



THE
AMANZI
ENTABA
PATH

JESSE DE KOCK 2016102671

A Fynbos Interpretation Centre within West Coast National Park to retell the Fynbos narrative and bridge harmony between humans and nature through architectural intervention

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To make a journey for
people to meet nature
in another way.

//

Yosuke Hayano, MAD Architects

TABLE OF CONTENTS

THE AMANZI ENTABA PATH	CHAPTER 01: CONCEPTUAL PREMEDITATIONS	i	CHAPTER 02: SITING THE CONCEPTUAL REACTION	1	CHAPTER 03: THEORETICAL CONCEPTS and IDEAS	29
			SITE ANALYSIS	3	FYNBOS LIFECYCLE	31
	DECLARATION	iii	ALTERNATIVE ANALYSIS	12	BIOMIMICRY Alvar Aalto	33
	ABSTRACT	iv	PREFIGURED SETTING	16	ORGANISM Le Corbusier	35
	RESEARCH FRAME	vi	TOUCHSTONE	19	BEHAVIOUR Le Corbusier	41
	INTRODUCTION	vii	CONCEPTUAL DEVELOPMENT	21	SYSTEMIC Mick Pearce	44
	CHAPTER LAYOUT	x	STRUCTURAL TOUCHSTONE	24	APPLICATION	50
RESEARCH TOOLS	xi	APPLICATION	26			

TABLE OF CONTENTS

<p>CHAPTER 04: PRECEDENTIAL INVESTIGATIONS</p>	53	<p>CHAPTER 05: RETELLING EVENTS THROUGH ARCHITECTURE</p>	64	<p>CHAPTER 06: EPILOGUE</p>	138
INTRODUCTION	54	INTRODUCTION	65	CONCLUSION	139
MAPUNGUBWE CENTRE <small>Peter Rich</small>	55	DESIGN DEVELOPMENT	66		
HAKKA INDENTURE MUS. <small>DNA Arch.</small>	57	FINAL DESIGN	90	CONS DOCUMENTATION	140
ZINC MINE MUSEUM <small>Peter Zumthor</small>	59	FINAL MODEL	120	ACKNOWLEDGMENTS	148
CONCLUSION	62	TECHNICAL INVESTIGATION	124	REFERENCE LIST	149
				PLAGIARISM	152



CHAPTER 01

CONCEPTUAL PREMEDITATIONS

Initial thoughts, ideas and concepts driving design considerations and site reactions

This chapter expands on the heart of the project and acts as an initial introduction to proposed intervention and to the prefigured scene. Within the first chapter, the foundation will be laid for the chapters to follow. Here, we will state the problem, research question and potential route for design, while additionally looking at the chapter layouts and the research tools that will be used to address the problem statement and answer the research question. This chapter consists of the premeditations that lead to the decisions for the site, theory and approach.

DECLARATION OF OWNERSHIP

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This dissertation is submitted in partial fulfillment of the requirements for the Masters Degree in Architecture. All work enclosed in this document is my own except where otherwise acknowledged.

Declaration of original authorship:

The work contained in this dissertation has not been previously submitted to meet requirements for an award at this or any other institution of higher education. To the best of my knowledge, this dissertation contains no material previously published or written by another person except where due reference is made.



A B S T R A C T

Nature, a vast and endless palette of inspiration, sets the stage for a library for textures, patterns, and motifs. There is no better designer than nature itself and architects have long been inspired by it, trying to evoke emotional connections to nature.

My interest in the connection between man and nature, as told by the delicate fynbos biome, stems from a life-long love and appreciation for nature, taught through generations in our family. As a child, I was directed into appreciating the intricate small beauties lying within nature, the scents and textures that make up a perfectly balanced existence. Even in school, we were taught a respect and understanding of our importance in nature's survival. Being taught the importance of nature, its role in our survival and vice versa, continued a childhood love implemented at a young age. My fondness for The West Coast National Park, and specifically fynbos, started in 2016, when I first visited this natural gem within the Western Cape. The endless beauty of something so refined brought peace in admiration of something that I knew to be intricate and unique.



A B S T R A C T

The Anthropocene era, the era of human impact on the earth, has taken us far from nature, creating a separation, lacking environmental connection instead of striving to connect architecture to nature through the creation of emotional and spiritual spaces for everyday life, through “amanzi entaba”. This is a Xhosa phrase, made up of the word’s “mountain” and “water”, for an emotional harmony between human beings and nature.

Fynbos, the “fine-leaved plants”, is an extraordinary biome, occurring solely on Africa’s southern peninsula. With a very wide range of plant species (roughly 8700), it stretches from the west coast to the east coast, outshining many rainforests in terms of sheer diversity. The beauty of fynbos truly lies in its birth and growth, a sensitive and intricate system of rebirth and fire.

A Fynbos Interpretation Centre, funded by SAN Parks, located within the West Coast National Park, is proposed to preserve and retell an overlooked and unique narrative. The poetical quality of the setting inspires an intervention that builds that tells a story. The Fynbos Interpretation Centre proposes an architectural intervention articulating various moments within a sensitive process and interconnectedness within human experiences as visitors move through spaces and times.



RESEARCH FRAME

In part, the life of fynbos occurs within an extensive timeline, rebirth every 8 - 40 years and growth 9-11 years. The moment of rebirth by fire, to survive, and the slow painful growth from an existing form was ultimately very different from the moment I stood and looked admirably at the various points of unending scenery existing in flourishing before me. Yet, in the presence of this endless flourishing landscape, marked by the unique viewpoints, I found myself able to imagine an experience in connecting with the landscape; transported back into time and place, reliving an experience and moment, precisely because of the narrative set up by the unique life of Fynbos. I asked myself . . .

**How can architecture bridge the gap between man and nature?
How can it create experiences evoking emotion and understanding of an
overlooked process?
How can architecture act as a mimetic tool, as scenes created by fynbos placed
between earth and sky to amplify and/or bridge differences in place and time
through the movement in space?**

Considering the mystery of the overlooked, which the still existence of fynbos holds, rooted in difficulty and survival – the following question presented itself:

**Is it important to employ architecture at all to collect, retell and connect
man to nature? OR Is the image of the fynbos landscape, a symbol of
interpretation and connection without needing explanation?**

These questions led me to realize that: yes, the fynbos landscape, of what is a uniquely South African scene, allures us to admire nature itself. I realized how limited my knowledge related to the topic of fynbos is and by extension, how little most of us probably can recall on its unique lifecycle and role within our ecosystem. But if there is no evidence of what once occurred, we would never reconsider the sensitivity of the landscape we inhabit. Interpreting nature is therefore important so that it can be fully experienced and remembered.

My first premise is that it is important to collect and retell the fynbos narrative. The second is that in being emplaced and embodied within scenes and moving through scenes allow a visitor to visualize the experience and to become more aware of the indifferences and connectedness of place and time, and the human experiences of such interconnectedness.

From this personal experience, I formulated the leading theme of this research document:

A Fynbos Interpretation Centre within the West Coast National park “to retell the hidden narrative and bridge harmony between human beings and nature through architectural intervention”.

This theme aims to:

Preserve and recount disremembered fynbos narratives through sequenced architectural interventions which articulates both the indifferences between and interconnectedness within human experiences as visitors move through places and times.



PROBLEM STATEMENT:

IF: a lack of respect for nature is rooted in misappreciation; and becoming part of the narrative allows us to experience interconnectedness with events.

THEN: architecture acts as lived moments and an intervention to situate us experientially within the narrative of fynbos, to collect and comprehend the sensitive existence of the misunderstood.

RESEARCH QUESTION:

How can architecture employ a series of experiential interpretive scenes to frame, educate and preserve the fynbos narrative?

While fynbos is the main driver for this project, the unique positioning of the site extends the viability of the scheme as there is a link with the West Coast National Park. The development of a Fynbos Interpretation Center that conserves the natural landscape of the West Coast, supplements the park's mission statement of SAN parks for the West Coast National Park:

"To conserve and enhance the unique terrestrial and marine, ecological and cultural, historic and scenic resources of the Langebaan Lagoon and Saldanha Bay, proximate islands and surrounding terrestrial environments of the West Coast for the appreciation, and use of, for present and future generations."
(Cowan & Mpongoma 2010).

The proposed site as well as the West Coast National Park is located 100km northwest of Cape Town on the Atlantic seaboard in the Western Cape Province. The park is situated between Yzerfontein and Langebaan, with the Atlantic Ocean to the west. The proposed site, shown in figure 1, resides within the center of the park, alongside the lagoon, situated between the popular tourist picnic area at The Preekstoel (West) and the private residential town of Churchhaven (East)

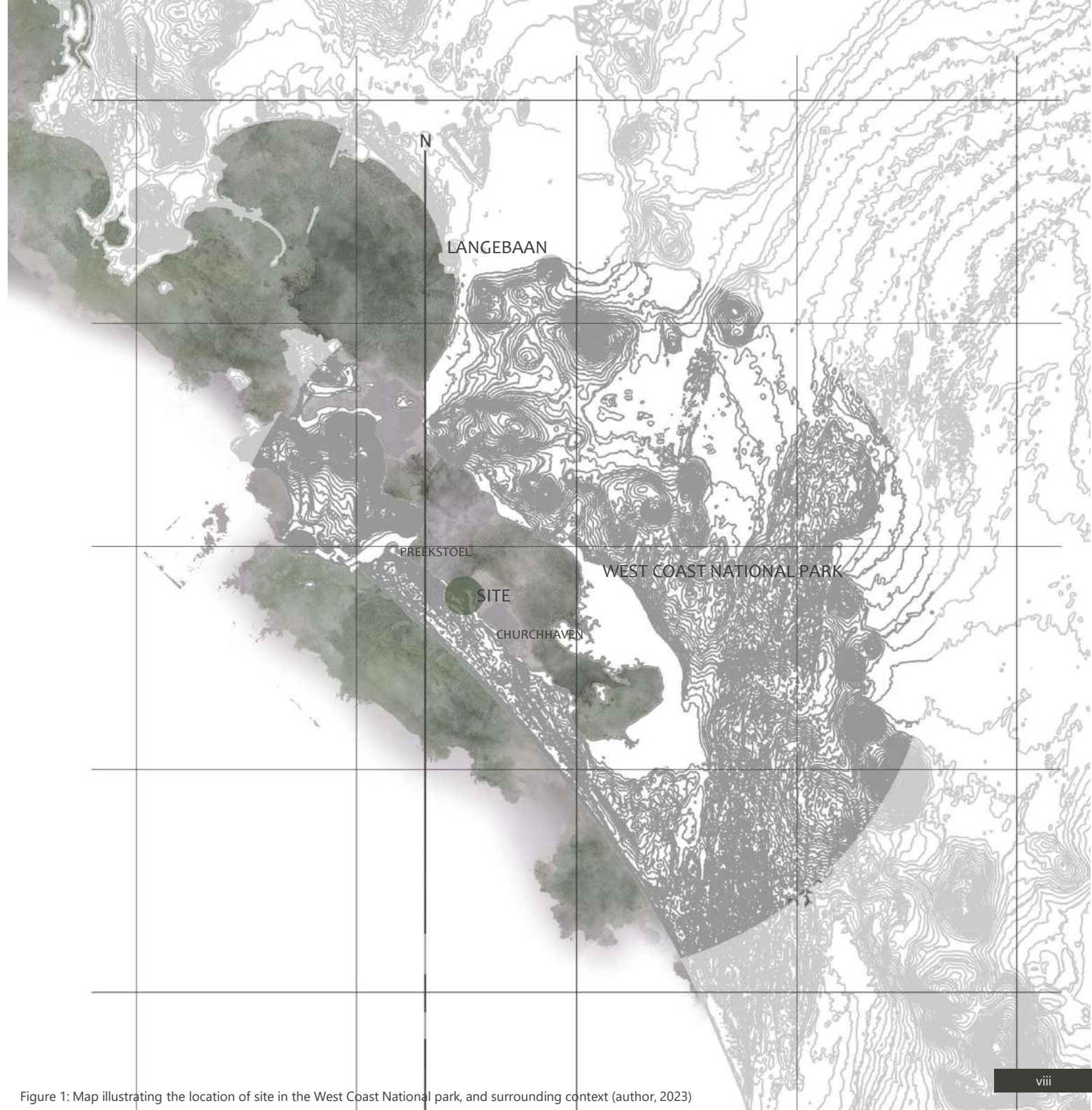


Figure 1: Map illustrating the location of site in the West Coast National park, and surrounding context (author, 2023)

The site is located between the park's Churchhaven area and its private residential area, along an older road running through the busy part of the park where all the main visitor attractions lie, providing opportunity for the development of another tourist attraction which can benefit the local community of the West Coast.

Given this unique setting of the site, this dissertation proposes that SAN Parks is the best client for the Interpretation Centre. The Fynbos Interpretation Centre can then accommodate a SAN Park visitor's reception with an orientation hub which links with the administrative facilities allowing the functional needs of the park to be accommodated while still including experiential spaces. The existing SAN Park administration is situated in a prefabricated building adjacent to the Geelbek historical building. The addition of an office more integrated into the park's visitors experience and closer to the main attractions, creates easier access for day visitors who want to obtain information and permits for fishing and hiking.

Within my research focus, the design project centers on staging the fragments and sequences of different INTERPRETATION SPACES (experiential pavilions), which enplace and embody the visitor within the natural narrative. The interpretive spaces' connection with the landscape becomes important as fynbos should be honored seeing that it is not only protected by the State, but that it is a South African indigenous biome that cannot be found anywhere else in the world.

Walkways and raised boardwalks become dynamic connection spaces linking the Visitors Centre, the fynbos interpretive pavilions and the Fynbos landscape.

ORIENTATION SPACE:

P R I V A T E

STAFF:

- + SAN Park offices
- + Staff functions
- + Delivery yard
- + Kitchen

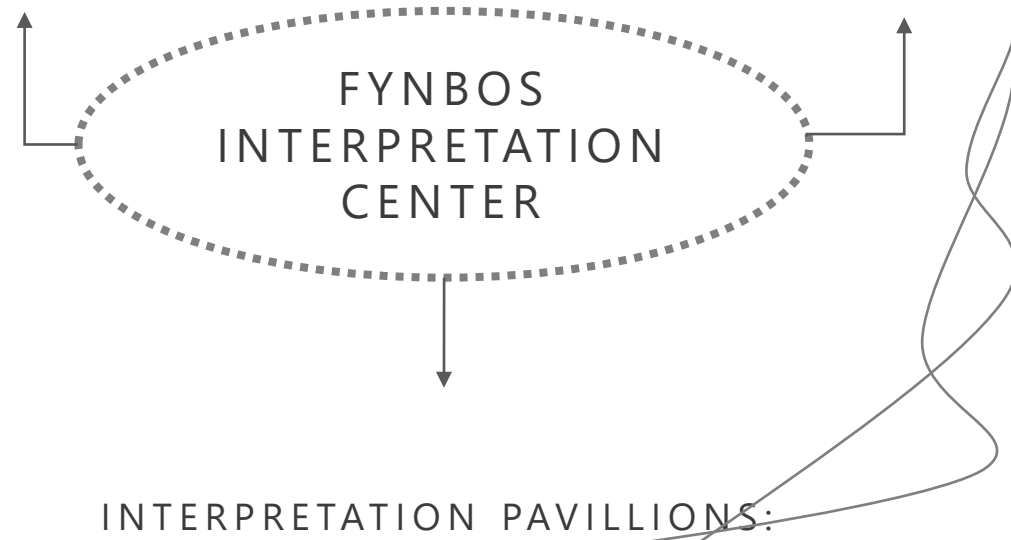
RESEARCH:

- + Fynbos laboratory

P U B L I C

ORIENTATION HUB:

- + Reception area
- + Café and restaurant
- + Ablutions



C I R C U L A T I O N
As a promenade and landscaping

INTERPRETATION PAVILLIONS:

Enclosed spaces that narrates Fynbos experiences

- Bridges
- Walkways
- Stitched spaces
- Fynbos structures

Figure 2: Interpretation Centre program (Author, 2023)

CHAPTER LAYOUT

SITING the CONCEPTUAL REACTION

Chapter TWO sets and interprets the existing setting within which the project is set. This aids in the understanding of what influences the experience of the place and acts as a first attempt at a conceptual reaction.

SITUATING CONCEPTS and IDEAS

Chapter THREE, the theoretical underpinning, investigating and interpreting architecture as a bridge between humans and nature. The theoretical concept develops an understanding of experiential quality within the characteristics of biomimicry and its translation into architectural spaces to convey a certain narrative.

TYOLOGY, MORPHOLOGY and TOPOLOGY

Chapter FOUR analyses architectural precedents which inspire and influence the design process. This investigation attempts to develop an appropriate understanding of theoretical application within design through topology, morphology and typology.

RETELLING in ARCHITECTURAL SCENES

Chapter FIVE synthesizes the previous chapters to develop architectural interventions, towards a final proposal and technical resolution. This chapter aims to merge theory, design, and construction in a symbiotic relationship to create a Fynbos Interpretation Centre.

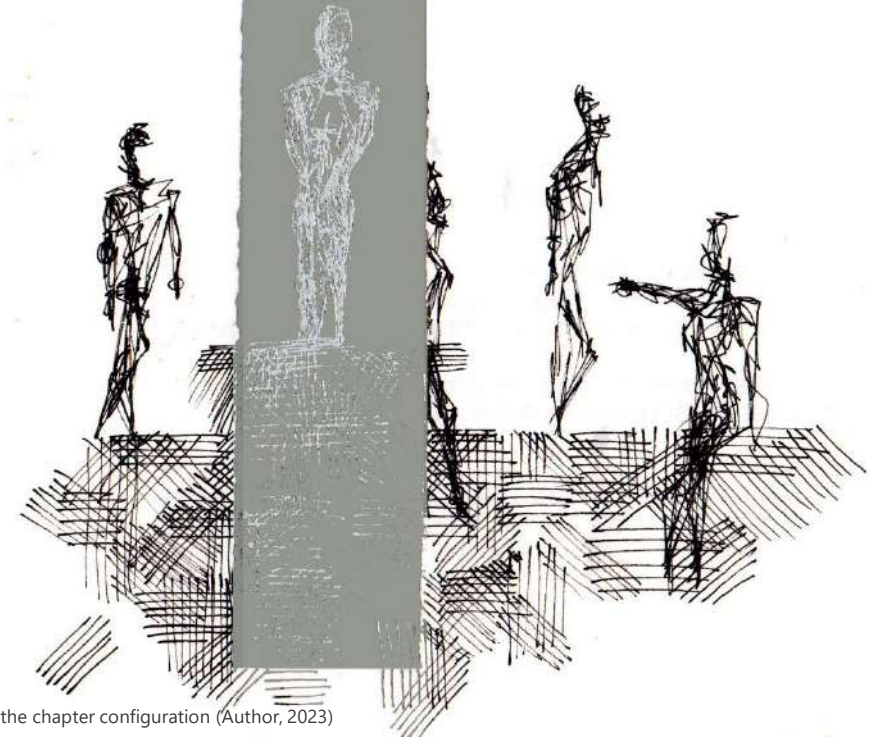


Figure 3: Diagram illustrating the chapter configuration (Author, 2023)

RESEARCH TOOLS

The research tools aim to address the problem statement and answer the research question. These tools are used throughout the chapters to reach a design solution that interprets, frames and preserves fynbos events. The research tools include:

CHAPTER 1 :

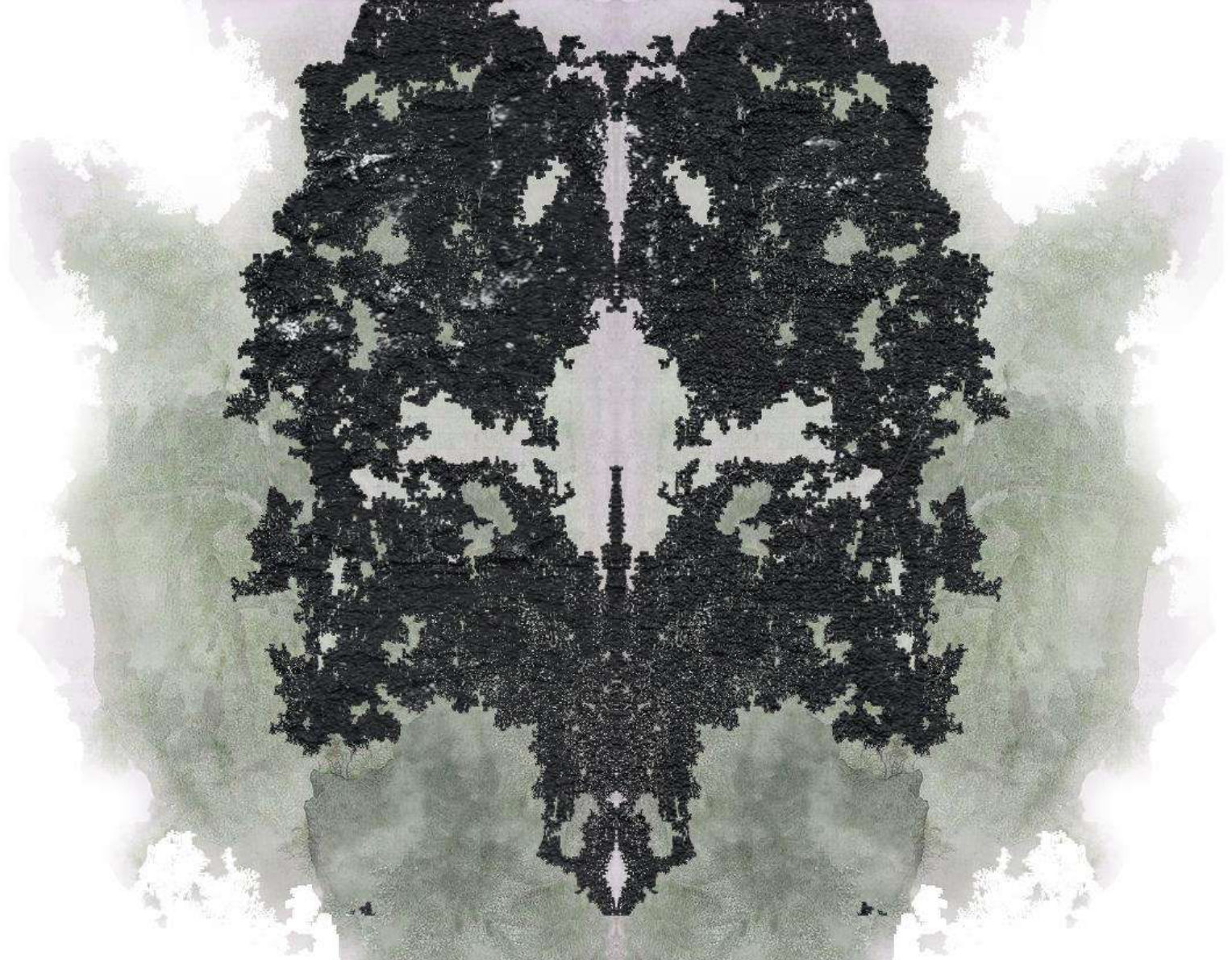
- A visual analysis supplemented by information obtained through published works, of the places within the West Coast Park and their influence on the emotional experience of place and site.

CHAPTER 2 :

- Site analysis that investigates the macro-, meso- and micro influences of and on the site that influences the design and construction.
- Architectural precedent analysis that pertains to theory, design and construction further reinforce decisions made in the design process.
- Touchstone and conceptual analysis capturing the essence of place, developing the theoretical stance.

CHAPTER 3 :

- Theoretical review and interpretation of narrative elements and the philosophy of man and nature, and techniques that serve as a theoretical underpinning for design and construction decisions.



CHAPTER 02

SITING the
CONCEPTUAL REACTION

Retelling and Interpreting the NARRATIVE of
the PREFIGURED SCENE

This chapter aims to develop a more detailed understanding of how the conceptual and theoretical ideas tie into the program, site, design and structural solutions. This chapter expands on the brief and program concerning the interpretations done in chapters 1. A deeper understanding of the site's macro, mezzo and micro-influences are gained to create appropriate structural solutions that merge the context, function and theory.

IDENTIFYING THE PREFIGURED SCENE

S I T E L O C A T I O N

The prefigured scene: the proposed site of the Fynbos Interpretation Centre before intervention, is located within the West Coast National Park. The appreciation of the National Park is based on the sensitive existence of the landscape, gathered in the sensory experience of moving in and through the place. Its picturesque quality allows an admiration of the place. The climate, land, sea, and in-between set the scene for interpretation allowing the viewer to react with emotion. Extracting and interpreting experiences can potentially allow for a conceptual reaction that listens and reacts to the spirit of the place.

C L I E N T a n d U S E R

South African National Park is responsible for managing South Africa's National Parks, in this case the West Coast National Park. SAN Parks own 19 parks to date since they formed in 1926. West Coast National Park was established on 25 April 1988 by SAN Parks. The mission statement of SAN parks for West Coast National park:

"West Coast National Park will conserve and enhance the unique terrestrial and marine, ecological and cultural, historical and scenic resources of the Langebaan Lagoon and Saldanha bay, proximate islands and surrounding terrestrial environments of the West Coast for the appreciation, and use of, for present and future generations." (San Parks, 2003: 13).

The Fynbos Interpretation Centre forms part of this mission as it promotes the conservation of the terrestrial heritage of West Coast Plain whilst building on the spirit of the place. Conservation of the cultural and marine biodiversity does not form part of the scope of the program, but it still plays an important part in the design consideration as they should be treated with respect. The intended users are locals and tourists who want to learn more about the rich history of the indigenous Fynbos biome.



Figure 4: A macro site analysis of the prefigured scene located in West Coast, Western Cape (San Parks, 2020: 159. Adapted by author2023)

EXISTING PARK FABRIC

CAPE DUTCH ARCHITECTURE

Cape Dutch architecture is an interpretation based on memory. This regionalistic architecture is made up of local materials forming 45° thatch roofs set on lime plaster white-washed walls on limestone. Cape Dutch buildings are influenced by roof span leading to elegant letter floor-plan forms, with thick walls, strong geometries and symmetrical facades.

The gable itself is a widely used symbol of Cape vernacular architecture, as it was practical in water and fire diversion. But the gable was a landmark indicating an expression of care. Cape Dutch and Cape Vernacular is an excellent example of critical regionalism representing the uniqueness of design to place, and therefore man to place (nature), and could set a potential basis for materiality and placemaking.

PARK MATERIALITY

Within the West Coast National Park's 27 500 hectares sit a few structures scattered within the landscape. The first, Geelbek farmhouse, is a national monument (1860) in the regionalistic Cape Dutch style, built out of limestone walls with characteristic white facades, surrounded by old limestone farmhouse remnants. A small white, limewashed-limestone building sits on the rocky lagoon lookout point. Just 1.2km east of the chosen site, is a historical residential area, made up of fisherman cottages and modern housing, hidden along the lagoon, while a natural stone public facilities building is embedded in the Kraalbaai area. A common connection found throughout the various public and private sites within the park, is raised timber walkways, hovering sensitively above the fynbos landscape. The existing will guide the materiality and construction of the thesis design.

EXISTING PARK FABRIC

BUILDINGS, STRUCTURES & HISTORY

PALAEONTOLOGY

1847 Thomas A. Hildegarde's skull paleontology was first described in 1847. The skull was found in a cave at the foot of the mountain. The skull was found in a cave at the foot of the mountain. The skull was found in a cave at the foot of the mountain.

ARCHAEOLOGY

Excavations at a large site in the park have revealed a number of structures. The structures were built in the 18th century. The structures were built in the 18th century. The structures were built in the 18th century.

CULTURAL HERITAGE

The site is a significant cultural heritage site. It contains a number of structures. The structures were built in the 18th century. The structures were built in the 18th century. The structures were built in the 18th century.

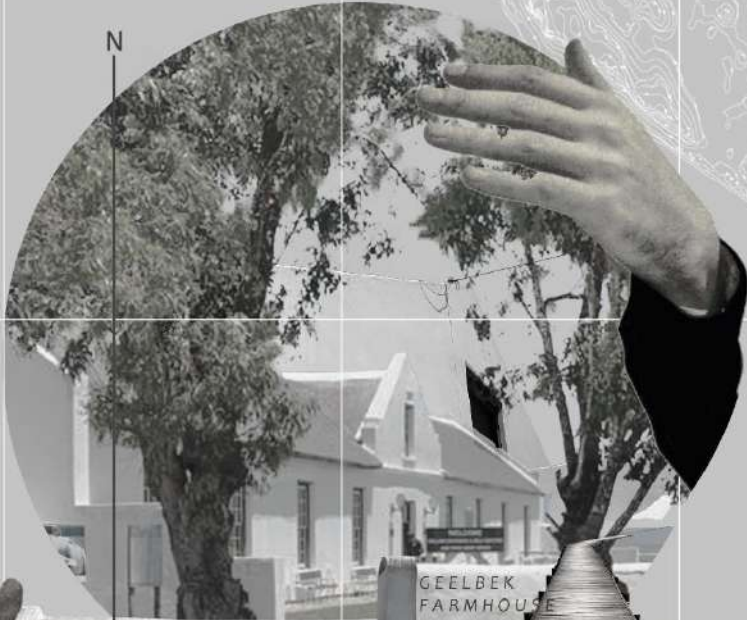


Figure 5: main existing park structures and buildings (Author, 2013)

SITE CONDITIONS

S O I L a n d F L O R A

When it comes to the chosen site within the larger park context, the site conditions will guide the design and construction of the building. The vegetation found on site consists of Langebaan dune Strandveld soil and Cape limestone fynbos. This will lead to the use of strip foundations due to the soil type. The site is rich in limestone rock formations and therefore all excavated limestone deposits will be used to create natural limestone walls within the design.

W I N D

The West Coast National Park is particularly windy with strong seasonal winds running from the north (winter) and south (summer). Structure will have to take wind strength into account, as well as its effect on space experience. By combining sheltered and exposed spaces in the design, the dual narratives of man and nature are enhanced.

B R I E F a n d P R O G R A M

The brief is to create a Fynbos Interpretation Centre that accommodates SAN Parks administrative functions to create an important link between the Site and the Park. The brief builds on the fynbos narrative and expands the SAN Parks amenities.

The seen experiences are based on the present events which include the visitor orientation spaces that include the information, gathering, service and SAN Park administrative functions. The real experiences also include the shared research facilities, that allows university students and researchers opportunity to gather and learn more information on the biome. The unseen experiences are based on the fynbos events categorized in chapter 2. These spaces include outdoor public spaces that narrate the fynbos events. The circulation spaces connect the seen and unseen narratives together through walkways, stairs, bridges and elevators that create vertical and horizontal movement.

PHENOMENOLOGY OF PLACE

A UNIQUE SITE ANALYSIS: PAINTING BLIND

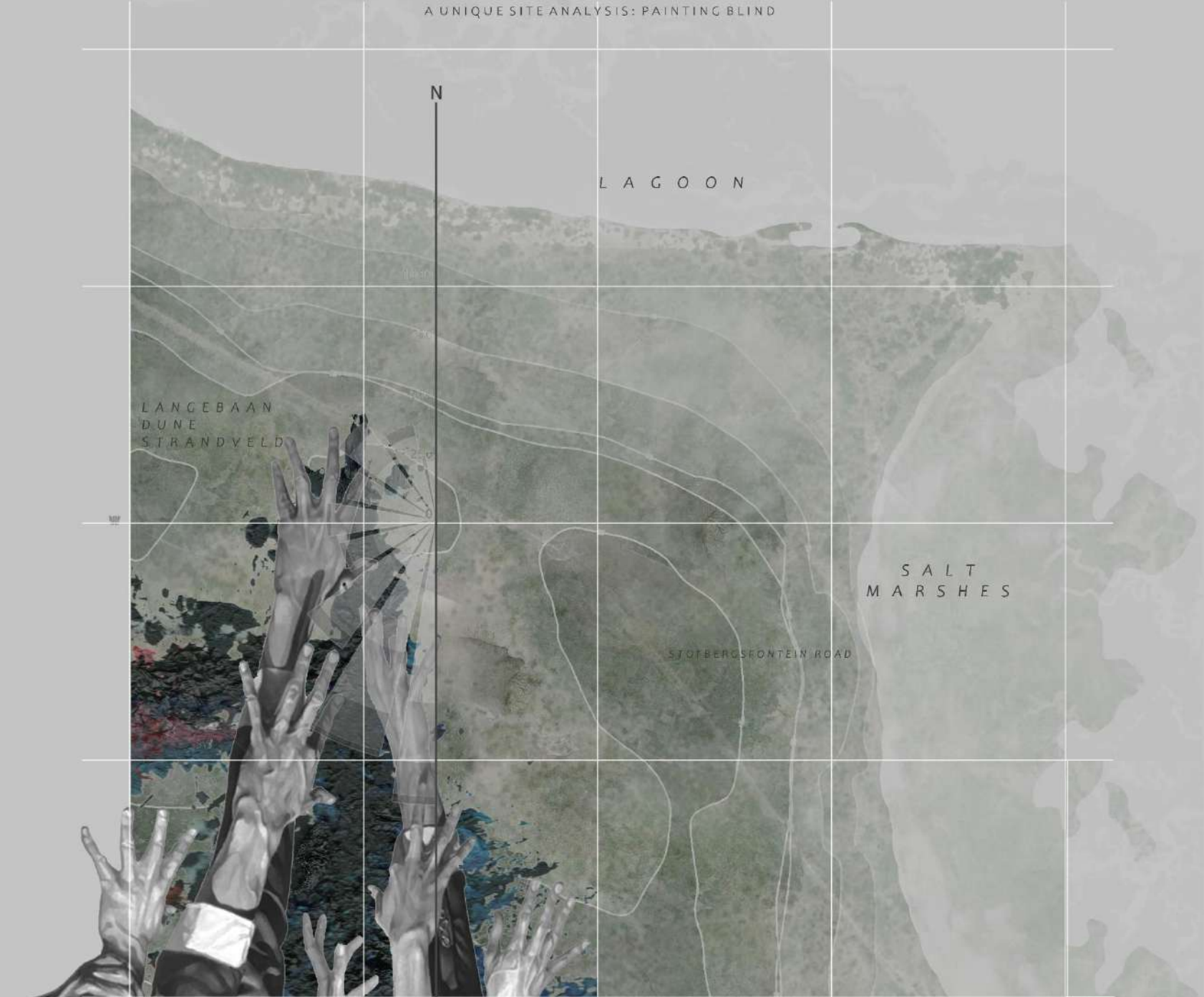


Figure 6: Site plan of the prefigured scene (Author, 2023)

FUNCTION and ACCOMMODATION

THEORY TOPIC and APPLICATION

Within my research focus, the design project centers on staging the fragments and sequences of different fynbos interpretation spaces, through the lens of Biomimicry.

The spaces can emplace and embody visitors within the fynbos narrative. The interpretive spaces' connection with nature will be very important in honoring fynbos. The narrative walkway will be the golden thread of the intervention. Walkways in themselves are an existing feature within the park and the idea of raised walkways and boardwalks will become an integral part of navigating the said narrative between the dynamic pavilions and orientation hub through promenade theory.

SPATIAL and PROGRAMMATIC REQUIREMENTS

From the preceding aspirations of the SAN Parks terrestrial conservation mission and the possibilities offered to student and researchers around South Africa in fynbos research, the client is situated as the coming together of science, tourism, and education.

In collaboration with the South African National Biodiversity Institute (SANBI), SAN Parks unite with SANBI to form the Fynbos Research and Interpretation Center in the West Coast National Park, creating a shared research hub for students and botanists from the 21 botany departments within South Africa.

The spatial and programmatic requirements respond to the four aspects of the Center:

- A laboratory facility for short-term Fynbos research by SANBI.
- Interpretation exhibition spaces for SAN Parks educational program on the fynbos biome.
- An orientation hub catering to the tourism function of the park.
- SAN Parks administration area for the functional needs of the client

FYNBOS
FOCUSING SUCCESSIVE SINGULARITY

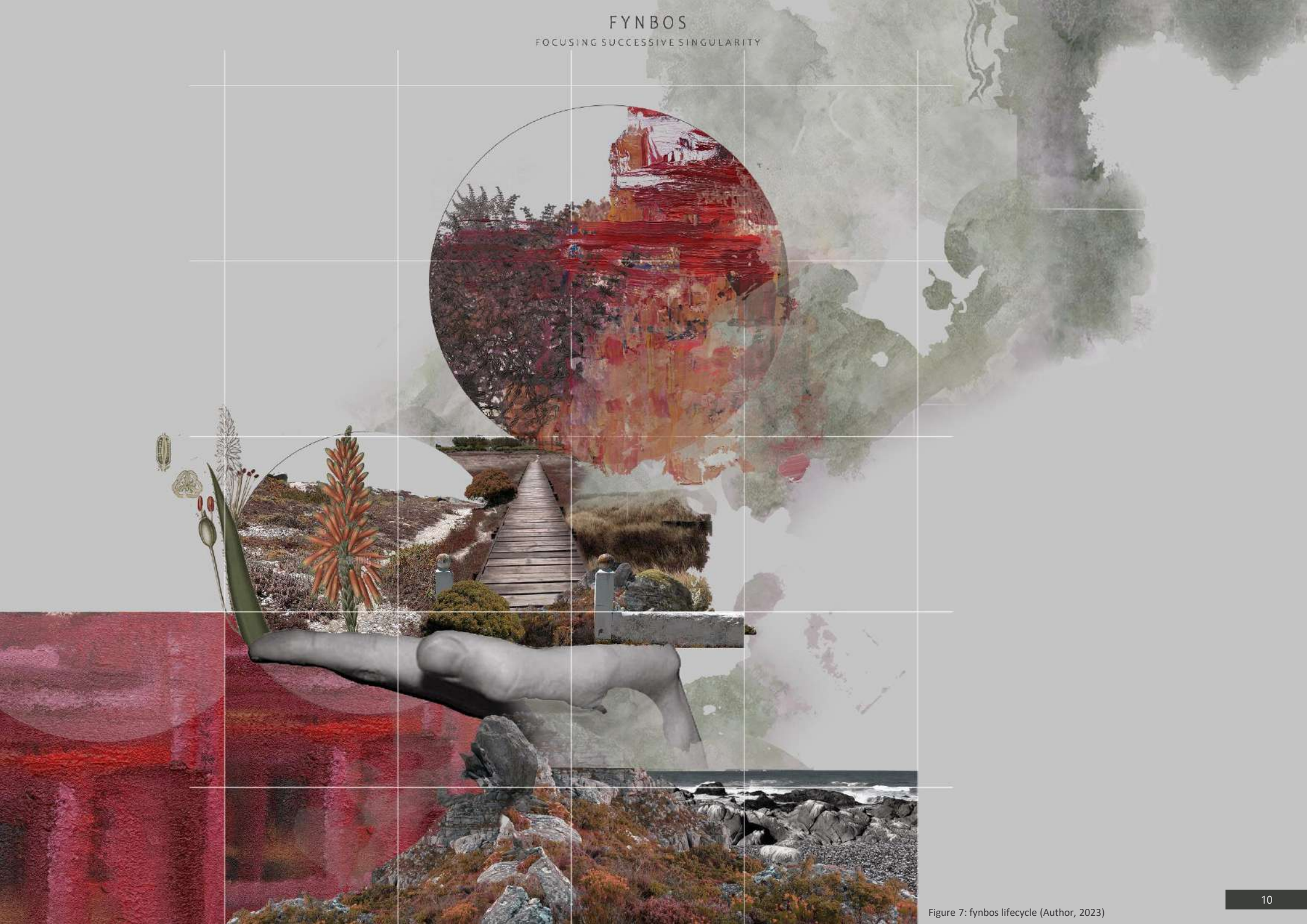


Figure 7: fynbos lifecycle (Author, 2023)

ACCOMMODATION LIST

MAIN ORIENTATION HUB

Foyer
Reception
Financing and management
Storage
Fynbos shop
Public ablutions

COFFEE SHOP

Seating area
Dry storage
Cold storage
Prep area
Circulation order and collection

INTERPRETATION PAVILIONS

(re)Birth
Growth
Maturity

PARK OFFICES

Reception and waiting area
Kitchenette
Offices
Ablutions
Boardroom

RESEARCH FACILITIES:

Clean Room
Sample Preparation
Open Lab
Lab Support
Chemical Laboratory
Algae Culture Room
Chemical Storage
Equipment Storage

Public parking and circulation

PUBLIC FACILITIES:

PARK FACILITIES:

INTERPRETING THE PREFIGURED SETTING

The indigenous Khio-Khoi had a deep connection to the nature surrounding them, using Fynbos found along the West Coast, as both food and medicine. The Khoi are a prime South African example of how people cannot only connect to nature but to respect it through a deep appreciation in its diversity.

As part of the initial site analysis, an alternative site analysis was conducted on the materialistic diversity found on site, allowing myself to dive deeper into the site, to connect with the existing beauty of the fynbos landscape. This was accomplished by visiting site, gathering natural materials on site and then painting with said materials, whilst being blindfolded, a rich investigation into the unseen.

Figure 1: "The Porous Skeleton"

The first experience of the unknown medium was an estranged object found on site, a salt-water sponge. Paint placement was done through pressing the sponge in various directions. Unimposed ideas created a freedom within the medium creating imprints of various textures and detail.

Figure 2: "Fiber of the earth"

Continued sightlessness decreases fear of the unknown and promotes acceptance of the senses available. With the second medium, soil was used within the paint, instead of as a brush. Revealing a different material truth, now emphasizing the texture created and not the formation of a pattern



INTERPRETING THE PREFIGURED SETTING

Figure 3: "Awareness at first sight"

The first moment experiencing the known allows self awareness within the site. The ability to accept surroundings and awareness of available materials, creates deeper acceptance and appreciation for the existing in place. Reinstating blindness, the perceived stone became the scraper to a chosen palette.

Figure 2: "Fynbos finale"

The final interpretation is finished of with an awareness of both colours and brush. Utilizing the dense leaf frond from a fynbos brush, the final artwork is created by beating the medium against the page with sense of materiality within the site and the shrub itself, creating a child-like experience.

In the end, this alternative analysis proved that one can connect to the nature surrounding them on a deeper level, increasing both knowledge and appreciation for nature., using a medium, a metaphorical bridge, an intervention. It can therefore be hypothesized that the gap between people and nature can only be closed through intervention , by going beyond conventional interaction and diving deeper into fynbos itself.



CAPE VERNACULAR GEELBEK HOMESTEAD and FISHERMAN COTTAGES



Figure 12: Geelbek Homestead (Author, 2023)

The form-giving of the Geelbek farmhouse draws on the typical Cape Dutch gable with the fireplace extending past the top of the gable. The stone walls are more exposed towards the base grounding the structure. The whitewash finish on the exterior gets more towards the gable creating contrast between the wall and the roof. Between the rocky-fynbos landscape, these white buildings appear almost contradictory. Depending on the scene, these white figures almost seem as though they are growing from the fynbos landscape as places for man and nature to meet.

The old fishermen's cottages are located south-east of the site, within the small village of Churchhaven. These cottages once served the purpose of fishermen's housing, within four whaling villages, but had been converted into a singular village for locals and privatized housing for tourists and visitors within their natural limestone walls (Prinsloo, 2017). Stone structures are dominant in the region, and they relate rocky coast and limestone outcrops. This vernacular architecture exists before the design intervention, acting as an existing order, form and type, associated with taking from nature and existing in harmony with it.



EXISTING PARK FABRIC RAISED TIMBER WALKWAYS

The raised timber walkways are found throughout the park. They lead over marshes to bird hideaways and from visitor parking to picnic areas. These walkways speak to not only the sensitivity of place but to the connection between nature and dweller. These walkways can be described as a golden thread throughout the park area, connecting various sites in materiality.

The walkways have been placed so that there is limited imposition to the landscape underneath, whether the area is pristine, public or private. The walkways vary in height above ground level, this is to allow accessibility to remote areas in some places, while enabling visitors to bend down and interact with nature in other places. These walkways play a vital role in the park's fabric, not only in materiality but in sensitivity to the fynbos.



EXISTING PARK FABRIC LIMESTONE WALLS

Throughout Geelbek homestead and Stofbergfontein stand structures composed of limestone aggregate walls. At Geelbek the home as it stands is made with limestone walls and the ruins surrounding it are evident of dry- and wet-stacked limestone walls.

In Stofbergfontein, there are multi-generational homes made up of limestone walls and foundations. The reason for this use of material is simply use of available resources located within the park's limestone-abundant soil. Limestone aggregate walls and foundations are another example of site materiality and sensitivity.

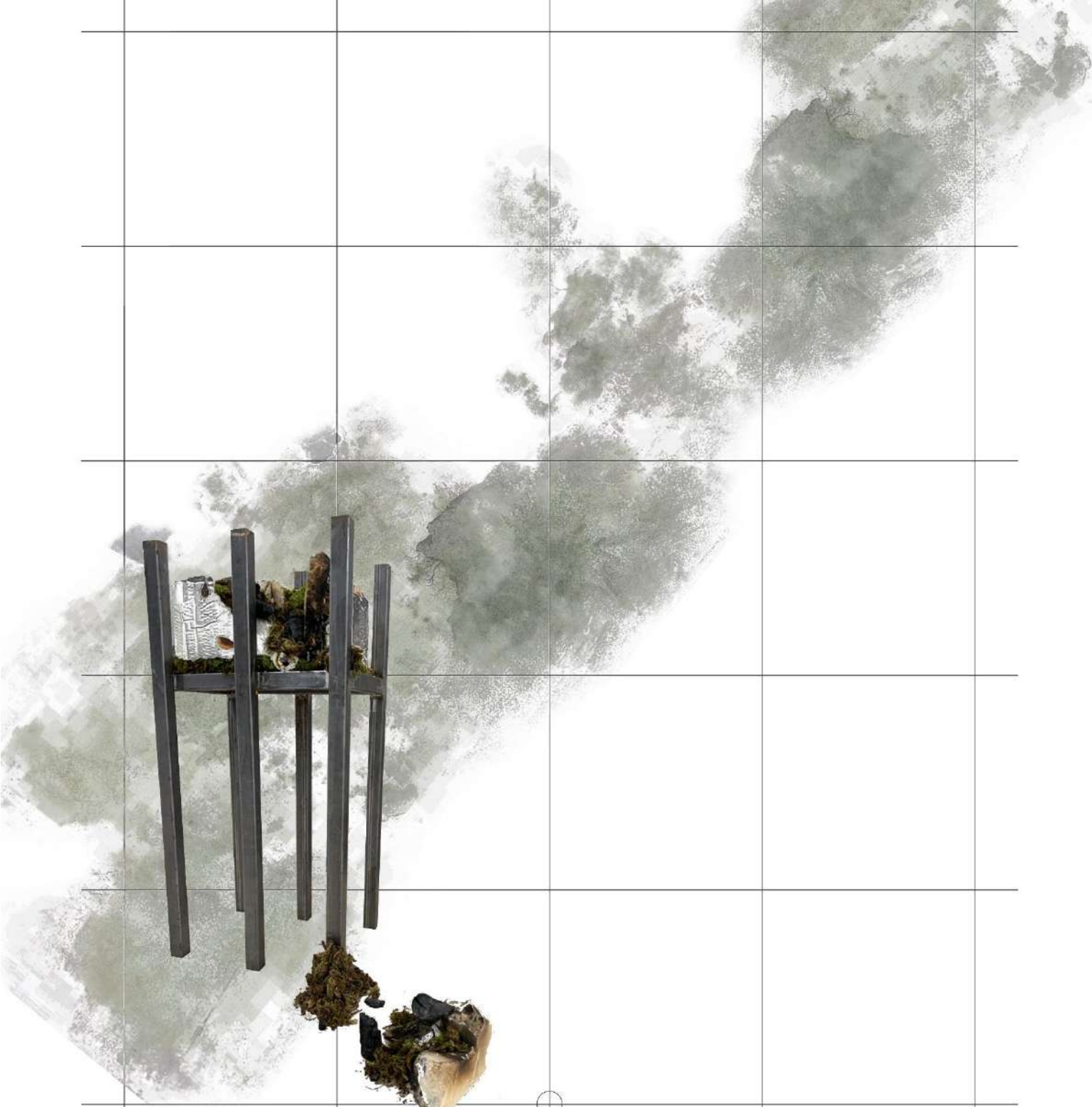
TOUCHSTONE

An approach inspired by feeling, the touchstone is meant as an exploration into the essence of the site and the project. The purpose of the touchstone is to try and reveal the hidden narrative of place (nature); by revealing nature's dependency on people to survive and their responsibility to reveal the narrative. It aims to celebrate the voice of the place caught between the earth and sky, linking humans with that which surrounds them. The human intervention and fynbos landscape as a hidden narrative within verticality, horizontality, fire, earth and sky, setting the scene for emplaced emotional harmony.

