RITUAL THREADS: BETWEEN LAND AND LAKE

A cultural and nature edge place articulating, facilitating, and preserving the traditional and natural ecotones in the Kosi Bay Nature Reserve.

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DECLARATION:

This dissertation is being submitted to partially fulfil the requirements for the **Masters Degree in Architecture at the University of the Free State** in 2023. The content of this document is entirely my own, except for the appropriately acknowledged contributions from other sources.

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PROJECT SUMMARY:

Program: Cultural Pavilion, Tourism Pavilion and Satellite Park offices

Location: Lake Makhawulani, Kosi Bay, KwaZulu Natal

Client: iSimangaliso Wetland Park

Users: Local Community, Tourists, Municipality

Theoretical Approach: How can an architectural response to vernacular routines, rituals, orders, forms, and types articulate, facilitate, and preserve the existing cultural and natural ecotones within a coastal community of Kosi Bay?

Architectural Approach: Light timber structures that creates accessibility and has low impact on the environment, inspired by the vernacular morphology of the site and culture.

ABSTRACT:

The Kosi Bay Thonga fish traps are a culturally significant landmark in South Africa. The traps can be described as finely woven “fences” or “kraals” spread around the lake system. These spectacular structures are what enable Kosi Bay’s sustainable fishery. And with these activities, a temporary link between land and lake is formed within the wetland ecotone, interweaving specific ways of human movement, living, and working.

The thesis outlines the design of a cultural and nature edge place articulating, facilitating, and preserving the traditional and natural ecotones in the Kosi Bay Nature Reserve. The research focuses on the preservation of the natural and human ecologies situated within the wetland ecotone, guided by the emplaced site phenomena and the community’s particular needs and activities. The focus of the dissertation stems from redefining the edge place has the potential to integrate social and cultural factors by way of an architectural approach. Architecture has the potential to sensitively affect how people use their surroundings, leading to the extension of existing rituals and everyday living that eventually become part of the interweaved phenomena of the park. This idea is implemented into the edge place to connect these concepts with Kosi Bay’s culture. Thus, the dissertation questions if an architectural response to vernacular routines, rituals, and orders, will articulate and preserve the existing cultural and natural ecotones within the coastal community of Kosi Bay. In order to create an interweaved relationship between culture and nature, the proposal grows on the existing chain of memories and ecological grid of the water edge. The theoretical methodologies of a shifting ecological grid and a chain of memories are a representation of a transparent axis that creates a roadmap for the design. The investigation gave form to a variety of methods of making which preserve indigenous knowledge and make use of environmentally friendly materials, assuring a generous and sustainable integration that lightly touches the earth and reduces the built impact on the natural environment.

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INTRODUCTION:

This dissertation investigates the accentuation, facilitation, and preservation of diverse ecologies within the iSimangaliso Wetland Park. The wetland park forms a transitory link between land and lake, while intertwining specific forms of human living, movement, and working activities.

The dissertation focuses on a small portion within the wetland park, where the site is situated at the edge of the first lake within the Kosi Bay lake system, currently used as a gathering space for people to cross over the water to access fish traps, grasslands, and the local school.

Guided by the emplaced site phenomena and the community's specific needs and activities, the dissertation centres on the preservation of the natural and human ecologies situated within the wetland ecotone. The wetland ecotone bridges and integrates land and lake and living and working. A transitional area known as an ecotone is where two biological communities come together and integrate. It may be local or regional, narrow, or wide. Ecotones have soft transitions or distinct border lines. Alfred Russel Wallace produced the phrase in 1859 by combining the words 'ecology' and 'tone' to describe the conflict between the ecological systems in these regions (Hortal et al., 2023. Online).

The architectural programme and design strive to illustrate a thoughtful and responsive approach towards the natural ecotone, which is the transitional wetland situated between the land, water's edge, and lake. The dissertation explore various methods that embrace indigenous knowledge and utilise materials with minimal environmental impact, ensuring a gentle and sustainable integration that touch the earth lightly and minimise the built impact on the natural environment.

Zooming out from the wetland ecotone, a larger human-centred ecotone comes into view. This larger ecotone incorporates the gradual transition between human living and human work. The human activities transition from a dispersed village-like layout to a network of winding pathways leading from the village through the foliage to the wetland and lake's edge. At the edge of the lake, human making centres on work activities, that is, materials are dried for cultural and building use, and the construction, restoration, and storage of Thonga fish traps occurs. It is also here where fishermen clean their catch of the day. The edge space provides access to the lake and the opportunity to travel to the school on the other side of the lake. In the lake area, the activities of making are gradually replaced by the forms of the traps. The underwater sandy contours, currents, and movements of the lake are emphasised by the undulating structures and arrangements of the fish traps. Shifting focus to the adjacent wetland, which forms a lesser ecotone between the edge space and the lake, the design programme is inspired by the existing work patterns in this specific location. The goal is to adapt and enhance the existing cultural rituals and routines, incorporating them harmoniously into the design approach.

Firstly, the design programme attempts to incorporate a place for the fishermen to meet the requirements for their daily working routine, including safe storage for pre-constructed traps and materials. Additionally, provision is made for a space for cleaning fish and storing bait. Considering the need to collect and dry materials, a workspace provides for these daytime activities. Secondly, a dock or port with communal waiting spaces facilitates access across the naturally formed channels in the lake during low tide.

Lastly, the design programme also attempts to accommodate the small number of visitors and ecologists that visit the wetland, edge space, and lake.

In addition to the function programme, the design intends to highlight and address the site's poetics, making, the morphology of Tsonga fish traps, and patterns found in patterns inherent to the local rituals and work routines.

Based on the preceding programmatic and poetic aims, the research question is formulated as:

How can an architectural response to vernacular routines, rituals, orders, forms, and types articulate, facilitate, and preserve the existing cultural and natural ecotones within a coastal community of Kosi Bay?

The dissertation attempts to illustrate the progression of the concepts, mentioned above, regarding the transitory connection between land and lake, and how they interweave with distinct forms of human living, movement, and work activities.

This paper is organised in a linear manner, presenting a narrative that reveals the design project's development throughout the year. To align with this narrative, the research methodology follows a structured approach. Initially, an explorative research methodology was engaged to observe a wide range of potential influences and inspiration on the project. Subsequently, the most relevant influences were emphasised and given priority, and is achieved through a thorough process of in-depth investigation, exploration, and synthesis.

FIG 1: Fish trap (Author, 2023)

RESEARCH METHODOLOGY:

The paper firstly talks about interweaving the poetics of the site and vernacular architectural language regarding the morphology, topology, and typology in Part 1. Part 2 unravels the investigative explorations and core of these terms through theoretical methodology, while Part 3 and 4 explores the design and technical approaches to a final project. To end, Part 5 reflects on the process and project.

The research is constructed to depict two translucent crossing grids that are gradually woven together by relating to the essentials of design:

- Design for the community.
- Incorporating the diverse ecology.
- Working with the vernacular materials of the site.
- Representing a feeling of porosity.

The research emerged from a personal experience of the site and its poetic character. Throughout this expressive investigation, various challenges are pinpointed, which pertain to the morphology of the project's location, the building programme, and architectural solutions. To create a design methodology that is shaped and distinctive for this project, an analysis of the following influences and explorations was interwoven. These research methods were helpful in discovering the challenges tied with the project:

1. Site analysis and mapping.
2. Creative interpretation
3. Literature review
4. Precedent studies
5. Design synthesis

01

PART 1: PLACE

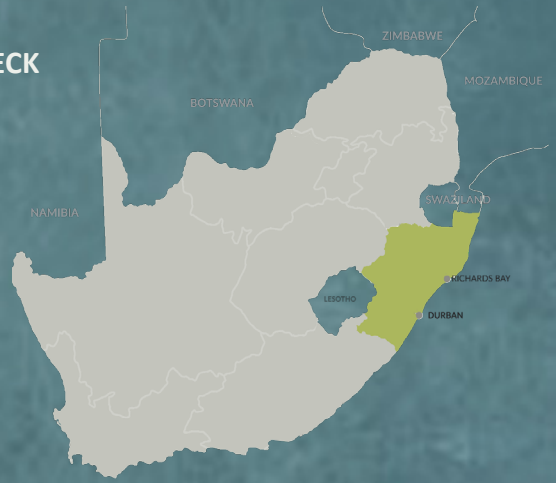
The making of an effective architectural response to the site depends critically on understanding the context of the project. In order to better comprehend the natural topography, this chapter investigates the project's position on the macro, mezzo, and micro levels of Kosi Bay to the specific location of the site. Through quantitative and qualitative site mapping, the analysis identifies patterns and influences to create a clear picture of the context.


MOÇAMBIQUE
Gazini
Mfakubeka
Mloli
Emfihlweni
SIHANGWANE
Makhaya
Phelandaba
Embonisweni
Sileza Nature Reserve
R22
Mpophomeni
Esicabazini

1. MACRO SITE ANALYSIS:

The site is located within the larger context of Kosi Bay and forms part of the iSimangaliso Wetland Park. The macro investigation concentrates on the site in relation to the context of Kosi Bay, the surrounding landmarks, and public points of interest. The map indicates the location of the dissertation

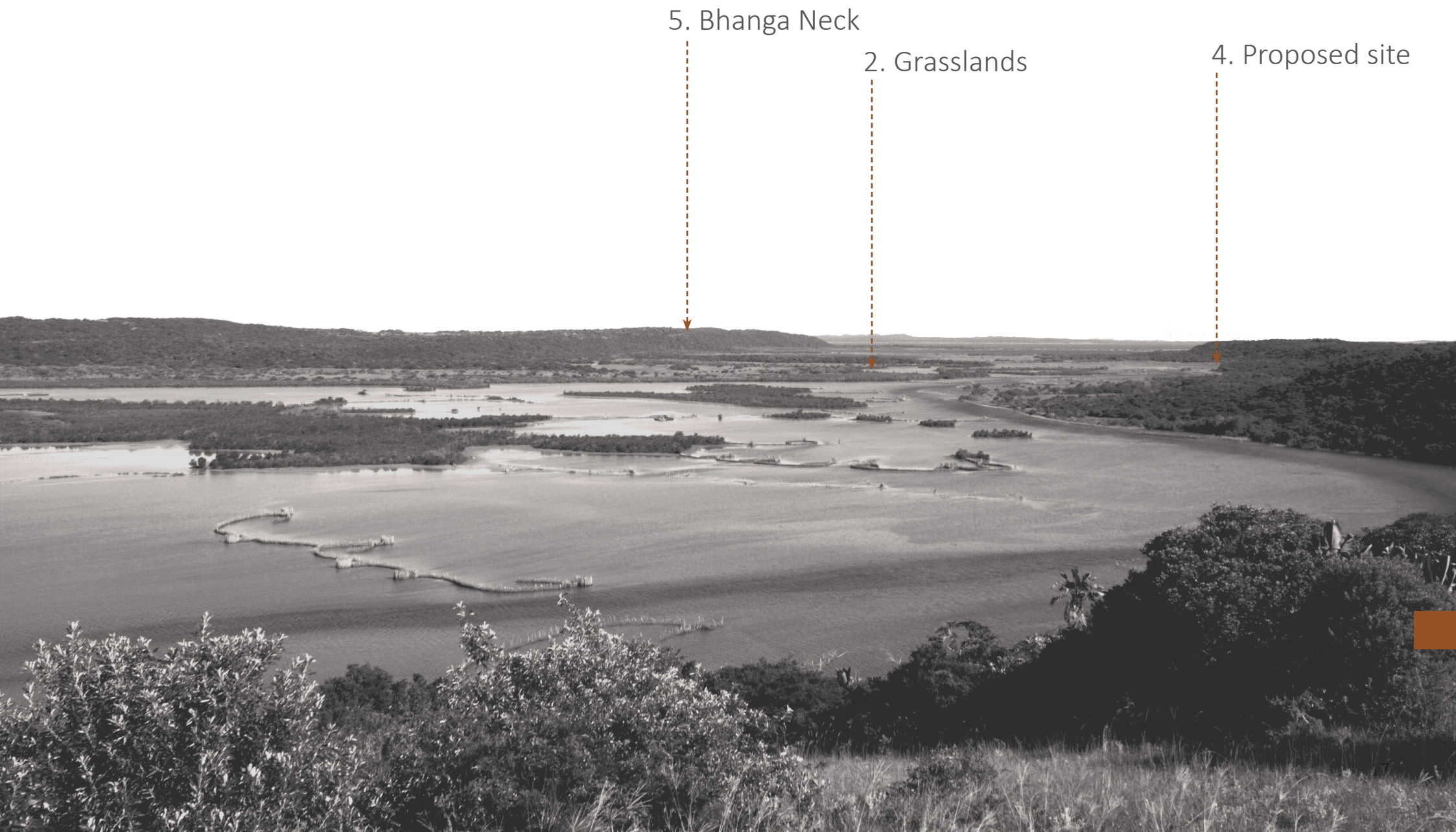
Benjamim
Ponta do Ouro
BORDER POST
Thelizolo
Mahlungulu
Kwa-Mshudu
KOSI MOUTH
eNkovukeni
SITE
eNgozini
KwaMazambane
Thandizwe
Mvutshana
Manguzi
BHANGA NECK
Thengani
Kwadapha
Nsukumbili
KwaNovunya



1.1. LANDMARKS:

FIG 2: Kosi bay mouth(Author, 2023)

FIG 3: Kosi bay aerial view(-Author, 2023)


5. Bhanga Neck
2. Grasslands
4. Proposed site

1.2. NOTEWORTHY FAUNA AND FLORA:

1 FAUNA:

1. **Prawns**
2. **Insect life:** tailor ant, butterfly, the skipper butterfly.
3. **Fish:** This reef is home to eighty percent of the species that have been documented in Kosi Bay. They are an extension of the normal tropical Indo-Pacific reef fauna, such as surgeonfishes, damselfishes, butterflyfishes, and wrasses.
4. **Mammals:** hippopotamus, water mongoose, crocodile, and clawless otter.
5. **Birds:** Flufftail, Whitebacked Night Heron and the Crab Plover.

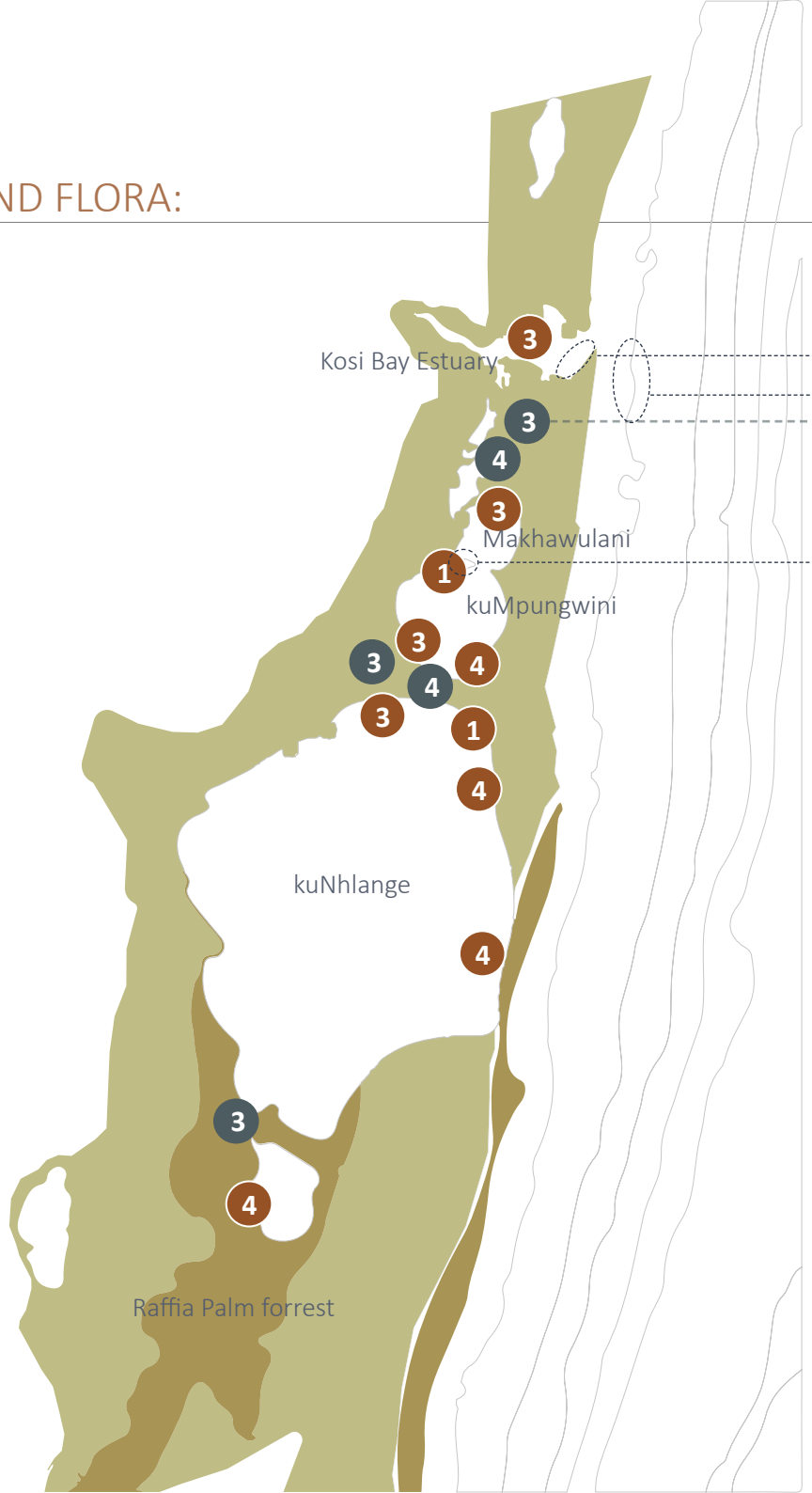


FIG 4: iSimangaliso park map (Author, 2023)

2 FLORA:

1. **Dune scrub, and dune forest** dominate the coastal dune vegetation on the system's eastern edge.

2. **Five species of mangroves** in the system.

3. Much of the lower-lying, partially or occasionally flooded areas are covered with **grasslands and sedges**; more permanent wetlands give rise to marshes and swamps, with papyrus swamps standing out.

4. Open grasslands, both closed and open forests make up the plant communities found in dryland areas.

5. **Raphia australis**, a unique species (giant palm), is found only in Kosi Bay. The palmnut vulture, depends on it.

FIG 5: Raffia palm (Author, 2023)
FIG 6: Ferns (Author, 2023)
FIG 7: textured leaves (Author, 2023)
FIG 9: Most common mangrove (Author, 2023)

FIG 8: Drawing of leaf colours on site (Author, 2023)

2. MEZZO SITE ANALYSIS:

The location of the site within the park is illustrated as an interactive edge. The map indicates the ecological grid and patterns of the lake-system. The Wetland Park is introduced on a physical and experiential level in the mezzo analysis. The physical analysis of the park is composed of the functions that are immediately adjacent to it, access to it, existing components, and any potential links between the site and the project program. A progressive narrative that illustrates the experiential part of the journey towards the lake edge captures the visitor's initial experience as they begin to explore the permeable nature of diverse ecotones.

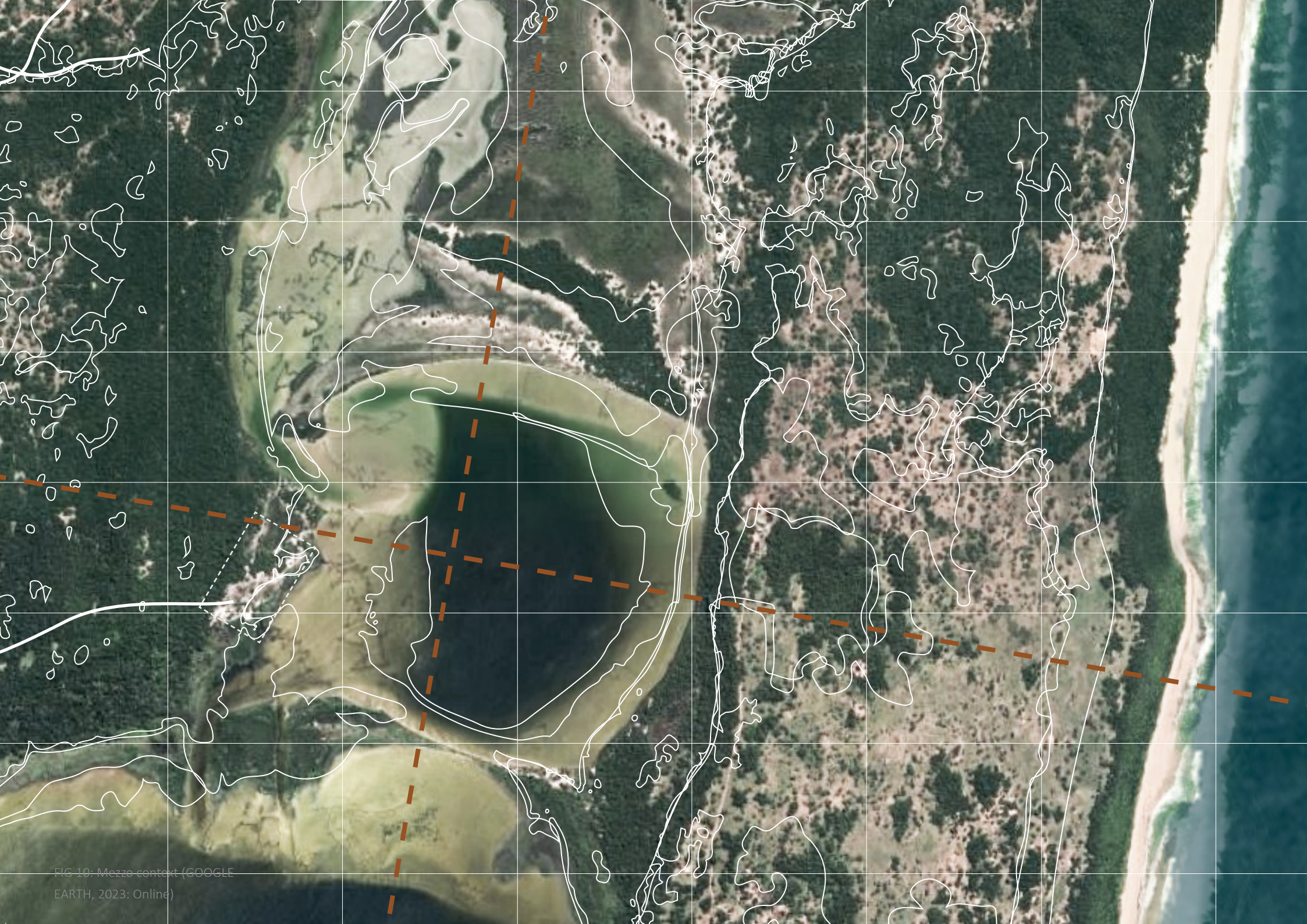


FIG 10: Mezzo context (GOOGLE EARTH, 2023: Online)

2.1. HISTORICAL INFLUENCES:

At Kosi Mouth, eNkovukeni, a remote community, is tucked between the vast lake system and the Indian Ocean. Their careful preservation of the historic fish traps demonstrates how deeply rooted their cultural heritage is. Interestingly, the tradition has continued through seven centuries, and these skills have been easily passed down from one generation to the next.

The traps have been placed in about the same locations, following the tide-driven, continual fish migration routes. The map (FIG) indicates how the traps were placed strategically to be close to banks and other regions where the presence of hippopotamuses is discouraged by high salinity levels, providing a more secure environment for the traps.

The cultural and social significance, of the traps, has a notable influence on the Thonga people in addition to being ecologically sustainable. Children are taught the craft of fishing from an early age, carrying on an inherited tradition. The tradition supports not only their way of life but also a significant portion of their livelihood. Surprisingly, the traps' building processes and materials have experienced very little change, maintaining the essence of this timeless activity.

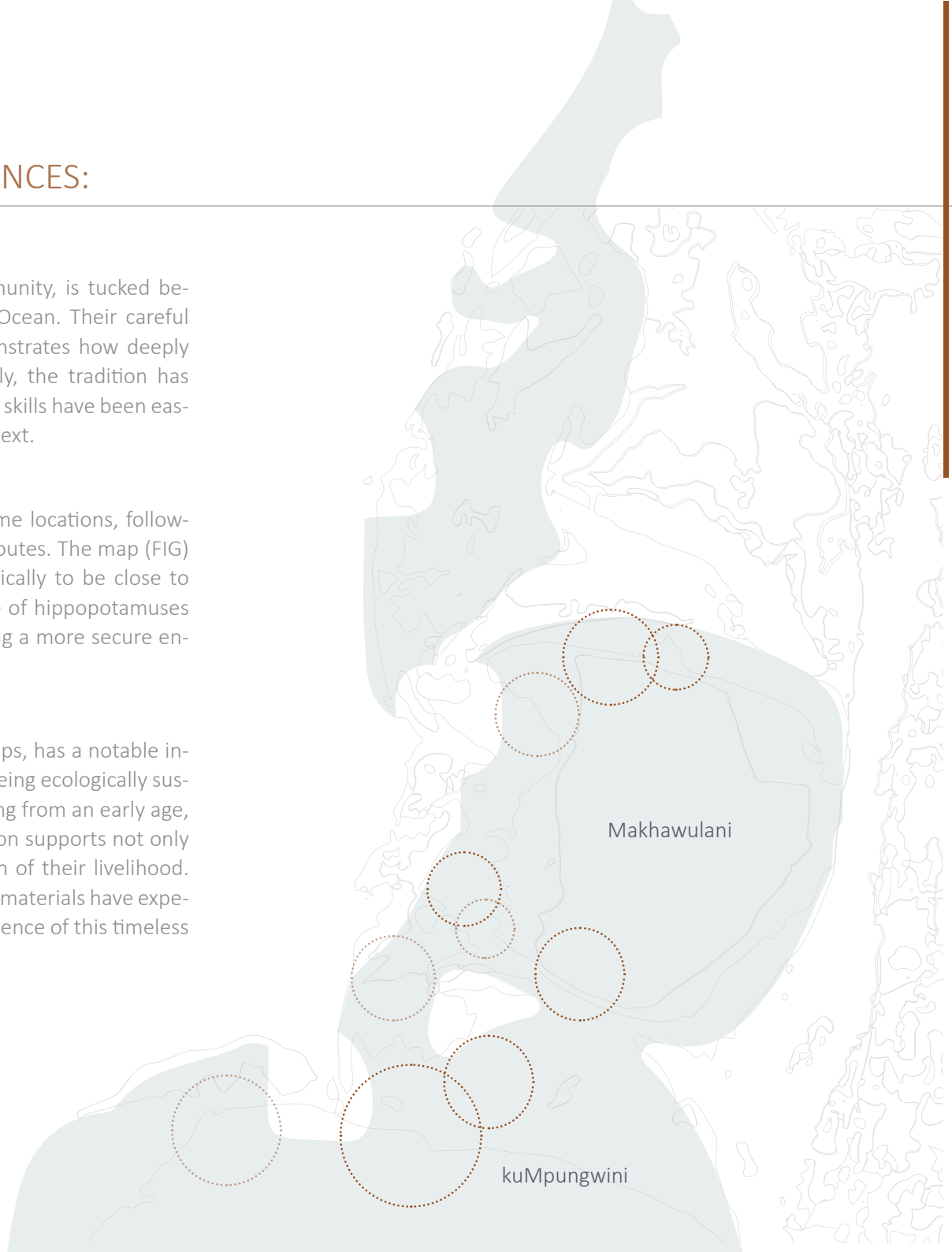


FIG 11: Trap indication map
(Author, 2023)

FIG 12: Fish caught from trap (Author, 2023)

FIG 13: Trap (Author, 2023)

FIG 14: Interior of “kraal” (Author, 2023)

2.1.1. THE FISH TRAP - COMPOSITION

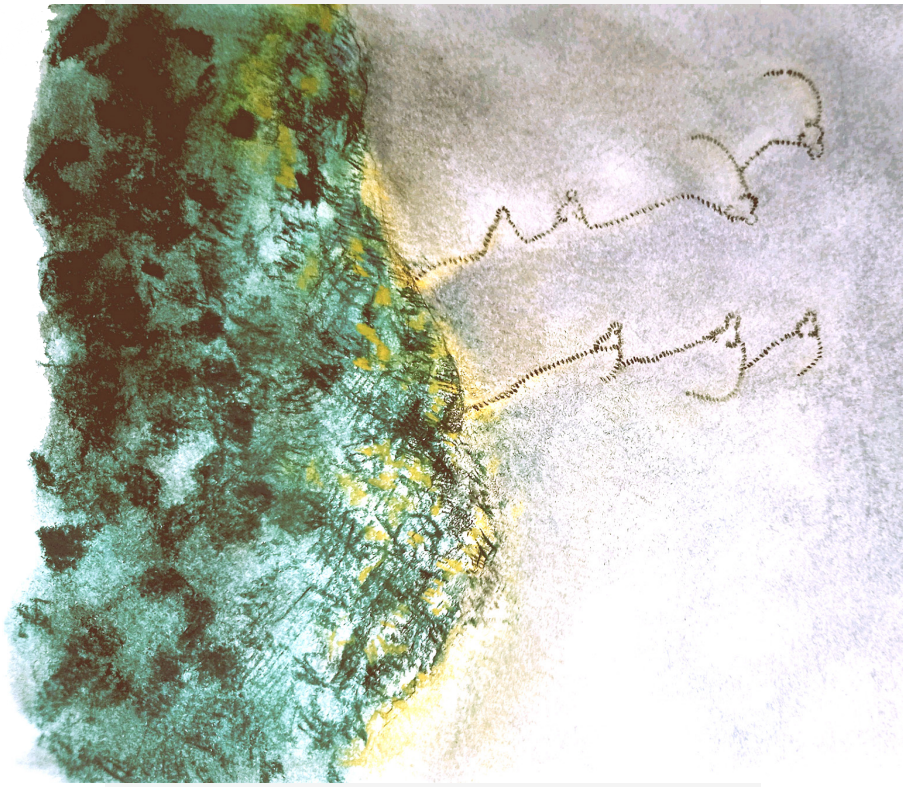


FIG 15: Pastel drawing of site indicating ec-otones (Author, 2023)

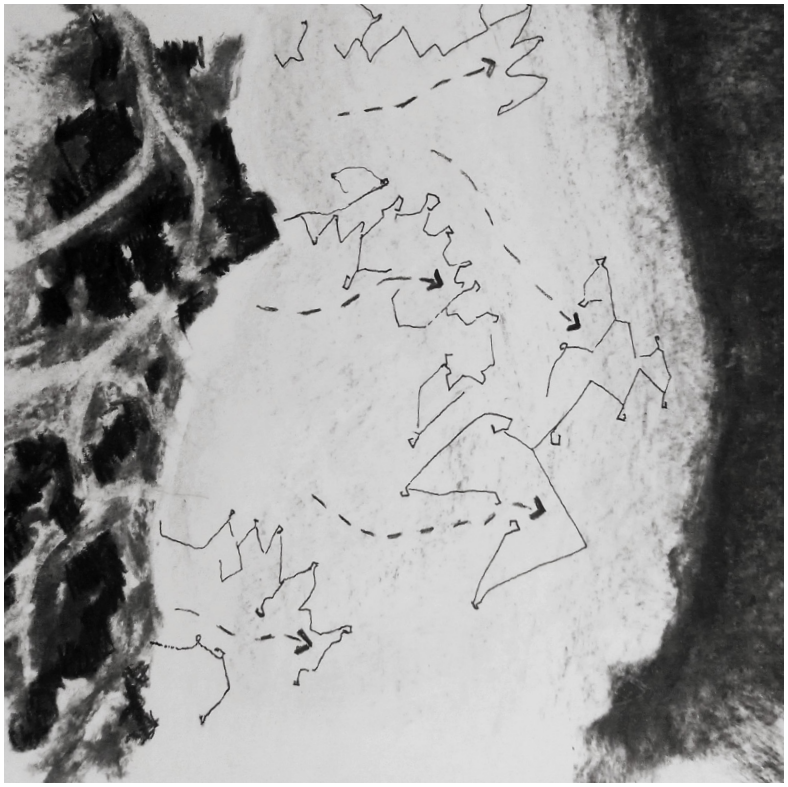


FIG 16: Charcoal drawing of movement patterns and lines (Author, 2023)

The channels and barriers that forms the fish traps' system of wooden structures allow fish to enter but keep them from leaving. The Thonga people have created sustainable and eco-friendly traps out of a great regard for the ocean and its wildlife. These traps are made to let smaller fish pass through, ensuring that the breeding population is not disturbed and that the total quantity of fish is not reduced.

Each person in the community works together to build these traps. Women and children help with fishing and processing the catch, while men in the community build and maintain the traps. The Thonga people reject contemporary tools in exchange for traditional methods. Their carefully crafted traps are made from natural materials such as dried silver oak tree branches, dried reeds for rope, and palm leaves for additional durability.

The design of the traps demonstrates the Thonga people's deep knowledge of fish behaviour and the natural world. During particular seasons, they place the traps strategically along the estuary where fish congregate. Furthermore, the precise alignment of these traps allows them to harness the power of the tides, which guides the natural flow of water and draws fish into the traps (M, 2023).

FIG 17: Ink exploration of fish trap composition
(Author, 2023)

2.1.2. THE FISH TRAP - PHASES

1. ILLUSION

2. DECEIVE

3. CAPTURE

4. COLLECT

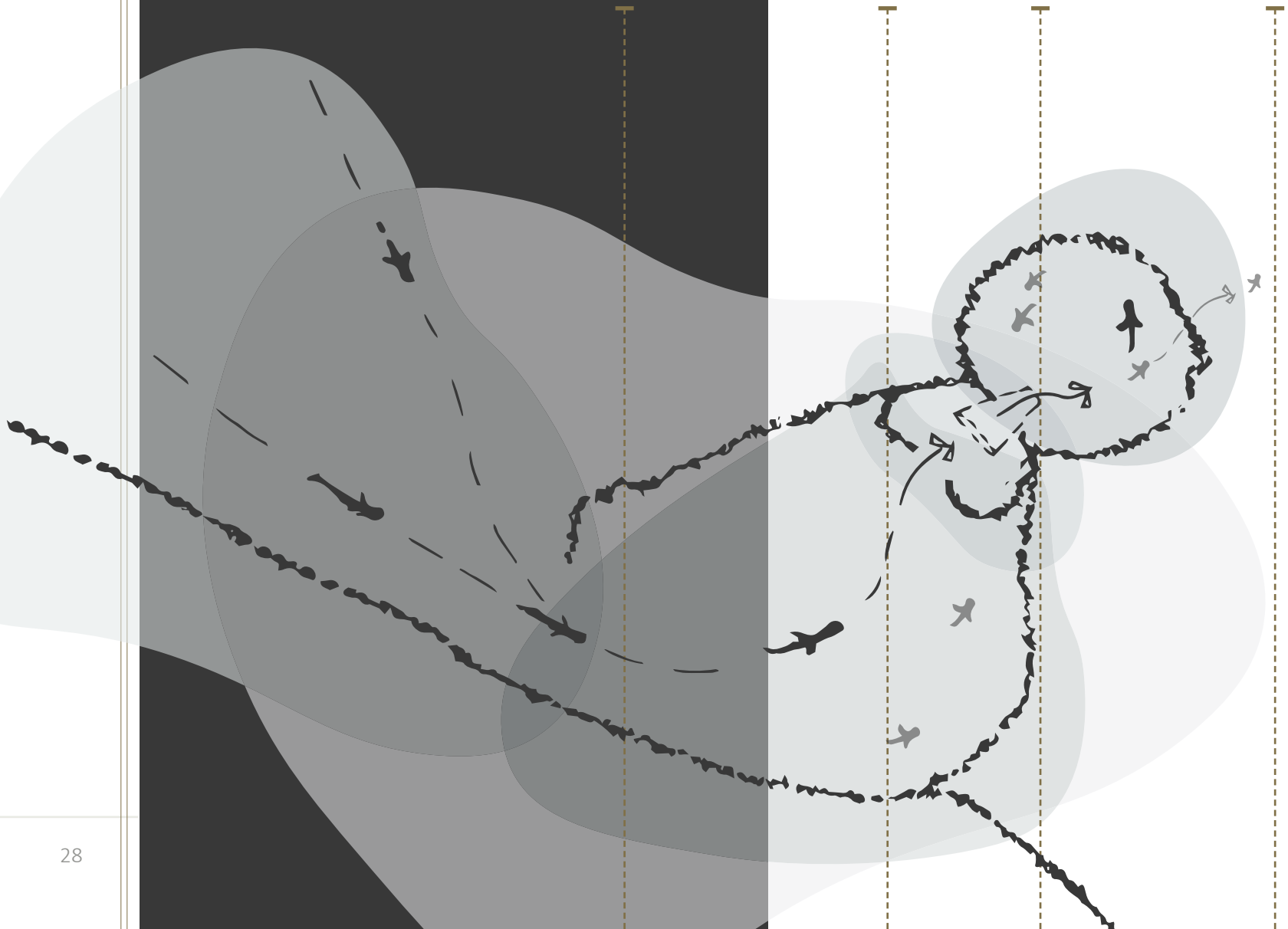
FIG 18: FIRST AND SECOND STAGE OF “KRAAL” (AUTHOR, 2023)

FIG 19:THRID AND FOURTH STAGE (AUTHOR, 2023)

FIG 20:HEART SHAPED FENCE (AUTHOR, 2023)

FIG 21:BASKET (AUTHOR, 2023)

2.1.3. THE FISH TRAP - MOVEMENT



1. Fish are captured by a hook-shaped guide fence that is positioned perpendicular to the water's flow.

2.This leads into a heart-shaped fence that is enclosed.

3. To get to the circular enclosed basket, fish must swim through a woven funnel. Fish inhabit the elevated exit of the funnel, which narrows as it swims back through.

4. Smaller fish can escape through the fence posts, while larger fish are stuck once they reach the final circular barrier.

