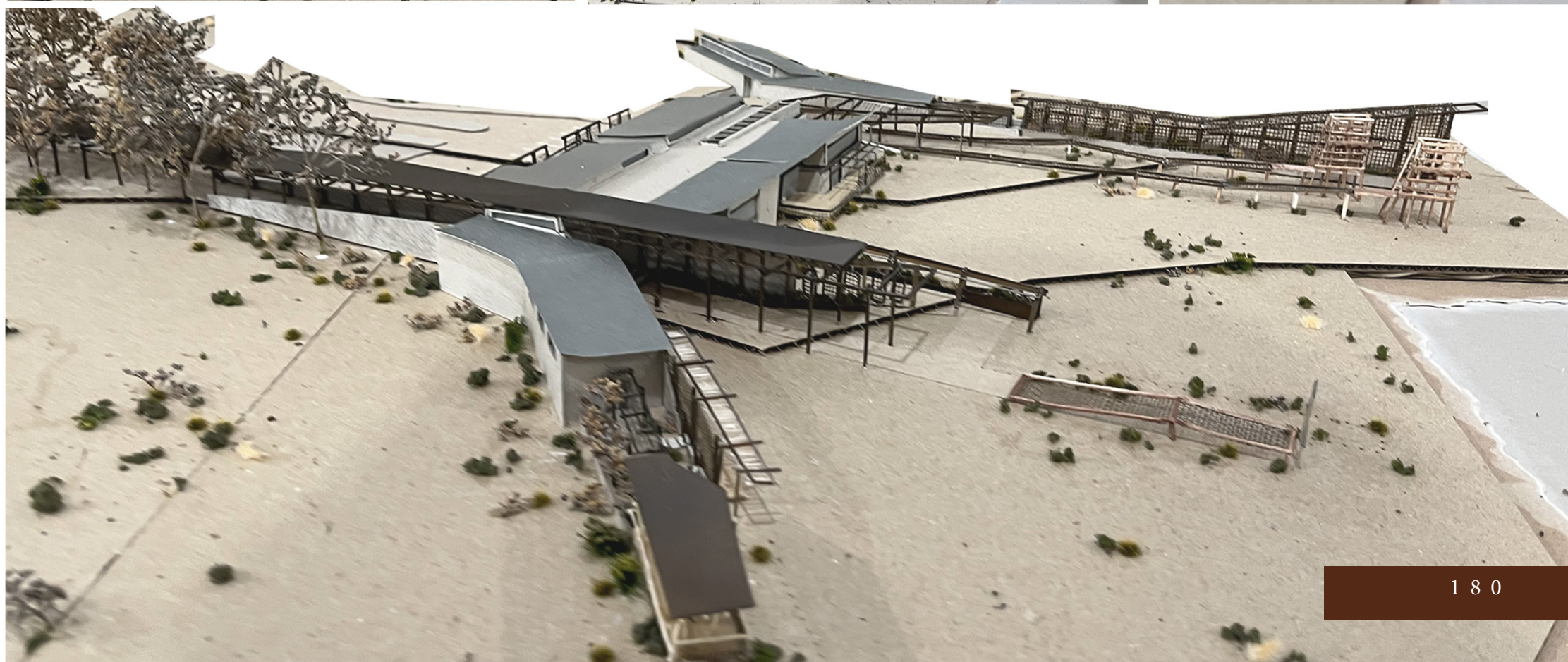
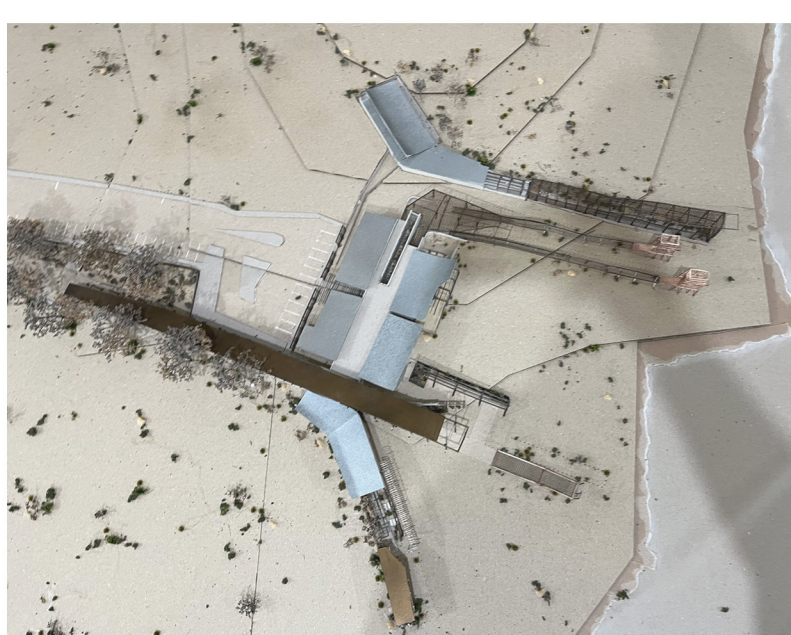
Reflecting on the progression of this dissertation, I began with an intuitive approach that captured the ephemeral nature of birds, exploring their lines of flight and delicate presence. This early phase enabled an exploration of the subtle balance between presence and absence, mirroring the spatial dynamics shared by birds and humans. As the design process evolved, however, it transitioned toward a more structured and rigid form. This transformation, essential for meeting practical design requirements, inadvertently reflected the broader impact of human activities on the natural environment.

