UNIVERSITY OF THE FREE STATE
SCHOOL OF ARCHITECTURE

MArch

MArch Design Thesis 2023

Transmission of Affect

A Land Based Integrated Multi-tropic Aquaculture Farm and Tourism Development

2023
JODIA STEENKAMP (2017164779)

ACKNOWLEDGEMENTS

This design thesis is submitted in partial fulfillment of the requirements for the Masters degree in Architecture (MArch). All the work contained in this document is my own except where otherwise acknowledged. Department of Architecture, Faculty of Natural and Agricultural Sciences, University of the Free State.

Jodia Steenkamp l 2017164779 l jodiasteen@gmail.com

Supervisors:
Prof. J, Smit / P. Smit / J. Nel

Date of submission:
October 2023

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.

ACKNOWLEDGEMENTS

Index

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS

Thank You

to The ***Giver of Life***, family and friends

for your love, guidance, and endless support throughout the years leading up to this.

ACKNOWLEDGEMENTS

00

Preface

PREFACE

Abstract

Life-winds of Nama-kwa: A Land Based Integrated Multi-trophic Aquaculture Farm and Tourism Development

Keywords: Transmission of Affect, Life-winds, Aquaculture, Post-industrial, Architectural Atmospheres

By countering typical remediation and breathing new life into a post-industrial site - through the reformation of its socio-economic amenities and marine terrestrial environment, a poetic act of countering a period of *abbau*, 'the unbuilding of the world' has surfaced in the form of an aquacultural and tourism development that embodies the moving *life-winds* known among indigenous communities and the site. Therefore, the research for the Development leads to ask - how may a strategically embodied architectural approach of *affect*[1] reconnect the transmission, absorption, and anchoring of the coastal town's hidden ecological *life-winds* by leveraging atmospheric configurations, multi-sensory maritime embodiments, and unearthed hidden terrains amidst a post-company showpiece? Locally, there have been past efforts to redress unemployment and rehabilitate the severely disturbed coastline caused by open-cast mining but seldom have been successful in addressing the three interlinked life-winds, and which aptly represent the Nama Khoi Municipality, which translates as putting 'people first'. The Development, as a response, is informed by both One Health and indigenous ques, both of which emphasise the interlinked *life-winds* - ecological, animal, and human well-being. The Development therefore seeks to reinforce these principles by taking an interdisciplinary and experiential architectural approach - with the site, building and programme - that promotes biodiversity, ecological conservation, and community participation. Counted as an *Operation Phakisa* (meaning 'hurry up') project, this research provides a hopeful glimpse into how an urgent act of reactivation would positively *affect* the derelict mining town of Kleinzee and unearth a west coast identity expressed through a set of *life-winds*.

[1]Affect - is usually a verb meaning "to produce an effect upon"
Effect - is usually a noun meaning "a change that results when something is done or happens

PREFACE

The Northern Cape, with its stark yet mesmerizing landscapes and resilient communities, has long been a place of intrigue and potential. This design investigation delves into the heart of this captivating region, driven by a profound appreciation for its people and the untapped possibilities it holds. Despite a history marked by industrial exploitation, there lies within the Namaqualand ‘dorpies’ a hidden wealth waiting to be unearthed, much like precious gems forged under immense pressure. Among these communities, Kleinzee, once a thriving diamond mining town, stands at a crossroads, facing an uncertain future. However, it also presents an opportunity—a chance to revitalize and reshape the destiny of this coastal haven. This proposal envisions a Land-based Integrated Multi-trophic Aquacultural (IMTA) Farm & tourism Development on Farm 654 Portion 1, near Kleinzee, leveraging collaboration between the Ocean’s Economy in South Africa and the Nama Khoi Municipality. This initiative, championed by Diamond Coast Aquaculture (DCA), seeks to stimulate rural development and harness the region’s natural beauty, breathing new life into a landscape scarred by past mining endeavours. In this endeavour, we embark on a journey to reconnect with the land, its hidden treasures, and its winds of change, ultimately fostering a sustainable future for Kleinzee and its surroundings.

01

Future Prospect[ing]
Analysing a wounded landscape

FUTURE PROSPECT[ING]

1.1 Introduction

This design investigation is rooted in a sincere and personal appreciation for the Northern Cape - its barren yet captivating landscapes and coastlines; its people, the real diamonds of the west coast and the stories they tell; as well as the promising prospects the area holds in offering significant potential for rural development (Massie, Hutchings and Clark 2018, #) despite the industrial plunder they may have experienced.

During a visit to the Northern Cape, I could not help but be struck by the harsh yet humble communities, their unique idiosyncrasies and how they survive their respective harsh and isolated localities. Yet, despite the difficulties they continue to endure, there is clear evidence of the 'hidden' and 'rich' deposits in each of the numerous Namaqualand 'dorpies' (small towns) scattered along the western coastline of South Africa—a true depiction of how beauty is 'unearthed' from immense pressure.

Once a flourishing diamond mining town situated on land previously owned and mined by the DeBeers Group, the Namakwa coastal town Kleinzee now faces an uncertain future (Stilwell, 2011: online). Countering typical fates of similar 'mining disturbances', Kleinzee was declared a public town to the Nama Khoi Municipality, which means 'people first', where the town now has a potential future of promising prospects in offering significant potential for rural development and attracting tourists to the coastal community situated along the 'shipwreck and daisies route'.

In searching for an appropriate solution that may begin to reverse a period of *abbau*, the 'unbuilding of the world', in other words, the evils written upon the site - the following proposal explores the potential of a **Land-based Integrated Multi-trophic Aquacultural (IMTA) Farm & Tourism Development** on Farm 654 Portion 1, near the historically known coastal 'company town', Kleinzee in the Northern Cape.

Hypothetically, the development builds upon existing aquacultural and future facilities proposed for the site and acts as a collaborative venture between the Ocean's Economy in South Africa and the Nama Khoi Municipality.

Funded by the primary client, Diamond Coast Aquaculture (DCA) - an Operation Phakisa project under the Ocean's Economy in South Africa, in coalition with the Nama Khoi Municipality and various subsidiary departments within the South African government, the development facilitates the culturing, growing, and harvesting of multi-trophic marine species for:

+ Rural development within the Nama Khoi Municipality, to address national key priority areas such as poverty, crime, and unemployment - an urgency stressed by Operation Phakisa, meaning "hurry up" in Sesotho.
+ Tourism
+ The purpose is poetically reclaiming, reframing, and countering the limitations of typical remediation of the site's already disturbed ecology by unearthing a new identity.

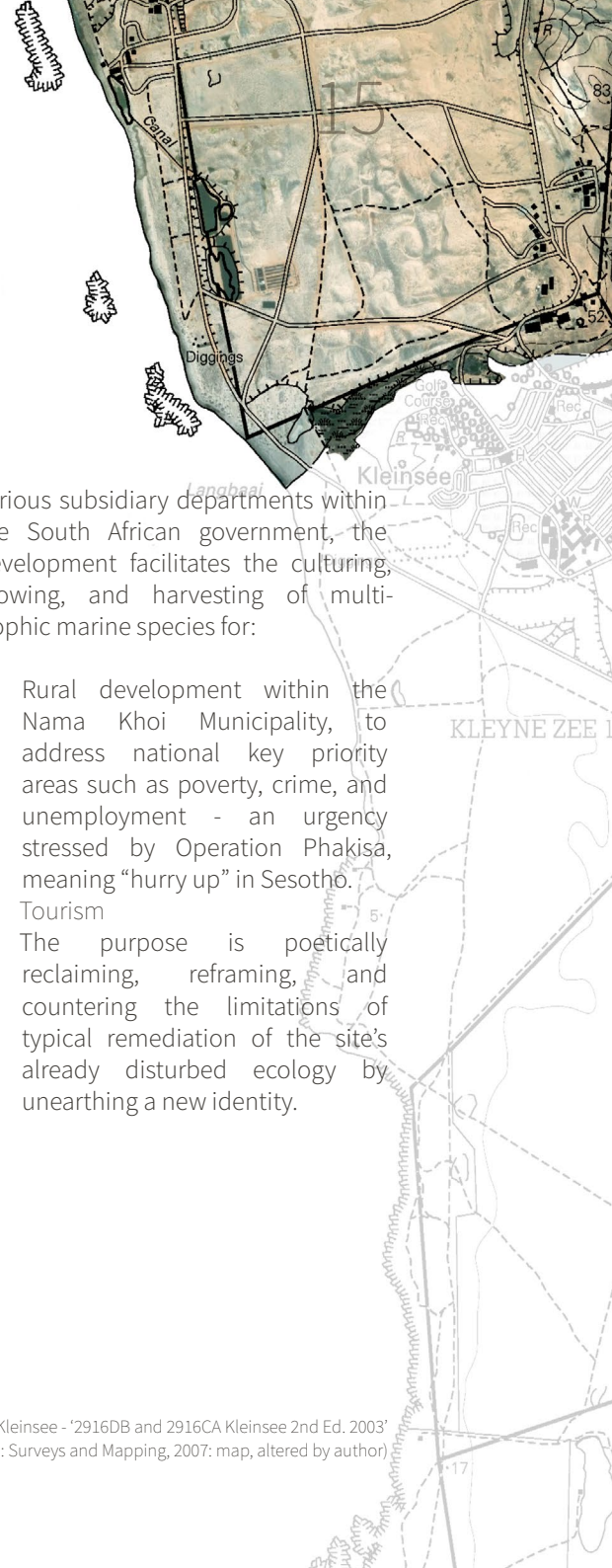


Figure 1. An area map of Kleinsee - '2916DB and 2916CA Kleinsee 2nd Ed. 2003' (Chief Directorate: Surveys and Mapping, 2007: map, altered by author)

FUTURE PROSPECT[ING]

Title

Towards a transmission of affect that reconnects the hidden coastal ecological life-winds amidst a mining-disturbance

Sub-title

a Land-based integrated multi-trophic aquaculture and tourism development in Kleinzee, Northern Cape

Implied question(s)

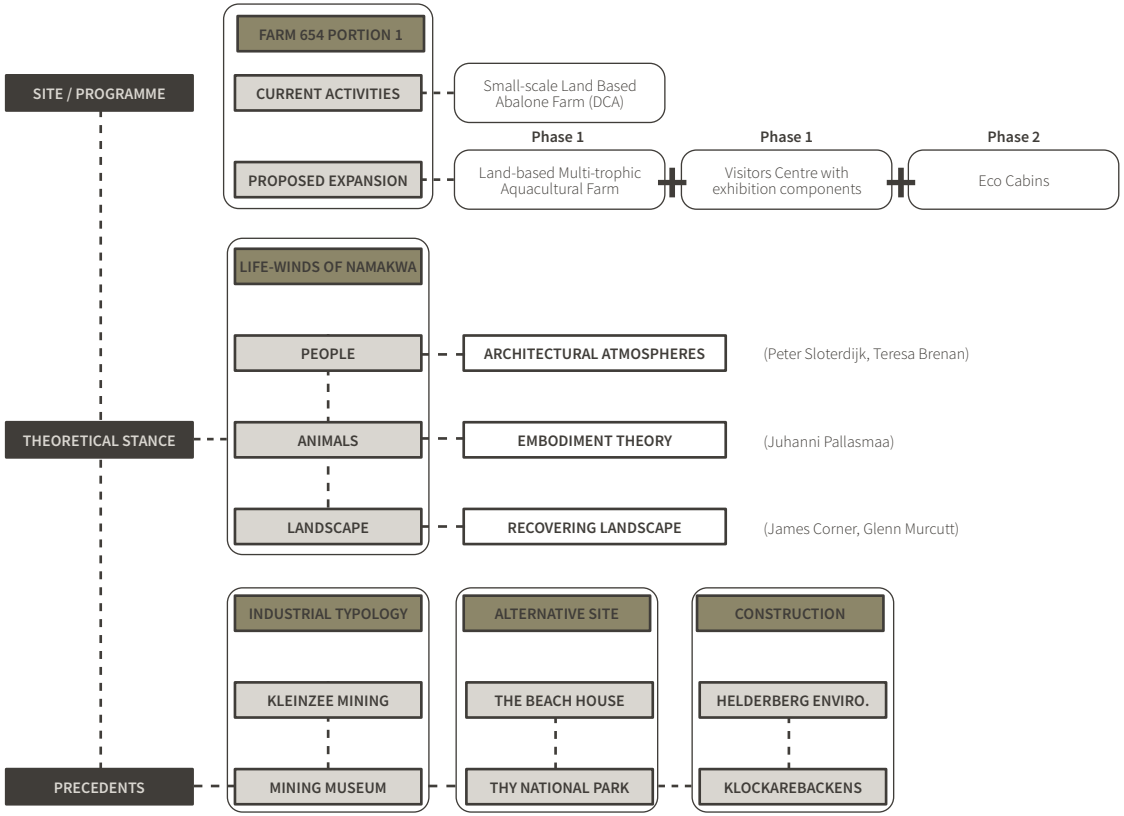
Can architecture sensitively promote and embody hidden identities unearthed?
(Insert)

Research tool(s)

Historical and cognitive site analysis;
Conceptual exploration(s);
Analysis, interpretation and synthesis of theoretical notions and precedents are employed in the design research and creative design development.

FUTURE PROSPECT[ING]

1.2 **Influent Overview**



FUTURE PROSPECT[ING]

1.3 Conceptual Beginnings

In the early stages of the brief and conceptual development, it was confirmed that the site needed to service the surrounding local and regional communities while poetically reclaiming, reframing, and countering the limitations of typical remediation of the site's disturbed ecology (Wennerstrom 2021). An instrumental point of departure was Chris Low's findings on wind and historical and recent Khoisan ethnography, including investigating how those cultures relate to it (Low 2007, s71). In reference to the One Health principles [design theories], coupled with the widespread belief among indigenous communities – that animals, plants, and people are born or given specific transferable characteristics; essentially, their *life-wind* linked to their form - the proposal looks towards the notion of potency, movement, and anchoring (possession) of form, or *life-wind*, and the shared qualities between these entities. This is an expression of the 'Khoi' and San people's belief in how wind moves through and anchors within the body (Low 2007, s80), which is congruent to Teresa Brennan's musings of how the atmosphere or environment gets into the individual (Böhme, et al. 2014, 61). This project, as a response to this belief, asks why this *Transmission of Affect* or possession of *life-wind(s)* cannot transfer to architectural atmospheres and tectonics, how they are experienced – or even strategically produced when considering Gernot Böhme's argument around the politically motivated design of atmospheres (Böhme, et al. 2014, 61).

The following section aims through the lens of three different and manufactured *life-winds* and the *Transmission of Affect* provided by Australian philosopher Teresa Brennan and German philosopher Peter Sloterdijk, to further unpack the effects of three key theoretical themes, namely architectural atmospheres, power, and the senses; embodiment theory; and the recovery of landscapes in conjunction with their respective *life-winds.*

With a brief recap of the research problem and question, the following sections attempt to rethink the architectural problem and reimagine, with the aid of specific architectural and indigenous cues on *life-winds*, a unique strategy and appropriate solution to correct the disturbed coastal environment in Kleinzee is presented.

FUTURE PROSPECT[ING]

FUTURE PROSPECT[ING]

Research Inquiry
1.4 Undoing a Period of '*Abbau*'

Fundamentally, the wind is tied to the phenomenon of life, and part of the broader Khoisan belief holds the perspective that when the wind blows, it is God who is breathing [life]; but what if the site, intended to hold the Development, reveals that it is in a state of serious illness? It is believed among Khoisan healers that to address that illness, they plead with God for the return of that *life-wind* from which strength is derived. (Low 2007, s78).

However, there does not seem to be a clear idea of why the illness originating from [life]winds stagnating, sticking, or being depleted. However, the sickness is attributed to the inappropriate movement of the 'wind' (Low 2007, s78). There is no illusion that the site is known for the inappropriate movement of its terrestrial biodiversity.

Two overarching issues this project aims to strategically address through the implementation of **Land-based Integrated Multi-trophic Aquacultural (IMTA) Farm & Tourism Development** – including redressing unemployment within the derelict mining town, Kleinzee, and the surrounding marginalised coastal communities, as well as the **loss of the environment** and its subsequent **west coast identity** (*life-winds*) due to the harmful impacts of its past mining activities. Consequently, after De Beers closed its mining operations, by the end of 2011, the nearshore coastal town of Kleinzee was declared by many as a 'ghost town' (SAHO, 2003: online), with its population dwindling from 7000 to 1000 inhabitants over the years. This 100-year period of *abbau*, 'the unbuilding of the world' (Carstens 2001, 3), subsequently resulted in the near 'draining' of the site's *life-wind*. Its strength, therefore, invited a reactivation (reimagining) of this post-company showpiece (Carstens 2001)

But what does that reactivation look like? The marine environment status quo will be maintained if the development does not go ahead. However, socio-economic needs would then not be realised. (Pallasma 2011, 429). This led to the question of what an appropriate intervention would be if it is to blow wind through the area, thus giving the **site**, its **communities**, and **ecology** – life.

Research Question

Expanding upon the issues identified as the driving causes necessitating intervention at the site, the following question is proposed that needs an answer regarding the course of the site's development. This inquiry aims to guide the architectural design process and question some assumptions concerning landscape recovery and architectural atmospheres' production.

How may a strategically embodied architectural approach of *affect* reconnect the transmission, absorption, and anchoring of the coastal town's hidden ecological *life-winds* by leveraging atmo[*spheric*] configurations, multi-sensory maritime embodiments, and unearthed hidden terrains amidst a post-company showpiece?

FUTURE PROSPECT[ING]

Theoretical Underpinnings
Research Question

[Title] **The Transmission of Affect**
[Sub-title] an Aqua[cultural] Development for the Nama-kwa and sojourners on the archetypal mining disturbance in Kleinzee

[RQ]...

How may a **strategically embodied** architectural approach of affect **reconnect** the **transmission**, **absorption**, and **anchoring** of the coastal town's hidden ecological *life-winds* by **leveraging atmo[spheric] configurations**, **multi-sensory maritime embodiments**, and **unearthed hidden terrains** amidst a post-company showpiece.

FUTURE PROSPECT[ING]

Formulating the brief
1.5 Client's Needs and Desires

The main objective is to expand upon the current aquaculture activities on-site and reframe the post-industrial landscape in Kleinzee into an innovative socio-cultural agent that will serve as a functional multi-trophic aquacultural development for marine food growth and production, as well as provide a public education component.

Upon their arrival at the site, visitors will receive insights into its historical context and the opportunity to engage with its aquacultural initiatives while strolling along a bio-secure promenade.

"An architectural promenade derives from Le Corbusier and his idea of a controlled sequenced journey through a building that can act as an architectural device" (Kretzer 2021).

Another key objective of the programme aims to reconnect the user, infrastructure, and reclaimed environment in a poetic yet strategically controlled manner, thus configuring spaces that serve as vehicles of influence that, strategically and positively, through the senses, affect and govern behaviours and experiences through physical interventions.