The STEEL FRAME represents man in his naturally dominant state and his necessity to both to support and protect the hidden narrative within fynbos.



Figure 15-17: various touchstone perspectives (Author, 2023)



The cemented box stands as the proposed architectural intervention formed around the narrative it embodies, represented by the FOLIAGE forms within it. The hidden narrative is only revealed through mans intervention and interpretation within the build form, breaking through the built form to find the flourishing narrative within. The narrative must be given freedom, to not only be revealed but to flourish without restriction, growing from its burnt survival.

The touchstone, therefore, acts as a catalyst that listens, interprets and retells the fynbos narrative that is revealed through human and architectural intervention.

Figure 18: full view of touchstone(Author, 2023)

CONCEPTUAL DEVELOPMENT

The concepts aided in developing a deeper conceptual understanding of the site. The common thread that links the concepts is biomimicry, as all of them explore ways to mimic the fynbos narrative through articulating partial narratives and events of the setting. The conceptual ideas discussed below link to the essence of the dissertation extracted in the touchstone.

1. MIMICRY in the SKIN of PLACE

The Fynbos biome of the West Coast that frames the narrative for the project has a much deeper, unadorned beauty to be explored. The intricate physiology of fynbos has allowed this sensitive kingdom to survive and thrive in extreme conditions. The man-made structure must imitate the intelligence of the construction and sustenance, of the life surrounding it to create a harmonious relationship between nature and architecture. The concept draws on the existing beauties and strengths within the make-up of the site and the narrative it conveys to create a balance that respects the existing rather than working against it. The natural environment has a big impact on the architectural outcome.

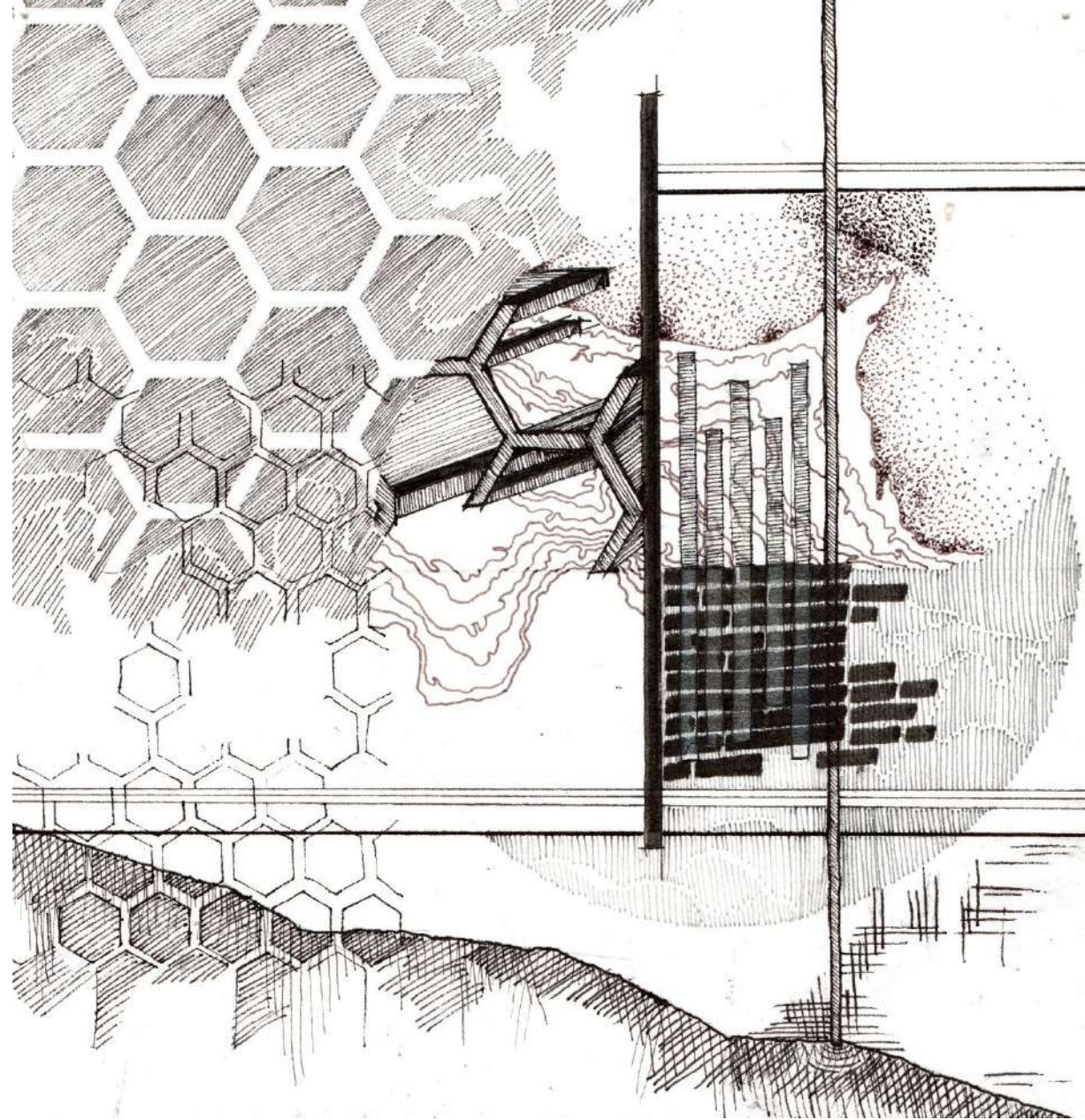


Figure 19: Drawn interpretation of concept 1 (Author, 2023)

2. The DIALOGUE of the FLOURISHING FIRE

Fire plays an important role in the narrative of place as it ignites life for fynbos' survival. Fire is used as the guiding element or catalyst, in the rebirth of fynbos and its flourishing existence. The concept plays on the dialogue between fire and life. The one cannot exist without the other, survival and decay, growth and life mold this narrative to evoke emotion and articulate spaces. The concept further explores how narrative can be the guiding-thread connecting spaces and site to create continuous movement and feeling throughout the design, blurring the lines between building and nature.

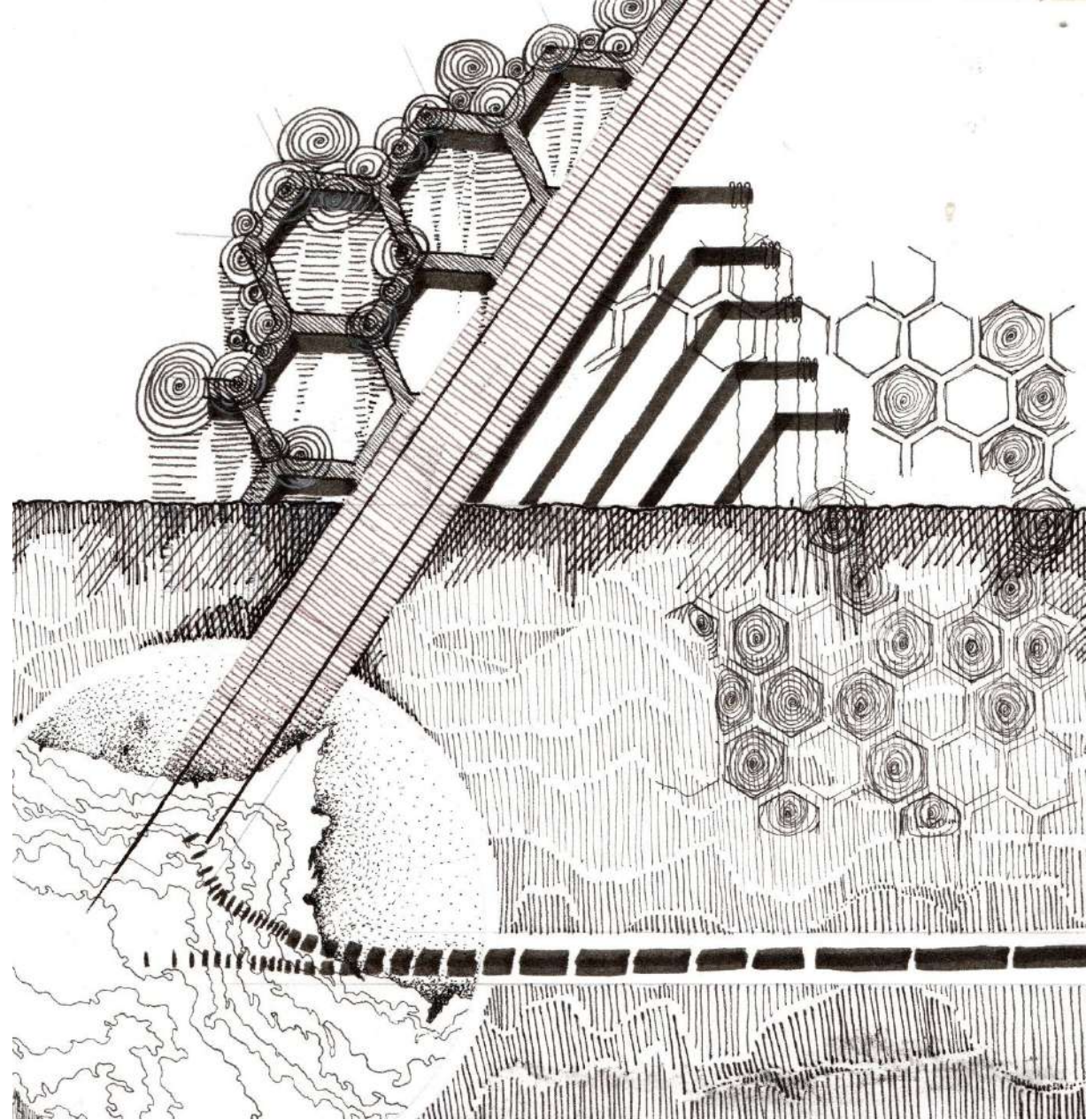


Figure 20: Drawn interpretation of concept 2 (Author, 2023)

3. BRIDGING the INTRINSIC REALM

The fynbos narrative on site becomes a quintessential symbol of the mystery of nature in which we exist. The concept explores the idea of bridging the mysterial-real divide through intrinsic elements. The 'organic' bridges space and site by reinterpreting nature's principles as filtered forms of interpretation more natural than nature itself. The path protrudes through the fynbos blanket as an anchor point connecting the realm and the real. Creating a platform on which the narrative can be communicated. In turn creating the real as a concrete dematerialization of the realm.

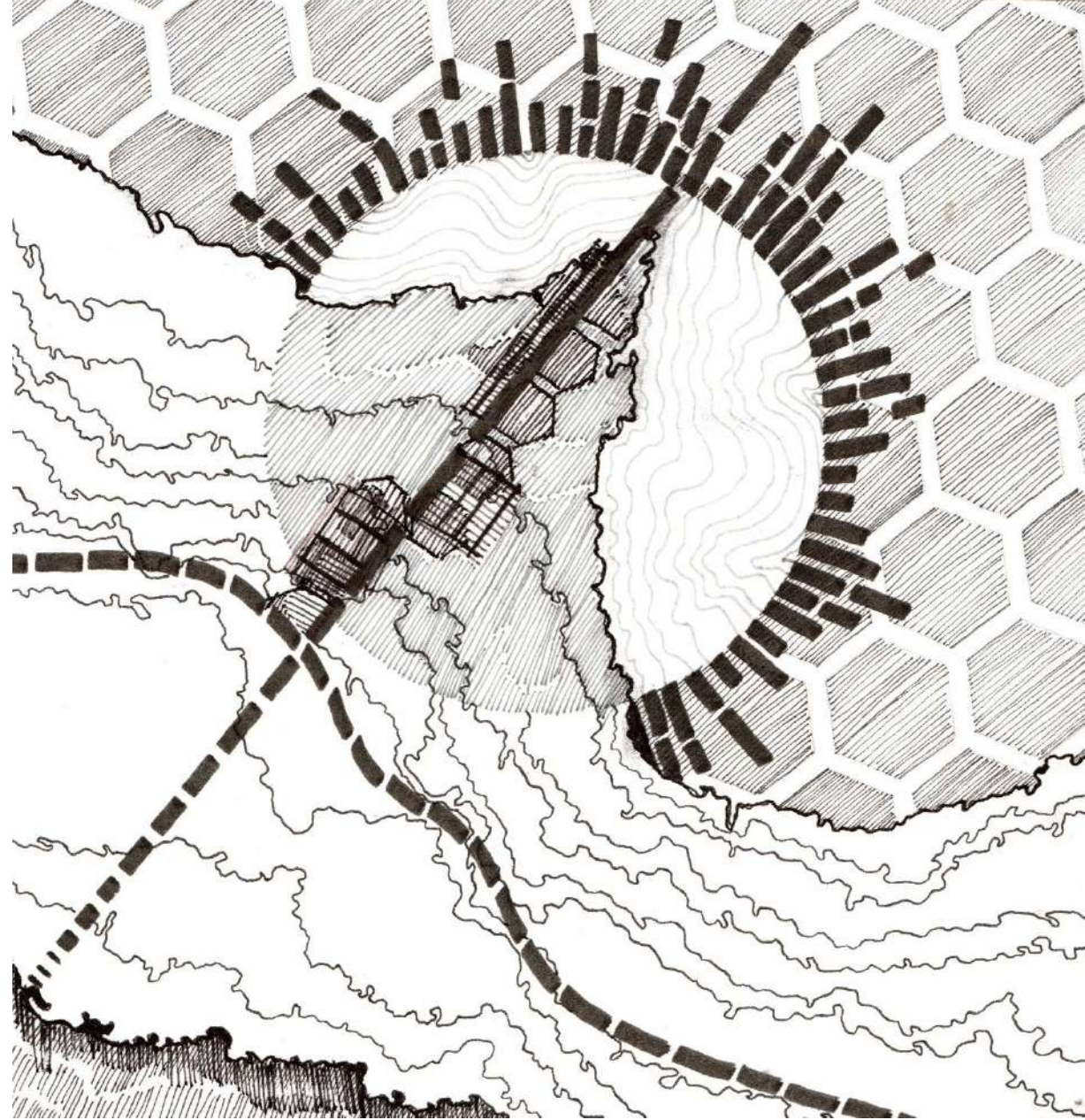


Figure 21: Drawn interpretation of concept 3 (Author, 2023)

STRUCTURAL TOUCHSTONE

An exploration of biophilic design acts as a way of telling a story through replicating the Fynbos narrative in construction, enforcing the connection between being and nature. The sectional acts as a design catalyst of a space that reacts to the environment and acts to embody a partial narrative of place and nature. Assembly and connection of the elements further explore the concept of Biomimetic architecture, a structural language relating to the theory. The touchstone also explores using massing walls on the site that will carry building, allowing the building to touch the site in a sensitive way.

Figure 22-23 Images of structural touchstone parts and details (author, 2021)

The complexity lies in the roof structure, detailing of weight-bearing elements and how an open pavilion is treated to allow free-flowing space with stereotomic elements. The construction methods are mostly derived and reinterpreted from structural elements in the region and functional elements in fynbos :

1. The high sandstone walls found throughout the West Coast National Park.
2. An intricate timber roof structure relates to the raised timber boardwalks and uses a weight dispersion system to distribute the weight of the roof onto the foundation walls and supports the infill boxes that frame spaces.
3. The roof structure is inspired by the water collection, retention and distribution system within the biological functioning of fynbos.
4. The construction touchstone, therefore, aids in translating theory into structural solutions, an initial reaction, with design explorations.

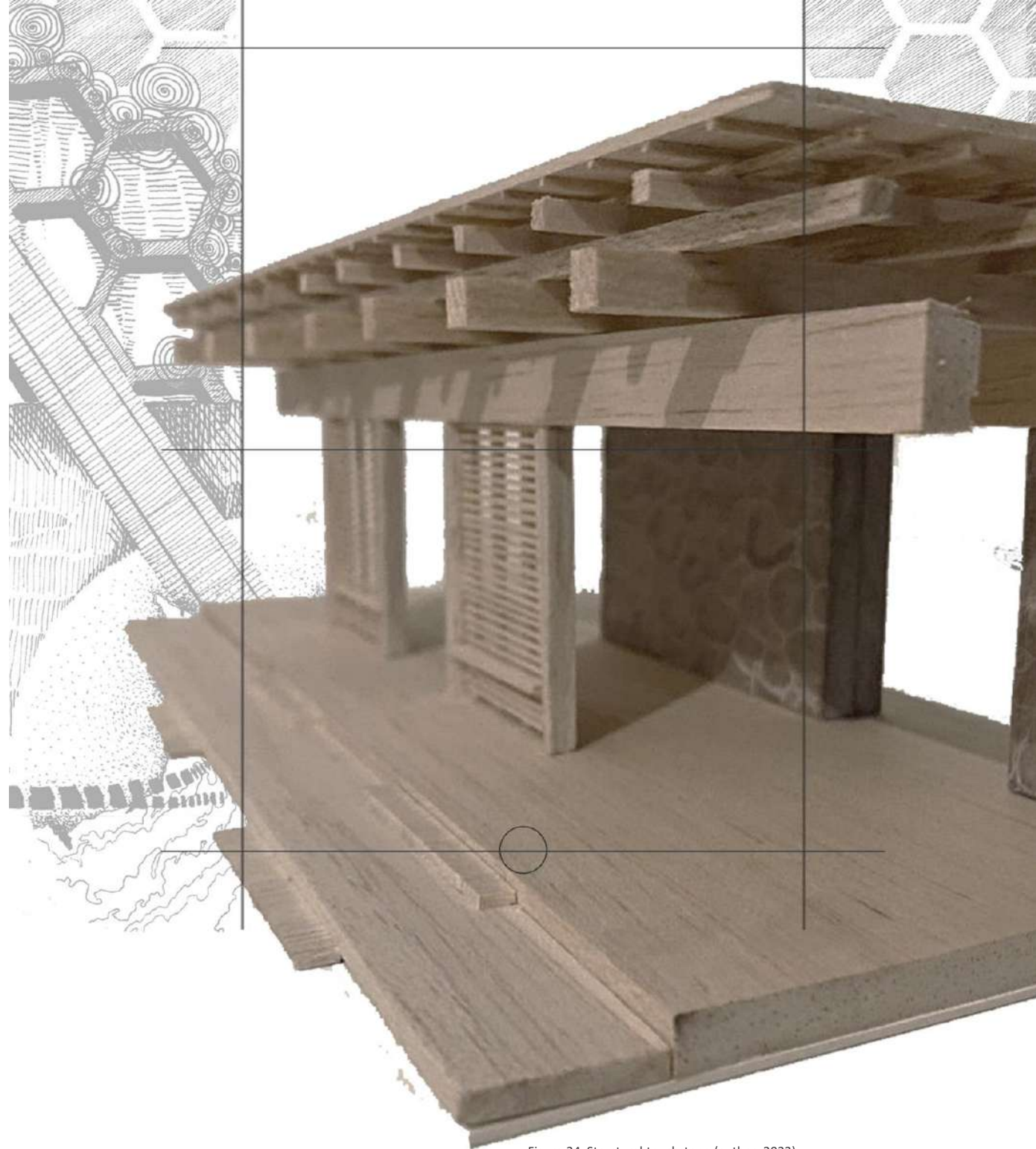
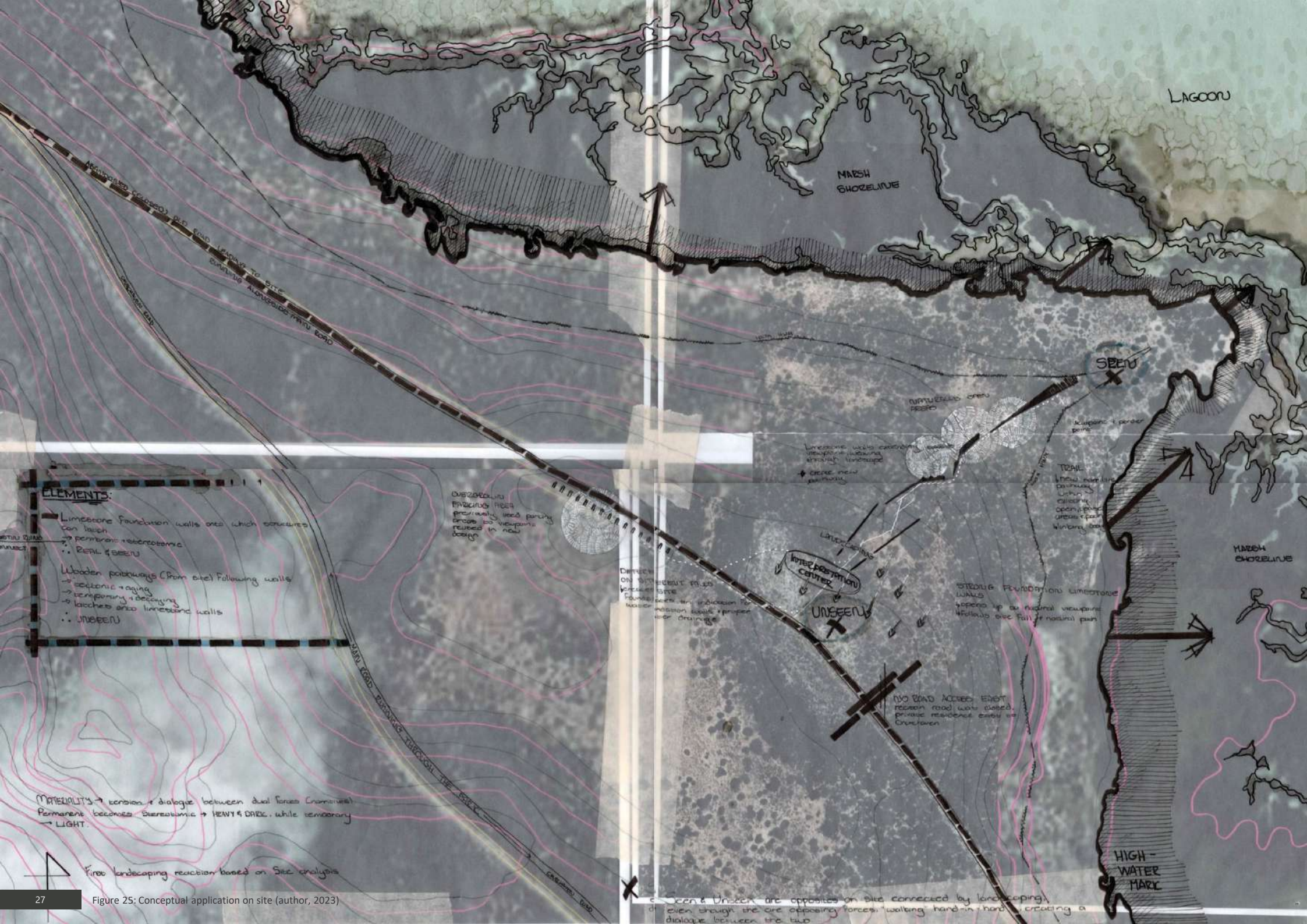


Figure 24: Structural touchstone (author, 2023)

A P P L I C A T I O N

The narrative conveyed is a constant duality made/nature, survival/decay and seen /unseen. Instead of choosing a concept, the concepts start to merge under the bigger theme of biomimicry with each concept being a way the experience, and narrative is conveyed.

The map (right) illustrates how the dual narrative, especially the idea of the duality between the man-made and natural, may take shape on site. The illustration starts connecting the concepts to the site, serving as an initial conceptual approach that organizes the site and employing landscaping possibilities. Interpreting the landscape as a living organism, feeding the heart of the organism, extracted from the concepts which lead to the main theoretical idea of architecture as biomimetic spaces. Architecture can preserve narratives within the West Coast landscape. Chapter three further explores the notion of architecture as a series of biomimetic experiences that retells the narrative hidden between earth and sky.



ELEMENTS:

- Limestone foundation walls area which structures can lean
 - permanent + stereotomic
 - ∴ REAL & SEEN
- Wooden pathways (from site) following walls
 - aesthetic + aging
 - temporary + decaying
 - latches onto limestone walls
 - ∴ UNSEEN

MATERIALITY → tension & dialogue between dual forces (material)
 Permanent becomes stereotomic → HEAVY & DARK, while temporary → LIGHT.

Free landscaping reaction based on site analysis

OVERLOOKING PARKING AREA
 previously used parking area so viewpoints raised in new design

DITCHES ON EXISTENT PILES
 foundation site
 Foundation an indication for water intrusion, earth & proper soil drainage

LANDSCAPING

UNSEEN

STEEL FOUNDATION LIMESTONE WALLS
 + opens up as natural viewpoints
 + follows site fall & natural path

UNUSUAL OPEN PLOTS

SEEN

TIDAL

→ tidal zone (no driveway) like a clearing opening onto lagoon of sea
 Winery area

NO ROAD ACCESS HERE!
 reason road was closed, private residence emb in driveway

Seen & Unseen are opposites on site connected by landscaping, even though they are opposing forces: 'walking hand-in-hand', creating a dialogue between the two

Figure 25: Conceptual application on site (author, 2023)



CHAPTER 03

SITUATING
CONCEPTS and IDEAS

Investigating and Interpreting Architecture
as BIOMEMETIC SPACES

This chapter expands on the theoretical concepts mentioned chapter 1 and 2 to develop a more detailed understanding of how the theoretical ideas can bridge with the Fynbos narrative. This chapter expands on the theoretical stance of:

B I O M I M I C R Y



which is linked to the
F Y N B O S L I F E C Y C L E



To

E V O K E T H E U N S E E N
narrative of fynbos



via the three levels of biomimicry:

O r g a n i s m
S y s t e m a t i c
B e h a v i o r a l

FYNBOS LIFECYCLE

From personal philosophy, to site, to function, the connection of people and nature is explored through Fynbos. Understanding the fynbos cycle is vital to exploring the appropriate theoretical stance or concept that will drive the design process.

Fire is a necessary element in most fynbos species to survive, without it the plant comes to the end of its lifecycle and dies (Pfeiffer, 2022).

Periodic fires are a natural phenomenon in fynbos vegetation, with a frequency of 5–40 years (Kruger et al., 1984). Fire occurrence could increase because of human activities. Fynbos species are variously adapted to recurrent fire cycles and fire-stimulated seed germination to complete their life cycles (Sharma, 2022).

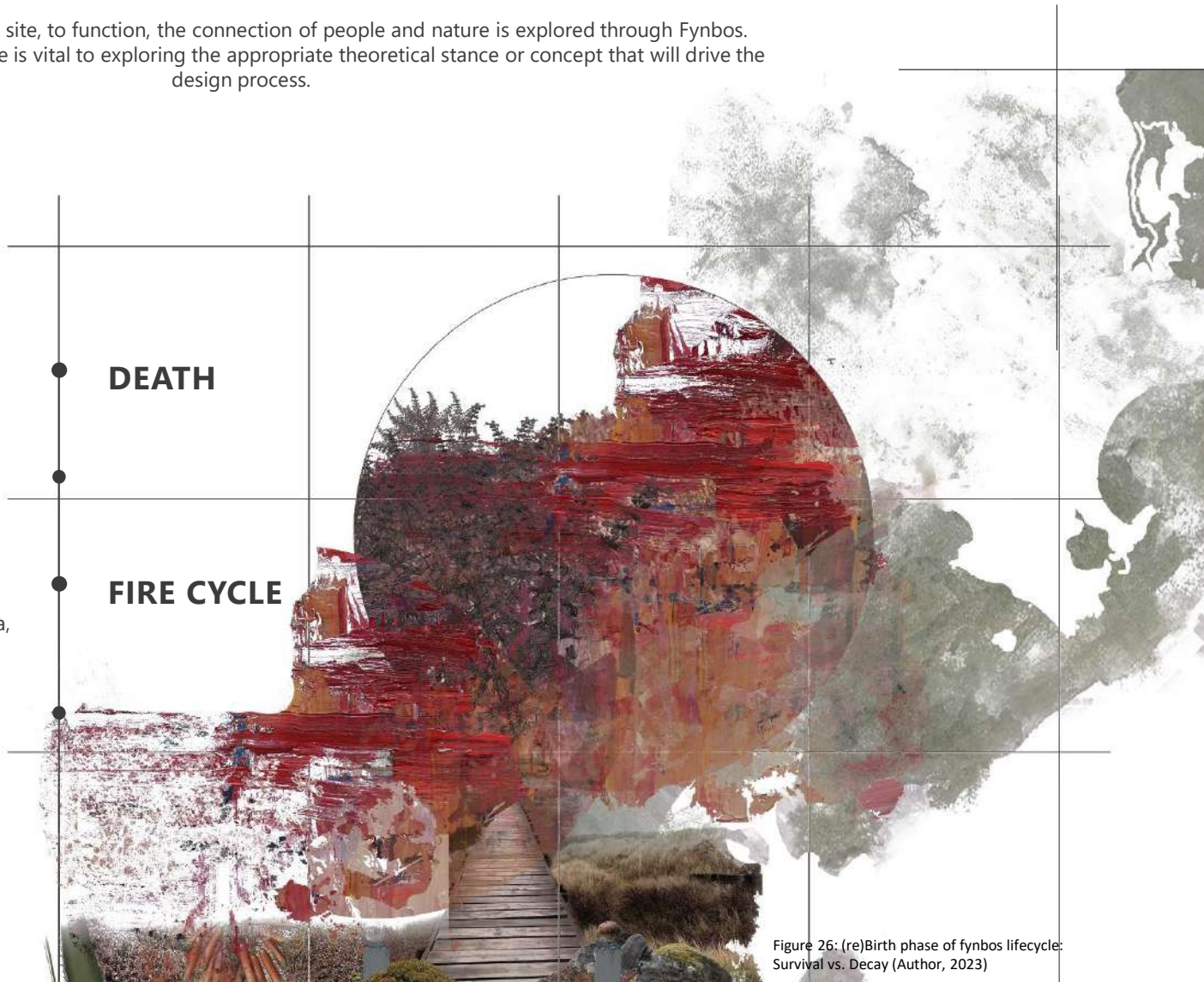
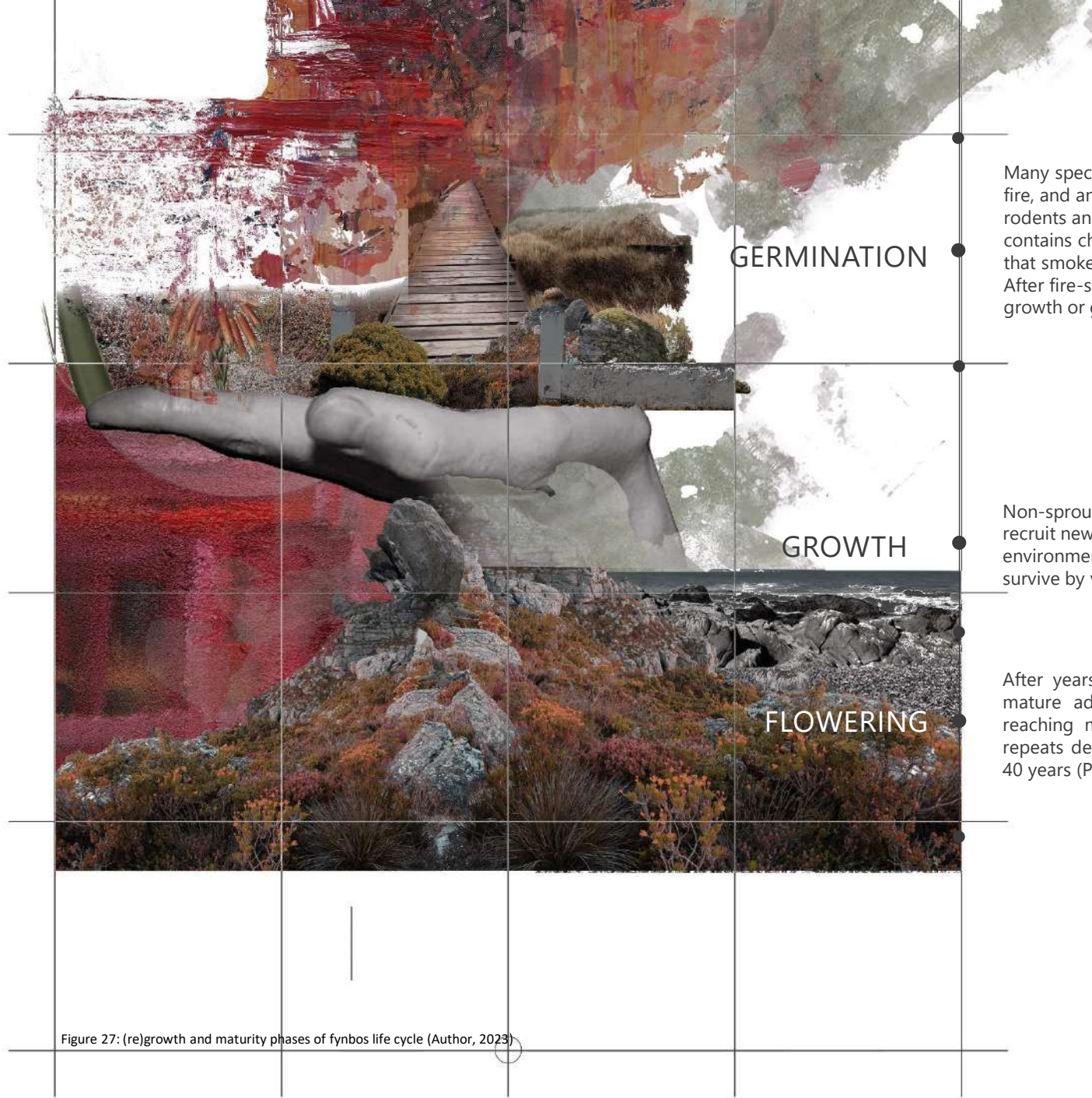


Figure 26: (re)Birth phase of fynbos lifecycle: Survival vs. Decay (Author, 2023)



GERMINATION

Many species store their fruit in fire-safe cones for release after a fire, and ants are enticed to bury fruit where they are safe from rodents and fire. The leachate from charred plant material contains chemical(s) that stimulated seed germination, indicating that smoke is the major source of activity (Van Staden et al., 2000). After fire-stimulated germination, fynbos releases seedlings for growth or grows anew from within the existing plant form

GROWTH

Non-sprouters, or better known as recruiters are killed by fire and recruit new seedlings in open canopy gaps in the postfire environment. Resprouters are killed by fire, but burned adults survive by vegetative resprouting (Keeley and Bond 1997).

FLOWERING

After years of growth from seedling, fynbos develops into the mature adult phase and flowers. Water plays a vital role in reaching maturity, as it feeds germinated seedlings. The cycle repeats depending on species and occurs regularly between 8 – 40 years (Pfeiffer, 2022).

Figure 27: (re)growth and maturity phases of fynbos life cycle (Author, 2023)

BIOMIMICRY

Vincent (in Pawlyn, 2019) defines biomimicry as 'the implementation of good design based on nature'; Benyus describes it as 'the conscious emulation of nature's genius.' In agreement with both statements, biomimicry can therefore be considered to focus on designing sustainable solutions inspired by nature to solve design challenges.

To successfully capture the hidden narrative of the fynbos lifecycle, biomimetic design can drive an intervention of visual and experiential stories.

Throughout history, architects have looked to nature for inspiration for building forms and approaches to decoration: nature is used mainly as an aesthetic sourcebook. Biomimicry, however, is concerned with functionality and is not necessarily as aesthetic position, focusing on plan experience (organism), spatial experience (behavioural) and structural complexity (systematic) (Pawlyn, 2019).

Biomimicry can shape construction in several ways to create architecture as a path toward sensitive and nature-inspired architecture - to convey different emotions concerning the bigger picture of the story. Through utilizing all the spectrums of biomimicry, we can evoke emotion and create deeper experience of the narrative (Braungart et al., 2002). The type of biomimicry sets the theme which gives a guideline to the type of experiences created within the space.

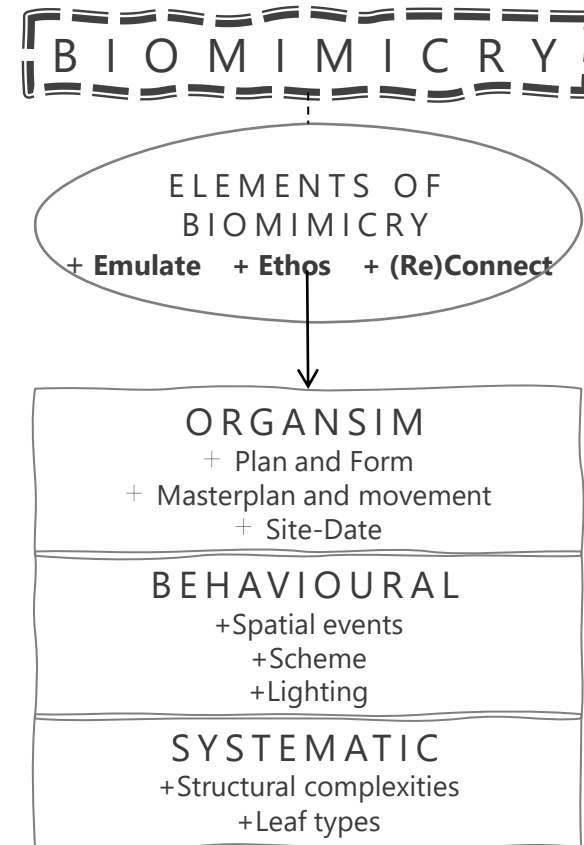


Figure 28: Diagram of Biomimetic elements (Author, 2023)

Antonio Monestiroli, Italian architect and theorist, states that architecture is an imitation of nature, as throughout history, art, and within it architecture, imitated nature 'from the simple reproduction of natural forms, to the more complex analogy between the artistic construction and the construction of nature' (Sampaio, 2015). When understood this way, every work is a 'second nature' or, in Alvar Aalto's words (1963, p. 158), 'the manmade extension of nature', with the capacity to convince us of its rightness, within proximation to the naturalness and the evidence which characterize the former (Aalto, 1963). This is the basis for biomimicry, the implementation of good design emulating nature, to construct a place, to emphasize and retrieve its already existing distinctiveness and peculiar character of place, identifiable within the surrounding context.

Without a priori theory, allowing the design processes to arise from site, seeking for a cohesive balance between man's interventions and pre-existing nature. When translating nature's strategies into design, the science of the practice involves three essential elements. Depending on the degree of mimicry: plan, sectional or systematic, will determine the level at which biomimicry of fynbos takes place and is conveyed. This in turn sets the scene for space and time, allowing for embodied memory and thought.

Biomimetics can be classified into three levels of design: **Organism (plan), Behavioral (sectional) and Systematic (construction)**(Lunawat, 2022). All together revealing the larger narrative. The concept of biomimicry is well suited to the Fynbos interpretation function, as the existing landscape not only contains the diverse fabric holding the various degrees of mimicry but can be communicated through its various levels within the design to evoke emotion through various spaces and timelines.

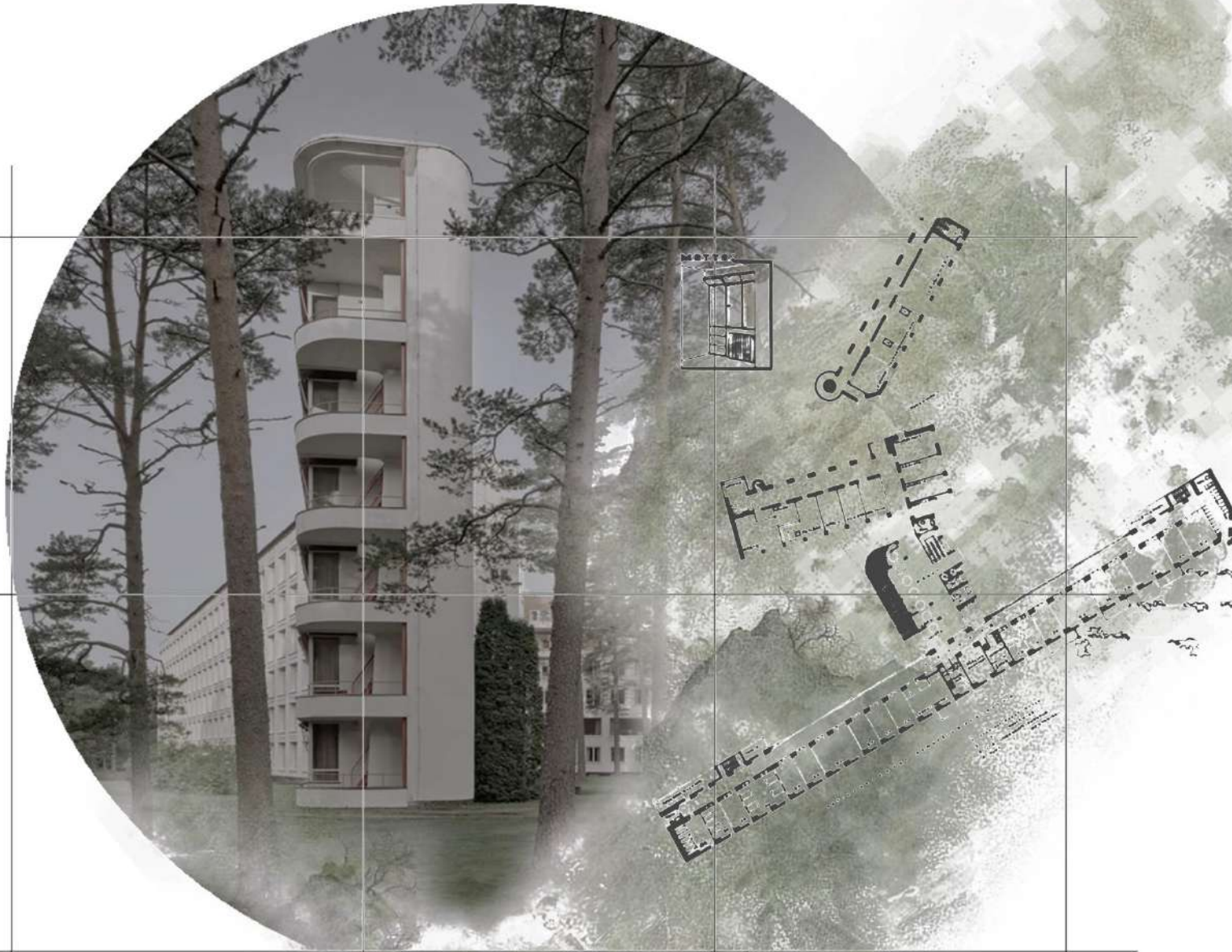


Figure 29: Paimio Sanatorium, facades mimicking surrounding trees (Aalto, 1993, adapted by author,2023)

ORGANISM

EXPERIENCE ON PLAN

Biomimicry of the Organism: replication of the **form** of an organism to inspire design (Lunawat, 2022).

Twentieth-century architects have frequently used nature as a source for unconventional forms and symbolic association, producing majestic architectural forms, such as Eero Saarinen and Le Corbusier. Organism biomimicry is concerned with the functional value of the **plan** experience, functioning as a shape-inspired mimicry in design, arranging known perspective to the onlooker and an enriched experience to the dwellers (Pawlyn, 2019). Interpretation forms a large part in biomimicry, when done harshly, disconnects experience and landscape. However, when biomimicry is used harmoniously, architecture can enrich experience and connection to the heart-source of the form.

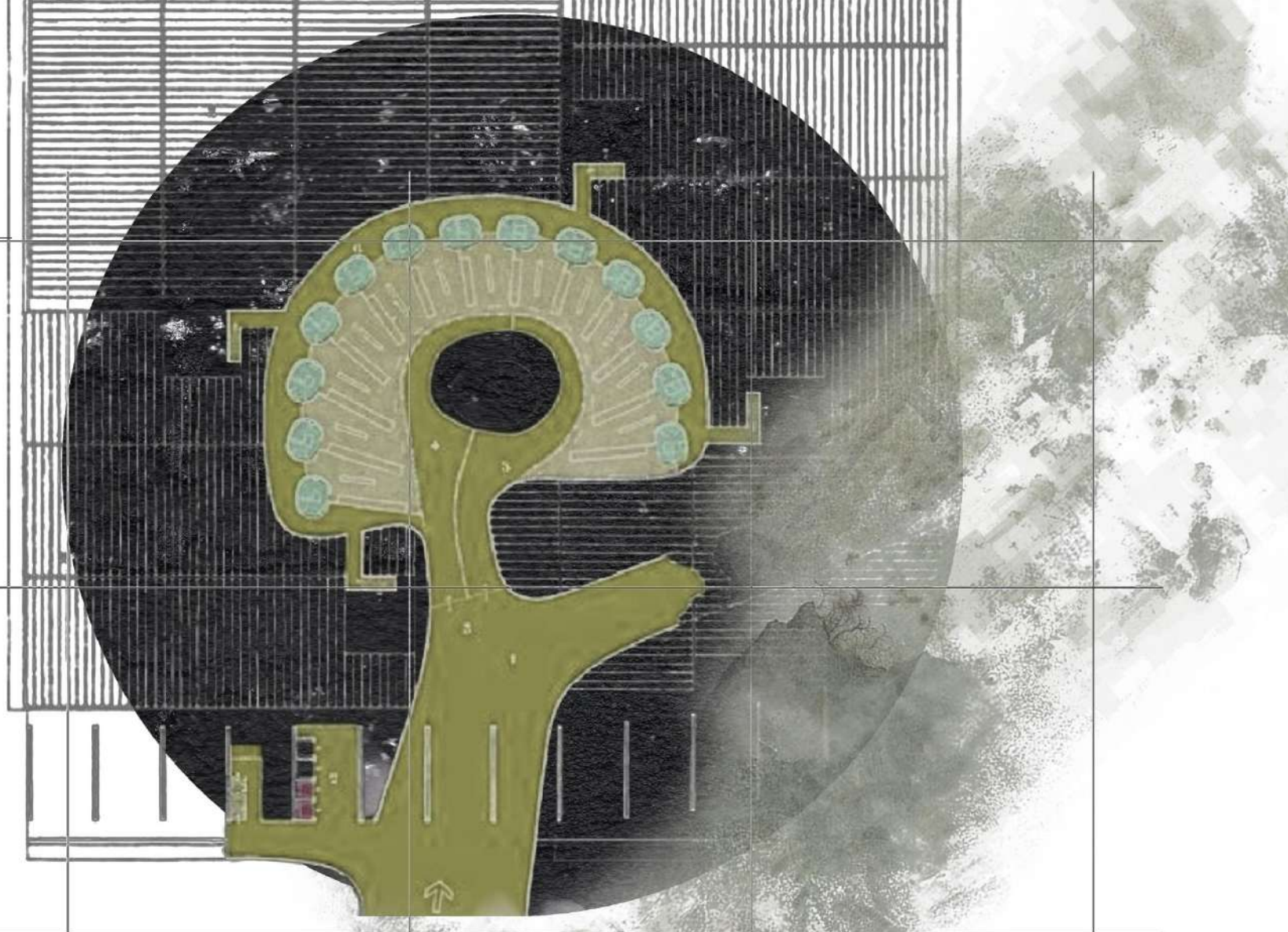


Figure 30: Le Corbusier's washroom design deliberately mimicking the cleansing function of kidneys in the unbuilt Olivetti headquarters project (le Corbusier, 1999, adapted by author, 2023)

INTERPRETING THE PREFIGURED SETTING

To truly explore and be able to mimic fynbos on various levels, deeper research on the skin of fynbos was conducted to be able to mimic fynbos on an organism, behavioral and systematic level. This visual study was done into fynbos on a naked-eye; sectional-; and microscopic level, to be able to identify its structural complexity and layout. This was conducted through an alternative site analysis:

MIMICRY OF THE SKIN OF PLACE

The fynbos biome that becomes the narrative for this project has a much deeper, unadorned beauty to be explored. The intricate physiology of fynbos has allowed a seemingly sensitive kingdom to survive and thrive in extreme conditions. As designers of care, architects are called to imitate the intelligent construction and sustenance, of the life surrounding us, to create harmony between man and nature. Humanity has always been in a constant state of searching and seeking the unknown, overlooking the various possibilities within our existing environments.