FIG 22: DRAWING INDICATING FISH MOVEMENT WITHIN TRAP (AUTHOR, 2023)

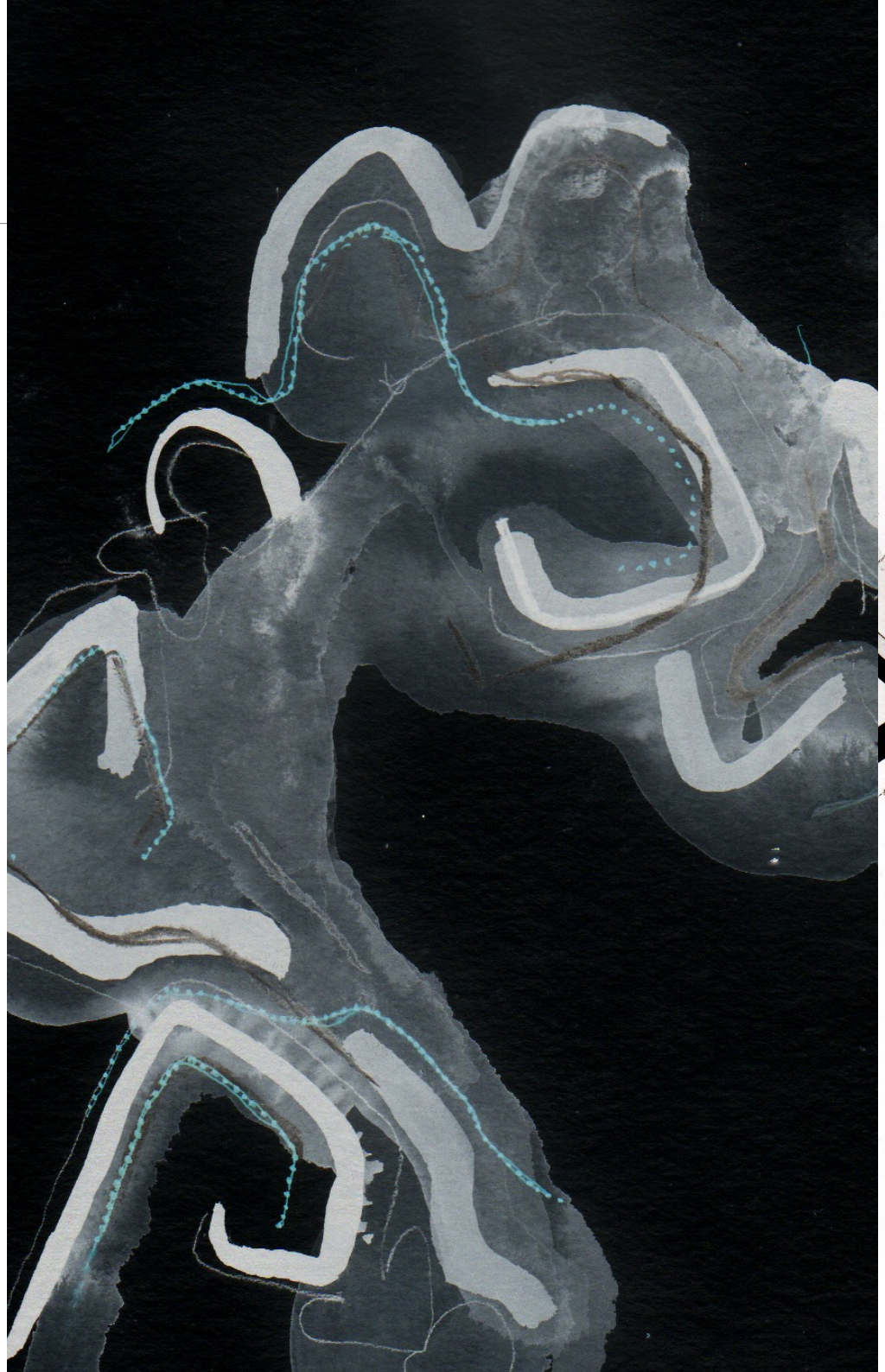
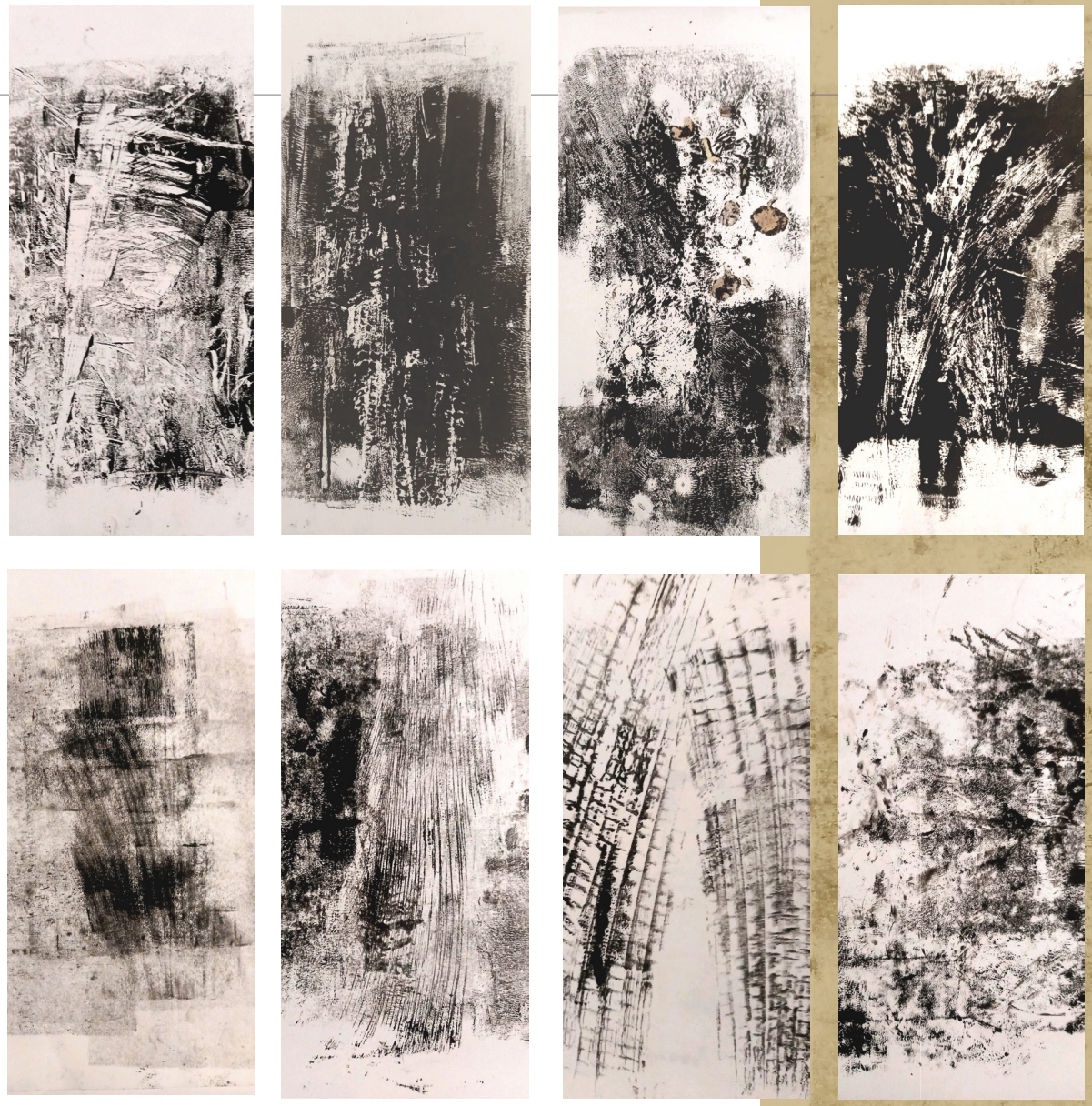


FIG 23: INK DRAWING OF MOVEMENT IN AND AROUND TRAPS (AUTHOR, 2023)

FIG 24:INK DRAWING OF TRAP (AUTHOR, 2023)

2.2. ALTERNATIVE ANALYSIS:



2.2.1. COLLECTION OF ELEMENTS ON SITE

FIG 25: COLLAGE OF PRINTS FROM SITE-SPESIFIC MATERIALS (AUTHOR, 2023)

2.2.2. EXPRESSIVE PRESENTATION OF ELEMENTS

FIG 26: COLLAGE FROM PRINTS (AUTHOR, 2023)

2.2.3. CREATIVE PROCESS

The aim was to collect elements on site and imprint the textures found to create a collection of expressions through abstraction. Oil paint was used to imprint the texture on a glass surface and print the result on paper. This creative process was inspired by the idea of capturing or reflecting the feeling one gets when looking deeper into organic fibres and transforming found objects to patterns and shapes on paper.

RAFFIA PALM OUTSIDE

RAFFIA PALM CUT OPEN

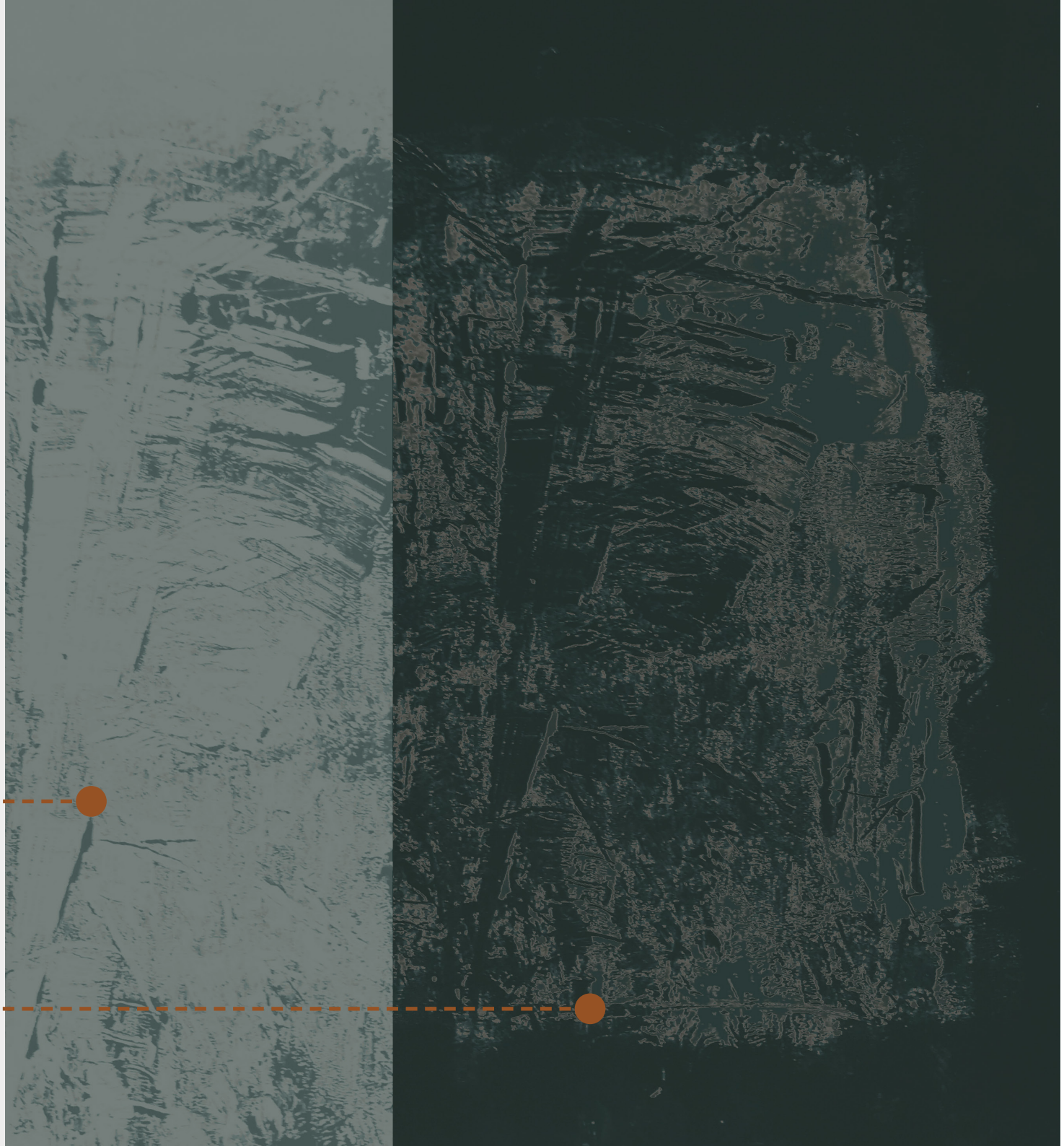
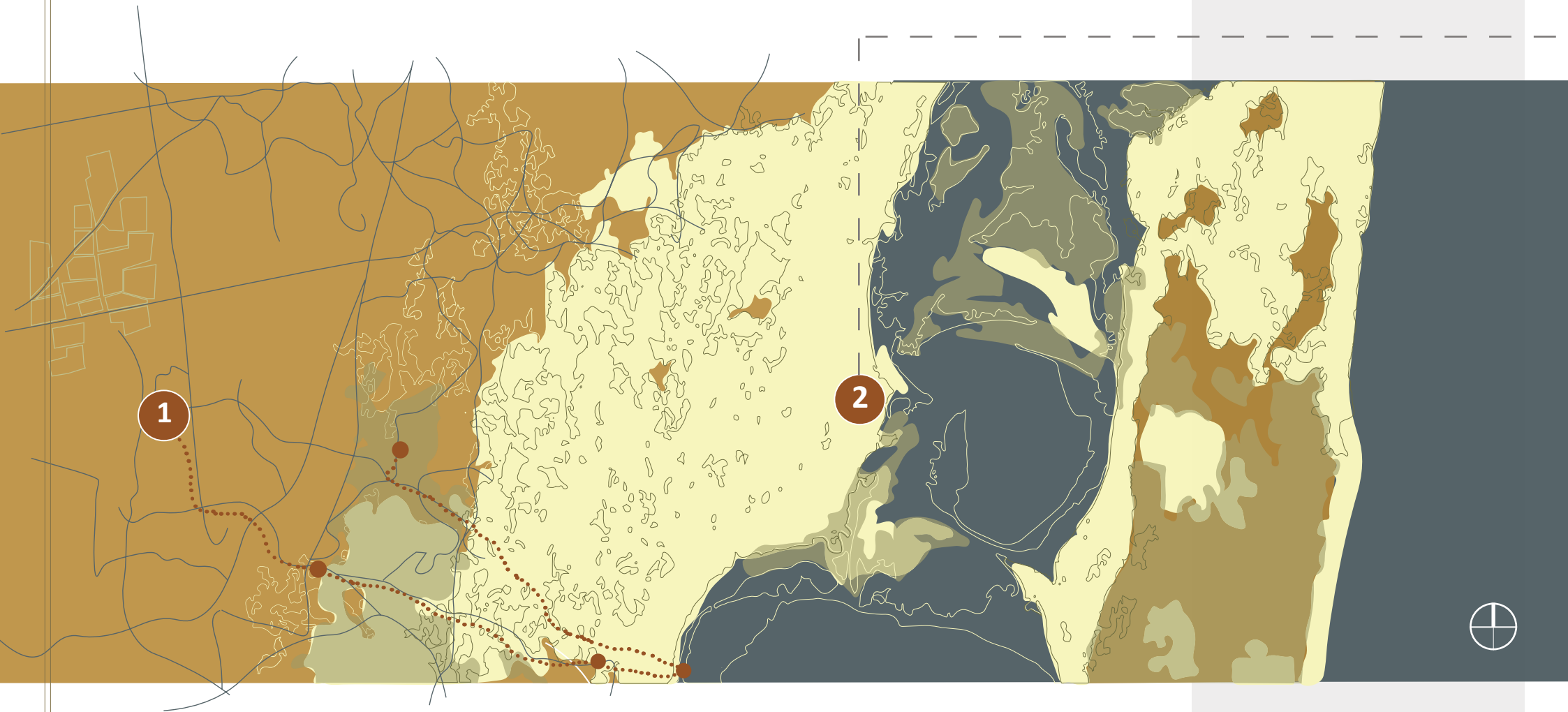


FIG 27: DRIED LEAVES FROM SITE (AUTHOR, 2023)
FIG 28: PRINT MATERIALS (AUTHOR, 2023)
FIG 29: PRINT MATERIALS (AUTHOR, 2023)
FIG 30: PRINT EXPRESSED IN COLOUR (AUTHOR,
FIG 31: PRINT EXPRESSED IN COLOUR (AUTHOR, 2023)
FIG 32:2023)

2.3. SITE VISIT- WALKING THE PARK

- PLACES STOPPED
- BY BOAT
- WALKED



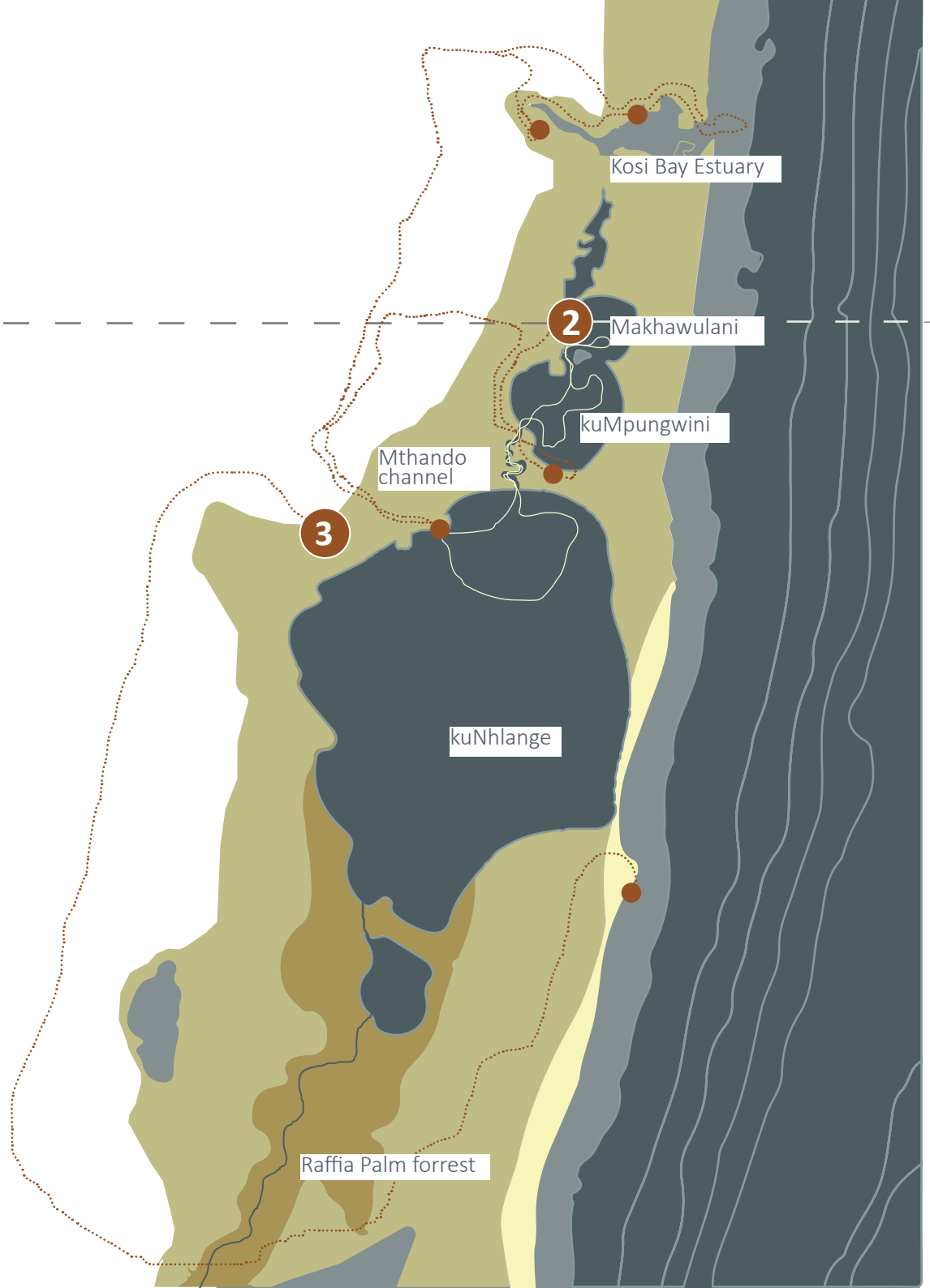


FIG 33: MAP INDICATING ROUTE TRAVELED IN PARK (AUTHOR, 2023)

FIG 34: MAP DEPICTING TRAVELED ROUTES ON DAY TWO AND THREE (AUTHOR, 2023)

DAY: 1

KOSI BAY GATE

FIG 35: JETTY AT KOSI GATE (AUTHOR, 2023)
FIG 36:OVERVIEW OF PARK BORDER (AUTHOR, 2023)
FIG 37: LOCAL LADIES' WEAVING (AUTHOR, 2023)

2

MTHANDO CHANNEL

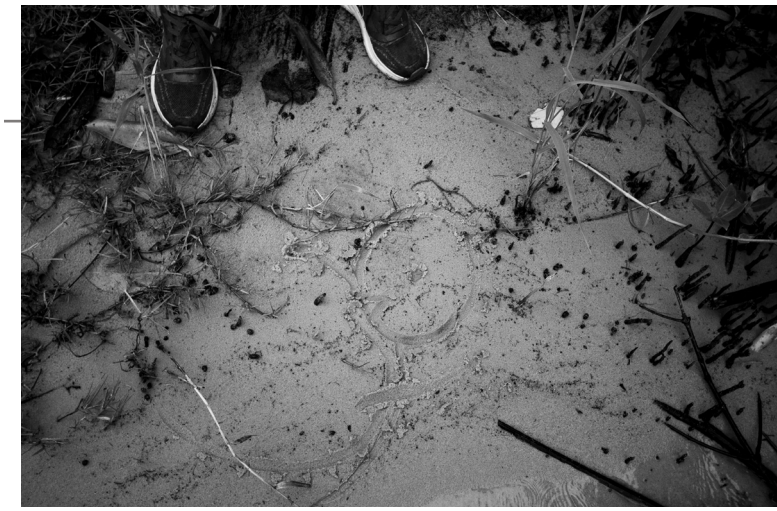


FIG 38: GUIDE'S PICTURE IN SAND INDICATING TRAP COMPOSITION (AUTHOR, 2023)
FIG 39:LOCALS CARRING GRASS FROM GRASSLANDS, OVER CHANNEL (AUTHOR, 2023)

MAKHAWULANI LAKE

FIG 40: OUTER FENCE (AUTHOR, 2023)
FIG 41: CHANNEL CROSSING (AUTHOR, 2023)
FIG 42:WOVEN FENCE (AUTHOR, 2023)

3

FIG 43: OUTER FENCE (AUTHOR, 2023)
FIG 44: BEACH AT BHANGA NECK (AUTHOR, 2023)
FIG 45:REEDS (AUTHOR, 2023)

3. MICRO SITE ANALYSIS:

The micro context introduces the site as the edge of the water. The site is situated at the western edge of the first lake within the Kosi Bay Lake system. The central place of access and the coming together of two translucent axis- land to lake, living and working.

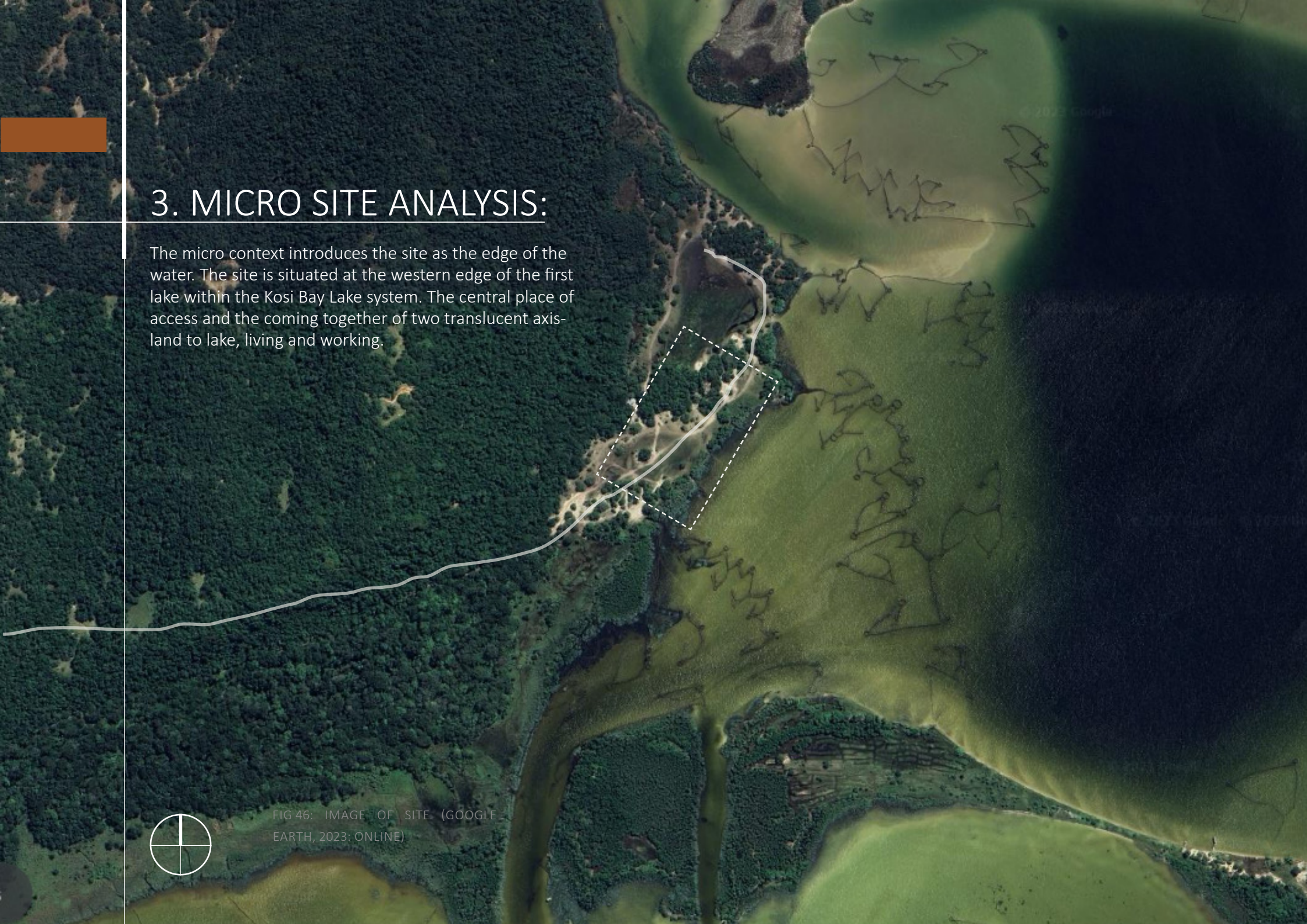


FIG 46: IMAGE OF SITE (GOOGLE EARTH, 2023: ONLINE)

3.1. INITIAL EXPERIENCE OF THE SITE:

FIG 47: EXPERIENCING COLOUR ON SITE (AUTHOR, 2023)

3.2. SITE CONTEXT:

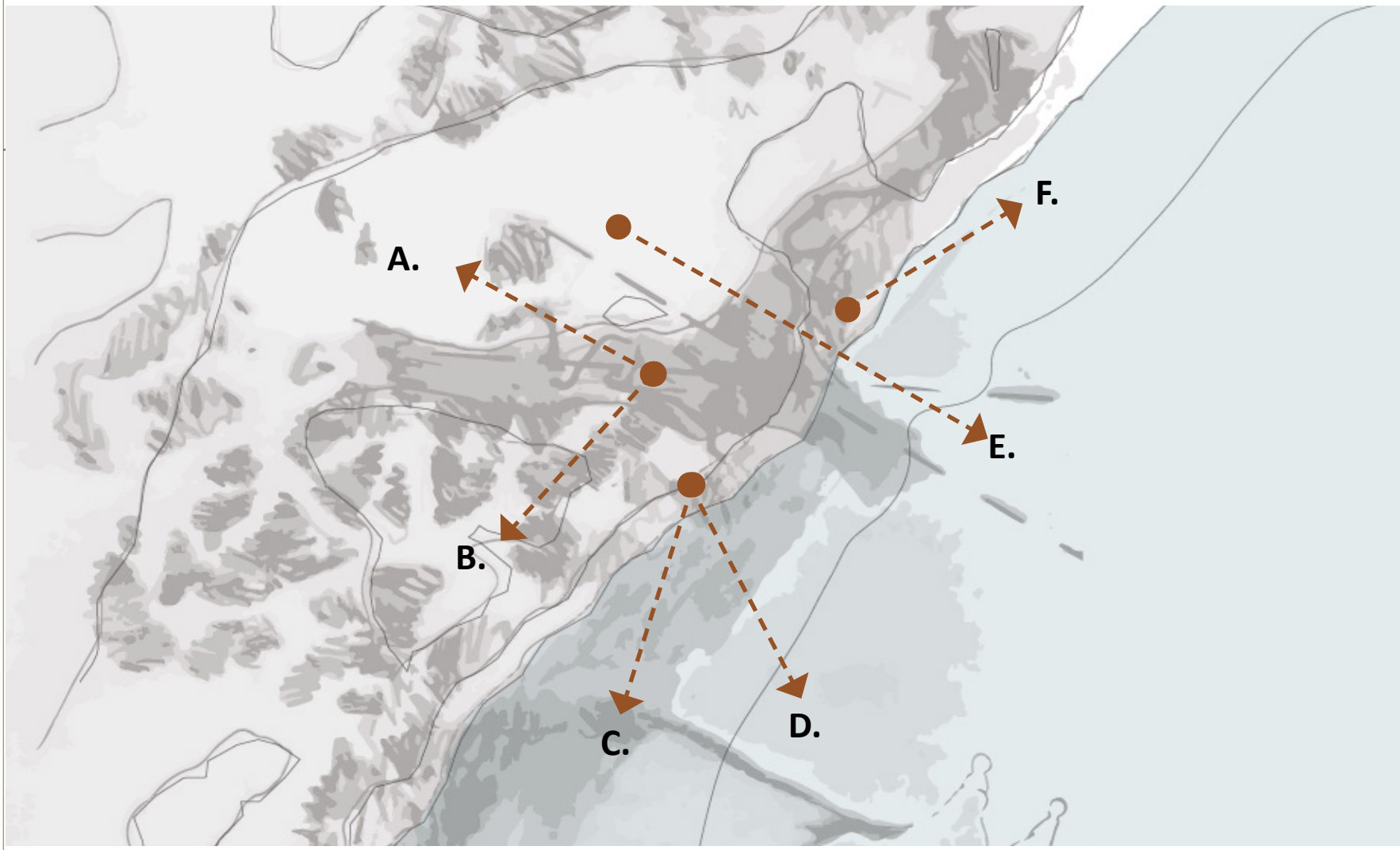


FIG 48: SKETCH INDICATING VIEWS IN SITE (AUTHOR,2023)

FIG 49: VIEW A (AUTHOR,2023)
FIG 50: VIEW B (AUTHOR,2023)
FIG 51: VIEW C (AUTHOR,2023)

FIG 52: VIEW D (AUTHOR,2023)
FIG 53: VIEW E (AUTHOR,2023)
FIG 54: VIEW F (AUTHOR,2023)

02

PART 2: THEORETICAL INVESTIGATION

This chapter centres on the instinctive reaction to the coming together of ecotones and the site's edges, utilising the touchstone, conceptual methodologies, alternative contextual studies, and theoretical knowledge. This process played a fundamental role in identifying the project's essence as a visible manifestation of the problem statement. The problem statement served as a foundation to connect theoretical and historical influences that pertain to the interplay between various ecologies. The resulting response provided a comprehensive understanding of how these concepts could be translated into a design solution.

The chapter is organised to indicate how the theoretical characteristics unfolds from the touchstone, alternative site mapping, and concepts to a fluctuating ecological grid and chain of memories.

1. TOUCHSTONE:

The touchstone developed from the significance of the site and is an abstract depiction of the traditional fish traps. Conceptually, it is vital that the touchstone adjusts to a solution for the project rather than merely exposing an issue that already exists. To address this aspect, the work plays with the essence of the site that revolves around the rituals and daily routines associated with the traditional fish traps.

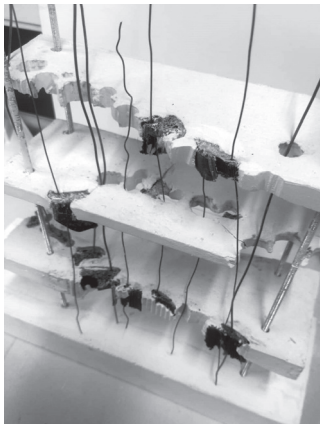
The purpose of this touchstone was to access possibilities by way of an abstract expression of what the project wants to become. The idea was to reflect the sensitive play between the ongoing rituals of the community and the ephemeral cycles within the liminal spaces of the site. The touchstone is a depiction of what it feels like when a compilation of diverse habitats connects. This represents an extension of a collection of rituals within one area.

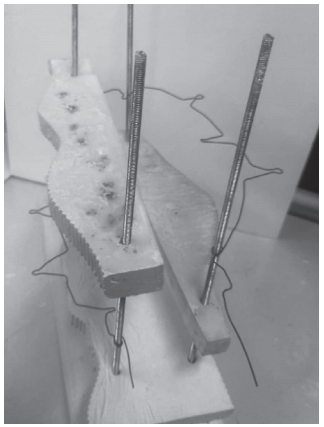
The project's concept intended to gather and repurpose site-specific materials, viewing them through an abstract lens to gain insight into the fundamental aspects that must be conserved and honoured. By reimagining these materials in a renewed context, the purpose was to grasp the true essence of the site and ensure its preservation in a meaningful manner. The work plays with the sensitive feeling one gets when haptically experiencing the site by way of reflecting/capturing the significance. Therefore, materials from site are used and reconstructed in an expressive way to depict the underlying significance. Whereas the negative spaces become blurred zones composed of relevant gradients of ephemerality that emphasise the core of the community's relationship with the landscape, time, and ongoing impermanence, the site is an anthology of shared edges mediating between the landscape that can be seen as a conversation between cultural artefacts and the environment.

FIG 55: DEPICTION OF TOUCHSTONE (AUTHOR,2023)
FIG 56: TOUCHSTONE(AUTHOR,2023)
FIG 57:DETAIL OF TOUCHSTONE(AUTHOR,2023)
FIG 58: ORIGINAL MATERIALS USED TO WEAVE TRAPS FROM SITE (AUTHOR,2023)
FIG 59: TOUCHSTONE(AUTHOR,2023)

2. CONCEPTUAL IDEAS AND THEMES:

The concepts are a visual representation of the theoretical foundations and ideas that translate in architectural forms to relate to the poetics of the site. The intent of the conceptualisation of the project is to make a connection between the conceptual ideas and the site. Three architectural concepts are investigated to understand the project's orientation, materiality, and atmosphere of the site. Each of the principles is intimately linked to the natural environment. A set of keywords that is influenced by the touchstone creates an understanding of the relationships between the site and concept. The concepts specifically focus on sensitively approaching the essence of the site as well as the preservation of the community's heritage.





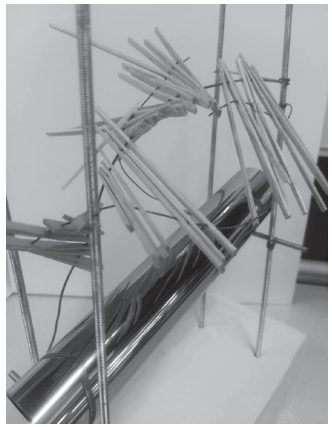


FIG 60: CONCEPT 1 MODEL (AUTHOR,2023)
FIG 61:CONCEPT 2 MODEL (AUTHOR,2023)
FIG 62: CONCEPT 3 MODEL (AUTHOR,2023)

2.2.1. INTERWEAVED EPHEMERALITY

The concept is a depiction of the interwoven relationship between the temporality of the site-specific materials and the daily rituals of the local community. The idea derived from the traditional fish traps that have been passed down from generation to generation. The residual marks of repairing these traps by way of replacing materials over the years, began to form constellations of densities within specific lines on the site. This created a fluent composition of rituals, time, and materiality where compact spaces started to coexist with the appearance of engraved gaps (given way) underneath and between the roots of the traps.

The concept disassembles the subtracting and adding of materiality within specific spaces and shows how it can be reinterpreted and interwoven as a representation of decay and time

FIG 63: INTERWEAVED EPHEMERALITY DEPICTION(AUTHOR,2023)

2.2.2 FLUCTUATING ECOTONE

This idea reflects the sensitive play between liminal space and coherent movement through them. Emphasis is placed on liminal spaces as an ecotone, in other words, an area where a compilation of diverse habitats connects. This term supports the greater biological range within a space, where various sets of resources and opportunities link the systems it mediates between. More specifically, looking at the concept of littoral drift taking place between these spaces.

The term littoral drift describes the action of wind-driven waves transporting sand and gravel. From a visual point, becoming the link between shifting edges and the way different species move through it. For example, the effect of a person's footpath through these liminal spaces will create a momentary imprint on the site and then change back to the effect created by the littoral drift patterns. But, as the traps becomes boundaries for this effect, the focus is on the way elements change when filtering through them. Thus, these spaces become blurred zones composed of relevant gradients of movement types that emphasise the core of the community's relationship with the landscape and ongoing impermanence.

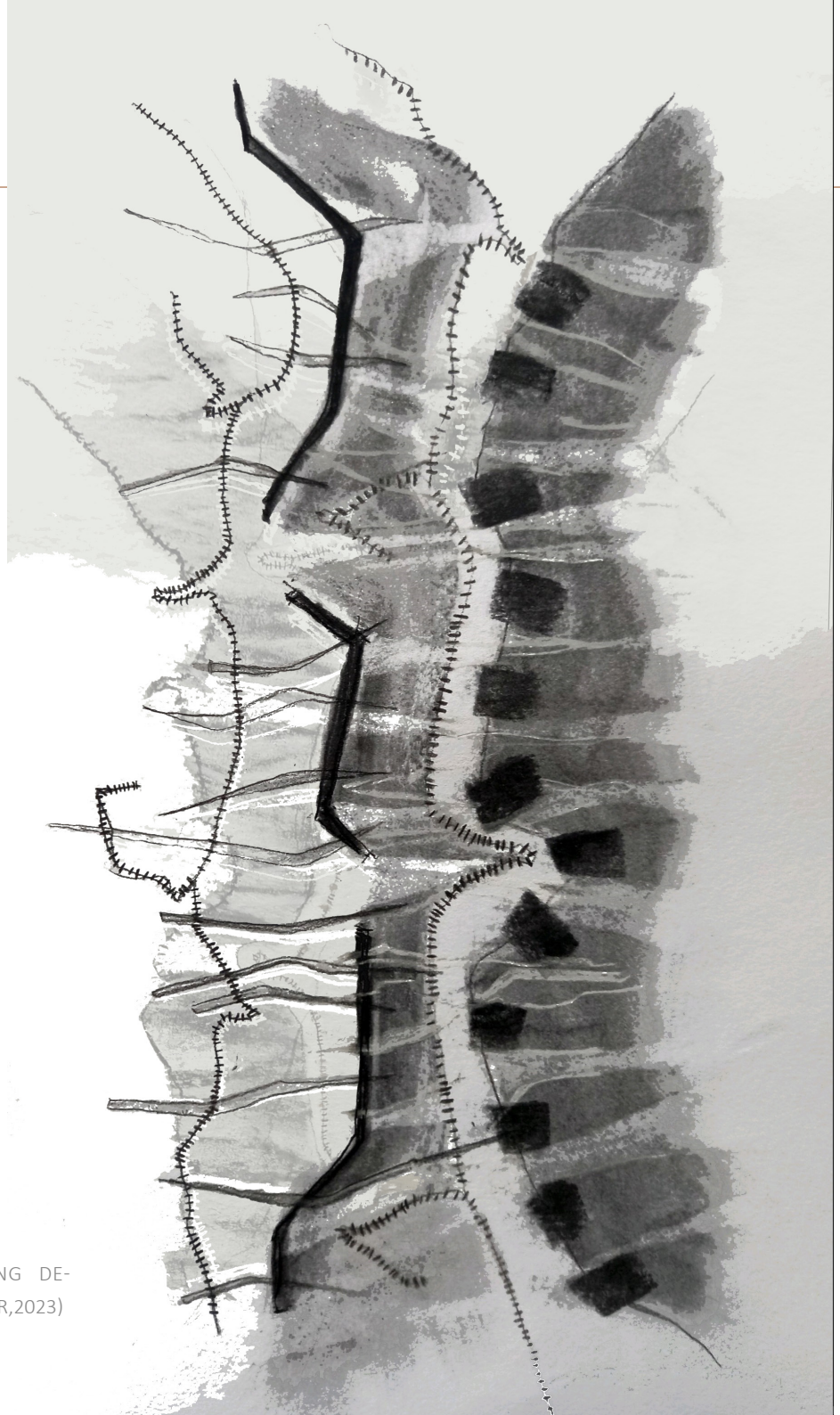


FIG 64: CHARCOAL DRAWING DEPICTING CONCEPT 2 (AUTHOR,2023)

2.2.3. CAPTURED CURVE

The concept derived from the basic notion of how the traps work and manipulate movement within and around it. These constellations become boundaries for movement and, thus, create transitional spaces that capture what is inside, giving one a misleading impression of nature from inside.

The idea of manmade structures and the deceiving effect it has on nature, is portrayed by distorting the artificial structures and, as a result, capturing the curve effect, which means, basically, capturing the dialogue between artificial and natural materials to form a space that reflects the environment on a sensitive and indirect way.

Specifically, looking at the use of materials, this theoretical approach will link with critical regionalism and how nature becomes the main source of construction. To get a better understanding of materials and how to link time as form of decay within the existing structures. The current use of materials has a short life span, approximately one year before it needs to be replaced or restored.

FIG 65: CHARCOAL DRAWING OF CONCEPT 3 (AUTHOR,2023)

3. ALTERNATIVE SITE ANALYSIS: A FLUID EXCHANGE

In this project the dialogue between natural elements of time and temporalities is captured to represent dichotomy within liminal spaces. The liminal space is composed of gradients with relative continuities that can be seen as an assemblage of ecolines. An ecoline is defined as a zone where there is a constant transition between one habitat and another. The site's liminal spaces share the qualities of an ecoline as it exhibits constellations of fluctuating ephemeral edges. Portraying these edges can be challenging to capture. The techniques of Meghann Riepenhoff were an inspiration as to how she collaborated with a specific landscape. This method linked with this project's idea of capturing contradicting and transitional movements on site.

Therefor the experiment is a series of submerging photochemical prints, within the liminal spaces of the site, to capture continual movement of opposing elements. The works are made in relationship with the landscape, where coexisting elements inscribe into the photographic material. The photochemical process reacts thermally and is developed when water is applied. Specifically, working with these materials to represent how water becomes a limiting factor on site.