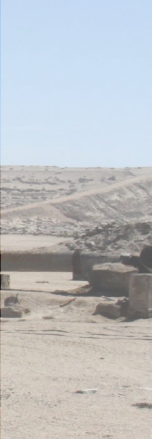
The intention behind the development's programme, building design, and structural and material choices is to remain functional and environmentally conscious while focusing on research and education that benefits the community and revitalises an already scarred ecology.

Ultimately, the development hopes to breathe life back into the area through responsible material use, strongly emphasising passive design interventions to achieve optimal thermal performance. The design will draw inspiration from One Health design principles, which leverage the interconnectedness among ecological, human, and animal health by sharing affinity with 'biophilic design principles'.

Its objective is to encourage human engagement with the natural environment, achieved through direct and indirect interactions with nature, in addition to spatial and contextual considerations. The development's design aims to form a nexus between humans and the environment.

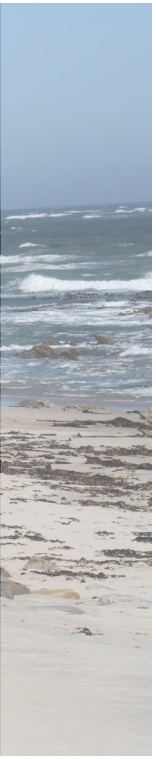
Figure 2. **Post-industrial** - *site visit views on Farm 654 Portion 1* (author, 2023)

FUTURE PROSPECT[ING]



Diamond Coast Aquaculture (DCA)

The Primary Clients' Ideals



Initially established as a joint venture with De Beers, DCA was formed as part of the exit policy and social responsibility project for the local community in an area where De Beers engaged in mining operations since 1922 under the approval of the Department of Minerals and Energy (Massie, Hutchings and Clark 2018, 395). DCA, now owns and holds the environmental authorisation and aquaculture rights for this land, forms part of Operation Phakisa ("*phakisa*" meaning "hurry up" in Sesotho) under the Ocean's Economy in South Africa (Massie, Hutchings and Clark 2018, 408), which represents a new spirit of moving faster in meeting the government's targets. The initiation of such an operation arose from recognition of the vast ocean surrounding South Africa and how the immense potential of this untapped resource has not been fully taken advantage of (Massie, Hutchings and Clark 2018, 27). Feasibility studies of aquaculture indicate that South Africa's aquaculture sector has high growth potential due to an increasing demand for fish in the face of declining fish stocks in the ocean. International demand for South African abalone is currently not met by production, and there is much opportunity for growth (Massie, Hutchings and Clark 2018, 19). With a keen focus on providing employment opportunities for the local and regional communities, the client comprises a coalition between DCA and the Nama Khoi Municipality. Other subsidiary partners such as the Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Environmental Affairs and Tourism (DEAT) are instrumental in meeting the aims set by the South African government for implementing priority economic and social programmes better, faster, and more effectively (Massie, Hutchings and Clark 2018, 408).

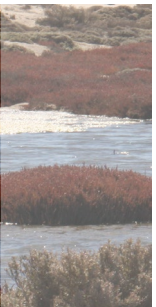
Considering the extensively mined and profoundly disturbed condition of Kleinzee, the project's proposed facilities aim to address the outcomes of an external assessment carried out in 2018 by Anchor Environmental Consultants. This evaluation declared the site suitable for select land use types, especially aquaculture.

The current aquaculture activities operated by DCA on Farm 654 Portion 1 near Kleinzee have approximately:

+ 50 staff working on the farm and
+ An annual production capacity of
+ 150 tonnes (t) of abalone and,
+ 200 tonnes of seaweed in an environmentally smart integrated multi-trophic aquaculture (IMTA) system.

This means that seaweed (*ulva*) grown in abalone effluent is used as feed for the growing abalone (Massie, Hutchings and Clark 2018, 3).
DCA, however, intends to expand its annual production capacity to:

+ 1000 tonnes of abalone;
+ 2000 tonnes of finfish;
+ 5000 tonnes of seaweed;
+ 300 tonnes of oysters, sea urchins and or/ sea cucumbers; and
+ Erect several wind turbines on the site to produce 660kW per turbine (approximately 97 hectares).



The planned upgrades to the existing facilities will no doubt diversify production and significantly increase production volumes, and as a result, increase the total number of people working on the farm to approximately 300. The potential environmental impacts on the marine environment resulting from the increase in the volume of effluent water discharged are mitigated as far as possible through the IMTA system, as shown in (Ref. Technical Report: Systems)
(Massie, Hutchings and Clark 2018, 4).

FUTURE PROSPECT[ING]

Spatial Programme Requirements
1.6 Response to the Client's Needs and Desires

In collaboration with DCA, the Nama Khoi Municipality and subsidiary governmental departments unite to form the Aquaculture and Tourism Development at Kleinzee. Upon investigation, the requirements set out in the Environmental Impact Assessment (EIA) specified that the expansion of the facility would require the construction of new production infrastructure, buildings to accommodate staff facilities, as well as upgrades and additions of service infrastructure such as pump houses, solar dams, and wastewater systems (effluent outfalls, and several septic tanks and trickling filter systems).

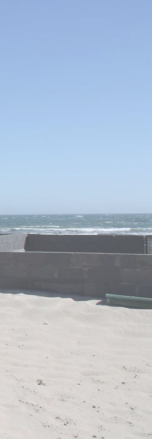
The spatial and programmatic requirements respond to the demand of South Africa's aquacultural sector, and the EIA executed upon request of the client:

+ Production facility includes Hatcheries, Nurseries and Grow-out infrastructure that support the various stages and operations for the intensive commercial production of select multi-trophic species.
+ A processing facility for processing canned shellfish, fish filleting and freezing.
+ An operations facility for researchers and management of the entire set of on-site operations.
+ A visitors' centre and short-term eco-bungalows (phase 2) for tours along the Shipwreck and Daisy Coast Route in collaboration with the Nama Khoi Municipality and the DEAT.

Reference the Technical Report for a more in-depth study of the spatial requirements for the above facilities

Figure 3.
Pump House -
exisiting infrastructure
(author, 2023)

Figure 4.
Abalone Raceways -
exisiting infrastructure
(author, 2023)



FUTURE PROSPECT[ING]

Aquaculture - Production

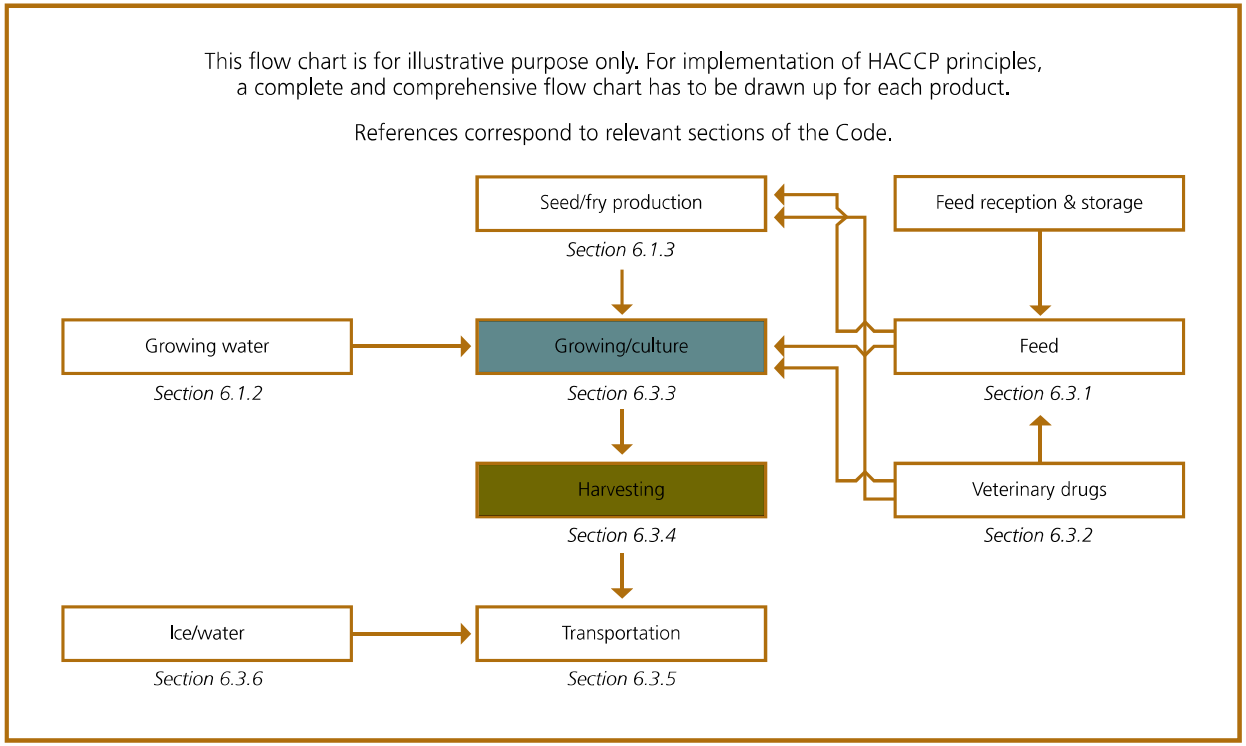


Figure 5. *Example of a flow chart for aquaculture production* (WHO and FAO, 2009: 37)

FUTURE PROSPECT[ING]

1.7

Programme Summery

Early Stage Development

Visitors Centre

+ Reception & Foyer
+ Administration
+ Exhibition (memory)
+ Shop
+ Public Toilets
+ Restaurant
+ Kitchen (industrial size)
+ Deliveries Port
+ Disposal Area
+ Visitors & Staff Parking
+ Storage

Hatchery
Production: Grow & Culture

+ Administration offices
+ **Hatchery** (*Grow/Culture Stage*)
+ Broodstock Holding
+ Live Feed Culture Facilities
+ Breeding & Larval Rearing Facilities
+ Laboratories
+ Nursery Rearing Facilities
+ Grow-out Raceways
+ Feed & Chemical Storage
+ Deliveries Port
+ Disposal Area
+ Visitors & Staff Parking
+ Workshops
+ Staff facilities

Administration

+ Reception & Foyer
+ Administration
+ Exhibition Hall
+ Research Laboratories
+ Reference Room
+ Staff Lounge
+ Staff Kitchenette
+ Visitors & Staff Parking
+ Offices
+ Workshops
+ Training Room
+ Multi-media Room
+ Conference Room
+ Server Room
+ Storage
+ WC

Processing: Cannery

+ Reception & Foyer
+ Administration
+ Dispatch Port
+ Disposal Area
+ Visitors & Staff Parking
+ Production Warehouse
+ Purge Room
+ Courtyard
+ Offices
+ Research Laboratories
+ Meeting Room
+ Medical Room
+ Staff Room
+ Workshops
+ Storage
+ WC

FUTURE PROSPECT[ING]

Micellaneous

+ Pump House (*seawater Intake*)
+ Water Storage (*solar dams*)
+ Water Treatment & Storage
+ Aeration Facilities (*"Blow-House"*)
+ Plant Room
+ Seaweed (ulva) Baths (*expansion*)
+ Integrated Multi-trophic (IMTA) System
+ Wastewater Treatment (*septic tank & trickling filter system*)

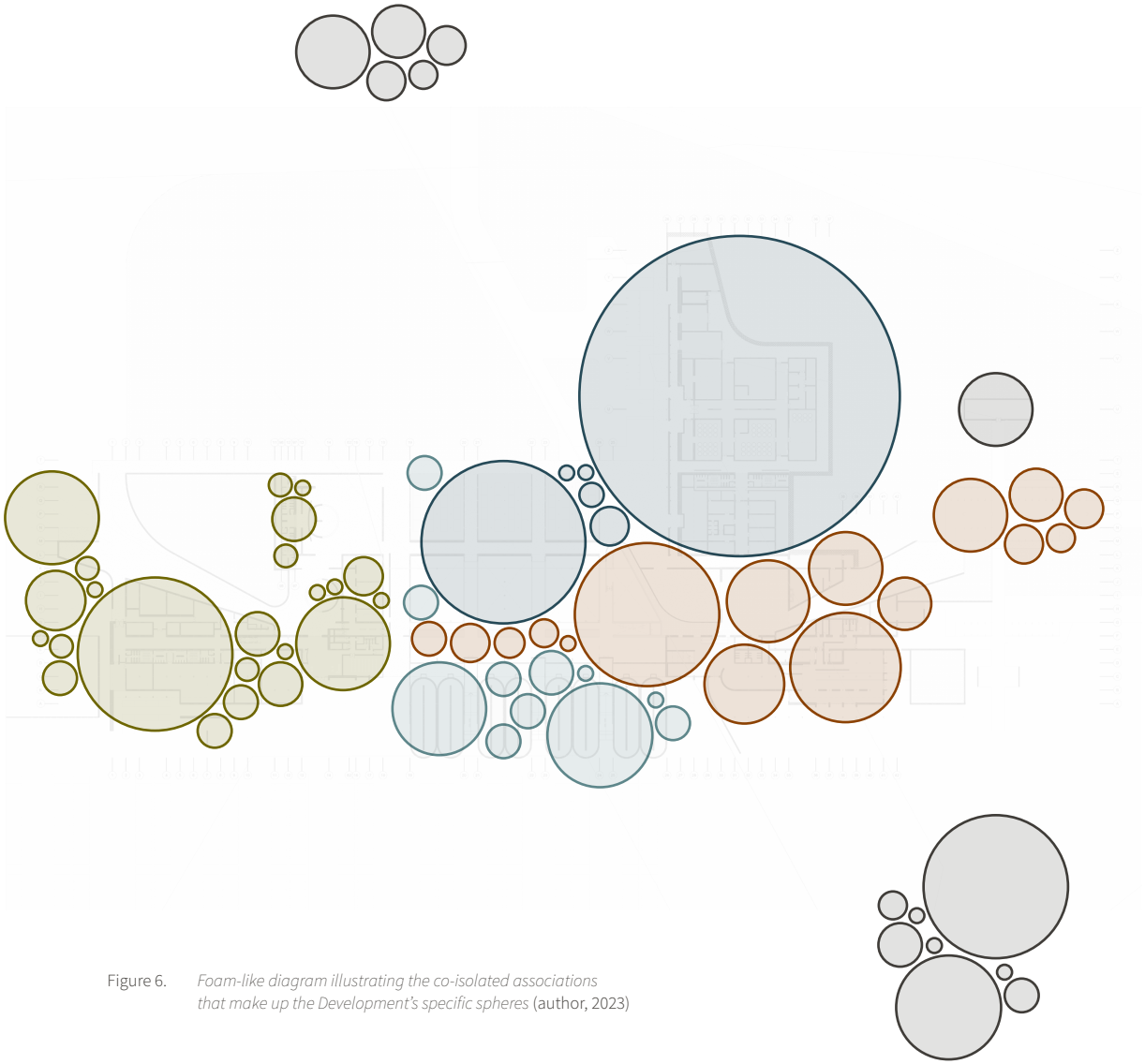


Figure 6. *Foam-like diagram illustrating the co-isolated associations that make up the Development's specific spheres* (author, 2023)

FUTURE PROSPECT[ING]

1.8

Users

A-typical Personnel Requirements

Visitors Centre

+ Information Desk Attendant (1)
+ Retail Manager/Shop Attendant (1)
+ Restaurant Manager/Owner (1)
+ Chef (1)
+ Line Cooks (2)
+ Kitchen Helper (Dishwasher) (1)
+ Server/Waitstaff (5)
+ Cashier/Host (1)
+ Prep Cook (2)
+ Bartender (1)
+ Cleaner/Janitor (1)

total
17 persons

Hatchery
Production: Grow & Culture

+ Unit Manager (2) - *Hatchery & Nursery*
+ Fish Veterinarian (1)
+ Feed Manager (1) Nutritionist
+ Water Quality Technician (1)
+ Harvest Manager (1)
+ Quality Control Inspector (1)
+ Aquaculture Engineer (1)
+ Maintenance Staff (4)
+ Fish Farm Workers (#)
+ Seasonal Marine Field Worker (#)
+ Breeding Specialist (1)
+ Algae Cultivation Specialist (2)
+ Fish Biologist (2)

total
17+ persons

Administration

+ Farm Director (1)
+ Farm Manager (1)
+ Assistant Manager (1)
+ HR Manager (1)
+ Sales and Marketing Manager (1)
+ Administrative Personnel (4)
+ Logistics Coordinator (1)
+ Fish Biologist (2)

total
12 persons

Processing: Cannery

+ Production Manager (1)
+ Quality Control Inspector (1)
+ Machine Operator (1)
+ Maintenance Technician (1)
+ Packaging Operator (1)
+ Food Safety Specialist (1)
+ Supply Chain Coordinator (1)
+ Lab Technician (1)
+ Production Planner (1)
+ Production Worker (#)

total
9+ persons

FUTURE PROSPECT[ING]

Micellaneous

+ Aquaculture Educator (1)
+ Environ. Compliance Officer (1)
+ Waste Management Specialist (1)
+ IT Specialist (1)
+ Safety Manager (1) (First Aid)
+ Compliance Officer (1)
+ Biosecurity Officer (2)
+ Sanitation Crew (4)
+ Equipment Operator (3)

total
14 persons

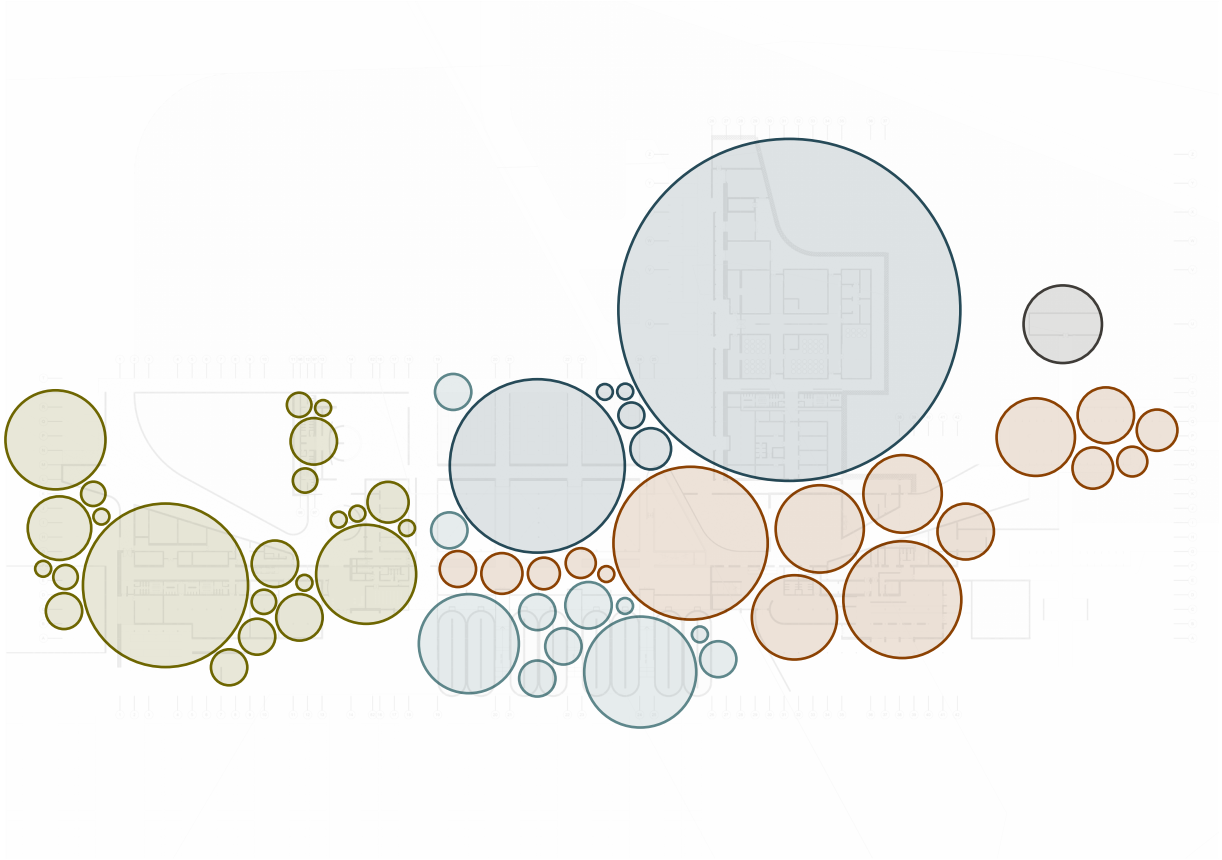


Figure 7. *Foam-like diagram illustrating the co-isolated associations that make up the Development's specific spheres* (author, 2023)