Figure 38 refers to the seeing the possibility of site complexity within fynbos physiology itself. Some of the most renowned art, literature and scientific revelation, derive from nature. Michelangelo's work, as the statue of David, was inspired from the works of Leonardo da Vinci, who's most profound inspiration was nature's divine perfection, as stated in Aristotelianism.

Figure 39 to 42 represents the microscopic physiology of the four-leaf types of fynbos: Myrsine; Metalasia; Retzia; Spatalla. These four categories represent a broad categorization of over 9000 fynbos species, which can be used in reference to Organismic Biomimicry. The 100n microscopic views of fynbos will be used in creating the plan experience with the interpretation center.

MIMICRY IN THE SKIN OF PLACE

ALTERNATIVE ANALYSIS



MYRSINE

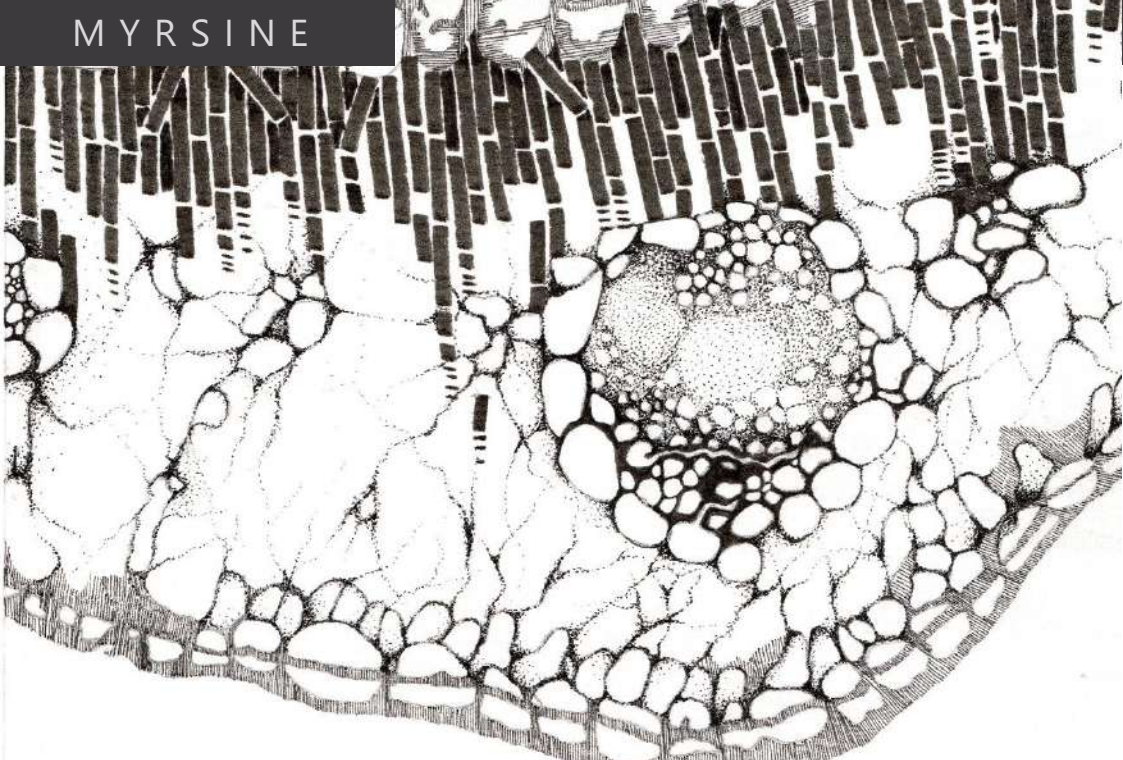


Figure 32: Myrsine fynbos at 100n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

METALASIA

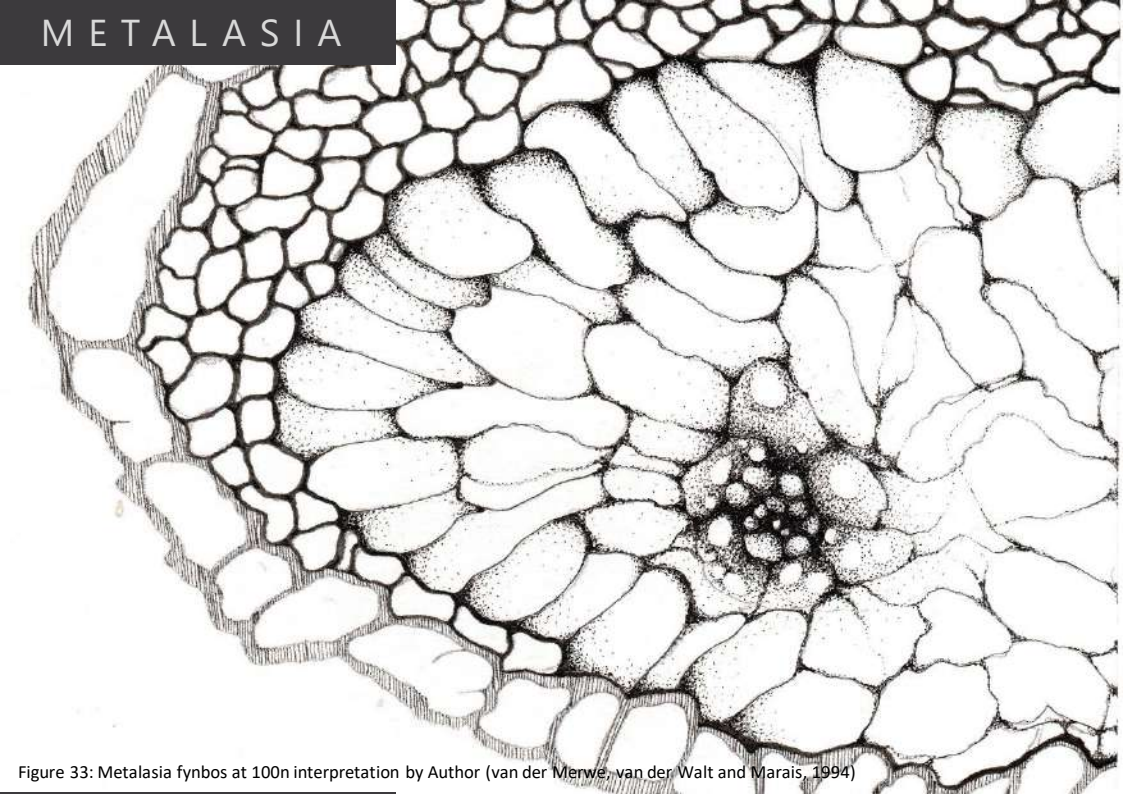


Figure 33: Metalasia fynbos at 100n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

RETZIA



Figure 34: Retzia fynbos at 100n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

SPATALLA

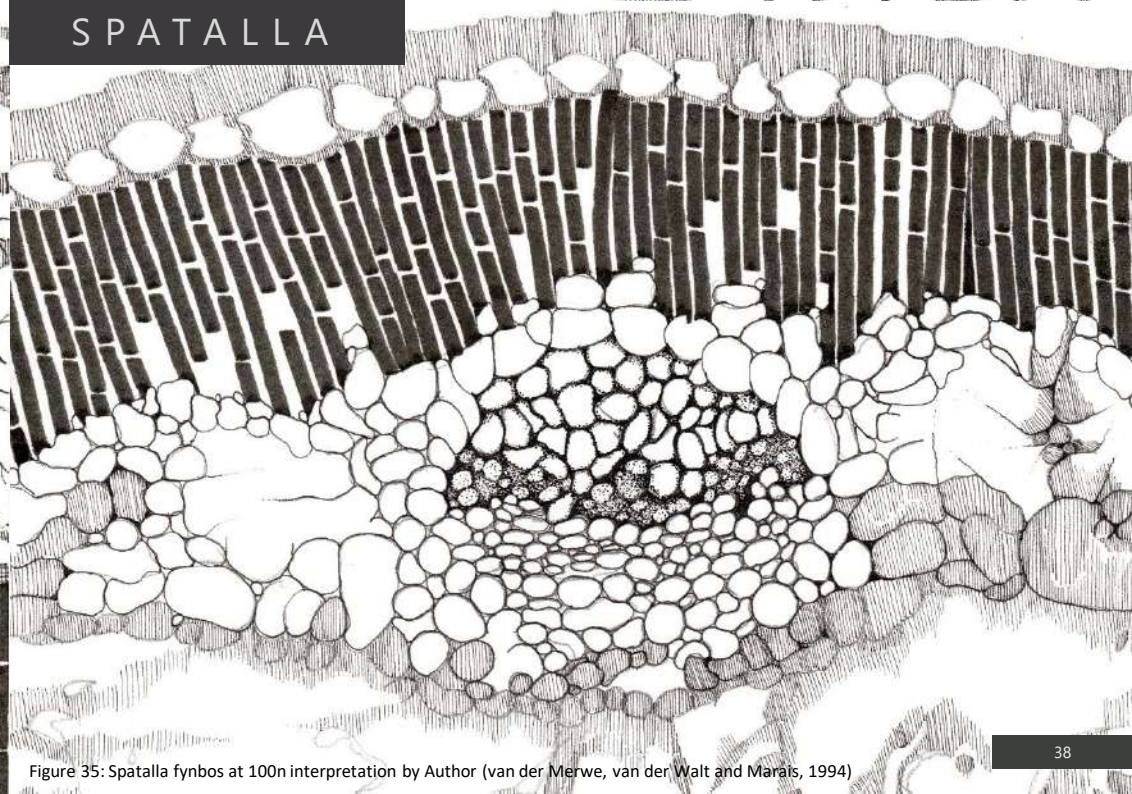


Figure 35: Spatalla fynbos at 100n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

INTERPRETING THE PREFIGURED SETTING

By completely removing any possibility of manipulating the outcome, and allowing the subject of fynbos to stand true, true understanding and mimicry can take place. By unveiling the deeper truth hidden within the site, the true fabric of site can be translated into architectural works. This process highlights the importance of experiencing site-specific elements in their raw form which will become the space.

Biomimicry within the organism can occur once there is focus on the existing beauties and strengths within the make-up of the site. Creating balance, that respects the existing, rather than competing with it, will be a vital driver to create an intervention that stands in harmony with the fynbos landscape it intertwines with.

MIMICRY OF THE SKIN OF PLACE

Figure 43 refers to the process of taking and magnifying the hidden beauty of the site. Biomimicry is rooted in purely learning from a source, nature, as it is, and developing artistic mimics to resolve various problems, whether technical, performative or decorative.

The 50n microscopic views and the naked-eye observations will be discussed further under the Systematic Biomimicry.

MIMICRY IN THE SKIN OF PLACE
ALTERNATIVE ANALYSIS

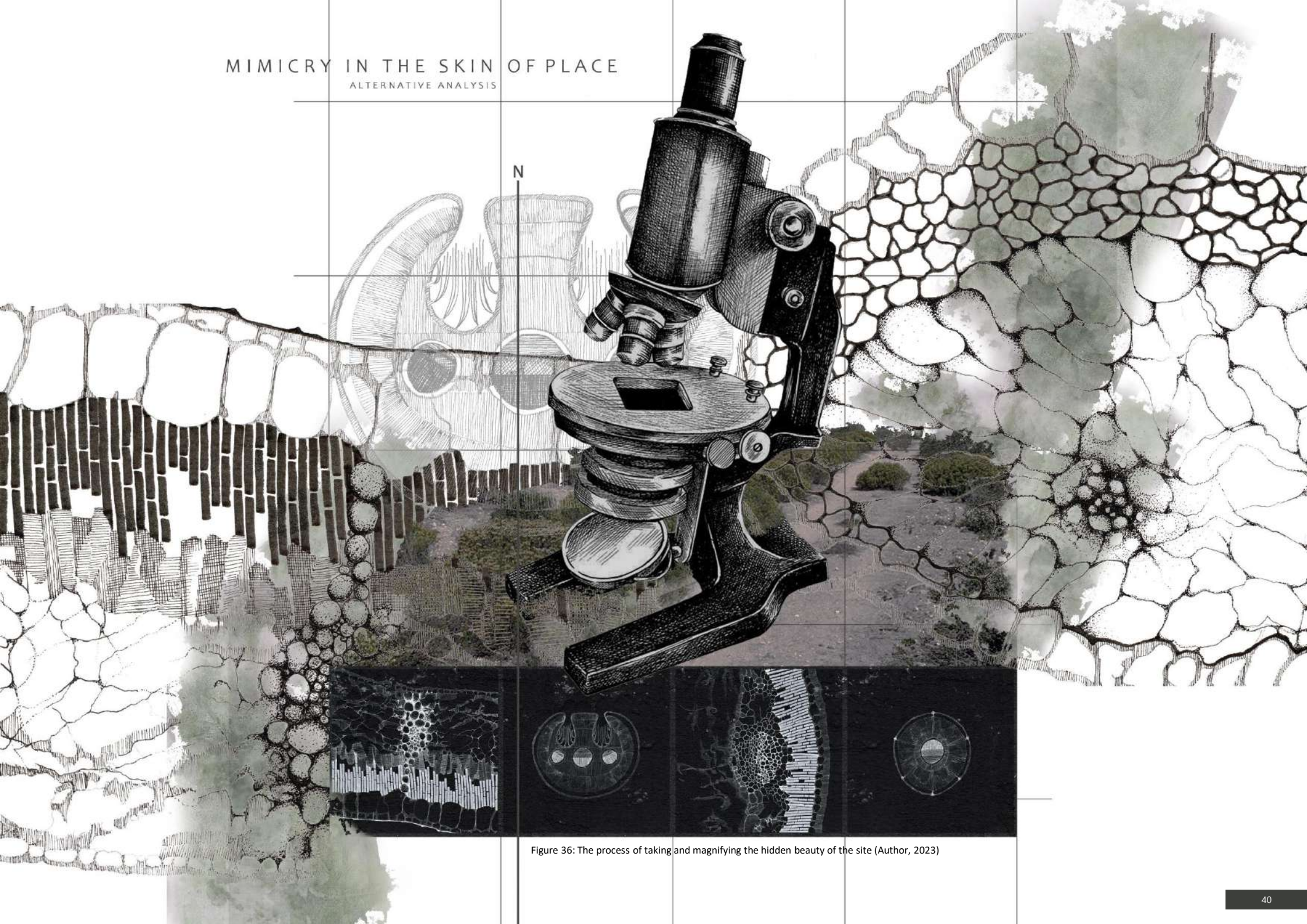


Figure 36: The process of taking and magnifying the hidden beauty of the site (Author, 2023)

BEHAVIOURAL

EXPERIENCE IN SPACIAL NARRATIVE

Behavioral-level biomimetics refers to the replication the **events** of an organism. (Lunawat, 2022).

The behavioral-level biomimetics of fynbos is where the form and function, the organism and systematic elements are compiled to create a narrative. Mimicking the fynbos' behavior in each of the 3 stages and stitching them together enhances the narrative, creating a fluid and liner timeline with non-linear interpretations in each pavilion.

Mimicking the behavior of fynbos, and the lifecycle, within the biomimicry context could relate to the idea of a promenade that relates to architecture. The lifecycle is told as a storyline connected via a promenade. The architectural promenade can be defined as "interpretive experience in and through architectural space" (Laubscher 2015: 103). The concept of the architectural promenade is one of the main elements in the work of Swiss-French architect Le Corbusier (Penz, 2004: 42). In *Vers une architecture*, Le Corbusier suggests the idea of an architectural promenade when he says, "The architect therefore Assigns destinations to his axes" (Penz, 2004: 42). William Curtis states in *Le Corbusier: ideas and forms* (1986) that the ramp as an honorific path becomes the spine of the idea of the architectural promenade (Penz, 2004: 42). Le Corbusier relates this version of the promenade to *Arab Architecture* (Penz, 2004: 42), expressing that: "Arab architecture teaches us a valuable lesson—it's best appreciated on foot. Walking—you must walk through a building with a changing viewpoint, to see the articulation of the building deployed." (Le Corbusier, 1929: 24).

The notion of the promenade acting as a catalyst that allows movement and interaction through different spaces, events and perspectives, becoming a connector in architecture.

As a Behavioural mimicry device, the space of interpretation and the promenade function as connecting mechanisms in the Fynbos Interpretation Centre, linking different stages, times and spaces together to configure a singular dynamic and immersive narrative. The act of mimicking a timeline(lifecycle), interpreted as a promenade, is illustrated in Le Corbusier's *Le Sainte Baume* scheme to analyze how the promenade can transport the viewer through different times and experiences.

BEHAVIORAL BIOMIMICRY illustrated in a PRECEDENT

Le Corbusier drew inspiration from the Egyptian processional routes in the scheme of Le Saint Baume, a promenade through a mountain, that forms part of the Compagnons du Tour de France pilgrimage of the Masonic group (Louw, 2016: 12-33).

The scheme starts at stage 1: pilgrimage towards the mountain. stage 2: disorientation from outside to into the cave-like mountain.

stage 3: "descent to sources of sensation", dweller moves down within the mountain, cut off from exterior surroundings (Louw, 2016: 12-33).

stage 4: dweller ascends towards the exit out of the mountain. Reorientation occurs, dweller adapts to their surroundings.

stage 5: enlightenment, dweller re-aware of present as they exit the other side of the mountain with the ocean and horizon (Louw, 2016: 12-33).

The scheme was designed to remove the dweller from the present to transport them to another time. The maze-like promenade design uses narrative, manipulation of light and different levels to disorientate and remove present time (Louw, 2016: 12-33).

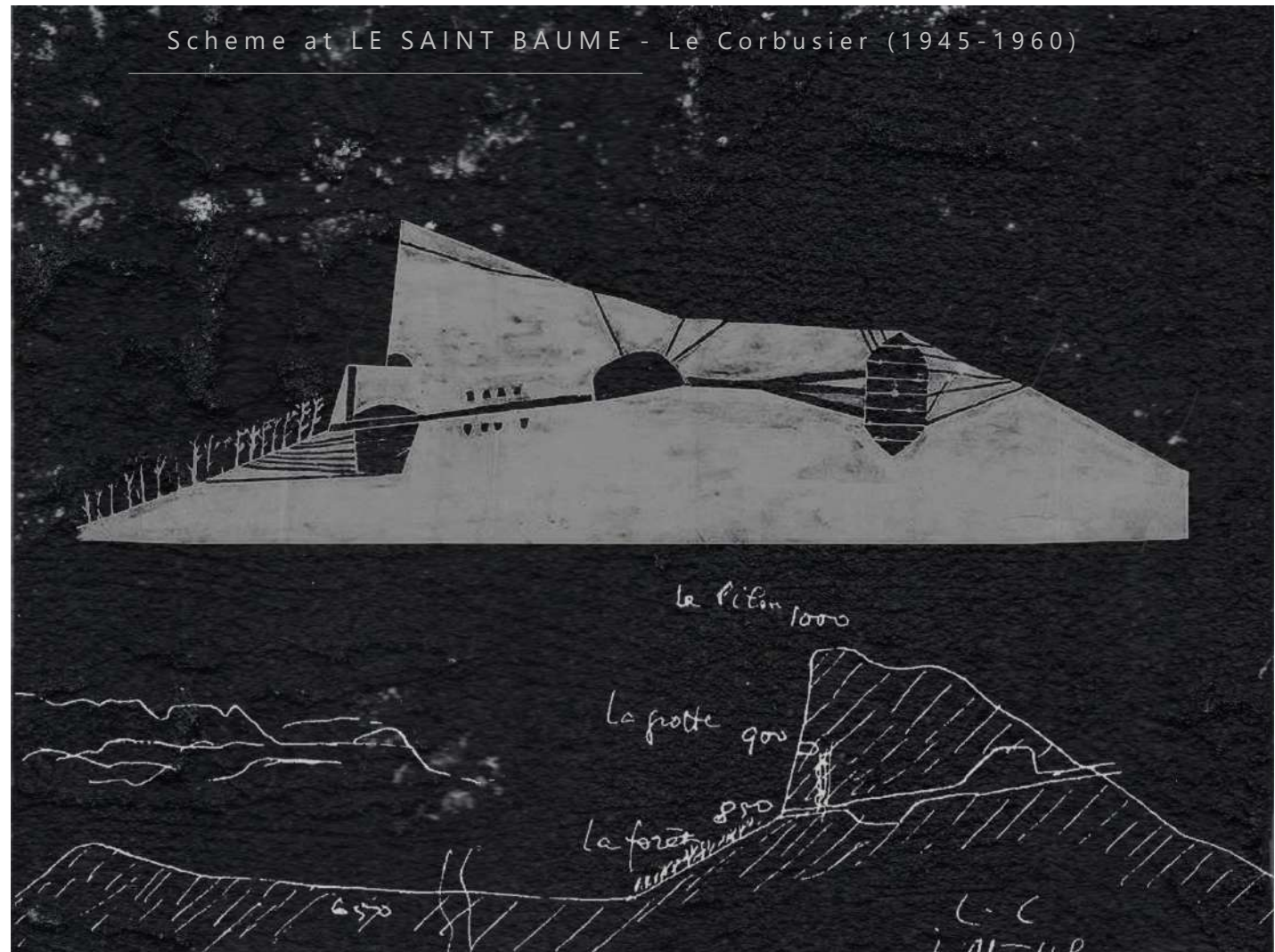
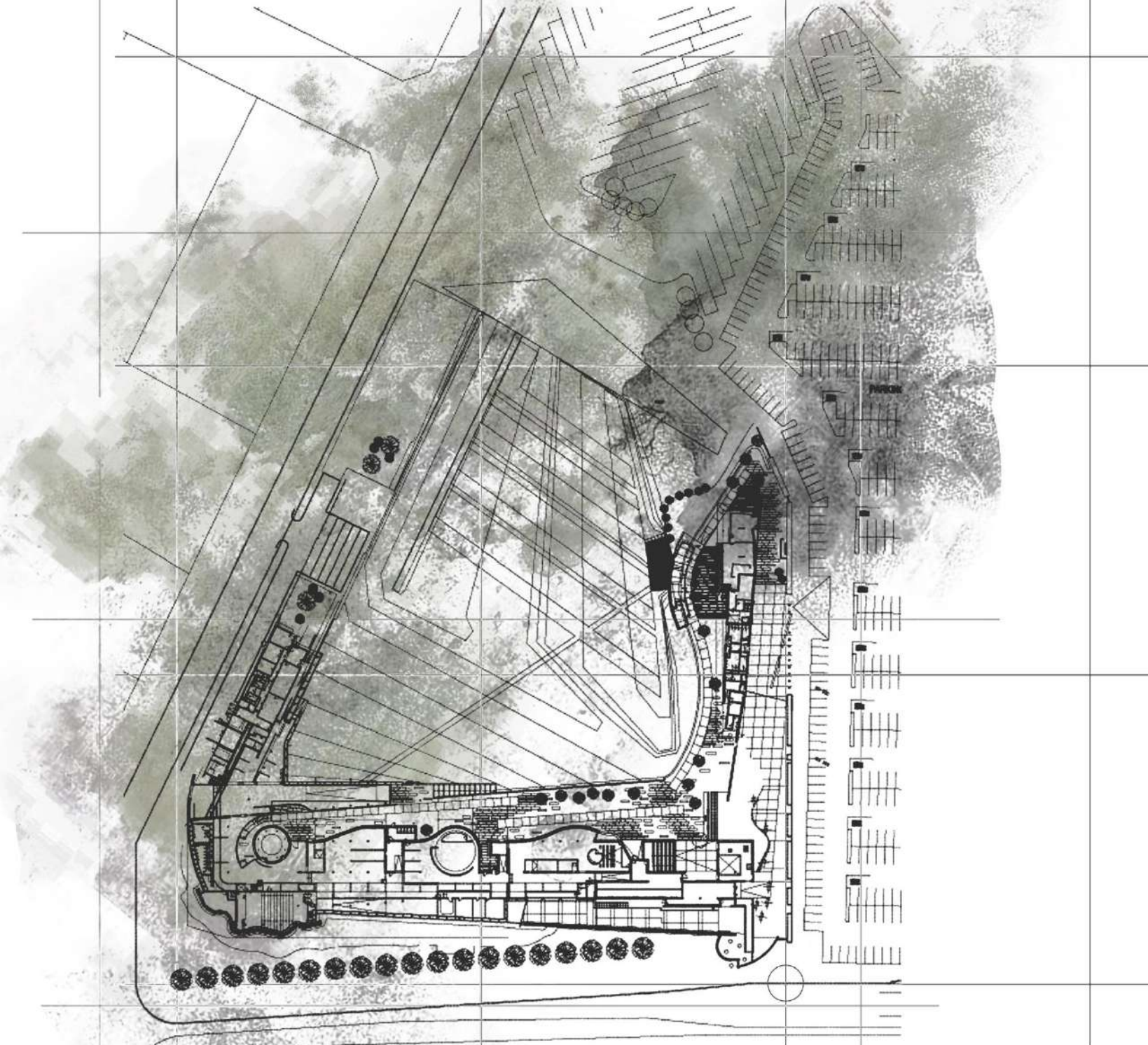


Figure 37: Scheme at le saint baume (Le Corbusier, 1945)



Biomimicry in architecture plays an important role in staging the narrative of fynbos through lived space. An excellent precedent of how a plan can set the evoke emotion for the dweller is Mashibane Rose Associate's Apartheid Museum located in Johannesburg (2001), where linear ascent and descent invokes a sense of manipulation and control, where everything is unknown and unpredictable (Bremner 2002:39).

Reinterpreting, framing and narrating the fynbos' events becomes important to the overall experience of the Fynbos Interpretation Centre. By creating a biomimetic stage, viewers can be transported through time to relive the living story for a landscape that cannot narrate it itself. By mimicking the organism-level of fynbos, an experiential framework can be developed into a design scheme to effectively retell the unseen truth of place.

SYSTEMATIC BIOMIMICRY OF STRUCTURES

Ecosystem-level Biomimetics refers to replication of the **function**, when systems are modeled to be a part of the natural ecosystem(Lunawat, 2022).

An important example of ecosystem-level biomimetics is Mick Pearce's 1996 Eastgate Centre in Zimbabwe, which is modeled on termite mounds. Termite mounds are designed to maintain stable temperatures inside, regardless of fluctuations in outside temperatures, through a series of thin 'chimneys' that absorb heat in the day, while keeping the inside cool. At night, the hot air makes its way out of these chimneys. At the bottom of the mound are open vents, which allow cool air to enter inside. In a similar fashion, the use of porous concrete and fan-assisted chimneys enabled architects to exclude conventional air conditioning systems in the Eastgate Centre yet maintain habitable temperatures in the otherwise semi-arid Zimbabwe (Lunawat, 2022).

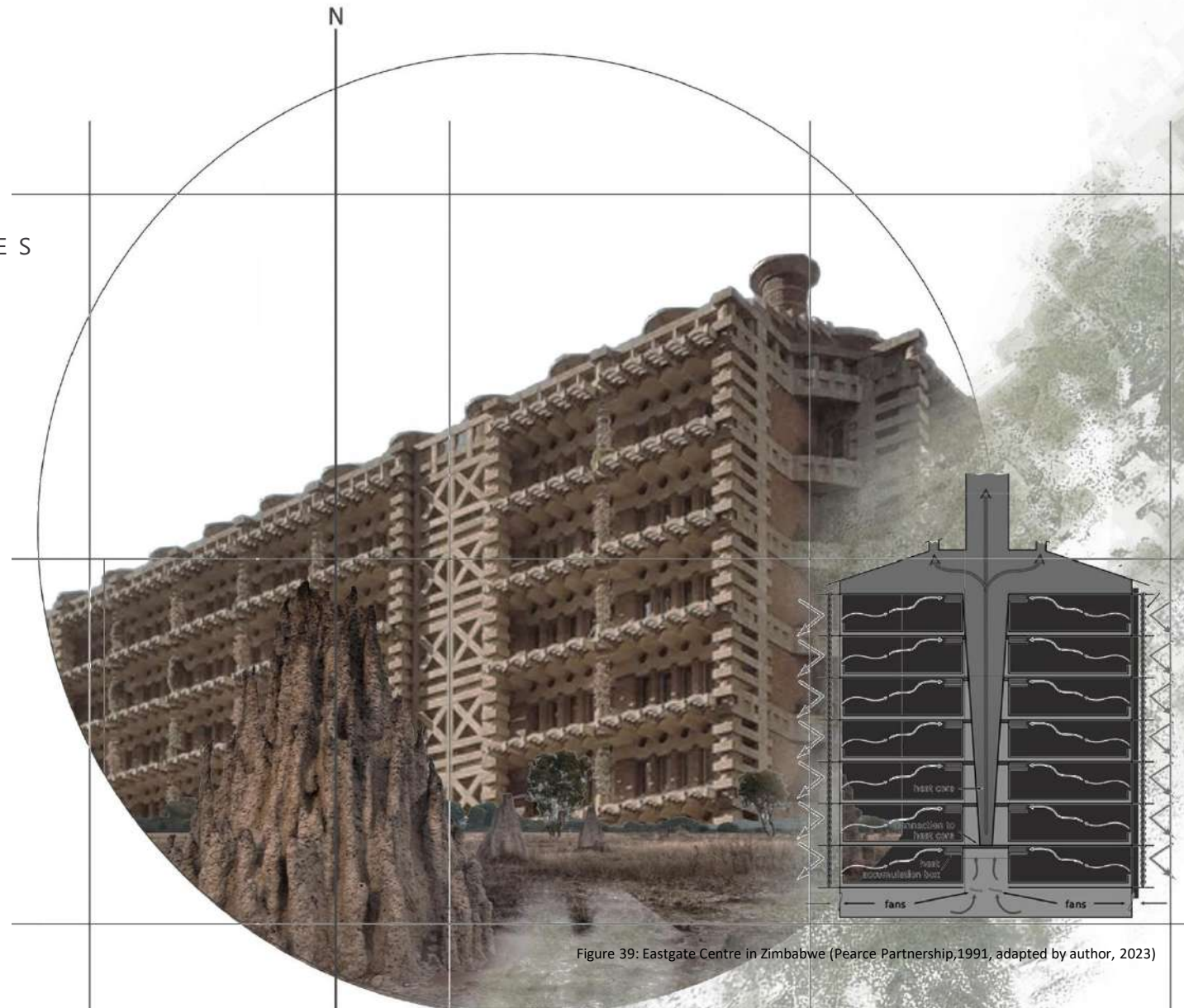


Figure 39: Eastgate Centre in Zimbabwe (Pearce Partnership, 1991, adapted by author, 2023)

MYRSINE

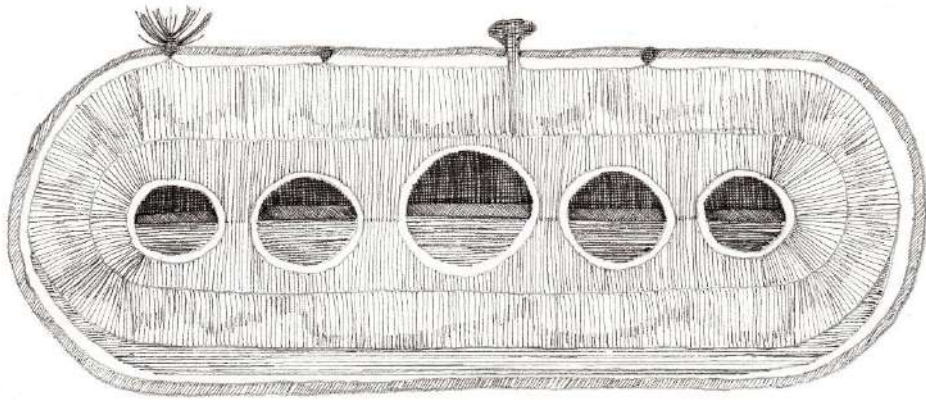


Figure 40: Myrsine fynbos at 50n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

METALASIA

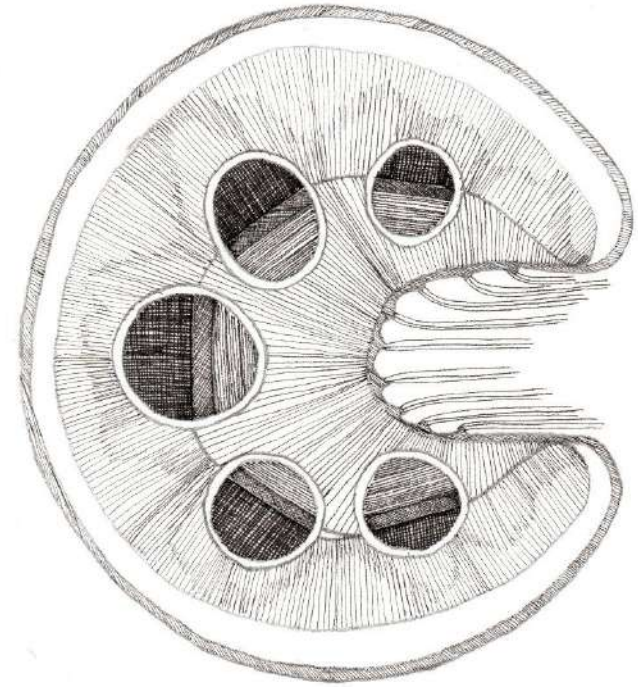


Figure 41: Metalasia fynbos at 50n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

RETZIA

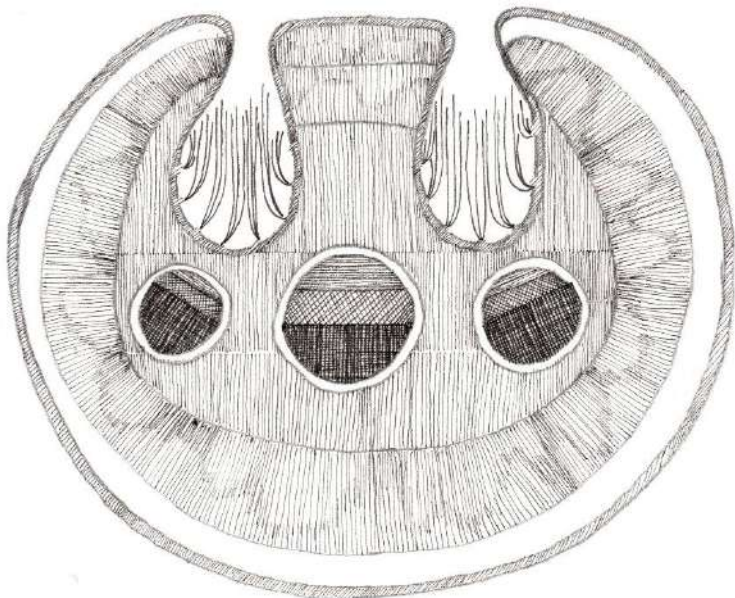


Figure 42: Retzia fynbos at 50n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

SPATALLA

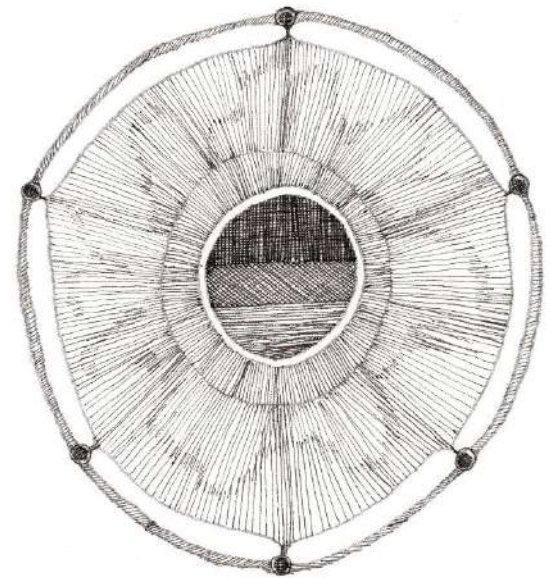


Figure 43: Spatalla fynbos at 50n interpretation by Author (van der Merwe, van der Walt and Marais, 1994)

INTERPRETING THE PREFIGURED SETTING

Through the process of discovering the hidden functionality of fynbos via the alternative site analysis: "Mimicry of the skin of place", the functionality of fynbos was revealed and can be reinterpreted to create quality spaces for narrative exploration.

MIMICRY OF THE SKIN OF PLACE

Figure 48 - 51 refers to fynbos sectional with 50n. This looks at the functioning of the fynbos structure, with reference the water storage and distribution, barrier protection from environmental factors, reproduction. These structures within the fynbos physiology can be used to guide design decisions such as materiality, planning, seasonal changes to the design, water collection and redistribution and structure. (van der Merwe, van der Walt and Marais, 1994)

Figure 52 – 55 represents the naked-eye observation of fynbos, an overseen element due to it's overlooked natural state. Yet, within this state, this is where the various fynbos types unique physical characteristics can be observed. From the fire-reliant proteas, to the water-savvy succulent like fynbos, from the unique fynbos that grows from within itself, to the succulent thicket creating lush shrubs. These additionally add complexity to the design by contrasting minimalistic and complex elements, textures and materiality. (van der Merwe, van der Walt and Marais, 1994)

Systematic Biomimicry will guide the designs materiality not only for the orientation hub and services but the unique materiality and design for each interpretation pavilion. (van der Merwe, van der Walt and Marais, 1994)

MYRSINE

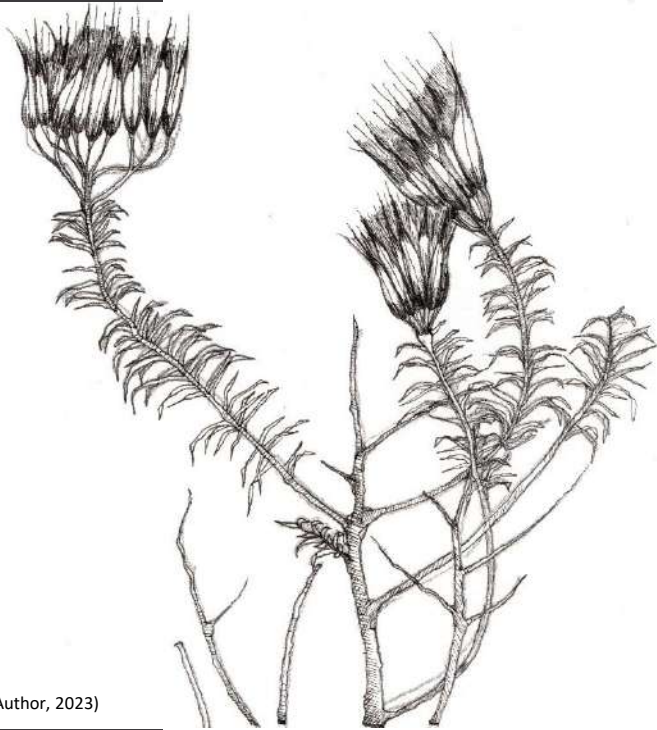


Figure 44: Myrsine fynbos (Author, 2023)

RETZIA



Figure 46: Retzia fynbos (Author, 2023)

METALASIA



Figure 45: Metalasia fynbos (Author, 2023)

SPATALLA

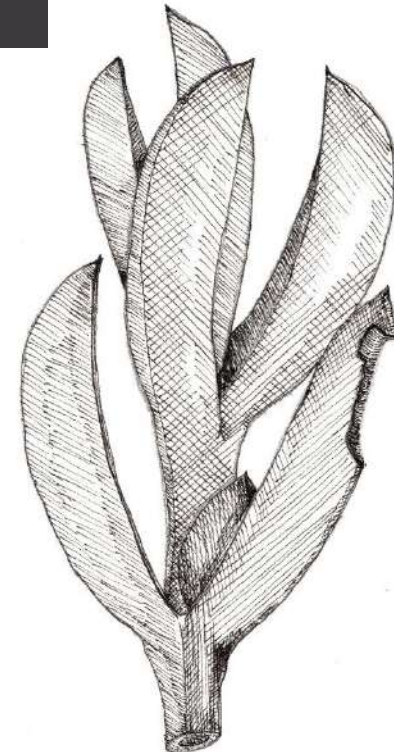


Figure 47: Spatalla fynbos (Author, 2023)

A P P L I C A T I O N

Application of **organismic** biomimicry:

When replicating the form of fynbos into the design, the focus was on using the microscopic makeup fynbos to create a building that functions as fynbos.

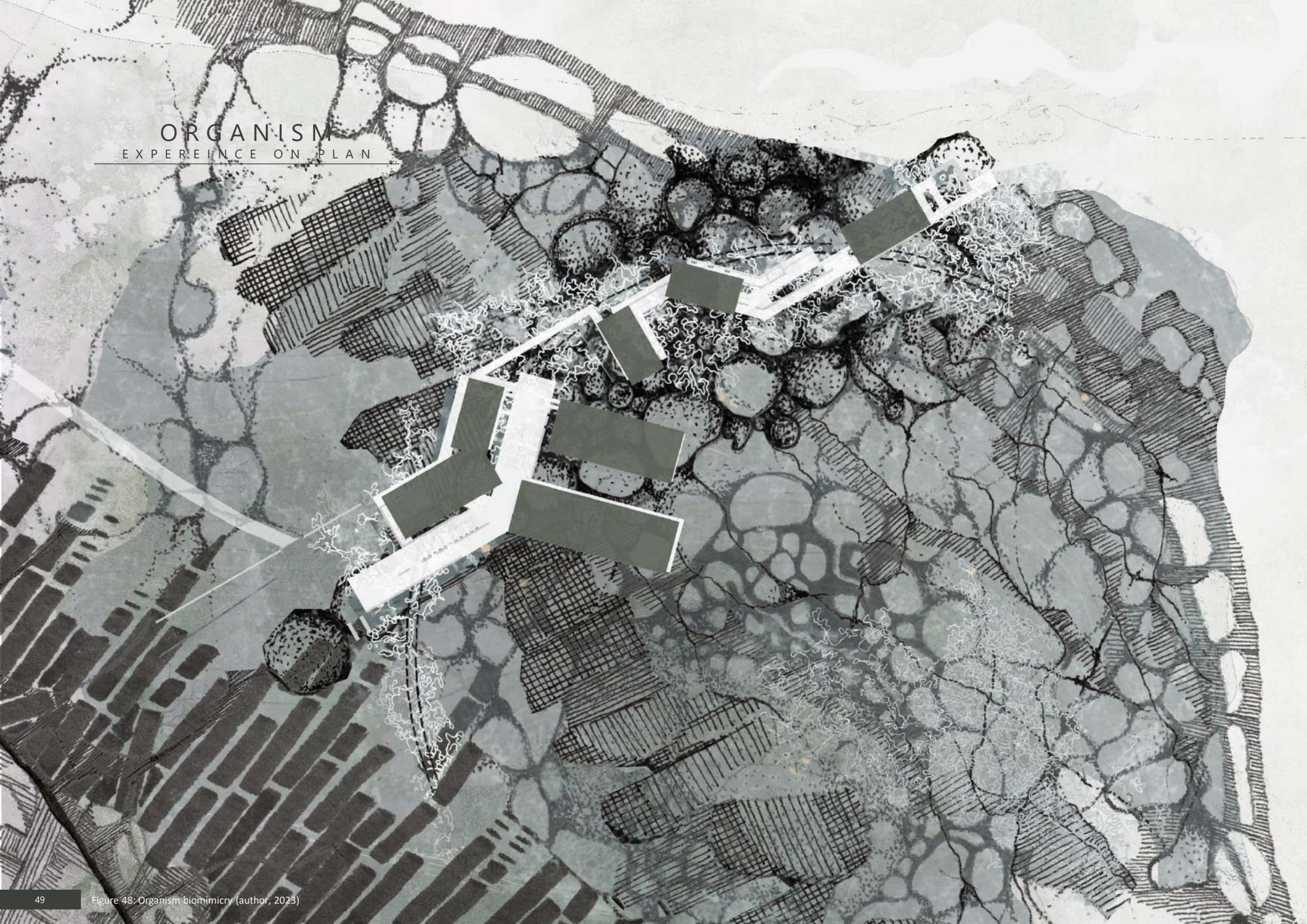
This was achieved by mimicking the singular fynbos structure, comprising of many smaller individual cells with individual functions interconnected by the life-giving network connecting the various cells. Just as fynbos the interpretation center is made up of multiple cell-like functions, interconnected via the promenade acting as the golden thread connection the spaces and fynbos story.

The form of the interpretation center was developed from the open spare areas existing on site (refer to figure 78 on page 73). By using the microscopic fynbos physiology as a blueprint to the interpretation center, a final masterplan was developed into what is the final design as seen in figure _ on page _.

Application of **systematic** biomimicry:

By replicating the functionality of fynbos, the final roof design was developed as seen on page _. The roof's structure mimics the multi-layered cellular makeup of the fynbos physiology. As in fynbos this complex "skin" allows for natural ventilation (oxygen), soft light dispersion (light absorption for photosynthesis) and water collection and distribution.

ORGANISM
EXPERIENCE ON PLAN



APPLICATION

Application of **behavioral** biomimicry:

The architectural promenade becomes a walkway in the landscape, stitching the different pavilions together that symbolize the categories of fynbos moments. The promenade takes the dweller on a visual journey, using perspective to convey the whole narrative:

1. Survival vs. Decay: (re)Birth

Through the use and disuse of light, aging materials, and the complex roof structure, the space can make the viewer experience the two competitors and the message they try to convey: progressing towards life(more) or death(end).