FIG 66: PRINT 1 (AUTHOR,2023)

FIG 67: PRINT 2: TRAPS (AUTHOR,2023)

FIG 68: PRINT 3: TRAPS (AUTHOR,2023)

FIG 69: PRINT 4: WATER(-AUTHOR,2023)

FIG 70: PRINT 5: SALT WATER(AUTHOR,2023)

FIG 71: PRINT 6: WATER & SAND (AUTHOR,2023)

INSIGHTS:

After experimenting with the idea of capturing movement as a static depiction, a conclusion can be made that patterns or lines can be revealed where elements connect. All elements on site correspond with one another, shifting in-between and from what is above or beneath water, vertical and horizontal boundaries, dynamic and static, or time cycles. It was found that water and the sun overrule most elements and thus creates the most prominent effect. Therefore, ecolines are exposed on the edge of contrasting elements.

FIG 72: COLLAGE OF CYANOTYPE PRINTS DEPICTING THE TRANSITON BETWEEN LIMINAL SPACES ON SITE AS WAY OF MAPPING THE PRINTS (AUTHOR, 2023)

4. THEORETICAL INVESTIGATION:

The above-mentioned conceptual components serve as a roadmap for the design process, influencing theoretical viewpoints and the project's morphological growth. The research topic for this thesis is likewise derived from these ideas and the touchstone. The concepts of a shifting ecological grid and a chain of memories will be further theoretically explored in this section.

FIG 73: MAP INDICATING AXIS (AUTHOR,2023)

4.1. FLUCTUATING ECOLOGICAL GRID –

from site reflection to edges, thresholds, and moving boundaries:

Travelling west to east through the park, I experienced fragments, layers, and transitions between natural and cultural orders, forms, and types. The village opens to the grasslands, through a dense forest, and at the end I discovered an open view of the waterscape. Like a never-ending passage, pockets of diverse but seamlessly stitched landscapes are revealed and concealed. Not knowing what you will catch sight of next, the environment creates a meandering relationship between east and west axis crossing a series of natural transitions. From the ocean, north to the fourth and furthest lake from the sea, at the southern border of the park, a system of lakes and winding channels link the lakes with each other. As the lakes progressively distance themselves more from the sea, the salty first lake is succeeded by ever-fresher lakes, terminating in the fresh water of the fourth lake. With the change in water salinity, the type and nature of the foliage and wildlife adapts to the character of each lake's unique watery edge. To the culture-centred east–west axis, the series of lakes add an irregular nature-centred north–south axis.

The significance is shown where these two co-dependent axis systems form a translucent crossing grid within the park – allocating the siting of this design dissertation. Where the two grids intersect, diverse habitats are slowly woven together. The interaction and interweaving of different ecologies, defines the notion: 'ecotone'. An ecotone is a transitional zone or boundary area where two distinct ecosystems or habitats meet. It is characterised by a blend of ecological features and species from adjacent ecosystems. The term is derived from the Greek words 'oikos', meaning house or dwelling place, and 'tonos', meaning tension or stretch.

Ecotones are important in terms of ecological processes and biological diversity. They provide a transition zone for species to adapt to changing conditions and can serve as corridors for the movement of plants and animals between different habitats. Due to the merging of two ecosystems, ecotones often have a higher diversity of species compared to the individual ecosystems they connect.

To compare merging ecosystems to merging architectural spaces, the notion of in-between or liminal spaces finds importance. Liminal spaces are transitional spaces where movement is activated on various scales and the boundary between inside and outside is questioned.

4.1.1 The edge effect:

The coming together of land and water creates a noticeable edge. The edge effect theory states that the transitional zone or edge between two ecosystems, as found in an ecotone, supports a typical assemblage of ecological conditions. Environment and Nature (2022) suggests that the environmental conditions as well as species' composition at the edge of two ecosystems differ from those in the interior of each ecosystem. In architecture, it can be seen within the experience of spaces where different elements or environments meet, such as the intersection of interior and exterior spaces or the boundaries between public and private areas. Spatial continuity and integration of these spaces can emphasise the coherent transitions, circulation patterns, and visual connections.

Also, by considering contextual surroundings by linking the ecological patterns and the built form, the ecotones are shaped by the environmental surroundings in which they exist and, with this in mind, the architectural response will be to follow the form of the surrounding built and natural environment.

Edward Casey explores the concept of edges in two different contexts, namely, the edges of mental space and visual–placial edges.

Mental edges refer to the implicit boundaries of thinking where conscious thoughts give way to something pre-conscious. In the edged mental space, our life-long intuitive and reflected collection of temporal embodied experiences, memories, rituals, routines, and intuitions blur the distinction, or edge, between mind and body and conscious and unconscious knowledge. (Casey, 2008:1-2).

Placial boundaries contrast the temporal nature of mental edges. Placial edges are not considered infinite but refer to the edges between loci – places. These edges define the location and scene of creation, distinguishing a work from others. They are crucial for both the architect creating the place and the user and visitor occupying, visiting, and identifying with and orientating within the place (Casey, 2008:2)

In both cases, margins play a significant role. Ideas gradually fade away as they reach their boundaries, just as physical locations define themselves within their own limits. Architecture explores the visual and material logic –order, form, and types – of edges, emphasising the importance of the perceptual and material field where both the figure and the ground matter. The architect, user, and visitor create or encounter a margin around central places, contributing to the overall visual and embodied experience. Since the interplay between mental and visual boundaries varies from one situation to another, edges do not conform to a particular type but manifest in numerous forms. Moreover, the concept of 'in-betweenness' is influenced differently by the edges negotiated in architectural design and the mental and embodied perceptions associated with them (Casey, 2008:2).

In between the edges of mental and material spaces, boundaries are defined, a context is created, and visual and embodied perception is shaped. This dissertation investigates the architecture as an edge condition. The edge effect attempts not to define the boundaries of a central interior space and an exterior space (ground), but articulates, facilitates, and preserves the transitory space between figures, between places, in this case the ecotone, and between the natural places of the land and the water.

Precedent study:

DEPICTING VERTICAL EDGES: THE LIGHT OF THE COCHAYUYO

Architects: Domingo Arancibia Tagle

Type of building: Pavilion/installation

Location: Las Condes, Chile

The installation is named after an algae found along the Chile coast, known as 'la luz del cochayuyo'. Conceptually, the idea was to create a space covered in the light of this algae, mimicking the ocean forest of the historic valley to reveal the unknown. The assemblage consists of 18 000 individual pieces of cochayuyos (seaweed), to create a suspended volume under which the viewer can wander (Eventos de Arquitectura, 2019).

Identification of place:

The idea was to create a crater-like space that will become a shelter within the park, forming a boundary that transforms into a refuge area. The topology of the park is modified by excavating approximately one metre below ground level to create a dramatic experience. The excess soil was used to construct a slope, giving the impression of being partially below ground. The creation of the crater was intended to isolate itself from the immediate surroundings, deepening the connection between visitors and the cochayuyos.

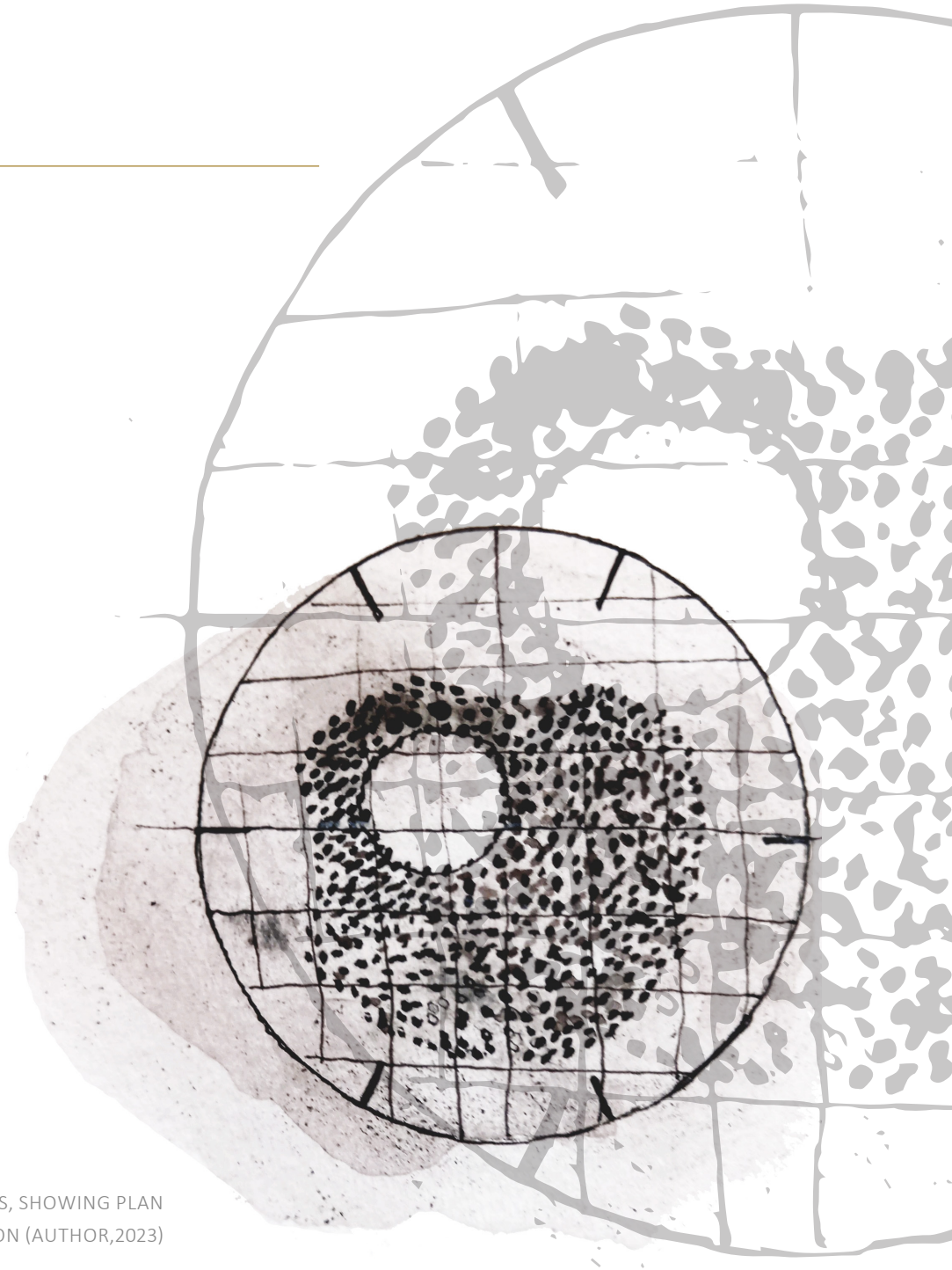


FIG 74: COLLAGE OF INK DRAWINGS, SHOWING PLAN OF PAVILION (AUTHOR,2023)

Configuration of elements:

The installation consists of a circular steel structure and pieces of algae. In other words, it can be described as a hanging framework formed by vertically stretched cochayuyos, supported by water weights. This structure is arranged in a north–south orientation, mirroring the original dry masonry wall of the early Inca period that was already in place.

Elements doing more than one thing:

The installation makes use of materials that tends to be overlooked. The characteristics of the algae was investigated and only thereafter was it discovered that the cochayuyo exhibits the phenomena of light dispersion. This implies that the seaweed automatically 'lights up' when touched by sunlight because of its transparency and shape. The cochayuyo functions as a light wave receiver and diffuser.

Not only does the material diffuse light, but also emphasise the ephemerality of it. The morphology of the pieces changed throughout the duration of the installation and some of the pieces turned in search of natural light, bending and breaking. The changing aspect of time gives the installation a dynamic experience of ephemerality that depicts the influence materials has on one another.

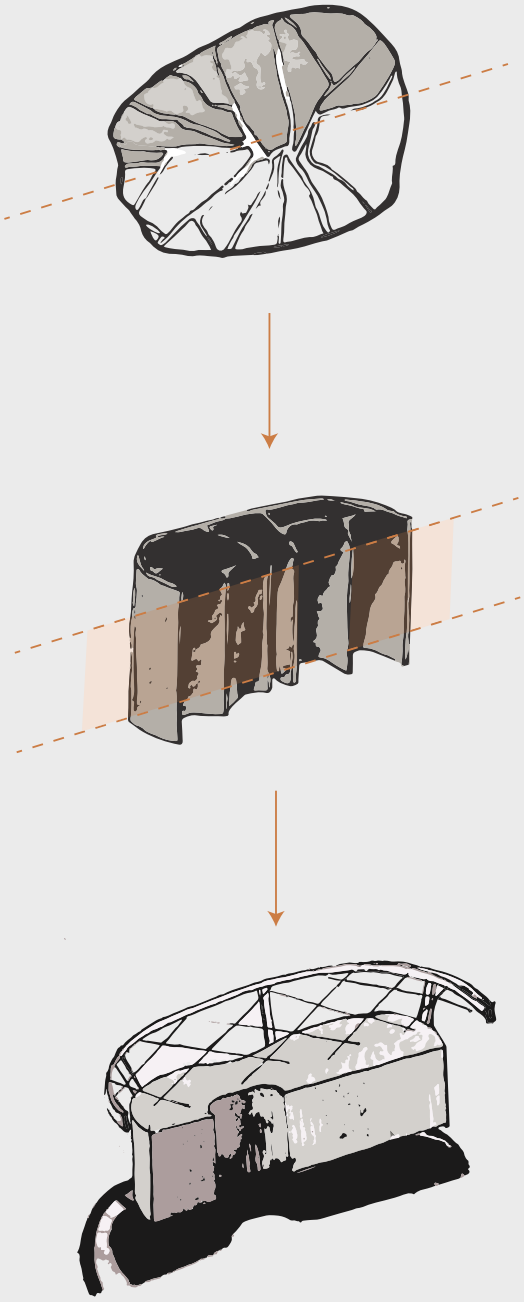
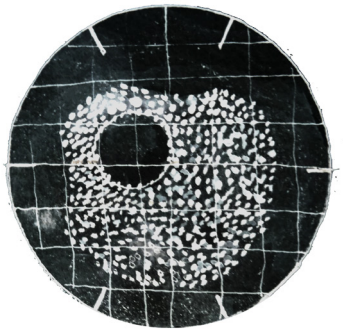


FIG 75: CONCEPT OF PAVILION (AUTHOR,2023)



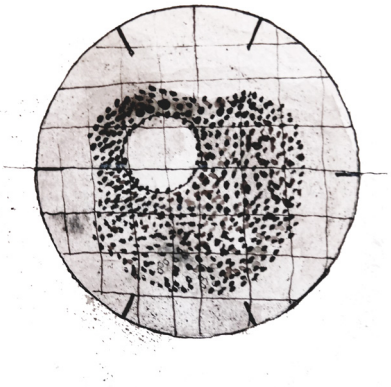


FIG 76:PLAN OF PAVILION (AUTHOR,2023)

Space organisation and geometry:

The space organisation of the project highlights the vertical edges and how it can influence the relationship between the visitor and the experience of the structure. The spaces are a vertical assemblage of three aspects: natural light, cochayuyo volume, and the crater. These elements draw attention to the link between them. The focal point of the structure becomes a boundary that influences the spatial continuity and integration of transition and visual connection.

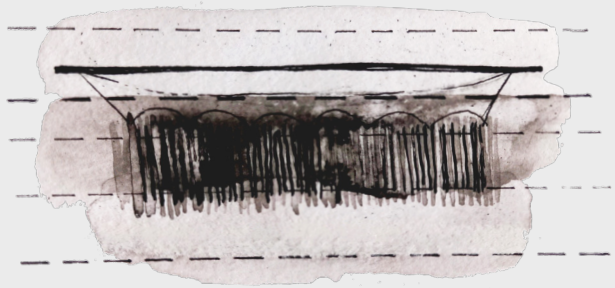


FIG 77:ELEVATION (AUTHOR,2023)

4.1.2 Spaces of transition

Returning to the transitional nature of the culture-centred east–west axis and the nature-centred north–south axis crossing on the site, the site is understood as dynamic, holding the potential of transformative interactions and encounters between different natural, social, cultural, or psychological realms. The site serves as more of a mental and placial threshold or dynamic edge, than a fixed and static edge, which can articulate, facilitate, and preserve the connection between adjoining systems or places – culture making and fishing, land, and water.

Gaston Bachelard points out in his book, "The Poetics of Space", that transitional spaces, such as thresholds, corridors, staircases, and doorways, are linked to the psychological and poetic significance of the site. Transitory areas are seen as spaces of change. Bachelard thinks of such places as spaces of transformation, where people undergo psychological or symbolic changes. Thresholds serve as transitional zones where we leave behind the known and venture into the unfamiliar. To create meaning within or on the transitional space, threshold-architecture depicts the essence of the different environments, places of figures it connects.

Assigning the symbolic meaning of 'a threshold' to architectural places, changes the psychological way we construct, understand, and experience the architectural places. Here the architecture does not become a single figure distinguished by edges from the ground/landscape, instead the architecture attempts to weave into, connect, accentuate, and preserve the already there natural places. This idea of adjoining transitional spaces can then be depicted within the feeling one get when moving through the spaces.

"The threshold is the space of passage, the area of fluctuation between one state and another." – Pallasmaa (The Thinking Hand: Existential and Embodied Wisdom in Architecture, 2017)

Juhani Pallasmaa, highly influenced by the phenomenological perspective and focusing on the sensory aspects of the bodily interaction with architectural spaces, speaks of topics relating to the built environment's transitory experience. He emphasises how thresholds are important sites of encounter, transition, and transformation. Beyond the purely visual perception of a threshold, threshold spaces, Pallasmaa holds, accentuates dynamic experiences by enticing embodied movement and changing sensory emotions.

These threshold spaces become passages meandering between the worlds. Serving as thresholds between various contexts, transitional spaces encourage the body to interact with the everchanging spatial movement of light, materiality, and sounds.

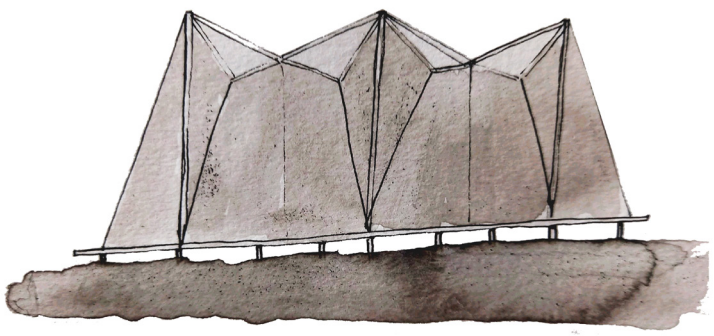


FIG 78:ELEVATION (AUTHOR, 2023)

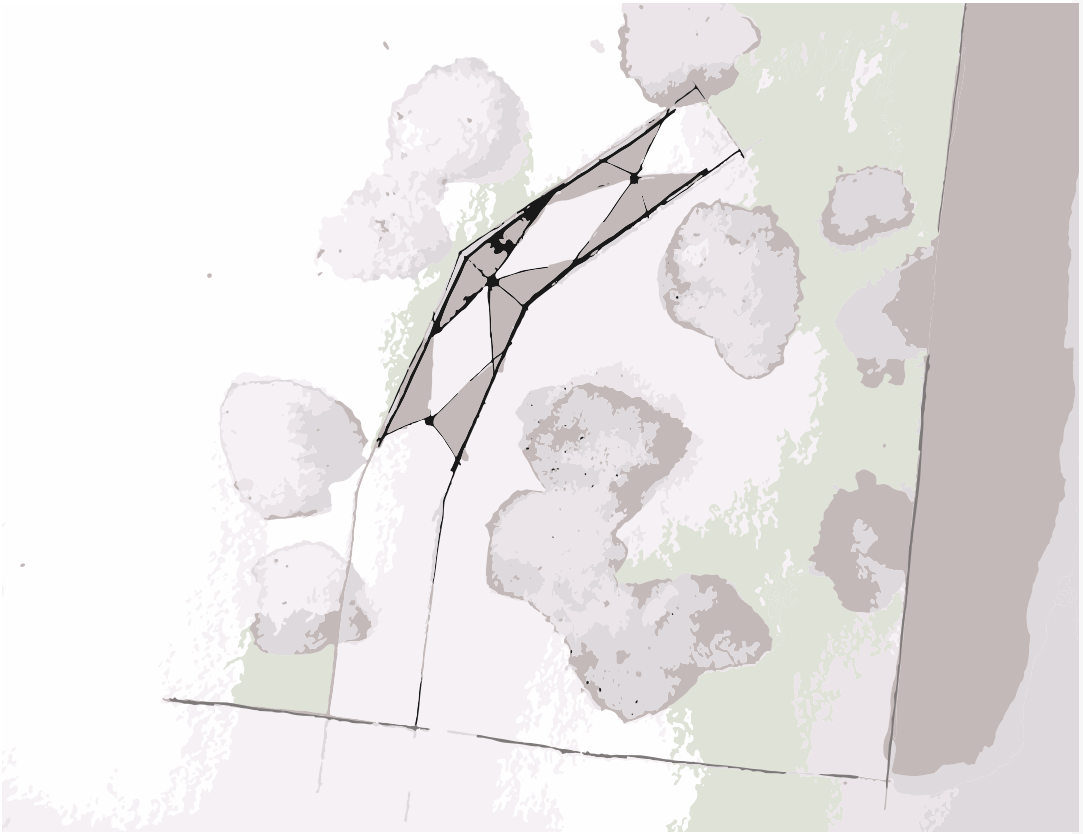


FIG 79:VATICAN CHAPEL PLAN (AUTHOR,2023)

Precedent study:

ARCHITECTURE AS THRESHOLD: VATICAN CHAPEL

Architects: Foster + Partners

Type of building: Pavilion

Location: Venetian Island of San Giorgio Maggiore

The chapel is situated within a wooded section on the outskirts of the Venetian island of San Giorgio Maggiore. The initial idea behind the design was to incorporate three symbolic crosses placed in the natural surroundings, similar to a canopy-like covering. As the design process progressed, these crosses transformed into a tensegrity framework composed of cables and masts, while the covering evolved into a lattice made of wood, affixed to this framework (ARCH20, 2021).

Identification of place:

Initially the project started with the choice of site, at San Giorgio Maggiore, near Palladio's church and the Teatro Verde. The site has two mature trees that elegantly framed the view of the lagoon. It resembled a small oasis within the garden, offering an ideal setting for viewing. The intent was to design a compact space filled with dappled shade, far removed from the usual commotion of passers-by, instead focusing on the serene water and sky beyond – essentially, creating a sanctuary.

Configuration of elements:

The architectural components of the chapel involve the tensegrity structure (three crosses), wooden platform, viewpoint, and wood lattice work. The chapel's design embodies the original concept that proposes to create a sense of lightness and a sensitive approach. It is composed of a ramped steel floor structure that supports a wooden deck and a structural system consisting of steel uprights and crossbeams, braced by tensioned steel cables and small inclined circular hollow sections. These components allow for the separation of horizontal crossbeams and vertical masts, while maintaining structural stability, creating a roof structure capable of withstanding both vertical gravity forces and lateral wind loads.

Modifying elements:

The interior space is enclosed by a series of slender arch timber slats that extend from the deck to the tensegrity structure. These slats permit dappled light to filter into the space, offering shade and defining the overall volume of the pavilion.

Utilising the existing:

The ramped platform, situated as the primary floor and walkway (as depicted in Figure_), serves to create an enclosed passage that leads one to the final viewpoint. However, due to the wooden lattice work facing the surrounding trees, it maintains a connection to the external landscape rather than isolating itself. The lattice work provides space for the jasmine vines planted around the structure to grow and intertwine with it, softening its lines and emitting a subtle fragrance, enhancing the atmosphere of spiritual tranquillity.

Architecture framing specific elements:

The pavilion frames a particular view and atmosphere when walking through. The form-giving of the structure creates a pattern of enclosed (shaded) and open (view of trees) spaces, where light filters in. This creates a progressive link between the interior and exterior to finally reaching the focal viewpoint.

A hierarchical composition is, thus, shaped by the transition from inside to outside sights, where the passage emphasises the threshold space as one walk through.

FIG 80:Vatican Chapel interior view (Ghinitoiu, 2021)
FIG 81:Vatican Chapel exterior view (Ghinitoiu, 2021)

4.1.3 Movement within boundaries

Threshold dynamics are predicted to take place close to boundaries. Natural boundaries are created on the edges where elements or ecosystems meet. In this case, the liminal spaces are the main zones of movement within these invisible boundaries. The people's daily paths portray the most prominent interaction between liminal space and ongoing movement. Spatial hierarchy can be created where movement is the most obvious.

The French philosopher and sociologist, Henry Lefebvre, explored how space is produced by way of the social acts within it. He stated that, "Movement patterns are shaped by social structures and cultural meanings (Lefebvre, 1991)." An architecture that responds to the movement needs to adapt to the patterns already culturally shaped by the community and their way of living.

To sensitively integrate the building into the continual dynamic and rich surroundings, the cultural habits circling around the fish traps becomes a key reference. The handmade palisade system of the fish traps is the only existing built form. Thus, the main reason the community visits the site. These structures inform the architectural approach by using the rich cultural history – as equally real and intangible- and helps to frame the project in a culturally appropriate manner. The design can then be seen to activate the liminal spaces to create accessibility. This could be seen as corridors or entryways for movement between fragmented habitats.

In this context, the corridors exhibit an infinite interaction between boundaries and the areas between, including both the surrounding landscape and the pathways themselves as they undergo a transformation, as can be seen in figure 82. The location embodies a dynamic state of existence within the space, refusing to remain static and continuously evolving the portrayal of landscapes through an endless display of shapes. These passageways evoke a feeling of openness, offering a multitude of perspectives to perceive the same land across different seasons and places, creating an uncontainable arrangement of visual encounters.

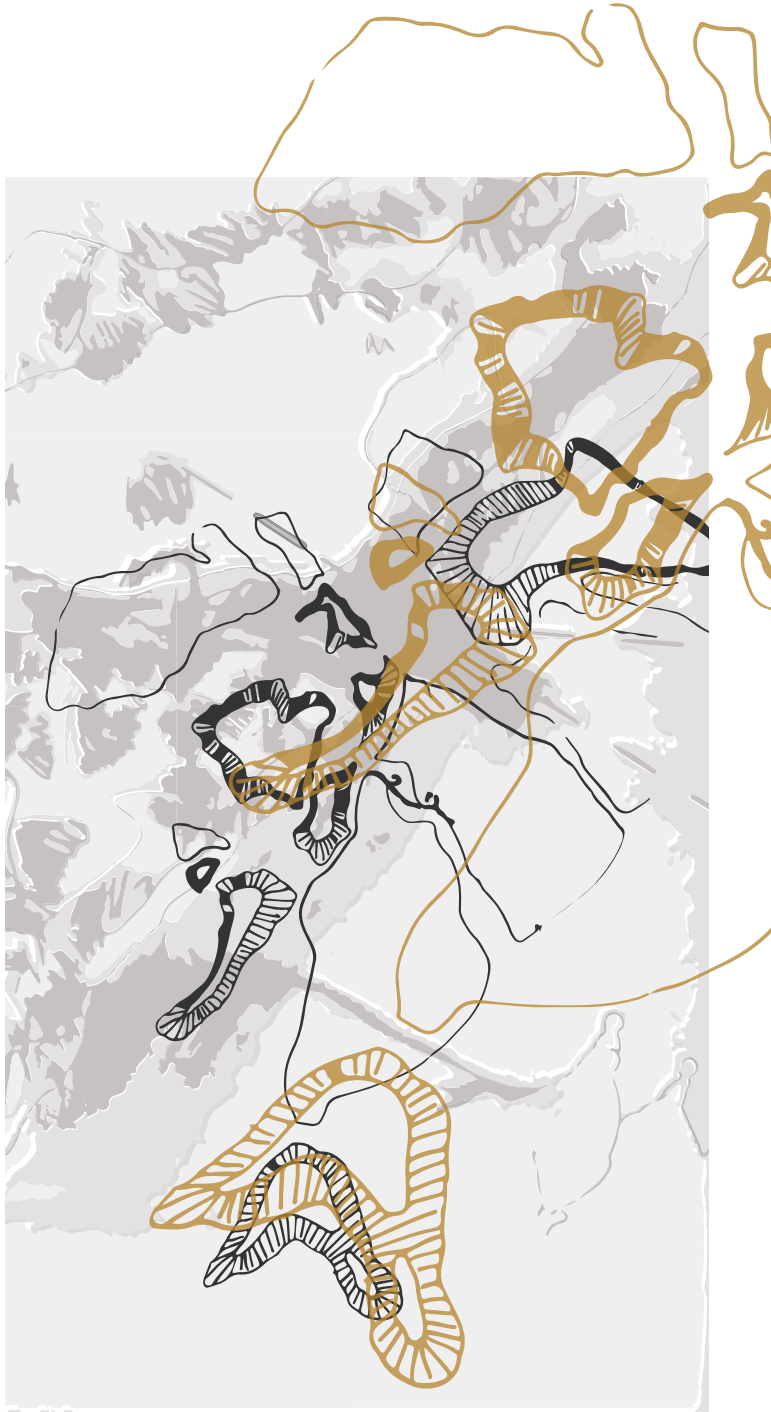


FIG 82: ECOTONES ON SITE
(AUTHOR,2023)

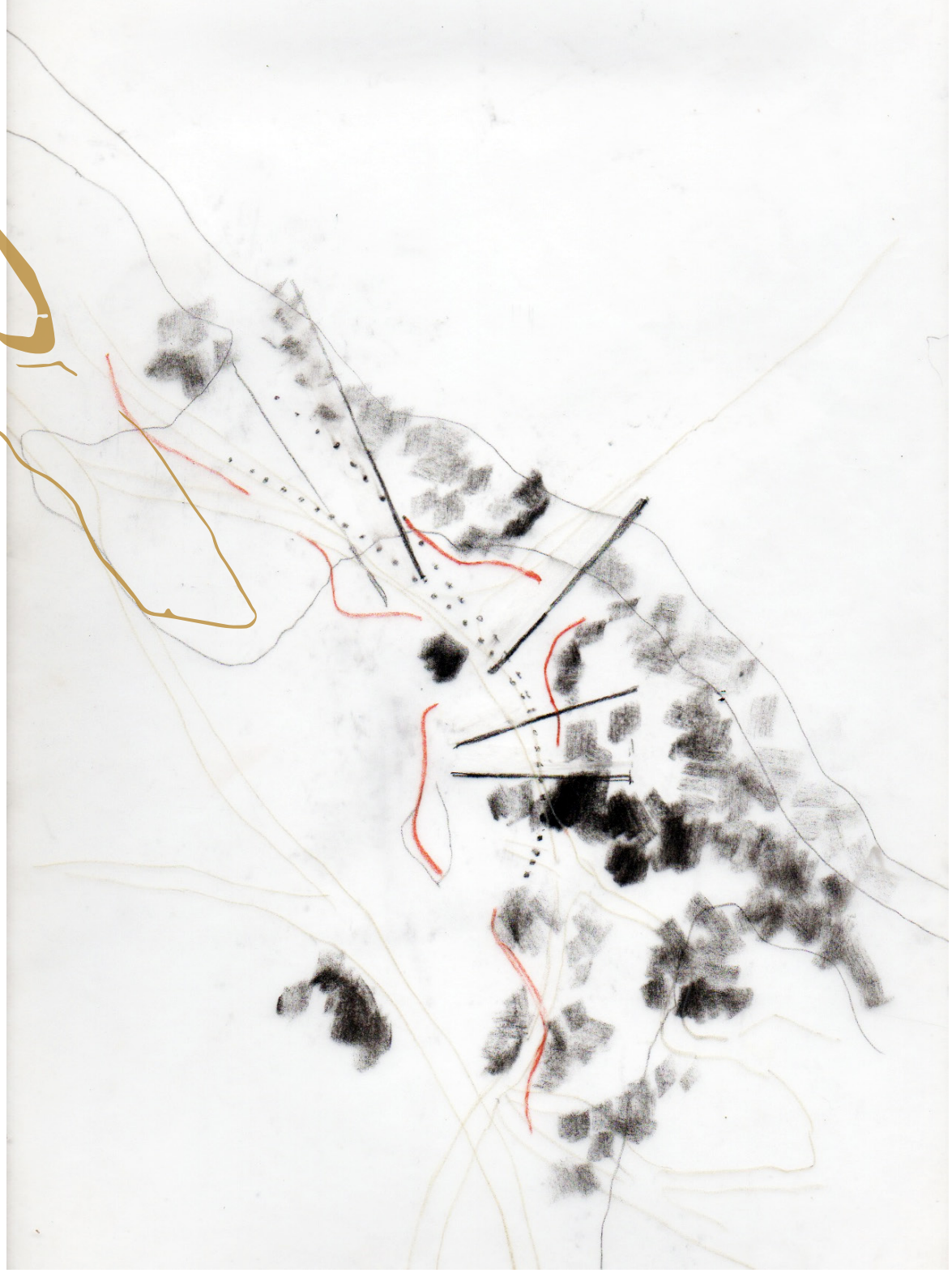


FIG 83: INTERACTION BETWEEN
BOUNDARIES (AUTHOR,2023)

Precedent study:

WICKER MEMBRANES

Architects: Andrea von Chrismar

Type of building: Installation

Location: Chile

The installation is composed of a constellation of wicker membranes that have the ability to create an intricate and durable design using the flexibility of the fibre and firmness provided by the weaving technique. This methodology distinguishes the use of wicker as building materials that is particularly used in Chile since the colonial times.

The construction method is particularly significant because of its seamless blend of natural, unprocessed material with an inherited technique. The installation not only exhibits the capacity to create architectural spaces but also objects, achieving ideal organisation and harmony in terms of form, structural integrity, and spatial quality.

The factors that affect the characteristics of the technique and possibilities include the wicker fibre's thickness, the geometry used to arrange the weave, how it is constructed, and the handmade method utilised to create them. These variables provide design tools for the material's best performance at each scale and use (Spangenberg, 2013).

On plan, the configuration of the membranes is composed for the visitor to walk in and around them. The membranes themselves serve as the boundary line or focal point, and the liminal space around them is spatially organised to create interactive spaces, depending on the visitor's position. The layout of the membranes determines the visitor's movement patterns.

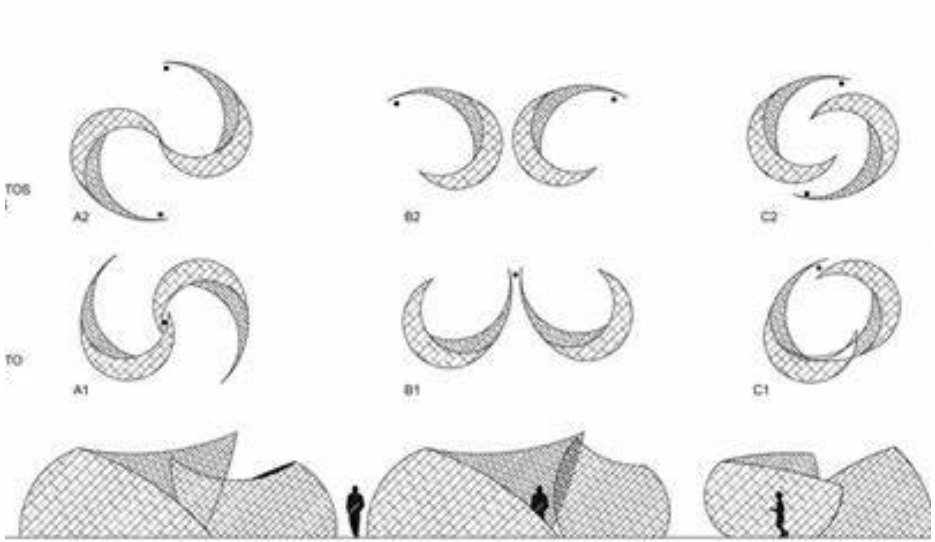


FIG 84: PLAN AND ELEVATION (FURUTO, 2012)

FIG 85: MATERIAL TECHNIQUE (FURUTO, 2012)

4.2. CHAIN OF MEMORY:

The community holds significant cultural, social, and historical value. Therefore, analysing how the community interacts with the site is essential.

Considering cultural succession allows us to understand the richness and diversity of the cultural dynamics, and how parts of cultural continuity and change are shaped by elements of preservation, adaptation, and coexistence.

To analyse the site as a continuous chain of tradition, culture and memory, we need a better understanding of the people and the challenges they face. This could then inform a specific programme influenced by cultural habits and contextual factors.

The following two points delve into the cultural use of materials as symbolic depictions of repetitive behaviours.

4.2.1 Ephemerality as source

Traditionally and still today, nature serves as the primary source of materials for constructing any form. The community relies solely on the materials available to them. Currently, these materials have a short life span, typically lasting only about a year before requiring replacement of restoration. Hence, the ephemeral value of these natural materials (the idea that something only exists for a moment), is closely tied to the annual cultural cycles.

Adopting a critical regionalism approach could clearly capture the essence of time and material decay within the existing structures. In this context, materiality plays a crucial role in demonstrating a sensitive approach towards site preservation.

John Ruskin believed that a building's choice of materials, their craftsmanship, and their texture all communicated their historical and cultural significance (Chatterjee, 2019). And the impression of 'truth to materials', emphasises the idea that architectural design should be genuine and expressive of the qualities and features of the chosen materials. This creates a sense of authenticity that links architecture with its surroundings.

"Materials possess the power to evoke memories, stimulate our imagination, and connect us with our bodily and sensory experiences."- Pallasmaa (The Thinking Hand: Existential and Embodied Wisdom in Architecture)

Likewise, Pallasmaa also points out the importance of materiality in preservation and architecture. He places special emphasis on how materials' spatial, tactile, and visual properties influence how a person feels and experiences a place. This contributes to the preservation of the originality and cultural significance of a space. Working with materials that constantly need to be restored, creates interplay between the preservation and materiality that would guide the character of the contextual heritage.

Case study: Critical regionalism

THE TSONGA HUT TYPOLOGY AND KOSI BAY VERNACULAR:

Conditions:

The residents in this area face specific difficulties due to the soil conditions of the sandy coastal plain. In addition to the restricted agricultural options, there few rocks and clay resources that are appropriate for building, crafts, or processing food. However, the utilisation of indigenous vegetation has offered various solutions to these challenges, and this is evident in the typology of the Tsonga built environment (Cunningham and Gwala, 1986).

Identification of place:

After selecting a location, the prospective hut owner obtains permission from the local headman to proceed with construction. Using a piece of string secured to a peg, they mark out a circular area with the desired radius for a round hut. For square or rectangular structures, the perimeter is outlined using pegs placed at each corner. Circular huts typically utilise reed walls, while square huts make use of lath woven walls due to the limitations of creating straight lath woven panels (Cunningham and Gwala, 1986).

Traditionally, men are responsible for building the huts, while women gather thatch and prepare materials such as twine, rope, and thatching mats. Because the construction process often involves threading binding materials back and forth, it typically requires a minimum of two men to work together.

FIG 86: GRASS DRYING AT WATER EDGE (AUTHOR,2023)
FIG 87:WOVEN MATS FROM DRIED GRASS (AUTHOR,2023)

Construction method:

The construction of the walls and roof is carried out separately. Once the roof framework is finished, a group of helpers assists in lifting it onto the walls, and supporting poles are installed. If the hut owner decides to relocate the hut to a different site, the reverse procedure is followed.

- Walls:

Thin poles are planted in the sand, spaced along the perimeter of the hut location. The poles are further reinforced by thinner laths that are bound together to create a horizontal ring within the poles. Then, using the vertical poles as a spacer, a second horizontal ring is bonded into position outside the poles next to the inner ring. Binding materials are buried on site in the wetted sand to moisten them to make the material more elastic. The reeds are then placed between the lath poles and the horizontal spacer poles are removed.

- Floor finish

The floor of the hut is finished with soil that comprises mostly clay and cow manure to harden the floor.

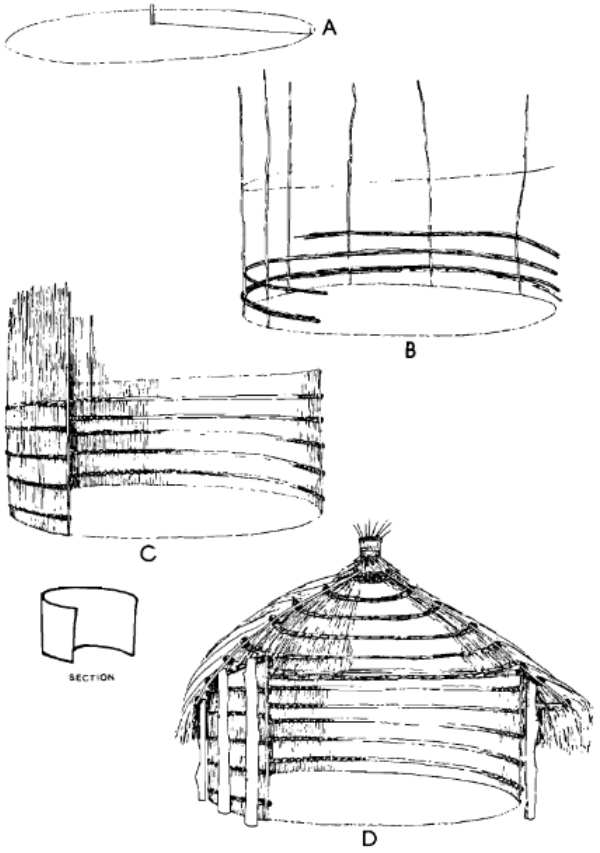


FIG 88: HUT CONSTRUCTION STAGES (CUNNINGHAM AND GWALA, 1986)

- Roof:

The roof is constructed upside down to form the roof apex. The materials are stuck into a hole and supported and woven around the laths. Sharpened, thicker laths are put into the gaps between the weaving that is resting on the climbers suspended between the roof's poles. Later, these are held up by lath rings both inside and outside the roof framework. After that, the roof is raised and set over the supporting poles. The group of laths bound next to the uppermost circle of laths supporting the wall prevents the roof from moving downward.