FUTURE PROSPECT[ING]

Precedents
1.9 Overview

A
Mining and Minerals Museum
/ Glenn Murcutt, 1987-89 (unbuilt)

Figure 8. Mining and Minerals Museum in Broken Hill (Bleuscape Design, 2014: online)

B
The Beach House
/ Design Workshop, 2008

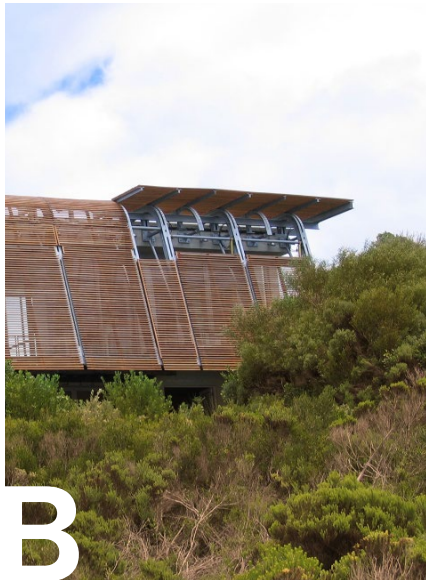


Figure 9. The Beach House in Pletenberg Bay (de Beer 2009, 362-363)

C
The National Park Visitor's Centre
/ LOOP Architects, 2021

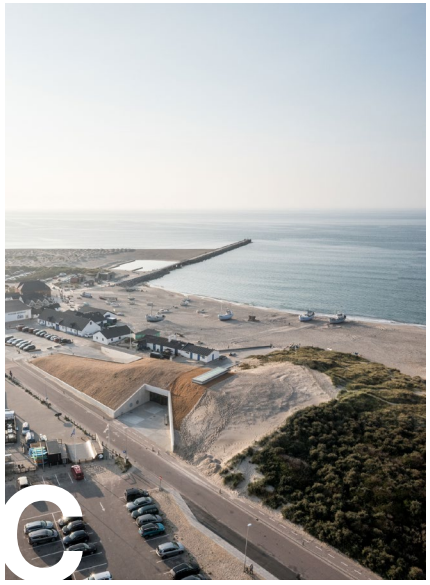


Figure 10. The National Park Visitor's Centre (Pintos, 2021: online)

FUTURE PROSPECT[ING]

D
Environmental Centre
/ Ebesa Architects, 2021

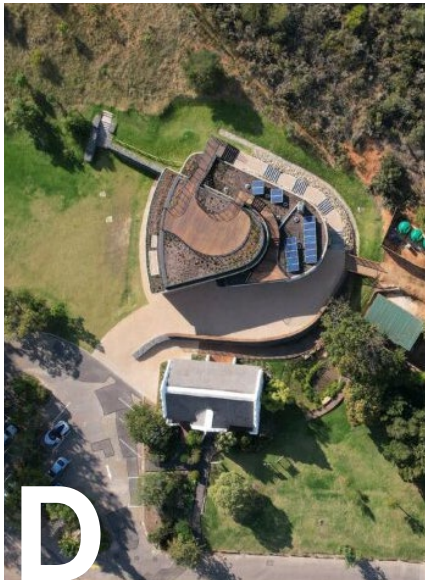


Figure 11. Helderberg Nature Reserves Environ. Centre in Cape Town (Scape, 2021: online)

E
Klockarebackens Funeral Chapel
/ Bernt Nyberg, 1972

Figure 12. Klockarebackens Funeral Chapel in Höör (Hall, 2022: online)

F
Central Library TU Delft
/ Mecanoo Architects, 1989

Figure 13. TU Delft Central Library in Delf (Mecanoo architecten, n.d.: online)

G
Mining and Minerals Museum
/ Glenn Murcutt, 1987-89 (unbuilt)

Figure 14. Mining and Minerals Museum in Broken Hil (Murcutt, 1992: online)

1.10 Conclusion

In conclusion, the explorations found throughout this research, of the potential for a **Land-based Integrated Multi-trophic Aquacultural (IMTA) Farm & Tourism Development** in the Northern Cape, begins to unveil a profound narrative of transformation and renewal. The story of Kleinzee, once a diamond mining town, reflects the resilience of communities and the promise of rebirth amid adversity. Delving into the intricate details, it becomes evident that the vision transcends mere economic development. It's a holistic endeavor that encapsulates the spirit of the land, its people, and its ecological treasures. Through the collaboration of DCA, the Nama Khoi Municipality, and various governmental entities, the effort of the Development aspires to alleviate poverty, combat unemployment, and restore the fragile coastal environment.

This initiative embraces the wisdom of indigenous cultures, recognising the interconnectedness of all life forms and the importance of the winds of change. By strategically embodying fostering the hidden potentials unearthed, and embracing our responsibility as stewards of the environment, we aspire to breathe life back into Kleinzee, while preserving its natural splendour. Throughout this journey, are attempts to correct the ecological imbalances and redefine the essence of Kleinzee—a place where prosperity, culture, and nature converge harmoniously. The future of this region lies not only in the 'riches' hidden beneath the earth but also in the sustainable opportunities that lie above it. With the vision set, the next chapter, *Unbuilding of the World: Site Analysis of a Wounded Landscape*, delves deeper into understanding the challenges and opportunities that await in Kleinzee's unique terrain.

Figure 15.
Flamingos - *1 of 176 bird species recorded*
(author, 2023)

Figure 16.
Signs of Hope - *signs of rehabillitation*
(author, 2023)

02

Unbuilding of the world
Analysing a Wounded Landscape

In the realm of site analysis, the following chapter explores the ‘wounded landscape’ in Kleinzee, South Africa, aiming to understand the complex interplay between its various parts. Kleinzee, once a thriving diamond mining town on the Atlantic coast of the Northern Cape Province, now bears the scars of closed De Beers’ operations and open-cast diamond mining. The chapter starts with an overview of Kleinzee’s arid coastal geography, showcasing unique ecosystems like the Buffels River estuary, a hub for birdlife and a significant seal colony. Examining Kleinzee’s history, thereafter, reveals its industrial character imposed by the diamond mining industry. Moving forward, the focus shifts to Farm 654 Portion 1, housing an aquaculture facility with expansion plans. An environmental impact assessment examines potential consequences, including marine ecology, biodiversity, avifauna, socioeconomic aspects, and heritage. The aim is to unearth the hidden potential within the landscape, weaving together processes, patterns, and artful interventions that may shape a more inclusive, multiplicitous, and harmonious coexistence between nature, industry, and community.

UNBUILDING OF THE WORLD

2.1 A Macro-analysis and Overview

2.1.1 The Wounded Landscape

Kleinzee is located in the Northern Cape Province on the Atlantic coast, roughly 600 kilometres from Cape Town. If one follows the course of the Skaap River, which merges with the Buffels River that ultimately feeds the estuary on its way to the sea, one will encounter the Namaqualand '*dorpie*' (small town) Kleinzee. Typical of *Nama-kwa*, it is an area characterised by gently rolling topography with few prominent hills. A few low rocky outcrops occur in places, and occasional deflations and dunes are evident. Vegetation is generally low and sparse, making visibility excellent (Savannah Environmental 2012, 2).

Set along the Atlantic coastline, Kleinzee was once one of many thriving diamond mining towns until De Beers closed its mining operations. Despite the rapid disintegration of industry, the hugely abundant bird life at the Buffels River estuary at Kleinzee attracts birders. At the same time, the huge seal colony just north of the beach, with around 350,000 animals right on the beach – the largest on-land colony in the country – is an added attraction. Open-cast mining for alluvial diamonds severely disturbed the biodiversity at the proposed development site during the last 100 years.

The vegetation and, therefore, the habitat for faunal communities is either impossible to protect or has been recovering very slowly, even in areas netted to assist rehabilitation. Recommendations have been made to avoid the dune area fringing the Buffels River estuary and to keep impacts on the dunes parallel to the coast to a minimum.

Furthermore, a relatively small flat area in the very north of the site has recovered comparatively well and has been earmarked as a 'green space' by DCA and will not be developed. Successful rehabilitation depends on many factors, and areas in the vicinity of Kleinzee show much higher rehabilitation success when compared to the proposed development site.

Note: Prospective visitors need a permit to gain access to the site as it is still regarded as a diamond-restricted area.

Figure 17. An area map of Kleinsee - '2916DB and 2916CA Kleinsee 2nd Ed. 2003' (Chief Directorate: Surveys and Mapping, 2007: map, altered by author)

i) Macro-analysis

i) Macro-analysis

2.1.2 History of Kleinzee

De Beers, Kleinzee and the control of a town

(Carstens, 2001)

1685 Govenor led **prospecting expedition** to *Nama-kwa* to pioneer Euoropean involvement in the industry / Marking advent of **wag labour** - transforming **subsitence farmers** to part farmer and **migrant labourers**

1840s **Copper mined commercially** – gave rise to secondary industries / Growth of **transportation systems** - better roads and a railway connecting O'kiep and copper mines with Port Nolloth / **Postal services** expanded – a crude telegraph system established

1910 **Union of SA constituded** (*Nama-kwa* was not well known)

Aug. **1925** **Discovery Of Aluvial Diamonds** In *Nama-kwa* - found near the mouth of the Kamma River, south of Port Nolloth, by Jack Carstens / Prospectors and land owners lost mining rights to the **power wielded by large businsess and corporate elites** in the industrial world. Who outmaneuvered the pick- and-shovel pioneers.

End **1925** **Coalition** between Harry Saunders Cartsens and George Scott Ronaldson / Agree to buy up all coastal farms from Oubeep south to Hondeklipbaai and beyond if necessary.

1926 **Discovery of Diamonds on Kleinzee** farm near the mouth of Buffels Rivers (*Oom Jan Kotze the owner of the farm*) - Kleinzee farm was 1,058 morgen – later acquired, along with other Namaqualand properties as an enormous asset for De Beers**.**

1927 Chester Beatty's Consolidated and African Selection Trust Company(CAST) (UK) acquired 50% in George Scott Ronaldson syndicate.

1927 Oppenheimer and Ronaldson enter negotiations – buys 50% of interests in properties (£30 000) and with 10% bought from CASTs Beatty - held a 60% majority – **led to much conflict and controversy** – law courts.

1928 Ronaldson (*Kimberley business man*) sells his half share to **Cape Coast Exploration Ltd.** (newly formed company) established by **Ernest Oppenheimer** in 1928 (*Anglo American Corp.*)

1928 Oppenheimer establishes a new company - **Cape Coast Exploration Ltd.** - which now owned 27 properties; 166 000 acres and expanding- p**reparing the way for De Beers Consolidated Mines**.

Oct 1928 Cape Coast **upgraded Kleinzee's mining technology** & **improved living conditions** of its workforce despite reluctancy, they were compelled to satisfy State's mining working conditions.

1929 Oppenheimer knighted, **reestablished the monopoly of the diamond industry**.

Mar 1929 **Construction began** – a difficult undertaking / used stone foundation and mudbricks from site, whereas other other materials and supplies shipped from Cape by steamer.

1930-50 **Most operations in full swing – 235 men employed** (*1930*) / **Kleinzee refered to as "The Camp"** – to keep insiders in and outsiders out / **Workers completely subordinate to management** or as long as contracts lasted / Numbers change in Kleinzee / Est.of new buildings, sport facilities, security, women employed.

Design **"Crystal Palace"** – the name given by management to the large 12 window **corrugated-iron construction** built at workers insistence - **to create a wind shield**.

Mar **1930** **Constructon Notice -** washing plant & pulsator completed / first cocopan ascended ramp with gravel from mining area into crusher / Began the process of mechanically extracted diamonds / Average of 1000 loads per day 26000 loads monthly / New technology brought 6,867 - 13, 574 loads per month

1928-32 **Peak of town** - never more than 260 people who lived there / 165 white contracted workers at Kleinzee / total of 551 **white labourers**, largely from **Namaqualand and adjacent districts** (6 month contracts) / Contracted workers wage averaged 15 pounds 4 shillings.

1926-49 The coloureds were involved with the alluvial diamond industry from the very early prospecting days – employed as pick-and-shovel laborers, water carriers, cooks, messengers etc.

Jun **1932** **1ST Closure of Mines** – 2yrs after completion of the town due to e**ffects of the great depression** / Drop in the diamond market forced the company to announce suspension of mining operations in Kleinzee / By July, 29 men to maintain – 50 people living in town – c**ut off from the rest of the world for 5 years**.

1937 **The Mine reopens again** - 50% of the original workforce / Poverty continues in the region / Many people out of work

1938 **2ND Closure of Mines – everyone left** - from drillers and blasters; truckmen, blacksmiths, diggers; trammers; haulage men; trommel workers and feeders from washing plant; jig operators and gravitators from pulsator; lorry drivers; cooks; washermen and cleaners / **Only 47 people left in Kleinzee**

1940s Song titled **Don't fence me in**" adopted by white emplyees as theme to depict there feeling of "**fenced-in-ness**" / Security became an issue during war years – **everyone - x-ray** (incl. coloured) – posed a political problem as separate ent. had to be built – resentment built up (*"onder die ligte gaan"*).

Dec **1941** **De Beer bought entire capital share of Cape Coast** (*voluntary liquidation*) / Connection to Kimberly meant the arrival of Kimberley people (a*rtisans and apprentices*).

1943 **Mining operations started again slowly** / Management decided "**blackout" Kleinzee due to war**.

1943 Decision by De Beers to **employ black South-West Africans** at Kleinzee as a result of failure to recruit sufficient numbers of white workers after the preceding closure. Strongly in favor of it because it was **cheaper and it had already proven successful** at Consolidated Diamond Mines **in Oranjemund**.

1945 **Company requests administrator of South West Africa** (*now Namibia*) for permission to **recruit 300 Ovamboland workers** (*repatriated in 1949 by Administraor, later replaced by coloured Namaqualanders in 1950*) – whites paid off end of 1945.

1950 **All Owambo workers repatriated** and 264 new coloured **workers recruited from various districts of Namaqualand** / Steinkopf, Concordia (*74%*); Komaggas, Leliefontein and Richtersveld (*9%*); Townsmen from O'kiep, Nababeep, Springbok and Port Nolloth (*17%*).

1951 **Leisure activities diversified** – younger men enjoyed soccer – more than half the coloureds had no interest in sport, but preferred reading – compound library only had 200 books – Afrikaans the language that everyone spoke.

1958 430 black workers at Keinzee with more recruited annually as **mining operations expanded**.

1961 Coloured workers earning much better wages – **being rewarded for long service** and because their qualifications and skills were being recognized / No longer doing pick-and-shovel work / Many skilled and semiskilled jobs taken over by coloureds / Relationships were therefore not good because of competition.

1961 354 Coloured workers employed by De Beers - **Paterson Band system** designed to order everyone employed by the company in a **hierarchy based on assumed decision-making capability**. Everyone arranged in a rigid system of differentiation based on occupation and status – being paid accordingly.

1970s **Better housing** for qualified coloured emplyees / De Beers makes significant **improvements in wage and salary structures** / Introduction of the **Paterson system helped remove some of the extreme discrepancies** between earnings based on race and ethnicity, but resulted in rigid differentiations.

1979 **New Mining Technology** - the earth-moving and loading fleet at Kleinzee included low-bowl scrapers, bulldozers, dump-trucks, front-end-loaders and hydraulic excavators.

1980s Following the lead of Anglo American, De Beers decided to **abolish racial discrimination** in work, housing and play.

1982 **The dragline** (*able to strip 11.5 million tonnes of earth a year*) was put into service.

1993 **De Beers Namaqualand Mines employed 2,409 people -** 1,805 of them involved in the Buffels Marine Complex based in Kleinzee - 576 in the Koinhgaas Complex and 28 in the Buffels Inland Complex at Langhoote / **It took a massive building program to accommodate this multi-occupational workforce** /

1993 **De Beers created a modern, suburban-type town in South African semidesert -** upgraded shopping facilities, medical and recreational facilities, schooling had to be provided, banking and postal services / acceptable water and sewage systems, roads, walkways, new security measures, with barbed and razor wire.

1993 **Discrimination against the coloureds and blacks continued**
nearly 19% of the 2,409 employees were classified as black, 61% as coloured and nearly 20% as white.

2000 **Diamond production dropped radically**

2009 **Downscaling of Mining operations – population reduced considerably.**

2011 **Diamond Coast Aquaculture** (previously Really Useful Investments No 72 (Pty) Ltd or RUI) was initially e**stablished as a joint venture with De Beers** / A company formed as part of the exit policy and social responsibility project for the local community in an area.

Figure 18. **White Pick-and-shovel Workers** - *excavating at the east face* (Carstens, 2001: 90)

UNBUILDING OF THE WORLD

2.1.3 Industrial Heritage

Kleinzee Town and Mining Facilities

It is no secret that the diamond mining industry (Figure 19) has scarred *Nama-kwa's* coastal areas while simultaneously introducing an industrial character to parts of the landscape and architecture (Savannah Environmental 2012, 2).