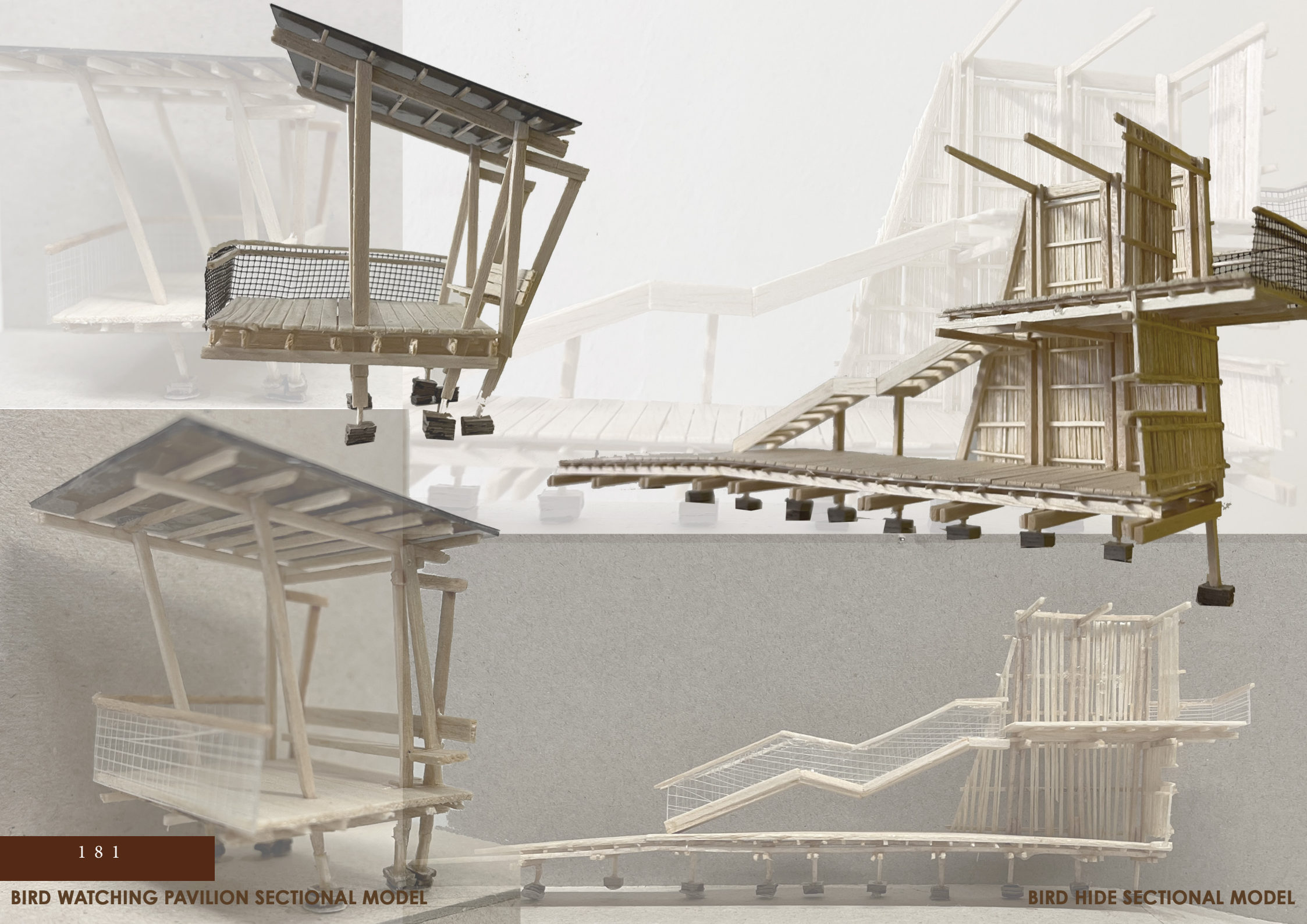
Just as the architectural forms began to solidify and lose some of its fluidity, human intervention frequently imposes rigid structures upon naturally fluid landscapes. This shift not only concludes the central theme of this dissertation, the interplay between human impact and natural systems but also highlights the profound responsibilities we bear in shaping our environment. It was fascinating to observe how subtly the architecture began to adopt a more rigid and defined structure the more I designed, changes that I did not initially perceive. Equally intriguing was my own transformation during the design process, I found myself inadvertently embodying the often harsh human inclination to impose our structures on the natural world. This