For a standard rectangular dwelling, between 40 and 50 mats are required, whereas between 20 and 30 mats are required for a circular hut. The roof structure of the hut's peak is where these bundles are tied on. This is woven from grass and is frequently finished with pointed sticks to fend off birds.

To finish off the roof structure, a thatch layer is added, and bark twine is woven around the inner lath rings of the ceiling; additionally decoration is added.

A part of the hut wall between inner lath rings can be decorated by way of stitching circular decorative discs that are attached to the roof (Cunningham and Gwala, 1986).

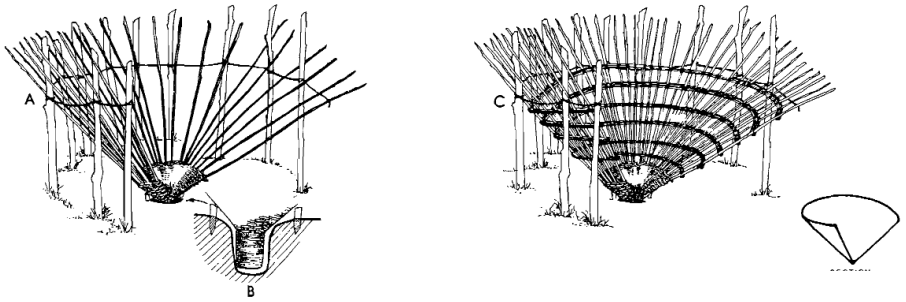


FIG 89: ROOF CONSTRUCTION STAGES (CUNNINGHAM AND GWALA, 1986)

FIG 90: INTERIOR OF TRADITIONAL DECORATED HUT (AUTHOR, 2023)

4.2.2 Mimicking nature

As mentioned above, the use of natural materials plays a significant role in the building methodology of the park. The traditional woven fish traps consist of handmade palisades that are constructed offshore and then assembled and planted in the lakes. The goal of the traps is to capture fish swimming upstream back to the sea to spawn. Larger fish are captured, whereas smaller fish can squeeze through the palisade gaps.

The traps are designed with the intention of deceiving or manipulating, making them mimic nature in order to lure fish for daily sustenance. In capturing the interplay between artificial and natural materials, they create a space that subtly reflects the environment.

This concept of guiding individuals into a particular space can be reinforced by combining the idea of enclosing the areas with high spatial qualities and mimicking the natural material use. Using natural processes, concepts, and forms as inspiration for building design and construction is known as 'biomimicry', aligning with the principles of the Biophilia theory. According to Edward O. Wilson, people prefer environments with natural components and have an instinctive connection to the natural world (Wilson and Campbell, 1996). To improve connectedness to the natural world, the intent is to create designs that mimic natural patterns, by using natural materials.

This contributes to the importance of regional vernacular architecture and local construction methods that are acknowledged by critical regionalism. A strong sense of place is the goal of critical regionalism. Buildings that respond to the topography, temperature, materials, and social context of the site are intended to be anchored in their environment. The architecture creates a meaningful link with its surroundings by incorporating aspects of the local environment, such as the usage of regional materials, spatial layouts, or local building forms.

Case study: Fish traps

The traps have remained largely stationary in their original locations over the years due to the limited movement of the main fish harvest, which continues to follows the same tidal swimming route it always has. These areas are situated near the banks of the lake.

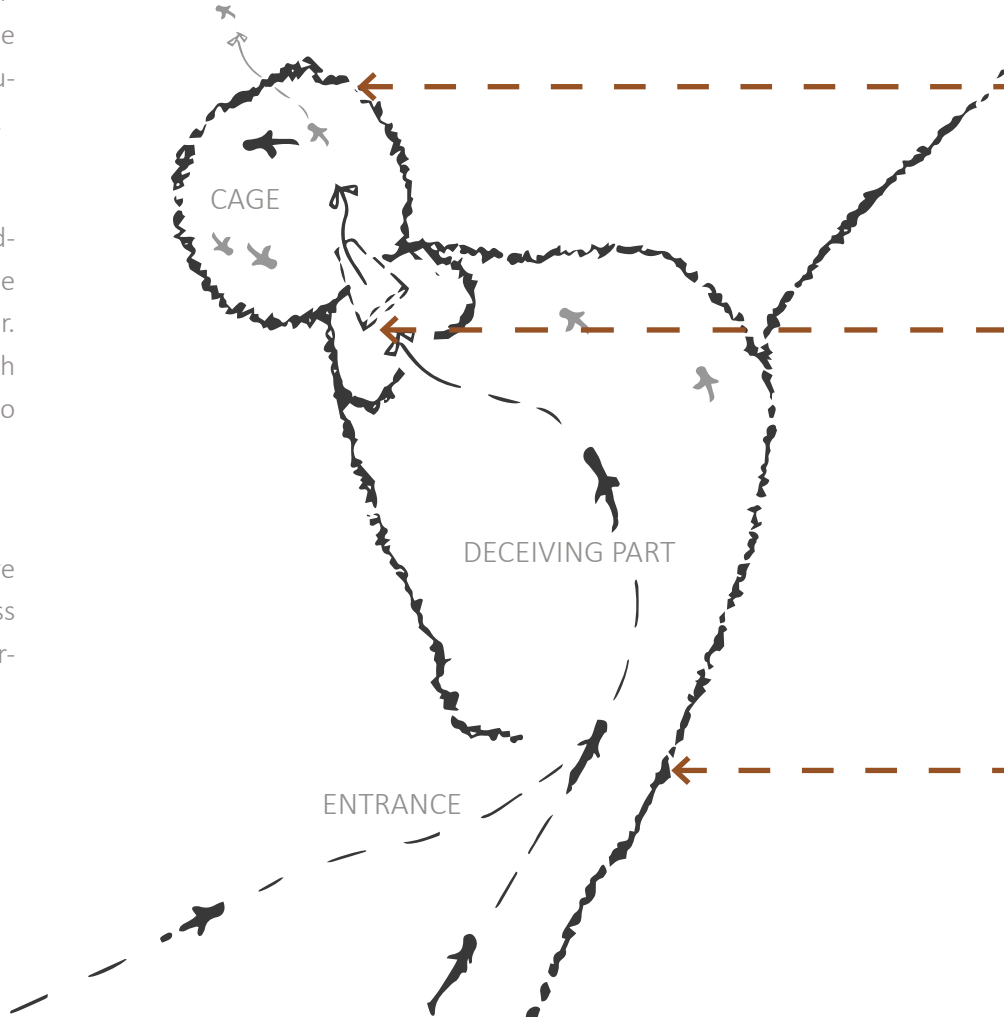
The fish traps are made up of several wooden structures that create a network of channels and barriers that let fish pass through but not out. The ocean and the creatures that inhabit the traps are considered sacred by the Thonga people. Consequently, the fish traps' construction is ecologically friendly and sustainable. The design of the traps allows little fish to get through, protecting the breeding population and preventing the decline of the fish population (James M, 2023. Online).

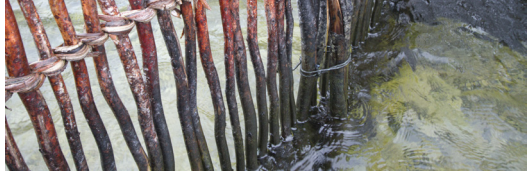
Basic plan of trap/combined elements:

The design of the fish traps reveals the Thonga people's profound understanding of the natural world and fish behaviour. They construct these traps at precise locations along the water's edge, where fish gather at specific times of the year. Additionally, the traps are strategically built to take advantage of the tides, with channels and dams positioned to create a natural water flow that draws fish into the traps.

Accessibility/movement around traps:

The fish trap employs an optical trick to deceive the fish. Initially, the fish perceive the large circle as at the entrance as passable space. However, once they cross over to the other side and enter the circular trap, they encounter the smaller circle, making escape impossible.





Morphology:

The Thonga people build fish traps using traditional methods without using any modern tools or technology. They use only natural resources to construct the traps, such as dried silver oak tree branches for strength and reeds for string.

Spatial organisation:

The spatial order of the structure is divided into three parts: the entrance, the deceiving part, and the cage. The spaces are influenced by the density of the material to mimic the natural topology of the environment. The space allocation is defined by the movement of the fish.

Liminal spaces serve a dual purpose for both fishermen and the trap itself. Depending on the user of the space, organisation thus becomes inversely defined.

FIG 91: PRE-CONSTRUCTED “KRAAL” (AUTHOR, 2023)
FIG 92:PRE-CONSTRUCTED “KRAAL” (AUTHOR, 2023)
FIG 93: BASKET (AUTHOR, 2023)
FIG 94: INDICATION OF CONNECTION BETWEEN HEART-SHAPED TRAP AND EXTERIOR STRUCTURE (AUTHOR, 2023)
FIG 95:

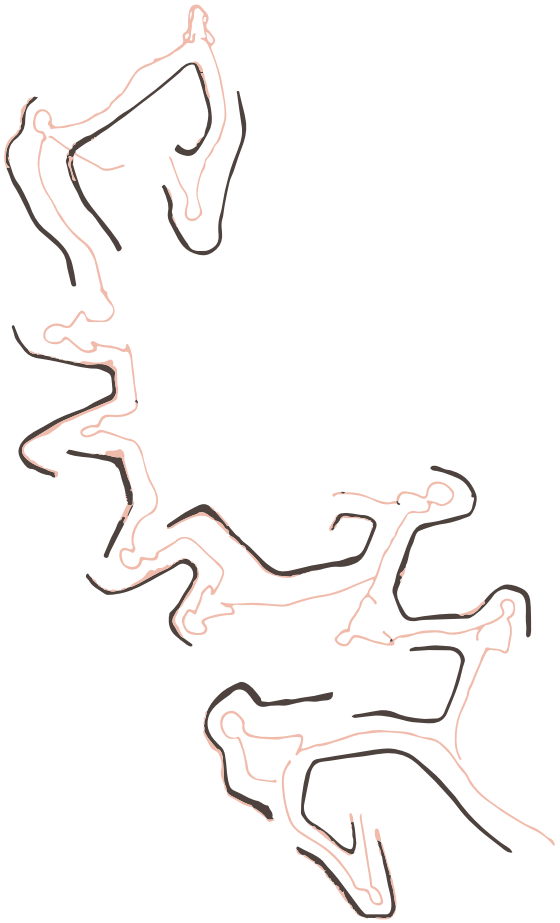


FIG 96: IMAGE TRACE OF TRAPS DEPICTING BOUNDARIES AS PASSAGEWAYS OF MOVEMENT (AUTHOR, 2023)

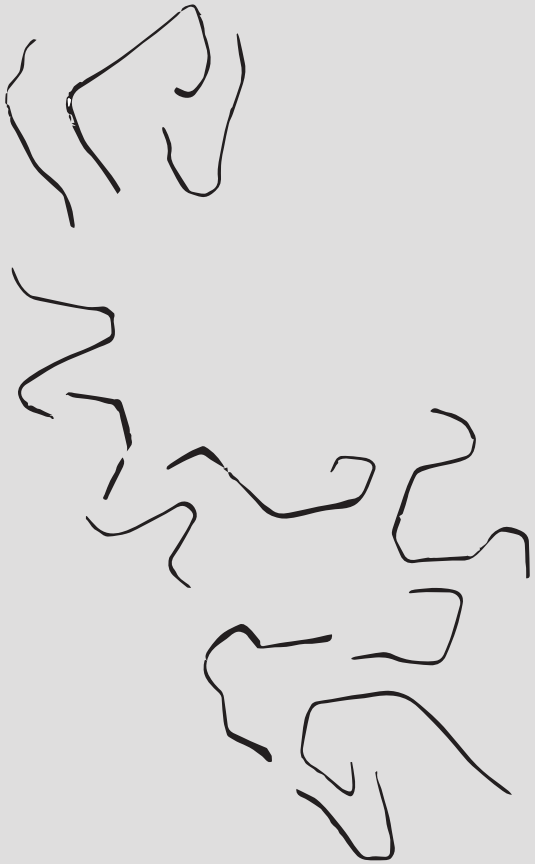


FIG 97: CREATING LIMINAL SPACE (AUTHOR, 2023)

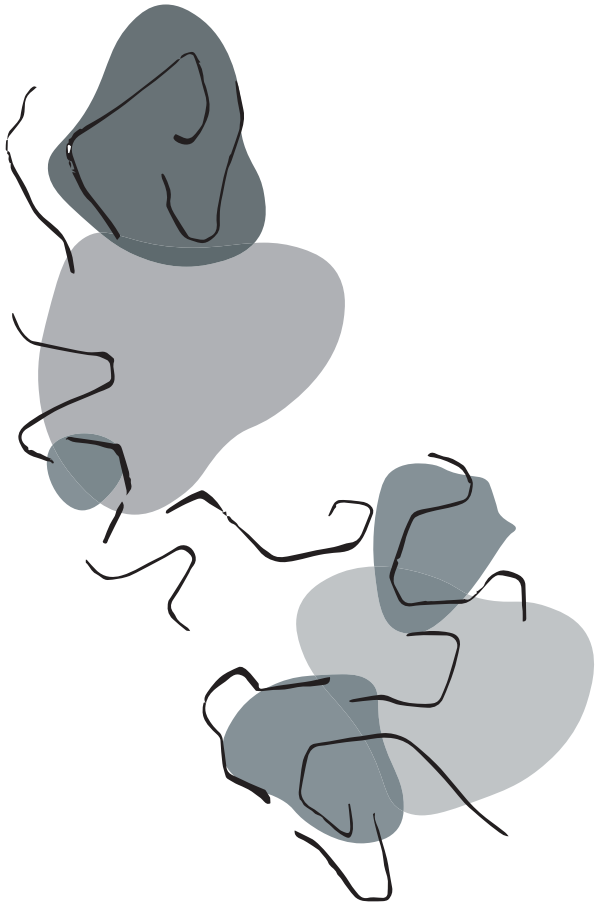


FIG 98: TOWARD SPATIAL ORGANISATION (AUTHOR, 2023)

Precedent study: Sandworm

Architects: Marco Casagrande

Type of building: Installation

Location: Wenduine coastline, Belgium

The installation effortlessly transitions between the realms of architecture and environmental art, being crafted entirely from willow, and inspired by the indigenous understanding of an ongoing interplay between the artwork and its natural surroundings. The work is a human-made structure that aims to integrate itself into the natural environment through its adaptability and organic essence.

Constructed to represent the site-specific characteristics of the tidal beaches at Wenduine, construction organically emerge from its surroundings, responding to the environment, embodying, and maintaining its unique identity, parallel to every other living being. The structure depicts how the built environment serves as a bridge between human nature and the natural world (Zimmer, 2012).

FIG 99: ELEVATION (ROSENFIELD, 2013)
FIG 100: INTERIOR VIEW (ROSENFIELD, 2013)

4.3. CONCLUSION:

The theoretical investigation helps to better understand the site's poetic and spatial qualities, which, in turn, informed the theoretical approach and function of the project. The chapter developed an architectural language that builds on the interwoven ecological principles to create spaces that preserve the rituals of the site. The typology, morphology and topology of the site were investigated and interpreted throughout chapters 1 to chapter 2 to create possible design tools.

03

PART 3: DESIGN DEVELOPMENT

This chapter builds on the foundation established in chapters 1 through 2, concluding with a thorough design synthesis. It explores the development of the edge place and demonstrates how elements including the site, culture, and theoretical frameworks influenced the design process. The chapter traces the progression from the early conceptualizations to the final designs that are suggested.

3.1 ACCOMMODATION LIST

LOCAL COMMUNITY

Tsonga Tembe Community

TOURISM

Fishermen
Fish bait traders
Research
Wildlife
Birdlife

Fishing
Photography
Mangrove species
Butterflies

MUNICIPALITY

iSimangaliso Wetland Park

COMMUNITY PAVILION

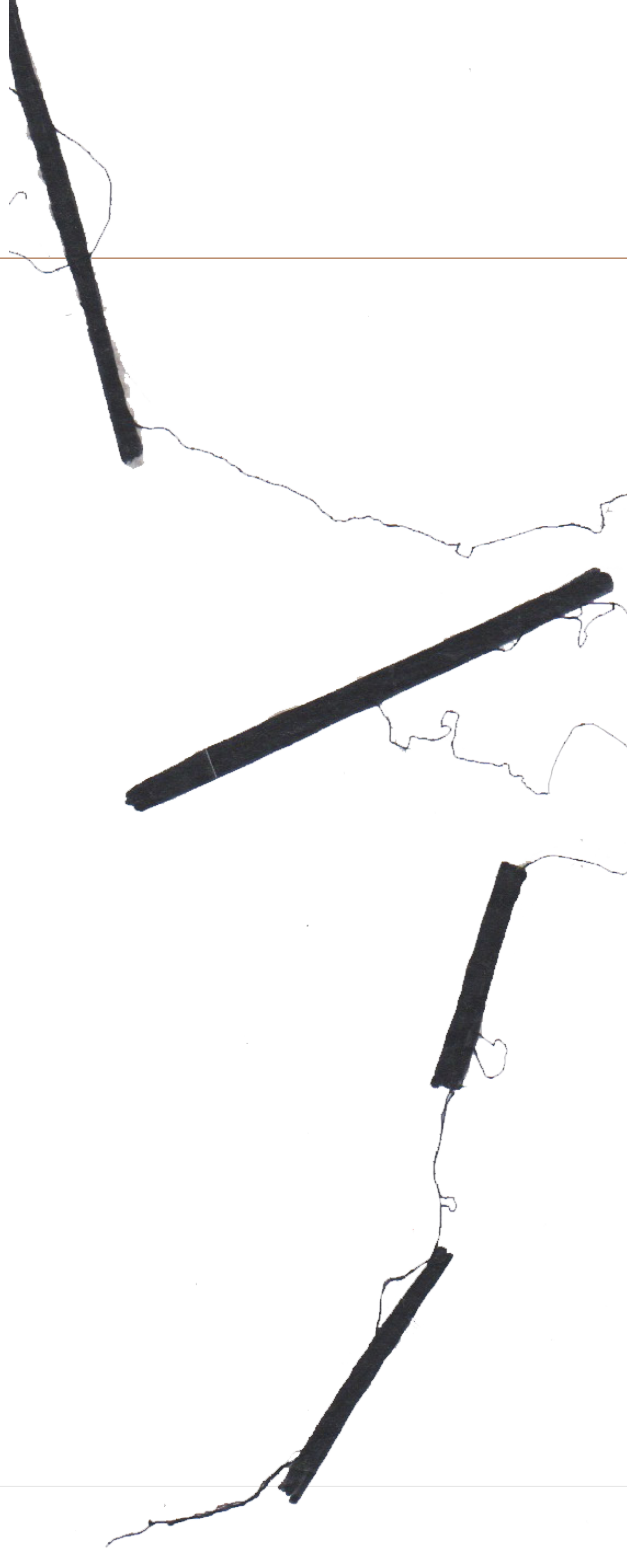
- gathering place
- weaving workshop
- storage
- grass cleaning/drying
- kitchen
- ablution
- trap restoration
- trap making
- storage
- fish cleaning
- guids lockers
- guids waiting area

VISITORS' PAVILION

- pier to lake
- waiting area
- ablution
- reception
- shops
- gathering areas
- exibition
- coffee shop
- storage
- small kitchen

SATILLITE PARK OFFICE

- reception
- offices
- lounge
- storage
- ablution
- kitchenette
- volunteer lounge
- locker room
- kitchenette
- ablution



3.2 INITIAL DESIGN PHASES

PHASE 1: LINK BETWEEN LAND AND LAKE

The design concept originated from the connection between the land and the lake. It was influenced by the unique features of the site and the specific needs of the community. This investigation focuses on preserving both the natural environment and the human activities within the wetland ecotone which acts as a bridge between the land and the lake, as well as work and living spaces. As discussed in the theoretical exploration in part 2, the site establishes a clear axis. This axis, illustrated in figure 101, serves as a connection point for all activities.

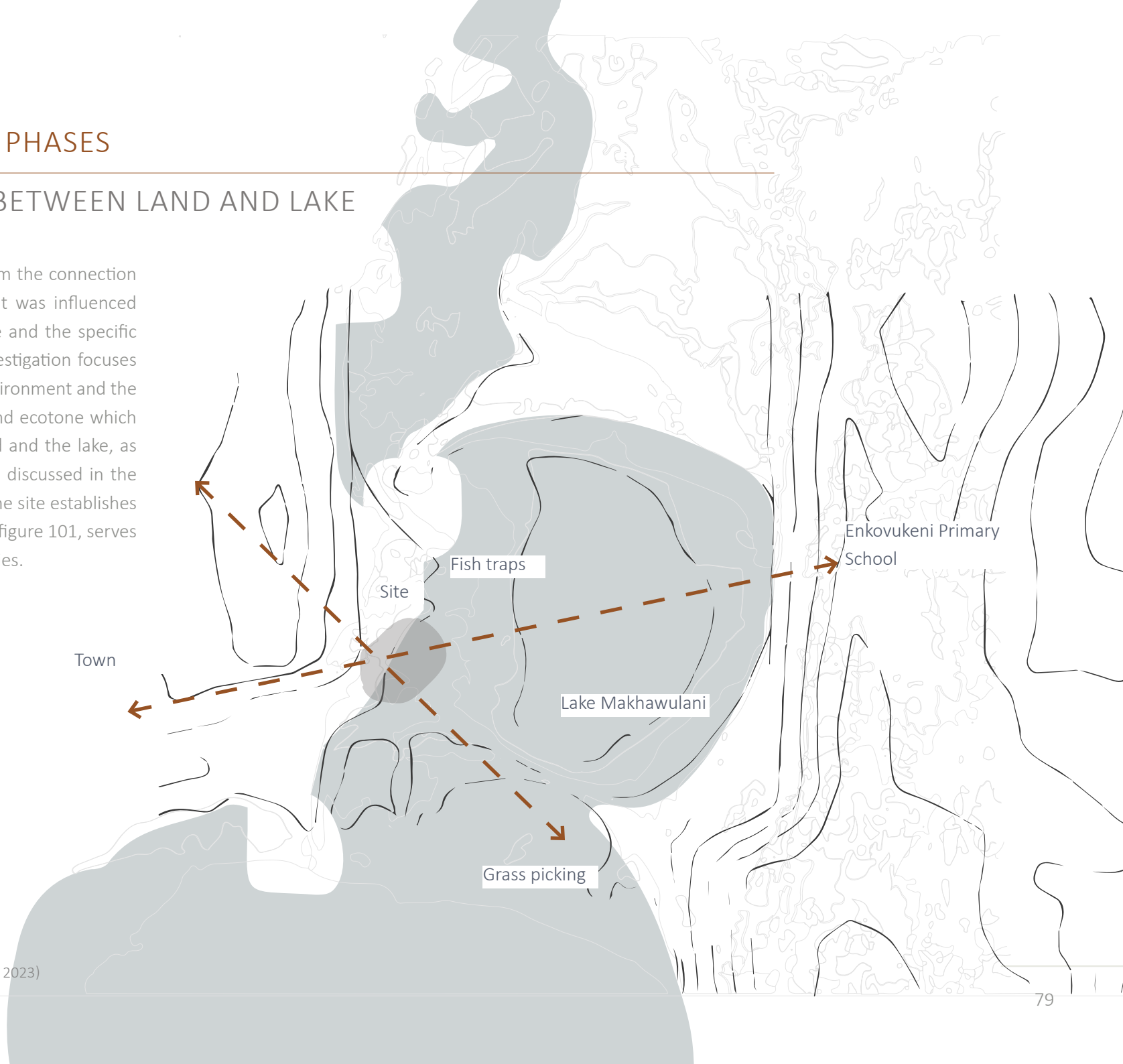
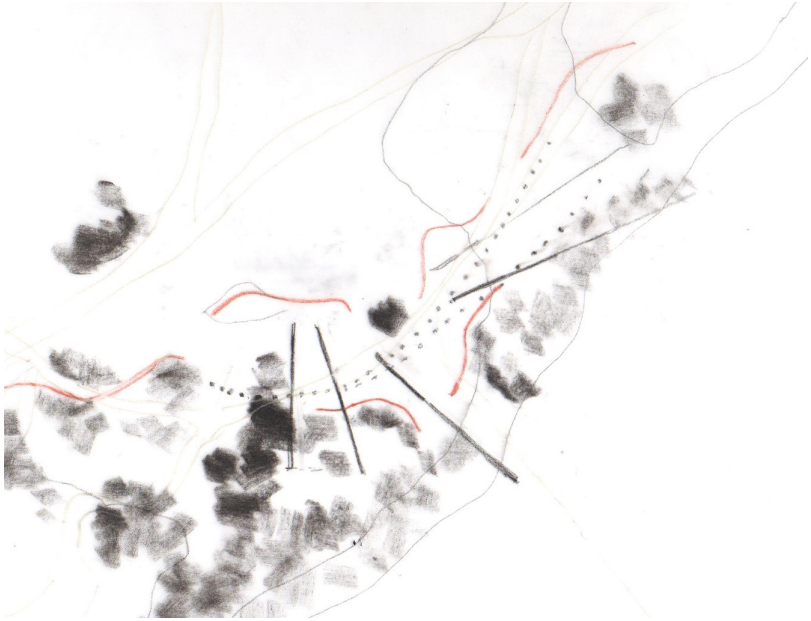


FIG 101:INDICATION OF AXIS (AUTHOR, 2023)

PHASE 2: MOVEMENT PATTERNS

In Phase 2, the concept of the axis is delved into through the analysis of movement patterns. This exploration ties back to the theoretical concept of movement within defined boundaries, where pathways become reflections of one another. The study focuses on movement occurring within the liminal spaces, accentuating these transitional areas. By examining how people pass through these liminal spaces, the exploration highlights the interplay between human activity and these transitional zones, deepening our understanding of the dynamics within these spaces



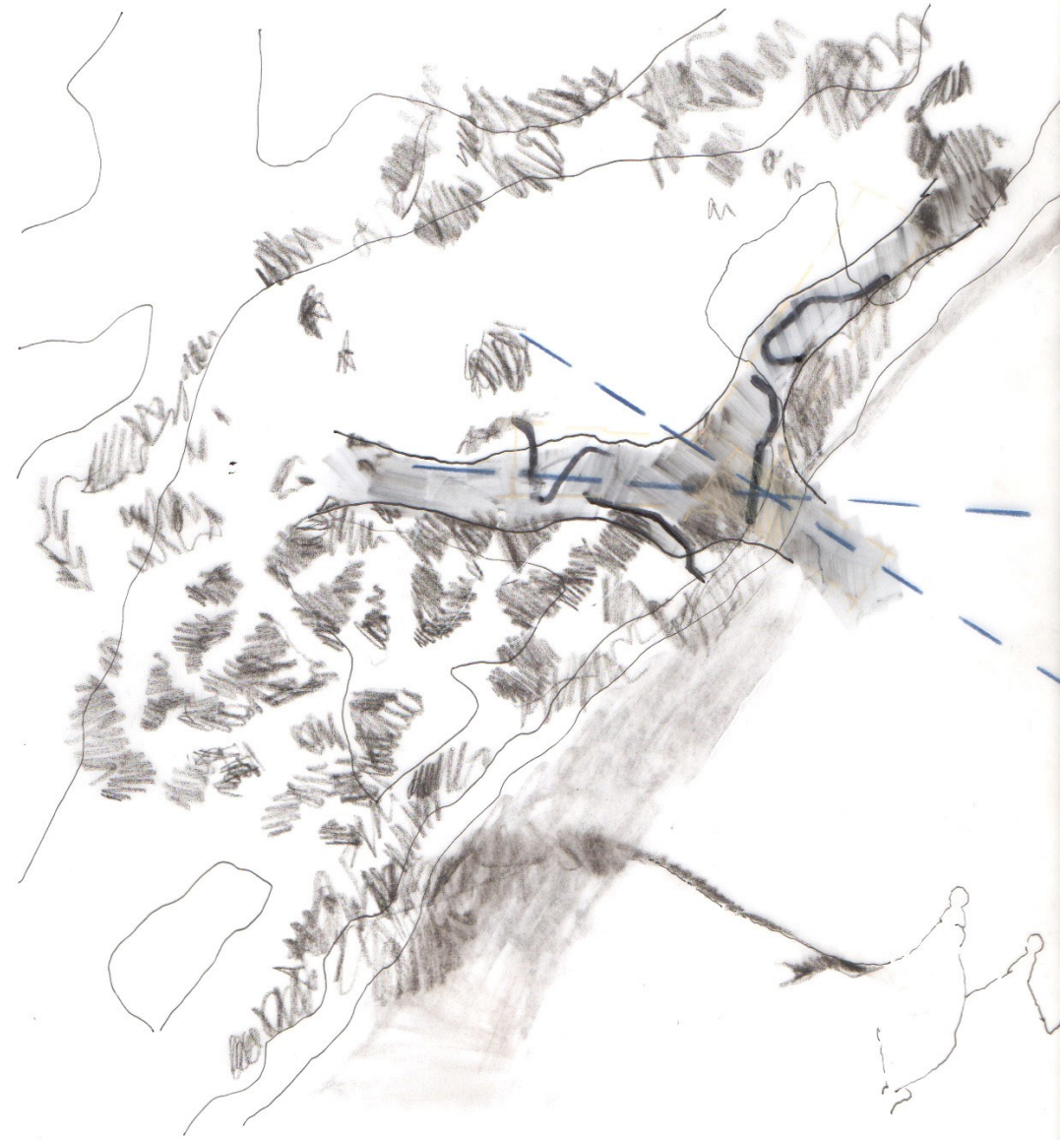


FIG 102:INDICATION OF MOVEMENT ON SITE (AUTHOR, 2023)
FIG 103: LIMINAL SPACE (AUTHOR, 2023)

FIG 104: MOVEMENT LINES AROUND TRAPS (AUTHOR, 2023)

FIG 105:TRAP LINES DEPICTED ON SITE (AUTHOR, 2023)

PHASE 3: TOWARD SPATIAL ALLOCATION

Integrating the conflicting movement patterns of the on-site liminal space and the liminal space around traps at the edge place has a profound impact on the approach to the floorplan. This fusion of divergent movement dynamics becomes the cornerstone of the complex's spatial arrangement. The resulting combined liminal space not only defines the intricate layout of the structure but also shapes the way inhabitants pass through and interact within the space, offering a distinctive experience within the design.

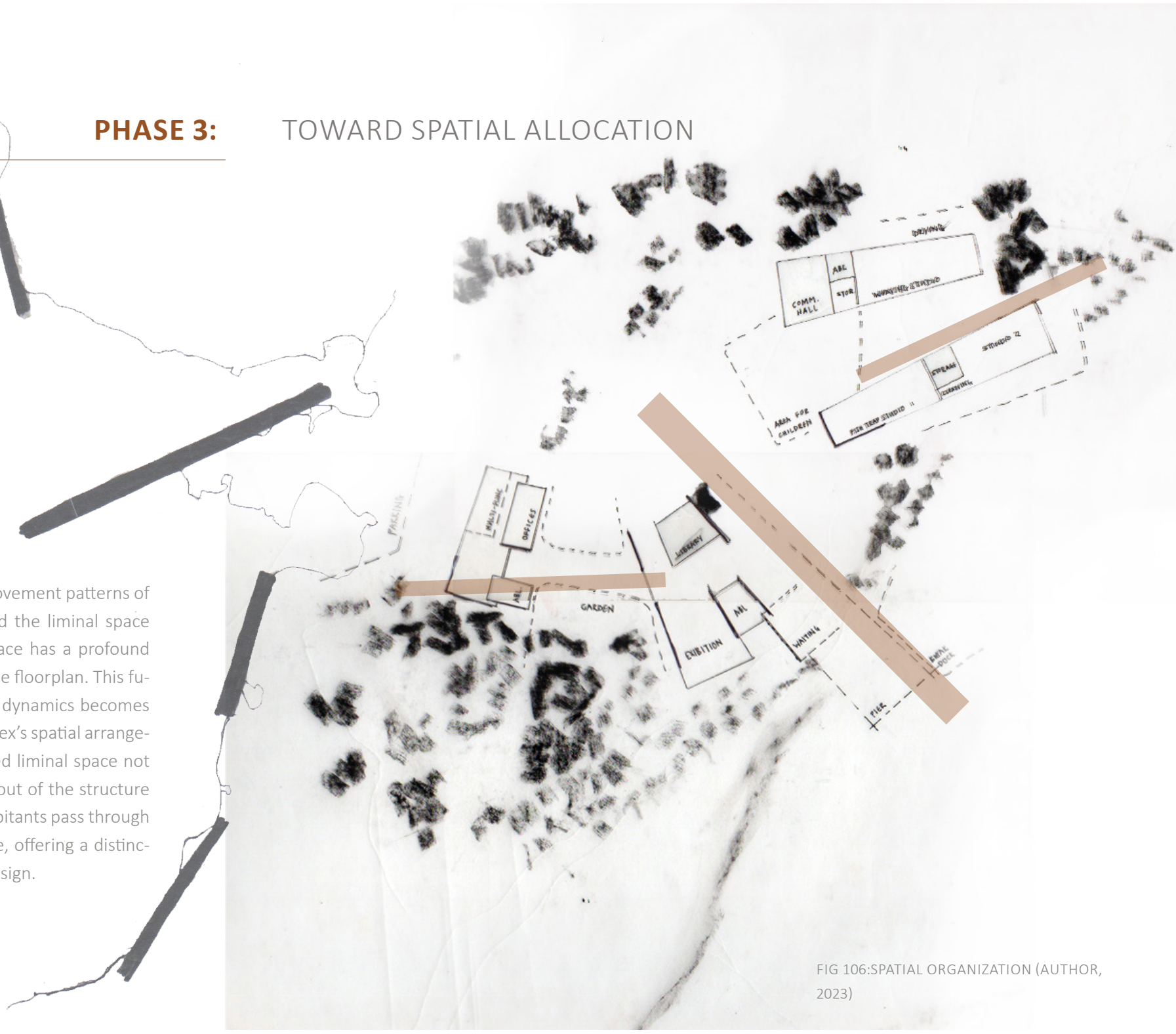
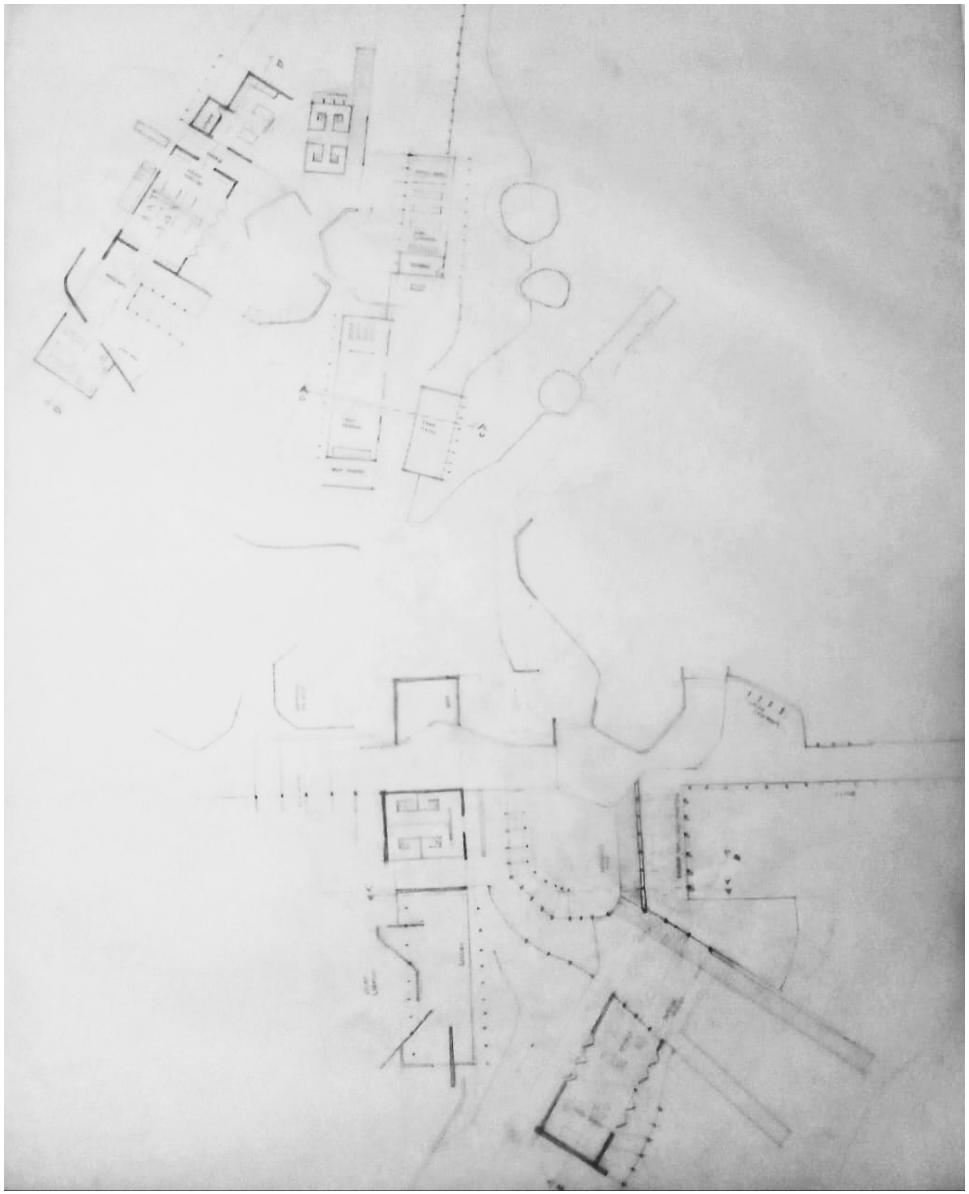


FIG 106:SPATIAL ORGANIZATION (AUTHOR, 2023)