In 1928, the Cape Coast board reluctantly decided to upgrade Kleinzee's mining technology and improve the living conditions of its workforce. Known for its penny-pinching policies, the decision to upgrade from the high profit-yielding Heath Robinson system, well known to the industry worldwide, with its tent-and-shack housing (Figure 20), was prompted by the state's minimum working conditions rather than concern for its employees. (Carstens 2001, 42). The board also wanted to reduce diamond theft, both by employees and by bandits who often raided the rich high ground at night, the plant and the pulsator and the establishment of a permanent workforce (Carstens 2001, 70-72; 142-143) over which the company would have full control was a way of accomplishing this.

Construction of the town and mining upgrades did not begin until 1929, which proved difficult. Except for the **mud bricks** that were made locally and the **stone for the foundation**, all the material and supplies had to be shipped by steamer from Cape Town to Port Nolloth and then loaded onto lorries for a 65-kilometre sand-track passage to Kleinzee.

The site (Figure 22) chosen for the town was a mile and a half from the ocean and a quarter of a mile from the south bank of the Buffels River, on a piece of ground declared by the company's geologists to be devoid of diamonds. Vegetation was stripped from the entire site to give the town a tidy look. Hence, when prevailing south-westerly winds blew strongly in summer, they carried large quantities of fine sand in suspension, pitting windows and windshields; the dry east winds were even worse (Carstens 2001, 43).

A poorly constructed system of roads, drains, and culverts was laid out. The entire town and mining area was encircled and subdivided by an elaborate system of barbed-wire fences (Figure 32) that diverted all noncompany traffic to the east of the town as well as segregated the area into the ethnic and social grouping required by the law and customs of the time (Carstens 2001, 44). Updating the water supply system, which was crucial to everything else, in a region of low rainfall, where the river flows only once every five to six years, there was complete reliance on subterranean water, which was pumped up and stored. *(Continued).*

It is no surprise that many conventional materials and methods used in the construction industry, past and present, harmed the environment. This includes high embodied energy, water, and waste footprint. Due to the nature and remoteness of the site, this project is attempting to mitigate these impacts by using environmentally responsible materials and serving as a carbon sink by sequestrating waste (Immelman 2022).

UNBUILDING OF THE WORLD

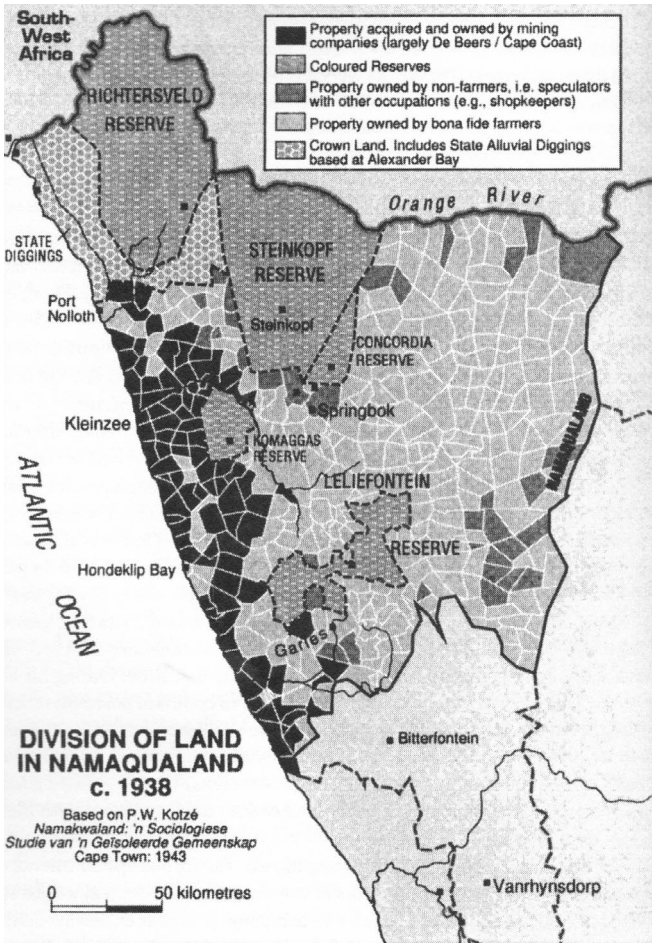


Figure 19. **Namaqualand -** divisions of land parcels (Carstens, 2001: 40)

Figure 21. **Namaqualand** region in South Africa (Carstens, 2001: 2)

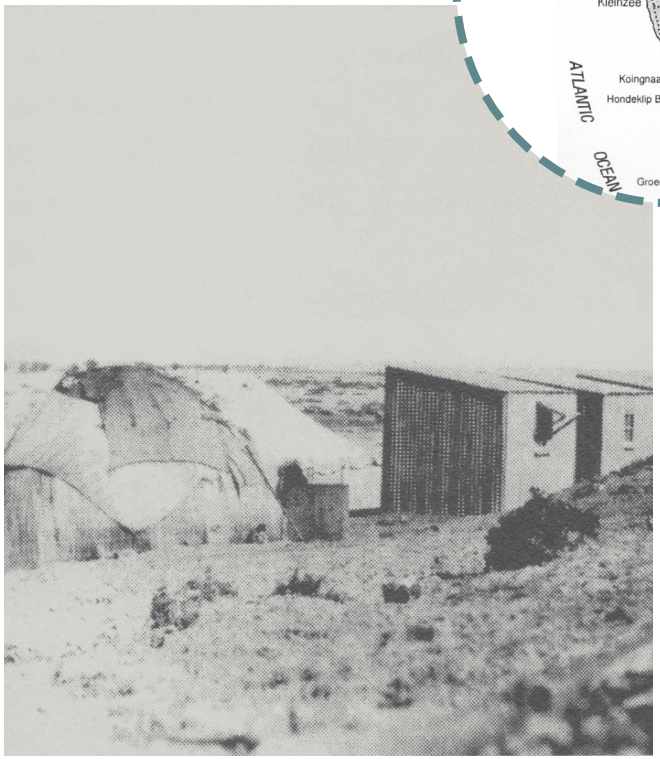


Figure 20. **Tent-and-Shack -** *Kleinzee Camp in 1927* (Carstens, 2001: 23)

Figure 22. **Kleinzee Town 1992** town in South Africa (Carstens, 2001: 131)

UNBUILDING OF THE WORLD

Figure 23. **Permananent Workforce** - *Owambo Trammers in Kleinzee 1940 (Carstens, 2001: 90)*

Figure 24. **Surveillance, 1930s** - *excavating near superintendent (Carstens, 2001: 91)*

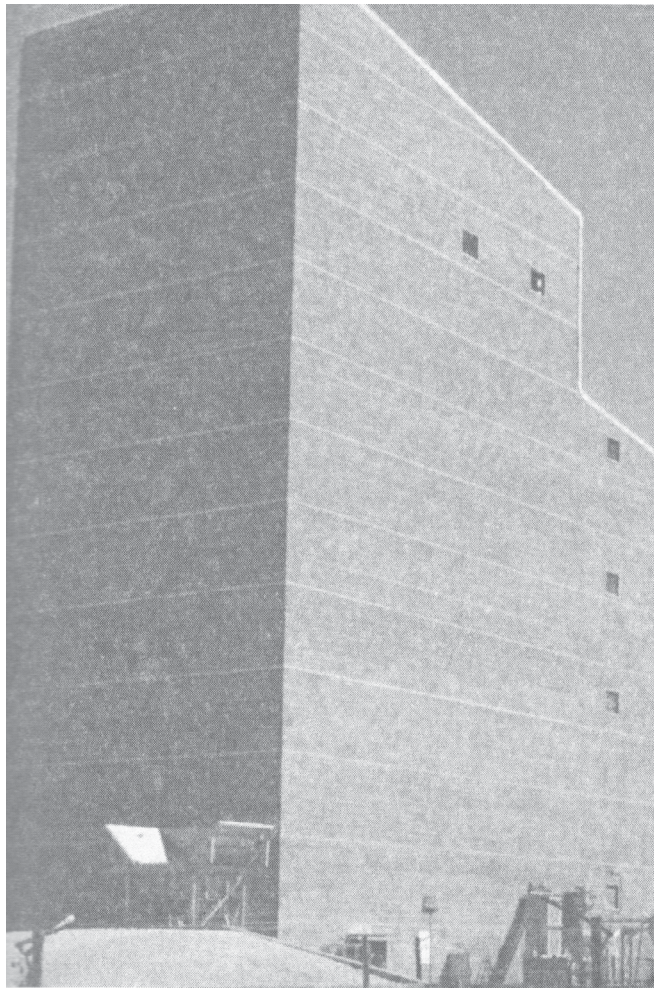


Figure 25. **Fortress Diamond** - *heavily guarded plant (Carstens, 2001: 141)*

UNBUILDING OF THE WORLD

Figure 26. **West Face, 1930** - *loading cocopans (Carstens, 2001: 91)*

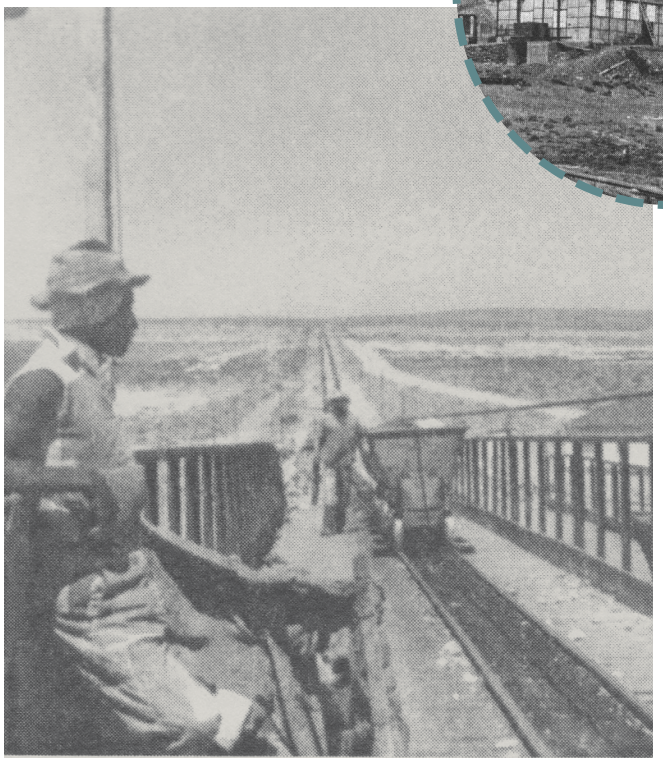


Figure 27. **Owambo Trammers** - *trammers are shown on the ramp (Carstens, 2001: 90)*

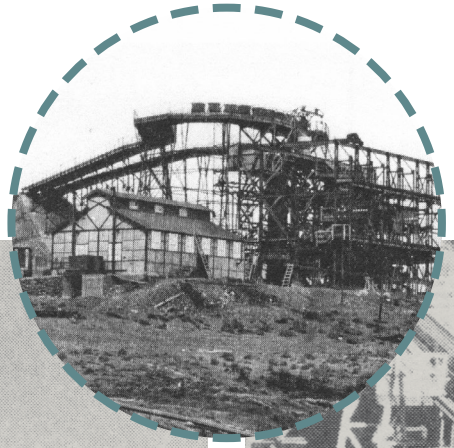


Figure 28.
Wash Plant & Power Station - *mechanical plant installed 1930s (Carstens, 2001: 89)*

Figure 29. **Washed and Washed Again** - *Photo shows the complexity of a modern washing plant (Carstens, 2001: 140)*

UNBUILDING OF THE WORLD

The main purpose was to supply the reduction-plant system. The plant was fed by cocopans (Figure 25-29) that were hooked onto endless steel haulage rope; the rope pulled the pans of tracks from the mining area up the ramp to the crusher, where they were tipped and then returned to the mining area.

Like other company towns, Kleinzee was not built for those who lived there. It was a rational result of the decision by a board of directors whose chief goal, while obeying the state's basic rules, was unhindered production at the lowest cost. The people were as much part of the machinery as were the washing plant, the haulage system, and the fences. The system was expected to operate smoothly, and, as far as the company was concerned, harmony could be achieved only if there was loyalty to Cape Coast and obedience to the system. (Carstens 2001, 45). In the 1940s, the popular song "*Don't Fence Me In*" was adopted by the white employees as a theme song to depict their feelings of "fenced-in-ness" that developed with the increase in security measures associated with checkpoints, X-raying, and barbed-wire fences. To most employees, the fence that imposed the greatest restriction was the company's boundary fence – because it prevented contact with the outside world. In the 1930s, in theory, all employees had to have their persons and belongings searched before leaving the town (Carstens 2001, 49).

Figure 30.
Single Quarters & Mess -
for white employees
(Carstens, 2001: 73)

Figure 31.
Signs of Hope -
signs of rehabillitation
(Carstens, 2001: 73)

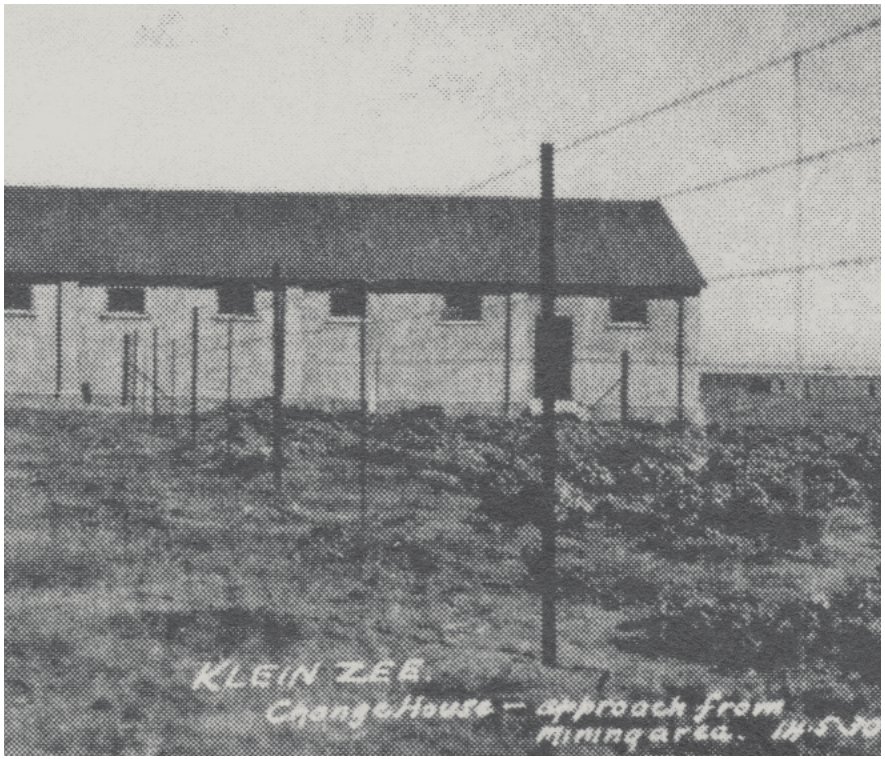


Figure 32. **Change House and Barbed-wire Corridor** - *which workers passed through into mining area* (Carstens, 2001: 73)

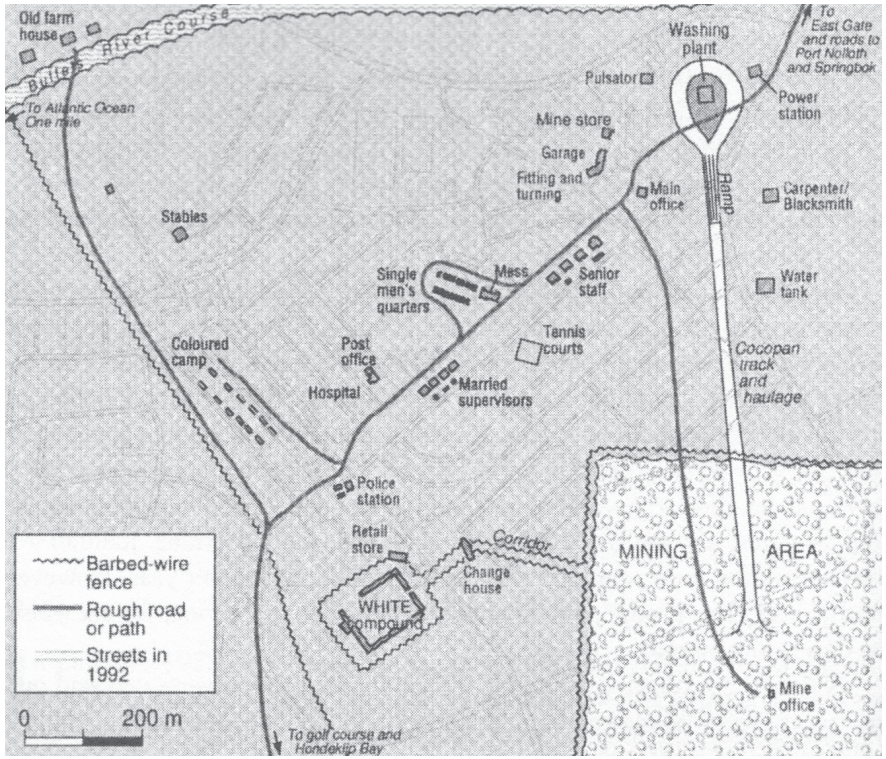


Figure 33. **Kleinzee Town 1932** town in South Africa (Carstens, 2001: 44)

UNBUILDING OF THE WORLD

A

2.1.4
Mining and Minerals Museum

Broken Hill, Australia / Glenn Murcutt (unbuilt)

Reminiscent of the town of Kleinzee, Broken Hill is a small, geographically isolated city in New South Wales, which was similar to the Kleinzee operation, sustained solely and economically by the mining industry (Murcutt 1992, 175). Yields of the mines began to slow - and to search for other ways to maintain itself, with help from Australian-based architect Glenn Murcutt - the idea to erect a museum devoted entirely to mining and mineralogy and stand as a civic institute was put forward.