2. Expansion and Dispersion: (re)Growth

With water running within the pavilion, leading from the pavilion into the promenade and the next pavilion, the dweller understands the growth and progress to come. By using distributed light and platforms stretching out of the existing form, growth is communicated in experience.

3.The Flourishing: Maturity

By creating an open pavilion, with an abundance of light shining onto a walkthrough fynbos garden, the dweller experiences warmth through light used to interpret certain attributes of fynbos, growth and honesty (understanding) within the final pavilion. By stretching the gardens from the pavilion outwards into the natural landscape, architecture and nature is blurred for a lasting effect.

BEHAVIOURAL
EXPERIENCE IN SPACIAL NARRATIVE



SYSTEMATIC
BIOMIMICRY OF STRUCTURES

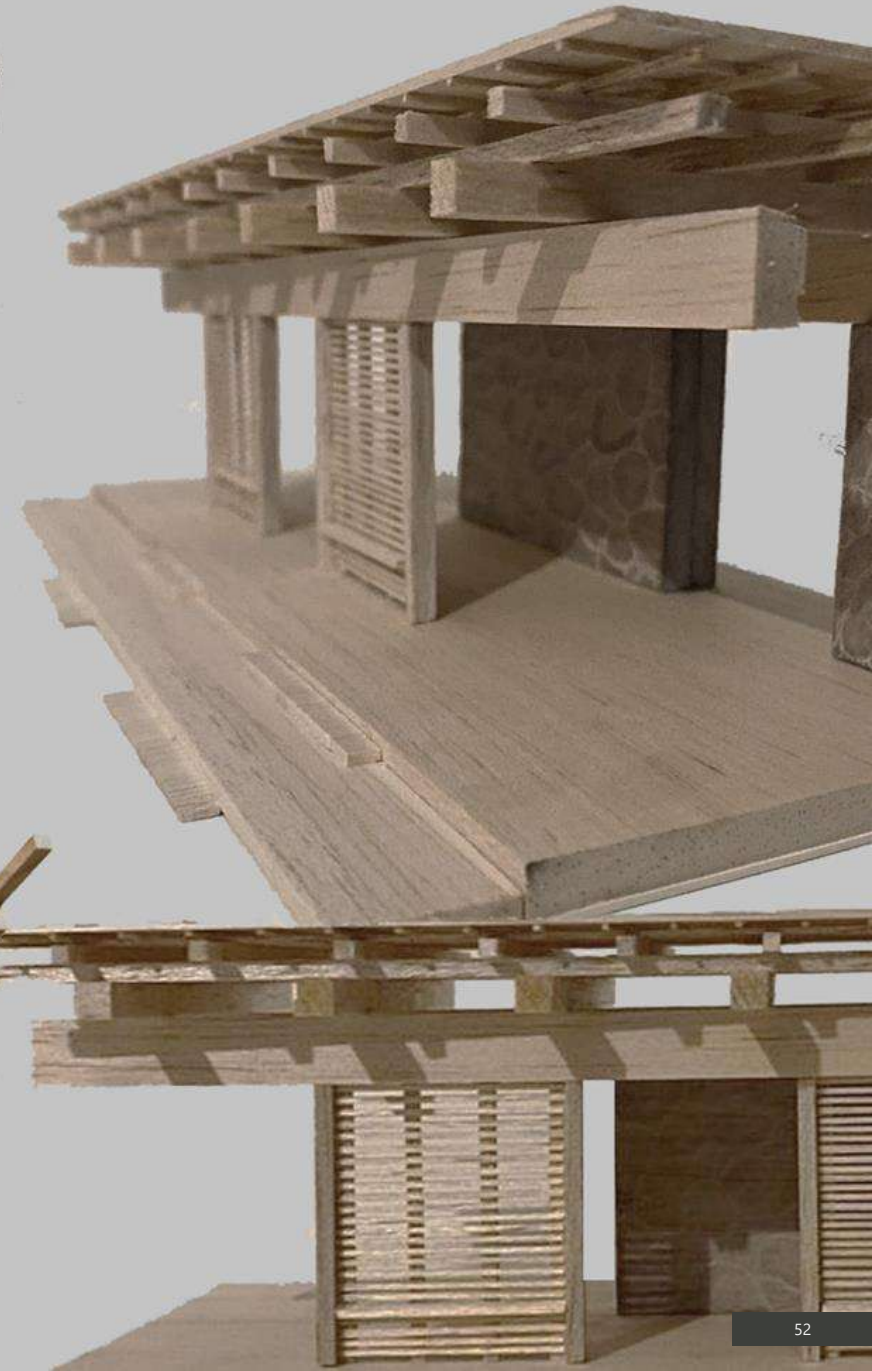
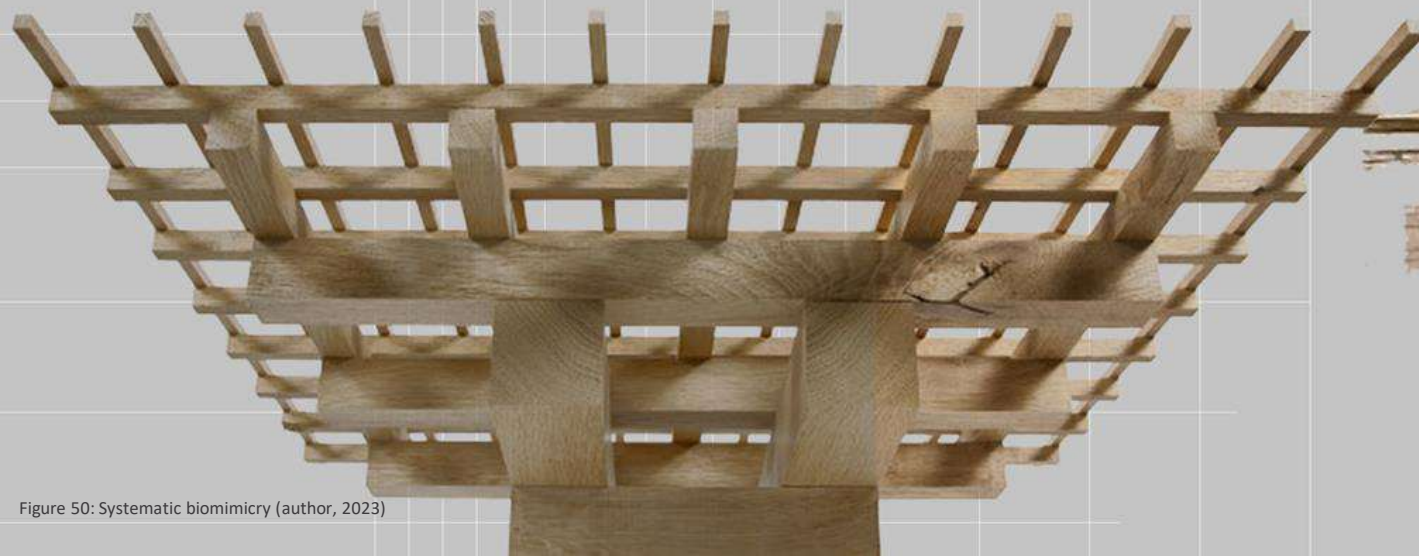
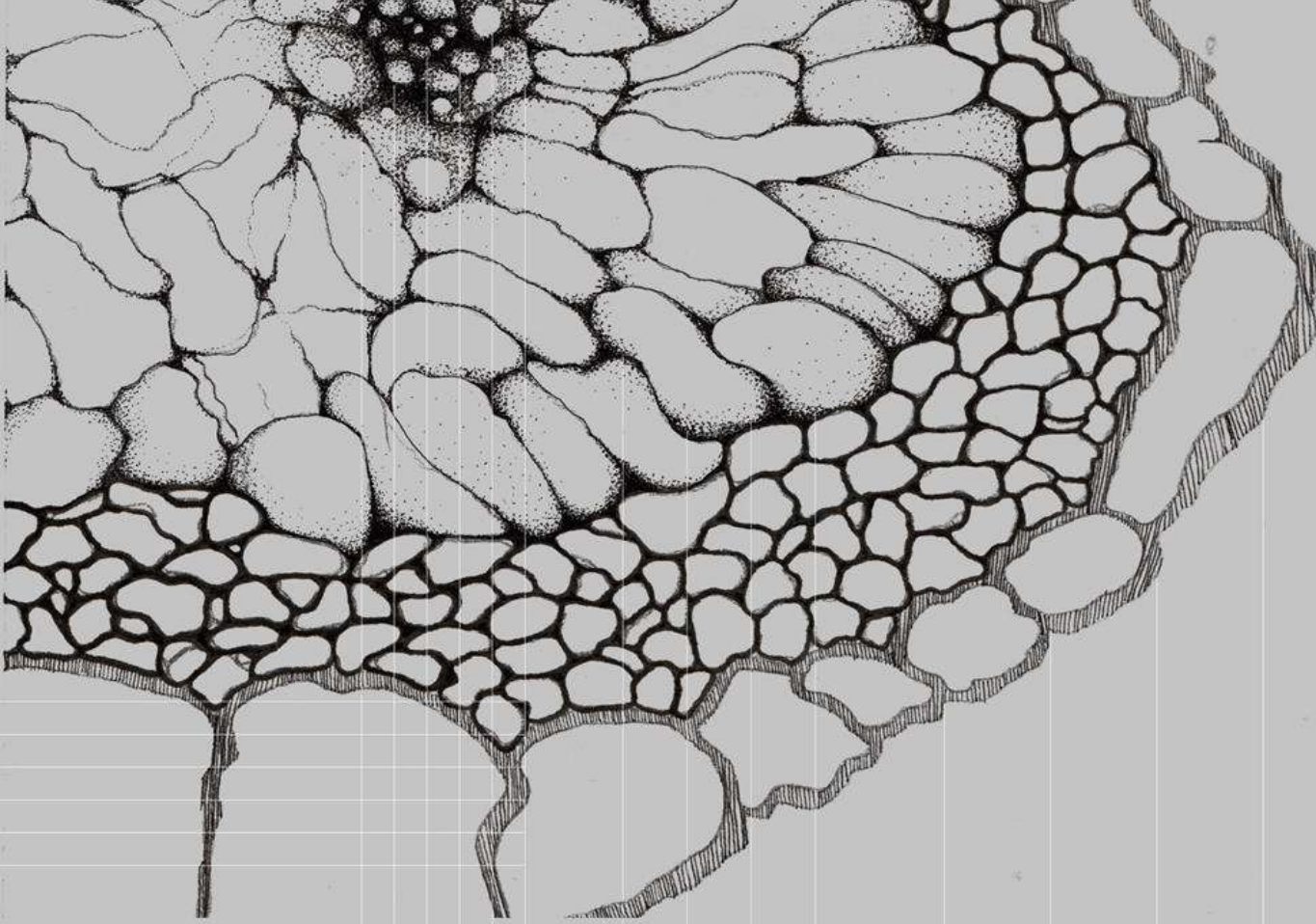
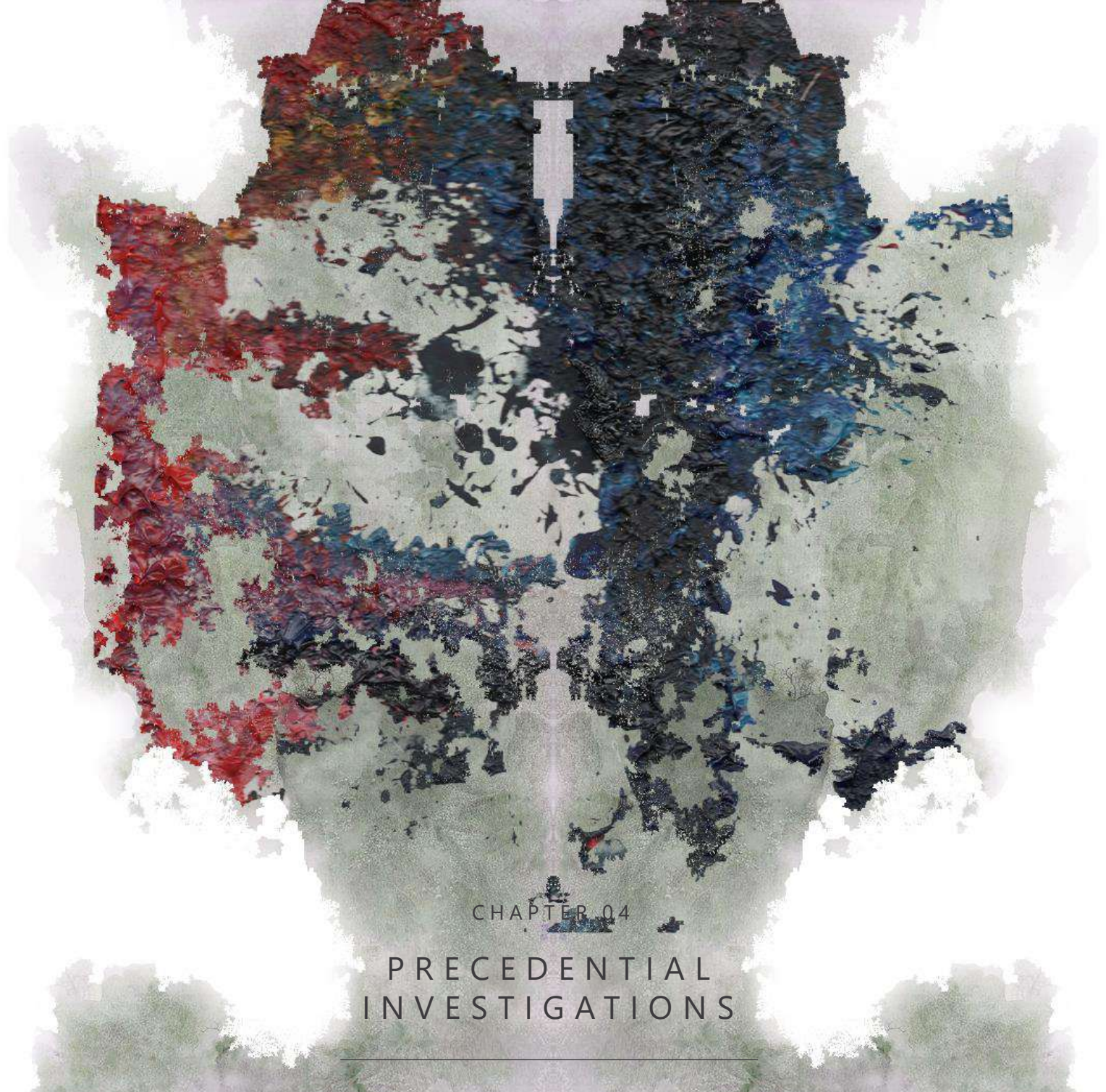


Figure 50: Systematic biomimicry (author, 2023)



CHAPTER 04

PRECEDENTIAL
INVESTIGATIONS

Analyzing various examples of ARCHITECTURE, considering MOVEMENT, MATERIALITY
and SENSITIVITY with existing PRECEDENTS

This chapter looks at existing interventions relating conceptual interpretations, with specific reference to biomimicry. By looking at other examples of interpretive spaces, a more detailed understanding on forming from theoretical ideas can be developed and used to create meaningful spaces. This chapter expands on materiality and the site, concerning biomimicry through materiality and sensitivity to the site.. A deeper understanding on application of both theoretical and conceptual stances in architecture can lead to appropriate structural solutions that merge the context and function. Precedents studies are analyzed to investigate possible functions, materials, structural systems and spatial qualities towards the final design proposal.

MAPUNGUBWE INTERPRETATION CENTRE

Peter Rich Architects

The Interpretation Centre is located in Mapungubwe on South Africa's northern border with Botswana and Zimbabwe (Baan, 2010: online). It houses the rich cultural history of the region together with tourist facilities and SAN Park Headquarters (Baan, 2010: online). The building type and client is therefore similar and can be interpreted to supplement the design process and thinking.

The functions of the building as illustrated in figure 45 includes a reception, restaurant, ablution facilities, exhibition and SAN Park offices. The SAN Park headquarters are separate from the main building dividing public and private.

'Delicate walkways create a zigzagging ramped route through the complex, through exhibition spaces, gently climbing the mesa to the highest point on the site, providing the visitor with a multiplicity of experiences and views, evoking the complex social interactions of the many cultures that have traversed the land.' (Rich, 2009: online)

Biomimicry as a Behavior

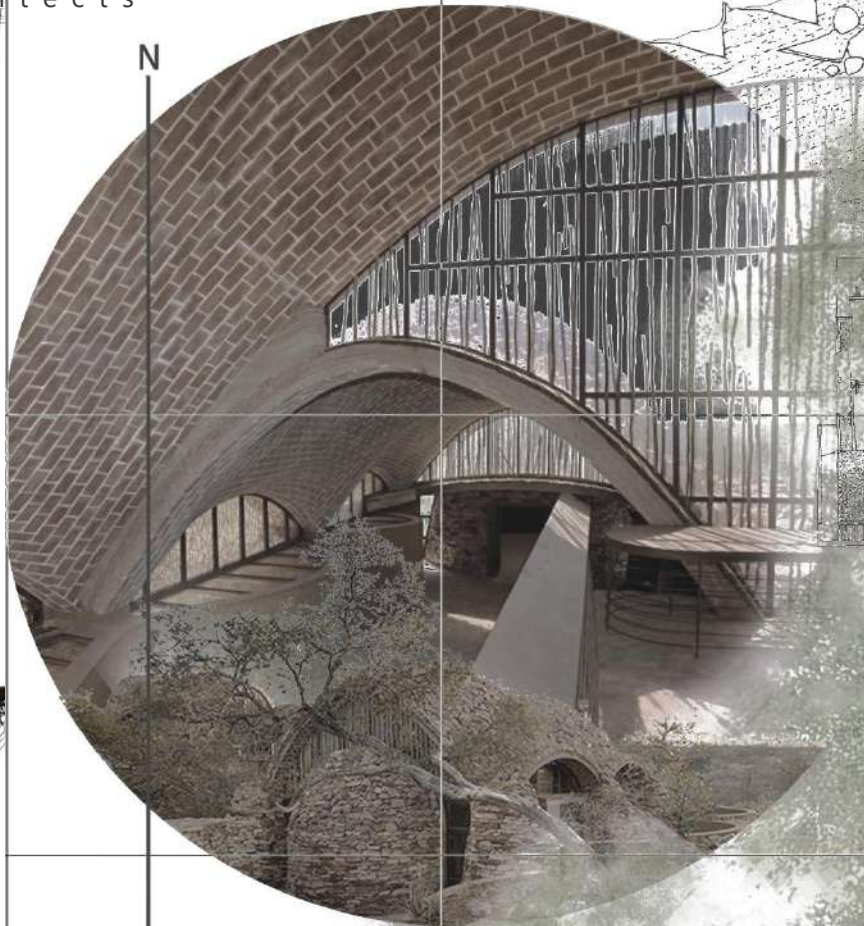
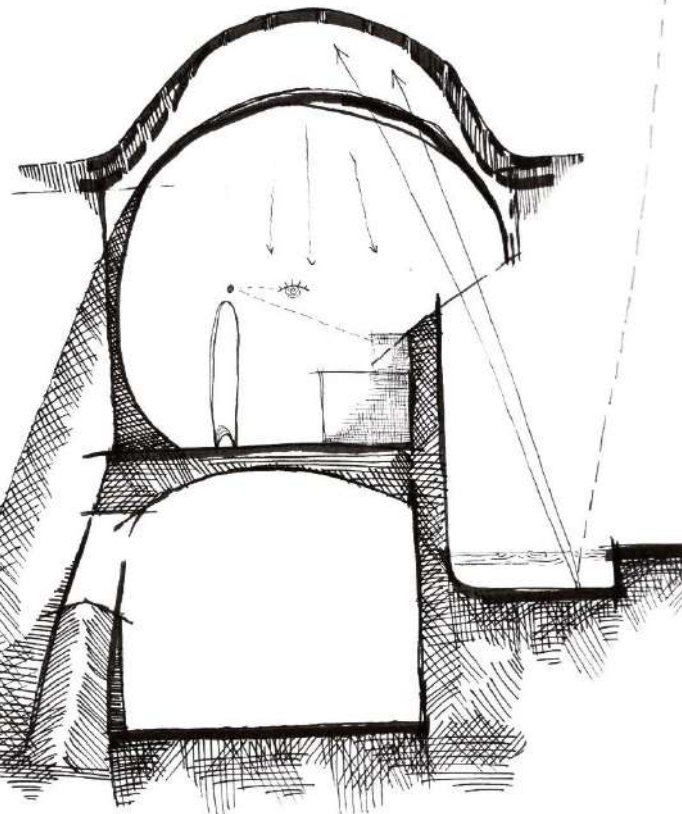
Mapungubwe Interpretation Centre acts as an example of behavioral biomimicry, as it can be seen as a narrative path where the form and functional elements are compiled. While mimicking the rich complexity of the various cultures found within the region, the centre stitches these cultures together to enhance the narrative. This Interpretation centre creates a fluid and linear timeline with non-linear interpretations in each exhibition area.

APPLICATION TO DESIGN:

- The functional program can inform the different spaces in the design as it is also SAN Parks owned.
- Creating natural ramped walkways creates an architectural promenade that connects spaces and emphasizes different views and moments in the design which links to the theory of knitting different moments together.
- Using water and reflection ponds to redirect and reflect natural light which links with the theory of light that enhances spaces and the narrative.
- The use of local and natural materials creates an architectural language that blends into the natural environment.
- Following the slope of the site to integrate with the environment.

MAPUNGUBWE INTERPRETATION CENTRE

Peter Rich Architects



- SPACE ON PLAN:
1. Pedestrian arrival
 2. Arrival landing
 3. Bridge
 4. Reception
 5. Outdoor Court
 6. Ablutions
 7. Restaurant
 8. Craft Shop
 9. Floating walkway
 10. Main exhibition space
 11. East cairn
 12. West cairn
 13. Teaching and Learning
 14. Mesa walkway access
 15. Return route
 16. External teaching
 17. Game drive drop off
 18. SAN Parks headquarters

Figure 51: Use of water feature to enhance atmosphere and light refraction (Author, 2023)

The exhibition space shown in the figure above uses water ponds to reflect light into the dome spaces. This enhances the atmosphere in the spaces and articulates the objects on display.

Figure 52: Mapungubwe interpretation centre by Peter Rich Architects (Author, 2023)



HAKKA INDENTURE MUSEUM DNA Architects

The Hakka Indenture Museum was built to commemorate the story of the village of Shicang (Wong, 2018: online). The name Shicang can be translated to “stone storage” which refers to a legend in the area. The architects used local construction and materials to form thick stone lattice walls to create exhibition spaces that merge the internal and external environment (Wong, 2018: online).

The museum nestles itself into the landscape linking the village with the natural environment. The existing irrigation channel was rerouted over the roof to provide water to the planted roof which sometimes flows into the internal spaces creating a design feature. Linear roof opening allows in natural light that emphasizes the water feature and the exhibition spaces (Wong, 2018: online). The natural elements flow into the internal spaces

Biomimicry as an Organism

The Hakka Indenture Museum is concerned with the functional value of the **plan** experience, functioning as a shape-inspired mimicry of the staggered terracing slopes of the landscape, arranging a familiar perspective to visitors and enriching their experience as dwellers. For this reason, the precedent stands as an example of Organism Biomimicry.

APPLICATION TO DESIGN:

The way the building sits on the site rooted in the hill with planted roofs and thick stone walls which can influence the main orientation hub structure and morphology.

The building becomes an extension of the terraced vegetation on the hill, the orientation hub structure can do the same through the roof becoming an extension of the fynbos blanket covering the limestone hill.

Linear openings and other forms of light shafts can be used in the design to draw in natural light illuminating certain elements in the design.

The water channel that catches rainwater and water from the irrigation system can be used in the experiential pavilion spaces that are more exposed to the natural elements. It can be used to divert storm water from the steep slope and to create a water feature.



First floor plan
1 Entrance
2 Exhibition room
3 Exterior activity space
4 Exit



Figure 53: Hakka indenture museum by DNA architects (Author, 2023)

HAKKA INDENTURE MUSEUM

DNA Architects

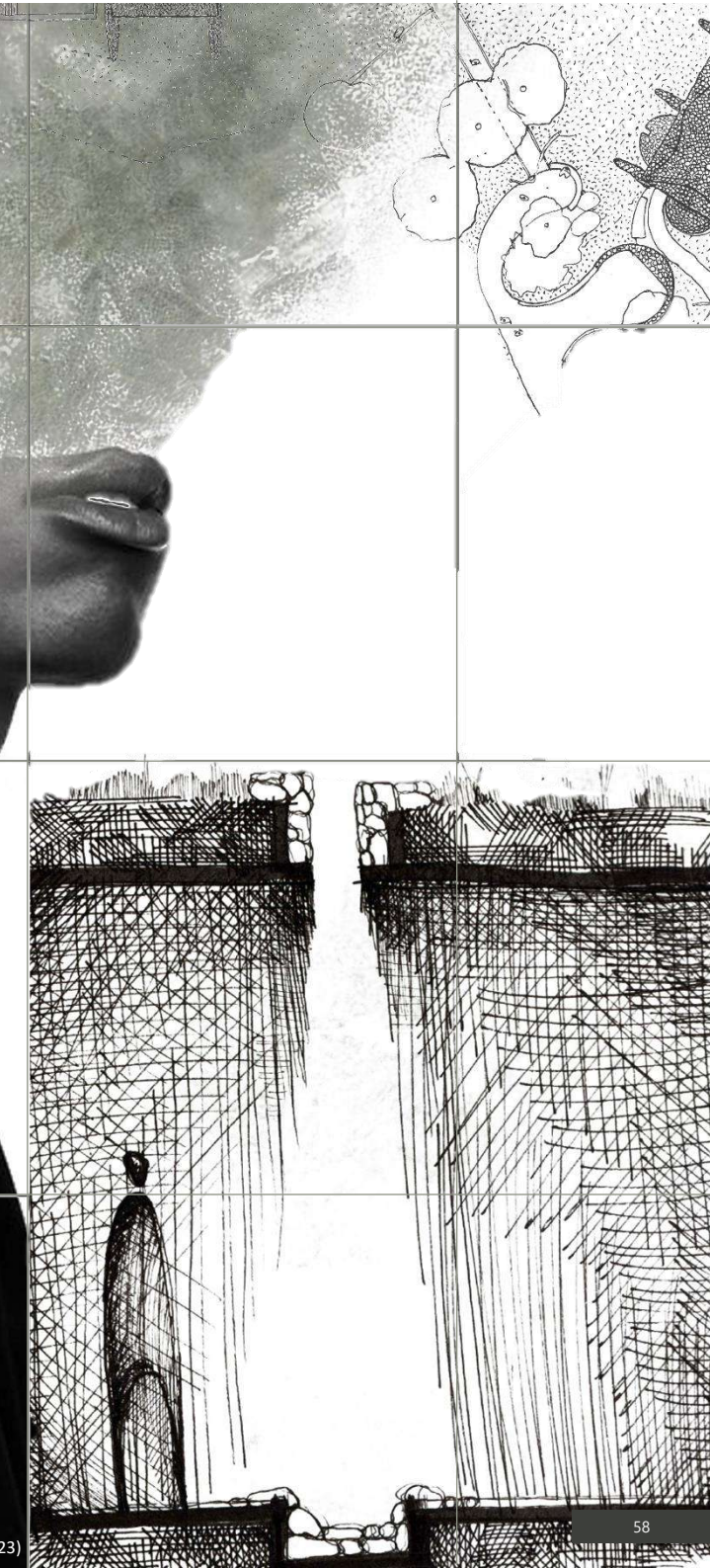


Figure 54: light filtration and water catchment system (Author, 2023)

ALLMANNAJUVET ZINC MINE MUSEUM Peter Zumthor

The Norwegian Public Roads Administrators commissioned Peter Zumthor in 2002 to design a museum that welcomes visitors to the old mine in Sauda that fell into disuse. The Museum is inspired by the history of the mining operations and the daily lives of the miners in Sauda. The zinc museum's functions include a mining gallery, a mining café, a staging area, toilets and parking facilities and a path that connects all the functions (Berntsen, 2016: online).

Biomimicry as an Organism and Behavioral

The Zinc Mine Museum is a narrative path where the form and functional elements are compiled, mimicking the harsh working conditions of the miners in each exhibition area. The Museum is concerned with the functional value of the **plan** experience, using light to create specific experiences within each pavilion along a bigger narrative, functioning as materiality driven mimicry of the mine.

APPLICATION TO DESIGN

Using separated pavilions connected by a path that links the different functions together to form a narrative. Structure of the pavilions that are more tectonic raised from the ground and latched onto stone retaining walls.

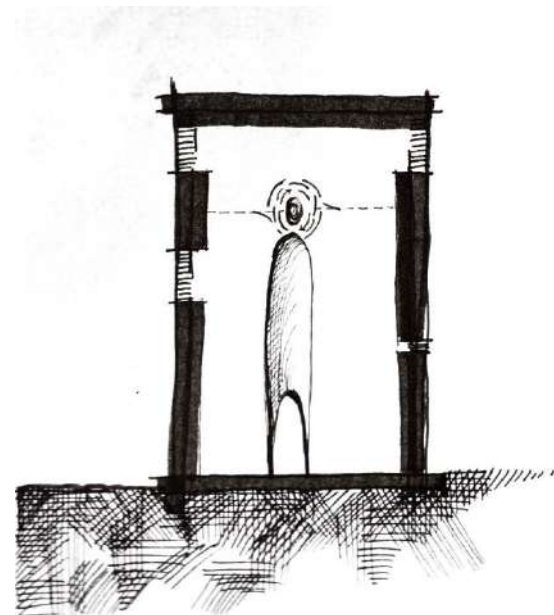
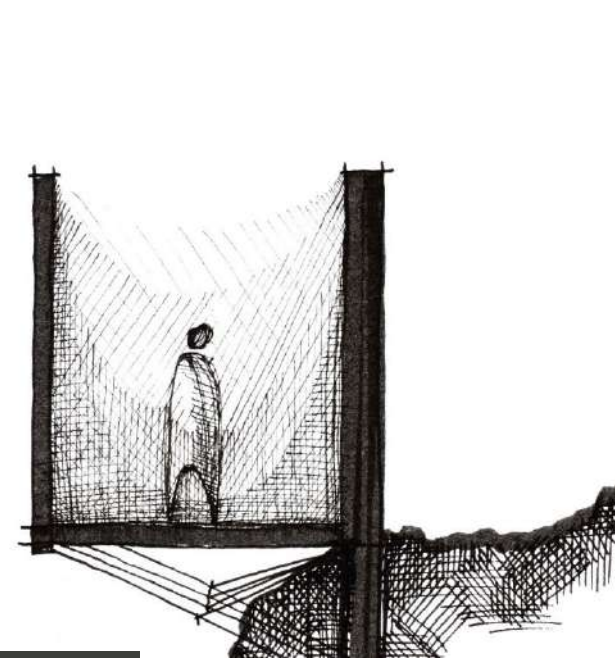


Figure 56: Illustration of eye level (Author, 2023)

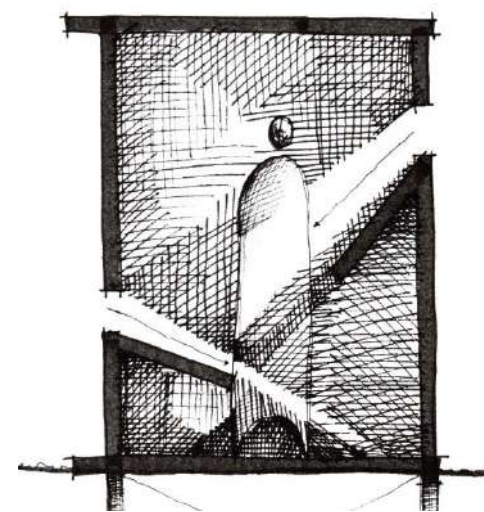


Figure 57: Illustration of oblique angle (Author, 2023)



Figure 58: Illustration of high angle (Author, 2023)



ALLMANNAJUVET ZINC MINE MUSEUM

Peter Zumthor

33° 10' 14.7" S
 18° 08' 57.0" E

Figure 59: Allmannajuvet Zinc Mine Museum by Peter Zumthor (Author, 2023)



ALLMANNAJUVE T ZINC MINE MUSEUM Peter Zumthor

ROOF: The structure of the roof becomes an extension of the cross braced, scaffolding system. The roof structure is clad in corrugated zinc sheets. The materiality of the roof therefore ties in with the zinc mines of the area (Saiello, 2018: online).

INFILL BOXES: The solid infill boxes is held up by the scaffolding and is in contrast with the lightness of the cross-braced structure. The box's exterior walls are made of 18 mm plywood sheets and jute burlap, coated with a German acrylic material (PMMA). The interiors are painted black to resemble a gallery (Berntsen, 2016: online).

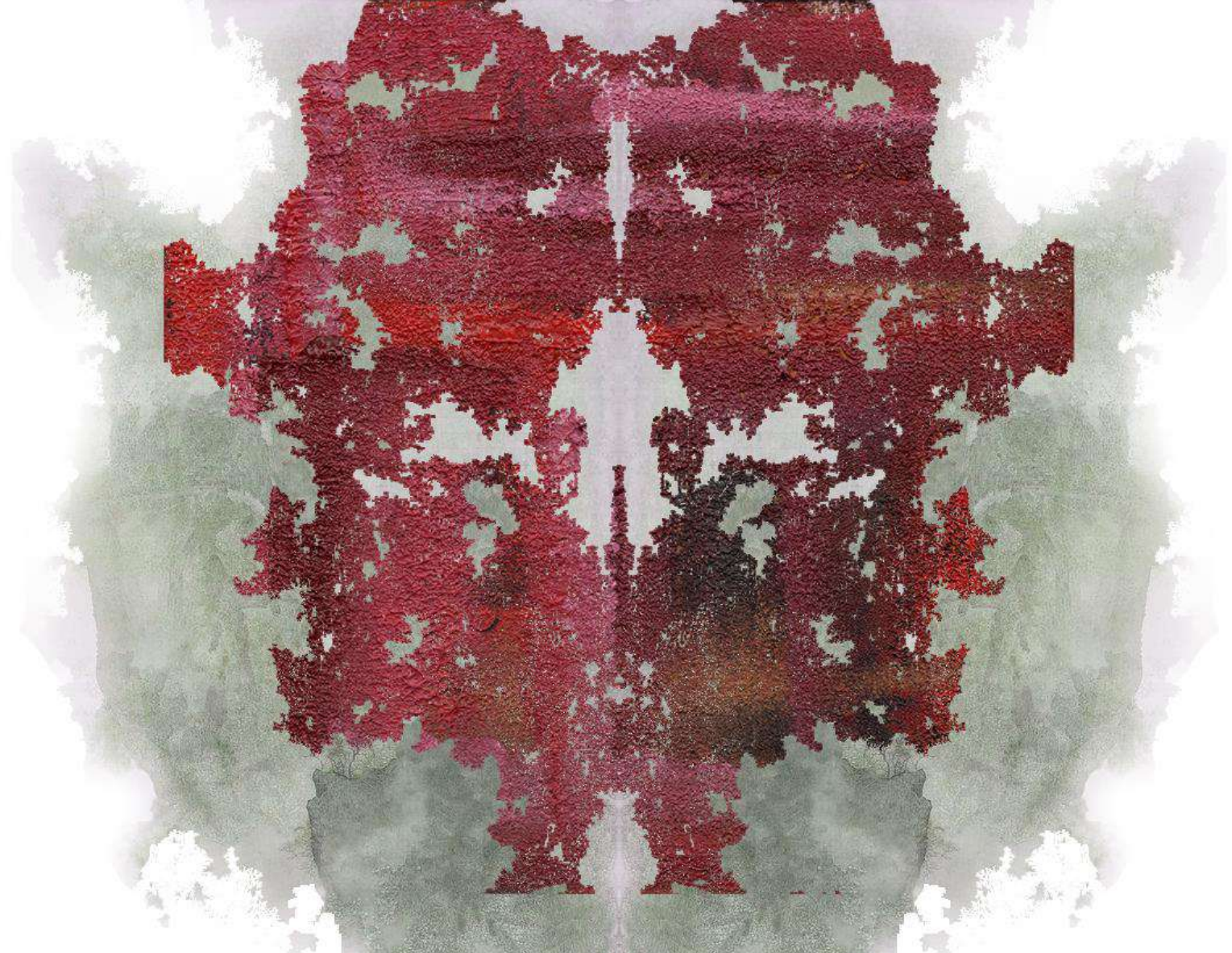
SCAFFOLDING: The cross-braced scaffolding structure just like the rest of the structure was prefabricated and assembled on site. The scaffolding is made of creosote pressure impregnated Nordic pine glulam. The Nordic pine is fixed together with hot dipped galvanized steel nuts and bolts (Saiello, 2018: online).

FOUNDATIONS: The foundations are fixed to the existing rocky ridge using hotdip galvanized steel footings that support the cross braced scaffolding structure. The foundations of the restrooms are a dry-stone masonry retaining wall (Saiello, 2018: online).

CONCLUSION

The site, theory, function and structure was investigated and interpreted throughout chapters 1 towards chapter 3 to create possible design tools. The site analysis creates a better understanding of the complexities and spatial qualities of the site which in turn informed the theoretical approach and function of the Fynbos Research and Interpretation Centre. The theoretical investigation developed an architectural language that builds on the biomimetic principles to create spaces that retell the forgotten fynbos narratives.

The precedent analysis done in chapters 3 created a better understanding of functional and structural aspects and how to integrate the theory in architectural spaces. The knowledge gained in chapters 1-3 will now be applied in chapter 4 where the design of the Fynbos Research and Interpretation Centre is developed from the initial stages towards the final design.



CHAPTER 05

Retelling Fynbos
EVENTS through
ARCHITECTURAL scenes

Developing experiential BIOMIMICRY knitted
together through the narrative of Fynbos

This chapter builds on chapters 1 to 4 to come to a design synthesis. The design development of the Fynbos Research and Interpretation Centre is illustrated in the chapter indicating how the place, function and theory influenced the design decisions from the initial thoughts towards the final proposed designs. A technical investigation further explores the different influences that shaped the design to create a Fynbos Research and Interpretation Centre that collects and retells various moments of fynbos events through fragments of architectural intervention.

DESIGN DEVELOPMENT

The design scheme was developed in three phases, responding to the specific site, environment, function and theoretical discourse discussed in the previous chapters. The phases are:

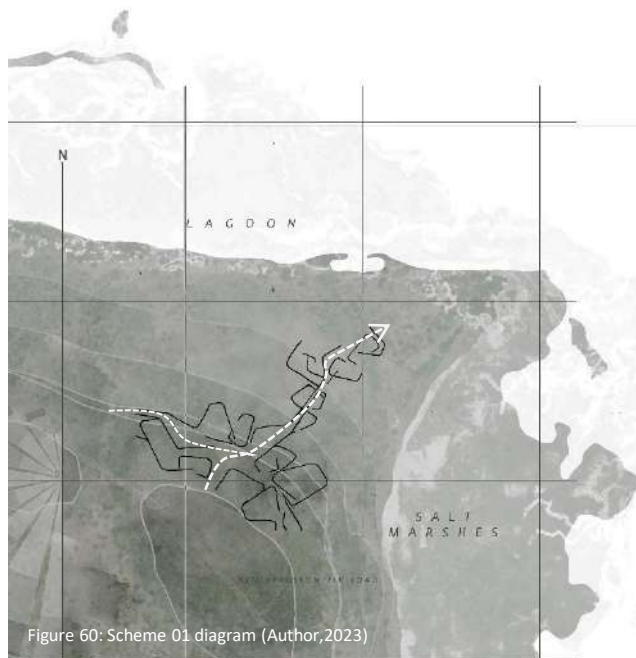


Figure 60: Scheme 01 diagram (Author, 2023)

SCHEME 01 development

The first scheme serves as an initial response to the site. The main structures are scattered across the narrative path hidden in the contours. Paths connect the almost cave-like spaces to each other and the pavilions in a very organic way.

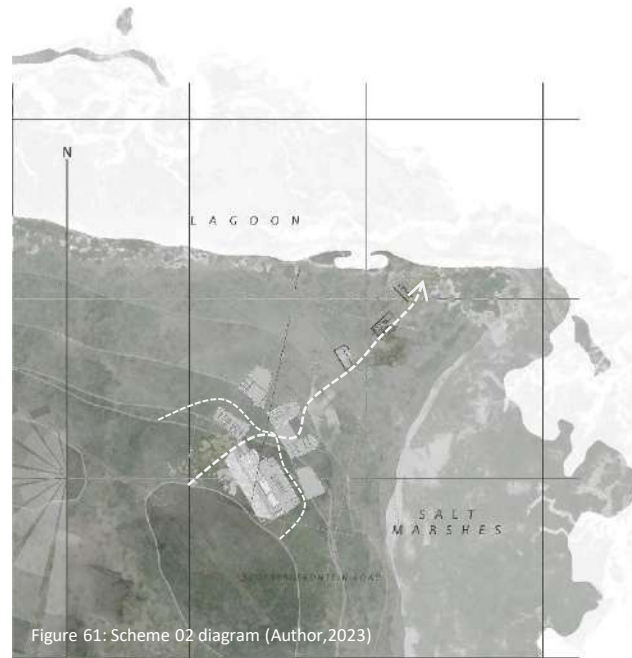


Figure 61: Scheme 02 diagram (Author, 2023)

SCHEME 02 development

Scheme 2 expands on the theoretical discourse. An axis connects the pavilions with the main orientation hub. The dispersed spaces allows for an exterior experience along the contours and connects the larger orientation spaces closer to the gravel road.



Figure 62: Scheme 03 diagram (Author, 2023)

SCHEME 03 development

Scheme 3 builds on scheme 2 developing more a more geometric layout and winding natural axis. The zigzagged axis reacts to the site, while the geometric plan relates to the existing structures on site (historical and recent). This phase developed into the final design proposal integrating site, function and theory.

SCHEME 1 DEVELOPMENT

The site plan in figure 68 indicates the initial development of the massing and placement of spaces on the site. Figure 69 - 71 starts developing possible abstract interpretations of the various fynbos lifecycle stages, as reactions to the narrative experience. These abstract interpretations are then translated into initial pavilion sketch plans in figure 72 - 74.

Pavilion #1 is completely submerged underground and pavilion #2 sits at the halfway mark of underground and above ground. The structure is compromised of thick concrete and limestone walls and foundations. The pavilion structure did not suit the sensitivity of the site.

Pavilion #3 was the only pavilion completely above ground. The hidden idea stemmed from creating an intervention that was hidden within the landscape, not taking from the scene. The walls consist of limestone aggregate found on site and throughout the park. The roof system consists of a heavy green roof to further hide the intervention within the landscape. This roof system and materiality relates to the landscape of the west coast, making it an appropriate reaction at the time.