3.3. PLAN DEVELOPMENT: PROPOSAL 1:



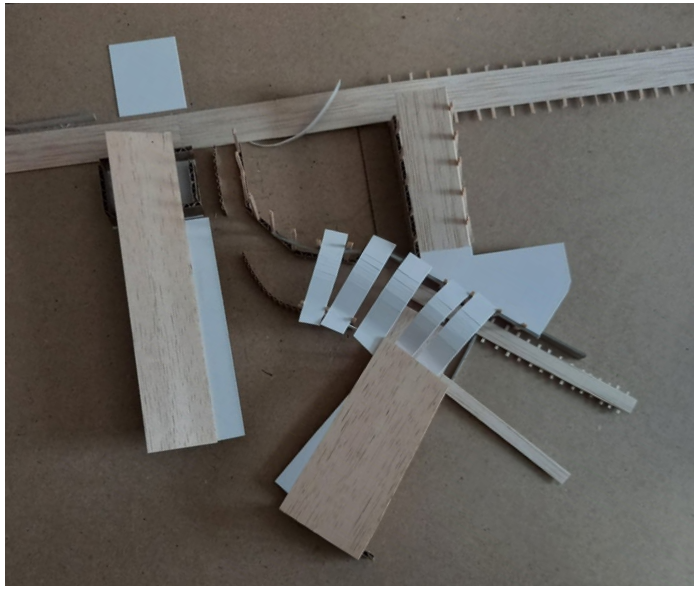
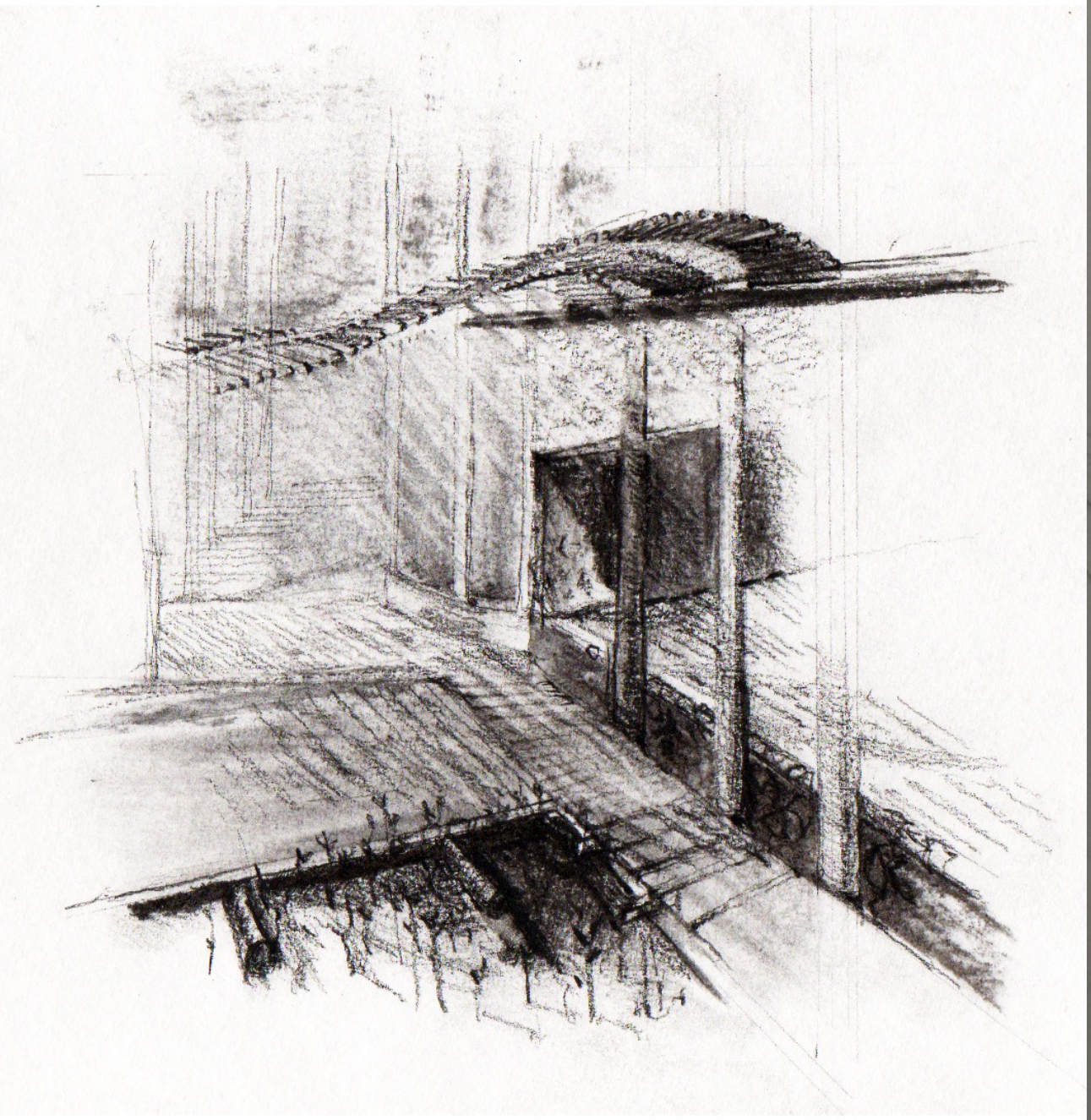


FIG 107:FIRST PLAN DEVELOPMENT (AUTHOR, 2023)
FIG 108:MODEL (AUTHOR,2023)
FIG 109:MODEL (AUTHOR,2023)



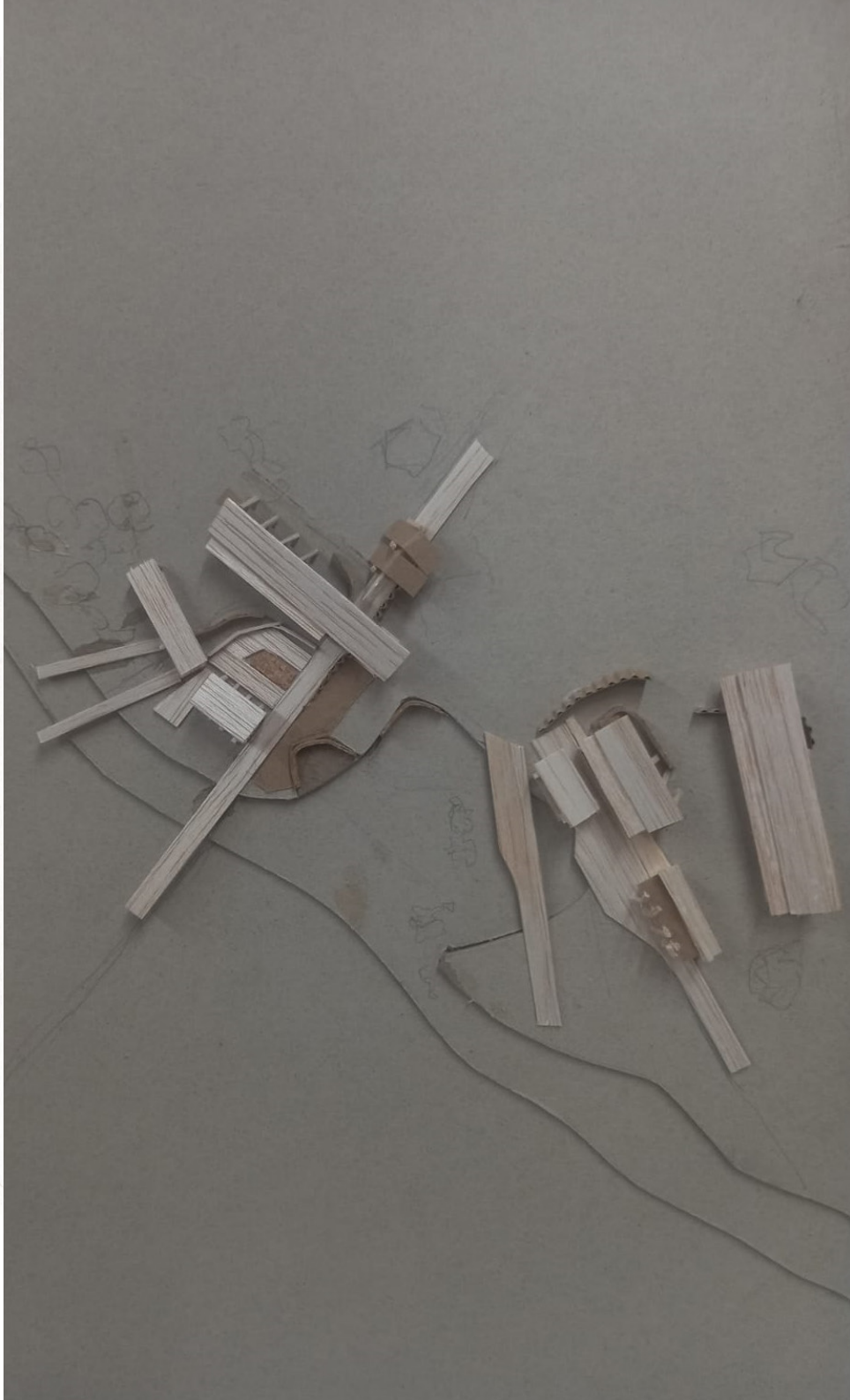


FIG 110:WALKWAY PERSPECTIVE (AUTHOR, 2023)

FIG 111:MODEL (AUTHOR,2023)

FIG 112:SEATING AREA PERSPECTIVE (AUTHOR,2023)

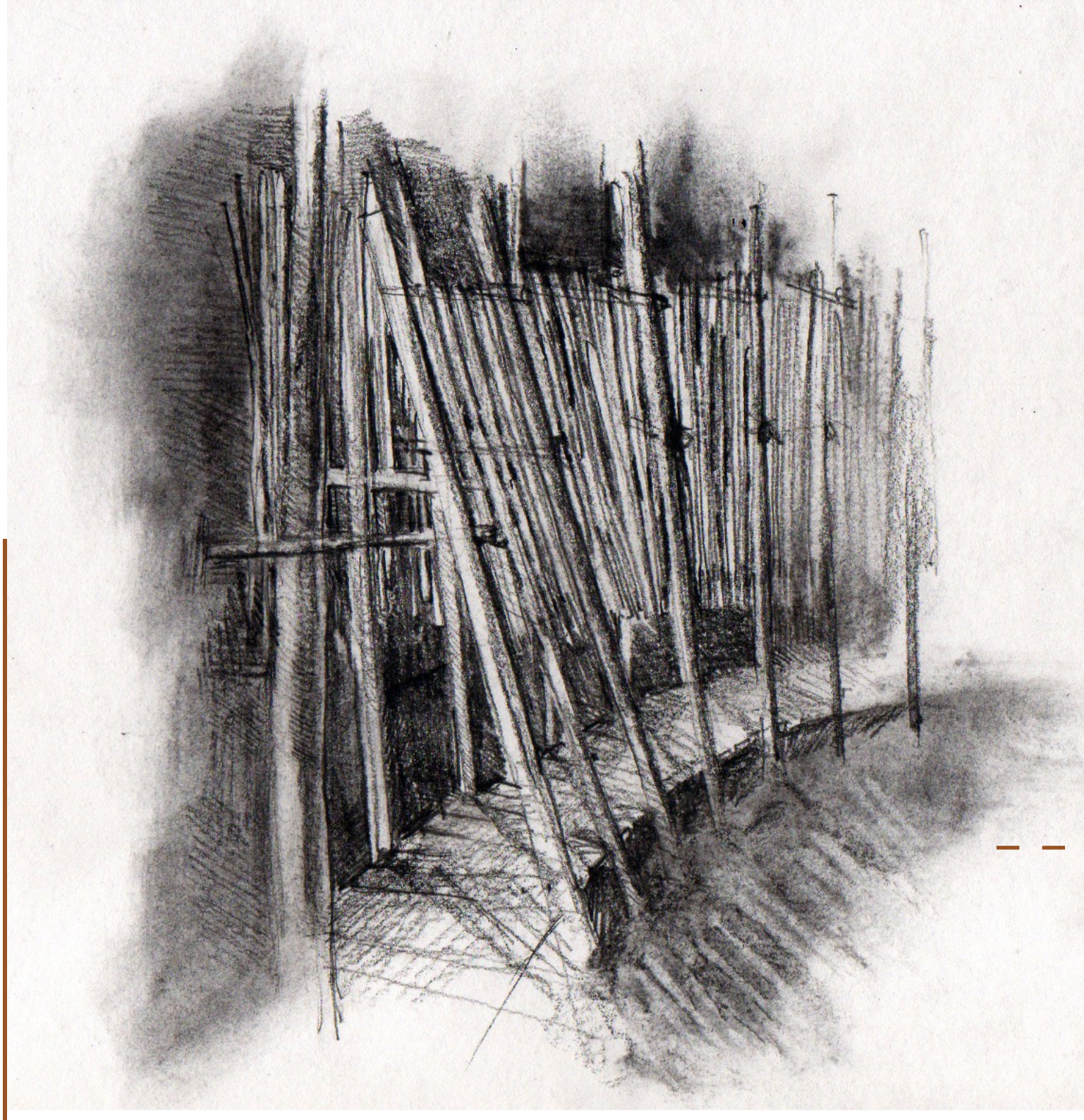


FIG 113:WALKWAY PERSPECTIVE
(AUTHOR, 2023)

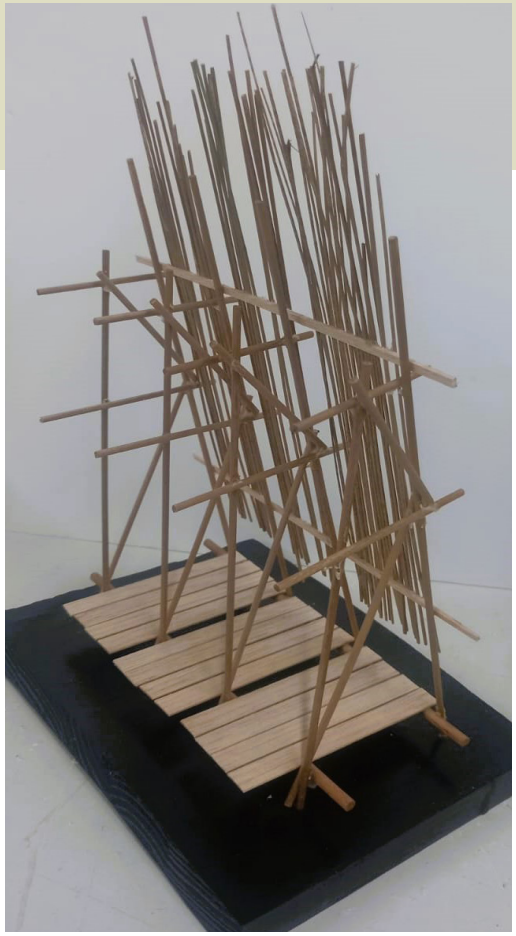


FIG 114:DETAIL MODEL 1 (AUTHOR,2023)

FIG 115:DETAIL MODEL 2 (AUTHOR,2023)

FIG 116:DETAIL MODEL 3 (AUTHOR,2023)

PROPOSAL 2:

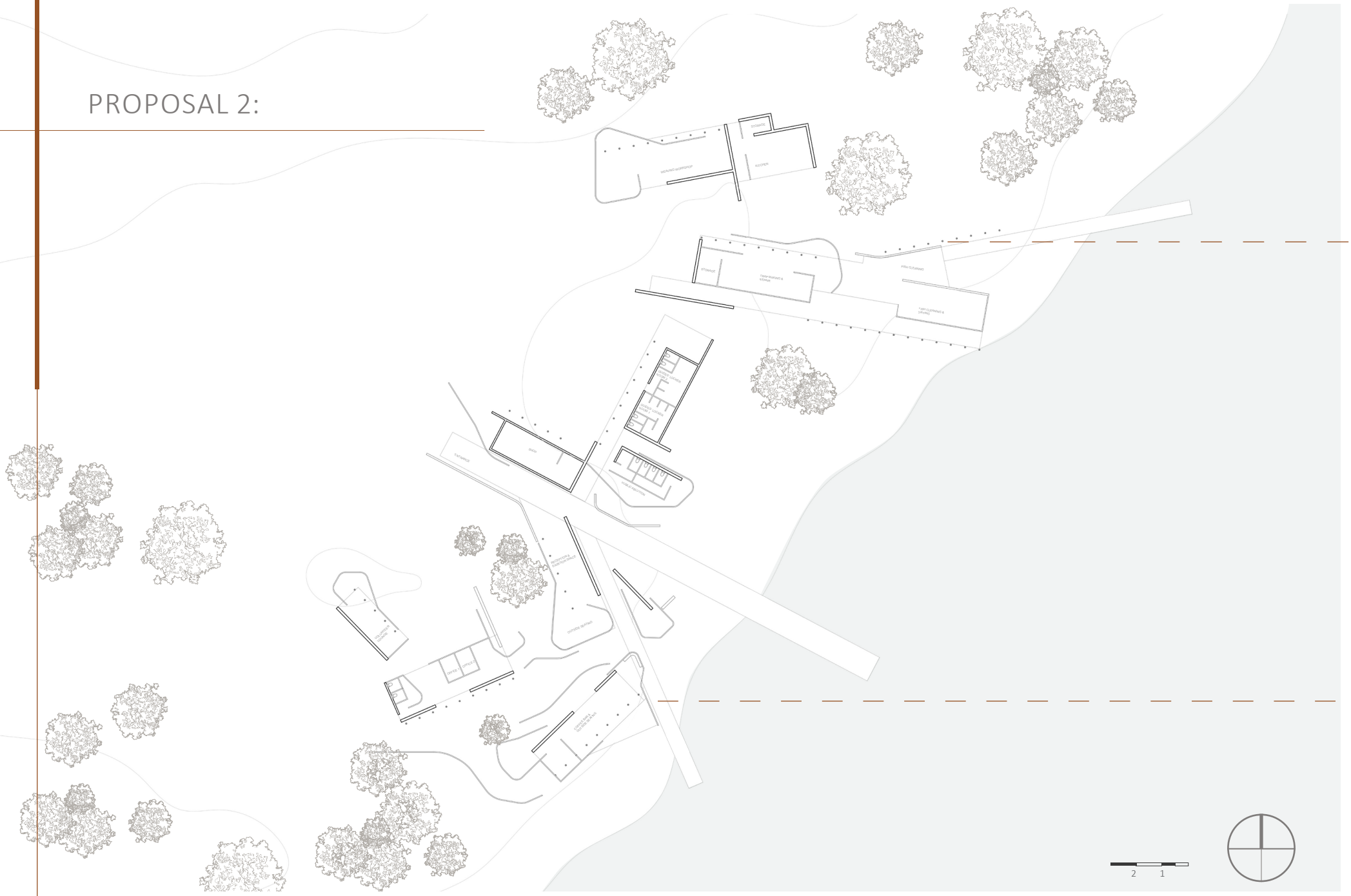
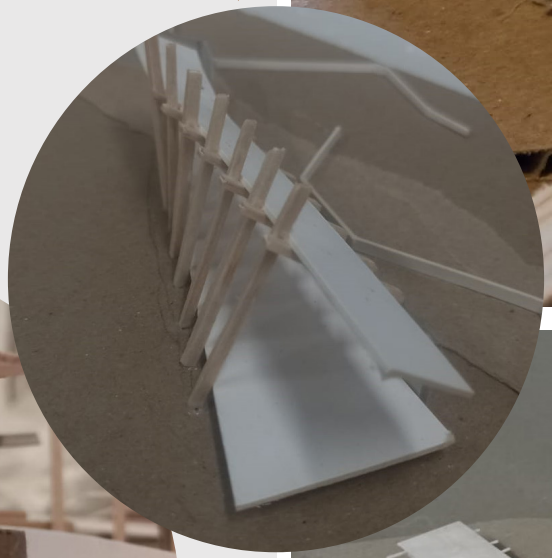


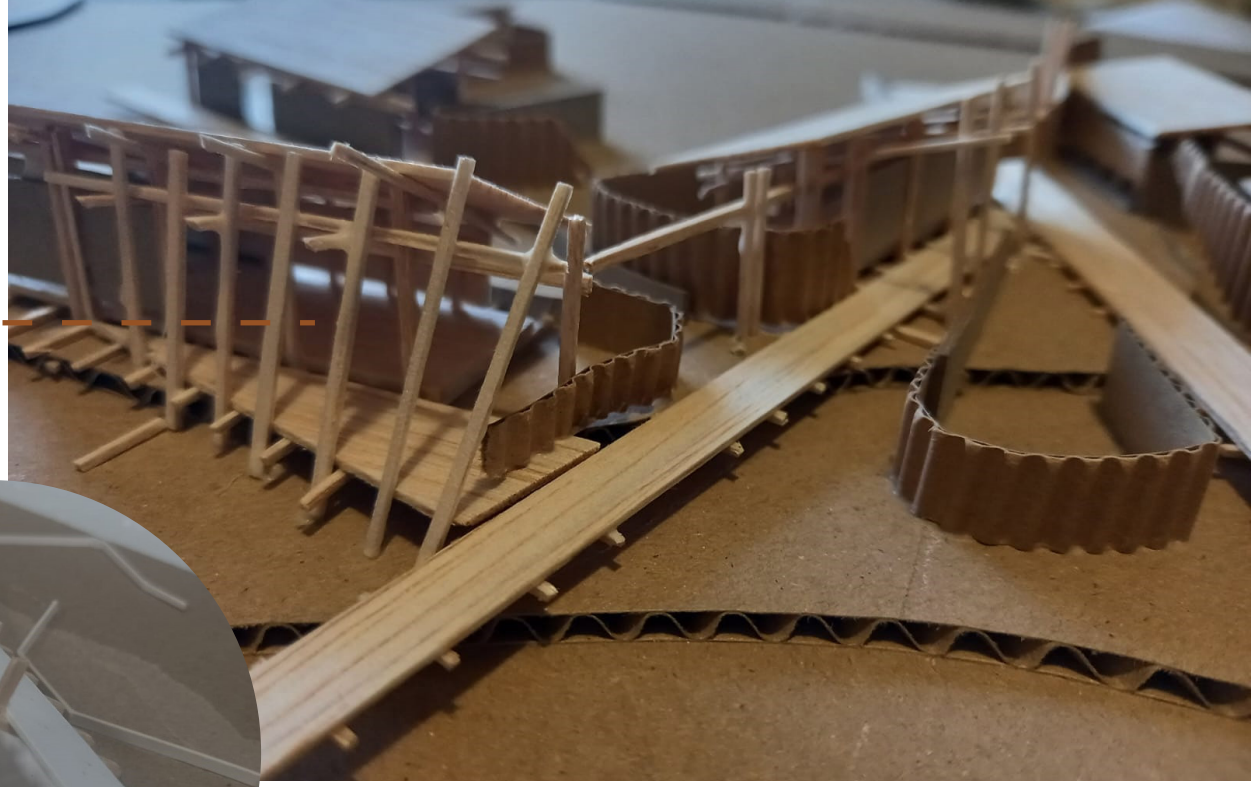
FIG 117:FLOOR PLAN EXTERNAL 3 (AUTHOR,2023)

FIG 118:MODEL (AUTHOR,2023)

FIG 119:MODEL CURVED STRUCTURE (AUTHOR,2023)

FIG 120:STRUCTURAL CONCEPT
(AUTHOR,2023)





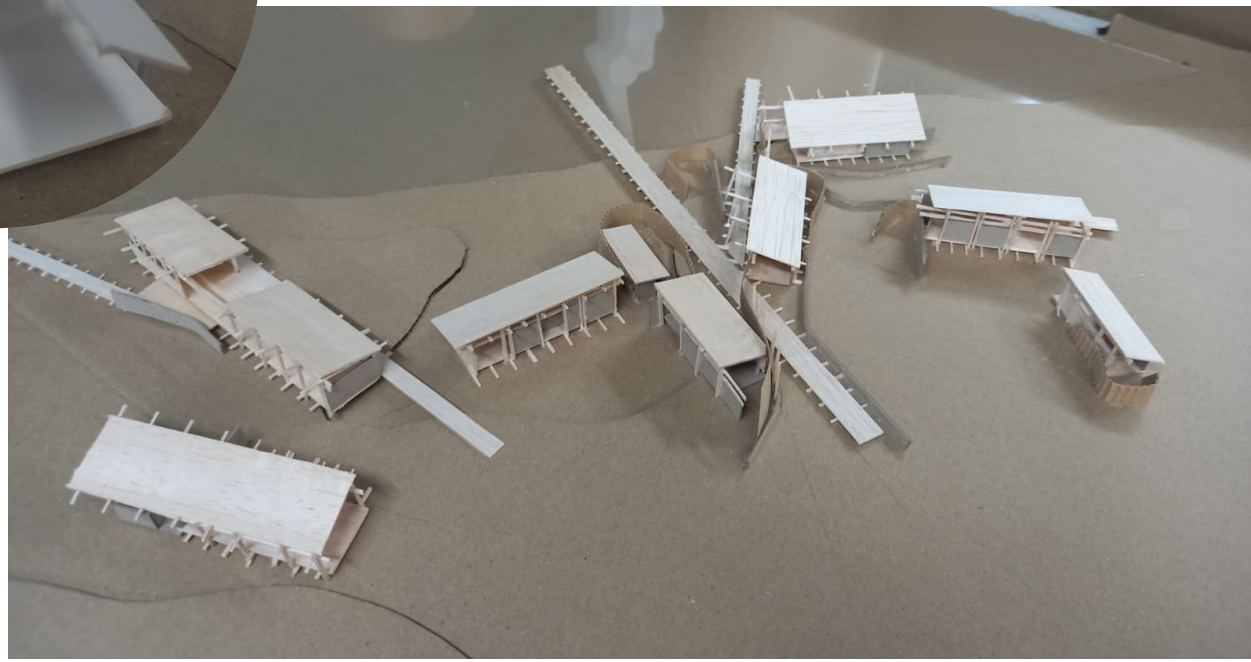
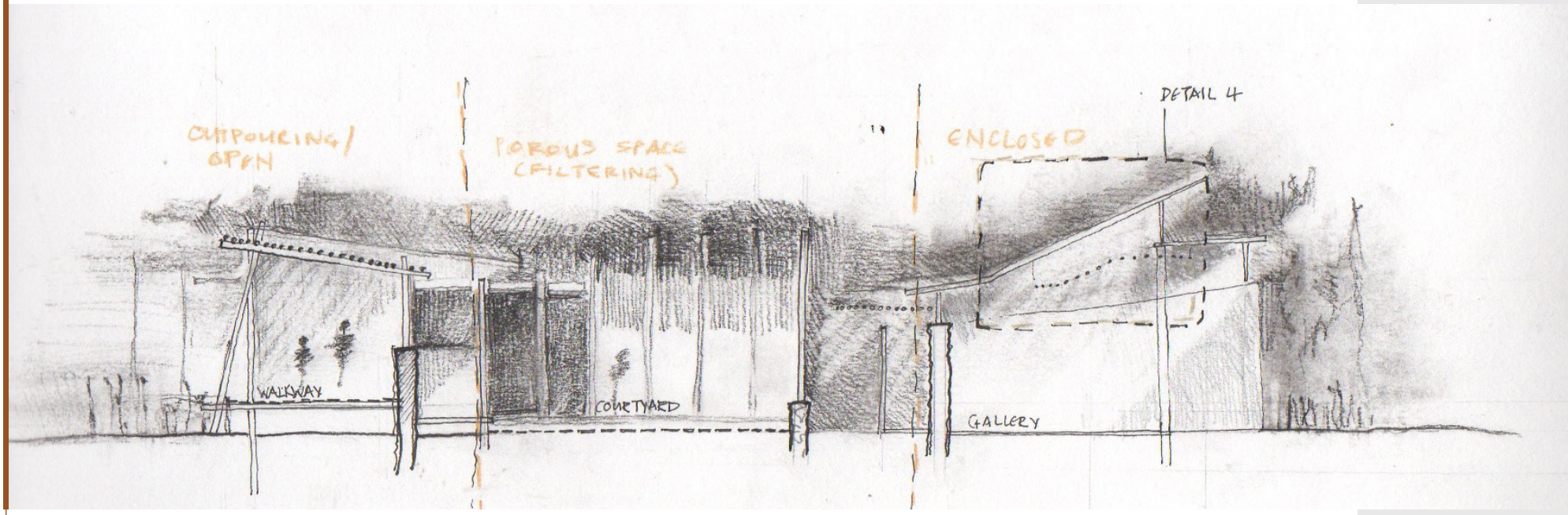


FIG 121:MODEL SOUTH-EAST VIEW(AUTHOR,2023)
FIG 122:MODEL NORTH-WEST VIEW (AUTHOR, 2023)



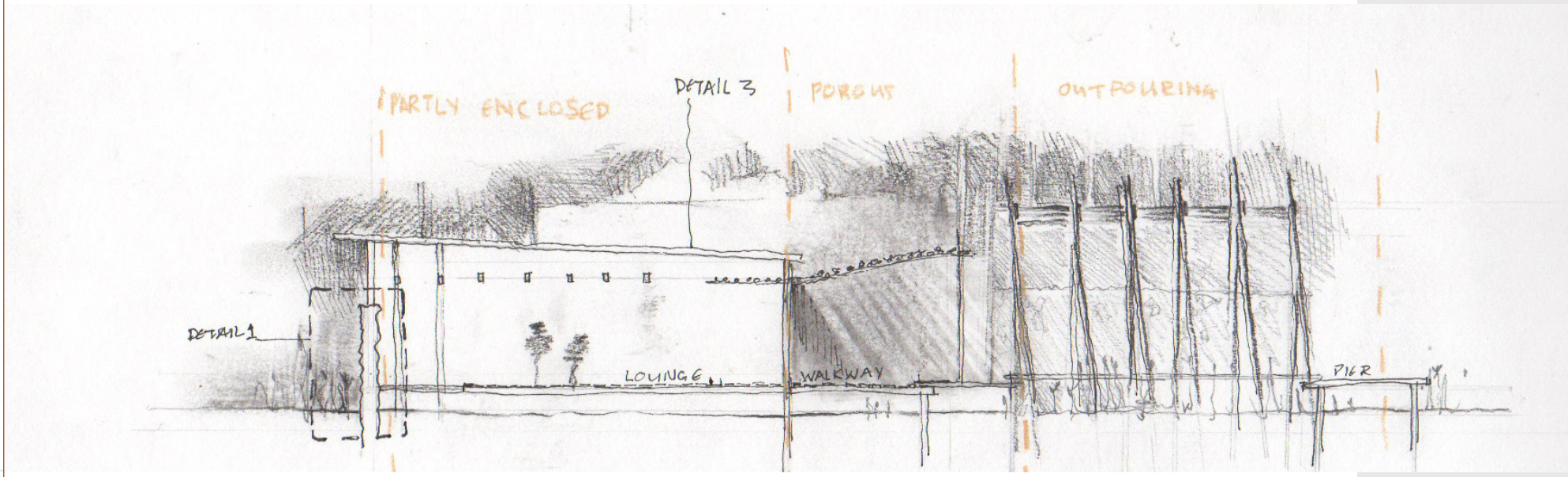
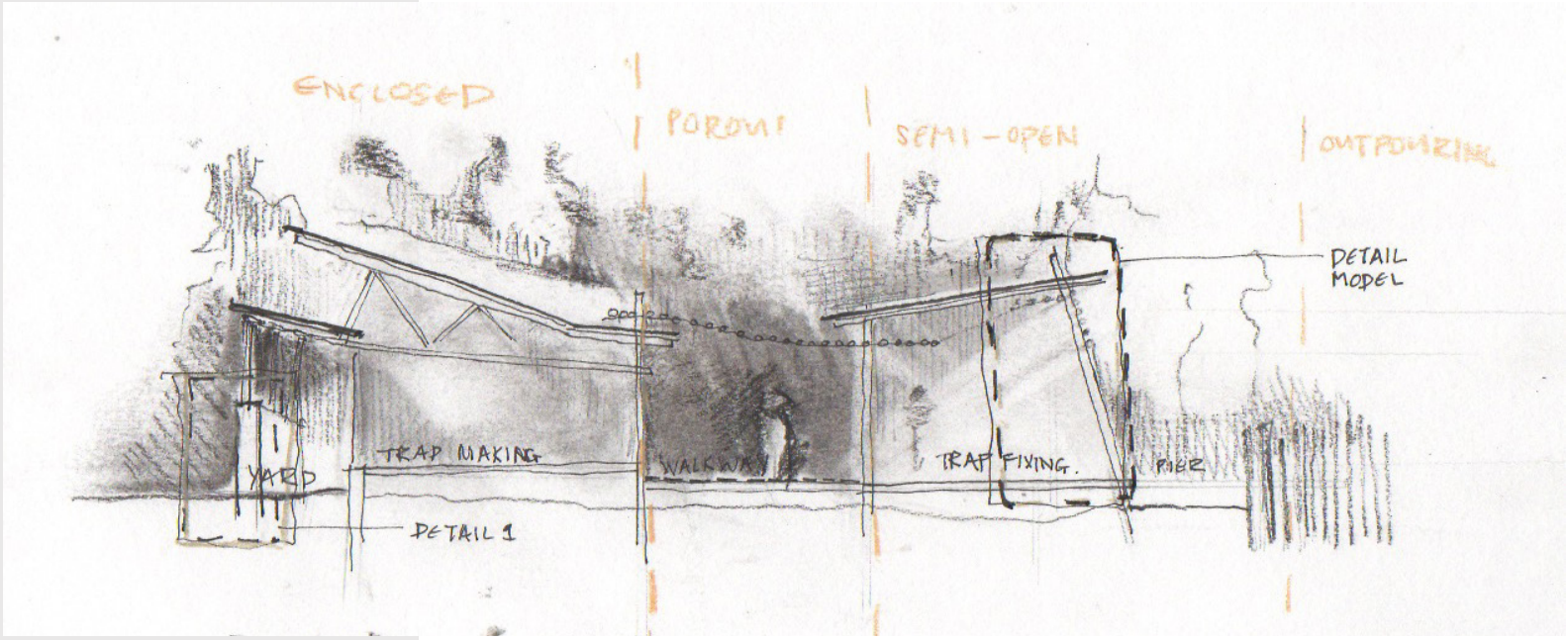
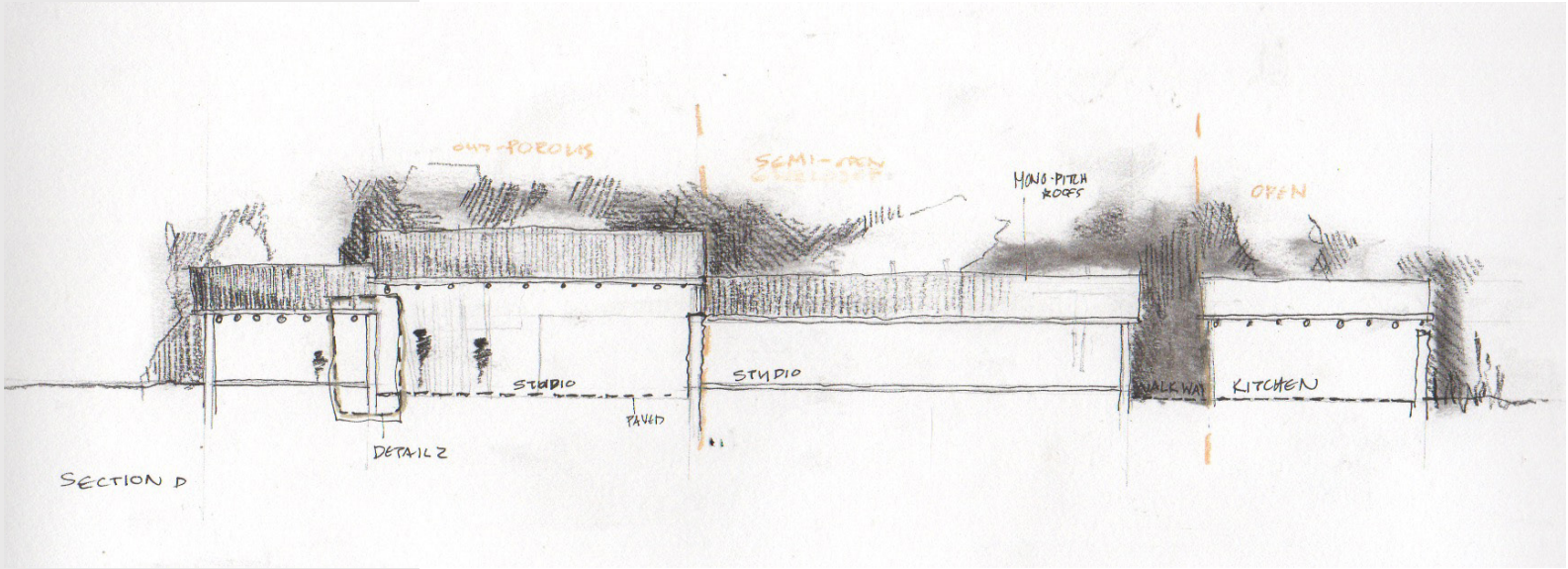


FIG 123:SECTION (AUTHOR,2023)
FIG 124:SECTION (AUTHOR, 2023)





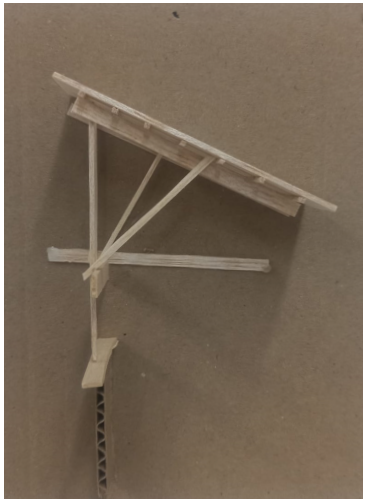
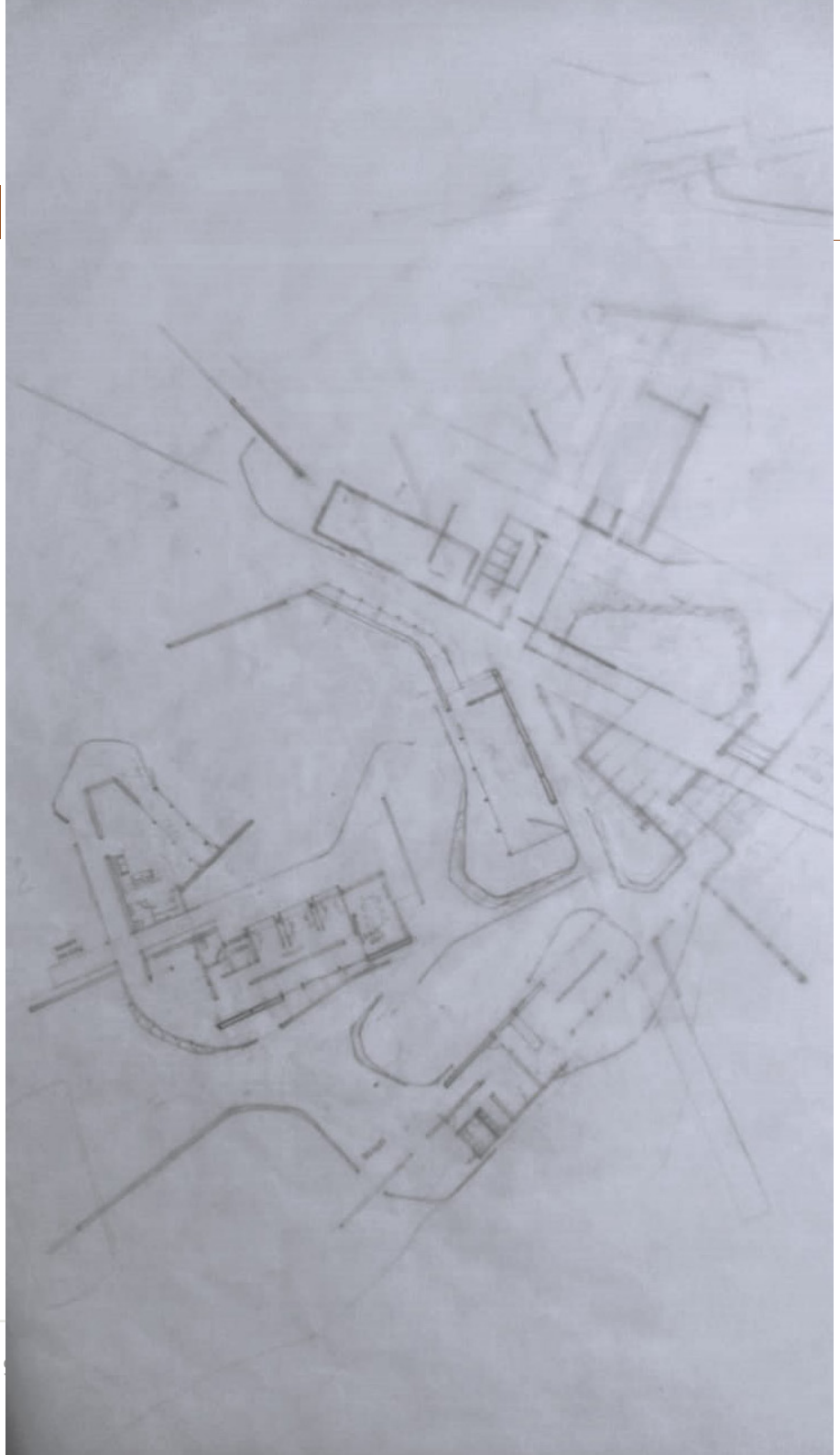


FIG 125:ROOF DETAIL (AUTHOR, 2023)
FIG 126:SECTION (AUTHOR,2023)
FIG 127:SECTION (AUTHOR, 2023)



PROPOSAL 3:

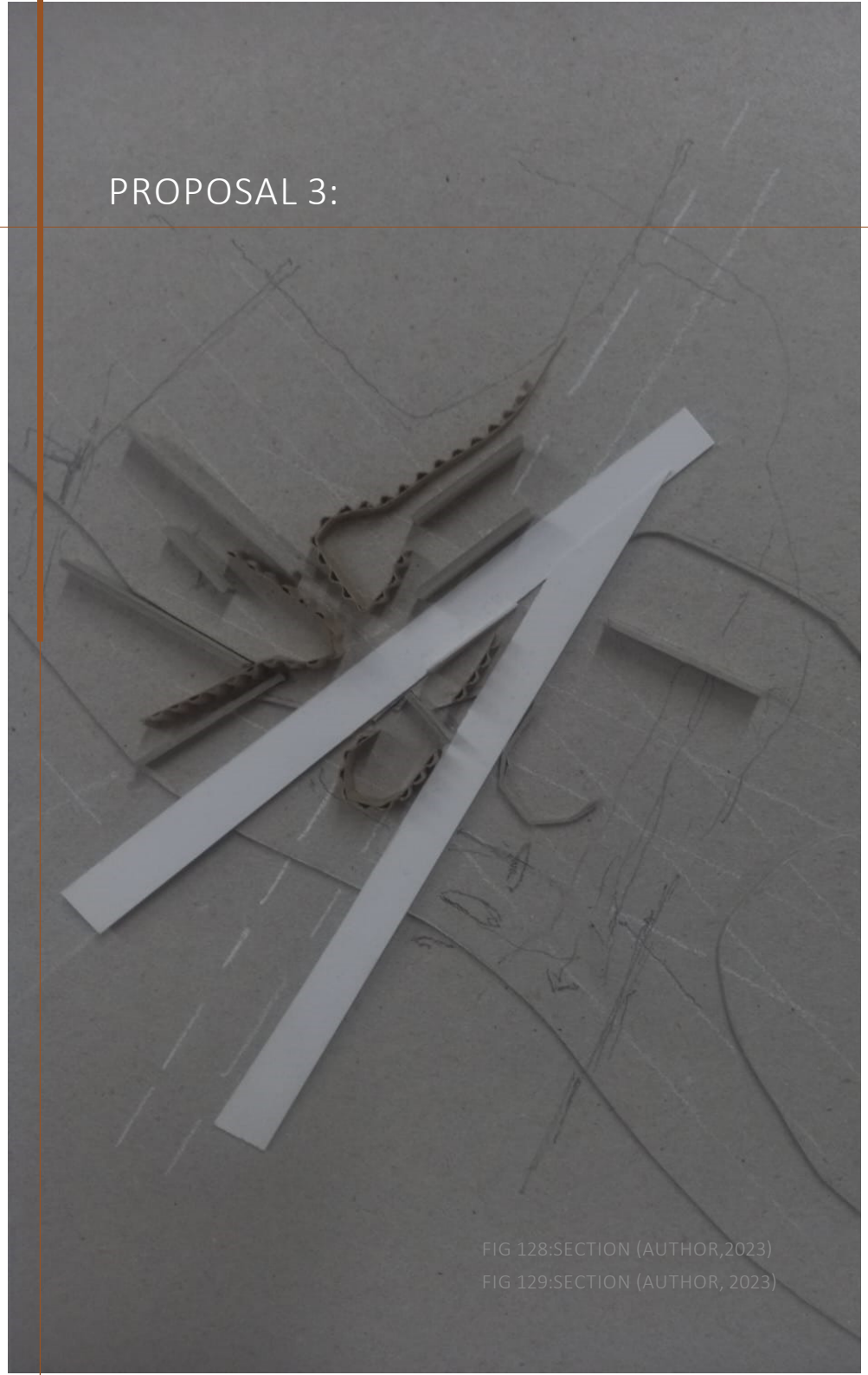
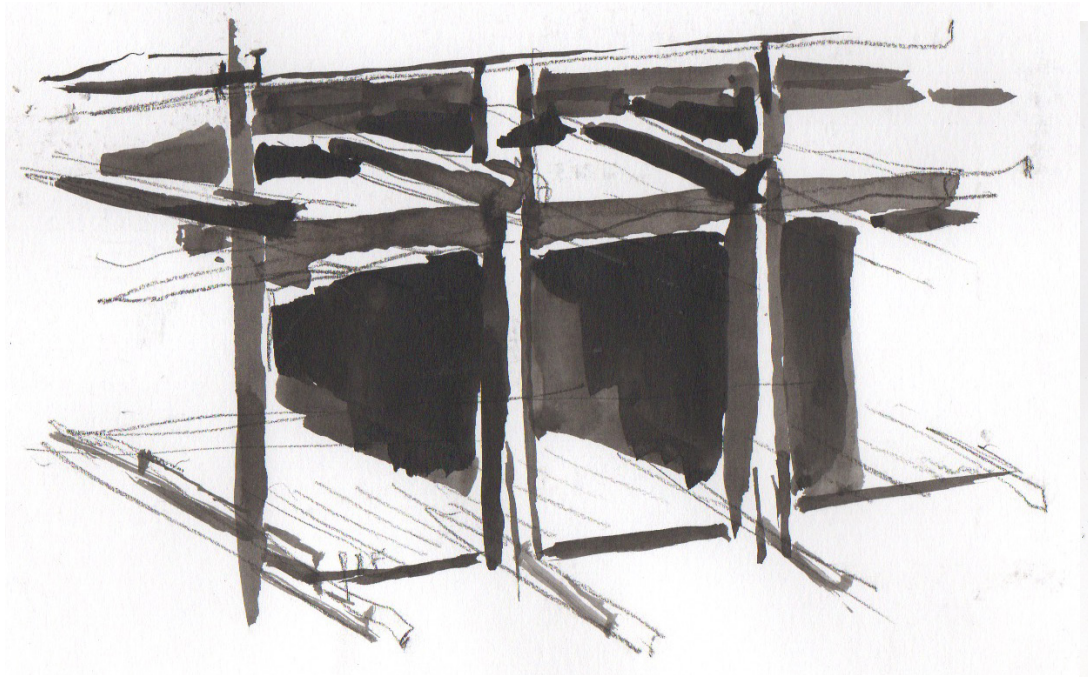


FIG 128:SECTION (AUTHOR,2023)

FIG 129:SECTION (AUTHOR, 2023)



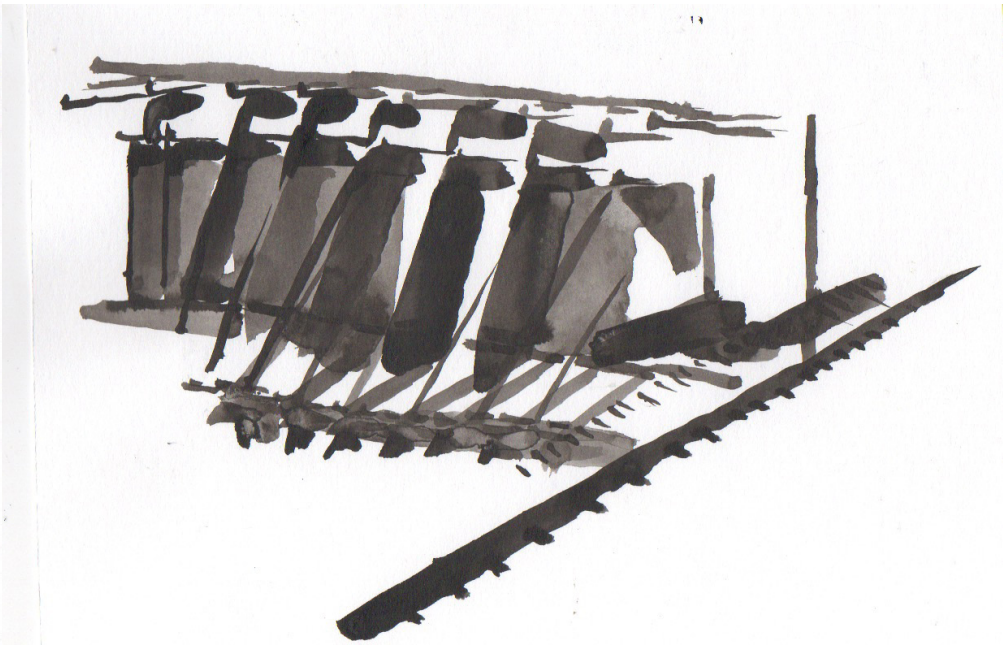


FIG 130:SECTION (AUTHOR,2023)

FIG 131:SECTION (AUTHOR, 2023)

FIG 132:

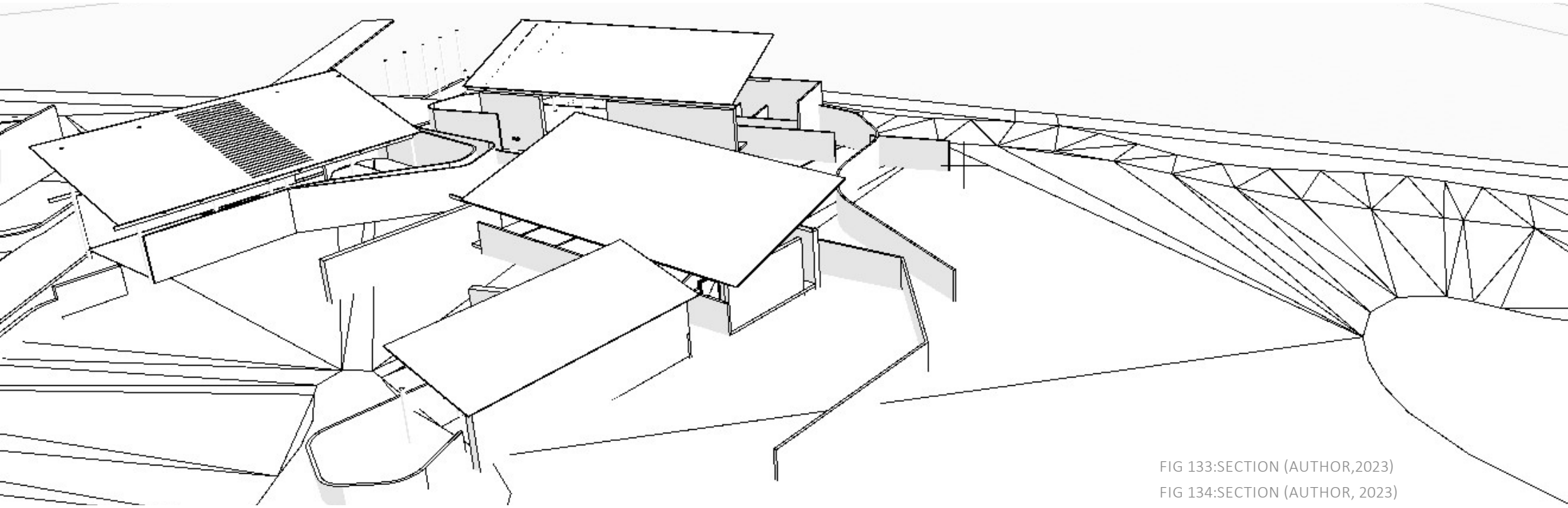


FIG 133:SECTION (AUTHOR,2023)

FIG 134:SECTION (AUTHOR, 2023)

FIG 135:SECTION (AUTHOR,2023)

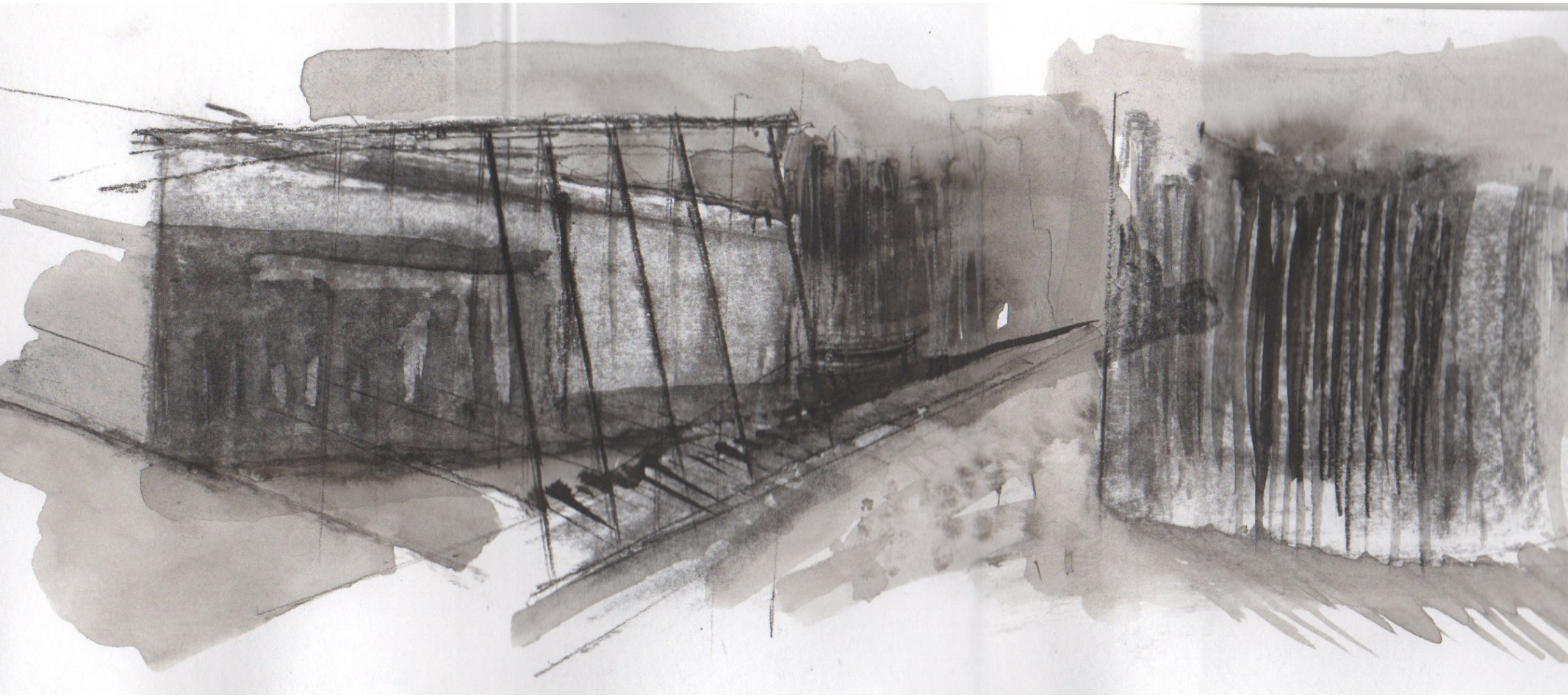


FIG 136:SECTION (AUTHOR,2023)

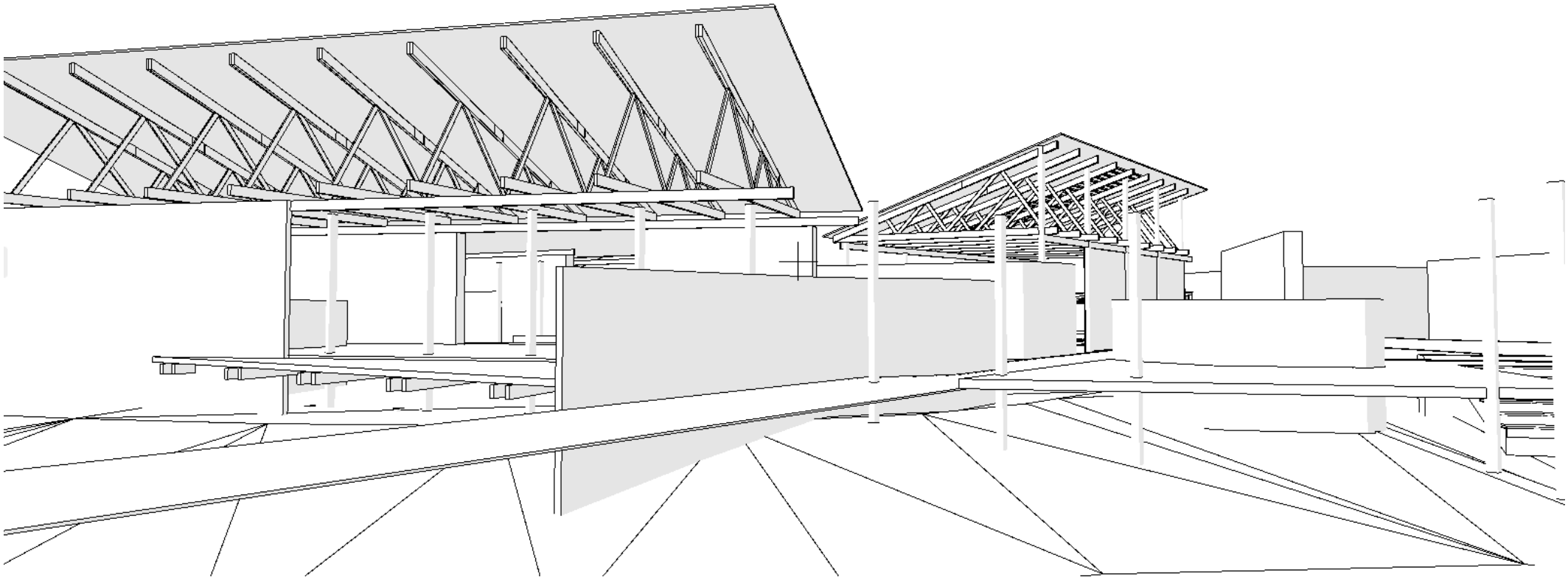


FIG 137:SECTION (AUTHOR,2023)

4. FINAL DESIGN PROPOSAL

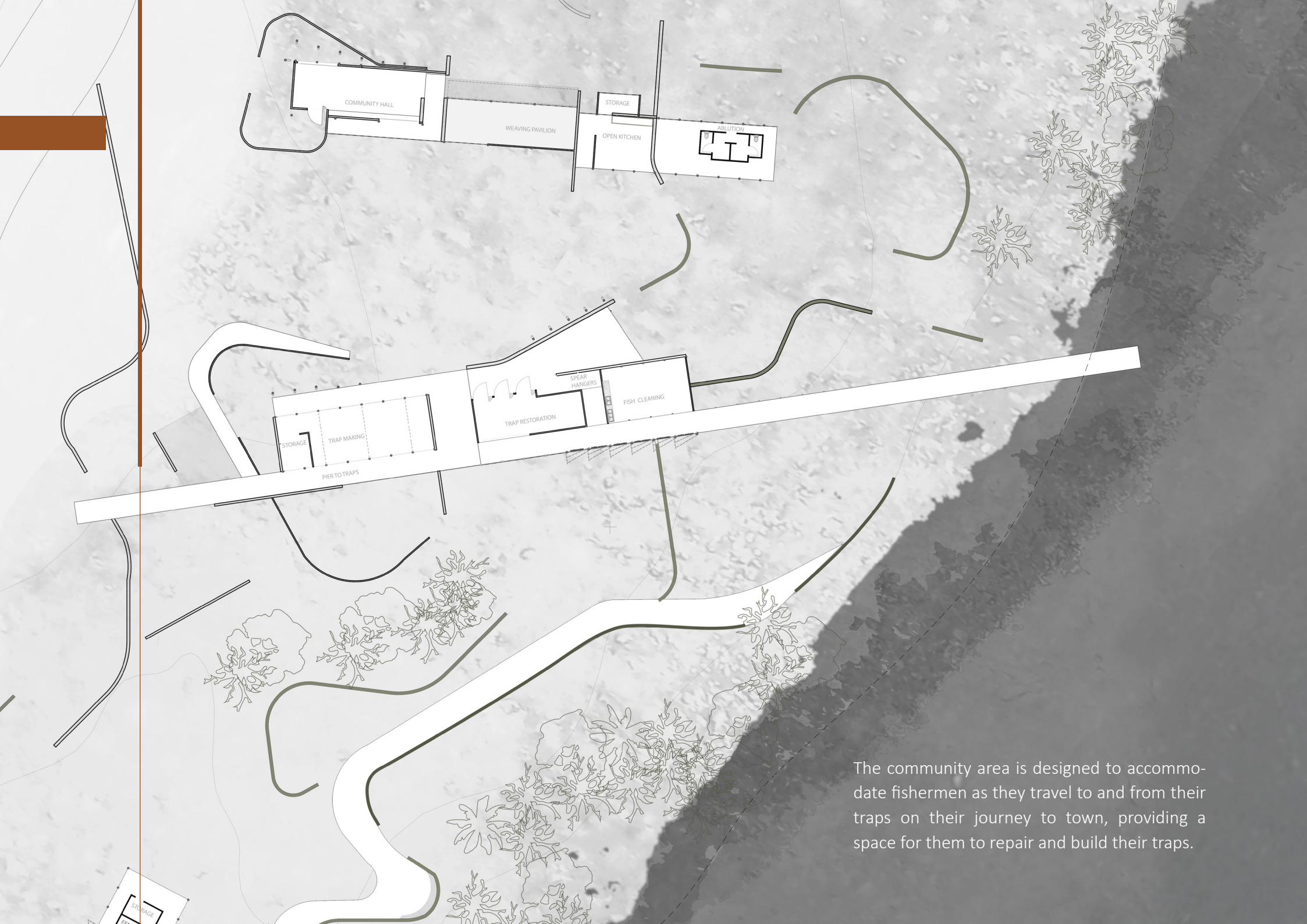
The above mentioned teoretical and conceptual ideas are depicted onto the site and created two axis that represents the earlier mentioned concept of ecotones and how movement can be portrayed. The East- west line indicates the parks vernacular whereas the north-south line depicts the direction in which people move, which guided the design layout.

The traps represents the cultural aspect and the straight lines, the functional. The plan highlights the interplay between human activity and these transitional zones. Working with the functions of the building, the initial idea of how a trap works is portrayed onto the plan.

FIG 138:FLOOR PLAN(AUTHOR 2023)


1. COMMUNITY PAVILIONS
2. VISITORS' PAVIL-
FLOOR PLAN
SCALE 1:200

FIG 139: SOUTHERN VIEW OF VISITORS' AREA (AUTHOR,2023)



The community area is designed to accommodate fishermen as they travel to and from their traps on their journey to town, providing a space for them to repair and build their traps.

1. COMMUNITY PAVILIONS

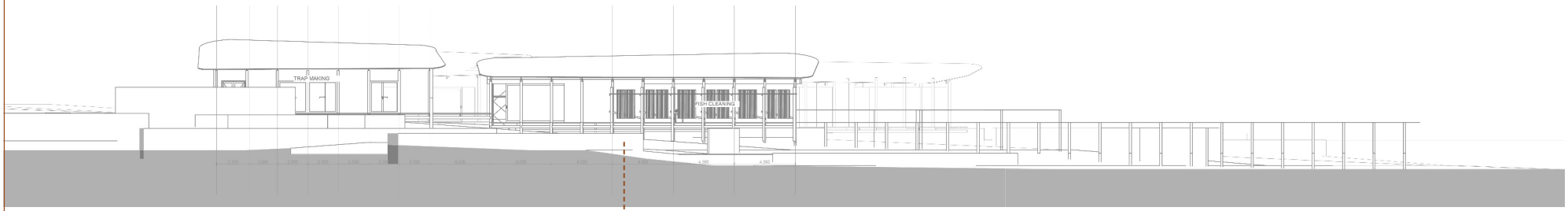


FIG 140: SECTION - COMMUNITY PAVILION SOUTH ELEVATION (AUTHOR,2023)

FIG 141: SOUTHERN VIEW OF FISH MAKING SPACE (AUTHOR,2023)

FIG 142: LOCAL WALL DE-COR (AUTHOR,2023)

FIG 143: LOCAL WEAVING (AUTHOR,2023)

FIG 144: GRASS DRYING AT WATER EDGE (AUTHOR,2023)

FIG 145:COMMUNITY PAVILION – PERSPECTIVE OF FISHERMEN STRUCTURE (AUTHOR,2023)

FIG 146: COW MANURE AND GRASS AS PLASTER (AUTHOR,2023)

FIG 147: COW MANURE AND GRASS AS BRICKS (AUTHOR,2023)

The program and design illustrate a thoughtful and responsive approach towards the natural ecotone, between the land, water's edge, and lake. The design explores various methods that embrace indigenous knowledge and utilize materials with minimal environmental impact, ensuring a gentle and sustainable integration that touch the earth lightly and minimize the built impact on the natural environment. One of the key objectives of the design was to maintain the use of natural materials that reflects the functionality of the building. By examining the present materials in use and integrating them into the structure.


STORAGE
RECEPTION
SHOP
GUIDES' OFFICE
ENTRANCE
STORAGE
FEMALE ABLUTION
MALE ABLUTION
GATHERING SPACE 1
MAIN PIER
GATHERING SPACE 2
EXHIBITION PAVILION
GATHERING SPACE 3
VOLUNTEER LOUNGE
SOLAR
PRIVATE PARKING
PARK OFFICES
RECEPTION
LOUNGE
BOARDROOM
COFFEE BAR
KITCHEN
LOOK OUT DECK

2. VISITORS' PAVILIONS

FIG 148: CHARCOAL SKETCH OF SOUTH ELEVATION (AUTHOR,2023)

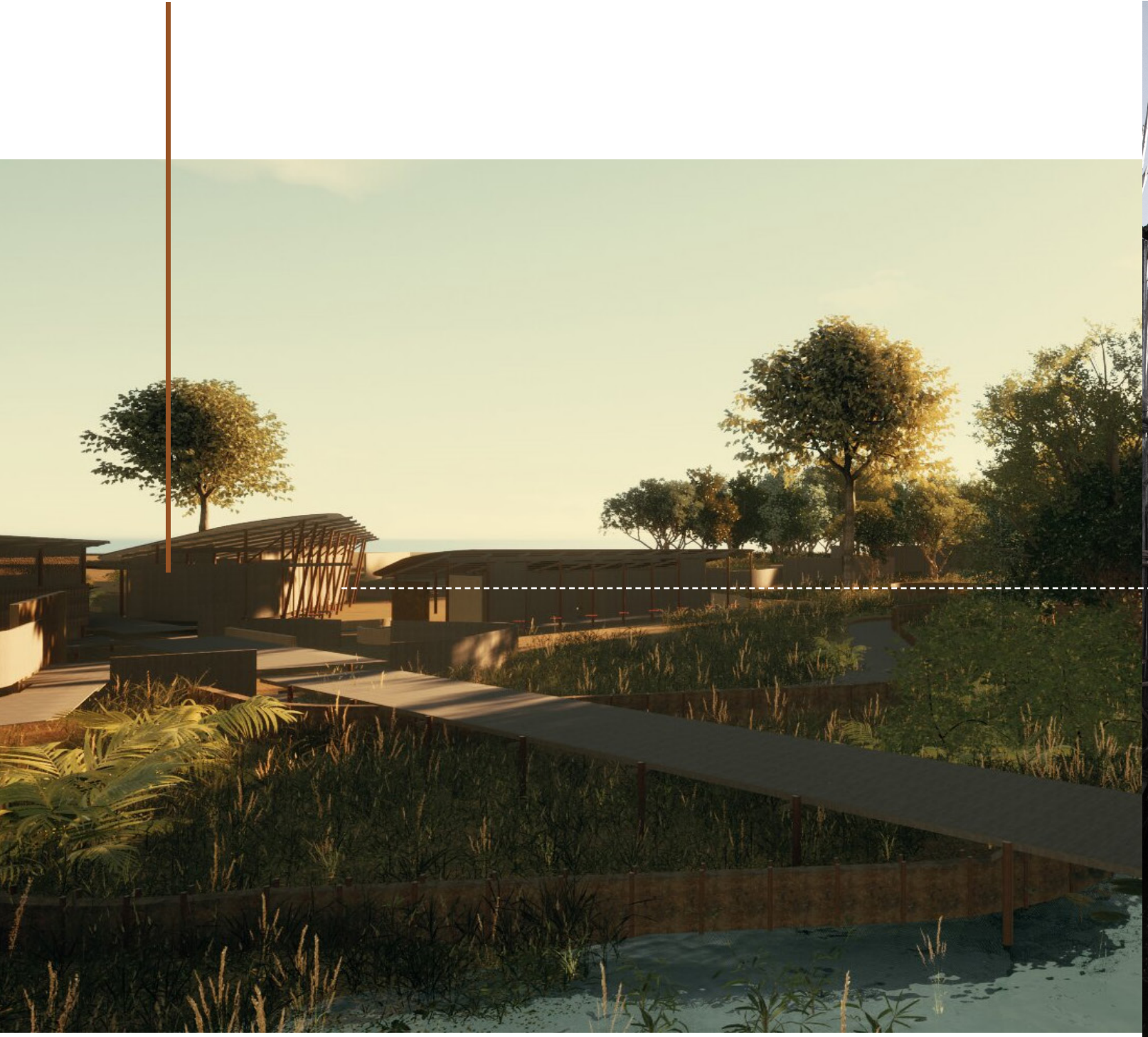


FIG 149: PERSPECTIVE INDICATING INSPIRATION FROM TRAPS (AUTHOR,2023)

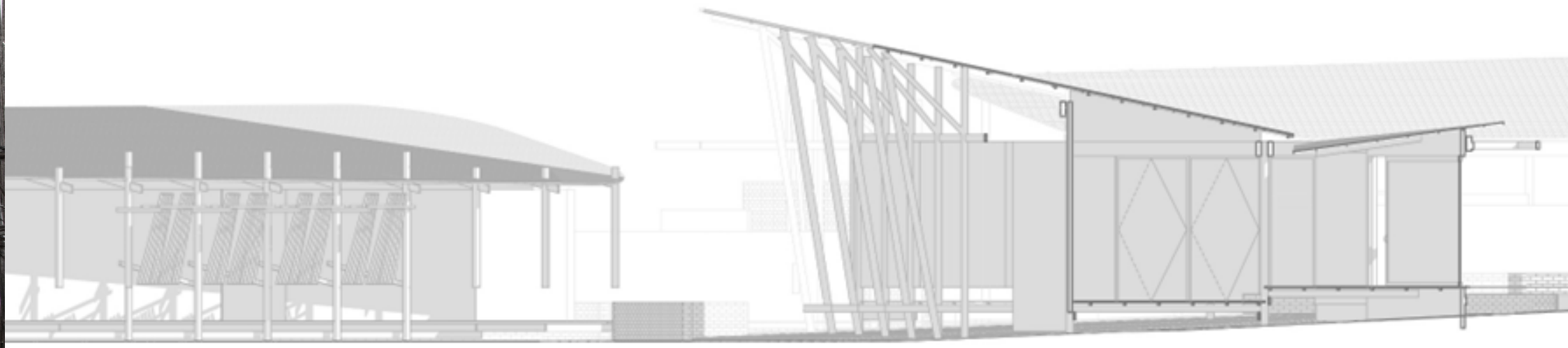


FIG 150: SECTION- MAIN JETTY AND SHOP (AUTHOR,2023)

FIG 151: NORTH ELEVATION (AUTHOR,2023)

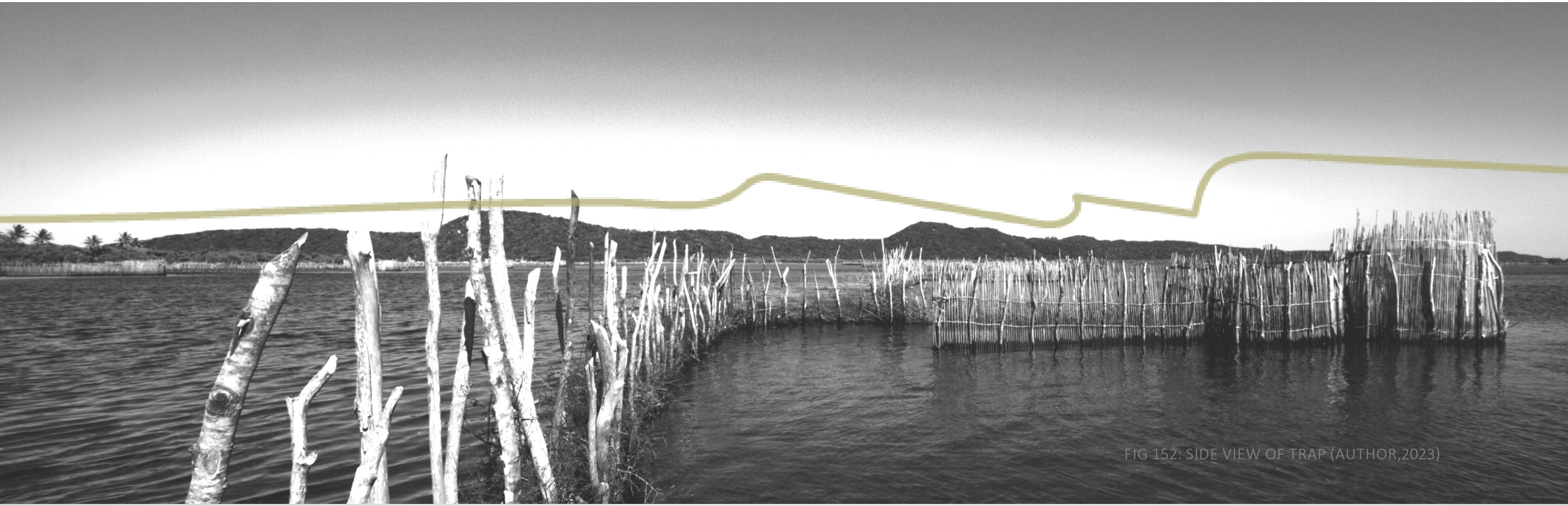


FIG 152: SIDE VIEW OF TRAP (AUTHOR,2023)

FIG 153: ELEVATION INDICATING INSPIRATION FROM TRAPS (AUTHOR,2023)

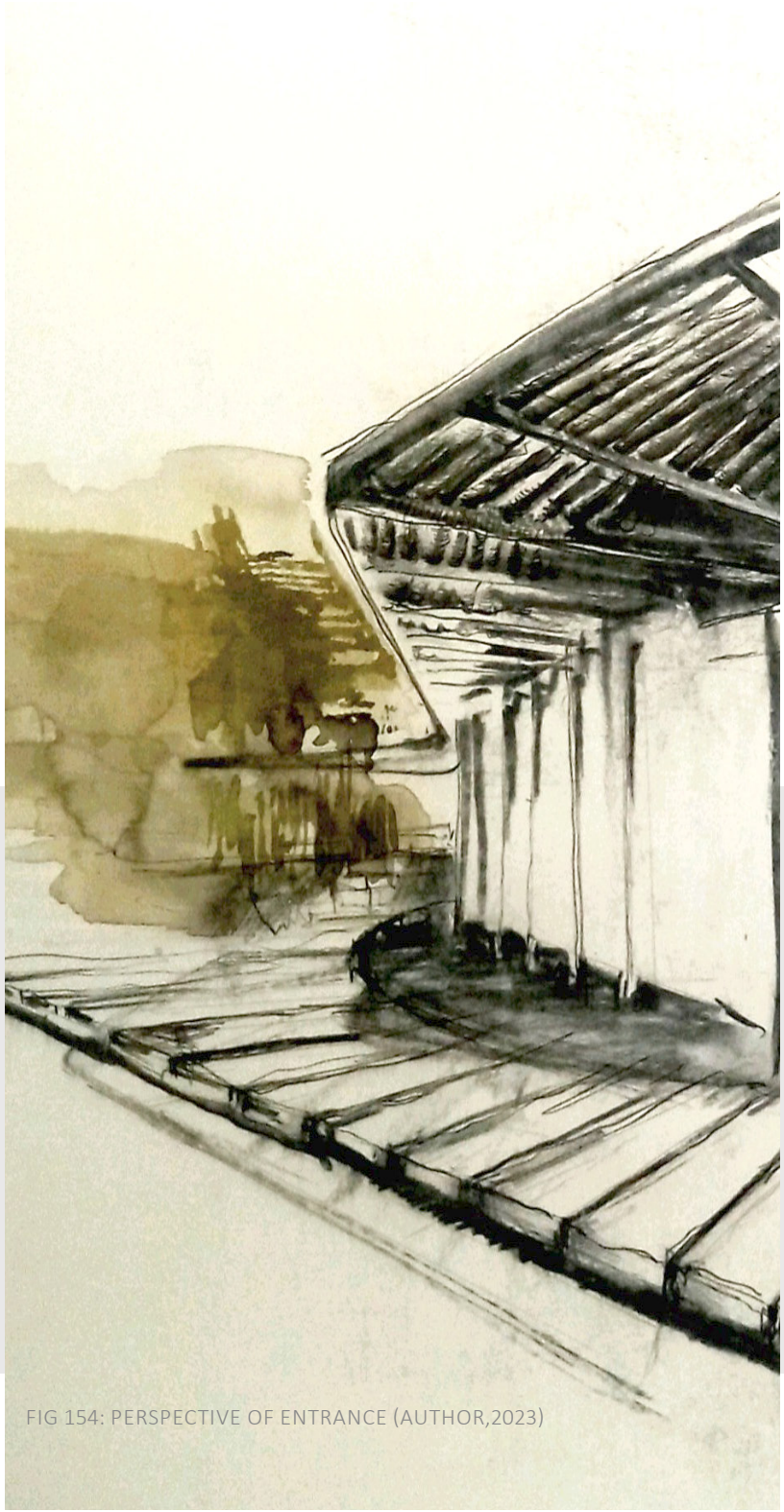


FIG 154: PERSPECTIVE OF ENTRANCE (AUTHOR,2023)

FIG 155: PERSPECTIVE- WALKWAYS (AUTHOR,2023)

Translating back to the vernacular inspiration of the site, the form giving is inspired by the traditional essence of a fish trap's profile, blending seamlessly into the surroundings. And with this, the structural lightweight system also finds its inspiration in the traps, shaping the architectural narrative towards sustainability and cultural preservation

FIG 156: CHARCOAL AND INK PERSPECTIVE DRAWING OF MAIN JETTY (AUTHOR,2023)

FINAL MODEL

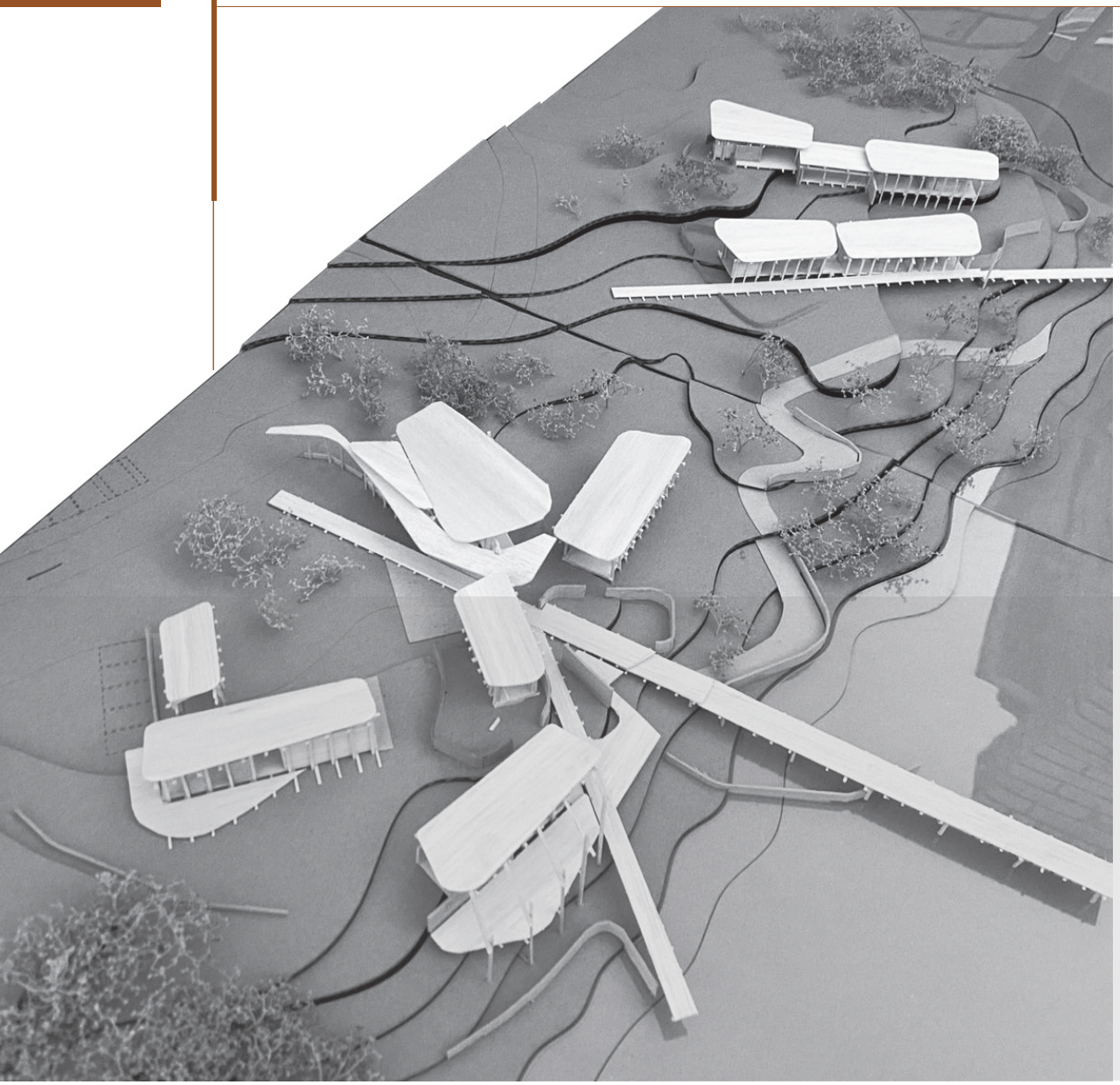


FIG 157: FINAL MODEL (AUTHOR,2023)