Like Kleinzee and its neighbouring 'company towns', Broken Hill is dominated by the residue of the mining operations that historically took place there. The residue of such operations is evident, with its mechanical equipment, mountainous earth, and stone filling the horizon. The museum's programme provides invaluable informants for the project, even more so with its low budget and constraints due to Broken Hill's extreme distance from large cities or industrial centres. It is hoped that the project in Kleinzee responds as successfully to its obvious constraints and limited range and availability of materials as the museum in Broken Hill intended to respond. Approximately 300 metres in length and rectangular in

Figure 34. Bleuscape Design, 2014: online

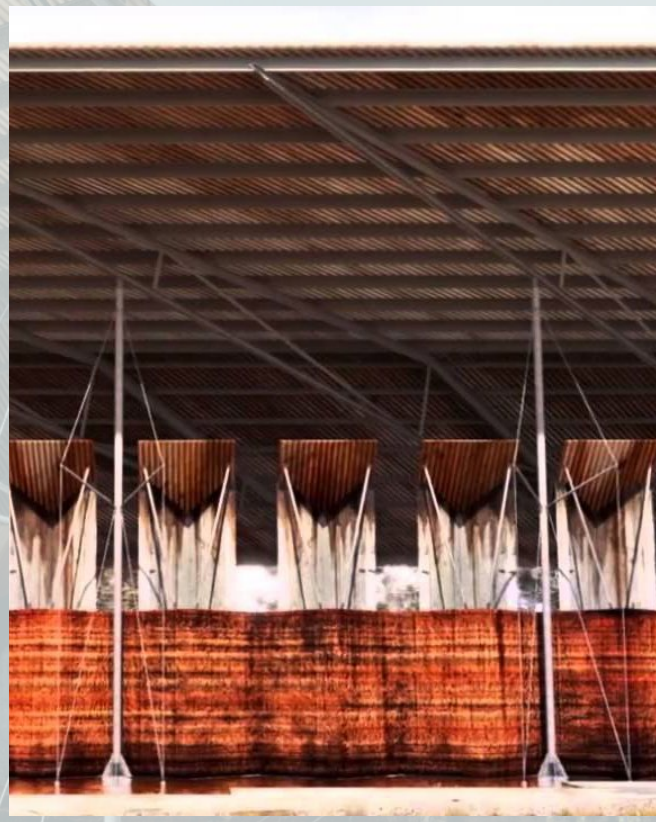


Figure 35. Bleuscape Design, 2014: online

form, the building is split down into two halves, separated by a narrow courtyard, where the public spaces face northwest (summer edge) and adjacent pools and administrative spaces lie adjacent to the street, providing easy access (Murcutt 1992, 176). The pools' position at the exhibition spaces' edge allows for evaporative cooling by the prevailing breezes. The cooled and moistened air is drawn into the *malqafs* (windscoops), which are integrated into the zigzagging rammed earth structure along the base corridor of the museum (Murcutt 1992, 178).

The air passes into the interior first-floor spaces (Murcutt 1992, 180-181), and out at the back of the building, augmented by the negative pressures provided by the shed roof (Murcutt 1992, 178).

Early studies demonstrate the idea of a heavy base providing thermal mas shaded from the desert sun by a parasol-like roof (Murcutt 1992, 177). The grid of columns and the parasol-like roof truss above it are racked such that the roof may extend beyond the building, thus providing a cover for the loading dock and entrance of the building. This feature mitigates the bluntness of the building's end elevation (Murcutt 1992, 179).

Murcutt's interest in architecture that continually acknowledged the physical and climatic character of the Broken Hill site was undeniable. The museum design captured that remarkably well by reading the language of the environment and appropriately responding to how life is sustained through the interplay of extremes of heat, light and mass (Murcutt 1992, 175). The Mining and Minerals Museum, although never constructed, illustrates Murcutt's strongly held principles and how to build with links to both land and the traditions of building on the land without compromising on the maximum use of passive design principles that aid in the discovery of the remarkable dynamic of a place (Murcutt 1992, 184).

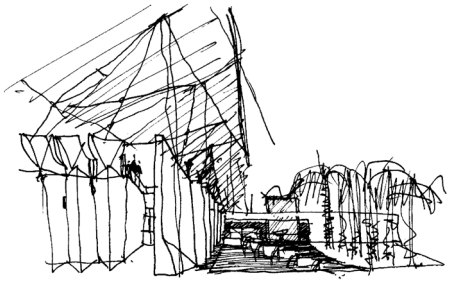


Figure 36. View of courtyard and pool from entrance. Air, cooled and moistened by evaporation of the pools's water, will pass into the malqafs, which stand at the water's edge (Murcutt, 1992: 180).

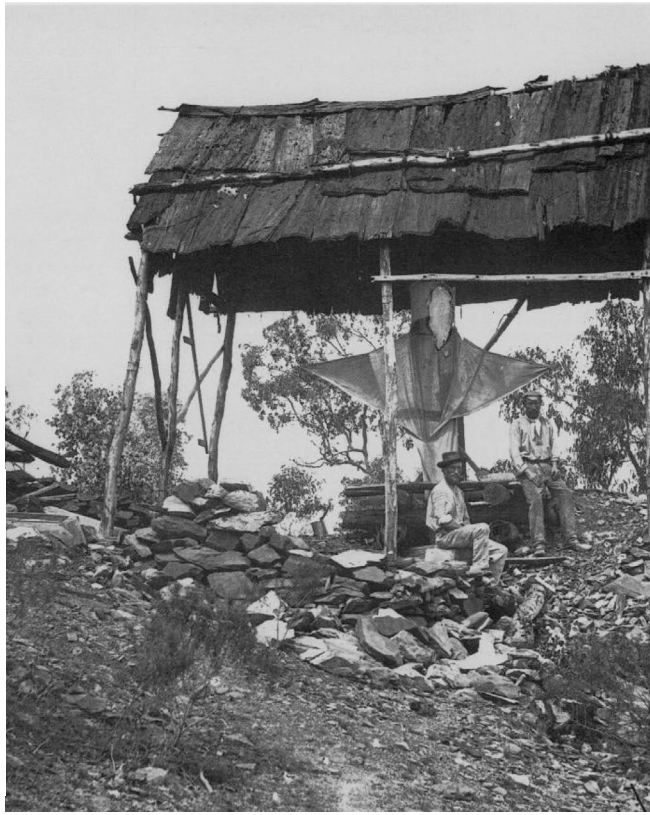


Figure 37. Some miners from the Broken Hill mine standing beside an opening to a mineshaft where they hadrigged some canvas to catch the wind and scoop fresh air down into the tunnels, resmbling a system of wind-aided evaporation (Bleuscape Design, 2014: online)

2.2 A Messo-analysis of Kleinzee *(Site and Town)*

2.2.1 Terrestrial environment

The site is situated within the Succulent Karoo Biome (SKB) (Figure 43), which spans most of the arid coastal lowlands of the Northern Cape. The SKB covers a flat to gently undulating plain, with some hilly and "broken" veld at altitudes mostly below 800 metres above sea level. The *Nama-kwa* coast, about thirty kilometres wide, is a generally flat plain of sandy material (Figure 44). It is an area characterised by low winter rainfall and extreme summer aridity. Desiccating, hot Berg Winds may occur throughout the year and during summer, temperatures above 40 C are common (Massie, Hutchings and Clark 2018, 304).

The Succulent Karoo is not considered an endangered ecosystem type and is the world's only entirely arid region diversity hotspot - home to more than 6300 plant species (Figure 47-54). Most of the endemic species are mostly succulents of geophytes (Massie, Hutchings and Clark 2018, 306). With rainfall between 20 and 290 millimetres yearly, the coastal vegetation mostly relies on fog for water supply (Massie, Hutchings and Clark 2018, 305).

The vegetation is dominated by dwarf succulent shrubs, of which the 'vygies' (*Aizoaceae*) and Stonecrops (*Crassulaceae*) are particularly prominent. Other variants of succulent shrubs include *Didelta, Othonna, Ruschia, Tetragonia, Tripteris*, and *Zygophyllum.* Nonsucculent shrubs (*Eriocephalus, Lebeckia, Pteronia, Salvia*) and spiny grasses (*Cladoraphis* 1-2 m) are common sights on the wind-blown semi-stable dunes. Mass flowering displays of annuals (mainly *Daisies Asteraceae*) occur in spring, often on degraded or fallow lands. In summary, the number of plant species mostly succulents – is very high and unparalleled elsewhere in the world for an arid area of this size. (Massie, Hutchings and Clark 2018, 306).

A small percentage of this vegetation type is protected in the Groen-Spoeg National Park, with approximately eight percent of the area covered by this vegetation type having been transformed by diamond mining and prospecting, including the project's site. Much of the area has been mined down to the bedrock (Figure 45), with the topsoil having not yet been returned to the mining sites. Therefore, the destructive nature of strip-mining for diamonds in the northern coastal regions has hindered properly rehabilitating impacted areas (Massie, Hutchings and Clark 2018, 306).

It is hoped that this proposal, through its sensitive climate-related design strategies, supports the conservation efforts of The Succulent Karoo Ecosystem Programme (SKEP). These efforts are explored in later chapters.

ii) Messo-analysis

Protection from the harsh climatic conditions known to Kleinzee requires certain climate-related design strategies, which should be considered for appropriate mitigators of the area's high temperatures and desiccating winds. These strategies are explored in later chapters.

UNBUILDING OF THE WORLD

Figure 38. Arial view of DCA's Operations (Microsoft Corporation 2023: online)

Figure 39. Arial view of the site and Kleinzee (Microsoft Corporation 2023: online)

Figure 40.
Wash Plant & Power Station -
mechanical plant installed 1930s
(Carstens, 2001: 89)

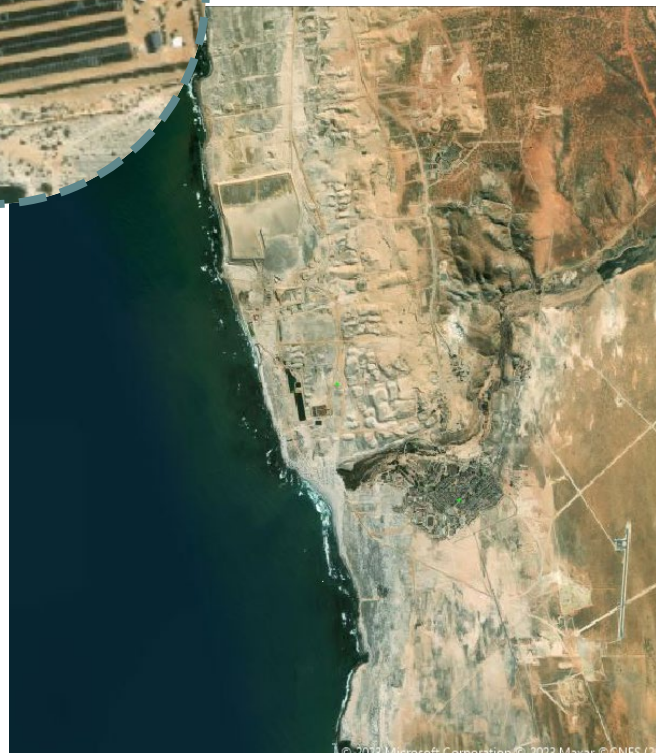


Figure 41. Arial view of Kleinzee (Microsoft Corporation 2023: online)

UNBUILDING OF THE WORLD

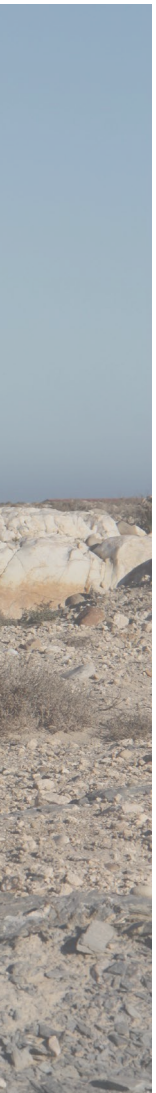
Figure 43.
Succulent Karoo Biome -
spanning arid coastal lowlands of Northen Cape
(Brothers, 2005: 143)

Figure 45.
Down to Bedrock, 1950 -
workers at bedrock level
(Carstens, 2001: 92)

Figure 42. **Surviving Flaura** -
sightings upon visiting the site (author, 2023)

Figure 44. **Nama-kwa Coast** - *generally flat plain of sandy material (author, 2023)*

Figure 46.
Bedrock Exposed -
landscape left depleted
(author, 2023)



UNBUILDING OF THE WORLD

Figure 47. *Didelta Succulent*
(Oliver, 2023: online)

Figure 48. *Othonna Succulent*
(author, 2023)

Figure 49. *Ruschia Succulent*
(Ebedes, n.d.: online)

Figure 50. *Tetragonia Succulent*
(Harris and Hoare, 2022: online)

Figure 51. *Zygophyllum Succulent*
(author, 2023)

Figure 52. *"Kapbok Bos" / Eriocephalus Africanus*
(Wildlife Den, n.d.: online)

Figure 53. *Pteronia Incana*
(Makola, 2021: online)

Figure 54. *"Spiney Grass" / Cladoraphis Cyperoides*
(Helme, 2023: online)

2.2.2
The Buffels River

The Restoration of the Buffels Estuary & the Return of its Life-winds

The Buffels River mouth (Figure 61) is adjacent to the settlement of Kleinzee and the proposed site. The Buffels River ultimately feeds the estuary, which is situated in the Lower Orange River Water Management Area (WMA 06). It drains both the western ridges of the *Nama-kwa* plateau north of Kamiesberg and the western slopes of the Nama-kwa escarpment inland of Kleinzee. It is fed by two main tributaries – the Brak and Riembreek Rivers; the distance from those junctions towards the sea is approximately 149 kilometres. Although the Buffels River has the eighth largest catchment area in the Cape, it only flows into the sea at exceptionally high rainfall.

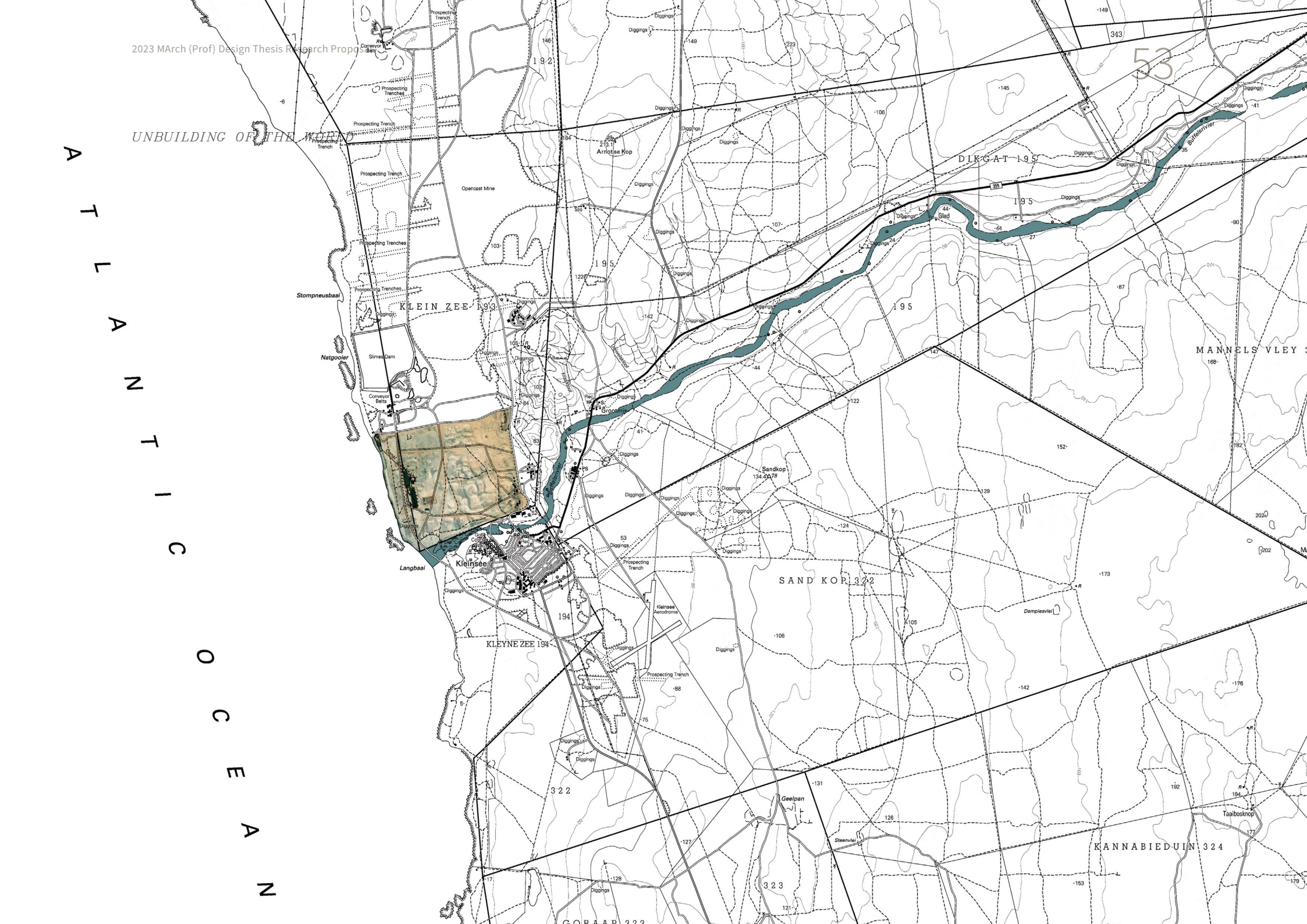
The estuary consists of a series of disconnected pools, separated from each other by arid areas of the riverbed, which are connected by way of subsurface water flow. Therefore, although the estuary falls into the category recognised as a coastal water body and does not entirely fulfil an estuary's normal functions, it appears to do so and requires proper restoration measures and subsequent management (Fielding 2017, 7). It is sometimes open to the sea, has freshwater input, and there is a clear difference in the salinity of the estuarine water (Fielding 2017, 8).

The Buffels Estuary has been located within the strictly access-controlled Kleinzee mining concession area (Farm 654 Portion 1) for a long time, and only recently has public access to the town and its surrounds been allowed. Currently, the estuary is not protected, and there is no monitoring or enforcement activity to ensure the health of its ecosystem (Fielding 2017, 14). Recently, attempts have been made to stimulate tourism in the area due to mining operations being significantly scaled back. Yet, better understanding and management of the area and further rehabilitation of areas damaged by mining activities could offer major benefits to conserving biodiversity. They could probably greatly improve the vegetation and the diversity of bird habitats (Fielding 2017, 14).

Therefore, DCA's vision is to have a healthy and functioning estuarine system which contributes to and conserves the biodiversity and ecosystem processes of a unique west coast arid estuarine system, as well as provide ecotourism opportunities focused on birds and the unique *Nama-kwa* coastal vegetation. The vision identifies the necessity to involve the local community in the management of the system. It highlights the need for the estuary to feature as a potential tourism attraction in conjunction with the aquaculture development, particularly focused on the terrestrial biodiversity known to the area (Fielding 2017, 19).

Figure 55. Kleinzee Estuary - an area map of Kleinsee
(Chief Directorate: Surveys and Mapping, 2007: map, adapted)

UNBUILDING OF THE WORLD



UNBUILDING OF THE WORLD

2.3 A Micro-analysis of Site *(Farm 654 Portion 1)*

2.3.1Exisiting Facilities

Figure 56.
Young Abalone 1 - *grow-out tanks, 80-90mm, 5yrs*
(author, 2023)

DCA Abalone Farm

Since 2011, DCA (previously Really Use ful Investments No 72 (Pty) Ltd or RUI) owns and operates a small-scale land-based aquaculture farm on the site. DCA now owns this land and currently holds the environmental authorisation and aquaculture rights for this facility, which has an annual production capacity of 150 tonnes of abalone and 200 tonnes of seaweed.