realization prompted a critical re-evaluation of my approach. I took a step back to dismantle the emerging hierarchies and reassess my method, striving to adopt a more delicate and mindful stance. This shift was crucial in realigning the design with its original intent, to harmonize with the natural environment rather than dominate it.

The design inhabits the interface of the “**third space**”, a heterotopia, created by the **tension** at the **edge** of **interdependent counterparts**. It underscores our shared vulnerability and the importance of an ecological equilibrium, urging responsible stewardship for ecosystem restoration and preservation. This **interstitial** approach presents “third spaces” as gateways to deeper environmental understanding.











- LEGEND**
- HYPERSALINE SEDIMENT
 - SALT PAN
 - MONOSPECIFIC VEGETATION
 - EXISTING BLUE GUM TREES
 - PROPOSED NEW STRUCTURE

THE BEAK-ONING
BIRD SANCTUARY AND ECO CENTRE

EMMALE BUNU
2019103992

LOCATION
BAR NONE SALT PANS
REDHOUSE VILLAGE, GOEBERHA

DRAWING NAME
SITE PLAN

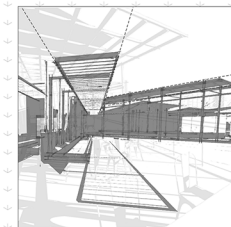
SCALE:
1:500

CLIENTS
ZWARTKOP'S CONSULTING
BIRDLIFE EASTERN

184

OCTOBER 2024

2



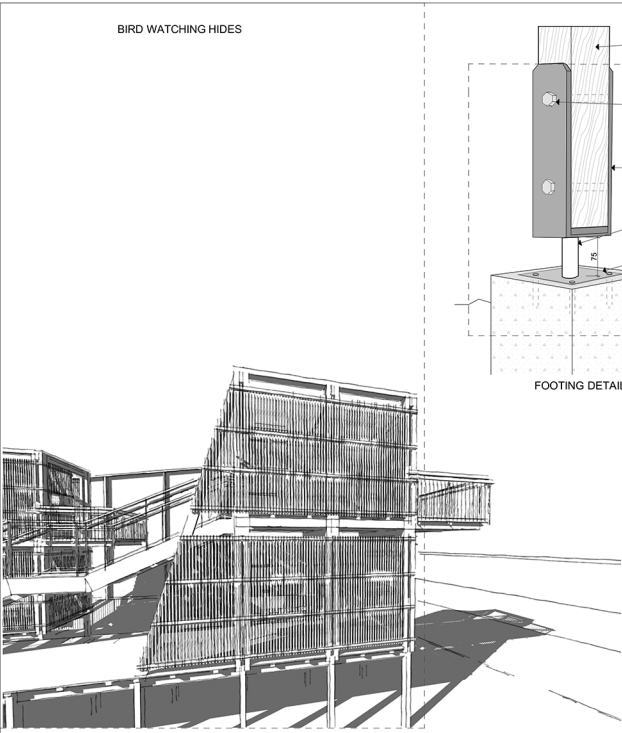
EMHLE BUNU
2019103692

DRAWING NAME	SCALE:
FLOOR PLAN	1/200

DATE:	SHEET NUMBER:
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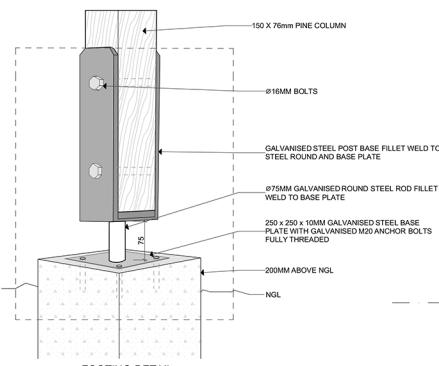
BIRD WATCHING HIDES