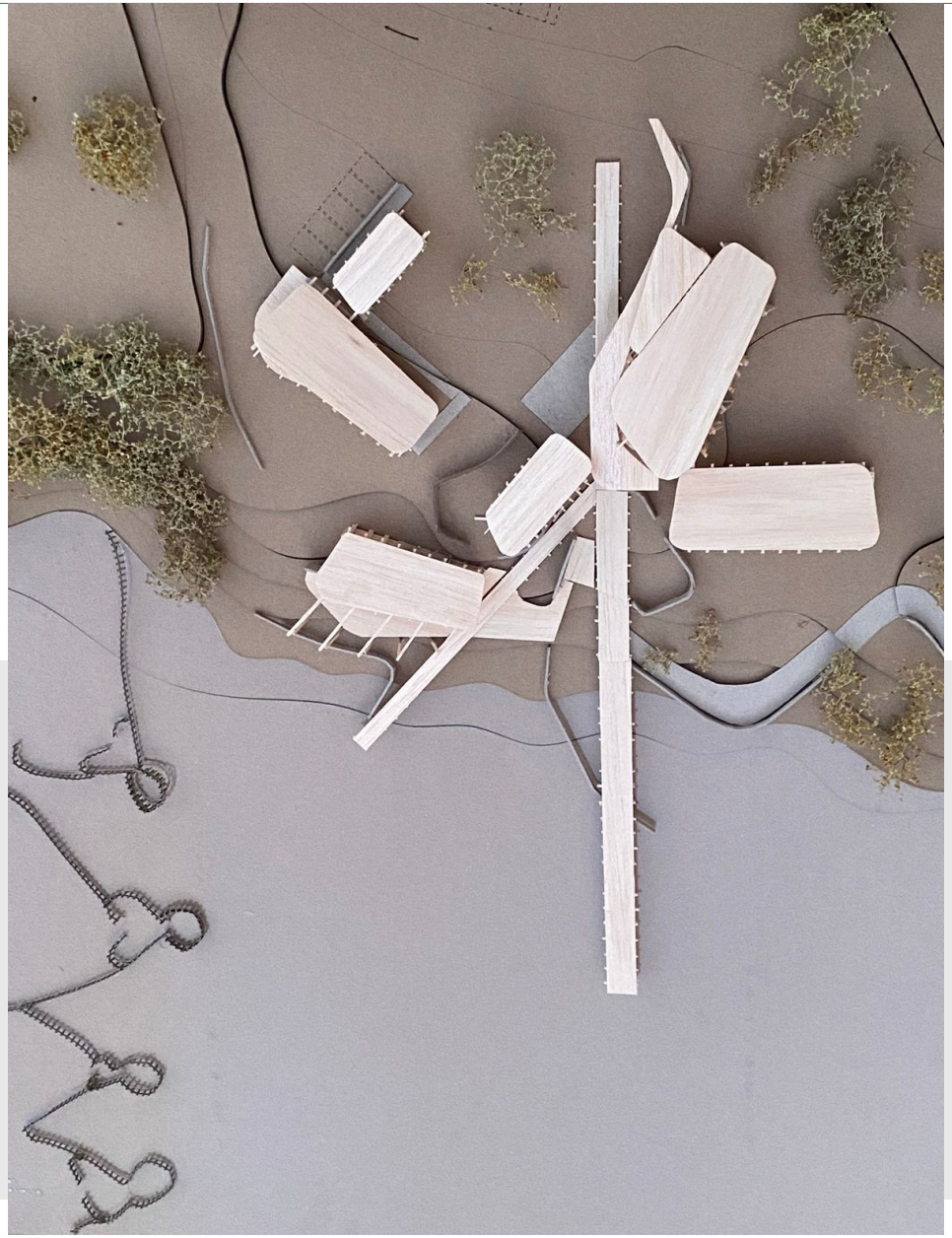


FIG 158: VISITORS' AREA (AUTHOR,2023)

FIG 159: OFFICES (AUTHOR,2023)

04

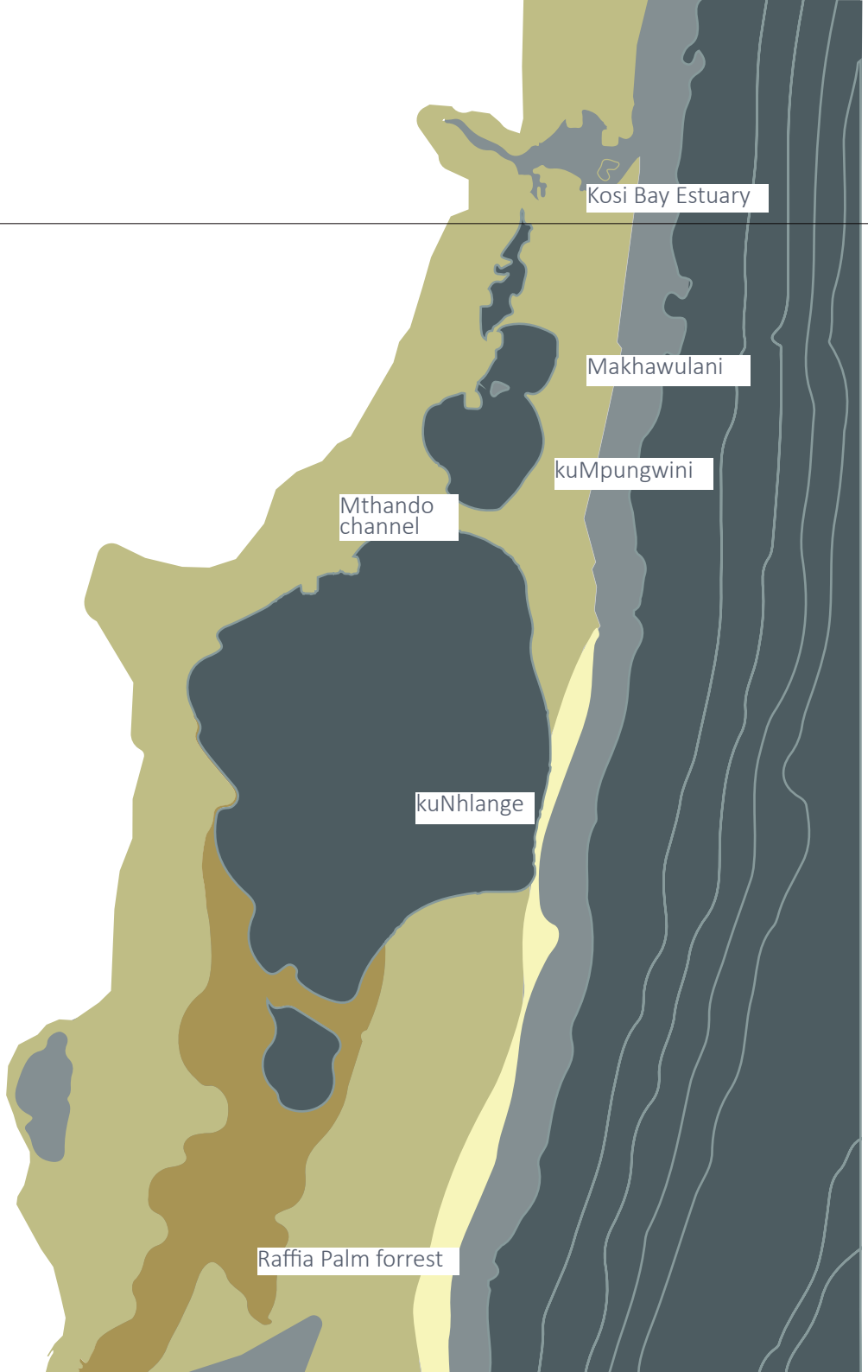
PART 4: TECHNICAL REPORT

The intent of the technical report is to communicate design solutions for the specific technical issues of the site. The approach toward the investigation is based on the analysis of local and climatical conditions of the wetland environment.

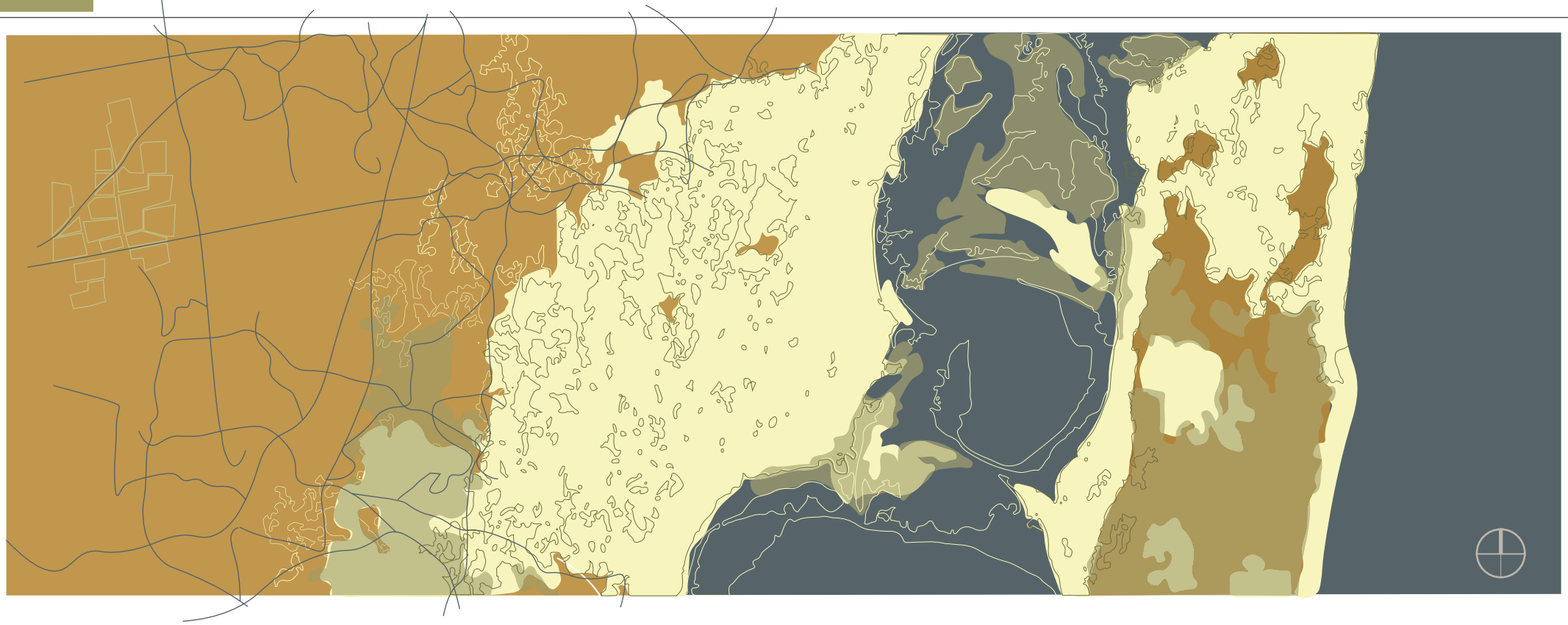
Firstly, the chapter will investigate and discuss the conditions of the site and the availability of materials. The second part of the chapter will investigate sustainability and a structural approach that can resolve the issues of the site on plan and section. Lastly, the tectonic resolution of the final design will be examined.

4.1. SITE AND LOCATION

The terrain consists primarily of dull, sandy soil that produces meandering grasslands and is interwoven with lakes, pans, streams, marshes, and swamps. The Kosi system provides a diverse environment, although the overall well-being is low. Marches, sedges, and aquatic communities; mangal communities; coastal dune forests; grassland/open woodland/palm communities; and algae are the main vegetation types. The system consists of four interconnected, nearly circular lakes (Makhawulani, Mpungwini, Nhlange, and Amanzimnyama), a long waterway extending to an estuary that leads to the Indian Ocean, and three extensive swamp areas. Swamp forest, Phragmites beds, mangrove forest (32 ha), coastal grassland/open woodland/palm communities, and algae are the most important habitats. The lakes are separated from the seashore by a 600 - 2000 m wide strip of sand dunes. In the system's lower tides, several sandy mudbanks emerge at low tide.



4.2. SITE TOPOGRAPHY



A critical analysis of the landscape, geology and topography of the site will be investigated to get a better understanding of the main constraints and possible technical concerns that can be prevented before starting with the design process. The research will further investigate possible conclusions of the climatic, material, and contextual aspects that should be considered: The initial steps in understanding the Kosi Bay Wetlands involves an examination of its geology and topography from a cartographic interpretation. The maps provide insights into the landscape, local climate conditions, wet and dry systems, all of which play a crucial role in understanding how water influences soil formation and the development of various types of vegetation.

The northern limit of the Wetland Park is demarcated by the Mozambique border, while the eastern boundary is defined by the Indian Ocean. The Kosi Bay system comprises four interconnected lakes linked by a network of meandering channels, surrounded by wetlands. It stands as one of the most captivating and unspoiled lake systems along the South African coastline.

4.2.1. THE GEOLOGY AND GEOMORPHOLOGY

The geology and geomorphology of the Kosi system create an intriguing pattern of natural wonders. Westward, a sharp contrast emerges: an empty landscape devoid of rocks or stones, except for the occasional rocky outcrop forming fascinating ledges and shelves along the coast. The outcrop at the estuary's mouth forms a tiny reef, attracting an extensive variety of marine species. The distinctive characteristics of the Kosi system resides in its segmentation, a natural process that transforms the land into circular water bodies separated by short beach barriers. These circular lakes reflect the opposing wave energy generated by the prevailing winds. The system, which consists of four lakes joined by a long shallow river leading to a bustling estuary, is a monument to the ecosystems. Three immense marsh areas find their outlet through permanent flowing streams within the landscape. The park's defining feature, however, is the presence of stagnant water and swampy terrain, which is caused by the region's high-water table.

4.2.2. THE SOIL TYPES

The Kosi System's soil types and chemistry exhibit a wide range of properties. The bottom materials are predominantly clean, white sands in the northernmost parts, where tidal forces are prominent. Even in steeply sloping profiles and around lake edges, sandy substrates predominate, with silt limited to deeper waters or as a thin layer overlying sand in certain shallow places. Kosi's sandy substrates are notable for their lack of fine particles and low nutritional content. This contrasts with the most profound parts of the system, where organic remains have collected over time. The bottom materials in such areas are distinguished by their low dry weights and high volatile and nutritional values. These elements, which are often rather thick, are dark and high in hydrogen sulphide. They begin in the system's surrounding marshes and swamps and naturally travel to deeper places, supplementing the soil with necessary organic material and nutrients critical to the ecosystem's health and vitality
Campbell, 1969).

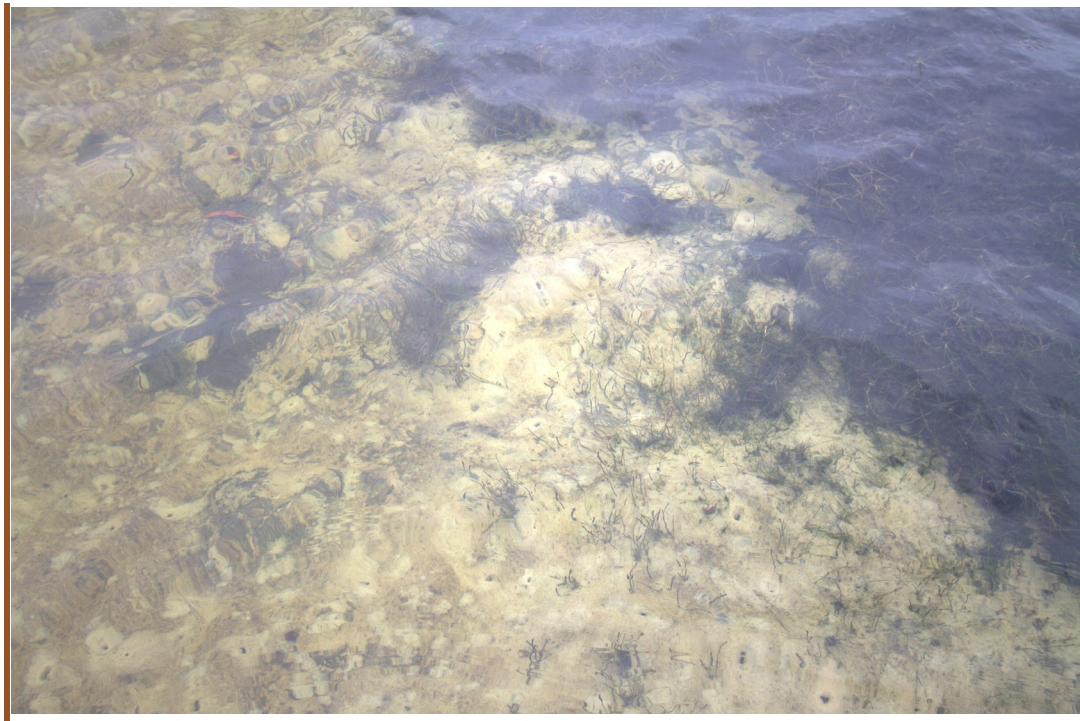


FIG 160:SOIL ON SITE (AUTHOR,2023)

4.2.3. WATER DYNAMICS

The water dynamics of the Kosi system, defined by depth, fluctuations, and permanence, display a rich natural diversity. Lake Nhlange has a maximum depth of 31 meters, while Lakes Mpungwini and Makhawulani have depths of 18 and 8 meters, respectively. The estuary, on the other hand, is relatively shallow, with a maximum depth of only 3 meters, while the southernmost Lake aManzimnyama is even shallower, with a maximum depth of only 2 meters. Notably, at low tide, over 70% of the tidal basin's area becomes visible, emphasizing the significant changes in water levels (Begg, 1978).

The estuary's mouth remains open throughout the year, despite the influence of regular and intense tidal movements. The upkeep of this opening is difficult, yet it provides a lifeline for the entire system. The dimensions of the mouth vary greatly, ranging from 20 to 50 meters in width and 3 meters in depth, with spring tides creating particularly noticeable fluctuations. The mouth can span an area of 5 to 100 meters at its widest point. These delicate interplay between depth, fluctuations, and the dynamic nature of the estuary demonstrate the intricate balance on which the Kosi system depends for its survival.

4.2.4. TIDAL CHANGES

Tidal changes have a considerable impact on the coastal dynamics, particularly during spring tides in late winter when water levels are at their lowest (approx. 0,9m). During certain times, the impact of tides can be seen clearly. The difference between low neap tide and low spring tide in the Kosi estuary is striking. Because the inflow of water during high spring tide does not have enough time to recede before the following high tide cycle begins (approx. 3,3m), water levels are lower during low neap tide. This causes irregular water levels, resulting in an ever-changing landscape within the estuary. Furthermore, seasonal fluctuations influence the rise and fall of water; summers see increased outflow to the ocean, whereas winter movements are mostly driven by tidal influences. Regardless of the season, outflow levels consistently exceed inflow levels (www.tideschart.com, n.d.).

4.2.5. CLIMATE:

Situated along the eastern coast of Africa, Kosi Bay experiences the influence of the warm Mozambican current that flows through the channel between Mozambique and Madagascar. Consequently, the region experiences a tropical climate, with significantly higher rainfall during the summer months compared to the winter months. According to the Köppen-Geiger climate classification, it falls into the Aw category. The average annual temperature in Kosi Bay is 22.7 °C, and the annual rainfall amounts to 840 mm. The warm and pleasant summer days typically begin in late June and last until September, covering the months of June, July, August, and September. On the other hand, the peak season for visitors is generally considered to be from January through December, excluding May and October (Climate-data, 2023: online).

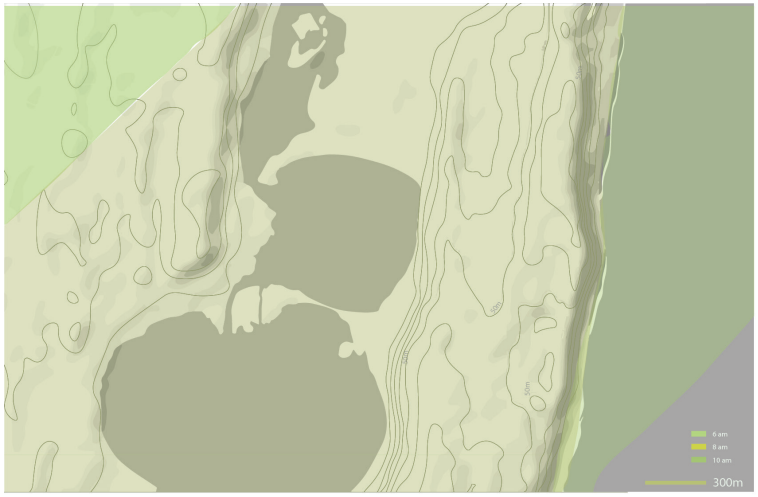


FIGURE 2: SUN DIAGRAM

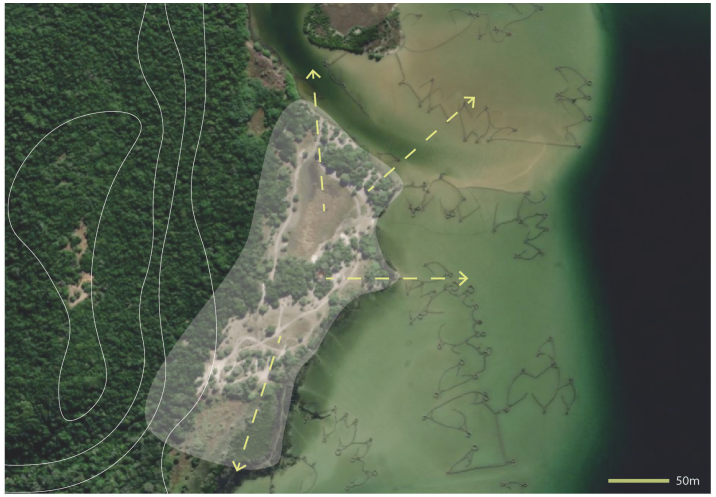


FIGURE 3: SITE & POSSIBLE VIEWPOINTS

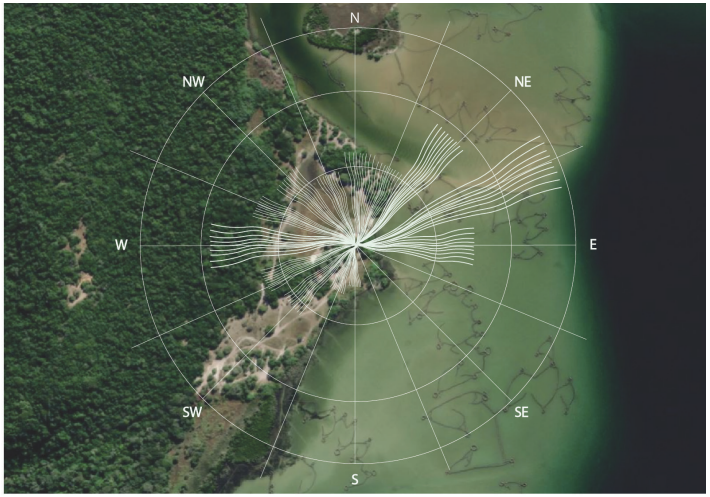


FIGURE 4: WIND DIRECTIONS

4.3. MATERIALITY

Informed by the inherent site phenomena and the unique requirements of the local community, the thesis is centred on the conservation of both the natural and human ecosystems existing within the wetland ecotone. This ecotone serves as a vital link, seamlessly connecting land and lake, as well as integrating living and working environments. Ecotones, recognized as transitional zones where two distinct biological communities merge, can exhibit soft transitions or clearly defined boundaries (as mentioned in Part 2). Coined by Alfred Russel Wallace in 1859, the term “ecotone” reflects the ecological conflict in these regions (Hortal et al., 2023, Online). The architectural program and design are carefully designed to embody a considerate and adaptive approach to the natural ecotone. This transitional wetland area, nestled between the land, water’s edge, and the lake, serves as the focal point. This section explores methods that embrace indigenous knowledge and employ materials with minimal environmental impact, ensuring a delicate and sustainable integration that treads lightly on the earth and minimizes the built footprint on the natural environment.

4.3.1. CONTEXTUAL MATERIALITY:

Materiality is an important aspect to look at, to depict a sensitive approach toward the preservation of the site. When exploring the area and visiting various structures within the town, I observed that the use of traditional materials has reduced over time, but traces of these elements are still visible. The architectural landscape showcases a diverse range of influences, evident in the building finishes and textures. These influences include prefabricated and locally made bricks, repurposing waste material that creates exterior textures, and the use of steel. Local buildings predominantly feature smooth materials like plaster, and many have retained their original appearance without repaint, revealing the organic nature of the informal material use established in this region. Over time, these buildings have developed a unique layer, reflecting their history and evolution. The modern structural framework has, in many instances, served as new inspiration, allowing current occupants to add layers of less permanent materials such as timber, corrugated iron, reeds, and welded reinforcing bar lattices. This adaptation reflects the inhabitants' specific needs and contributes to the area's diverse architectural language. It is crucial to acknowledge that buildings in this area will continue to evolve organically, shaped by the material availability. Therefore, when selecting materials and finishes for construction and renovation, it is essential to consider this natural process. Finishes that demand regular maintenance, are not suitable for this context, as they do not align with the evolving, adaptive nature of the local architecture.

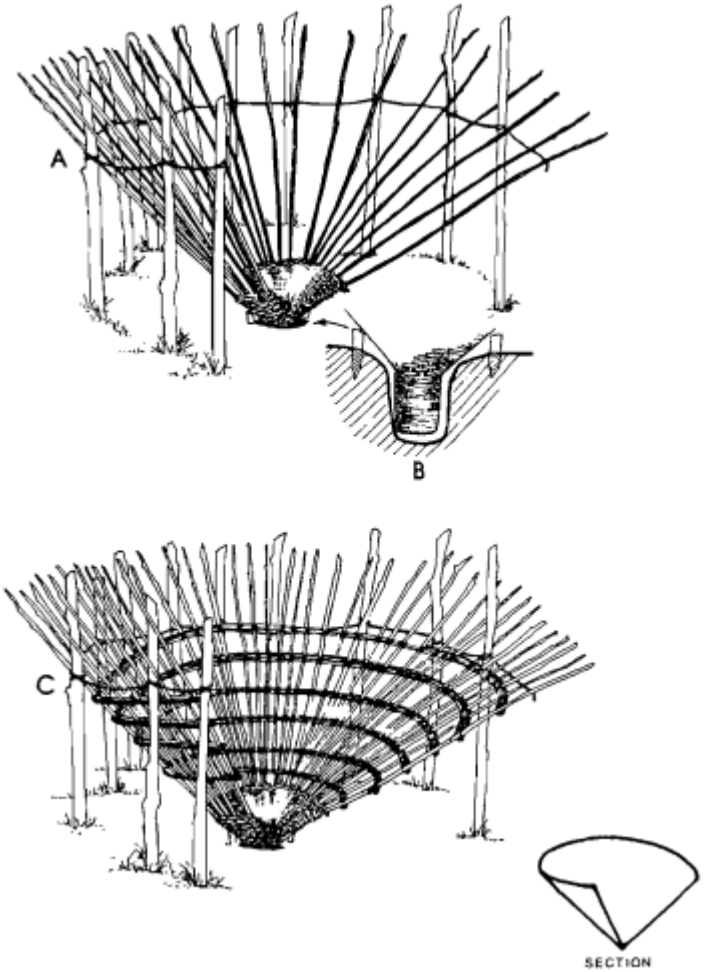
MATERIALS GATHERED WITHIN THE PARK

Revisiting the Tsonga hut typology and Kosi Bay vernacular discussed in part 2, a comparison between the initial use of materials and their present applications becomes evident. The images provided illustrate a noticeable inherent similarity between the original and current use, highlighting the continuing influence of traditional Tsonga hut typology on the architectural elements of Kosi Bay.

FIG 162: BUSHES FOR TRAPS (AUTHOR,2023)
FIG 163:GRASS FROM GRASSLANDS (AUTHOR,2023)
FIG 164:GRASS DRYING (AUTHOR,2023)

FIG 165: BUSHES IN TRAPS (AUTHOR,2023)
FIG 166:WEAVING (AUTHOR,2023)
FIG 167:GRASS WIYHIN STRUCTURE (AUTHOR,2023)

FIG 168: REEDSFOR TRAPS (AUTHOR,2023)
FIG 169:WATTLE(AUTHOR,2023)



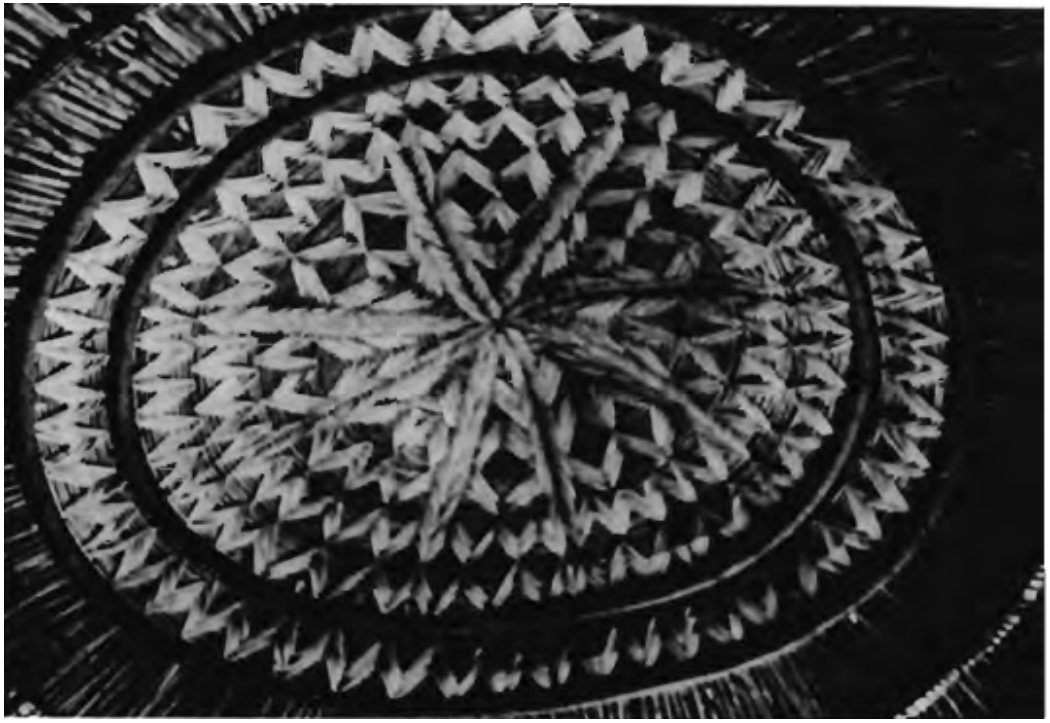


FIG 170: ROOF CONSTRUCTION STAGES (CUNNINGHAM AND GWALA, 1986)
FIG 171:THATCHING METHOD (CUNNINGHAM AND GWALA, 1986)
FIG 172: INTERIOR OF TRADITIONAL DECORATED HUT

CURRENT USES

FIG 173: ROOF INTERIOR (AUTHOR,2023)
FIG 174:EXTERIOR (AUTHOR,2023)

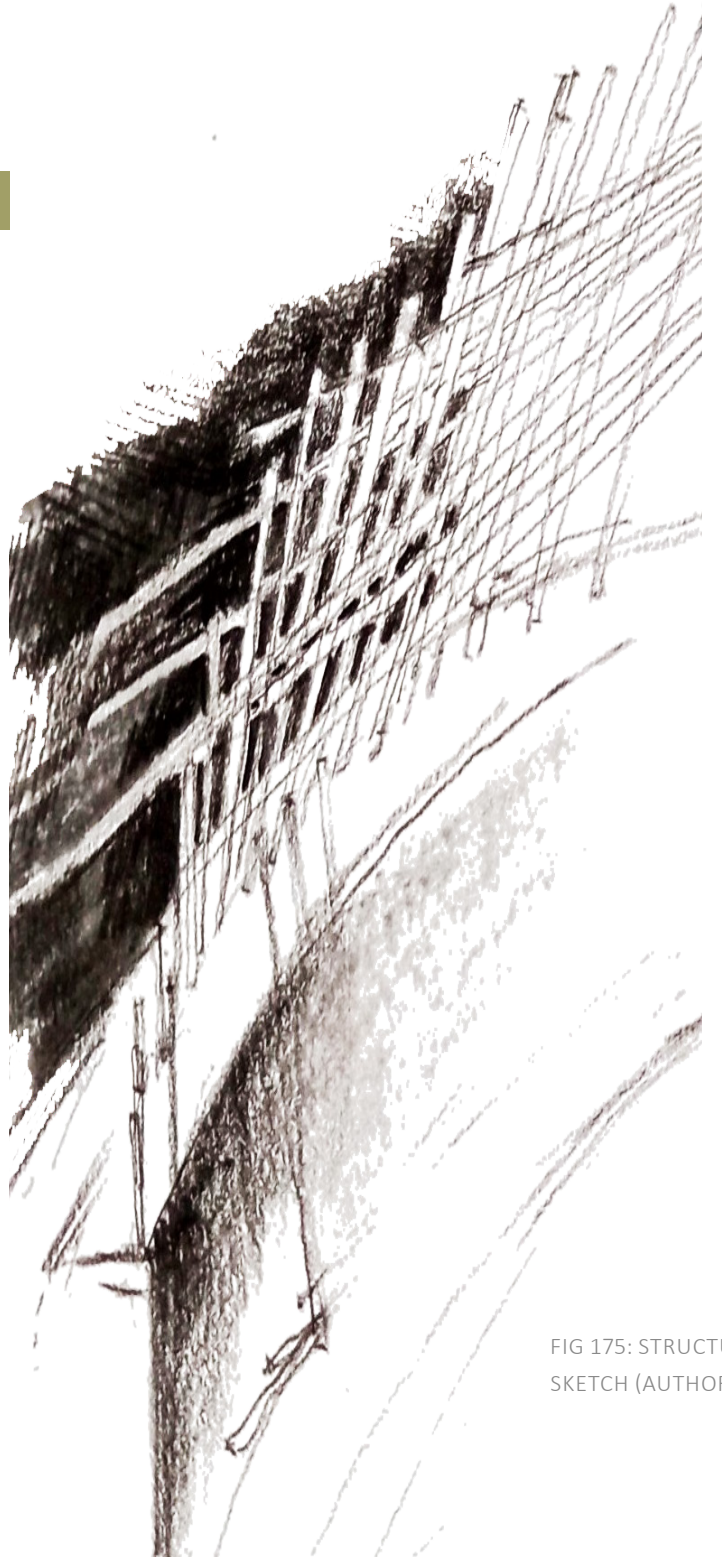


FIG 175: STRUCTURAL SKETCH (AUTHOR,2023)

4.4. STRUCTURAL COMPOSITION

a. ORIENTATION: What type of structure will preferably capture or block out the prominent south-eastern wind to maintain constant circulation and ventilation within the building?

b. FOUNDATIONS: From an ecological point of view, this is a sensitive environment, and the use of artificial materials should be limited. How can the use of different foundation systems be utilized to decrease the structure's negative environmental impact?
To avoid damaging the natural Mangrove system close to the water's edge, the construction will need to be lifted at specified locations on the site. What kind of structural systems can be employed to reduce the structure's footprint?

c. WALLS: Can the use of screen or lightweight structures be incorporated to increase ventilation within the building?

Think about how modular components allow for simple space expansion or to create hybrid spaces.

d. ROOF: In order to maximize ventilation, how can the roof structure be constructed to control wind flow?

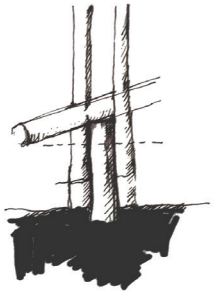


Figure 1: Post in drilled hole on land (Author. 2023)

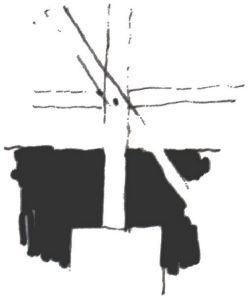


Figure 2: Post in Pre-cast foundation footing in water (Author. 2023)

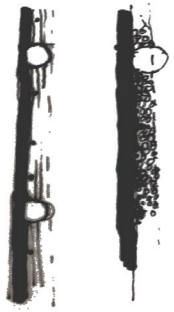
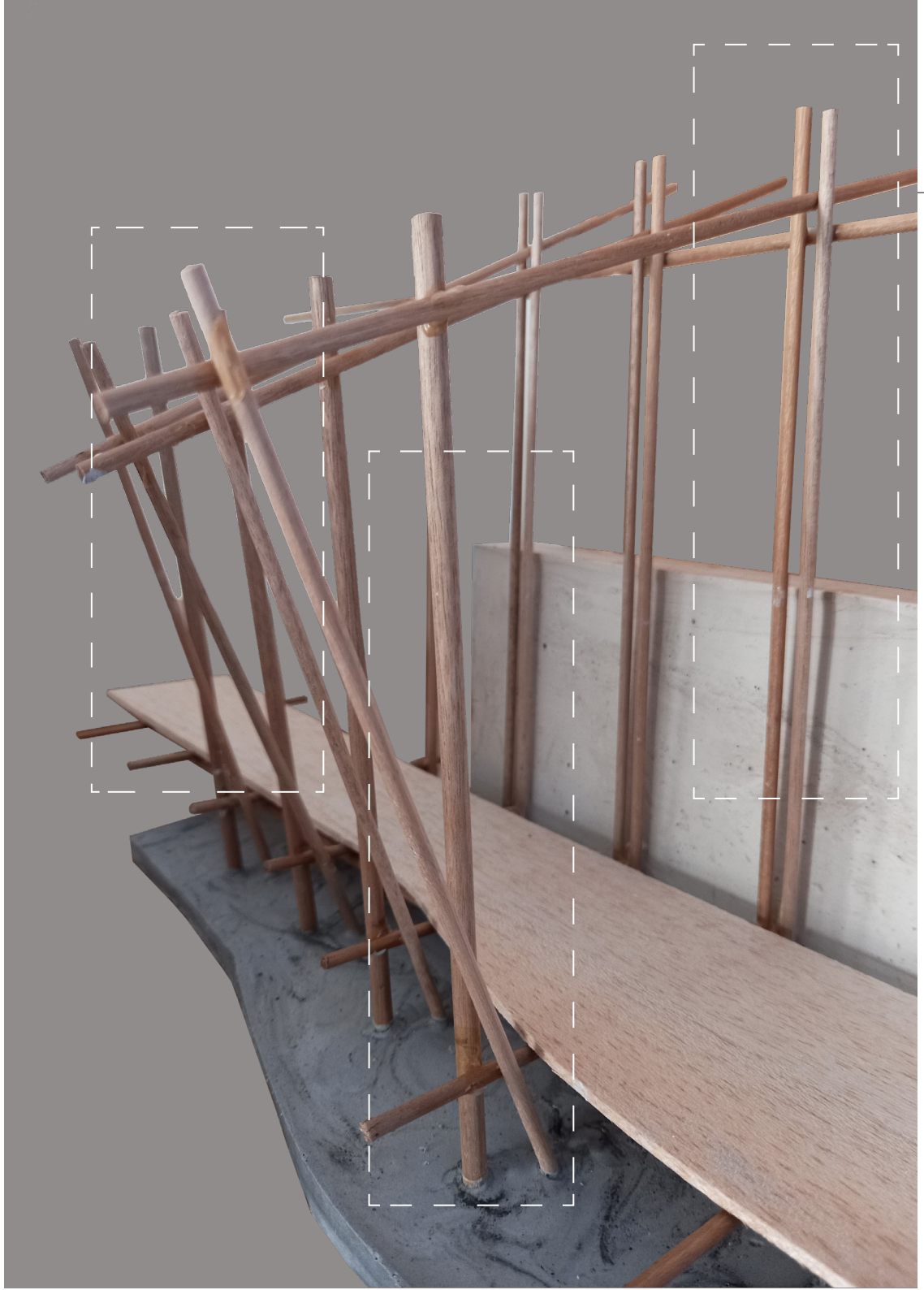


Figure 3: Cement & Grass wall (Author. 2023)



4.4.1. STRUCTURAL TOUCHSTONE:

The structural touchstone explores the connection between different materials to capture the dialogue between artificial and natural materials that can reflect the environment on a sensitive and indirect way. The construction methods will emphasise the ephemerality of site-specific materials.