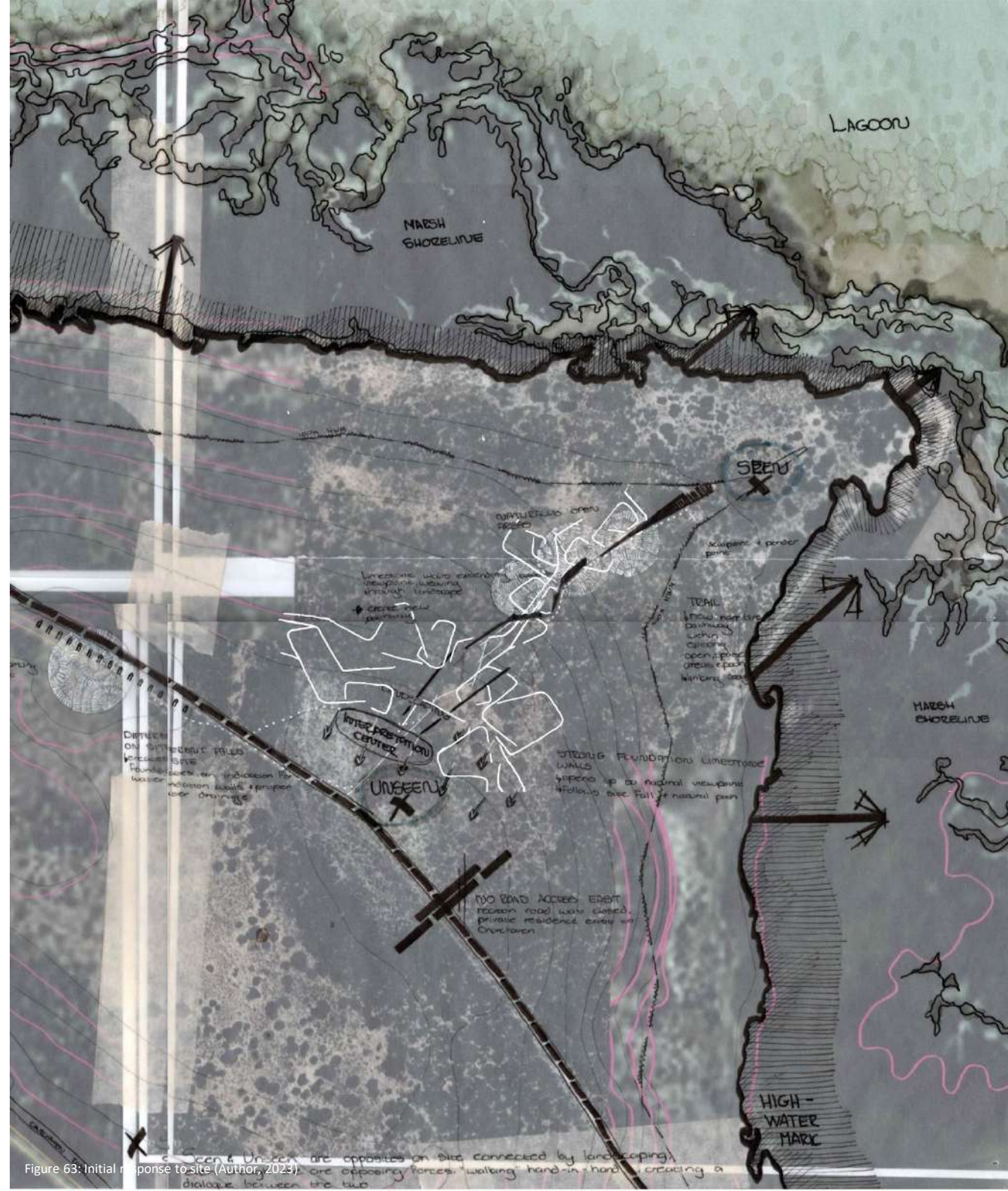
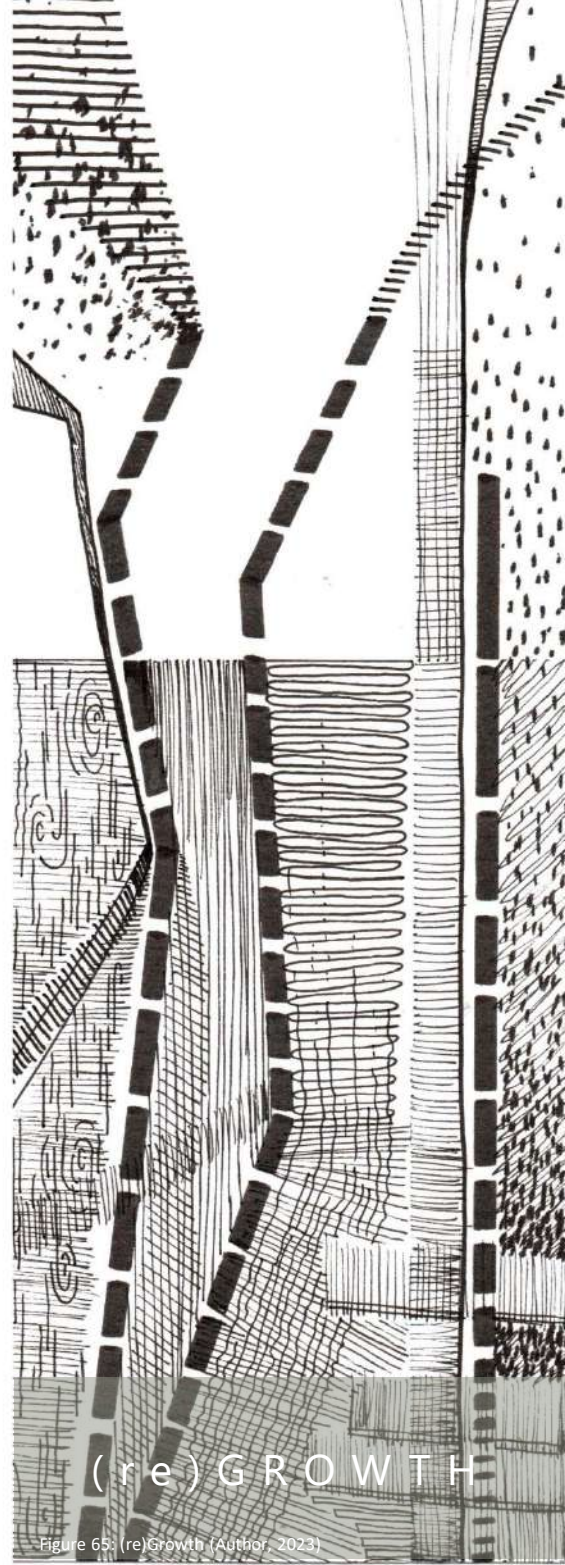


Figure 63: Initial response to site (Author, 2023). Seen & Unseen are opposites on site connected by landscaping, they are opposing forces, 'walking' hand-in-hand, creating a dialogue between the two



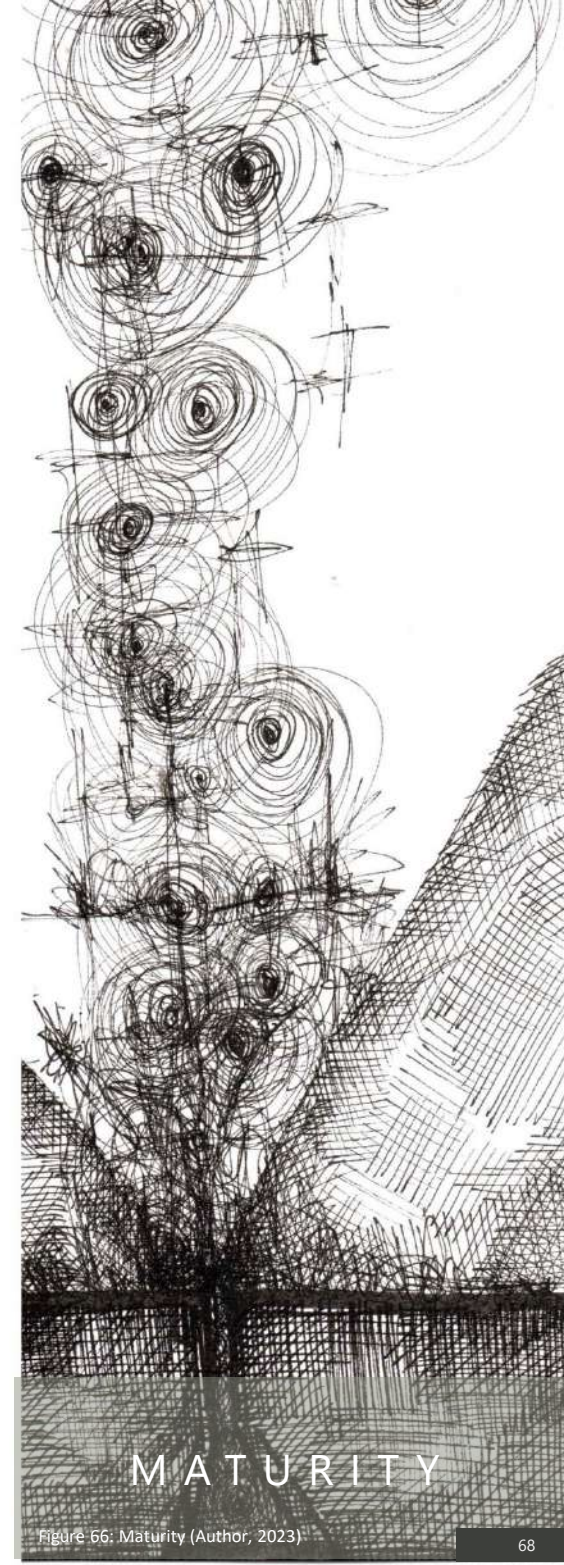
(re)BIRTH

Figure 64: (re)Birth (Author, 2023)



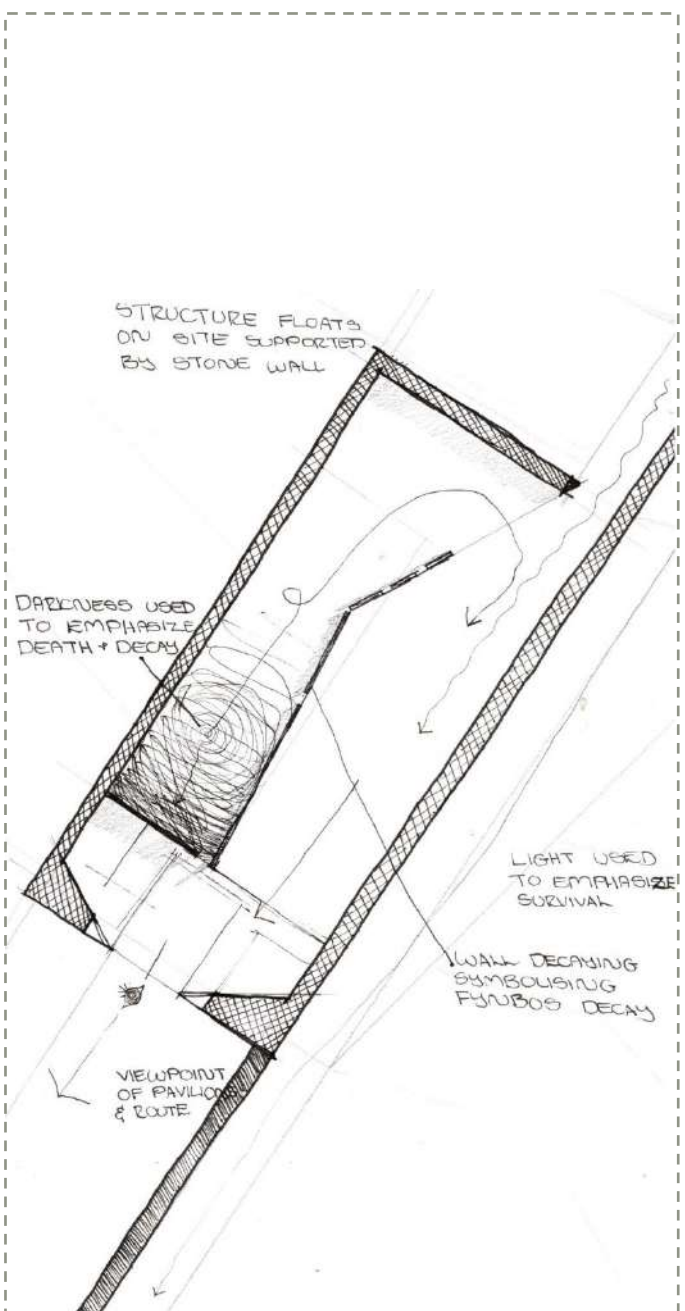
(re)GROWTH

Figure 65: (re)Growth (Author, 2023)



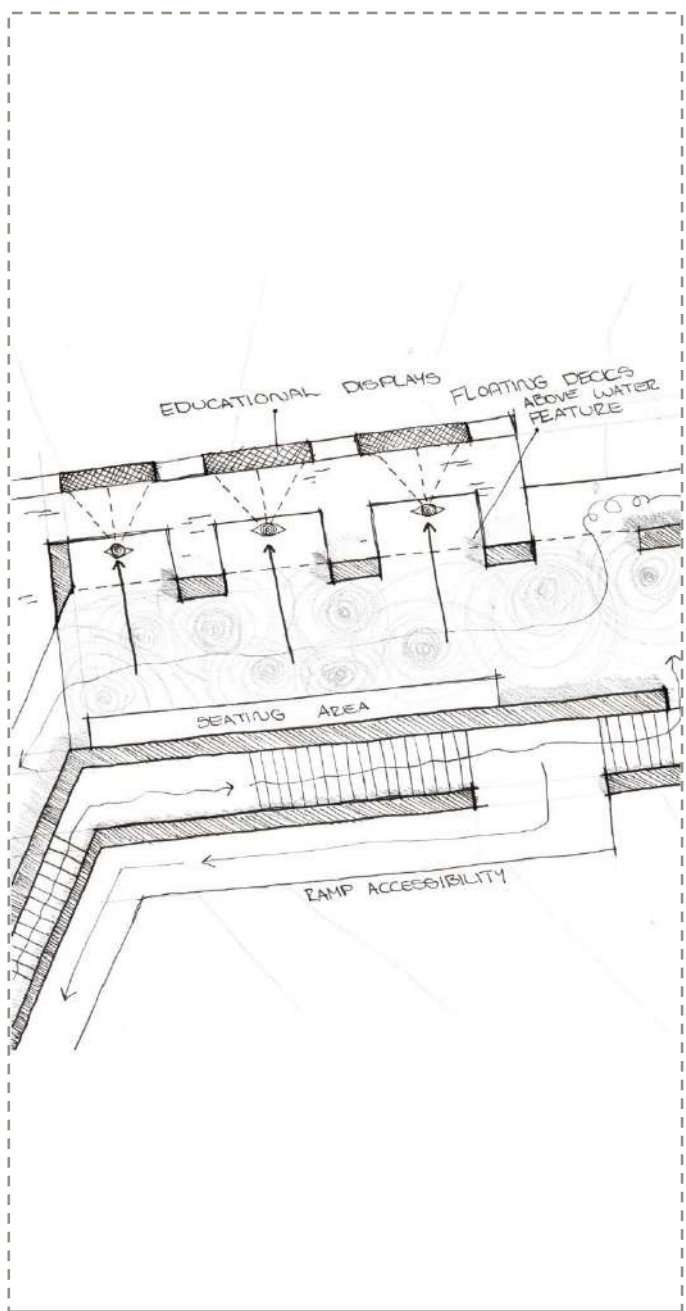
MATURITY

Figure 66: Maturity (Author, 2023)



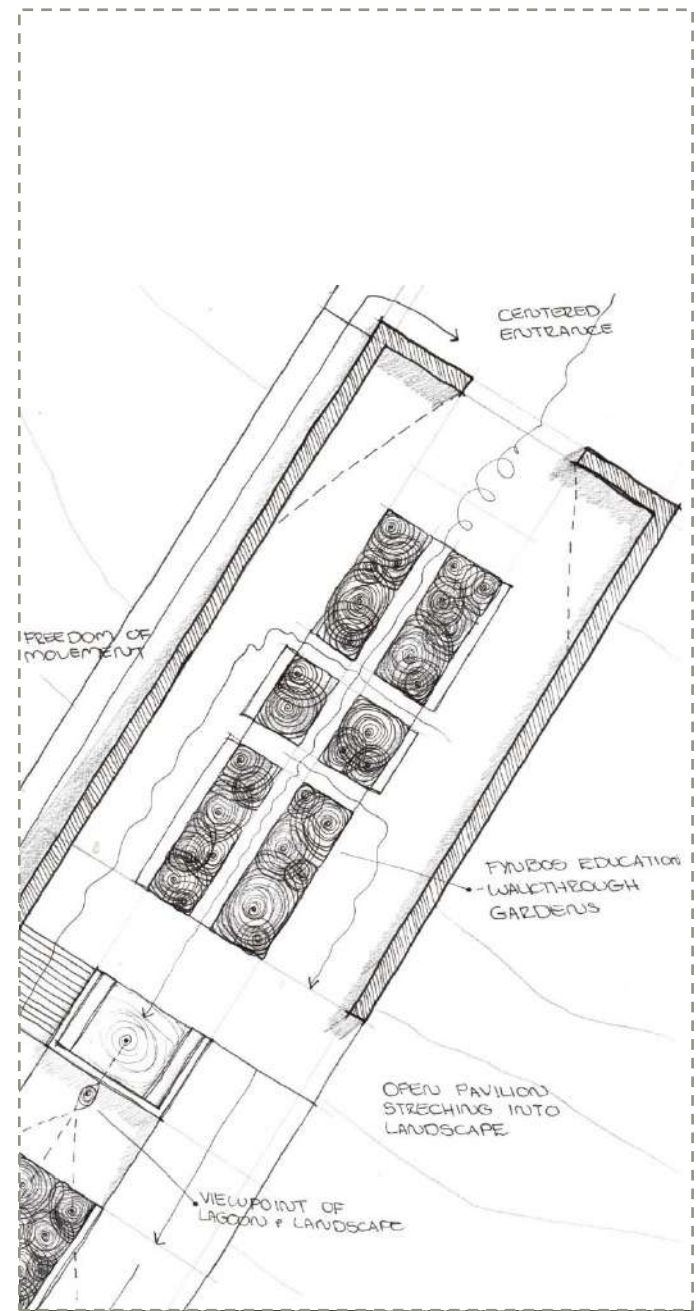
(re)BIRTH

Figure 67: Pavilion 01 spatial development (Author, 2023)



(re)GROWTH

Figure 68: Pavilion 02 spatial development (Author, 2023)



MATURITY

Figure 69: Pavilion 03 spatial development (Author, 2023)

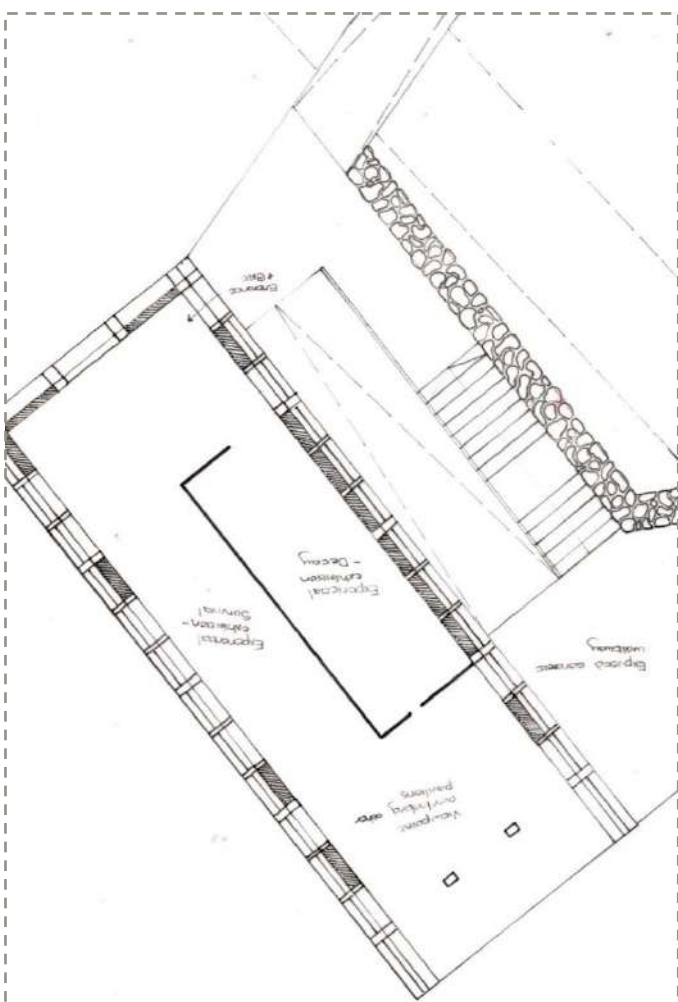


Figure 70: Pavilion 01 structural development (Author, 2023)

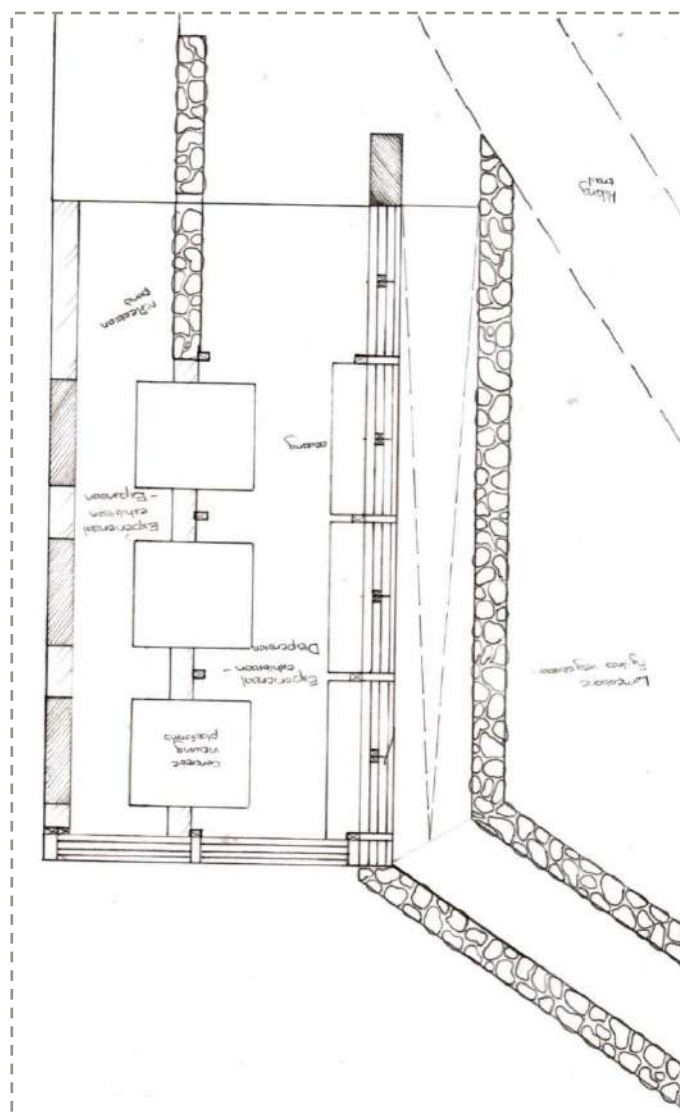


Figure 71: Pavilion 02 structural development (Author, 2023)

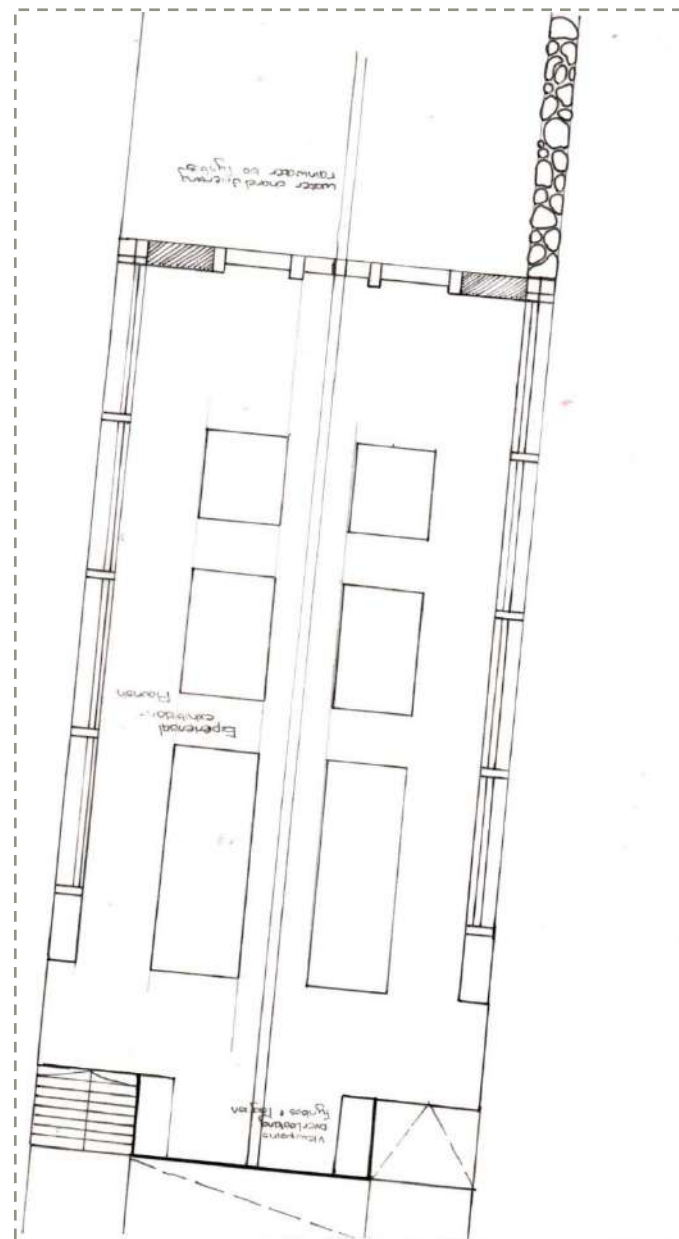


Figure 72: Pavilion 03 structural development (Author, 2023)



ASKING THE SITE

Before continuing to scheme 02, proper placement of the architectural intervention needed to be decided. Due to the sensitivity towards nature, it was important to locate the least invasive area on site. By looking at the site, it was clear that there were moments of open and sparse areas running along the north-west side of the site, as indicated in figure 78 in white.

SCHEME 2 DEVELOPMENT

The development of scheme 2 elaborates on the organic form given in scheme 1 with a more spacious approach.

Figure 79 indicates various cave-like spaces hidden in the landscape. From this scheme it was evident that with a clear narrative path, the spaces would seem isolated and floating within the expansive landscape. A clear pathway is needed to connect spaces and integrate the idea of 'unseen' and 'seen' within the scheme. The pavilions spaces which forms the unseen spaces sits on the axis that connects the orientation hub with the interpretation pavilions. This linear axis zig zags through the landscape reacting to the site. Figure 79 shows how these pavilion spaces are linked via a pathway to create a continuous route from the orientation hub to the pavilions. In figures 81 - 83 the three pavilion sections show a progression from hidden underground to celebrated above ground, however by digging a building into the site is extensively invasive to not only the fynbos but the landscape.

The 'seen' spaces form closer to the start of the narrative path, from the parking bay. These spaces stand as stepping-stones towards the north-facing pavilions, opening towards the north.



Figure 74: Scheme 02 sketch plan (Author, 2023)

MAIN HUB SECTION 1

The orientation hub forms part of the site allowing the fynbos blanket to extend to the roof of the spaces. The flat roof extends past the planted roof drawing of the green roof. This allows the structure and spaces to be rooted in place.



Figure 75: Orientation hub section and structural development (Author, 2023)

PAVILION SECTIONS

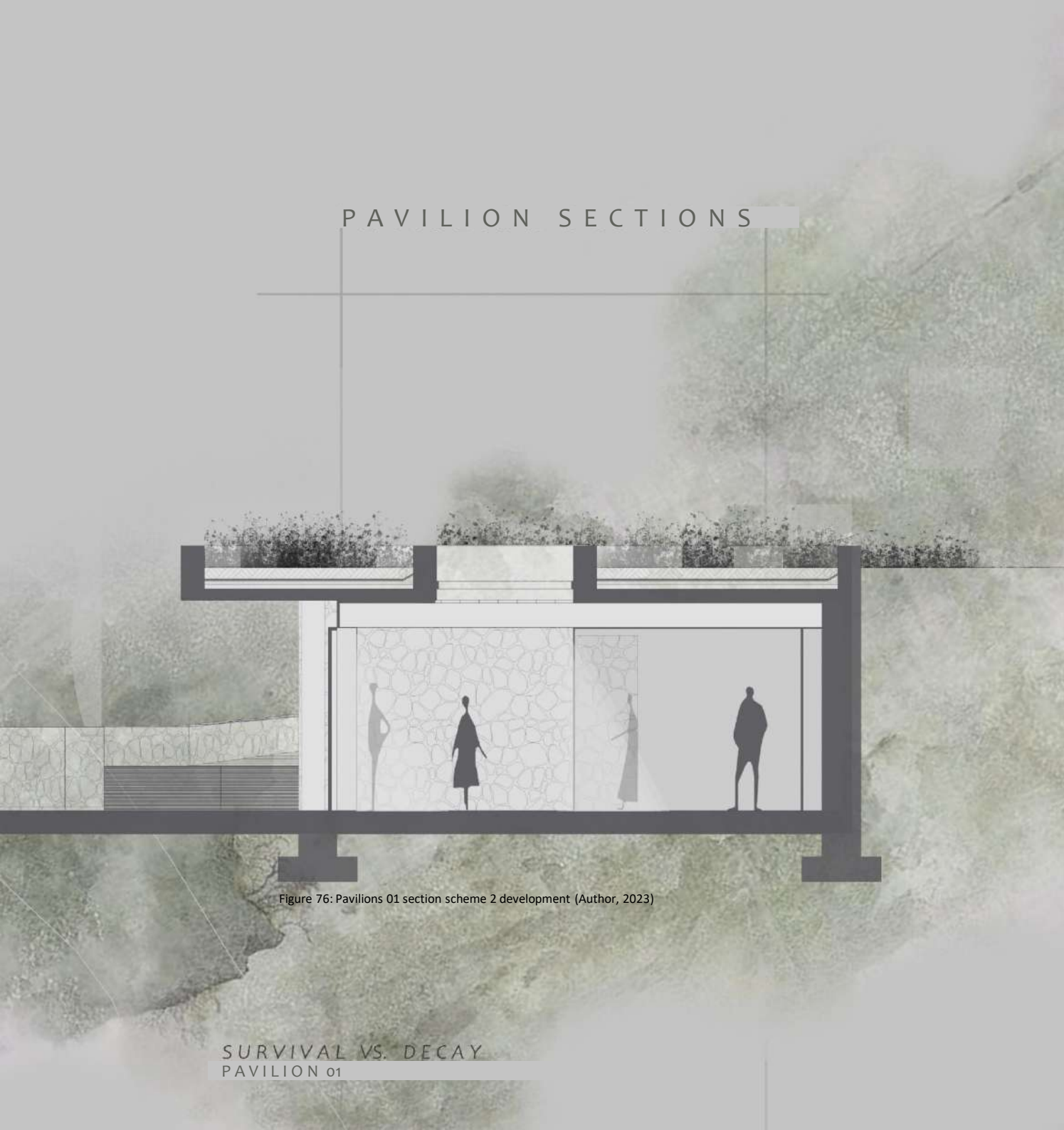


Figure 76: Pavilions 01 section scheme 2 development (Author, 2023)

SURVIVAL VS. DECAY
PAVILION 01

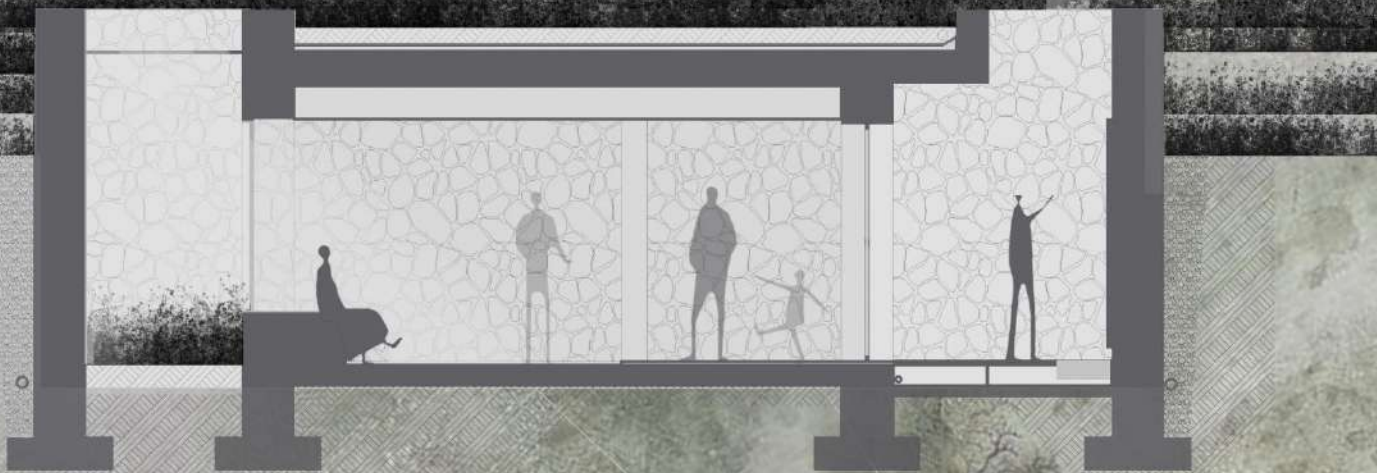


Figure 77: Pavilions 02 section scheme 2 development (Author, 2023)

EXPANSION & DISPERSION
PAVILION 02



Figure 78: Pavilions 03 section scheme 2 development (Author, 2023)

LIFE & FLOURISHING
PAVILION 03

REFLECTION:

Scheme 02 moves with the contours of the site and has a rooted characteristic. The pavilions develop from hidden, underground, to celebrated, above ground. A progression of the pavilions ties the idea of the narrative together, emphasizing stages and completion. However, the path, the narrative or 'golden thread' of the design needs to become the hero of the design. The path must be clear and progressive from start to finish.

SALT
MARSHES

SCHEME 3 DEVELOPMENT

ACCESS ROUTE
TO SITE

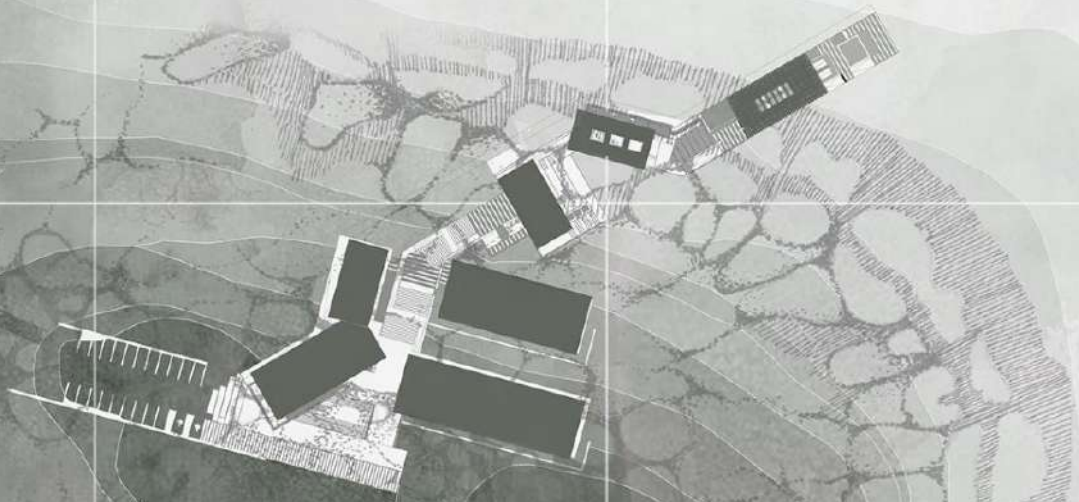




Figure 80: Path from parking to orientation hub (Author, 2023)

Figure 81: Coffee shop entrance for scheme 03 (Author, 2023)

Scheme 3 is built on scheme 2 as it developed the datum of the design, the linear axis, pavilions and orientation hub spaces shown in the model, figure 84. The circulation developed into an architectural promenade, descending the contours, through the pavilions and into the landscape. This frames different views and connects different moments created by the pavilion's external experiential narratives.

Biomimetic roof structure, mimicking the complexly layered fynbos physiology becomes a structural golden thread through the intervention. This structure allows the lines of interior and exterior to be blurred to the user by providing natural ventilation of West coast air to move freely through the buildings (figure 86).

ORIENTATION HUB FLOOR PLAN 00

SCALE 1:200

ORIENTATION HUB FIRST FLOOR PLAN

1. Dry storage
2. Cold storage
3. Kitchen & prep
4. Serve
5. Orders
6. Collection
7. Outdoor seating
8. Indoor Seating
9. Promenade seating
10. Entrance from parking
11. Reception & shop
12. Admin
13. Storage
14. Male ablutions
15. Female ablutions
16. Universal ablutions
17. Seating area





Figure 83: Orientation hub reception and shop area (Author, 2023)

Figure 84: Orientation hub coffee shop (Author, 2023)

The main orientation hub developed from an organic form giving in scheme 2 towards a more linear and geometric shape. The functional spaces branch off from the promenade, keeping the narrative at the heart of the design as it flows down into the fynbos landscape. The layout of the functions on plan shifted that the delivery yard and staff facilities could be privatized on the western front for functional purposes.

The Interpretation center focus on creating biophilic intimate spaces, mirroring the intricacy of the materiality surrounding it. The reception area, coffee shop, office area and research area, add to the experience of the Fynbos narrative, by creating spaces to the client, users, tourists and researchers.

ORIENTATION HUB FLOOR PLAN -01

SCALE 1:200

ORIENTATION HUB GROUND FLOOR PLAN

- 1 Reception
- 2 Waiting area
- 3 Entrance
- 4 Boardroom
- 5 Kitchenette
- 6 Office
- 7 Storage
- 8 Staff ablution
- 9 Promanade
- 10 Research hub entrance
- 11 Support area
- 12 Open lab
- 13 Fume hood
- 14 Culture room
- 15 Storage
- 16 Clean room
- 17 Procedure room
- 18 Chemical lab
- 19 Chemical storage
- 20 Equipment storage
- 21 Chemical waste
- 22 Refuse
- 23 Biological room

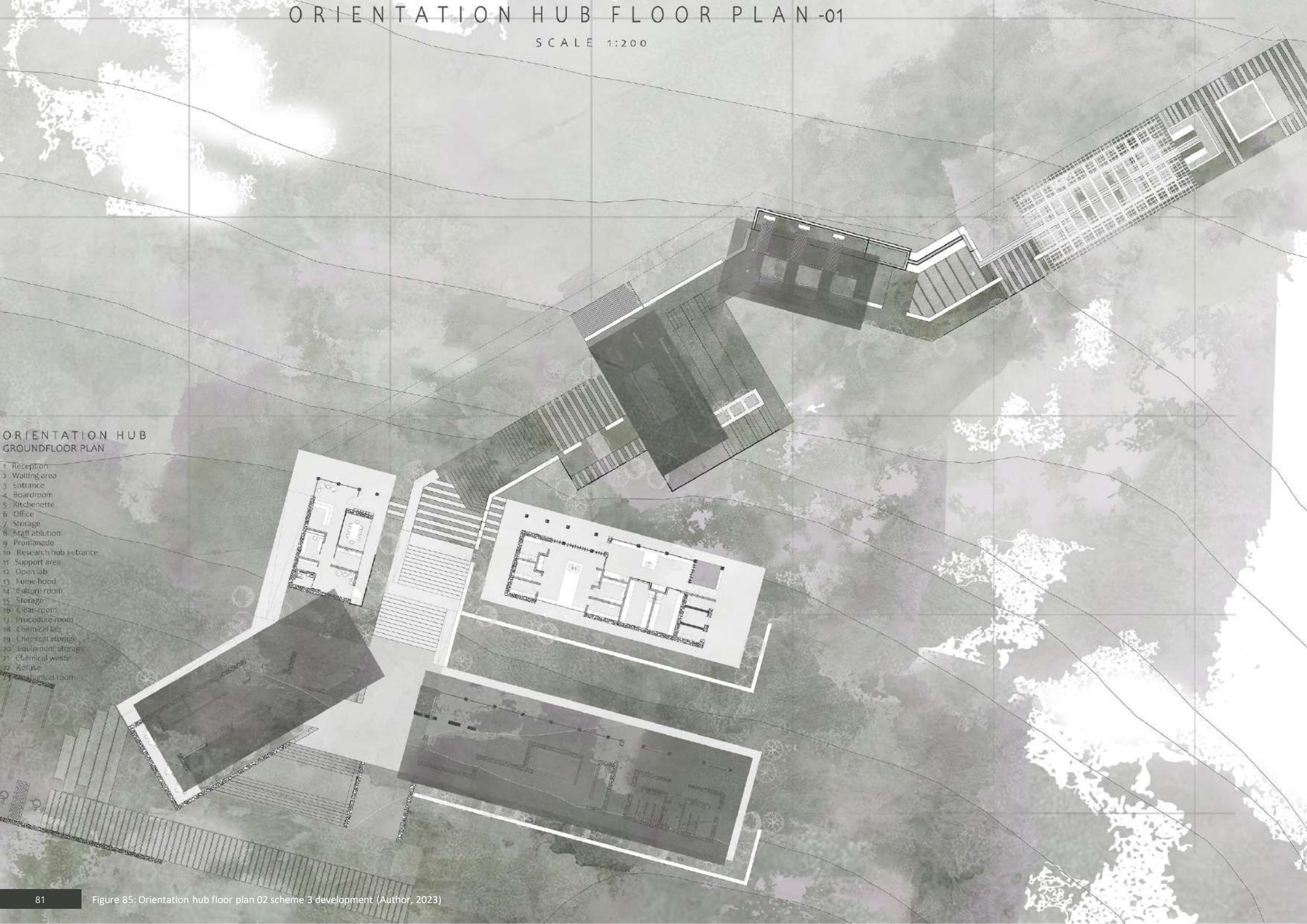




Figure 86: Promenade on floor plan 02 (Author, 2023)



Figure 87: Entrance to pavilion 01 along promenade (Author, 2023)

The internal spaces and structures of the pavilions, developed from the initial sketches in scheme 1 and in scheme 2 of highly invasive underground pavilions and developed into structures sitting on the landscape.

This development however still had an element of invasiveness, by requiring thick foundations and heavy concrete steppingstones to be build throughout the scheme in a sensitive landscape.

PAVILION PROMANADE FLOOR PLAN -02

SCALE 1:200

PAVILIONS NARRATIVE PROMANADE PLAN

1. Promenade seating
- Survival
3. Decay
4. Amphitheatre lookout
5. Expansion
6. Dispersal
7. Water feature
8. Fynbos walkthrough gardens
9. Life lookout point
10. Finale viewpoint
11. Return route



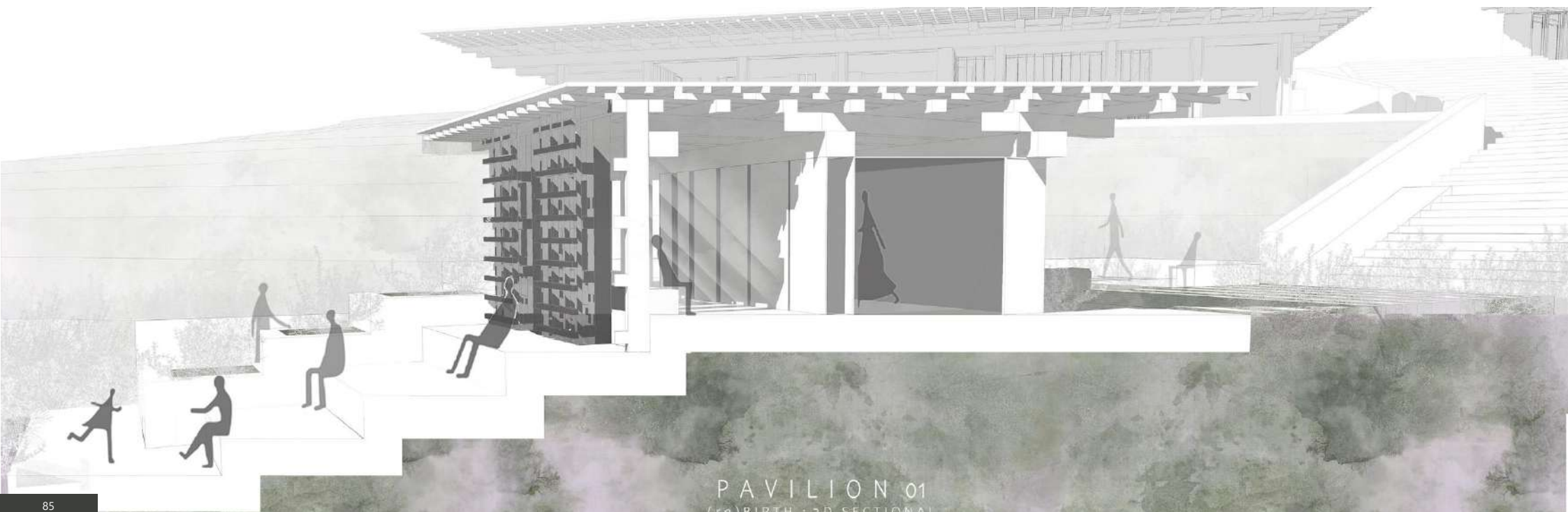


Figure 89: Pavilion 01 scheme 03 (Author, 2023)



Figure 90: Pavilion 02 scheme 03 (Author, 2023)0

Pavilion 01: (re)Birth has a dramatic amphitheater area overlooking the other pavilions, this amphitheater, however, is very heavy and invasive and takes away from the sensitivity the pavilions are meant to bring, this made me revisit the massing of the entire promenade towards the final design.



PAVILION 01
(re)BIRTH : 3D SECTIONAL

Figure 91: Pavilion 01 3D sectional scheme 03 (Author, 2023)



Figure 92: Pavilion 02 scheme 03 (Author, 2023)



Figure 93: Promenade to Pavilion 03 (Author, 2023)

A space requirement of pavilion no. 2 investigated the experiential quality of the specific pavilion. It aided in understanding how structure, light and the natural environment could be used to tell the narrative of (re)Growth expansion and dispersion.

The space aims to translate the narratives of fynbos growth within the West Coast. Fynbos can grow either through expansion, the process of a new living form growing from within the existing one, or dispersion, the process of new living forms being disperses around the old and growing anew. Platforms extending from the main frame of the pavilion, hovering over a reflection pond, are used to capture the process of expansion. The roof structure is covered by a thin steel roof, with three light shafts allowing light into specific areas of the pavilion, to represent the process of dispersion. This however, showed that the pavilion was not the best example of light distribution compared to pavilion 3 and therefore needed to be changed towards the final design.



PAVILION 02

EXPANSION & DISPERSION : 3D SECTIONAL
Figure 94: Pavilion 02 3D sectional scheme 03 (Author, 2023)



Figure 95: Pavilion 03 scheme 03 (Author, 2023)

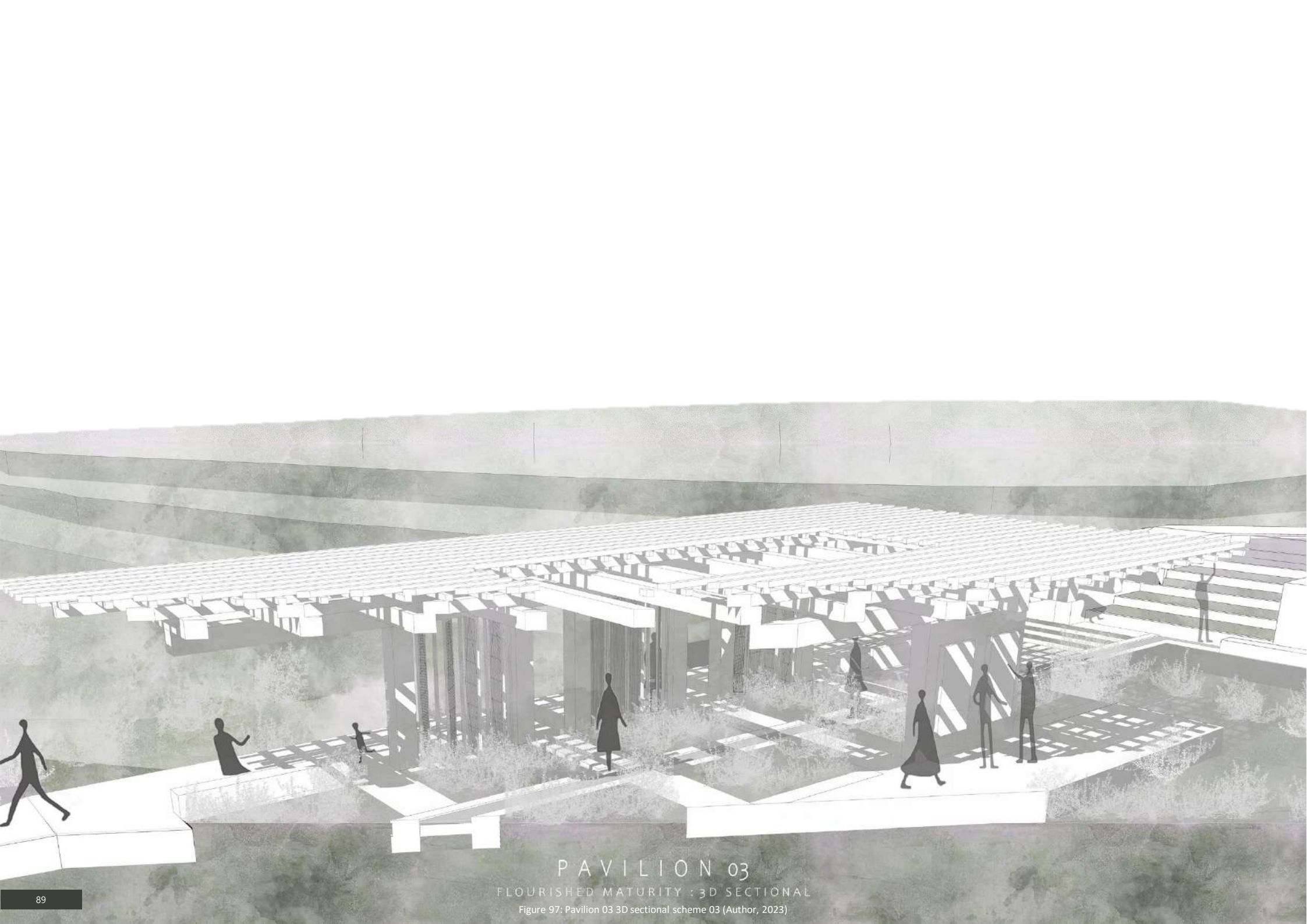


Figure 96: Pavilion 03 scheme 03 (Author, 2023)

The experiential pavilions, were no longer floating along a path as in scheme 2, but instead became part of the path as pondering points on a bigger narrative. Due to the development of the path and space the interpretation centers proportions became more elegant compared to the previous schemes, where no real datum existed.

Users move through the pavilions horizontally, diagonally and vertically, allowing for a richer experience of individual moments along the promenade.

The pavilions however still needed to be refined to create a better cohesion within the 3d experience for the final design.