The facility hosts an environmentally smart integrated multi-tropic production system (IMTA), where the farmed seaweed (*ulva*) (Figure 66), which grows in abalone effluent, is used as feed for the growing abalone (Figure 67). The integrated multi-trophic production facility approach is designed to mitigate any environmental impacts on the marine environment from the effluent water discharged (Massie, Hutchings and Clark 2018, 79-80).

The expansion of the facility involves the construction of new production infrastructure and buildings to accommodate staff facilities to support approximately 300 staff (Massie, Hutchings and Clark 2018, 167).

Figure 57.
Abalone Clusters - *grow-out tanks, 80-90mm, 5yrs*
(author, 2023)

iii) Micro-analysis

UNBUILDING OF THE WORLD

Aquaculture - Production

The current abalone farm footprint includes the following:

+ **Admin block** *with offices and support staff facilities (small-scale)*
+ **Courtyard(s)** *(informal storage and sorting)*
+ **Feed container** *(informal storage)*
+ **Grading facilities**
+ **Seaweed (ulva) baths** *with water reservoirs and pump houses*
+ **Abalone Grow-out Tanks**
+ **Blow House**
+ **Solar Dam**
+ **Pump house**
+ **Water Treatment System** *- a septic tank and trickling filter system unit*
+ **Parking**

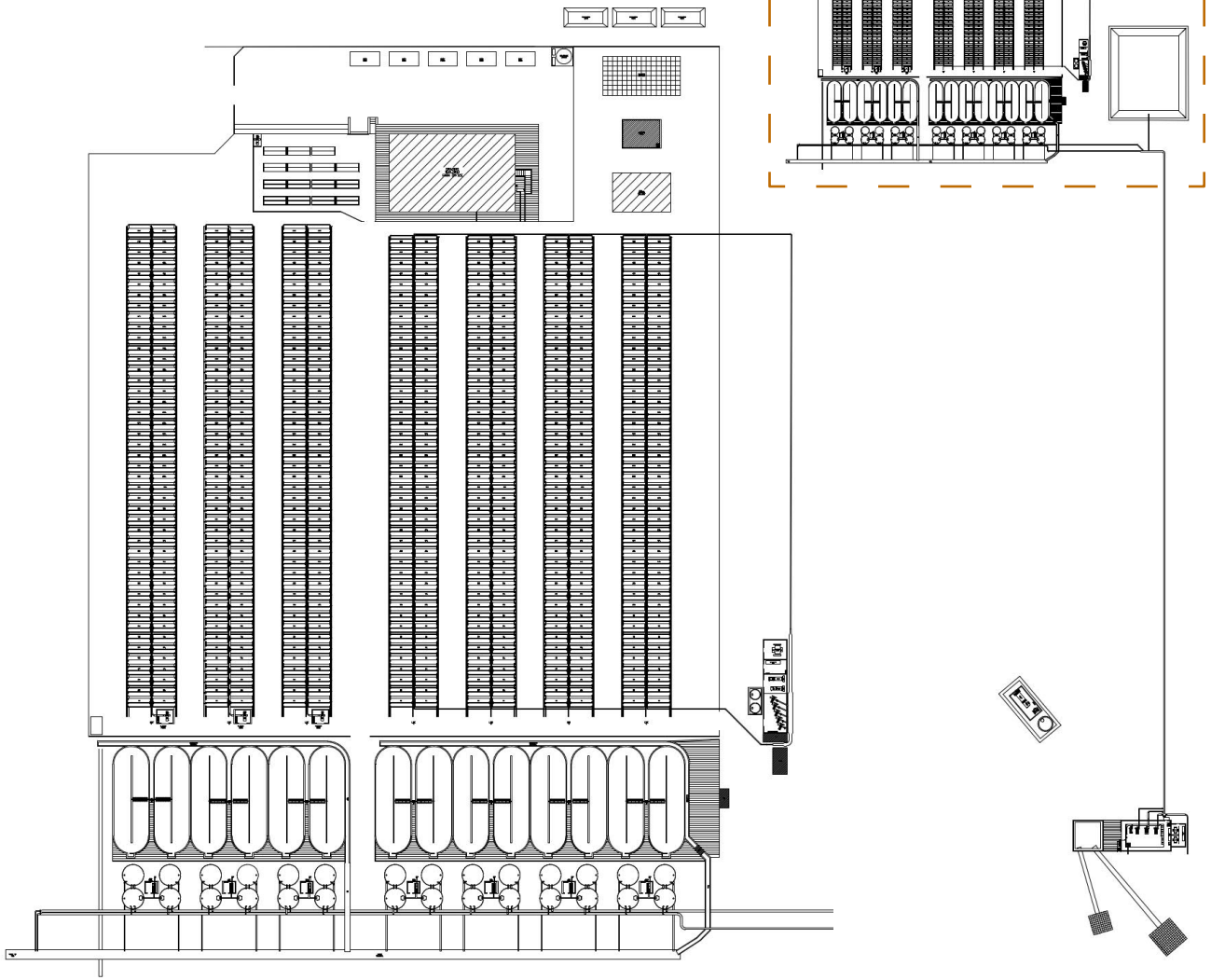


Figure 58. *Exisitng aquaculture facilities in Kleinzee* (DCA, n.d.: correspondence)

UNBUILDING OF THE WORLD

Figure 61.
Ulva (seaweed) - *live feed (author, 2023)*

Figure 62.
Ulva Baths 1 - *live feed, part of the IMTA system* (author, 2023)

Figure 59. **Entrance to Farm 654 Portion 1** - *the sole entrance onto the farm* (author, 2023)

Figure 60. **Ulva Baths 3** - Water reservoirs & filtration system with a pump house (author, 2023)

Figure 63.
Ulva Baths 2 - *live feed, part of the IMTA system* (author, 2023)

iii) Micro-analysis

UNBUILDING OF THE WORLD

Figure 64. **Abalone Raceway Tanks** - *existing grow-out tanks in Kleinzeefor the growing of abalone (author, 2023)*

Figure 65. **Abalone Cages** - *an individual holding cage hosting young abalone (author, 2023)*

Figure 67. **Post-Larvae Abalone** - *first and second nursery raceway abalone (author, 2023)*

Figure 66. **Diatome Plates** - *innoculated nursery plates young abalone grow from early on in production (author, 2023)*

UNBUILDING OF THE WORLD

2.3.2
Environmental Impact Assessment (EIA)

In 2018, DCA submitted their bid as an EIA (Figure 76) to request permission to develop and expand their aquaculture farming activities. The expansion of the DCA farm, on which this project lies, triggers several listed activities in the EIA Regulations, 2014 (as amended by Government Notice No. 40772 of 7 April 2017). Therefore, DCA was required to apply for environmental authorisation from the Northern Cape Department of Environment and Nature Conservation (Massie, Hutchings and Clark 2018, 79).

MARINE ECOLOGY

Potential Negative Impacts

The proposed expansion of the DCA facility to include finfish and other organisms (2018, 296) is expected to alter the marine ecology due to the release of higher quantities of effluent discharges from the land-based multi-trophic aquaculture facility, thus impairing water quality (2018, 297). The proposed expansion to the seawater intake and effluent outfall structure could also potentially impact the area's marine fauna and flora (2018, 296).

Response to Potential Impacts

With the effective implementation of recommended mitigation measures, such as the IMTA system (Ref. Chapter 6 – Technical Report: Systems), it has been proven that the DCA facility will not contribute significantly to the accumulation of waste and impairment of the marine environment. Due to a small footprint, habitat loss is confined to the project's intake and outfall infrastructures (2018, 300).

TERRESTRIAL BIODIVERSITY

Potential Negative Impacts

Biodiversity is the variability among living organisms and the ecological complexes of which they are a part. It is an inevitable consequence of the Development that it will further impact the terrestrial biodiversity. As described, much of the area was mined down to the bedrock (Figure 68, 75), and the topsoil was not returned to the mining sites. Consequently, the vegetation has not recovered well (2018, 314). Potential impacts on the vegetation and fauna (Figure 74) may be due to the clearing of vegetation, erection of security fences, new aquaculture facility infrastructure, the erection of wind turbines, noise generation and structures for the storage of seawater (2018, 305).

The assessment of impacts is based on expert field observations and desk-top analysis executed by professional environmental assessment practitioners - Anchor Environmental Consultants (Pty) Ltd. Based on their findings, it was revealed that the nature of the proposed activity (aquaculture), the nature of the receiving environment (Farm 654 Portion 1), the following key environmental issues – potential negative impacts and potential benefits – were identified (Massie, Hutchings and Clark 2018, 291).

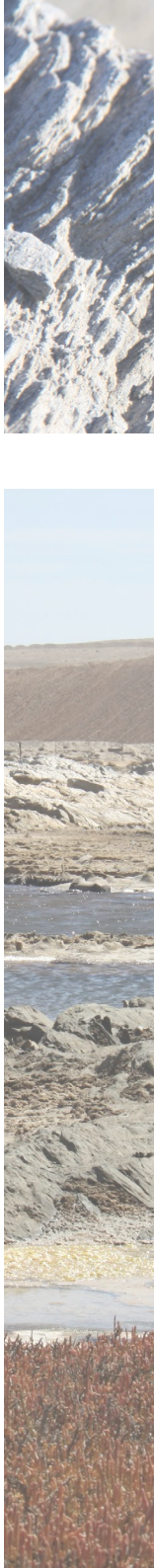


Figure 68.
Exposed Bedrock -
topsoil was not returned
(author, 2023)

DCA Farm in Kleinzee

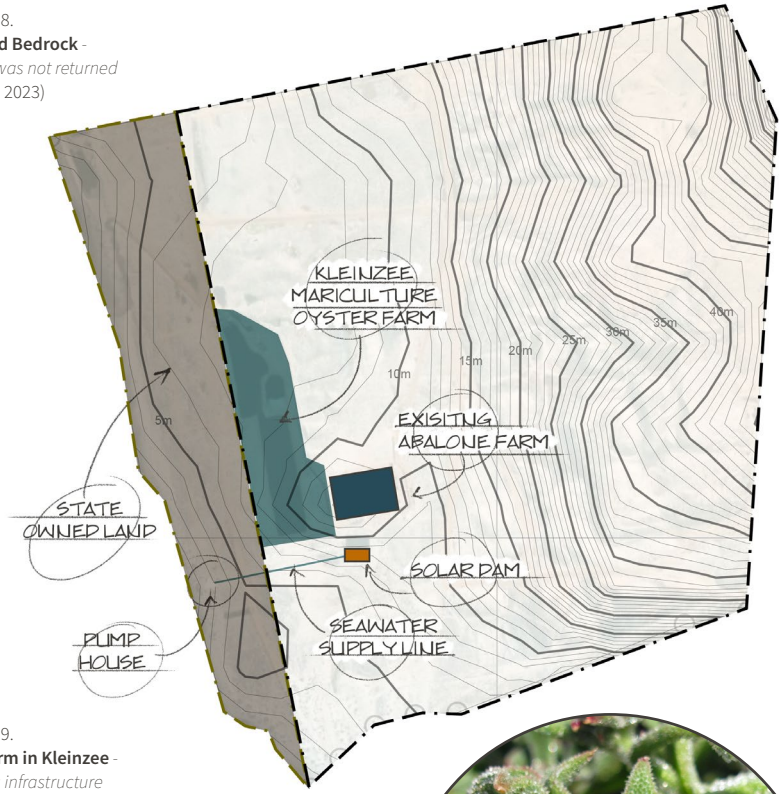


Figure 69.
DCA Farm in Kleinzee -
exisiting infrastructure
(author, 2023)

2

3

4

5

Figure 70. **Plant Species** - *recorded on site* (ref. figures cited))

Response to Potential Impacts

Due to the site having been severely disturbed by open-cast mining of alluvial diamonds over the past 100 years, the terrestrial biodiversity has either been recovering very slowly or not. Therefore, the terrestrial biodiversity at the site does not currently contribute to biodiversity targets of this biome, nor does it seem to have the potential to do so significantly in future. To avoid further impacting the site's biodiversity, careful adherence to mitigation measures and monitoring should occur during the construction and operation phases. By adhering to the recommended mitigation measures and using alternative construction methods that serve as carbon sinks and reduce environmental impacts, the development is unlikely to contribute significantly to the cumulative loss of rehabilitation potential (2018, 321-322).

BIRDS (AVIFAURA) AND BATS

Potential Negative Impacts

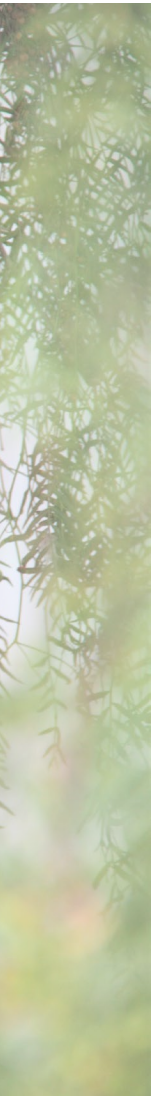
DCA intends to erect several wind turbines on the eastern inland portion of Farm 654 Portion 1, which can supply power to the aquaculture farm using wind energy. During the proposed development, aquaculture and turbine farms will likely impact the avifauna (birds) and bats during the construction and operation phases (2018, 325). The loss of potential roosting sites, poaching and disturbances during the construction phase may, directly and indirectly, impact fauna residents at or when passing through the area. Not all faunal impacts can be mitigated. Some residual impact will result from noise, disturbance, and collisions of individual animals that cannot flee the construction activities (2018, 315-316). Among the one-hundred and seventy-six (176) bird species recorded in the broader study area (Figure 85), including the Buffels River estuary, 16 species have been red-listed by the International Union for Conservation of Nature (IUCN) in southern Africa (2018, 327). The lack of abundant seeds and roosting sites in this highly transformed landscape at the proposed development site is likely reflected in low local bird densities. (2018, 328).

Figure 72.
Avifauna Species 2 -
birds recorded on-site
(author, 2023)

Response to Potential Impacts

It is reasonable to assume that with mitigation, the impacts will be justifiable when weighed against the benefits of the aquaculture activities and renewable energy produced by the small-scale wind farm. Therefore, by actioning mitigation measures and through the adoption of alternative construction methods and the placement of such facilities, it is deemed that sufficient mitigation should be done to combat further impact on the fauna residents, birds and bats known to the site (2018, 341). Therefore, direct impacts during construction will be temporary and will not generate significant long-term impacts, especially after mitigation measures have been actioned, thus making it of “very low” impact significance (2018, 316).

Figure 71.
Avifauna Species 1 -
birds recorded on-site
(ref. figures cited)



SOCIO ECONOMY

Potential Negative Impacts

The proposed development is expected to have visual impacts due to the constructing of aquaculture and wind farm infrastructure and lighting at night. Noise levels may also increase during the construction and operation phases of the project. In combination, visual and noise impacts will alter the sense of place in the area. Dust emissions may also reduce air quality (2018, 291).

Response to Potential Impacts

Orchestrated to provide potential benefits to the wider community through job creation, skills development, increased investment, and growth (2018, 291), it is expected that approximately 270-300 people will be employed during the construction phase of the proposed development, with an expected value of employment opportunities worth R75-100 million during the first ten years, of which 85-90 percent will accrue to the previously disadvantaged communities of the area as a result of mine closures (2018, 349, 354). To mitigate the impact on the sense of place and the subsequent dilution of the benefit accruing locally, alternative construction methods have been specified to reduce unnecessary specialised equipment and materials and boost skills development programmes during the construction phases. (2018, 349).

HERITAGE

Potential Negative Impacts

DCA is required under law to notify the South African Heritage Resources Agency (SAHRA) of their intention to undertake development on Farm 654 Portion 1 and to furnish details of the proposed development's location, nature and extent. (Proposed upgrades to the Diamond Coast Aquaculture facility 2018, 366). Potentially significant impacts are likely to be limited, and where they do occur, they will be confined to the shore near the existing pump station (2018, 368).

Response to Potential Impacts

Despite a detailed field study assessment undertaken in 2018, apart from the few traces of archaeological resources (displaced marine shellfish, beach cobbles and quartzite flakes) recorded scattered around the farm, no archaeological traces were found, as almost the entire area has been heavily mined for diamonds. Therefore, the archaeological remains have been rated as having low significance, and the proposed development does not threaten the landscape (2018, 368).

Social impacts can be defined as the consequences to human populations of any public or private actions that alter how people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts manifest at various levels, including individual level, family, community, organisation, or societal level, either as a physical reality or emotional. It includes economic, recreational, visual, noise, access to coastal property and dust emission (2018, 347).