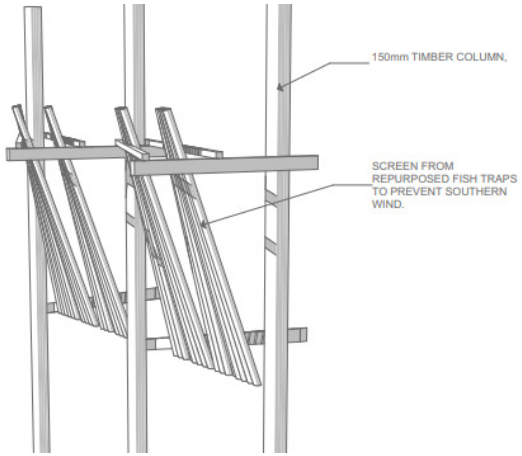
Vernacular construction methods play a big role in the availability of the materials. The materials are used and manipulated into built form, mostly on a practical level. The community depends on the availability of the materials in the area although these materials constantly need to be restored and maintained. This creates a sense of ephemerality within the ongoing construction method of the structure. Structural systems that can be restored easily will be investigated for the architecture to engage with the cultural aspects of the community.

The touchstone is an exploration of the initial design touchstone that emphasises the essence of the site. Indicating the phases of temporality and the coming together of these temporal elements.

A. ORIENTATION:

Drawing inspiration from the design and functionality of traditional fish traps, the concept behind the basket revolves around capturing and preventing fish from entering or exiting a specific area, as elaborated in Part 2: Section 4.2.2, which provides a detailed breakdown of the trap's composition. From an architectural approach, the form-giving of the basket has been altered to suit a different purpose: it will effectively capture or deflect the prevailing south-eastern wind. By doing so, the structure provides a regular flow of air circulation and ventilation within the building, mimicking the trap's planned approach to limiting the movement of fish.

The building's orientation plays a pivotal role in enhancing ventilation, harnessing the natural flow of southern winds that permeate through its structure. To optimize ventilation, innovative methods have been integrated into the wall structures, ensuring efficient air circulation. Moreover, a unique cooling system has been devised using a collection of clay pots. These pots serve as natural heat absorbers; when they come into contact with water and wind passes through, the air inside cools down significantly. This ingenious combination of strategic orientation, advanced ventilation techniques, and the use of traditional clay pots not only ensures a comfortable indoor environment but also showcases a sustainable approach to cooling within the building (Franco, 2019).



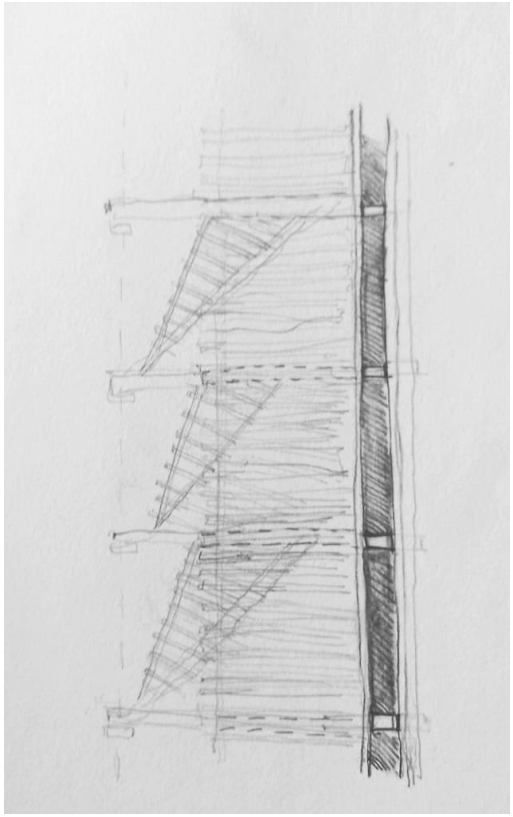
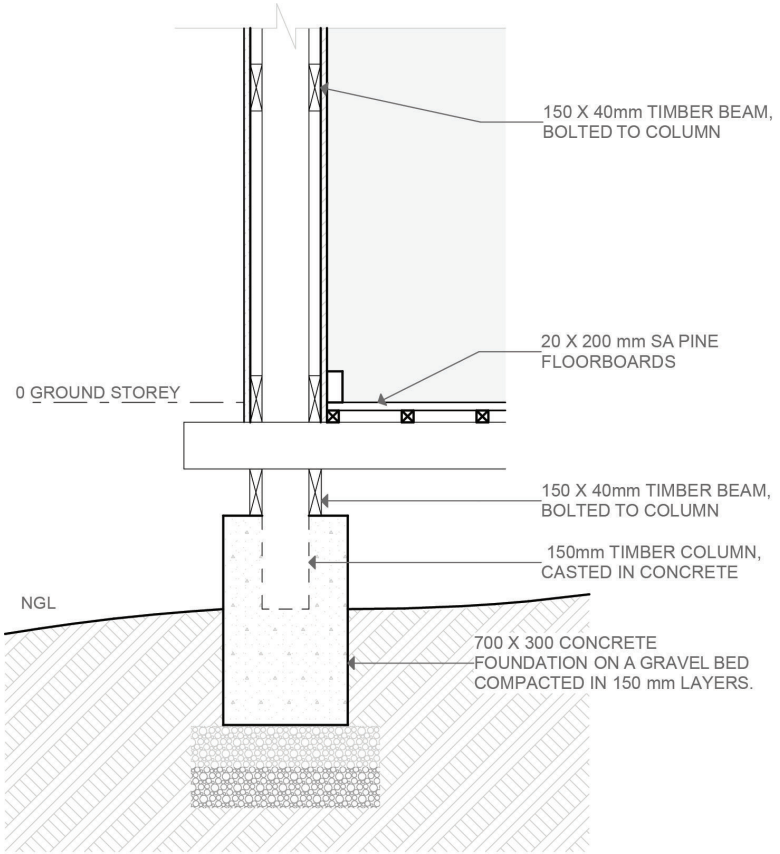


FIG 176: STRUCTURAL DRAWING OF SCREEN (AUTHOR,2023)
FIG 177: MODEL (AUTHOR,2023)
FIG 178:PERSPECTIVE (AUTHOR,2023)

B. FOUNDATIONS:

Considering the environmental conditions and to prevent harm to the delicate natural ecosystem near the water's edge, it is imperative that the construction process involves lifting the structure. To minimize the adverse environmental impact, a specialized foundation system will be employed. In this method, the timber structure will be encased within a concrete foundation measuring 700 x 300mm. By adopting this approach, careful consideration is given to preserving the surrounding environment while ensuring the stability and longevity of the construction.

FIG 179: MODEL OF FLOOR GRID (AUTHOR,2023)



DETAIL SECTION - FLOOR

SCALE 1:20

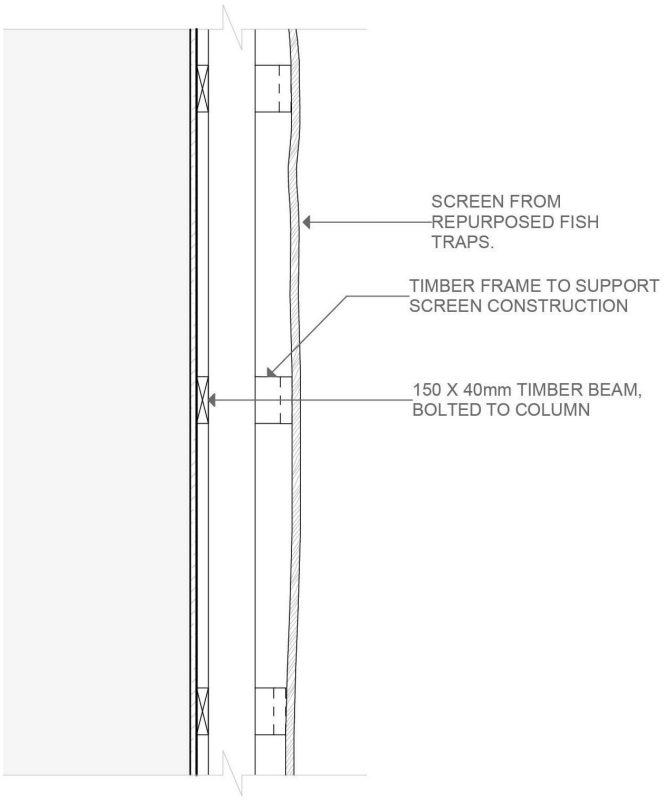
C. WALLS:

The walls in the structure will be non-loadbearing components, filling the gaps between the frame structure. These walls will be built with 50mm x 38mm studs and shutterboard panels on both the inner and outer surfaces. To improve thermal efficiency, the framework's gaps will be filled with insulation material. A damp-proof membrane will be affixed to the shutterboard on the outer side of the walls, ensuring moisture protection. This membrane will then be covered with natural timber cladding, which will provide both a protective barrier and a visually appealing finish to the structure's outer walls.

In addition to the cultural characteristics, the architectural design of the area incorporates the rich heritage of the community. Specifically, the interior walls of the buildings will be decorated with locally woven mats, reeds, and repurposed traps, reflecting the indigenous craftsmanship and traditions of the region. This integration of cultural elements not only adds a distinctive aesthetic to the structures but also depicts the community's heritage, creating a combination of tradition and modernity.

D. ROOF:

The intention is to create an overhang that also allows for natural insulation and ventilation. This approach not only incorporates current architectural techniques, but it also reflects the region's underlying traditions. As described in Part 2: Section 4.2.1, the appreciation for tradition is represented through the finish of ceilings with indigenous craftsmanship, thereby merging current practicality with cultural history.



DETAIL SECTION - SCREEN
SCALE 1:20

4.5. SERVICES

4.5.1 WASTE REMOVAL:

The waste yard has been strategically placed right next to the service yard, with its own dedicated service road for access. This thoughtful arrangement ensures that the waste yard is kept separate from public areas. This deliberate design allows for efficient trash management activities, all the while ensuring a distinct separation between where garbage is deposited and the areas where the public can easily access the building.

4.5.2. SEWAGE DISPOSAL

There is no direct municipal sewage connection available on the grounds. Instead, a septic tank serves as the site's sewage disposal. To transfer black water from the toilets to the septic tank, 110-diameter sewage pipes with a 1:100 fall are used. The septic tank is strategically located at the lowest part of the site, more than 3 meters away from the main building, ensuring effective and environmentally responsible wastewater management.

4.5.3. SOLAR:

The primary energy source for the design is solar electricity, which is harnessed by way of a configuration of 18 north-facing solar panels. These panels are strategically located on the roof of the park office parking facilities, serving as the major power source. Within the pavilions, these include projectors, water pumps, and lighting systems, as well as motor elevators and landscape lights. The batteries for both set of solar panels are housed within the staff facilities for convenient access and maintenance.

FIG 180:SITE PLAN (AUTHOR,2023)

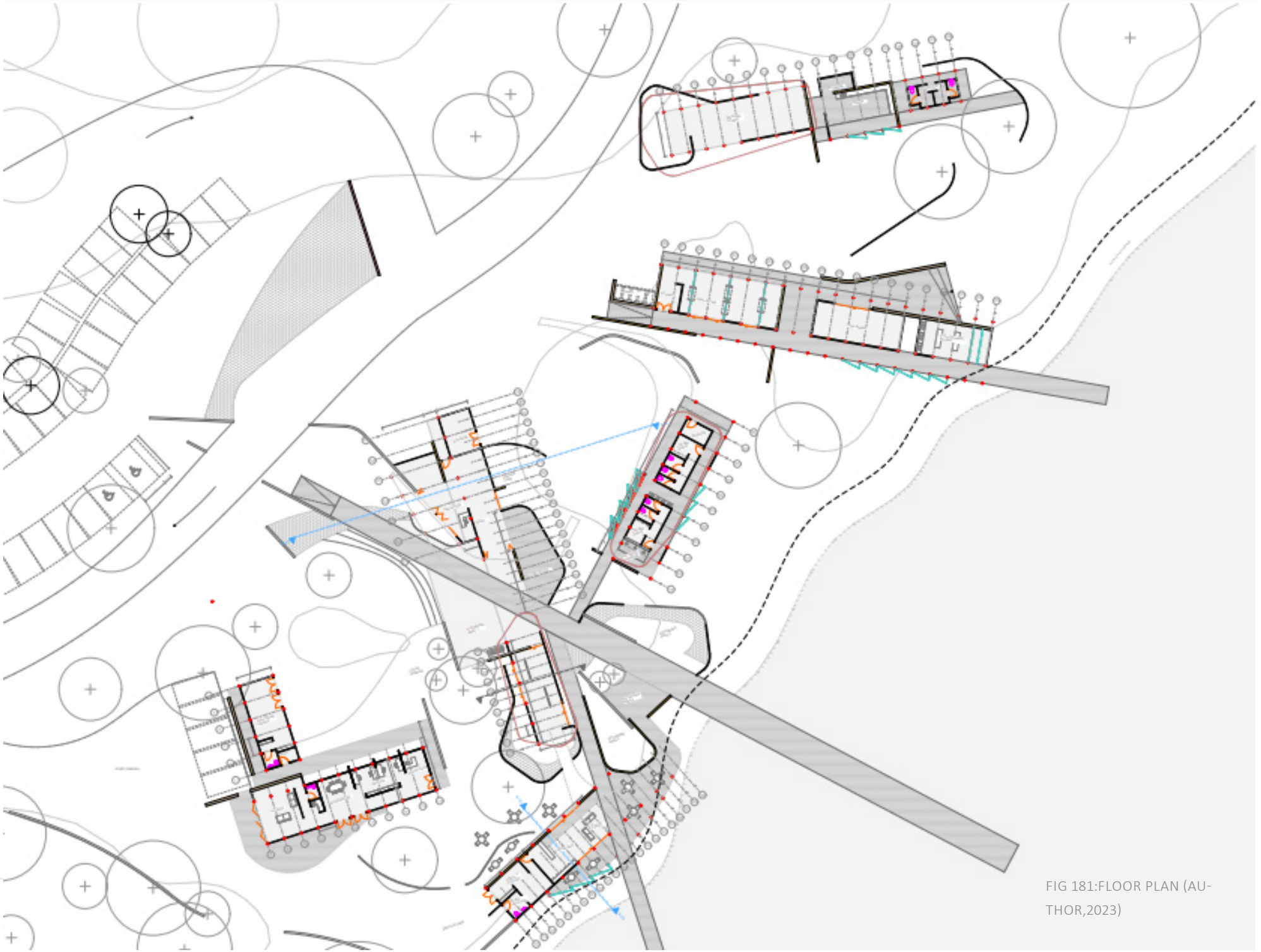
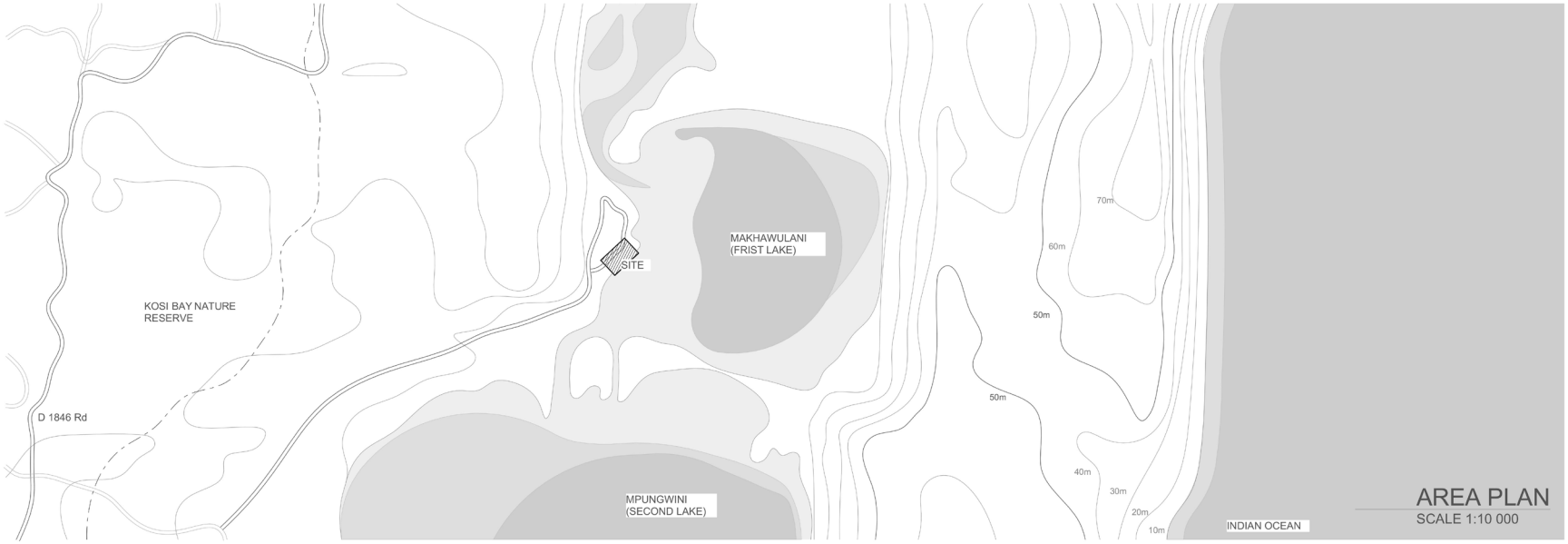


FIG 181:FLOOR PLAN (AUTHOR,2023)

APPENDIX A: CONSTRUCTION DOCUMENTATION



AREA PLAN
SCALE 1:10 000

SITE PLAN
SCALE 1:500

NOTES:

ARCHICAD EDUCATION VERSION

N

PROJECT TITLE:

CULTURE AND NATURE EDGE PLACE

PROJECT DESCRIPTION:

PROPOSED NEW BUILDING

PROJECT LOCATION:

ISIMAGALISO WETLAND PARK

DATE:

2023-09-06

DRAWN BY:

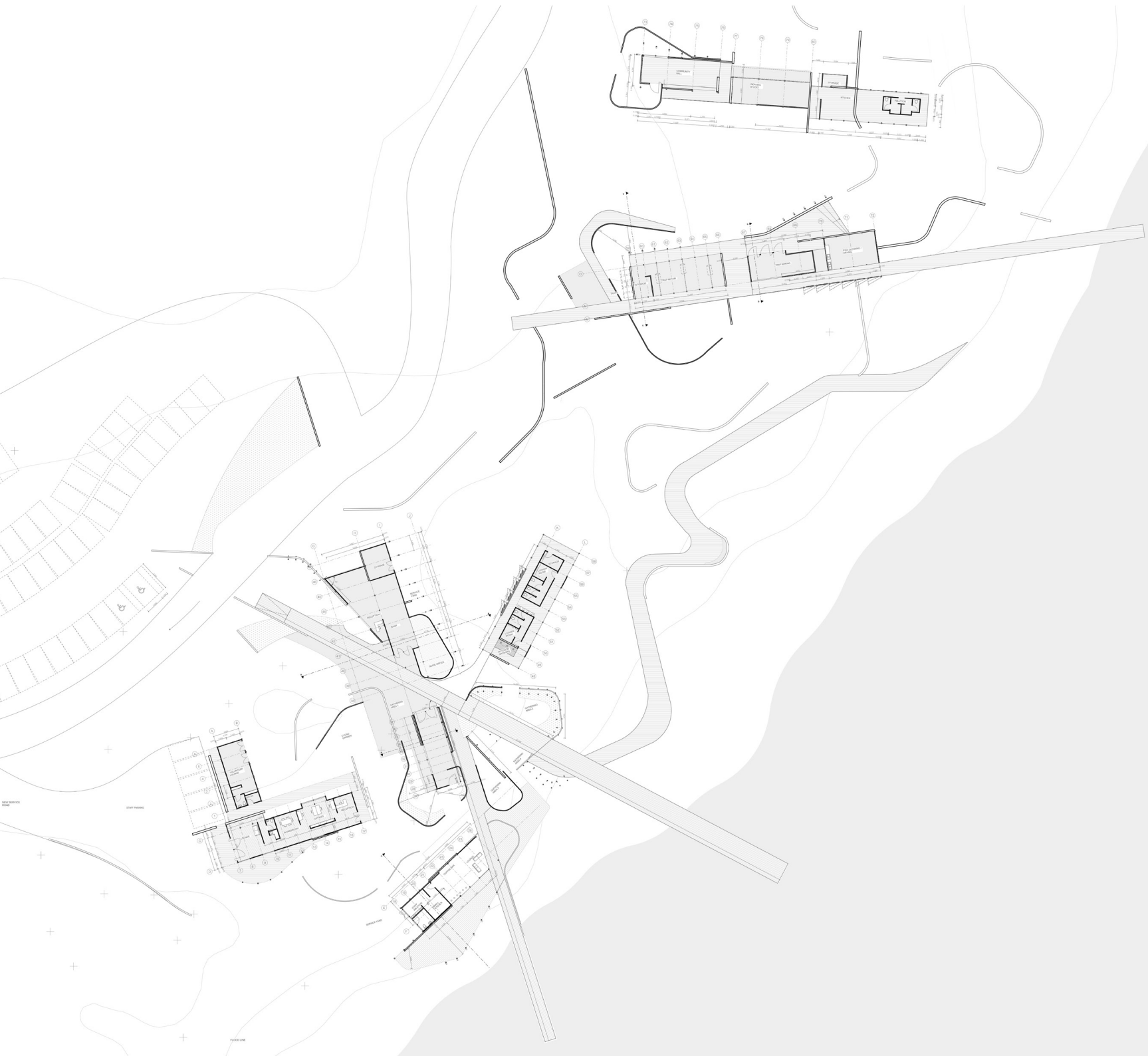
KARMEN SWARTS
2017079597

DRAWING NAME:	SCALE:
AREA PLAN	**1:10 000**
SITE PLAN	**1:500**

SHEET NUMBER:	SHEET SIZE:
001	**A1**

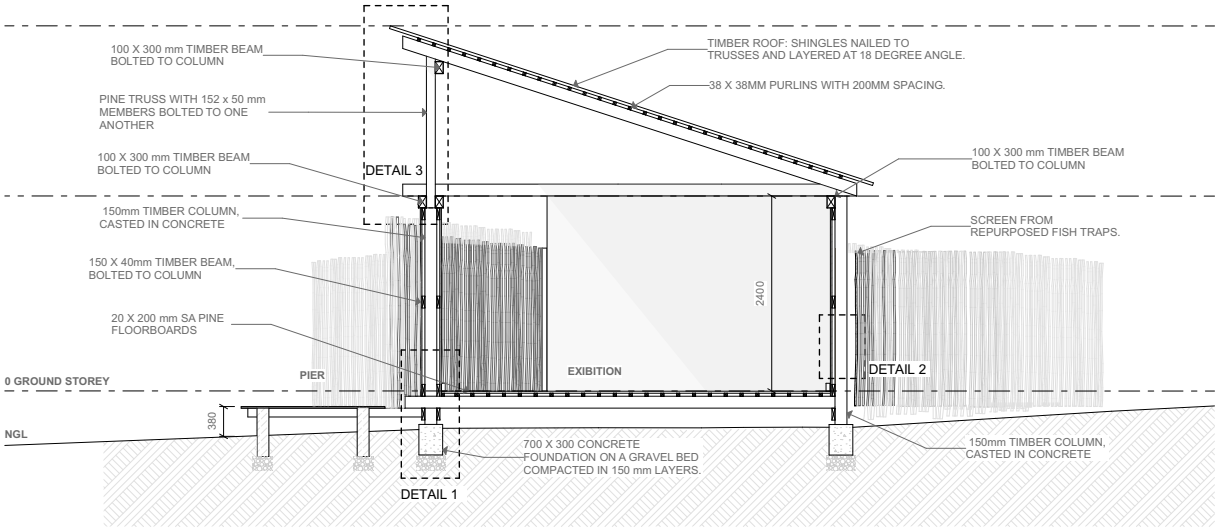
DRAWING TITLE:

AREA & SITE PLAN

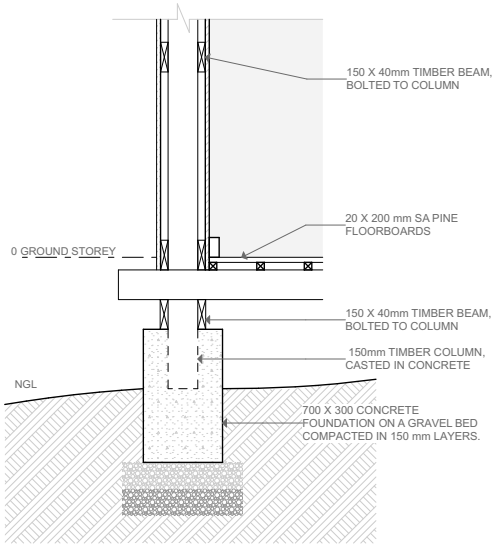


GROUND FLOOR PLAN

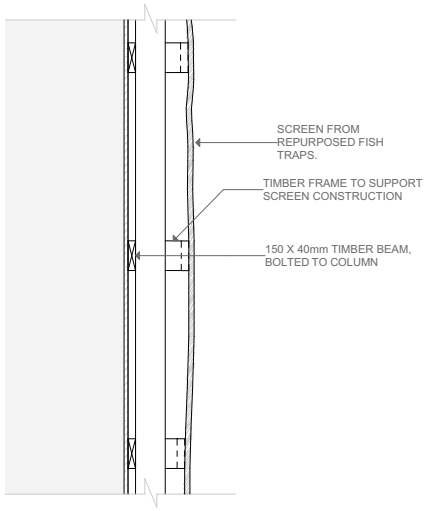
SCALE 1:200



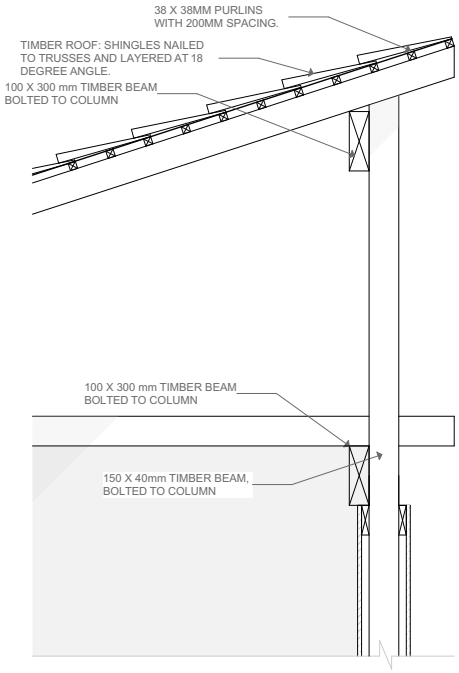
SECTION A - A
SCALE 1:50



DETAIL 1 - FLOOR
SCALE 1:20



DETAIL 2 - SCREEN
SCALE 1:20



DETAIL 3 - ROOF
SCALE 1:20

PROJECT TITLE:
CULTURE AND NATURE EDGE PLACE

PROJECT DESCRIPTION:
PROPOSED NEW BUILDING

PROJECT LOCATION:
ISIMAGALISO WETLAND PARK

DATE:
2023-09-06

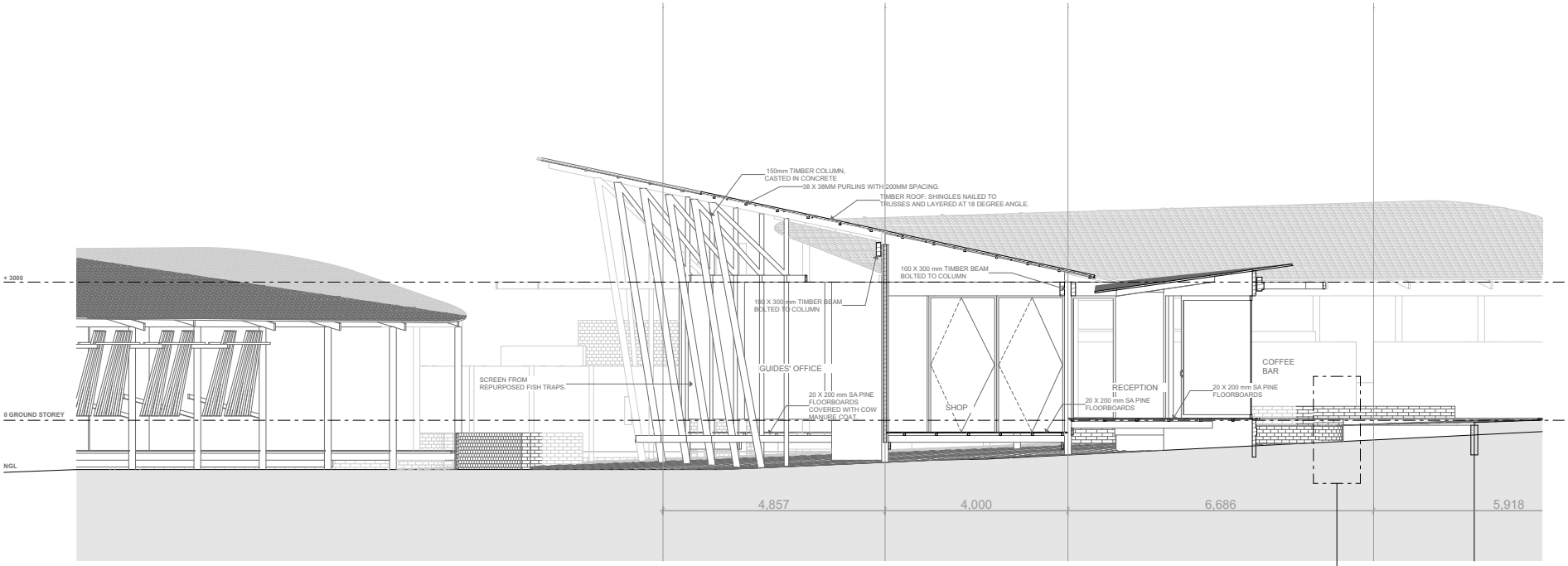
DRAWN BY:
KARMEN SWARTS
2017079597

DRAWING NAME:	SCALE:
SECTION A - A	**1:50**
DETAIL SECTION - FLOOR	**1:20**
DETAIL SECTION - SCREEN	**1:20**
DETAIL SECTION - ROOF	**1:20**

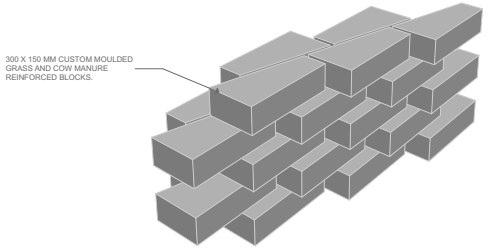
SHEET NUMBER: **003**

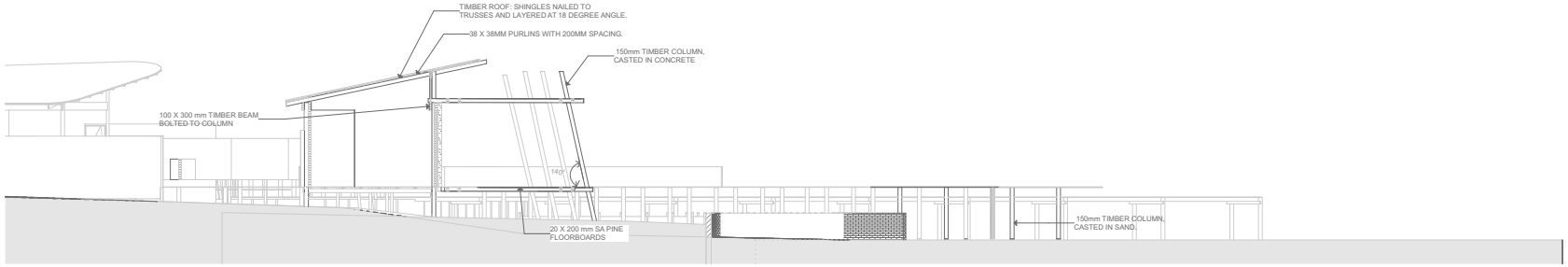
SHEET SIZE: **A2**

DRAWING TITLE:
SECTION & DETAIL SECTIONS



SECTION B-B
SCALE 1:50





SECTION C-C
SCALE 1:100

NOTES:

ARCHICAD EDUCATION VERSION

PROJECT TITLE:
CULTURE AND NATURE EDGE PLACE

PROJECT DESCRIPTION:
PROPOSED NEW BUILDING

PROJECT LOCATION:
ISIMAGALISO WETLAND PARK

DATE:
2023-09-06

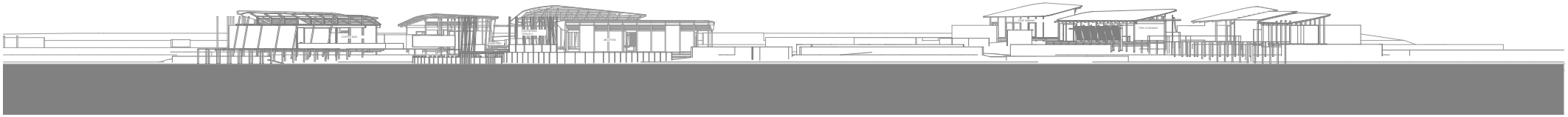
DRAWN BY:
KARMEN SWARTS
2017079597

DRAWING NAME:	SCALE:
SECTION B-B	1:50
SECTION C-C	1:100

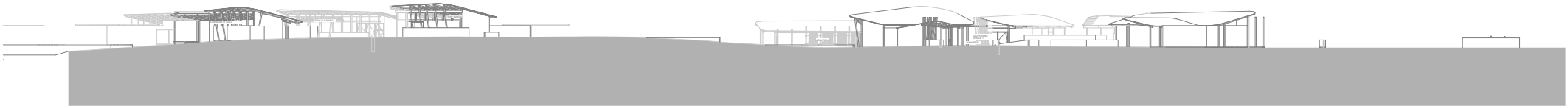
SHEET NUMBER: **004**

SHEET SIZE: **A1**

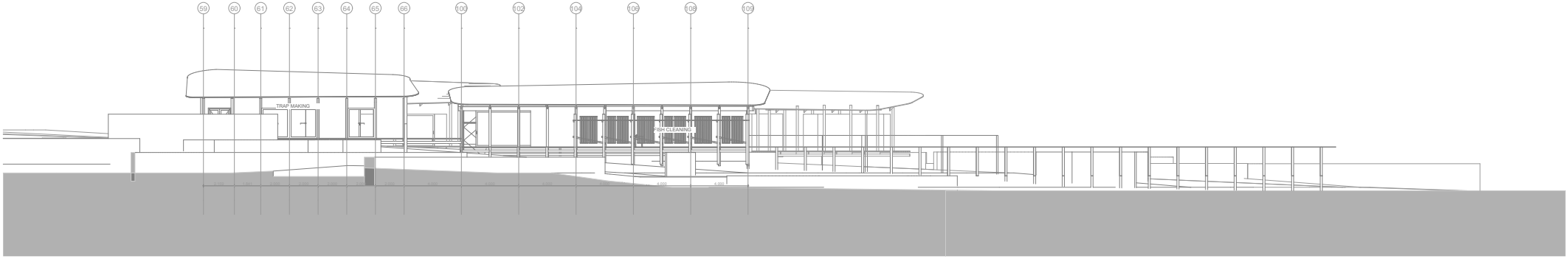
DRAWING TITLE:
SECTION & DETAIL SECTIONS



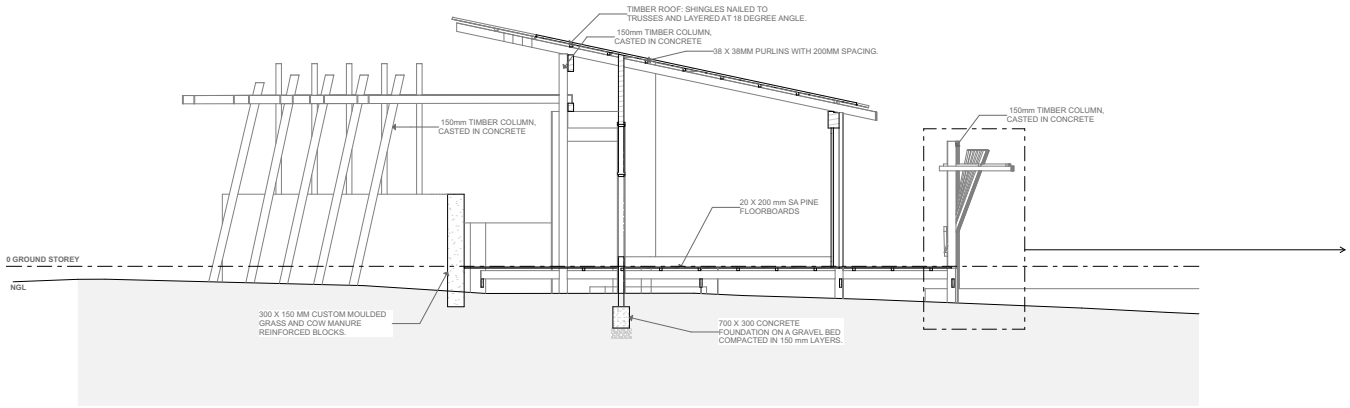
EAST ELEVATION
SCALE 1:200



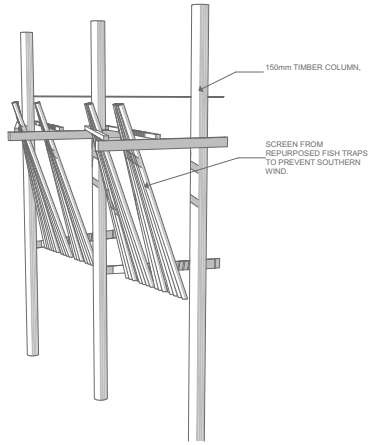
WEST ELEVATION
SCALE 1:200



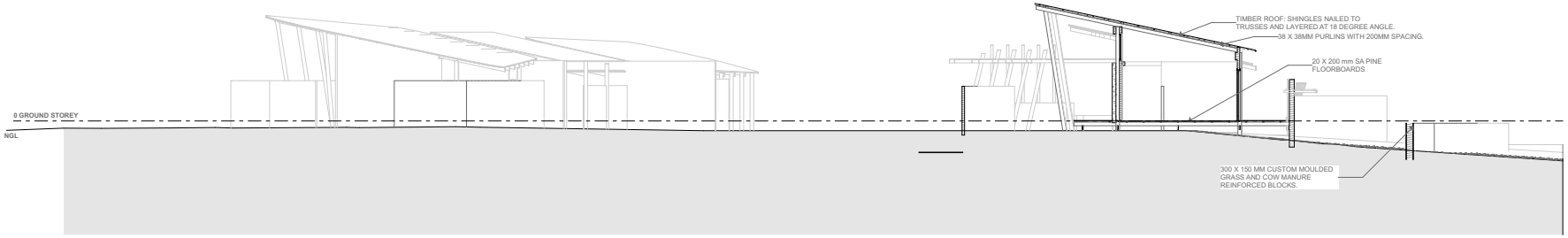
COMMUNITY PAVILION - SOUTH ELEVATION
SCALE 1:100



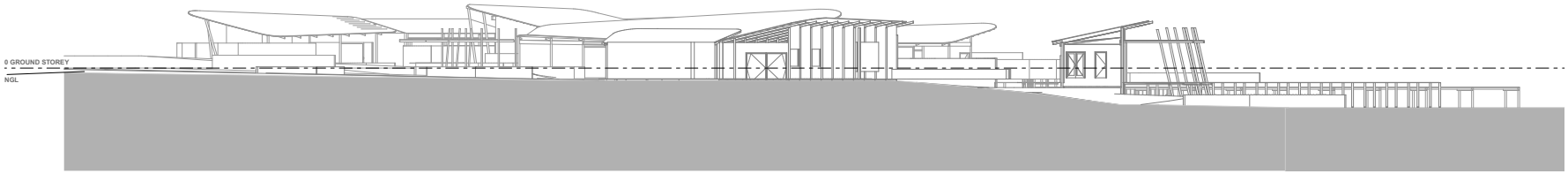
SECTION D-D
SCALE 1:50



DETAIL 4
SCALE 1:20



SECTION E-E
SCALE 1:100



SOUTH ELEVATION
SCALE 1:200

NOTES:

ARCHICAD EDUCATION VERSION

PROJECT TITLE:

CULTURE AND NATURE EDGE PLACE

PROJECT DESCRIPTION:

PROPOSED NEW BUILDING

PROJECT LOCATION:

ISIMAGALISO WETLAND PARK

DATE:

2023-09-06

DRAWN BY:

KARMEN SWARTS
2017079597

DRAWING NAME:	SCALE:
SECTION D-D	1:50
SECTION E-E	1:100

SHEET NUMBER:

SHEET SIZE:

A1

DRAWING TITLE:

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