PAVILION 03

FLOURISHED MATURITY : 3D SECTIONAL

Figure 97: Pavilion 03 3D sectional scheme 03 (Author, 2023)

An abstract artwork featuring a central, irregularly shaped area with a light greenish-grey background. This central area is overlaid with various colors and textures, including shades of red, pink, purple, orange, and black. The colors are applied in a way that suggests depth and movement, with some areas appearing more saturated and others more translucent. The overall composition is framed by a white background with dark, irregular shapes at the corners, possibly representing the edges of a torn piece of paper or a canvas. The text 'TOWARDS A FINAL DESIGN' is centered within the artwork in a simple, sans-serif font.

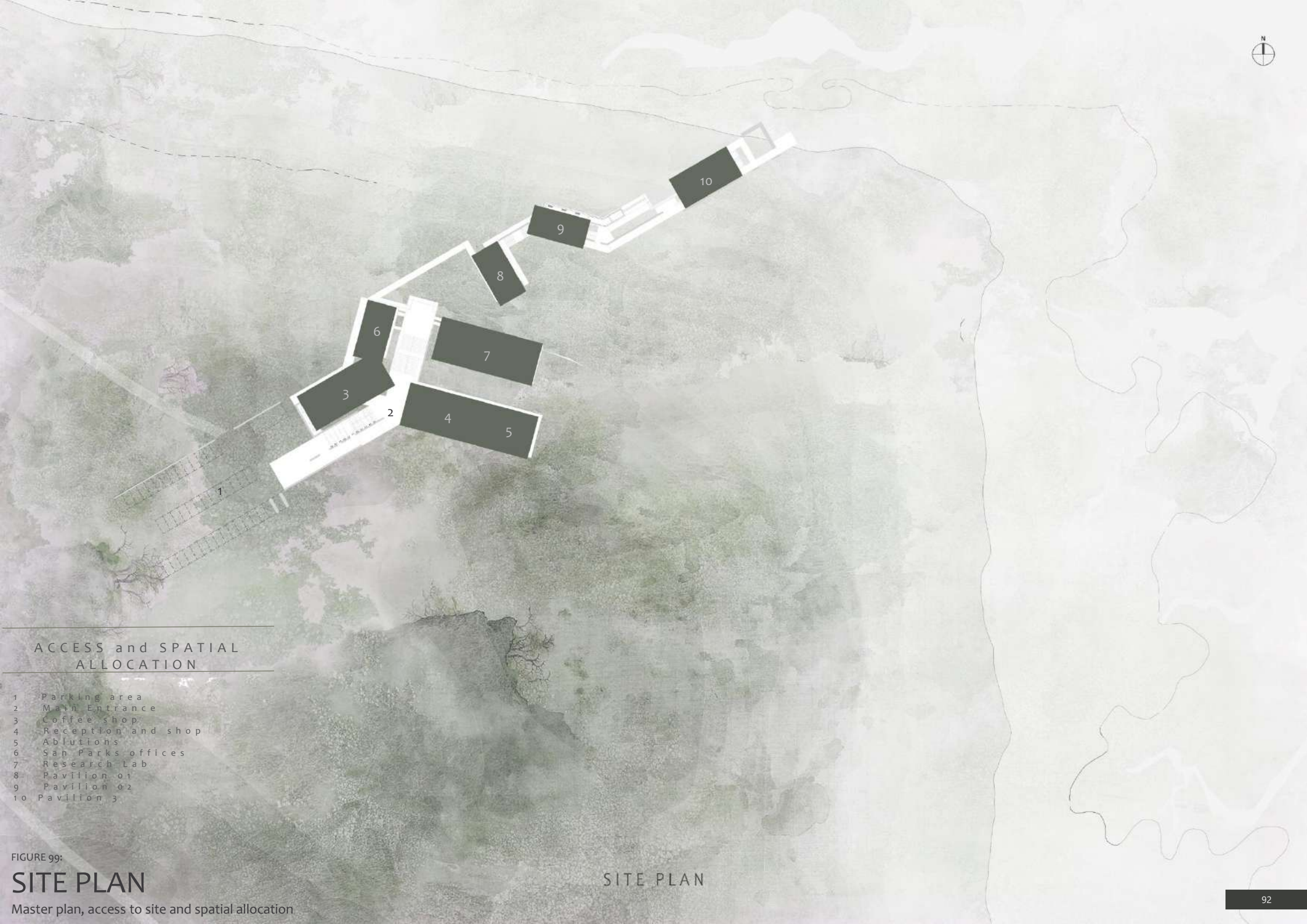
TOWARDS A FINAL
DESIGN



FIGURE 98:

PERSPECTIVE of EXPERIENTIAL PAVILIONS

Overlooking West Coast National park lagoon



ACCESS and SPATIAL
ALLOCATION

- 1 Parking area
- 2 Main Entrance
- 3 Coffee shop
- 4 Reception and shop
- 5 Ablutions
- 6 San Parks offices
- 7 Research Lab
- 8 Pavilion 01
- 9 Pavilion 02
- 10 Pavilion 3

SITE PLAN

FIGURE 99:
SITE PLAN
Master plan, access to site and spatial allocation



FIGURE 100:

RECEPTION and SHOP

FIRST FLOOR PLAN



- 1 Parking
- 2 Main Entrance
- 3 Dry Storage
- 4 Cold storage
- 5 Seating indoor
- 6 Seating outdoor
- 7 Order
- 8 Collection
- 9 Reception
- 10 Shop display
- 11 Admin and financing
- 12 Storage
- 13 Female Ablutions
- 14 Universal toilet
- 15 Male Ablutions

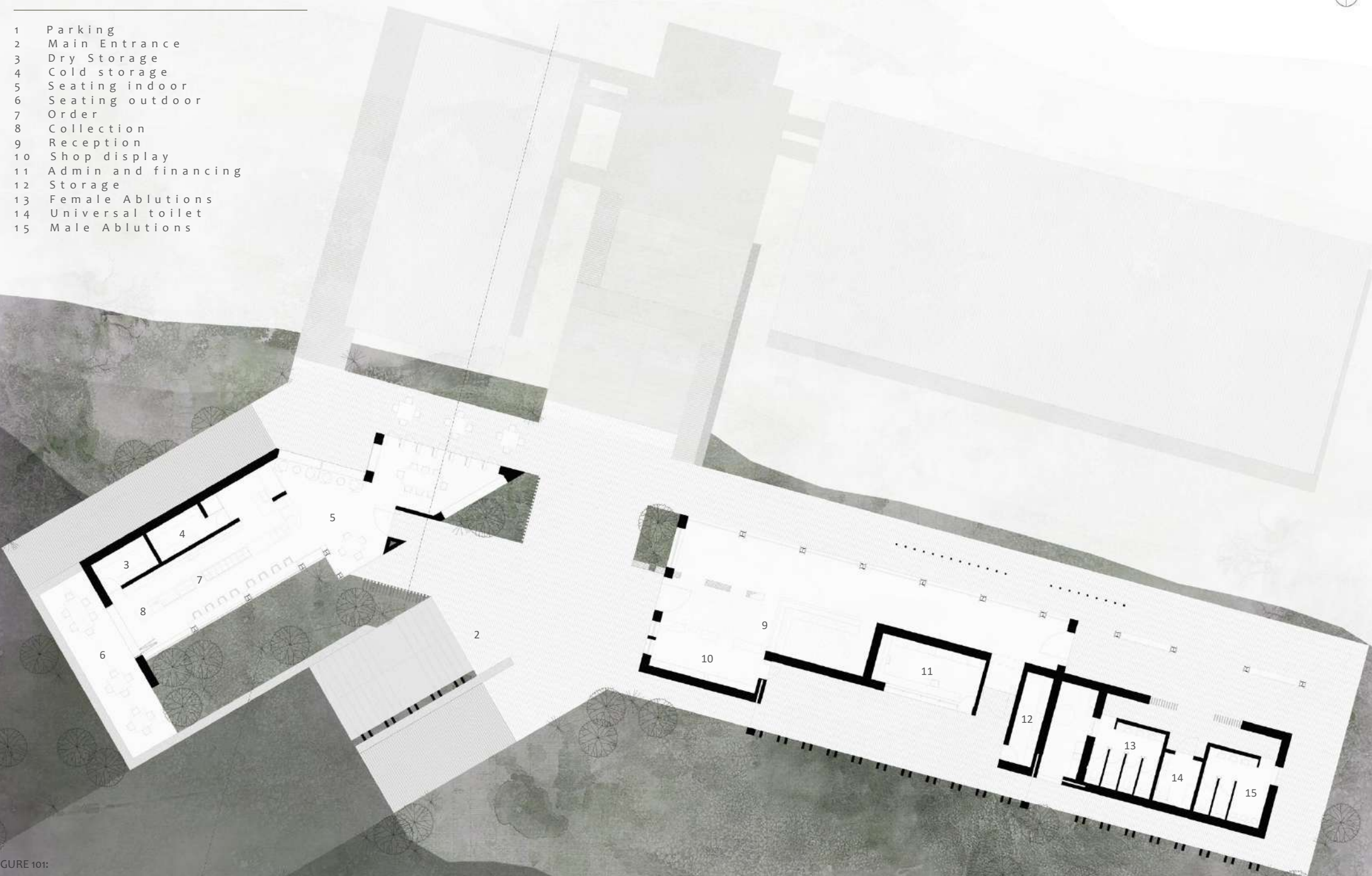


FIGURE 101:

MAIN ORIENTATION HUB

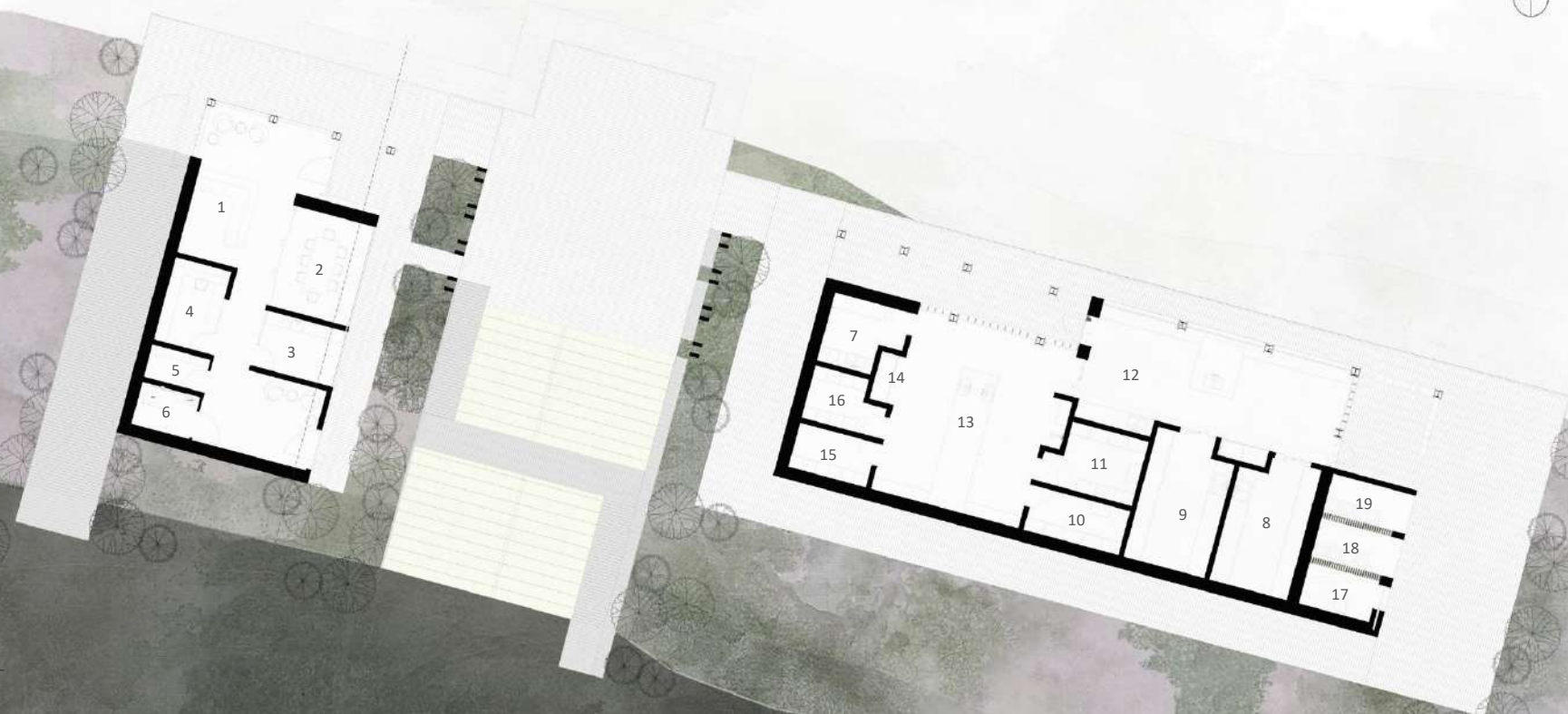
Floor plan 01

ORIENTATION HUB PLAN 01



FIGURE 102:

ARTISAN BAKERY and CAFÉ



SECOND FLOOR PLAN

- 1 Reception
- 2 Boardroom
- 3 Kitchenette
- 4 Office
- 5 Storage
- 6 Universal toilet
- 7 Clean room
- 8 Procedure Room
- 9 Chemical Lab
- 10 Chemical Storage
- 11 Equipment Storage
- 12 Support Zone
- 13 Open Lab
- 14 Fume Hood
- 15 Algae Culture Room
- 16 Storage
- 17 Reverse Osmosis Water Purification
- 18 Chemical waste
- 19 Waste disposal

FIGURE 103:

MAIN ORIENTATION HUB

Floor plan 02

ORIENTATION HUB PLAN 02



FIGURE 104:

OFFICE RECEPTION AREA

SAN Parks Office facilities

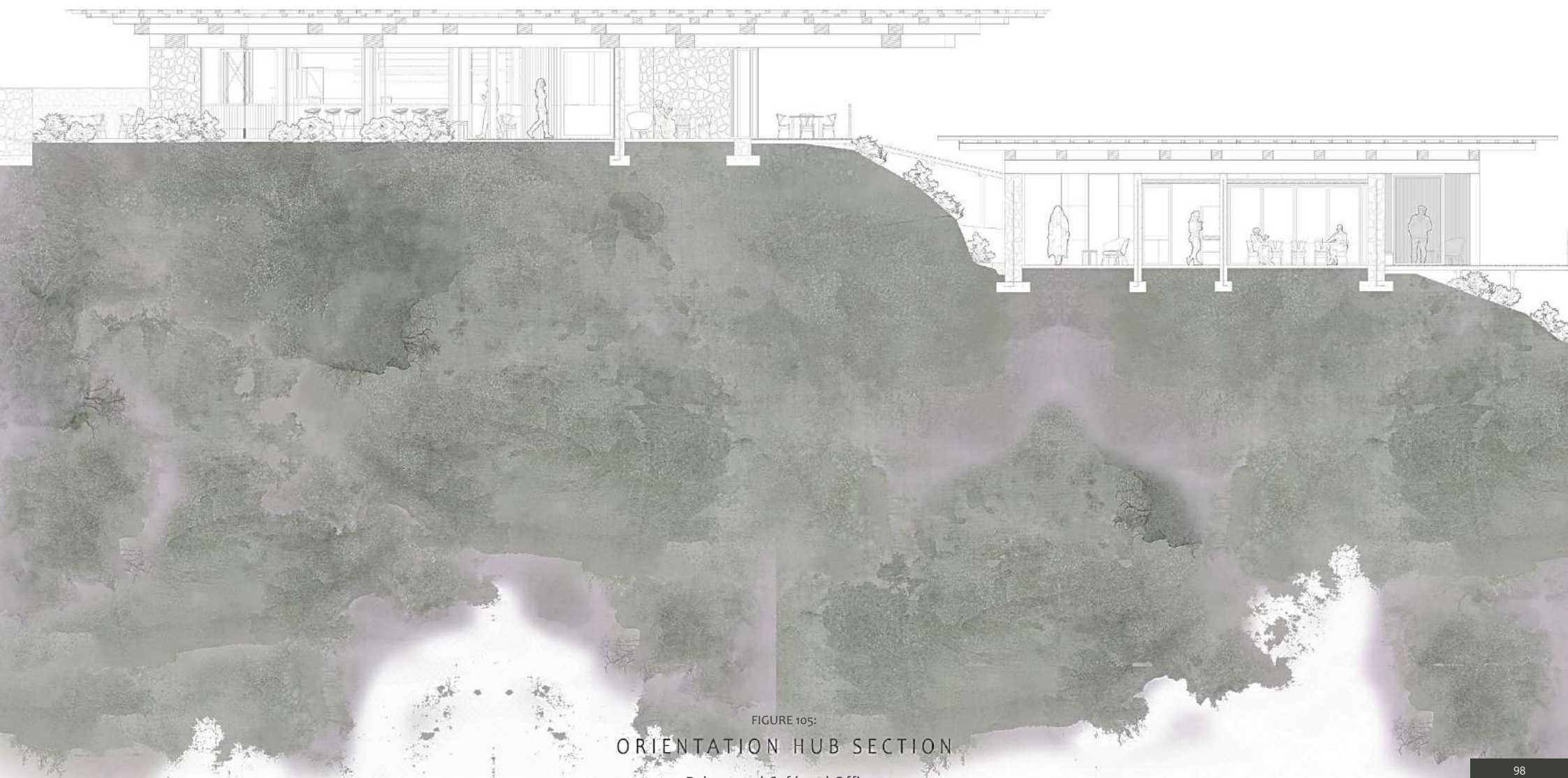


FIGURE 105:

ORIENTATION HUB SECTION

Bakery and Café and Offices

FIRST FLOOR PLAN

- 1 Promenade to pavilions
- 2 (re)Birth Pavilion
 - i. Decay
 - ii. Survival
- 3 (re)Growth Pavilion
 - i. Expansion
 - ii. Dispersion
- 4 Water feature
- 5 Strand grass steps
- 6 Maturity Pavilion
- 7 Viewpoint
- 8 Final lookout
- 9 Path to return route
- 10 Returning hike

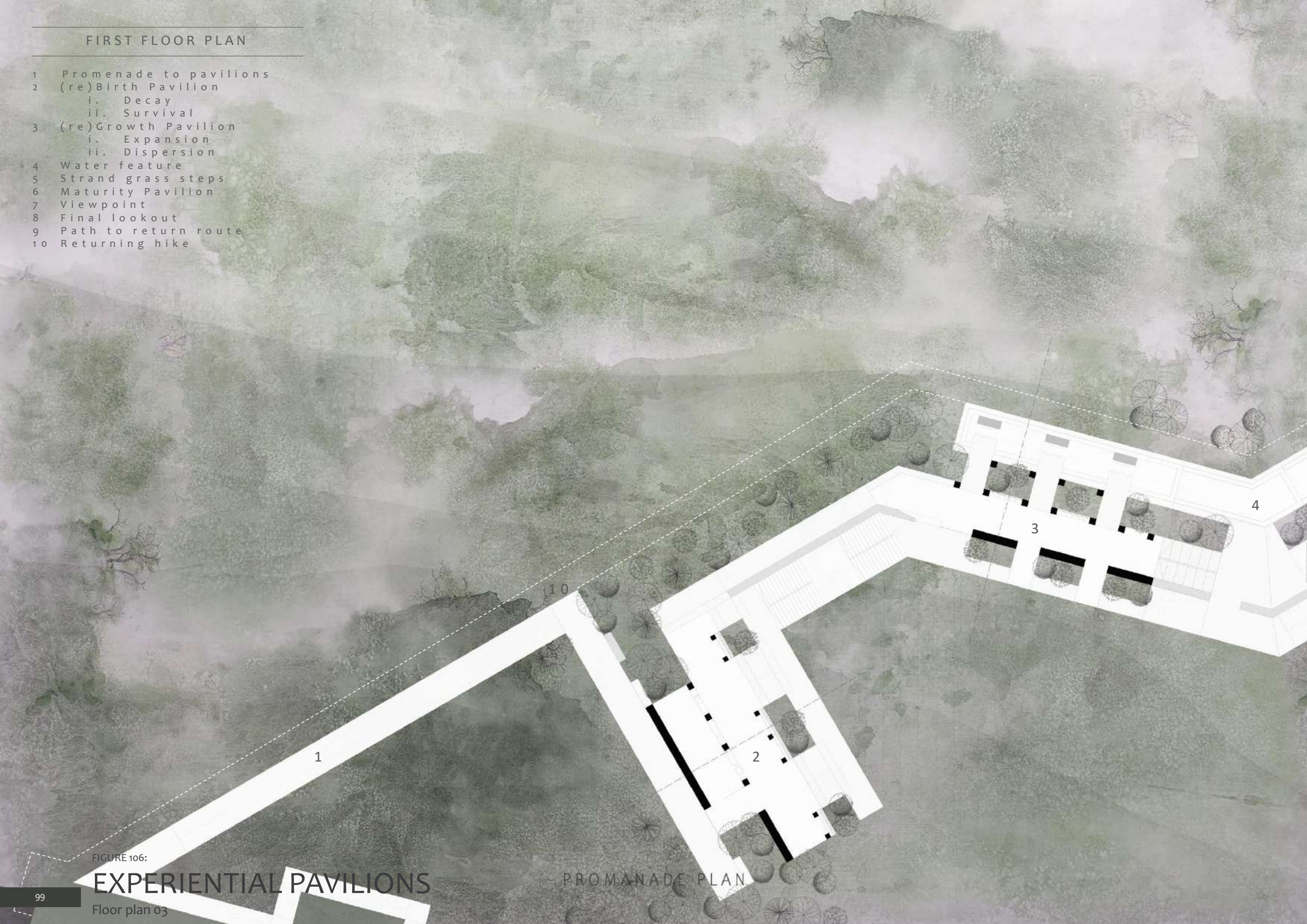
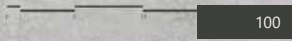


FIGURE 106:

EXPERIENTIAL PAVILIONS

PROMANADE PLAN

Floor plan 03



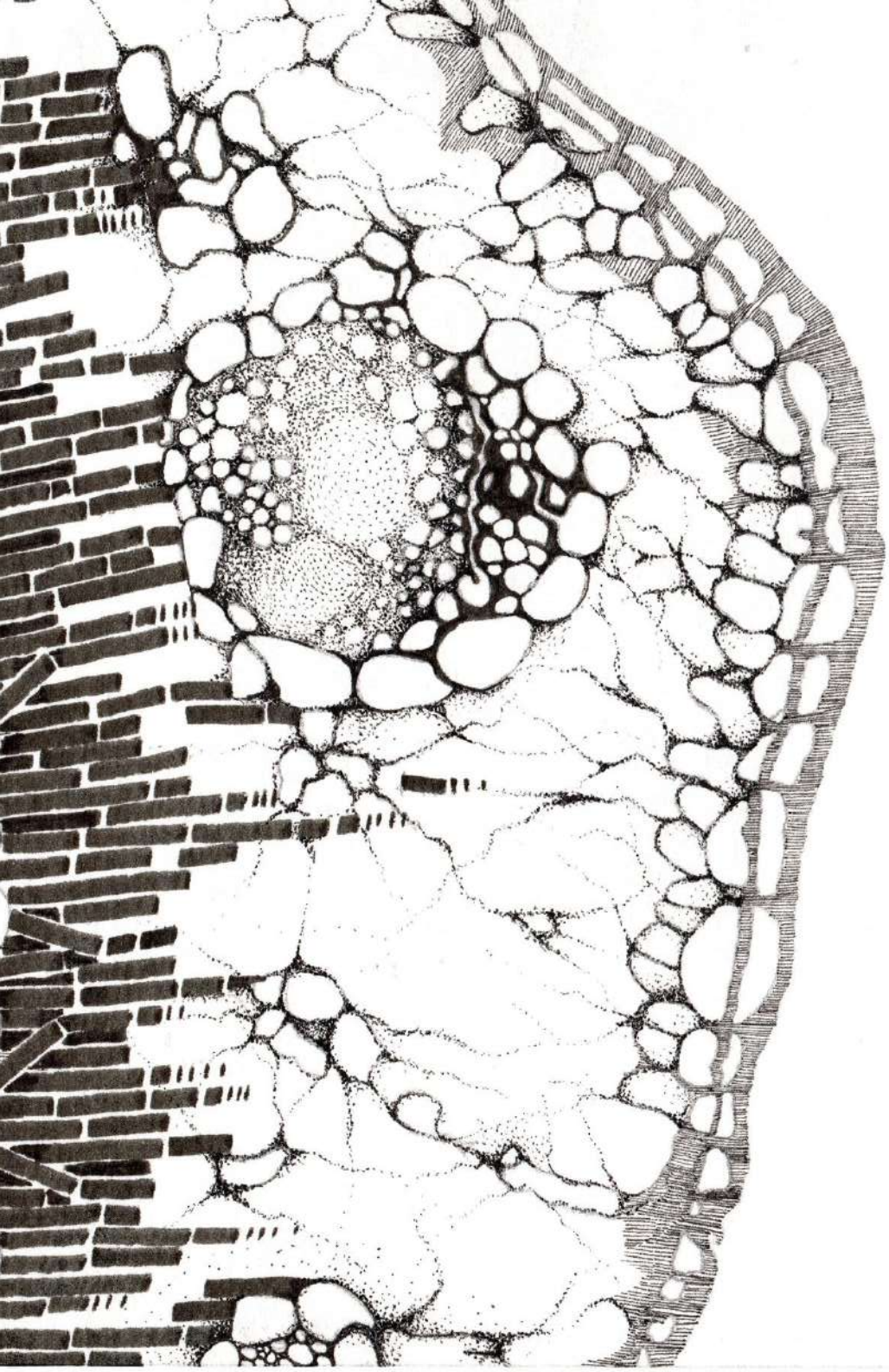
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FIGURE 107:

MATURITY PAVILION LOOKOUT POINT

Pavilion 03



PAVILION 01

(RE)BIRTH: Survival
versus Decay



FIGURE 108:

SURVIVAL vs DECAY EXPERIENTIAL PAVILION 01

(re)Birth

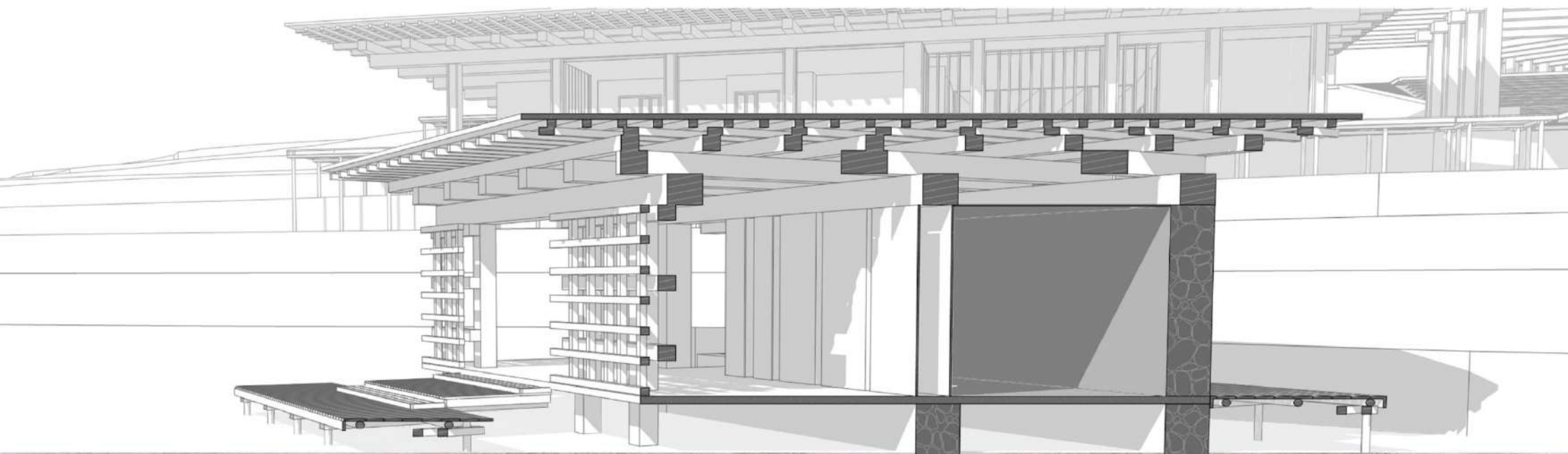
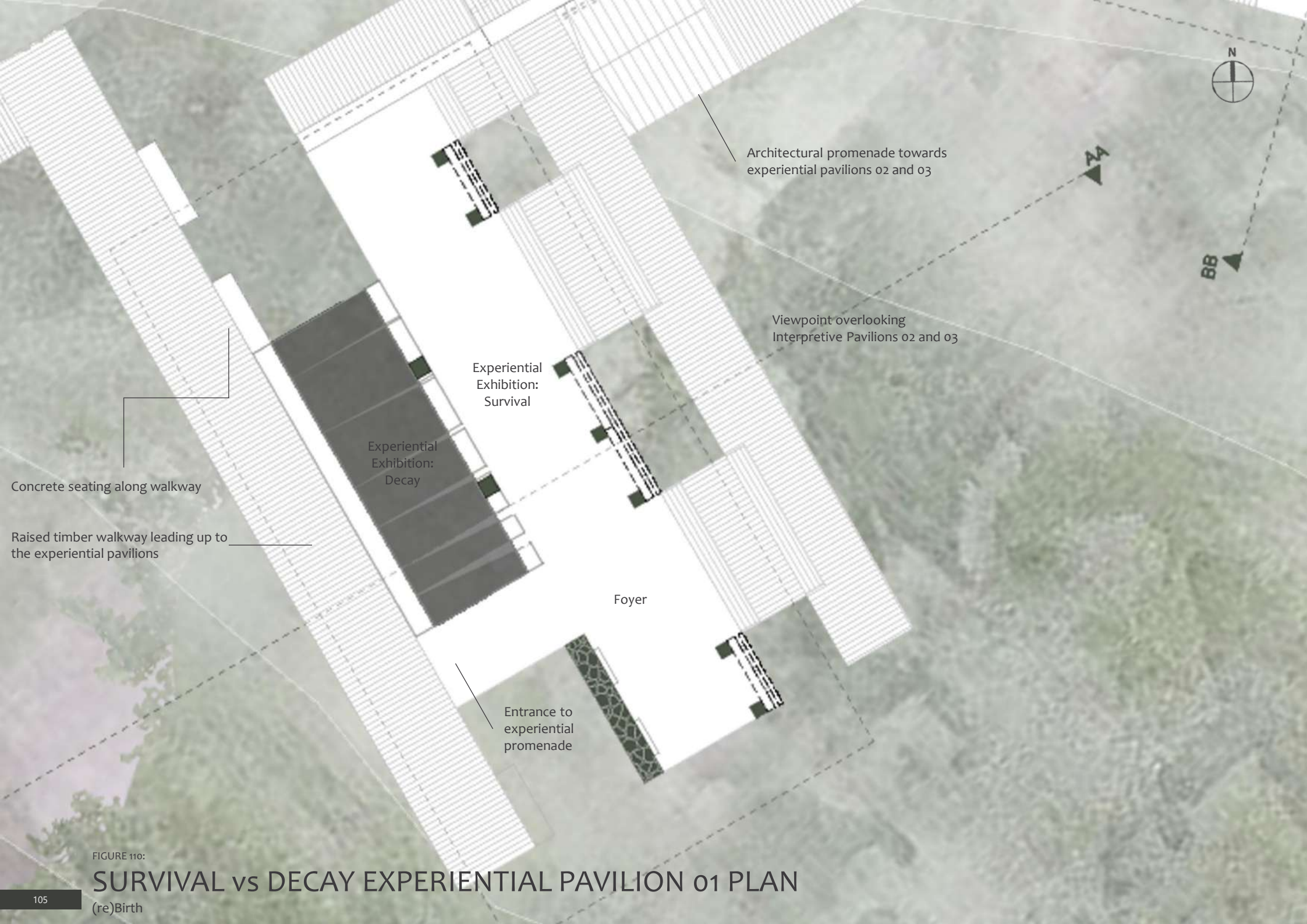


FIGURE 109:
3D Cross-section through experiential pavilion 01
(re)Birth: Survival vs. Decay



Architectural promenade towards experiential pavilions 02 and 03

Viewpoint overlooking Interpretive Pavilions 02 and 03

Experiential Exhibition: Survival

Experiential Exhibition: Decay

Foyer

Entrance to experiential promenade

Concrete seating along walkway

Raised timber walkway leading up to the experiential pavilions

FIGURE 110:

SURVIVAL vs DECAY EXPERIENTIAL PAVILION 01 PLAN

(re)Birth

EXPERIENTIAL EXHIBITION -

DECAY

In contrast to the very bright Survival exhibition space, with an aroma of warm burnt wood, this exhibition is a dark and melancholic weathered steel box with cool steel touch, to convey the idea of Fynbos' death. This exhibition begins with large slits within the weathered steel wall and progresses to smaller slits, creating dark progression, symbolising the slow progression of decay. The end of the box gives the illusion of an opening, with an opening so small to move through suspended over the Fynbos below, symbolising an end with no progression towards the other pavilions. This allows a pondering point, forcing the dweller to return to the "Survival" exhibition.

EXPERIENTIAL EXHIBITION -

SURVIVAL

A deep charred larch wood permeable wall mimicking the Biomimetic roof structure fixed to timber beams creating a warmth through light and scent, contrasts the cold, dark Decay exhibition. This symbolises the need for fire to survive through touch and scent. This exhibition, allows dwellers to flow through the (re)Birth Pavilion along the promenade towards the other interpretive pavilions. The exhibition contrasts the heaviness of the "decay" exhibition through utilizing a permeable timber façade allowing dwellers to flow freely between the interior and exterior with visualization of the coming Pavilions, symbolising that (re)Growth and Maturity is accessible through Fire-induced Survival.

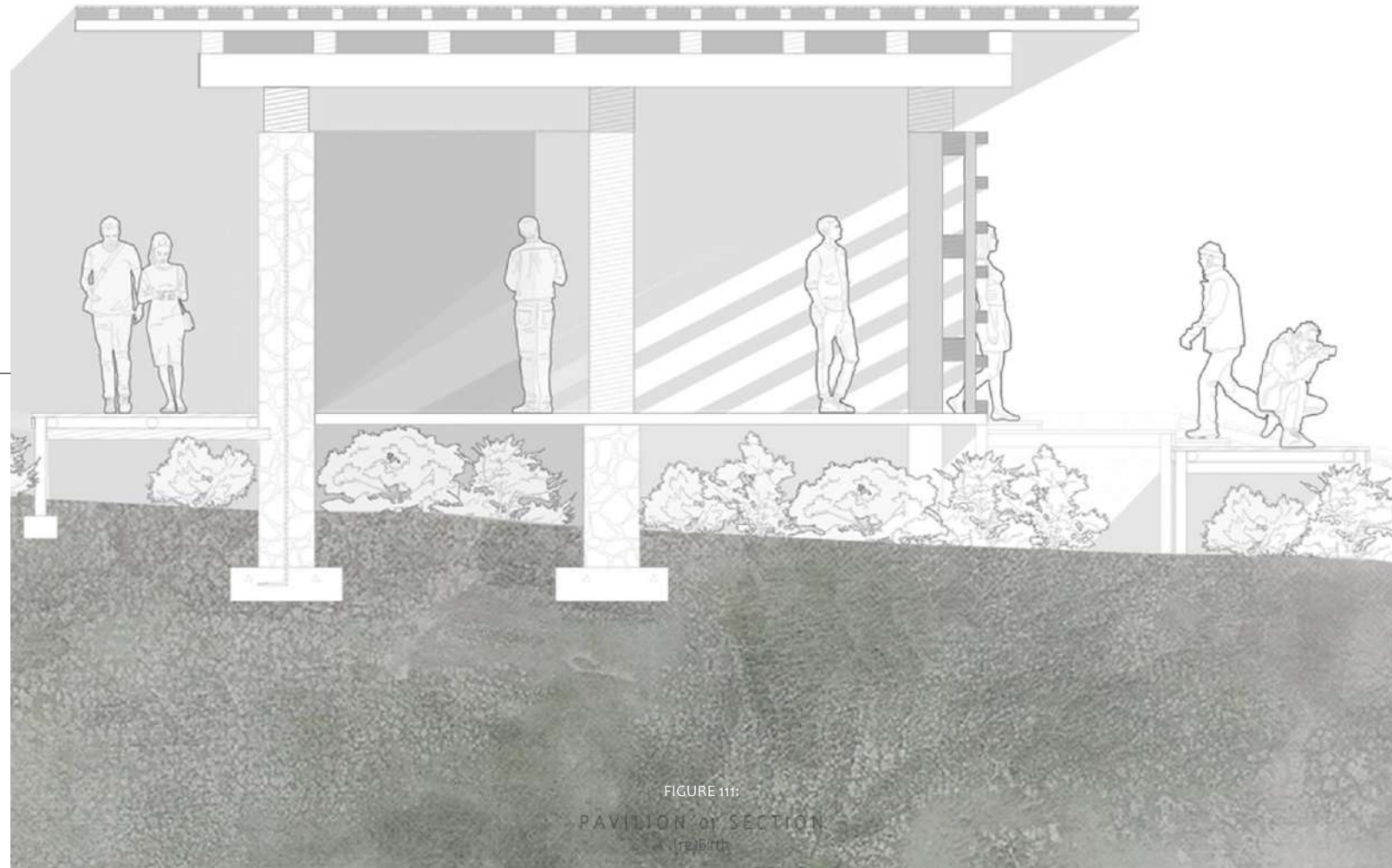




FIGURE 112: Pavilion 01



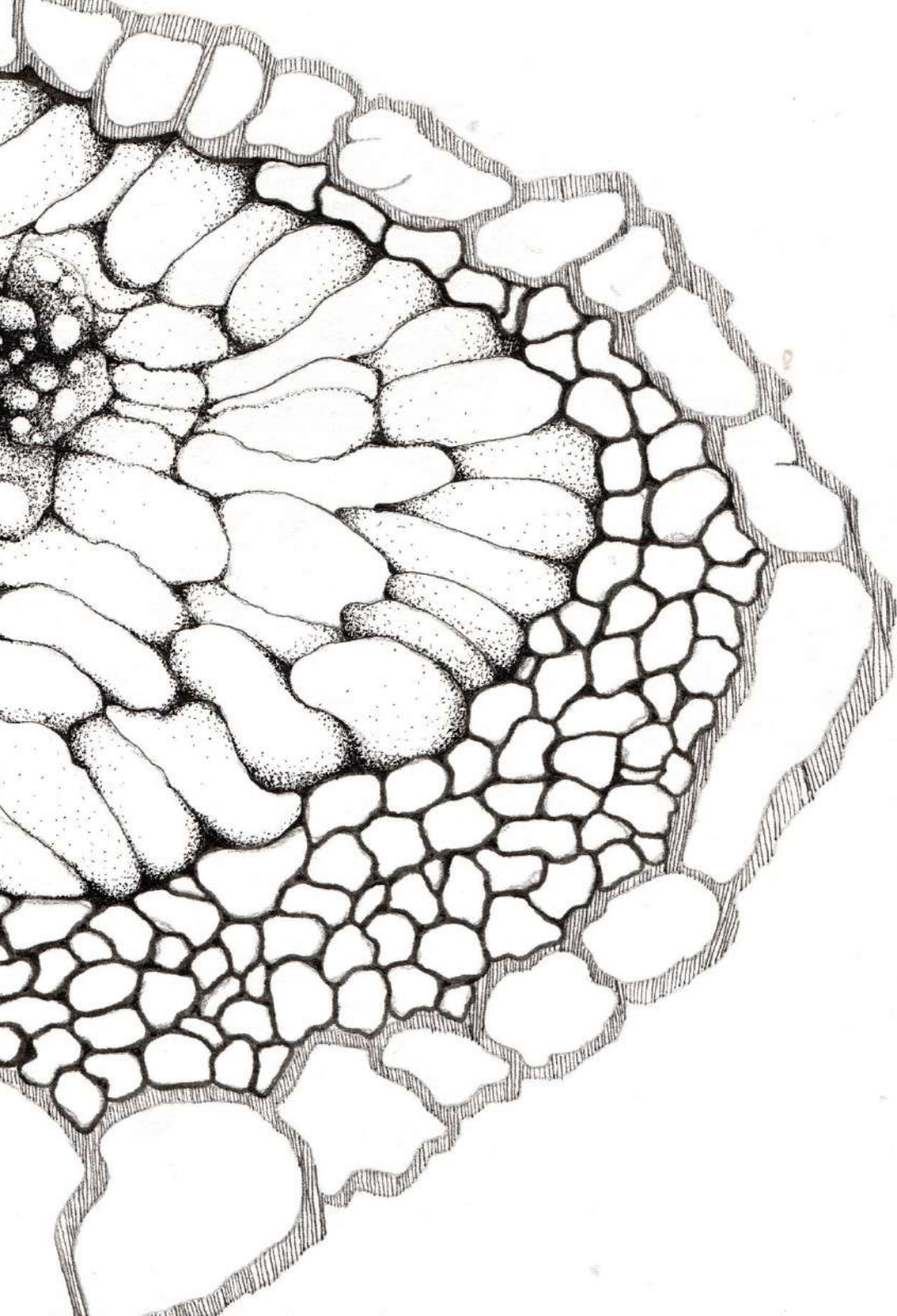
FIGURE 113: Final lookout



FIGURE 114: Pavilion 02



FIGURE 115: Walkway to return hike



PAVILION 02

(RE)GROWTH: Expansion
and Dispersions



FIGURE 116:

EXPANSION and DISPERSION EXPERIENTIAL PAVILION 02

(re)Growth



FIGURE 117:
3D Cross-section through experiential pavilion 02
(re)Growth: Expansion and Dispersion

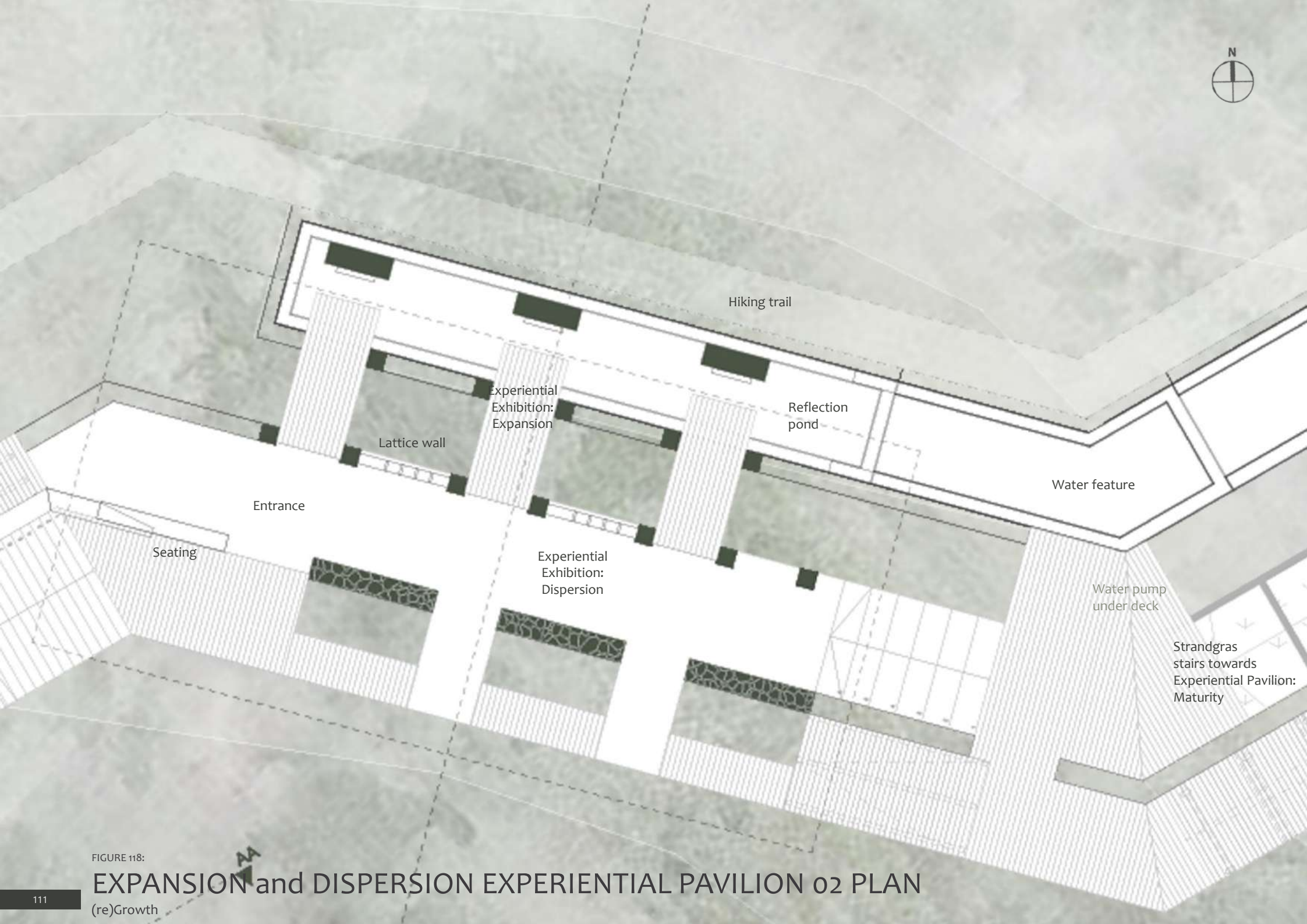
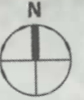


FIGURE 118:

EXPANSION and DISPERSION EXPERIENTIAL PAVILION 02 PLAN

(re)Growth

EXPERIENTIAL EXHIBITION -

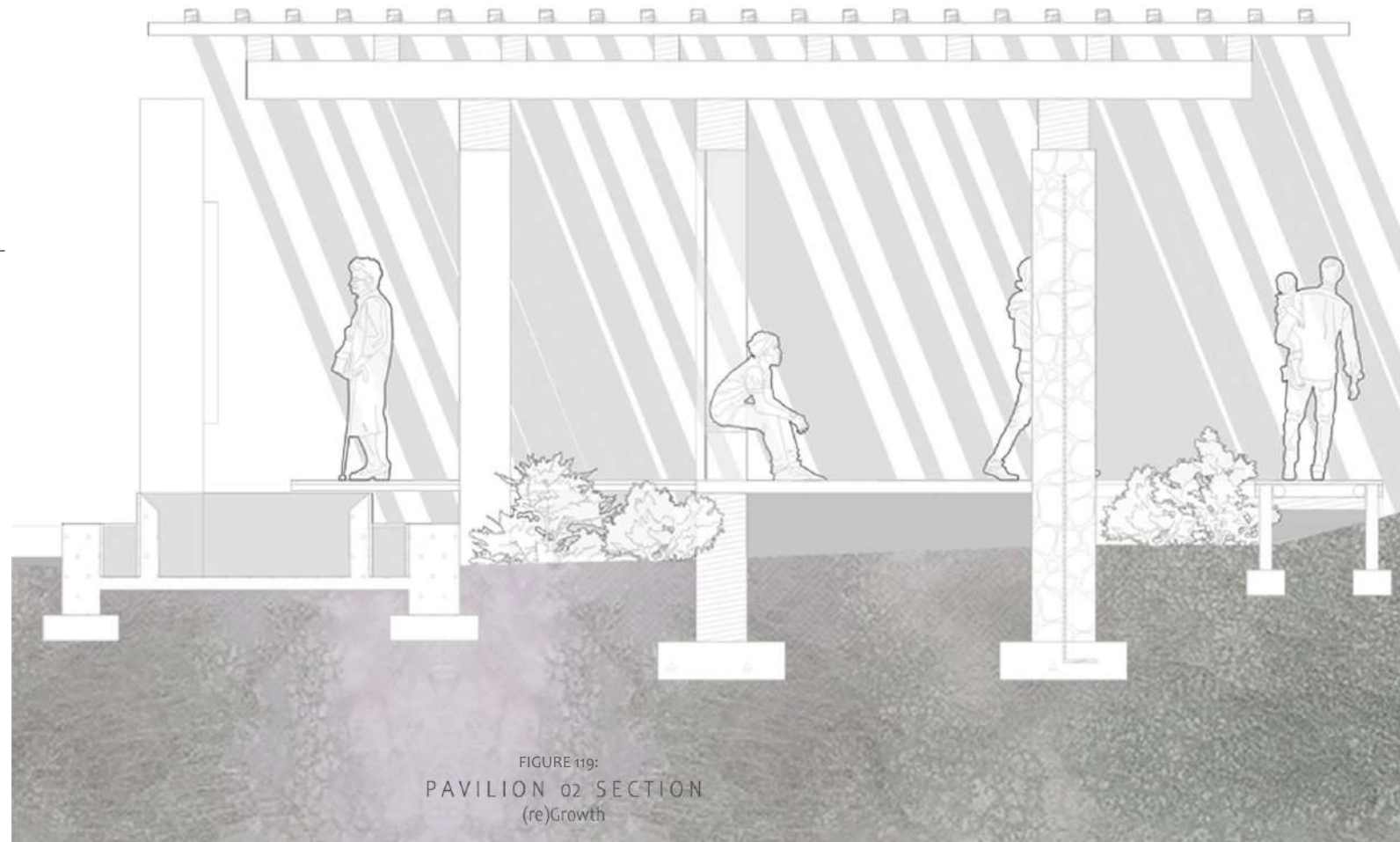
EXPANSION

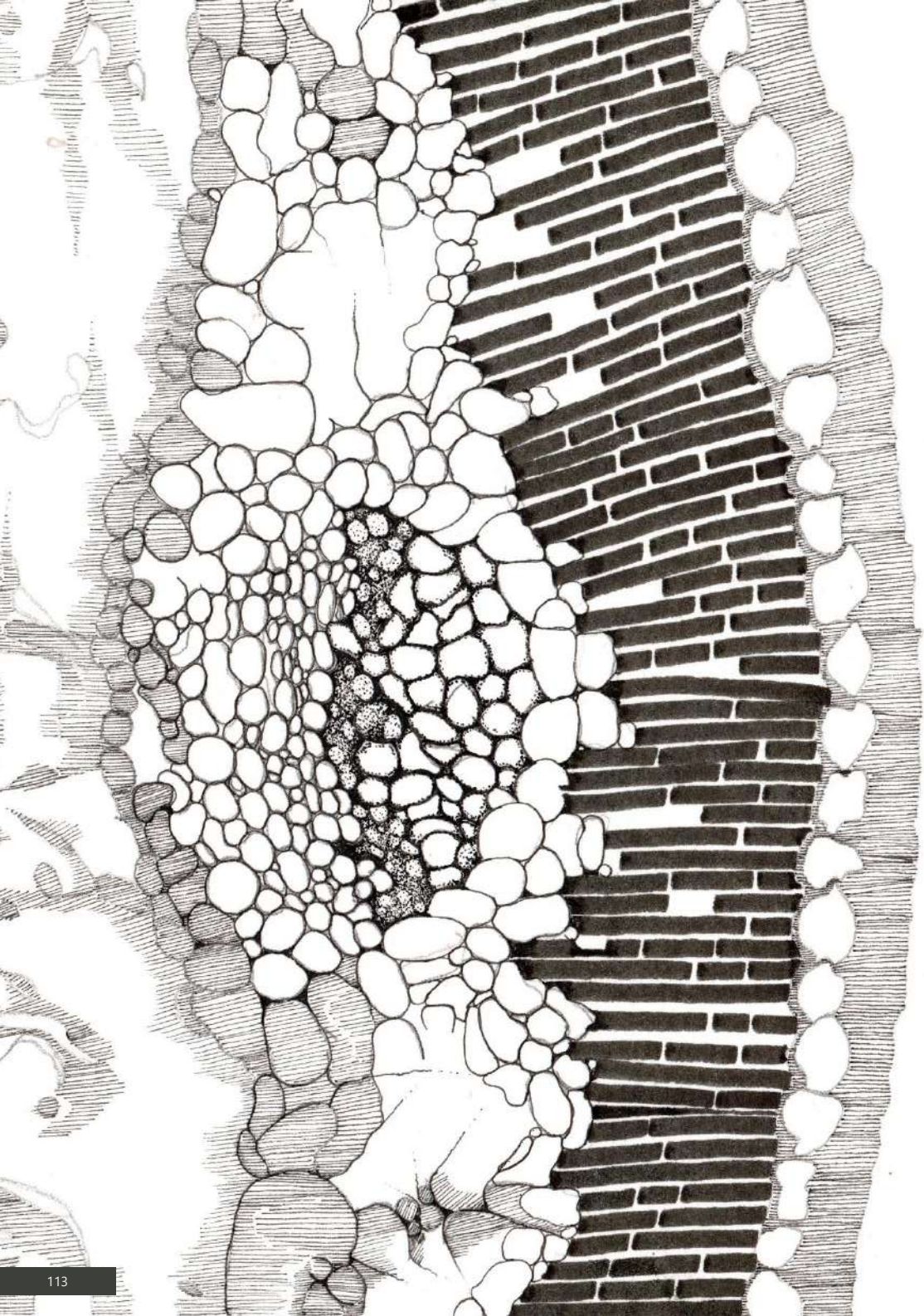
In contrast to the other experiential pavilions pavilion 2 has no solid roof, creating a raining-light experience, symbolizing the dispersion of fynbos germinated seeds around the existing mature plant. This experience is further enriched through the refined lattice timber wall between the Expansion and Dispersion exhibitions, further sifting the harsh Western light. By utilizing a dry-stack Limestone wall, the idea of plant dispersion is further heightened as moss is able to grow in the open spaces. The spaces are linked as opposed to pavilion 01, as the two exhibitions or processes aren't opposing but mutual, as each Fynbos plant grows either way.