Figure 73.
Avifauna Species 3 - *birds recorded in area* (author, 2023)

UNBUILDING OF THE WORLD

Post-mining Rehabilitation Areas

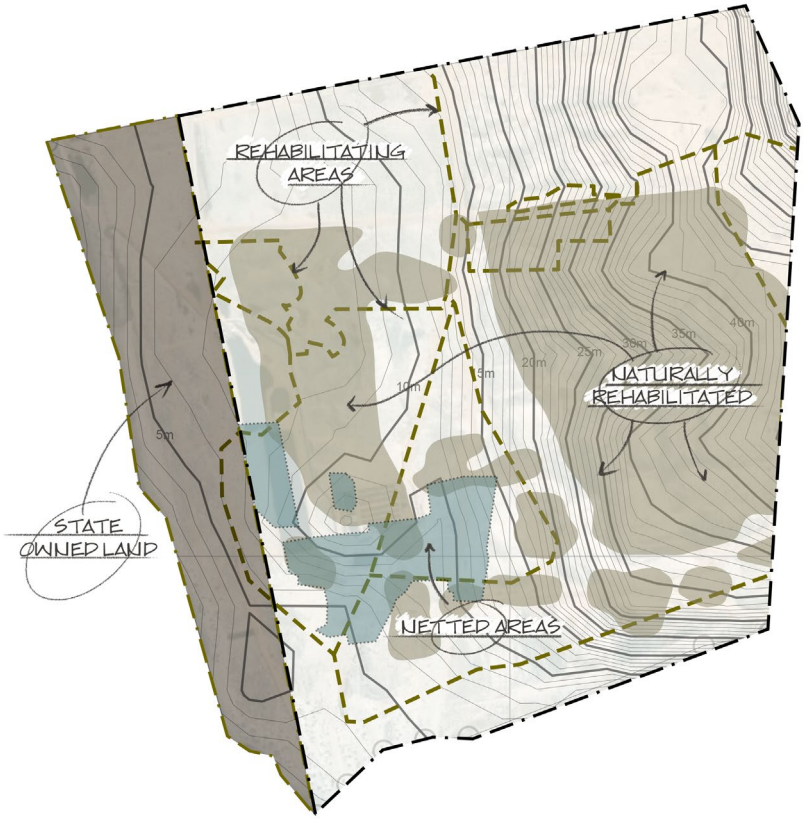


Figure 74. **Rehabilitation Areas** *- DeBeers post-mining rehabilitation areas mining in relation to the footprint of the proposed DCA farm expansion*
(Massie, et. al., 2018, 288; adapted by author)

Post-mining Blocks & Dump Sites

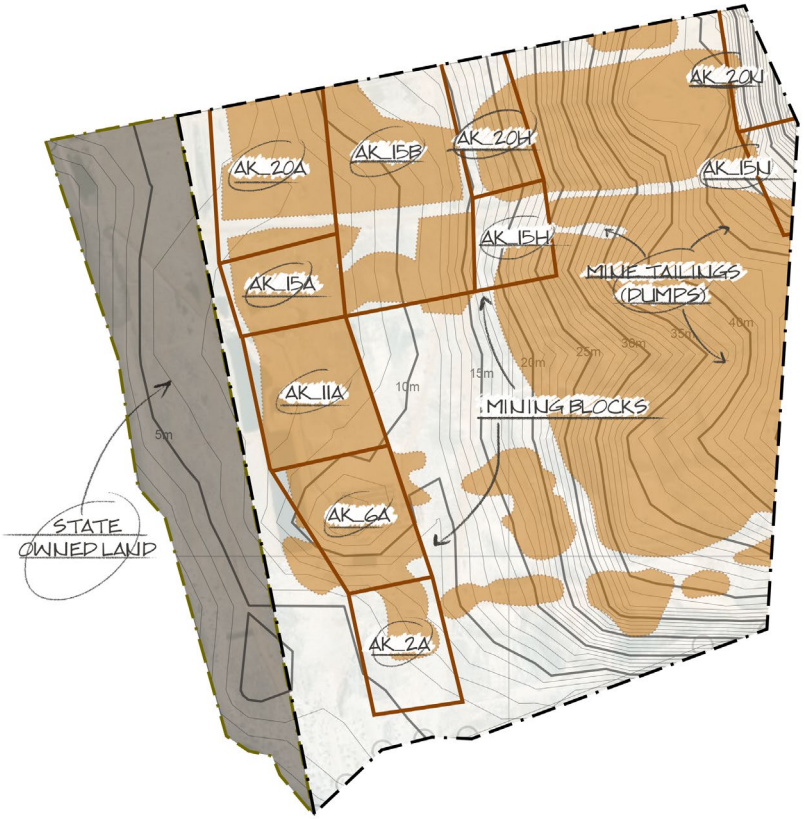


Figure 75. **Mining Blocks & Dumps** *- Historic DeBeers mining blocks and mining operation dump sites on Farm 654 in relation to the footprint of the proposed DCA farm (Massie, et. al., 2018, 287; adapted by author)*

Figure 76. **Integrated Sensitivity Map** - *proposed site layout of the Diamond Coast Aquaculture Farm in Kleinzee, Northern Cape (Massie, et. al., 2018, 11; adapted by author)*

2.3.3
SiteDAte

Problem Statement

Within the context of a widespread belief among indigenous communities; animals, plants, and people are born or given specific transferable characteristics; essentially, their *'life-wind'* linked to their form - but what if the site has gone through a period of *abbau*, the unbuilding of the world, the draining of a site's *life-wind* – what can this post-company showpiece become (Carstens 2001, 3), to transform away from the near archetypal mining-disturbance. By revising the very nature of the landscape and rethinking what it might become (2001, x), Corner's sentiments come to mind, wherein he proposes that the recovery of the landscape is less about recuperation and restorzation and more about extension and realisation of a landscape's hidden potential.

Therefore, because of the size of the site, how may the reading and transmission of the landscape serve as a metaphor for inclusive multiplicity and pluralism, which will enable differences to play themselves out not only through the embracing of naturalistic and phenomenological experiences but also extending to a strategic art form, which aligns diverse and competing forces into newly liberating and interactive alliances (2001, 2).

In other words, it will be about unearthing the site's layers accrued over time and rediscovering its hidden potential even though not much was left behind.

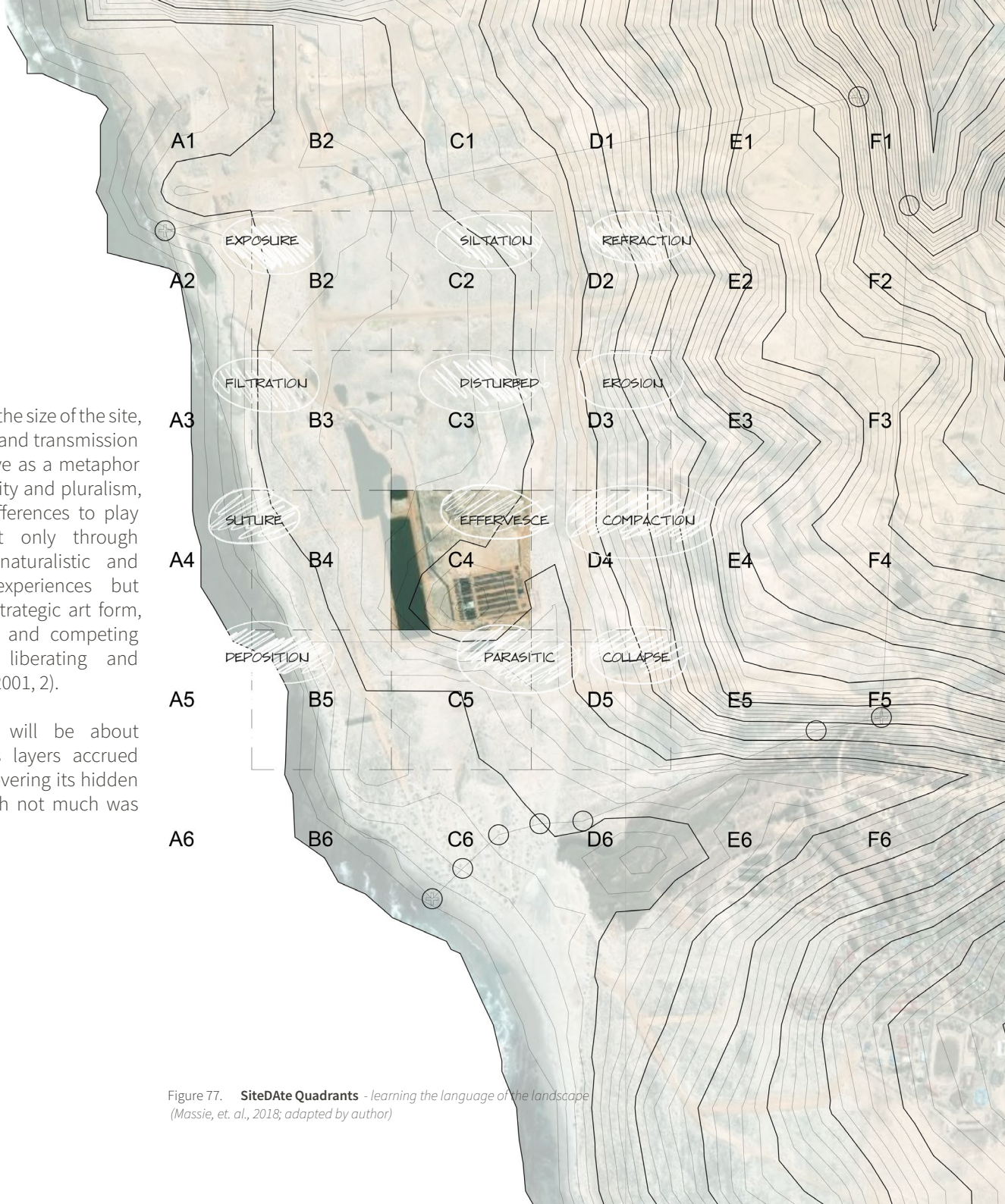


Figure 77. **SiteDAte Quadrants** - *learning the language of the landscape (Massie, et. al., 2018; adapted by author)*

UNBUILDING OF THE WORLD

Figure 78. **Quadrant C3** - *act of learning the language of landscape (author, 2023)*

Figure 79. **Quadrant D2**- *act of learning the language of landscape (author, 2023)*

Figure 80. **Quadrant B3**- *act of learning the language of landscape (author, 2023)*

UNBUILDING OF THE WORLD

SiteDAte

Poesisphilia

The following study views the landscape through a 'lens' based on what was perceived within the relative fragments prescribed. This enables unravelling patterns and systems that govern and inform what is manifest as the site's landscape. By adopting words that speak to process and utilising these as the lens for investigation, the constructs and drawings made in the investigations form the beginnings of the site interventions.

Each fragment of the site, to a specific process word(s) - i.e., evaporation, compaction, deposition, through the act of model-making, begins to allow an act of discovery, thus unravelling hidden potentials, relationships, textures, topographies, juxtapositions, and thresholds, etc. viewing the development through the chosen lens(s) will inform and transform the reading and recording of place.

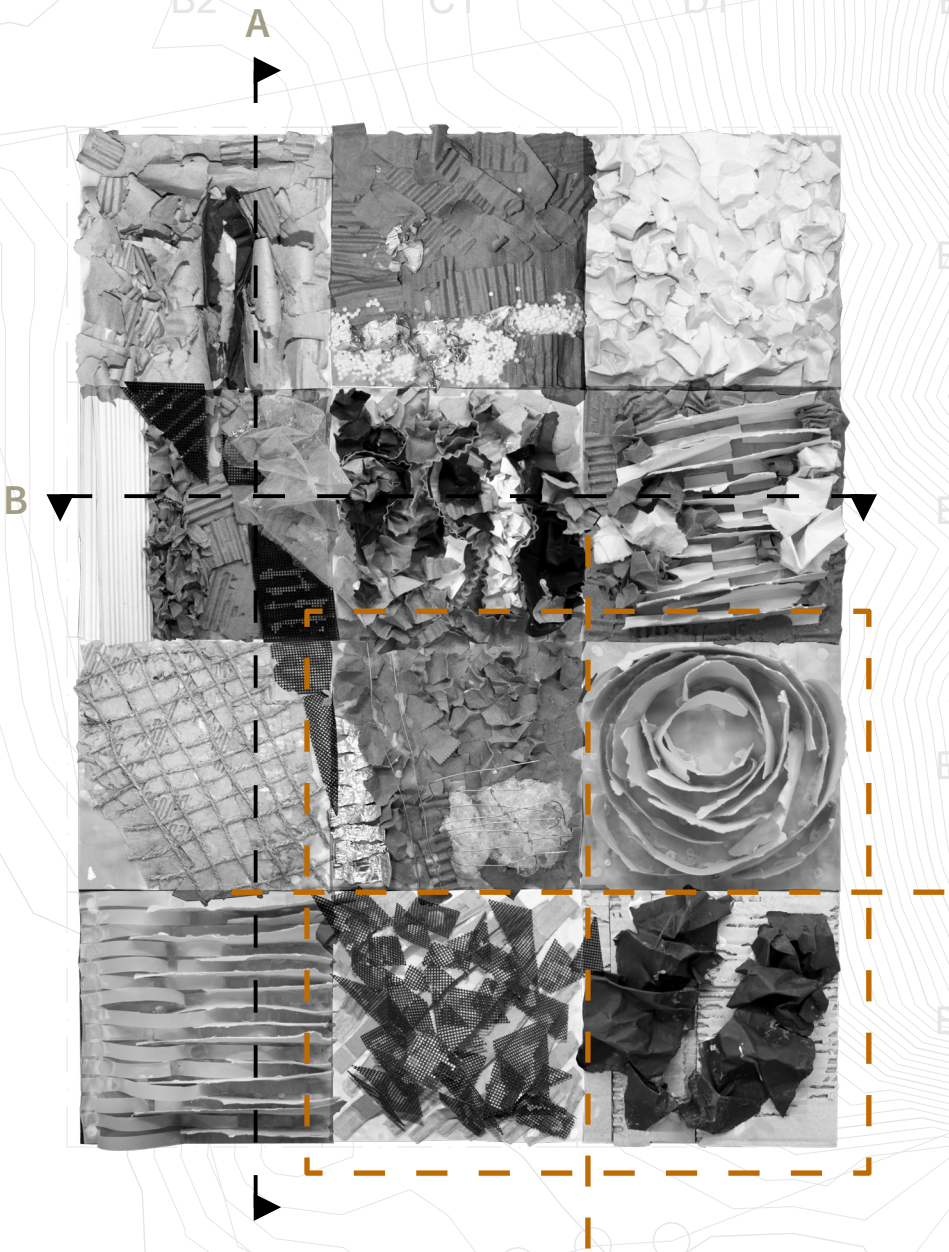


Figure 81. **SiteDAte Quadrants** - *learning the language of the landscape (Massie, et. al., 2018; adapted by author)*

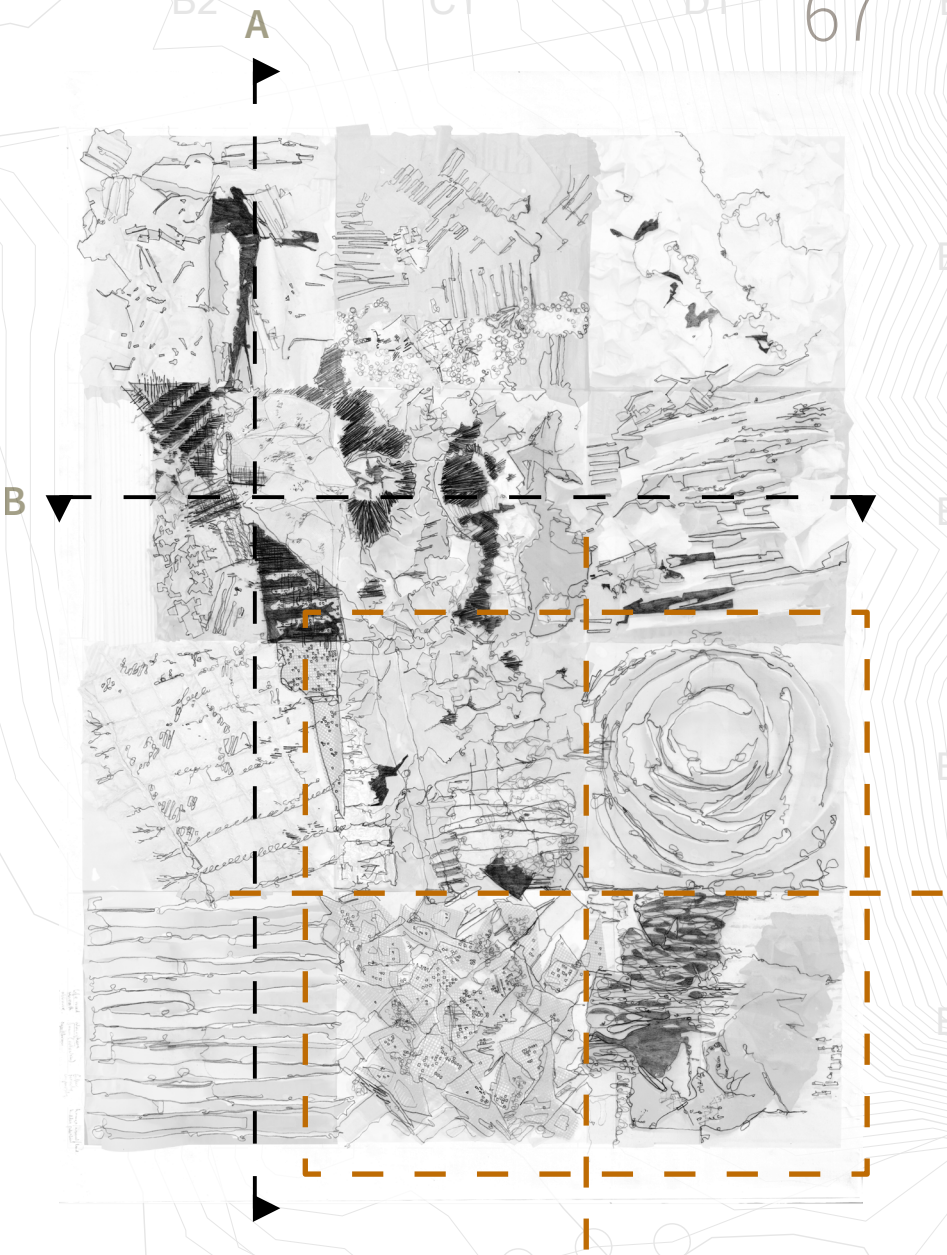


Figure 82. **Imagined terrain** - *art form plan* (author, 2023)

UNBUILDING OF THE WORLD

SiteDAte

Insights

> *"To recover and renew the language of landscape is to discover and imagine new metaphors, to tell new stories, and create new landscape."*
>
> – Anne Whinston Spirn (Spirn 2001, 43)

An imagined terrain comprised different readings and naturalistic yet synthetic and strategic art forms (2001, 1), section, and elevation. To reveal the site's agency of enabling differences on-site to play out, a new era may unfold by aligning diverse and competing forces. It is, therefore, important to understand how these competing forces should condition construction and how the construction, in turn, will condition the play of landscape ideas (2001, 8).

Since landscape is not given but rather made and remade, it is an inheritance that demands to be recovered, cultivated, and projected towards new ends (2001, 12) – the various readings lead to a set of strategies that assisted in the development of the site as we advance and attain conceptual clarity.