BIRD WATCHING PAVILION



FOOTING DETAIL



150 X 76mm PINE COLUMN

Ø16MM BOLTS

GALVANISED STEEL POST BASE FILLET WELD TO STEEL ROUND AND BASE PLATE

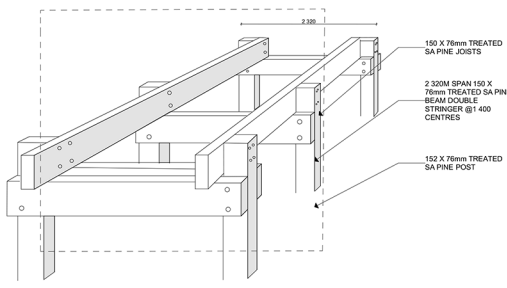
Ø75MM GALVANISED ROUND STEEL ROD FILLET WELD TO BASE PLATE

250 x 250 x 10MM GALVANISED STEEL BASE PLATE WITH GALVANISED M20 ANCHOR BOLTS FULLY THREADED

200MM ABOVE NGL

NGL

SUBSTRUCTURE DETAIL

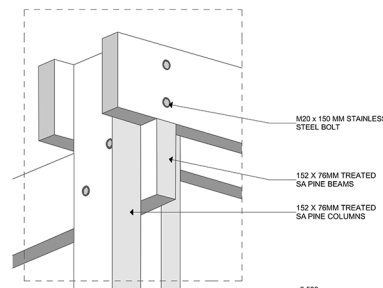


150 X 76mm TREATED SA PINE JOISTS

2.320M SPAN 150 X 76mm TREATED SA PINE BEAM DOUBLE STRINGER @1400 CENTRES

152 X 76mm TREATED SA PINE POST

CONSTRUCTION JOINTS DETAIL



M20 x 150 MM STAINLESS STEEL BOLT

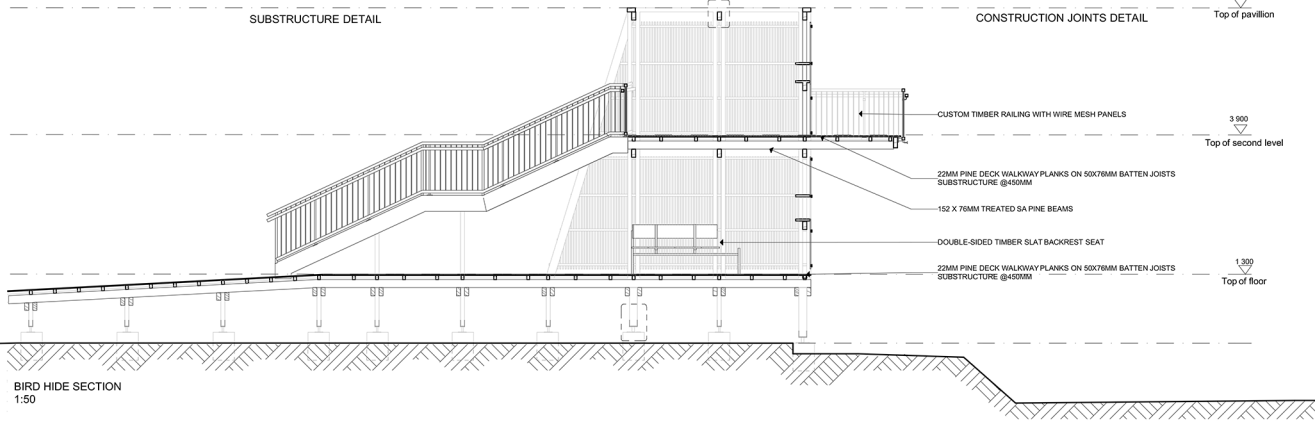
152 X 76mm TREATED SA PINE BEAMS

152 X 76mm TREATED SA PINE COLUMNS

6.500

Top of pavilion

BIRD HIDE SECTION 1:50



CUSTOM TIMBER RAILING WITH WIRE MESH PANELS

22MM PINE DECK WALKWAY PLANKS ON 50X76MM BATTEN JOISTS SUBSTRUCTURE @450MM

152 X 76mm TREATED SA PINE BEAMS

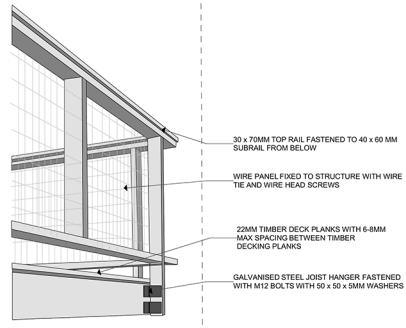
DOUBLE-SIDED TIMBER SLAT BACKREST SEAT

22MM PINE DECK WALKWAY PLANKS ON 50X76MM BATTEN JOISTS SUBSTRUCTURE @450MM

1.300

Top of floor

RAILING DETAIL



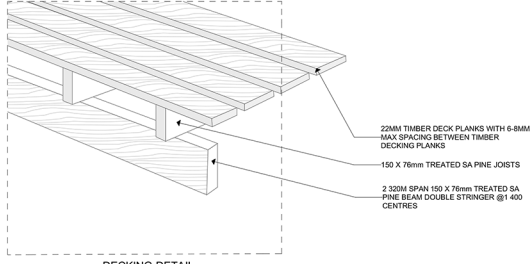
30 x 70MM TOP RAIL FASTENED TO 40 x 60 MM SUBRAIL FROM BELOW