EXPERIENTIAL EXHIBITION -

DISPERSION

The timber decking hovering over a reflection pond plays on the idea of Fynbos' growth being reliant on water availability, additionally, water retention is a personalized characteristic of the Fynbos plant itself, collecting and releasing water when needed. The timber platform symbolise the expansion growth of new fynbos plants from within the existing form. The timber deck stretches out from the concrete form as a new extension, towards the reflection pond and the landscape. The permeable roof structure draws in natural light that reflects off of the water feature and illuminates the expansion space experience.





PAVILION 03

MATURITY: Final
Flourishing



FIGURE 120:

MATURITY EXPERIENTIAL PAVILION

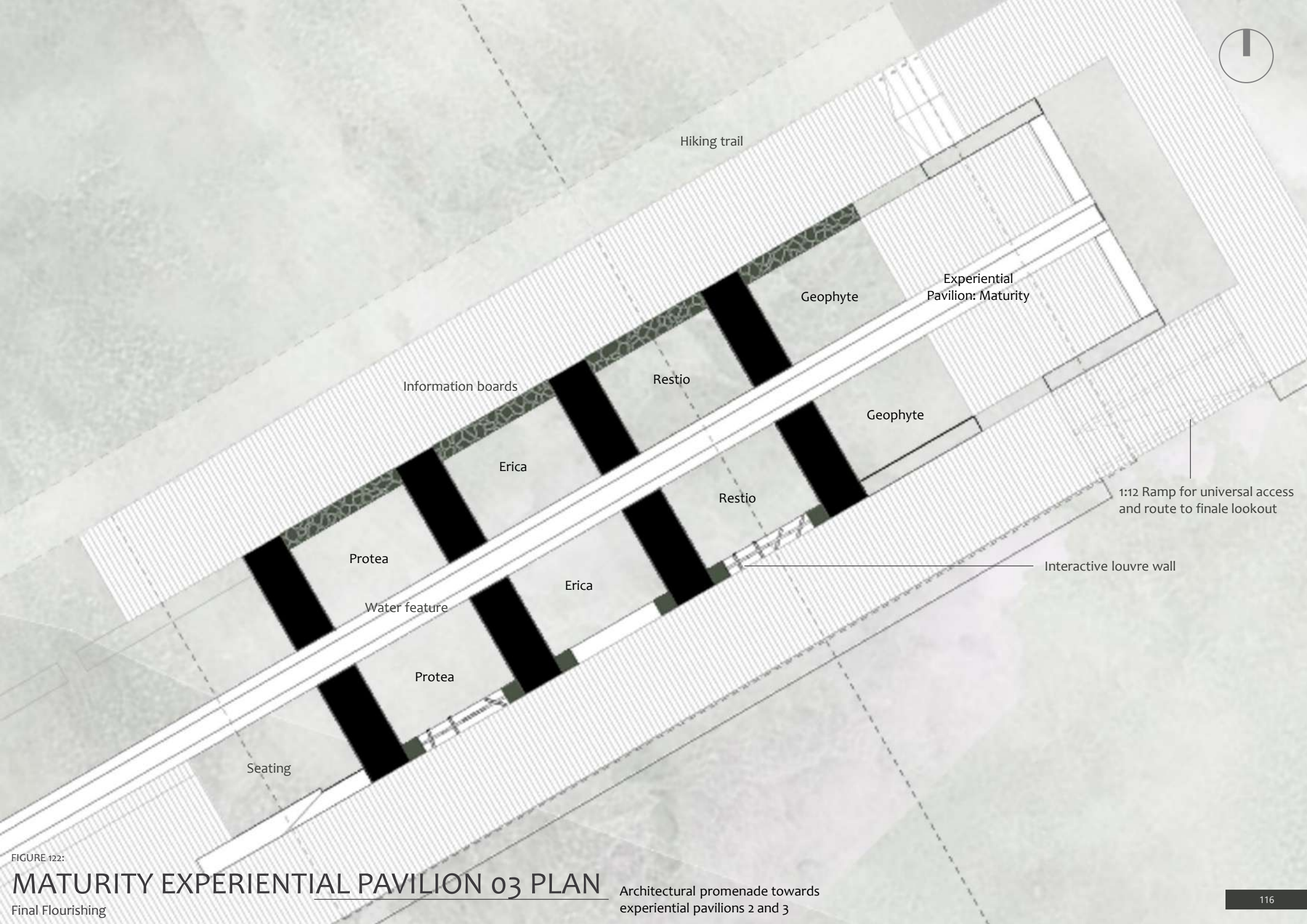
Pavilion 03



FIGURE 121:

3D Cross-section through experiential pavilion 03

Maturity



Hiking trail

Experiential Pavilion: Maturity

Geophyte

Information boards

Restio

Geophyte

Erica

Restio

1:12 Ramp for universal access and route to finale lookout

Protea

Erica

Interactive louvre wall

Water feature

Protea

Seating

FIGURE 122:

MATURITY EXPERIENTIAL PAVILION 03 PLAN

Final Flourishing

Architectural promenade towards experiential pavilions 2 and 3

EXPERIENTIAL EXHIBITION -

FINAL FLOURISHING

The promenade ends in the final interpretation space: Maturity. In this exhibition dwellers can interact, touch and identify the four kinds of Fynbos. The use of rotating louvres allows dwellers to limit and create certain views of the fynbos, symbolising the 'reveal' of the fuller picture of the Fynbos narrative.

The roof structure provides shading for users, while utilising natural light for Fynbos growth through weathered steel skylights. The water feature from Pavilion 02 collects rainwater, stores and redistributes the collected water to the growing Fynbos within Pavilion 03.

This architectural intervention aims at touching the sight light, but pavilion 03 ends the promenade as the most sensitive space within the design.

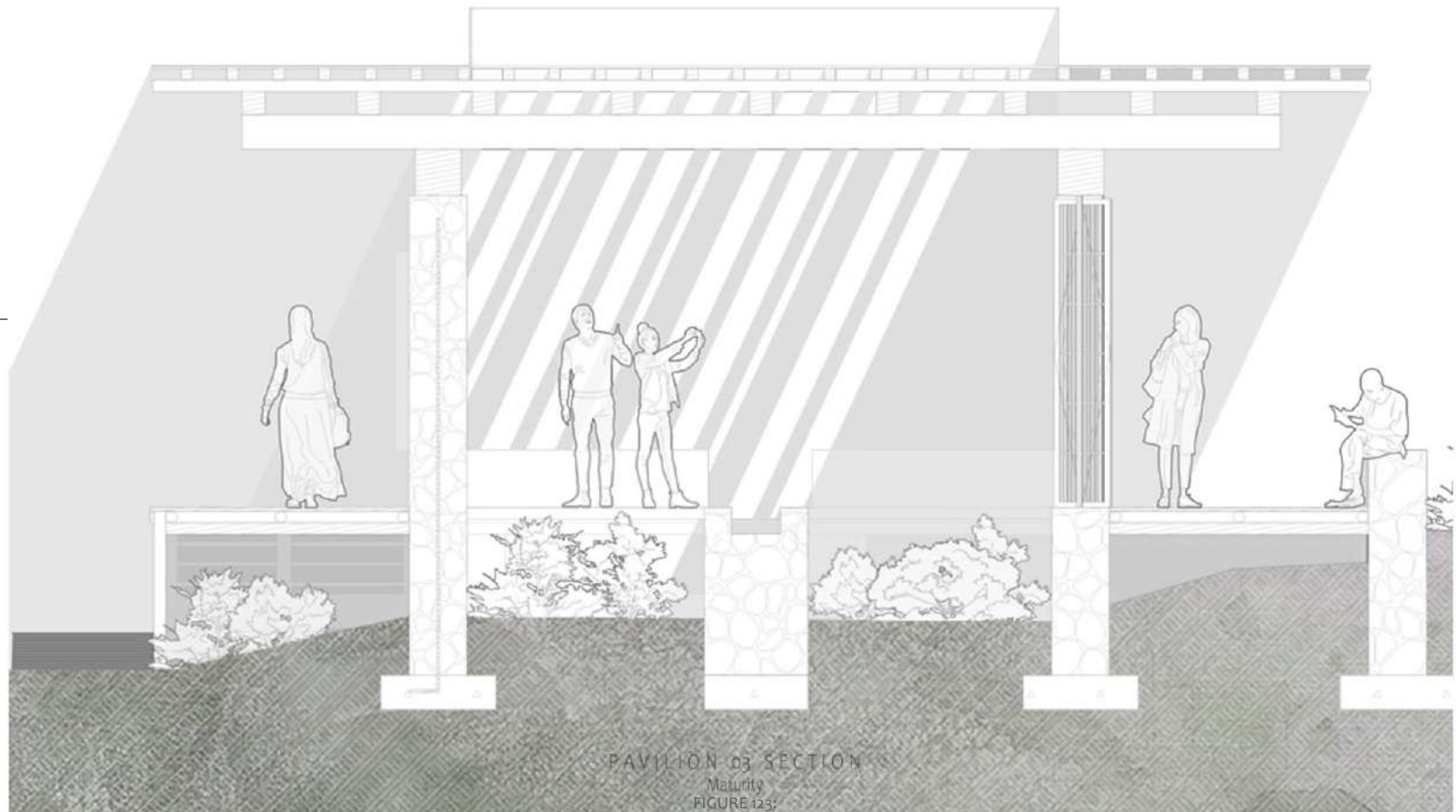




FIGURE 124: Pavilion 03 Perspective



FIGURE 125: Pavilion 03 lookout



FIGURE 126: Water feature for water collection and redistribution



FIGURE 127: Strandgras promenade steps to Pavilion 03



FIGURE 128:

EXPERIENTIAL PROMENADE FINALE

Final Flourishing



FIGURE 129:
FINAL MODEL
Orientation hub



FIGURE 130:

PAVILION 03

Final lookout & return hike

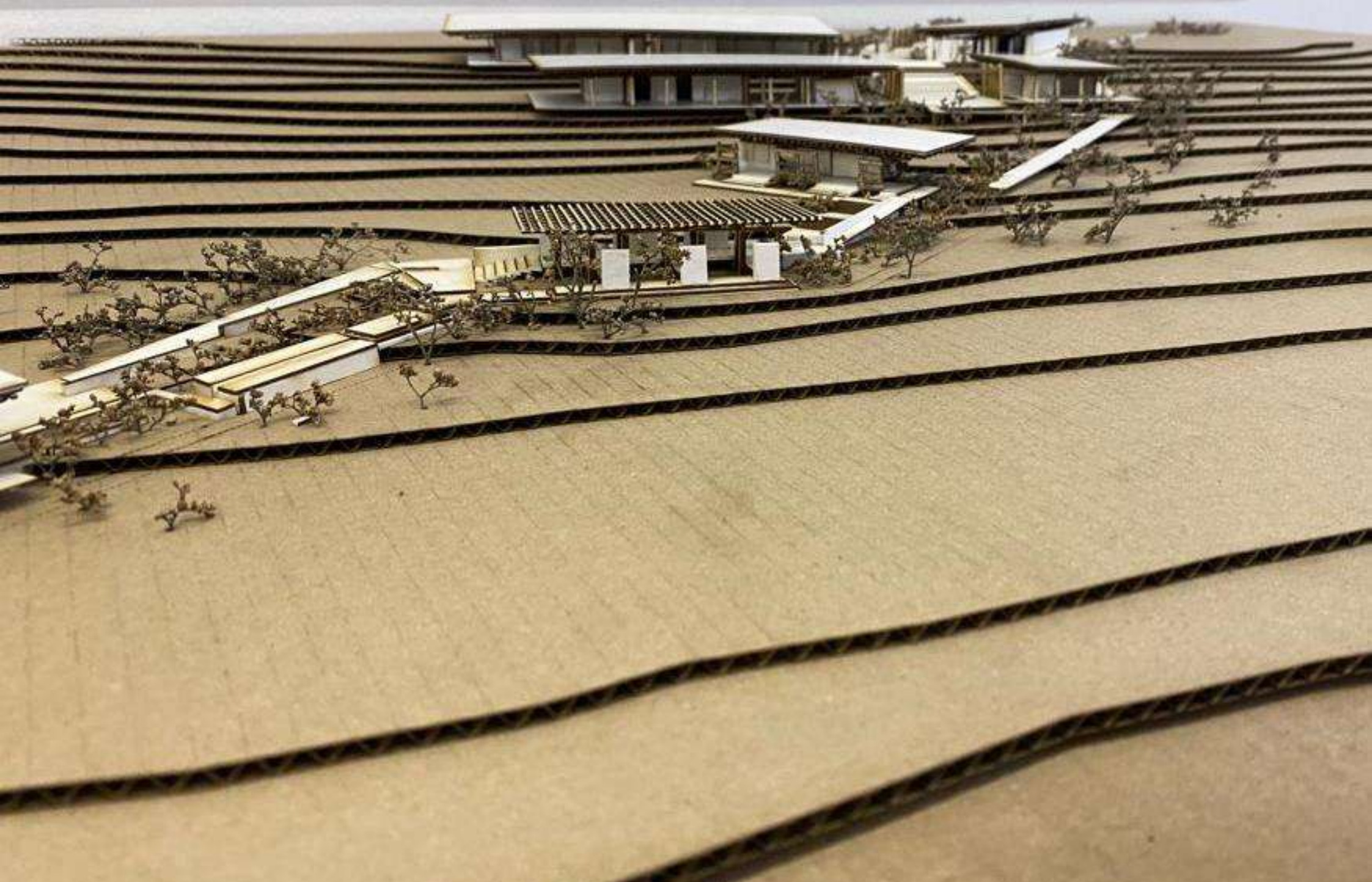


FIGURE 131:

PAVILION 02 ALONG PROMENADE

(re)Growth



FIGURE 132:
RETURN ROUTE
Raised metal walkway

TECHNICAL INVESTIGATION

The investigation starts to compile all the previous chapters explorations, interpretations and development towards a design resolution combines function, structure and theory to create a Fynbos Interpretation Centre. The technical investigation explores the influences of the site and environment on the design together with the building services, circulation, structural and experiential approaches which all work together in a symbiotic relationship to preserve and recount the hidden narrative.

SITE and ENVIRONMENT

TOPOGRAPHY

The site, located in West Coast Nation Park, is at the highest point is approximately 25 m above sea level. The site is situated in the lagoon coastal plain of the park, resulting in large limestone outcrops on site that cap the sandstone soil. The fall on the site has an overall difference of 15m from the Orientation hub towards pavilion 3, connected through a narrative path. The fall of the site and the limestone deposits have a large impact on the form giving of the design as it informed a natural shape of the master plan and the layered nature of the design.

VEGETATION

The main vegetation type in the area Langebaan Dune Strandveld soil and Cape limestone Fynbos. The predominant species on site is Cape limestone species grow on northeast-facing, moderately steep limestone hills with shallow alkaline soil. The height of the vegetation ranges from 0,5m to 2,5m growing in approximately 0,14 m deep soil. The Cape Limestone fynbos become an important part of the design as it is the main vegetation on site..



Figure 133: Fynbos on site (Author, 2023)

FYNBOS RESEARCH LABRATORY

General layout

The most crucial stage in laboratory design is ensuring that the laboratory facility has enough floor space for the desired laboratory activities. In every laboratory, adequate movement and working space are critical factors.

The area must be large enough to contain all of the necessary design elements of a core laboratory, such as hand-washing basins, benches, sinks, and workstations, as well as equipment such as refrigerators and freezers (World Health Organization, 2020).

Today's "open lab" concept is significantly different from that of the "closed lab" of the past, which was based solely on accommodating the individual principal investigators. In open labs, researchers share not only the open space itself, but also equipment, bench space, and support staff (Arizona State University, 2020).

The barrier between laboratory and non-laboratory area should be formed by a lobby (buffer space) at each laboratory exit. This will enable for sanitary, safe, and secure laboratory environments.

FYNBOS RESEARCH LABORATORY

Floors and Walls

- The surfaces of the walls and flooring must be smooth and continuous. This may need the use of coving, which involves introducing curved edges.
- Wall and floor materials must be simple to clean, impermeable, and resistant to the chemicals and disinfectants used in the laboratory.
- Walls must be structurally sound and functionally finished. Wall protection, for example, may be necessary to avoid trolley damage, or splash backs may be required behind sinks and hand-washing basins.
- Floor drains in laboratories must have grills or water traps to keep insects, rats, and other pests out.

Windows

- Windows should be sealed in most cases; however, they may be openable if the laboratory is meant to be naturally ventilated.
- If they are openable, they must be constructed to keep insects and vermin out of the laboratory and be lockable.
- Openable windows should be simple to use and easily accessible so that they may be opened and closed as needed.
- Natural ventilation design should minimize excessive air movements and draughts that might interfere with equipment operation.

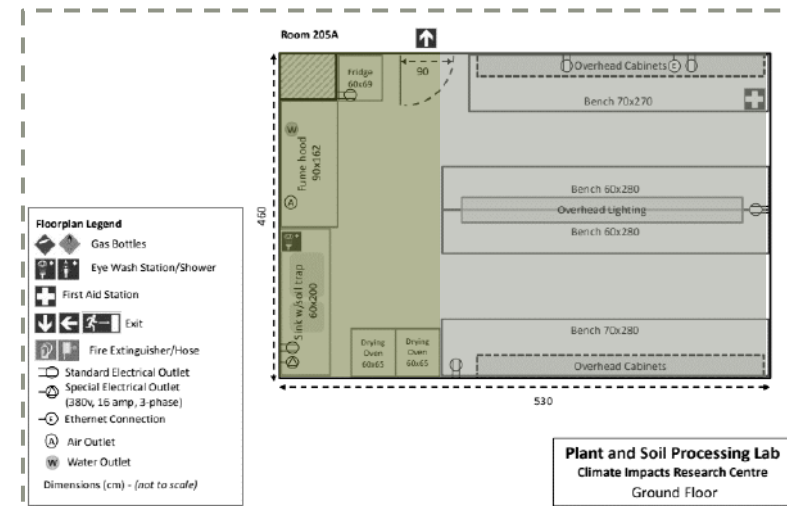


Figure 134: Plant and soil processing lab floorplan layout. (Umeå University, 2021: online).

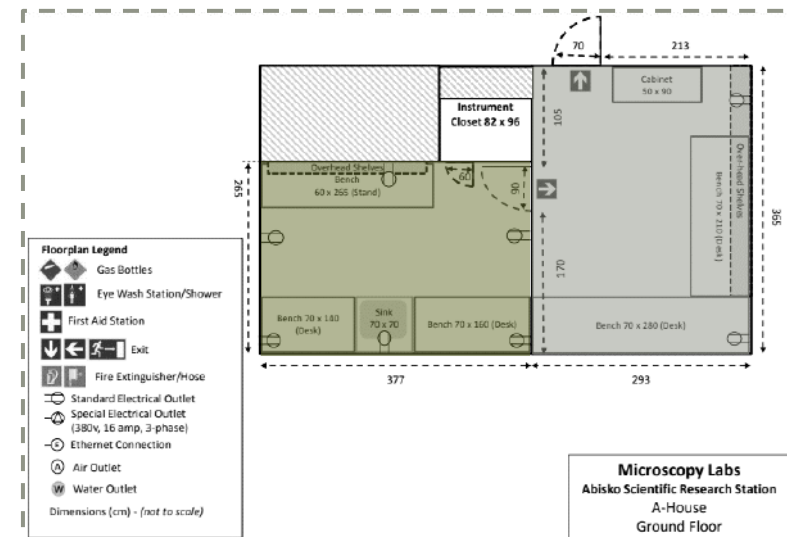


Figure 135: Microscopy lab floorplan layout. (Umeå University, 2021: online).

FYNBOS RESEARCH LABORATORY

Doors

- The doors to the essential component's laboratory must be locked and equipped with a vision panel to provide visibility inside the laboratory.
- Internal laboratory doors must be equipped with vision panels to provide worker visibility and to avoid accidents.
- Doors must comply with applicable building codes (for example, fire ratings), be self-closing, and be broad enough to readily transport equipment, supplies, or garbage.
- Doors should be labeled correctly. At the very least, they should have:
 - international biohazard symbols where bio- hazardous items are handled or kept,
 - contact information for the laboratory's responsible person in the event of an emergency,
 - a signal that entry to the area is prohibited.
- external doors and windows should be protected against pests and wildlife.

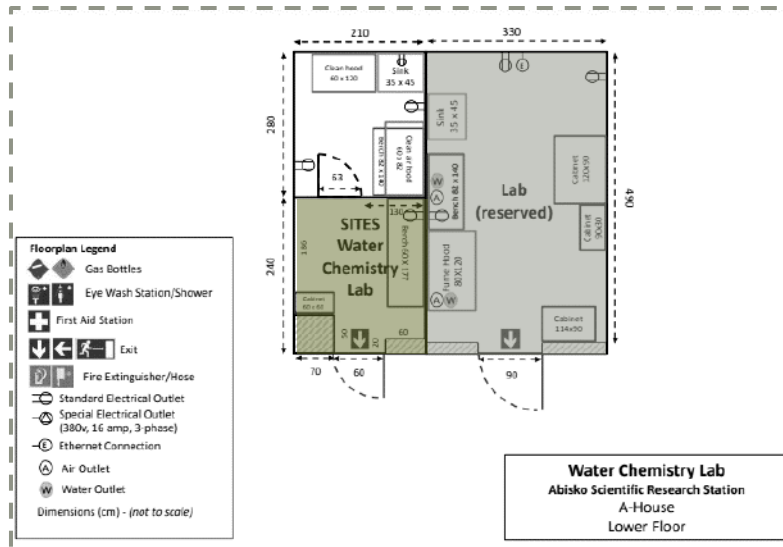


Figure 136: Water chemistry lab floorplan layout. (Umeå University, 2021: online).



Figure 137: Utility rooms floorplan layout. (Umeå University, 2021: online).

FYNBOS RESEARCH LABORATORY

Workbenches

- A workstation designed for working, writing, or typing while sitting should be 720 mm
- The optimal recommended setup for a workstation comprises one 750 mm work surface.
- 600 mm work surface, with the computer in the corner.
- It is suggested that a counter-to-counter clearance of 2150 mm be used.
- Workbenches should be built of non-absorbent, skid-proof, wear-resistant materials that are also resistant to the harmful effects of acids, solvents, and detergents in normal usage.

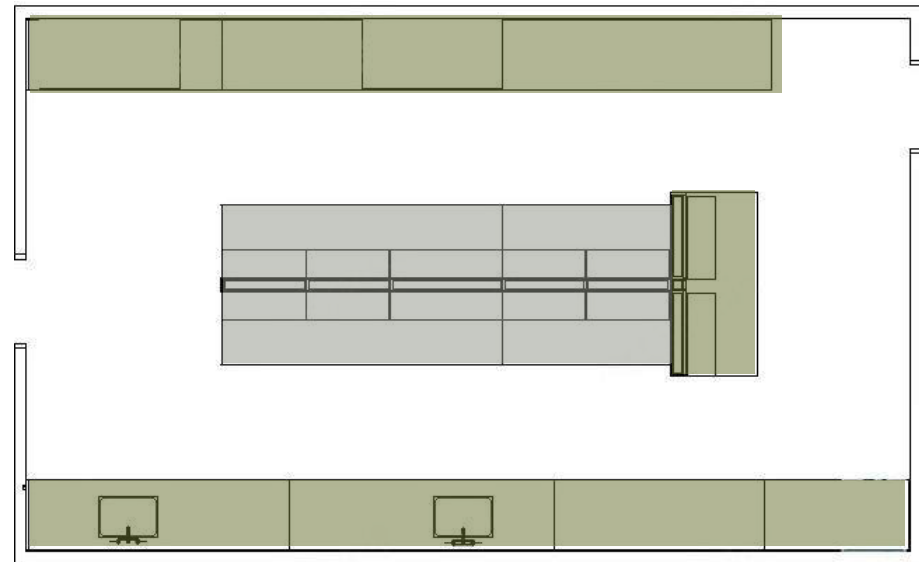


Figure 138: Typical layout of work benches in laboratory (Umeå University, 2021: online).

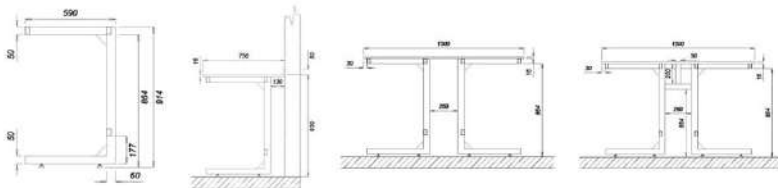


Figure 139: Specifications for C-structure work benches (Umeå University, 2021: online).

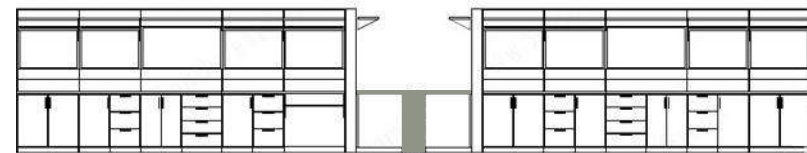


Figure 140: Typical layout of work benches in laboratory (Umeå University, 2021: online).

FYNBOS RESEARCH LABORATORY

Emergency shower

- opens in one second
- water remains on without use of hands
- delivers 113.5 liter of water per minute
- easy to locate and accessible controls
- head at 2 100 mm from floor
- adjustable water supply
- visible sign
- checked and flushed weekly

Emergency eyewash

- water remains on without use of hands
- goes from off to on in one second or less
- large and easy to operate controls
- delivers 1,5 liter of water per minute
- water nozzles 850 to 1 150mm above floor
- visible sign
- checked and flushed weekly

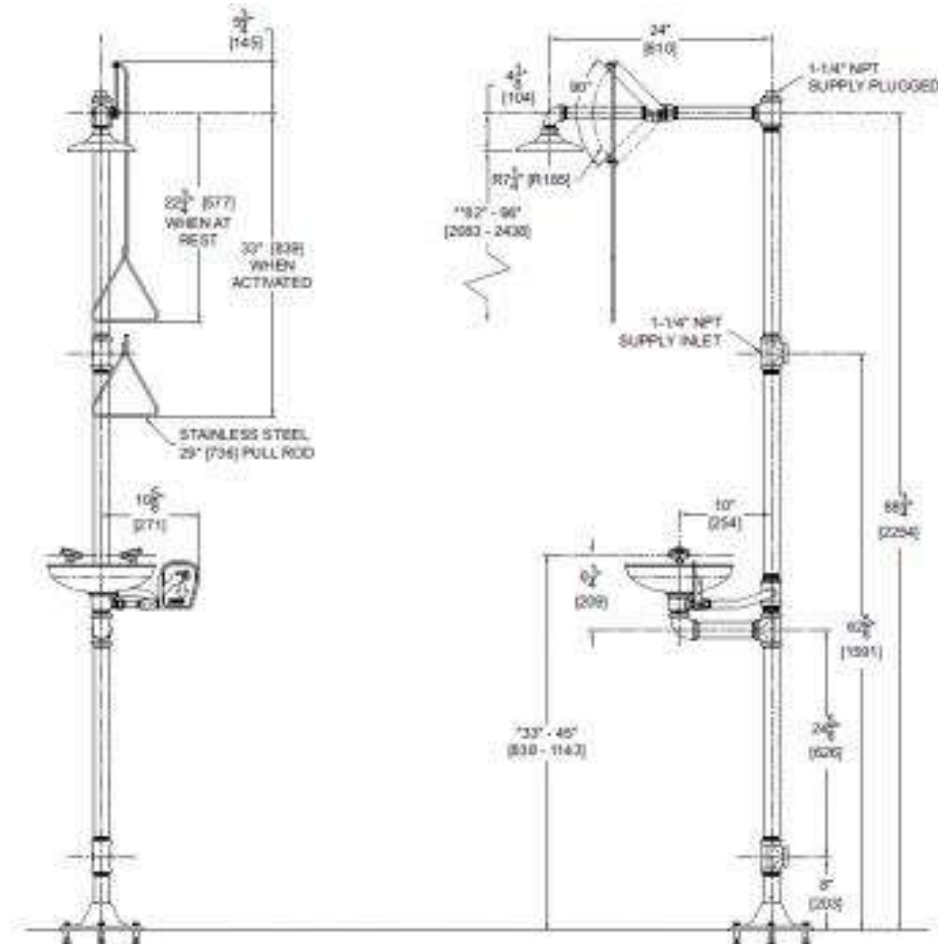


Figure 141: Emergency eyewash specifications (Umeå University, 2021: online).

SITE PLANNING

STORM WATER CONTROL

Storm-water control becomes an important factor on site as the heart of the intervention is the fynbos surrounding it on the limestone hill. The limestone walls of the orientation hub and experiential pavilions together with falls created by landscaping redirect the storm-water around the design and through gutters that are placed under the pavilions and through the walls. A storm-water gutter is situated between the cut-out limestone rocks and the north facing courtyard facades. This gutter collects all the storm-water coming down the hills and redirects it towards the planted fynbos landscape surrounding it. A storm-water catchment area is planned within the landscaped area connected to the narrative pathway connecting pavilions, to gather the storm-water flowing down the hill. The storm-water is stored in a JoJo tank to irrigate the vegetation.

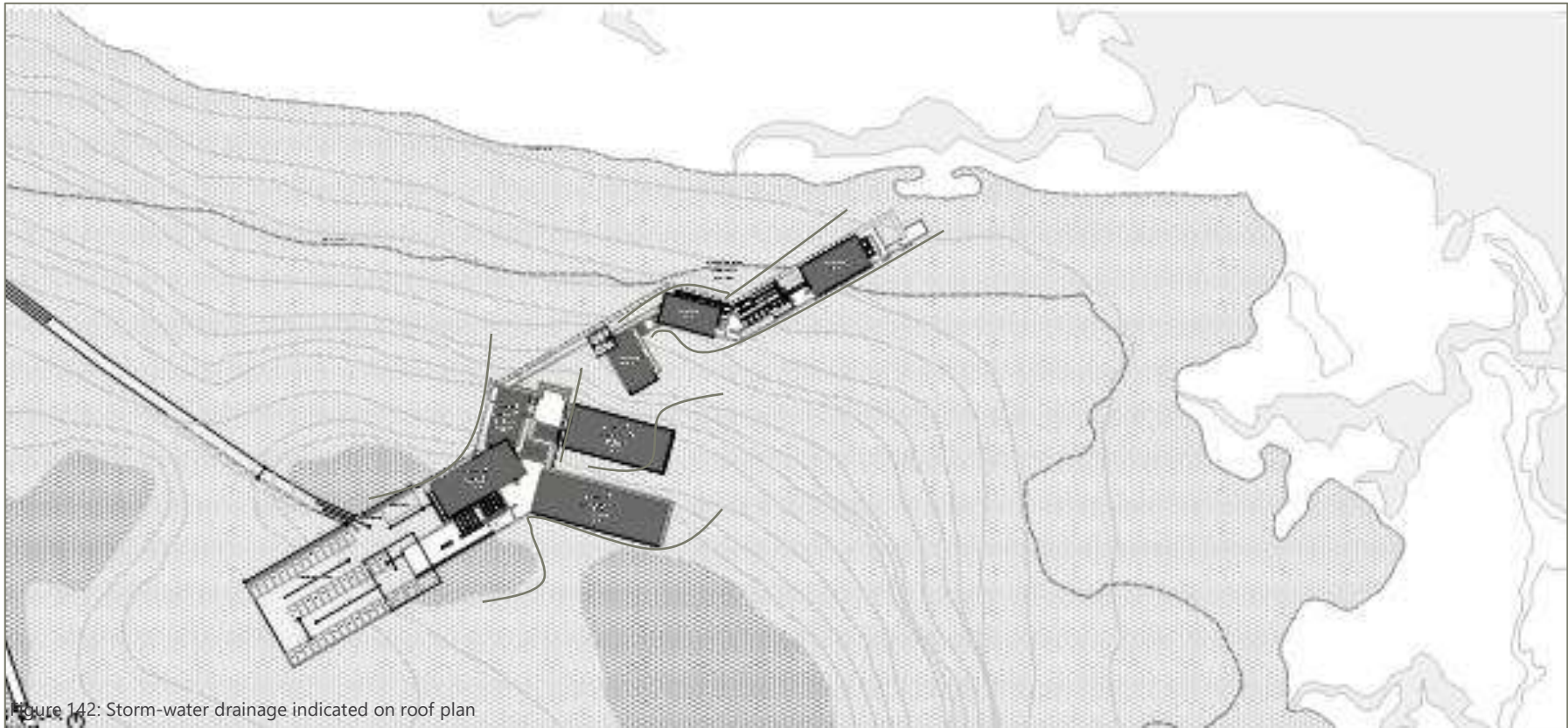
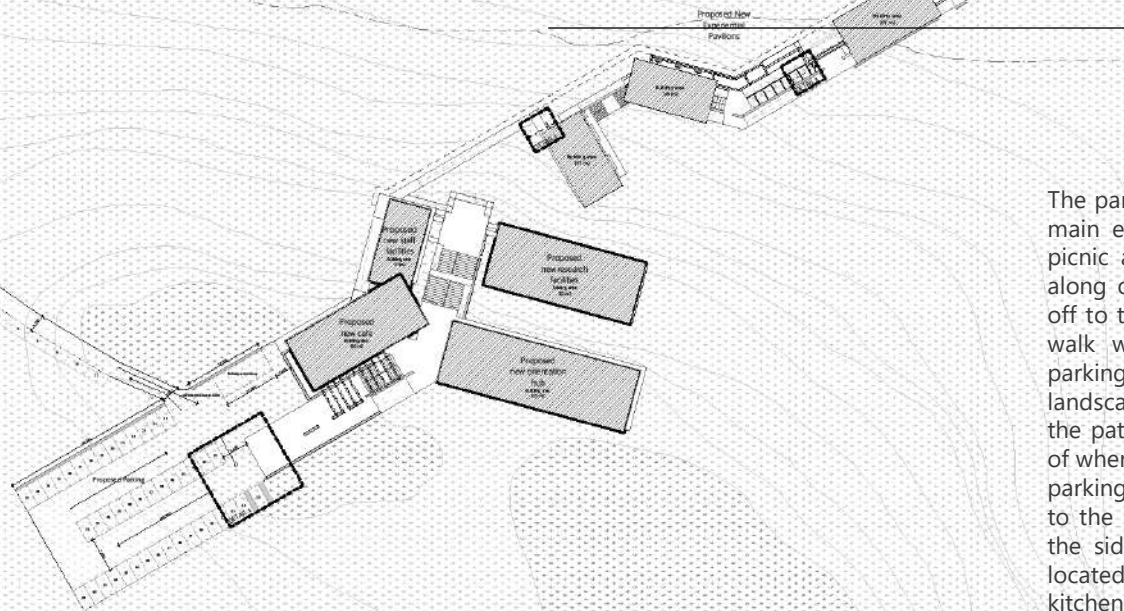


Figure 142: Storm-water drainage indicated on roof plan

PARKING and LANDSCAPING



PARKING

The parking is located to the south-west along the main entrance to the site, from the busy tourist picnic areas at Kraalbaai. The parkings will occur along on an existing gravel road, that was closed off to the Churchhaven town, where visitors usually walk when hiking or visiting the site. The 35 parking spaces are integrated in the natural landscape, with various parking areas marked along the path to the site. This makes the visitors aware of where they should park without creating a harsh parking lot. Disabled parking spots are in proximity to the main entrance and have 1,5m clearance to the side for wheelchair access. A delivery bay is located at the staff entrance for easy access to the kitchen and trash bins.

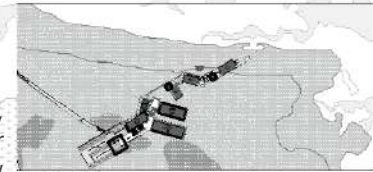
LANDSCAPING

The landscaping forms a large part of the scheme as it connects the Fynbos Interpretation Pavilions and various hubs. Sculptural concrete walls with cut up limestone rock from site form sculptural walls that wrap around site and the pathways. These walls forms a natural axis connecting the experiential pavilions and main orientation hub.

In between the various interpretation pavilions, stone walls are combined with raised timber walkways where visitors can walk and sit on the low stone walls, within certain areas the stone walls become more stereotomic with concrete paths leading the visitor through spaces. The walkways are surrounded by Agulhas limestone fynbos giving the idea that the paths are floating in a sea of fynbos.

AMAZI ENTABA

Site Plan	scale 1:500
Locality Plan	scale 1:5 000
Detail 01: Parking	scale 1:100

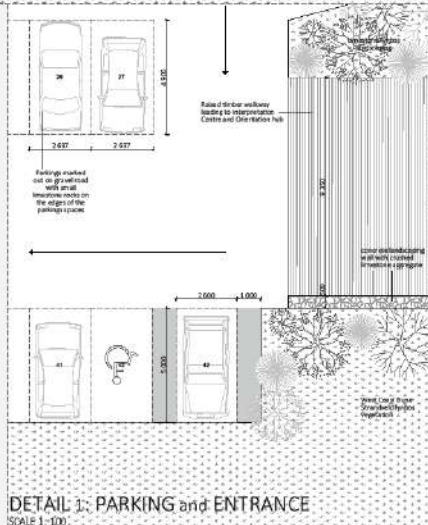
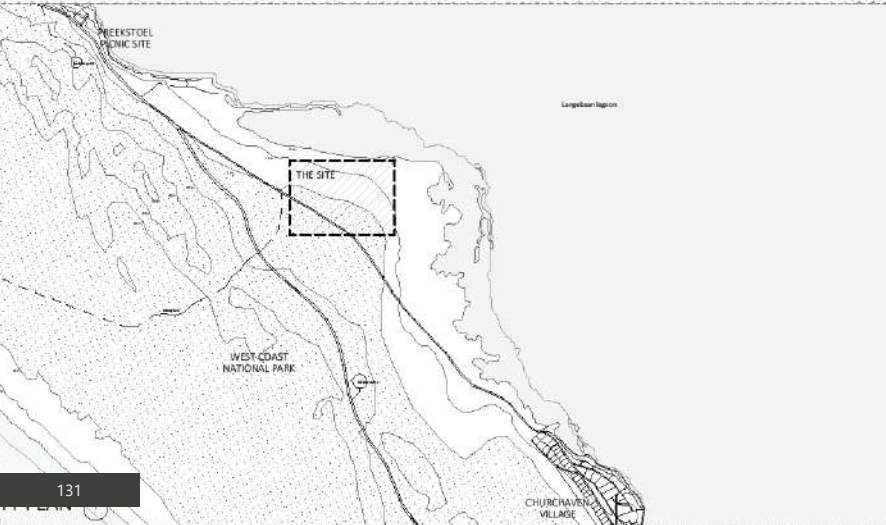


The site plan indicates the larger plan of the intervention, including parking routes to site and roof plan. Additionally the site plan indicates the landscaping effect on orientation, as the Interpretation Center and the pavilions pull towards the dramatic point of the contours pointing towards the West Coast National Park lagoon.

The Locality plan indicates how the site is nestled into the "tourism hub" of the park, between the popular lagoon picnic area towards the North-West, and the small local town of Churchhaven 1,2 km South. This is an important detail as the site is not eligible to be burnt due to the local town's proximity to the site itself.

Detail 1 refers to the parking area's sensitive approach towards the site. Parking bays are indicated using limestone rods on a gravel parking area instead of an invasive and paved area with painted lines.

AN 1



HORIZONTAL and VERTICAL CIRCULATION

Circulation plays an integral role in the design scheme as it knits the different spaces and narrative together. The circulation is seen as an architectural promenade taking the viewer through different moments that frame time, place, experiences and narratives via movement.

The NARRATIVE of the circulation:

1. The visitor walks from the south-western parking towards a main entrance of the Orientation Hub, reaching a momentary pause between the “seen” experiential pavilions above and the “unseen” Orientation Hub below them. This emphasizes the idea of moving into the site, connecting to the seen landscape and the unseen lifecycle.
2. This leads through to as the circulation route and architectural promenade. With the Orientation Hub to the South and the Interpretation Centre to the North, the visitor is confronted with the beginning and end of the narrative at the same time.
3. The first section of the promenade serves as a landscaping path, making the viewer aware of their surroundings, emphasizing the fynbos landscape.
4. This promenade articulates the connection between the building and the landscaping, almost floating in the air which connects it with the sensitivity of the landscape it hovers over.

MAIN ORIENTATION HUB STRUCTURE

Foundations: The foundation for the concrete columns consist out of a 1000x300mm reinforced concrete pad foundations that are 300 mm deep. 1000x 300 mm reinforced concrete strip foundations are used for the 500mm thick load-bearing walls.

Floor: The interior floors are 85mm reinforced concrete floor slab cast in-situ with a polished finish to reflect natural light in the design. The exterior concrete ramps and walkways uses a coarse texture to make it slip resistant.

Walls and structural columns: 500mm thick stone walls, consisting out of 250mm and smaller limestone rocks from site mixed in with concrete, form the outer shell of the building. 220mm and 110mm load-bearing walls are used in the interior together with 276x261mm steel columns spaced in a grid in the main orientation hub and a separate grid in the restaurant. Fixed, sliding and pivoting glass door facades to north of the reception area, café, toilets, offices and research hub for natural light.

Roof: 100x100mm treated timber beams spaced at 520 CTC are used for the roof structure. These horizontal beams are fixed to 200x200mm perpendicular timber beams spaced at 1200 CTC. These beams are fixed to a 300x300mm perpendicular timber beams spaces at 1500 CTC, which are fixed to perpendicular 400x400mm timber beams, supported by the timber columns and structural walls. The roof structure’s 100x100mm roof beams are fixed to 0.53mm untreated ZINCALUME® kliplock sheeting, that is left to form a natural patina on the exterior.

PAVILIONS STRUCTURE

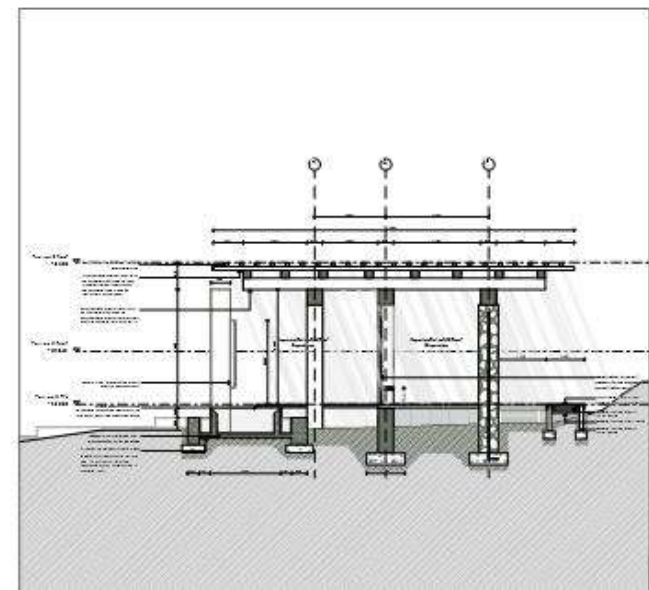
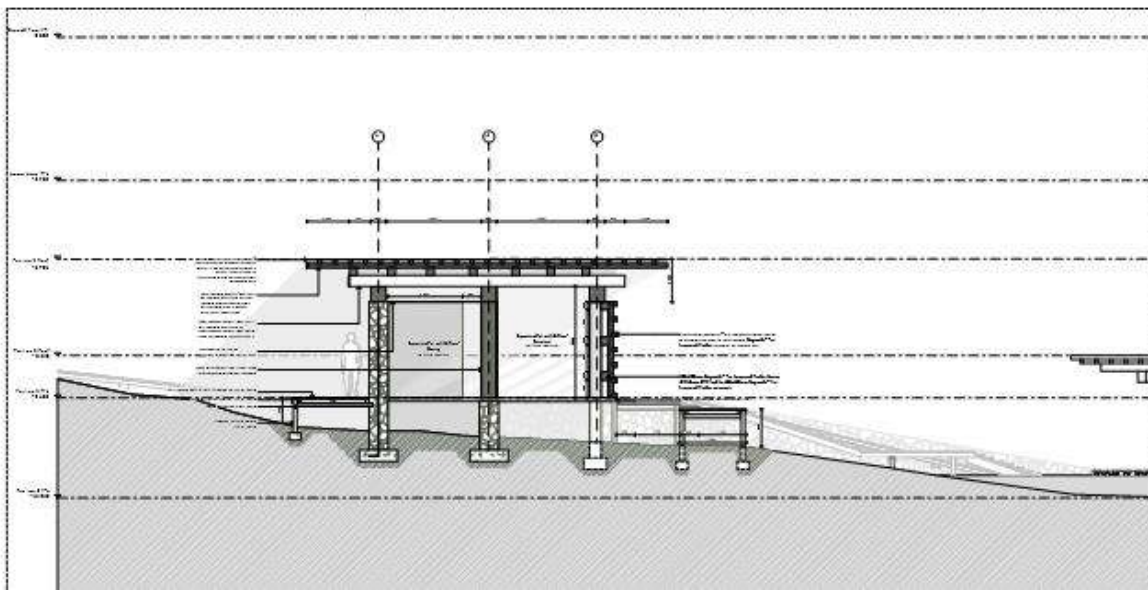
Foundations: All the pavilion structures load-bearing foundation and walkway walls have 1000x300mm Reinforced concrete strip foundations that are 300mm deep.

Foundation walls: Like the load-bearing structure of the Orientation Hub, the pavilions have 500mm thick stone walls, consisting out of 250mm and smaller limestone rocks from site mixed in with structural concrete. These foundation walls support the timber structures of the pavilions. The foundation walls extends to form the structure of the walkways that is very stereotomic in the landscape giving the illusion that it is a thick continuous wall wrapping around the pavilions and limestone outcrops.

Floor: The pavilion floors are 85mm reinforced concrete floor slab cast in-situ with a textured finish for slip resistance. The reflection pond in pavilion 2 comprises out of a 100mm waterproofed reinforced concrete surface bed. The overflow of the reflection pond connects to the concrete gutter to water vegetation within pavilion 3. 32x120mm treated timber decking board is fixed to the reinforced concrete floor slab with 5mm gaps in between the boards for natural ventilation and drainage. These timber panels hover over the reflection pond allowing the visitor to “float” on the pond.

Walls: The foundation walls are extended in the pavilions to become structural walls that are cut in at places to form exhibition boxes. The timber columns and studs in pavilion 1 are clad with corrugated iron panels and insulated with 100mm bulk insulation to create walls.

Roof: 100x100mm treated timber beams spaced at 1000 CTC are used for the roof structure. These horizontal beams are fixed to 200x200mm perpendicular timber beams. These beams are fixed to a 300x300mm timber beams which are fixed to 400x400mm timber beams, supported by the timber columns and structural walls. The roof structure’s 100x100mm roof beams are fixed to 0.53mm untreated ZINCALUME® kliplock sheeting, that is left to form a natural patina on the exterior.



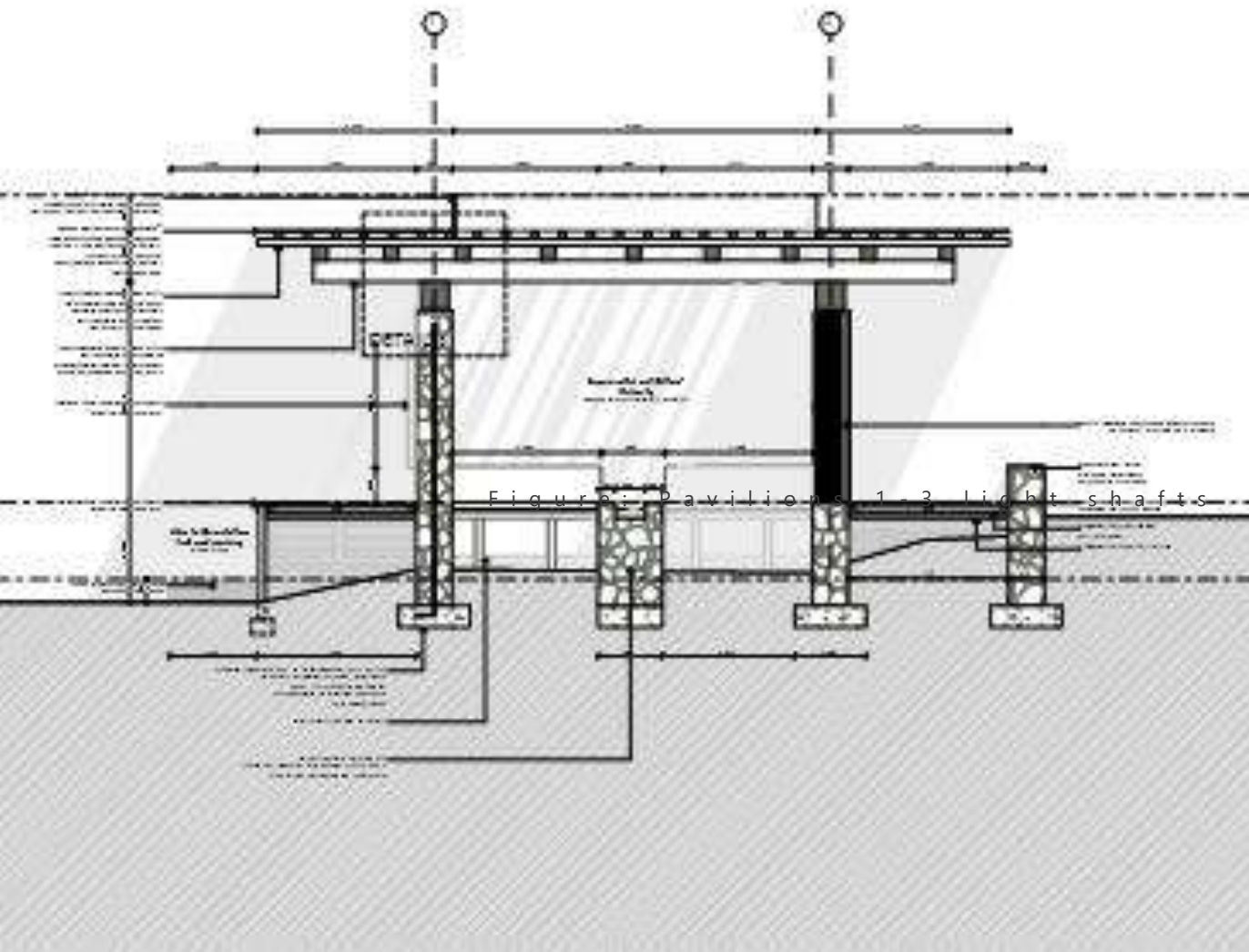
PASSIVE DESIGN STRATEGY

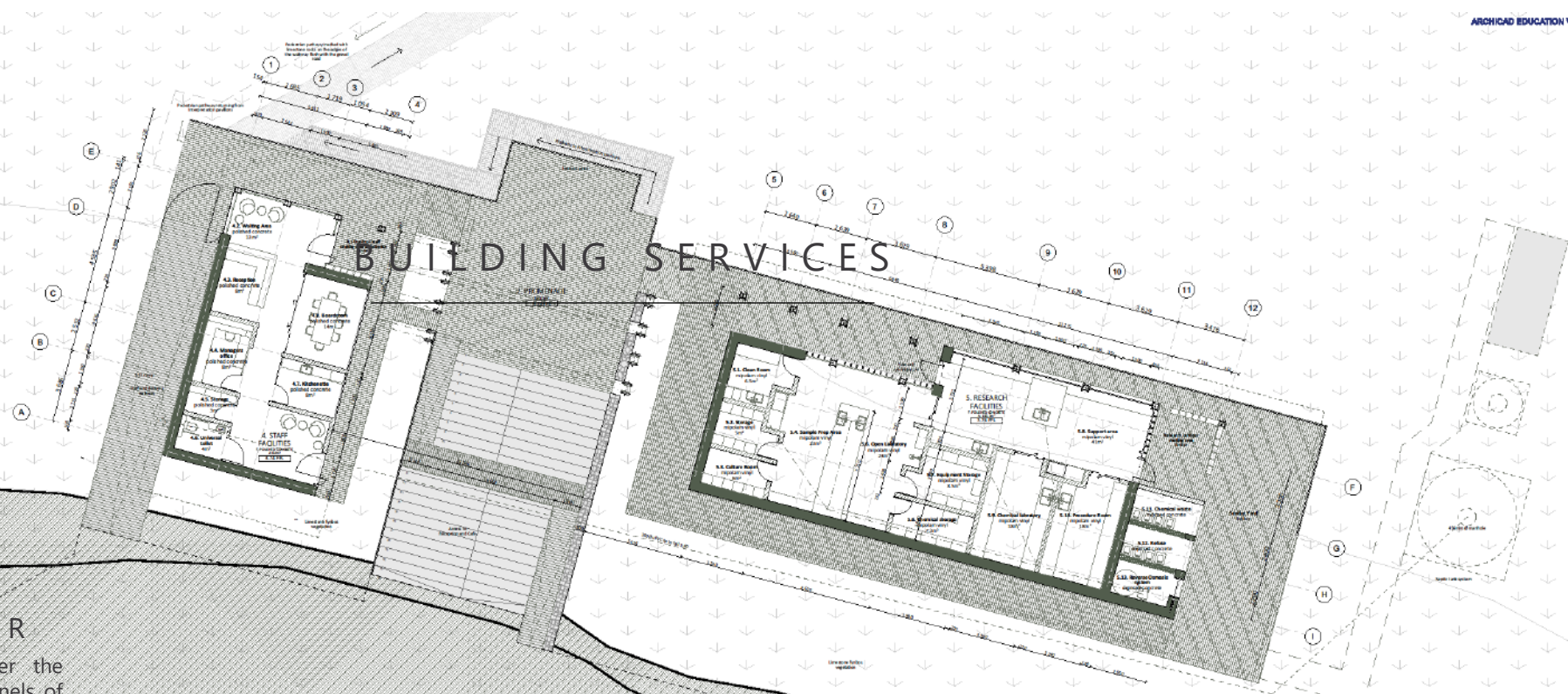
Passive design solutions are used throughout the design to increase the energy efficiency of the building. This minimizes the amount of electricity the design uses, as the design only depends on solar energy.

The orientation of the spaces are north and east to allow in natural light. Light shafts and a northern glazed facade is used in the orientation hub to minimize the use of artificial light. Light shafts and openings are strategically placed in the experiential pavilions to use natural light to create a certain atmosphere in these spaces and emphasize certain moments and narratives. Western exposure is limited while a large part of the southern side is open to allow in indirect southern light.

The materiality of the building further contributes to the passive design strategy. The biomimetic roof and thick concrete and stone walls, create a good thermal mass that naturally regulates the building's temperatures.

Cross ventilation is used to naturally ventilate and cool the spaces especially in the Orientation hub as it blurs the interior and exterior, allowing visitors to experience natural conditions inside.





BUILDING SERVICES

SOLAR POWER

Solar power is used to power the design. 20 north facing solar panels of 1700x1000mm are used to power the main Orientation Hub and Restaurant. They are mounted on the roof of the reception area. The batteries of the solar system are in the reception facilities for easy access and maintenance. 10 north facing solar panels of 2100x1000mm are used to power the research lab and staff facilities. The battery of the solar panels is in the research lab for ease of access and maintenance.

SEWAGE DISPOSAL

There is a municipal sewage connection on site. This connection comes from the small town of Stoffbergfontein, located 1.2 km east of the site, where residents have municipal water and sewage lines.

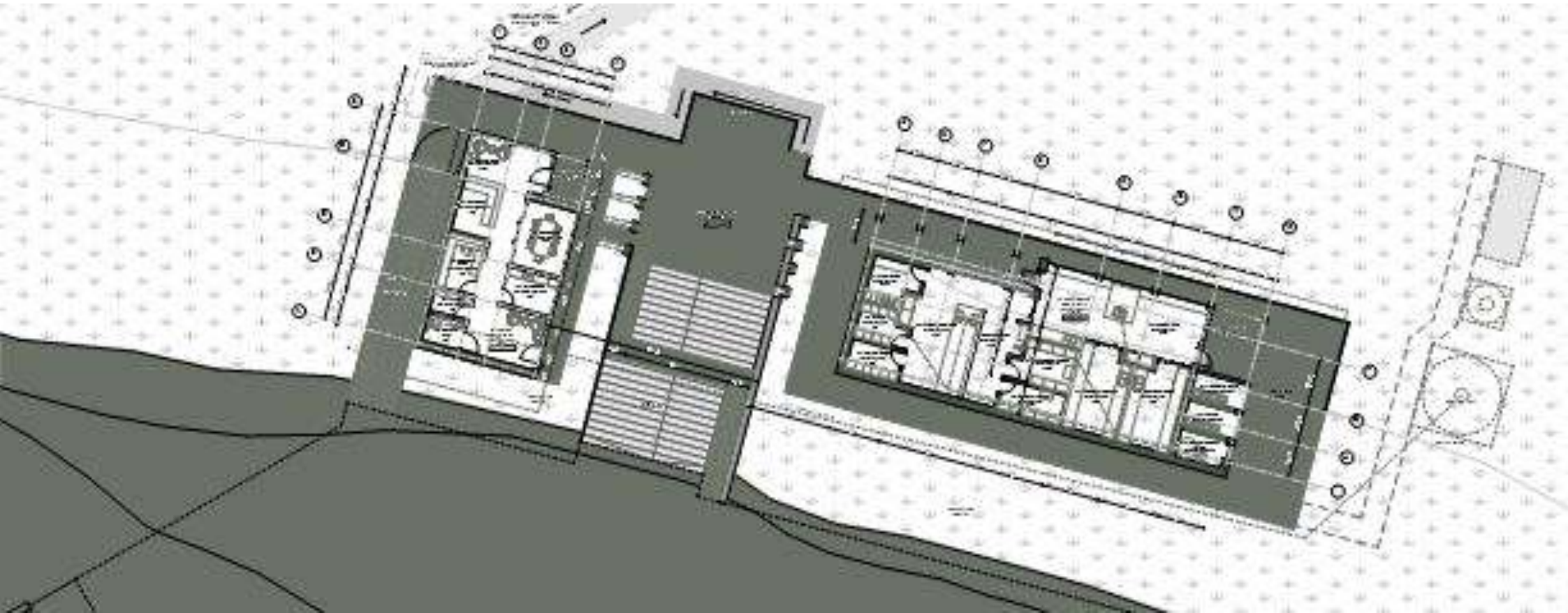
AMAZI ENTABA

Orientation Hub Floor Plan D2 scale: 1:100

The second part of the orientation hub acts as the primary part of the design. This is evident as the primary part of the building is integrated through the main walls and structure. The access points to the Offices and Reception Hub are small and visible, with a private access to the Reception Hub along the western wall of the office area.

The building's waste system is indicated as stars on plan.





GREY WATER SYSTEM

A grey water system is used to irrigate the surrounding landscaping. One of the grey water systems are in the service yard which filters the water from the kitchen and stores it in a JoJo tank. An irrigation system is connected to the JoJo tank for watering the surrounding fynbos. The grey water overflow connects to the sewerage pipes that takes the water to the municipal line. A similar system is used for the toilets where the hand-wash basin water is diverted to the grey water system. This grey water is stored in a JoJo tank which is in the service duct of the restrooms and is re-used for the toilets.

WATER SUPPLY

Water is supplied by the municipality connecting to the water line that runs from Churchhaven. Water is heated by the solar geyser for the kitchen and the staff shower. Storm water is gathered as an alternative water source to make the design more sustainable.

ACCESSIBILITY

Universal access toilets are included in the public and staff toilets that it is accessible to everyone. Due to the steep slope of the site 1:12 ramps are used that everyone can access the functions of the Fynbos Interpretation Centre and experience the hidden narratives of the landscape. Braille is included on all the information panels for the blind together with guided tours. Guided tours through the experiential pavilions for people in wheelchairs are also available to allow easy access through the exhibition spaces. Making the building accessible to everyone becomes very important aspect of the design as it wants to retell the untold narratives of the land, if it is not universally accessible some will never learn and experience these narratives.



CHAPTER 05

EPILOGUE

Answering the Research Question and Final thoughts

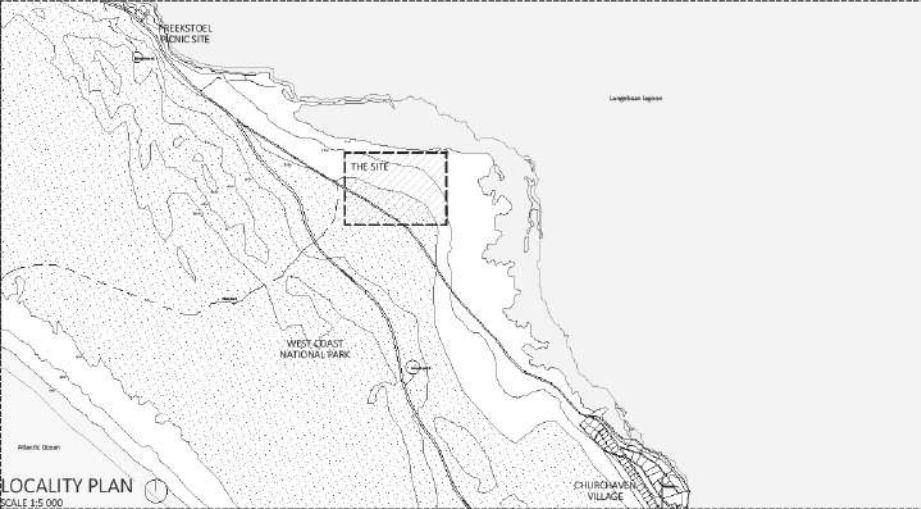
The interpretation and explorations done in the document all works together to in the end answer the research question:

Is it important to employ architecture at all to collect, retell and connect man to nature? OR Is the image of the fynbos landscape, a symbol of interpretation and connection without needing explanation?

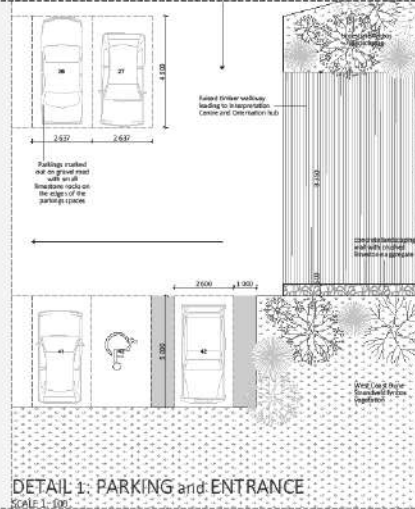
Experiential Biomimetic scenes developed using the organism, behavioural and systematics as a narrating device. Architectural interpretive space retells the narratives that cannot speak for themselves, the life and phases of Fynbos unseen through time and space. The polarities of people and nature are consistently intertwined in the Fynbos Interpretation Centre, creating dual experiences that bridge different phases and times. The experiences are bridged together by an architectural promenade, that takes the viewer through a visual and experiential journey framing and expressing fynbos events. The Fynbos Interpretation Centre ultimately becomes a monument serving as an ode to the hidden narrative hanging between the earth and sky.



SITE PLAN
SCALE 1:500



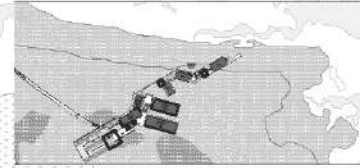
LOCALITY PLAN
SCALE 1:5 000



DETAIL 1: PARKING and ENTRANCE
SCALE 1:100

AMAZI ENTABA

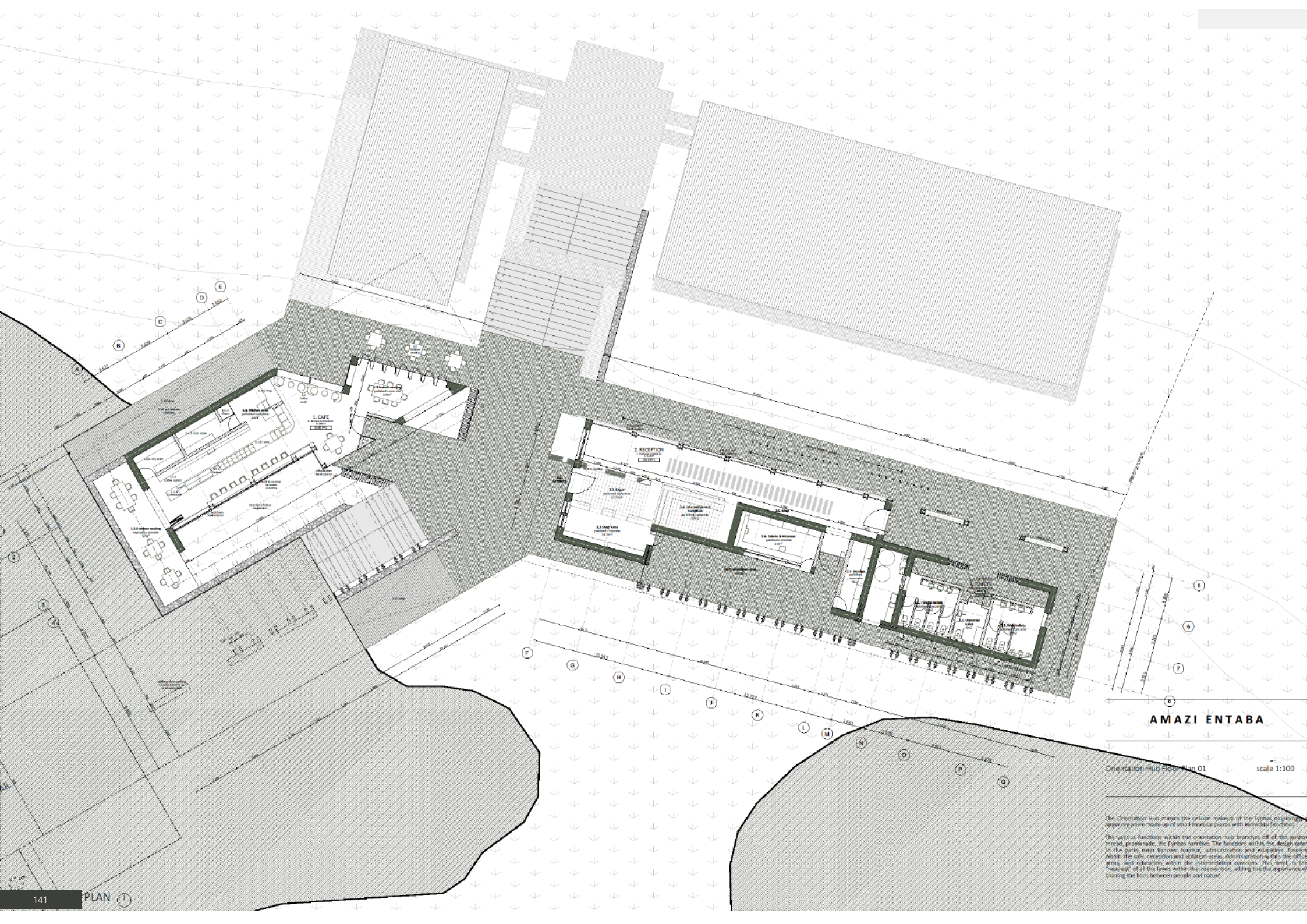
- Site Plan scale 1:500
- Locality Plan scale 1:5 000
- Detail 01: Parking scale 1:100



The site plan indicates the larger plan of the intervention, including parking spaces to site and roof plan. Additionally the site plan indicates the landscape effect on orientation, as the interpretation Center and the pavilions pull towards the dramatic point of the contours pointing towards the West Coast National Park.

The Locality plan indicates how the site is nestled into the "tourism hub" of the park, between the popular lagoon picnic area towards the North-West, and the small local town of Churchman 1.2 km South. This is an important detail as the site is not eligible to be burnt due to the local town's proximity to the site itself.

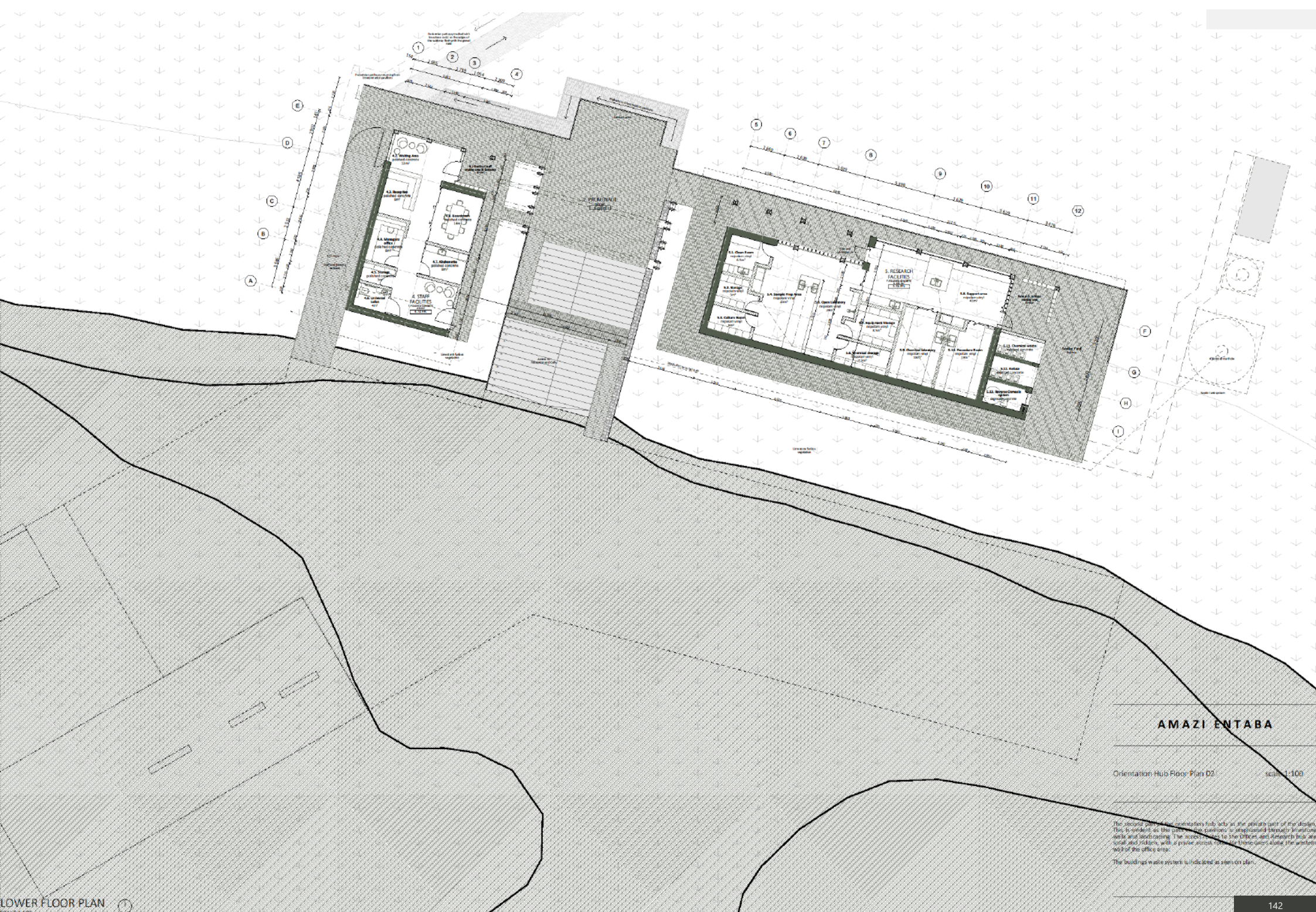
Detail 1, refers to the parking area's sensitive as bays are indicated using limestone rocks on a gravel mat and paved area with painted lines.



AMAZI ENTABA

Orientation Hub Floor Plan 01 scale 1:100

The Orientation Hub marks the cellular nucleus of the Fynbos National Botanical Garden, a large structure made up of small breakout spaces with individual functions. The various functions within the orientation hub branch off of the central transit promenade, the Fynbos narrative. The functions within the design value for the park, entry reception, tourism, administration and education. Located within the cafe, reception and solution areas, Administration within the office areas, and education within the interpretation pavilions. This level is the "nucleus" of all the levels within the orientation, adding the experience of curating the lines between people and nature.

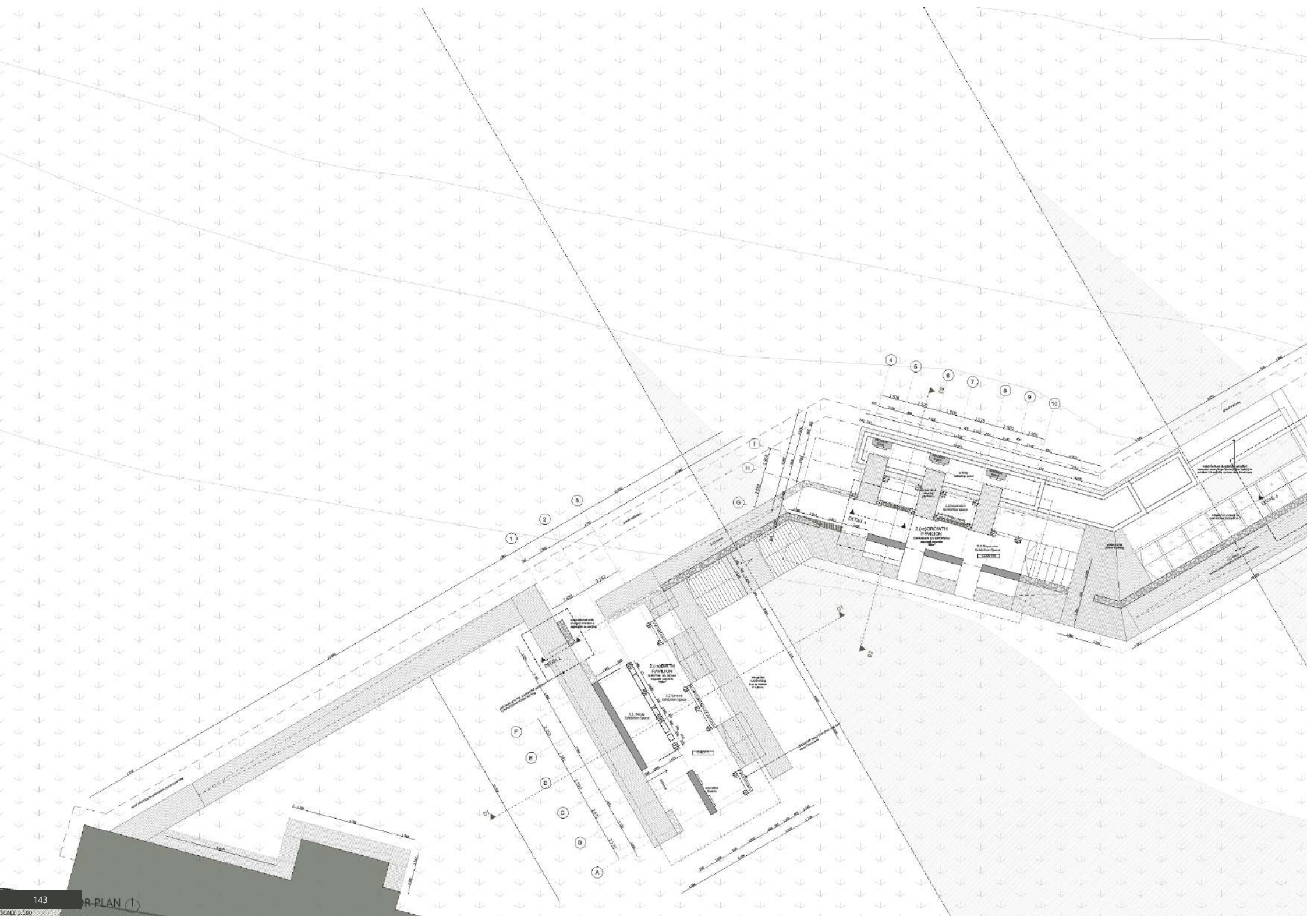


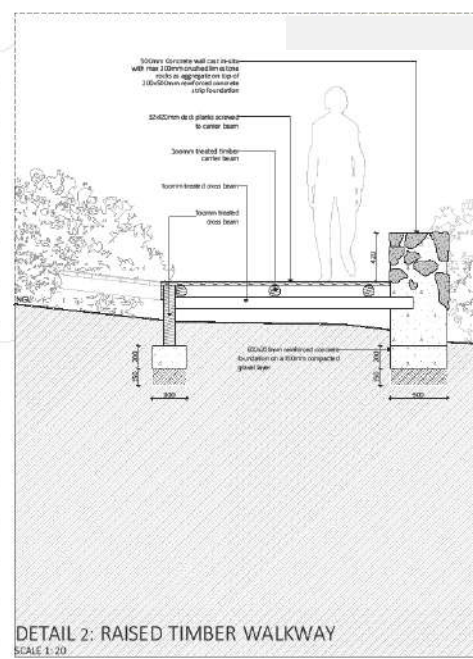
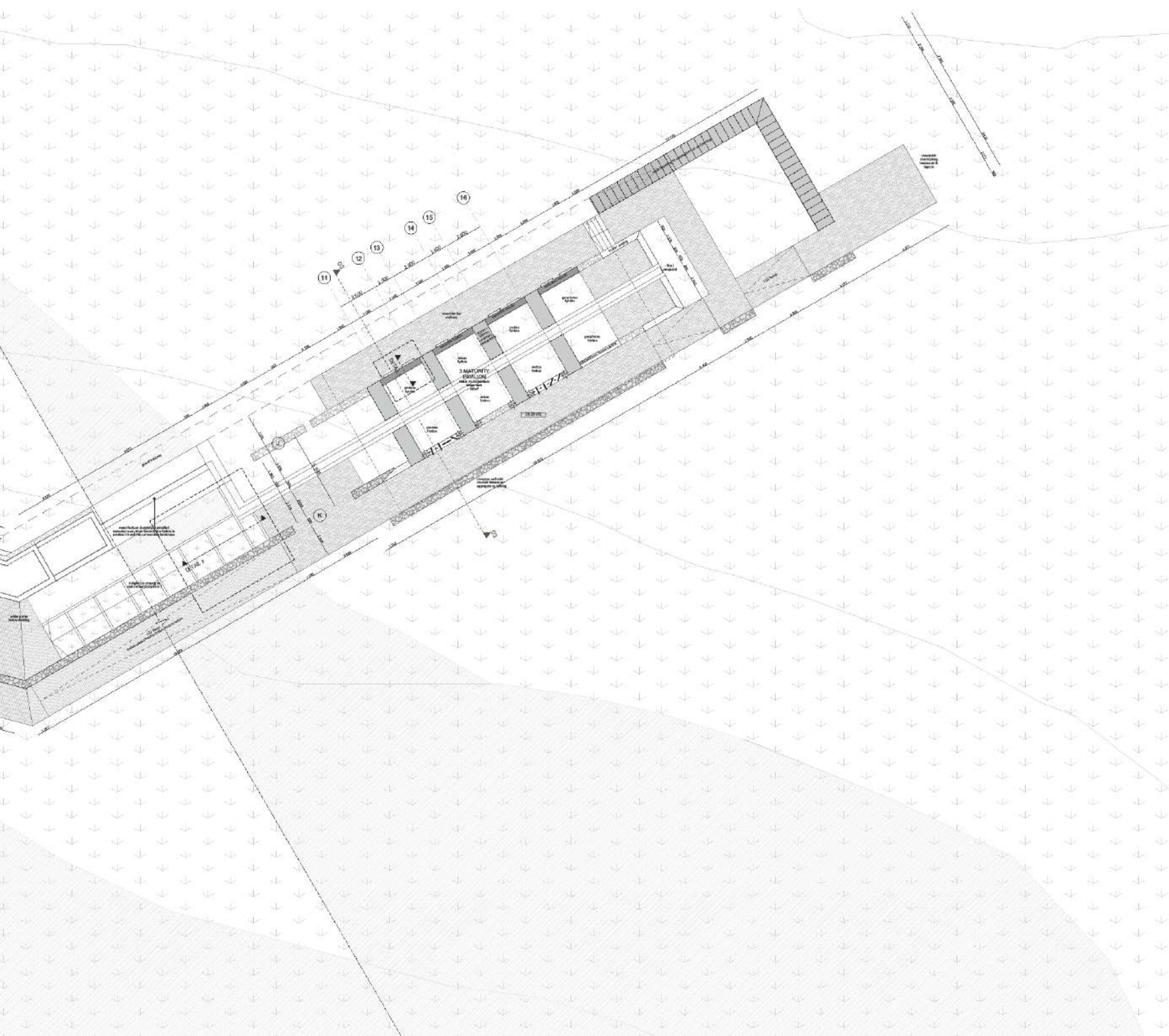
AMAZI ENTABA

Orientation-Hub Floor-Plan D2 scale: 1:100

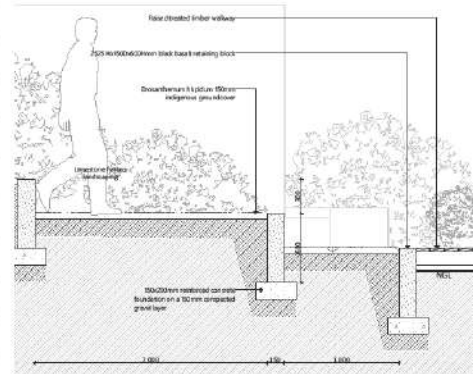
The second part of the orientation hub acts as the private part of the design. This is evident as the pattern of the openings is emphasized through structural walls and landscaping. The access points to the Office and of electricity hubs are small and hidden, with a private access to the three gates along the western wall of the office area.

The building's water system is indicated as seen on plan.





DETAIL 2: RAISED TIMBER WALKWAY
SCALE 1:20



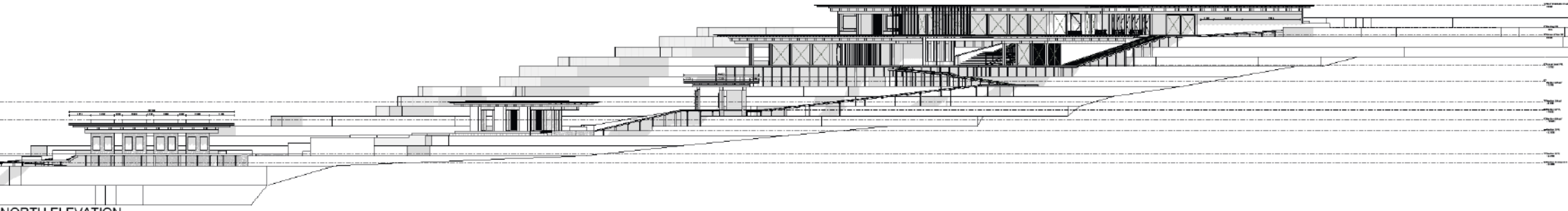
DETAIL 3: TERRACED GRASS STEPS
SCALE 1:20

AMAZI ENTABA

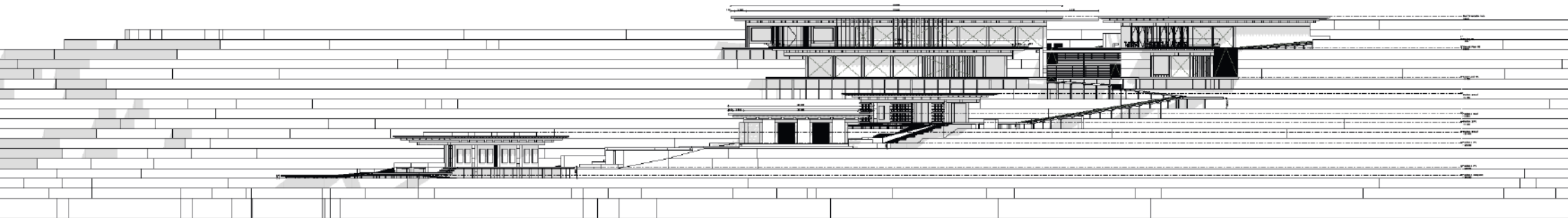
Pavilions Floor Plan	scale 1:100
Detail 02: Raised Timber Walkway	scale 1:20
Detail 03: Landscaped Steps	scale 1:20

The Fybos narrative, made up of three interpretation pavilions along a raised promenade, allows visitors to experience the Fybos narrative on a deeper level. This is achieved through biomimicry of Fybos through the master plan, as stated on the ground floor plan, biomimicry in the systems of Fybos, in the roof and sensitivity to site and through creating material interpretation of the actions of Fybos: Birth, Growth and Maturity.

The promenade is driven by Fybos from the first pavilion guiding the user through to the final lookout point. The promenade grows more tectonic and gives way to Fybos, emphasizing the blurred lines into the narrative of Fybos.



NORTH ELEVATION
SCALE 1:200



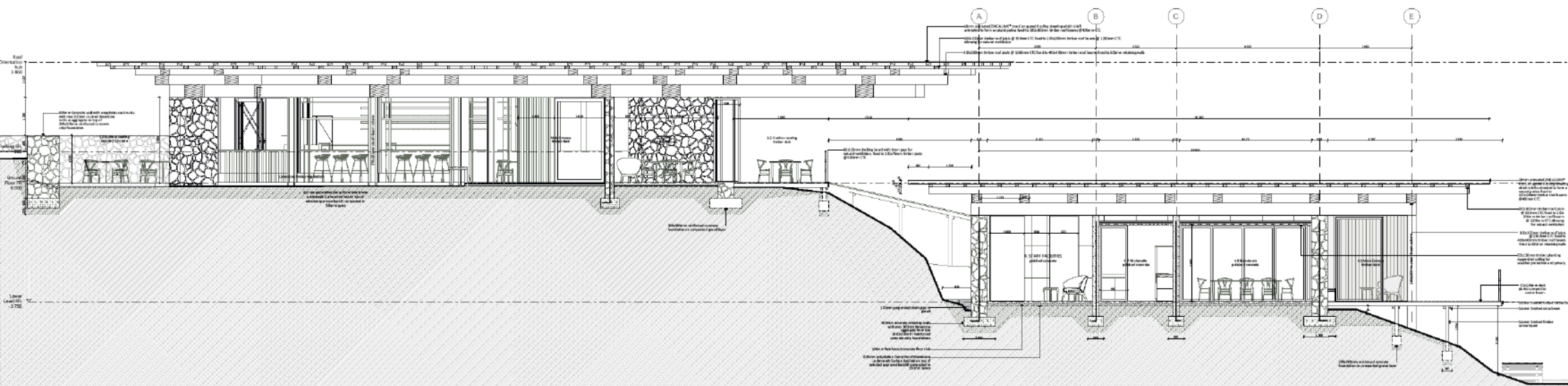
WEST ELEVATION
SCALE 1:200

AMAZI ENTABA

Western Elevation scale 1:200

Northern Elevation scale 1:200

The Elevations speak to how the intervention touches the site. Boardwalks and raised timber walkways are used through the scheme of the park and have become the essence of touching the site lightly within it's context. The language of the design stands throughout the scheme, emphasising form as the hero. Here one can see the pavilions opening throughout the narrative and breaking down the stereotomic elements to something lighter.



SECTION 00
SCALE 1:200

AMAZI ENTABA

Western Elevation scale 1:200

Northern Elevation scale 1:200

The Elevations speak to how the intervention touches the site. Boardwalks and raised timber walkways are used through the scheme of the park and have become the essence of touching the site lightly within its context. The language of the design stands throughout the scheme, emphasising lightness as the hero. Here one can see the pavilions opening throughout the narrative and breaking down the stereotomic elements to something lighter.

ACKNOWLEDGEMENTS

Firstly, I give honour where honour is due, to my First Love, my Father, I thank God for not only revealing my purpose to me but for sustaining me in His strength, creativity and peace. He is the reason I am here, finishing my Masters and fulfilling my purpose of becoming an Architect, all honour and Glory to Jesus.

To Prof J.Smit, P.Smit and Martie for their wisdom and guidance through the last two years, I honour and appreciate you both.

Jac, Jaqui and JJ de Kock, for your continued prayers, financial and emotion support through the last few years. Thank you for cheering me on even through the trying times.

Prof. J. Noble, J. Wasserfall and A. Louw for taking the time out of your busy schedules to attend and examine my masters dissertation. I honour you.

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A Fynbos Interpretation Centre with in West Coast National Park to

reiterate the Fynbos narrative & bridge harmony between humans &

nature through architectural intervention