WIRE PANEL FIXED TO STRUCTURE WITH WIRE TIE AND WIRE HEAD SCREWS

22MM TIMBER DECK PLANKS WITH 6-8MM MAX SPACING BETWEEN TIMBER DECKING PLANKS

GALVANISED STEEL JOIST HANGER FASTENED WITH M12 BOLTS WITH 50 x 50 x 5MM WASHERS

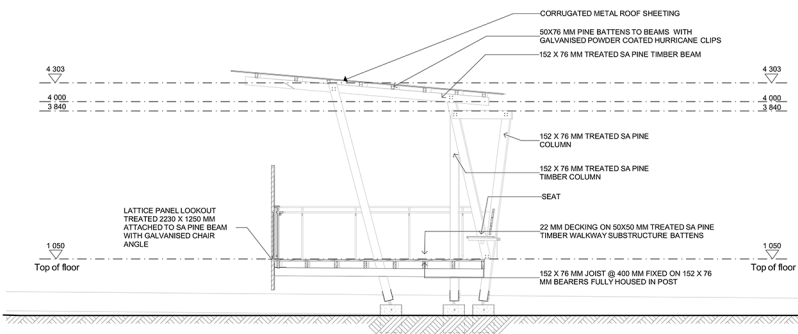
DECKING DETAIL



22MM TIMBER DECK PLANKS WITH 6-8MM MAX SPACING BETWEEN TIMBER DECKING PLANKS

150 X 76mm TREATED SA PINE JOISTS

BIRD WATCHING PAVILION SECTION 1:50



CORRUGATED METAL ROOF SHEETING

50X76 MM PINE BATTENS TO BEAMS WITH GALVANISED POND COATED HURRICANE CLIPS

152 X 76 MM TREATED SA PINE TIMBER BEAM

152 X 76 MM TREATED SA PINE COLUMN

152 X 76 MM TREATED SA PINE TIMBER COLUMN

SEAT

22 MM DECKING ON 50X50 MM TREATED SA PINE TIMBER WALKWAY SUBSTRUCTURE BATTENS

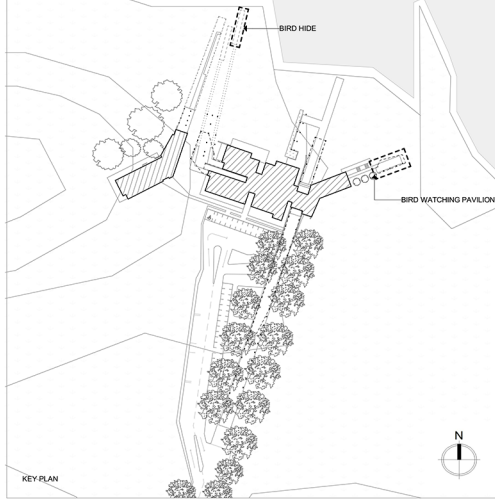
152 X 76 MM JOIST @ 400 MM FIXED ON 152 X 76 MM BEARERS FULLY HOUSED IN POST

LATTICE PANEL LOOKOUT TREATED 2250 X 1250 MM ATTACHED TO SA PINE BEAM WITH GALVANISED CHAIR ANGLE

1.050

Top of floor

KEY PLAN



BIRD HIDE

BIRD WATCHING PAVILION

N

THE BEAK-ONING

BIRD SANCTUARY AND ECO CENTRE

EMBLE BUNU 2019103692

LOCATION

BAR HOME SALT PANS REDHOUSE VILLAGE, GOEBERHA

DRAWING NAME

BIRD HIDE SECTION

SCALE:

1:50

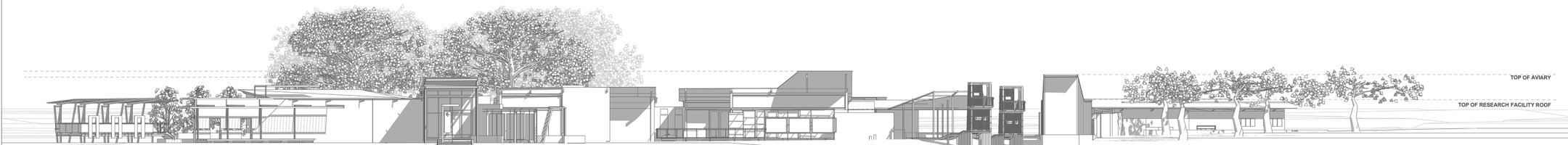
CLIENTS

ZWARTKOP CON BIRDLIFE EASTERN

OCTOBER 2024

5

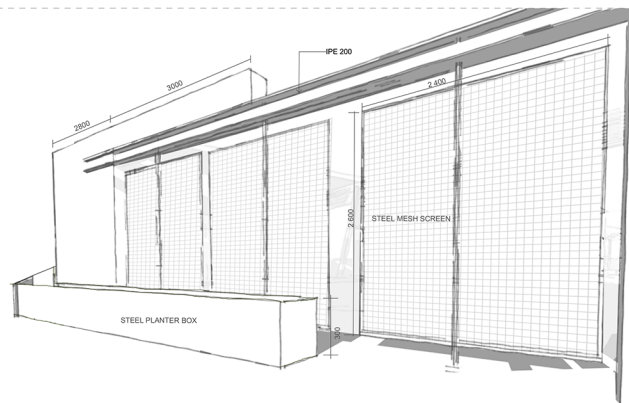
186



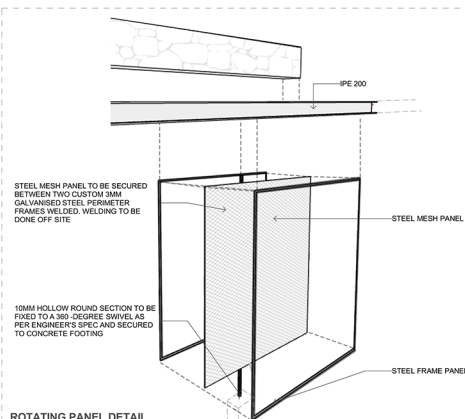
NORTH ELEVATION
1:200



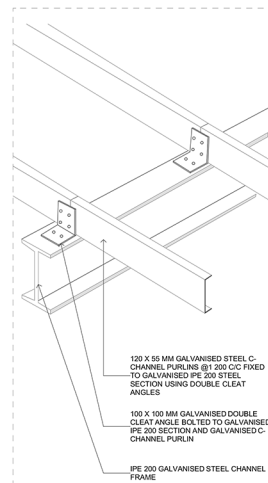
EAST ELEVATION
1:200



ROTATING PANEL - WALL CONNECTION DETAIL

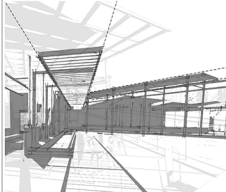


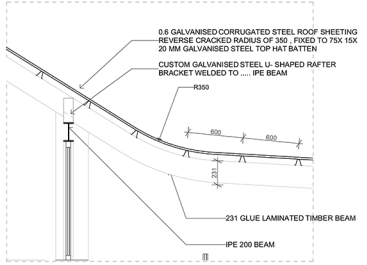
ROTATING PANEL DETAIL



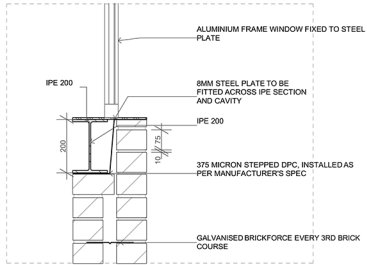
ROOF STRUCTURE DETAIL



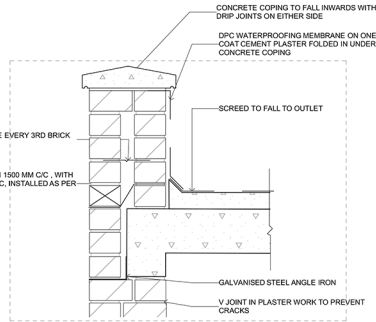
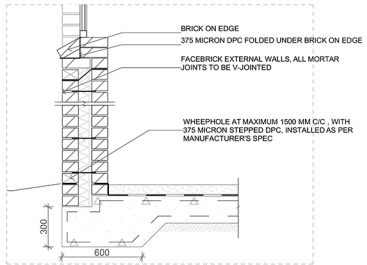
		BIRD SANCTUARY AND ECO CENTRE		EXAMPLE BUNU 2019/03092	
	BAR NONE SALT PANS REDHOUSE VILLAGE, GOEBERHA		NORTH ELEVATION	1:200	
			EAST ELEVATION	1:200	
	ZWARTKOP'S CONSERVANCY BIRDLIFE EASTERN CAPE		SECTION B-B	1:100	
			OCTOBER 2024	4	



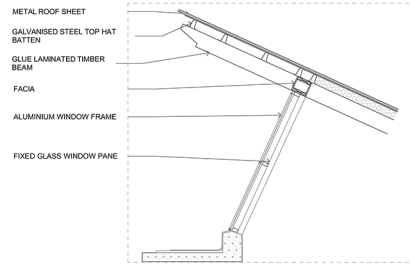
DETAIL 01



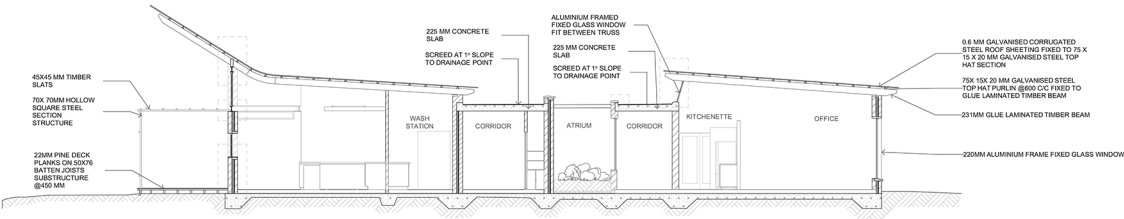
DETAIL 02



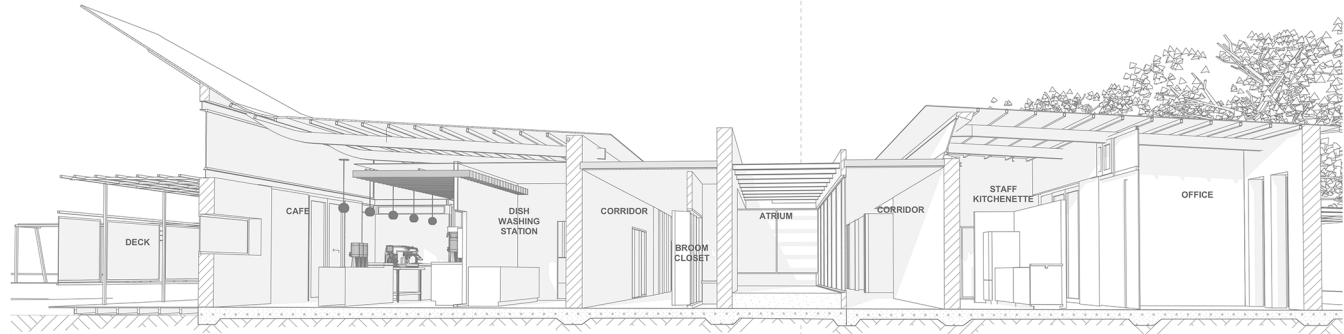
DETAIL 04



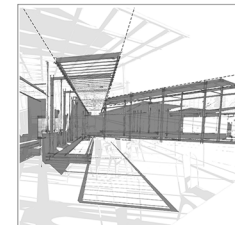
DETAIL 05



SECTION C-C
1:100



KEY PLAN



THE BEAK-ONING		EMPHILE BUNU 2019103692	
BIRD SANCTUARY AND ECO CENTRE			
	LOCATION	DRAWING NAME	SCALE:
	BAR HOME SALT PANS REDHOUSE VILLAGE, GOEBERHA	FLOOR PLAN	1:200
	CLIENTS	188	
	ZWARTKOP'S CON BIRDLIFE EASTER		
	OCTOBER 2024		6

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