Figure 83. **Art form** - *section* (author 2023)

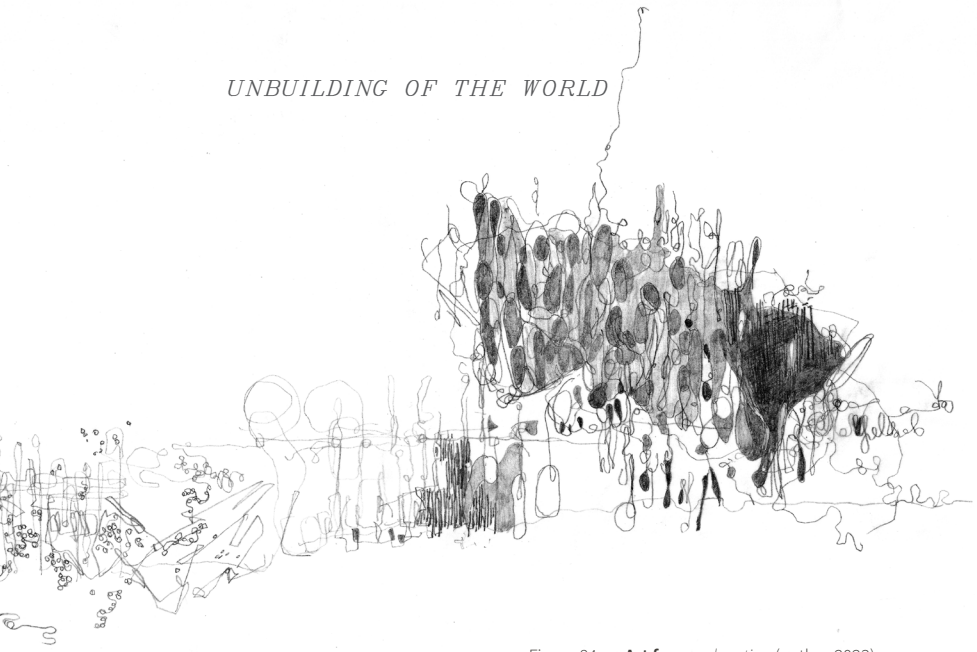
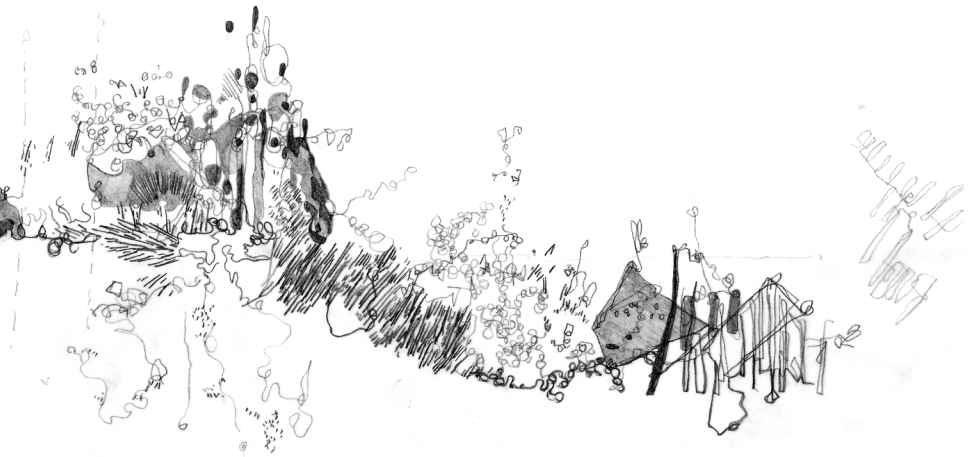


Figure 84. **Art form** - *elevation* (author 2023)



SiteDAte

Hidden potentials

Extractable design strategies

Architectonic strategy
(buildings as mass and form and space interacting with landscape)

Much like lichen found growing, in symbiotic co-existence, on the bark of the site's only surviving fauna, absorbing everything in their atmosphere, the building(s) too should be seen as absorbents of the sites' ecology – it's life-wind(s).

Tectonic strategy
(the assembly and detailing of buildings)

The building's tectonics should depict the symbiotic trade-off relation between condensed formwork (robust/hardy) and tensile tectonics (fragile) – thus capturing the competing forces known to the site.

Landscape strategy
(site as a landscape)

The active renewal of the site's hidden potential, reflected in the transmission of affect into and beyond the building(s), should draw from and rethink how the very readings unearthed may condition design throughout, telling a story.

UNBUILDING OF THE WORLD

B

2.4
Beach House

Robberg Beach, Plentenberg Bay / Design Workshop

The Beach House in Plettenberg Bay is located on a dune with expansive views of the ocean and mountains on Robberg Beach. Despite standing out starkly from the nearby vacation homes, it looms large over the seafront and yet feels cozy nestled in its surroundings. Due to the exposed and environmentally sensitive nature of the site, it was essential to respect the dense fynbos, achieve privacy, and be protected from erratic coastal weather. With the exception of the entry and utilities, which were positioned perpendicular to this arrangement, the site and house were both organized as a parallel series of longitudinal spaces. The layout created a barrier between the private interior and the public realm on the southeast corner of the property. The choice of material, structure, and volume incongruously express the layered sequence of spaces—**circulation spine**, double volume, or subsidiary areas—that the silhouette echoes. A hydraulically operated timber screen spans the entire length of the glass façade on the seaward side, allowing it to adjust the amount of privacy and shading needed in response to shifting climatic conditions and various activities.

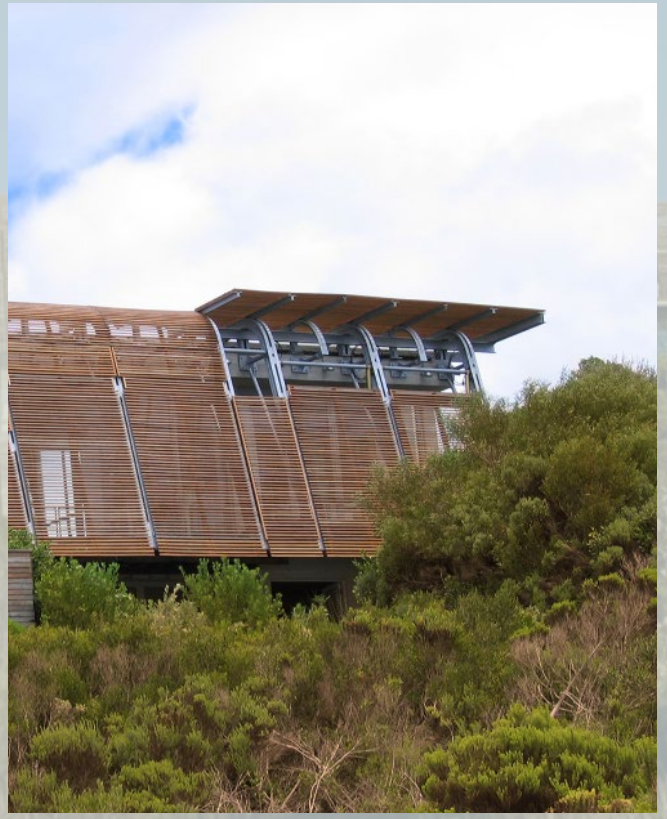


Figure 85. (Design Workshop n.d.: online)

Figure 86. (Design Workshop n.d.: online)

UNBUILDING OF THE WORLD

The front of the house respects the dunes, whereas the rear's less prominent pitched roof reflects a more traditional approach in sympathy with the neighboring houses. The movable timber veil (which will eventually turn grey) conceals the freshly formed horizon, obfuscating the distinction between man-made and natural elements (Beer 2009, 362-363).

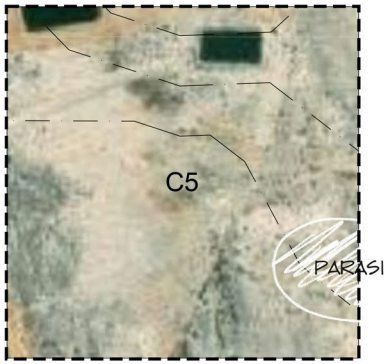


Figure 88. **Quadrant C5** - learning the language of the landscape (author, 2023)

Figure 87. **Strong Line** - horizontal line acting as organising image (Design Workshop, n.d: online; adapted)

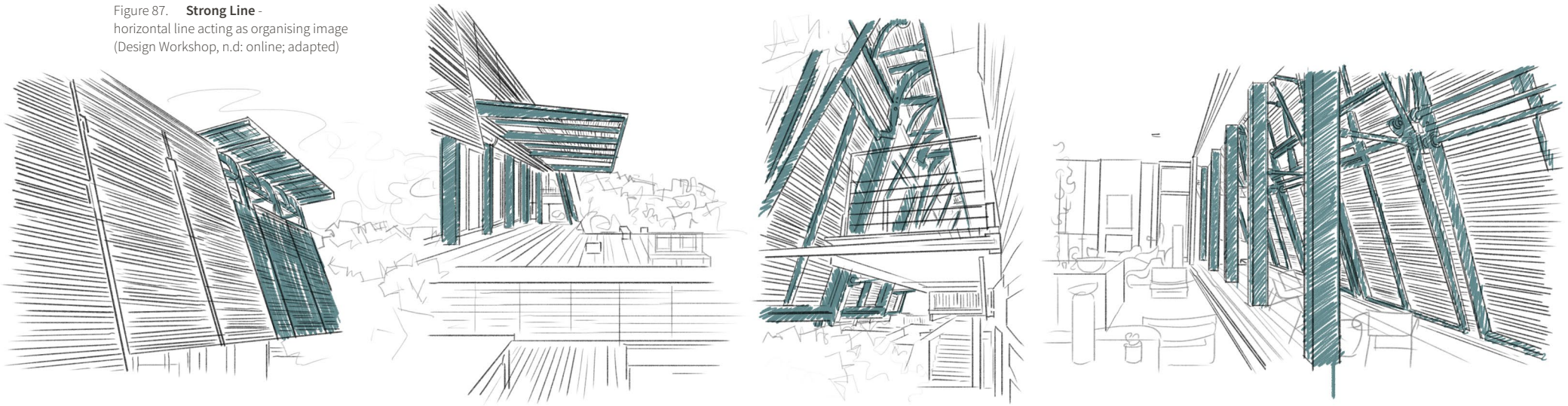


Figure 89. **Quadrant C5** - learning the language of the landscape (author, 2023)

UNBUILDING OF THE WORLD

C

2.4

National Park Visitor's Centre

Jutland / Loop Architects

A tiny coastal village in Northern Jutland is home to the Thy National Park Visitor Center. Subtly inserted into the dune landscape, the building acts as an architectural entrance to the 244 square kilometer national park. Its architecture gently nudges its visitors to enter and explore the park; act as a steppingstone into nature. Part of the walls made of cast-in-place concrete serve as shelters. The crucial element is the ability to walk around, besides, and even on top of the building in the planned dune landscape, which also closely connects the interior of the building to the surrounding landscapes. From here, guests and visitors can take in the distinctive views of the sea, the city, and the nearby national park while also directly experiencing the extraordinary forces of nature that are unique to Northern Jutland. Nature is staged and framed inside. The two primary daylight sources inside convey the park's essence. The first is a sizable rectangular window that frames the North Sea and the nearby white-washed fishing houses perfectly. The back wall is also marked by a sizable skylight that extends across the entire space. As a result, the skylight allows light to enter the room and the outside weather is always visible. The large west-facing window is buffeted by the wind and rain, displaying both a

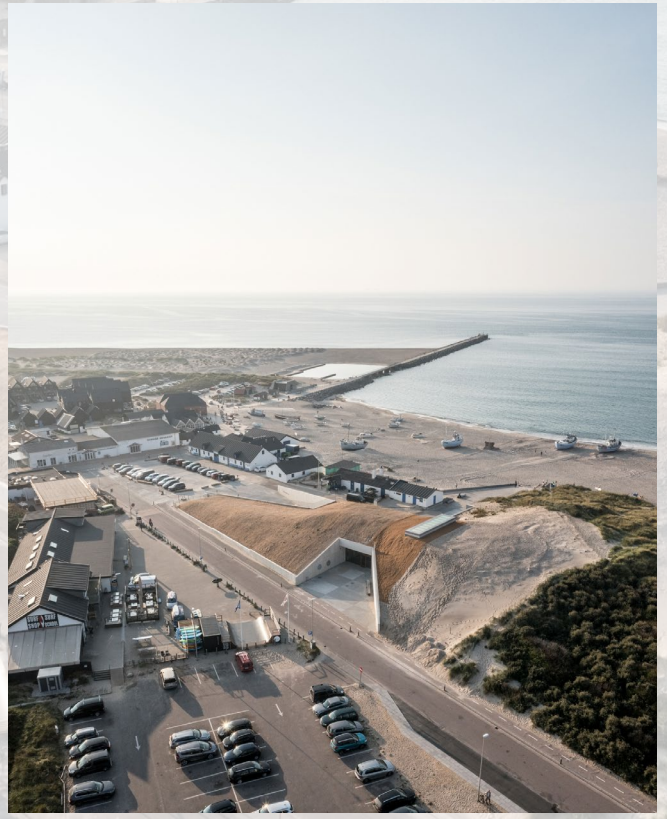


Figure 90. (Pintos, 2021: online)

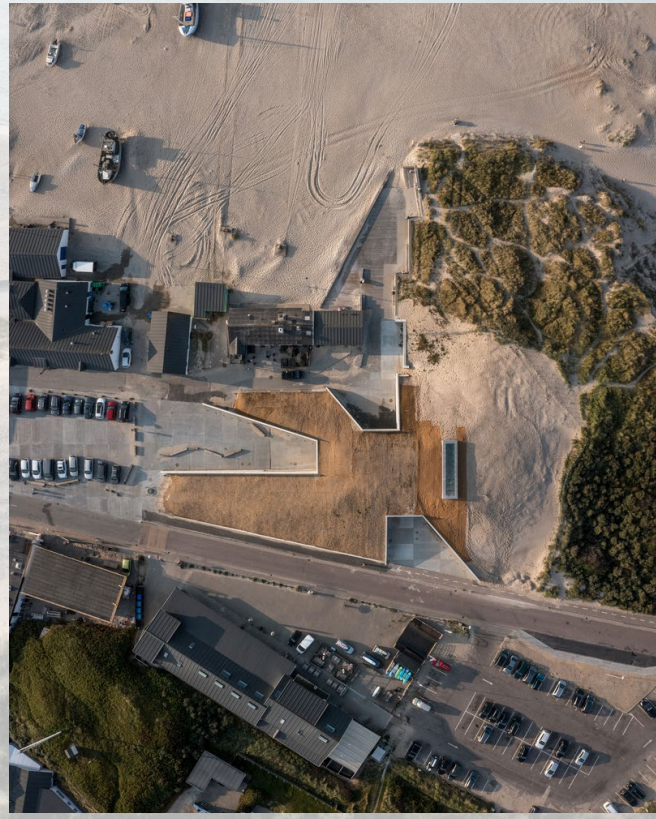


Figure 91. (Pintos, 2021: online)

UNBUILDING OF THE WORLD

rustic and refined aesthetic. The Thy National Park visitor center is made of sturdy materials that can withstand the harsh weather that is typical along Jutland's west coast. Cast-in-place concrete is primarily used to construct the building's pavement and the walls that make up its façades, which are primarily concealed within the dune landscape. The warm tone of the material was inspired by the local sand. The exterior and interior are connected by a concrete pavement that continues inside (Pintos 2021)

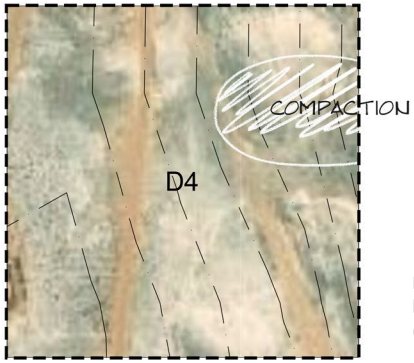


Figure 93. **Quadrant D4**- learning the language of the landscape (author, 2023)

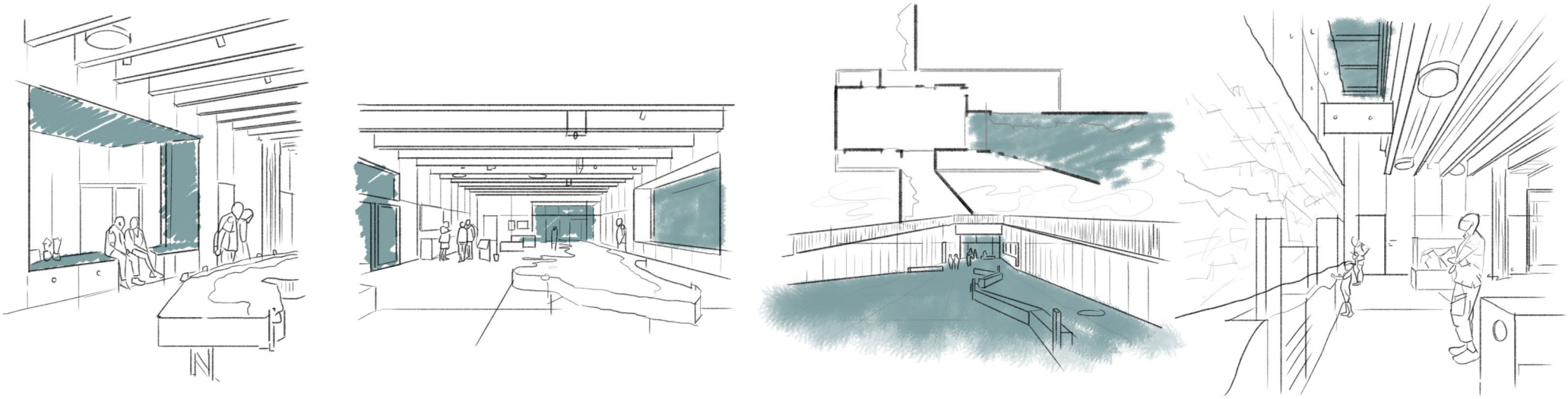


Figure 92. **Earth Shelting** - descreetly merging with the surrounds (Pintos, 2021: online; adapted)

Figure 94. **Quadrant D4** - learning the language of the landscape (author, 2023)

UNBUILDING OF THE WORLD

2.5
Conclusion

In conclusion, the analysis of Kleinzee's wounded landscape reveals the complex interplay between nature, industry, and human history. Kleinzee, once a thriving diamond mining town, now bears the scars of open-cast diamond mining, impacting its ecosystem and heritage. Kleinzee's geographical context highlights its arid coastal terrain and unique ecosystem, such as the resilient Buffels River estuary. The town's history too reflects the industrial character imposed by the diamond mining industry. The micro-analysis which focused on Farm 654 Portion 1, through an EIA, helped raise concerns about potential impacts on marine ecology, terrestrial biodiversity, avifauna, socioeconomic factors, and heritage.

The goal therefore is to envision a future for Kleinzee that transcends its wounded past, tapping into hidden potential through thoughtful interventions. Through a lens of *poesisphilia* and careful insights into the site, the intention going forward is to contribute to the transformation of Kleinzee into a place of renewed purpose and vitality, ushering in a brighter future for Kleinzee.

In concluding the site analysis of Kleinzee's wounded landscape, the journey continues into the realm of theory, exploring the intricate *life-winds* of *Nama-kwa* in the next chapter 3, *Life-winds* of *Nama-kwa*: a theoretical investigation.

Lichen
recorded on site
(author, 2023)

Anchorage
recorded in the area
(author, 2023)

In the realm of architectural exploration, the Southern African landscape of Kleinzee emerges as a captivating canvas intertwined with the life-winds of its people, the delicate poetry of its wildlife, and the profound transformation of its recovering terrain. This theoretical visual essay embarks on an immersive journey into the heart of these interconnected themes, illuminating the invisible gift of wind attributed to the divine presence by the 'Khoi' and San peoples. Each living entity, possesses its own unique wind, shaping the phenomenology of encounters and embedding itself in the perceiver's consciousness. This essay poses a compelling question: Can the Transmission of Affect, encapsulated within these distinct life-winds, be transmitted into architectural atmospheres and tectonics, thus reshaping the way they are experienced and strategically produced? We delve into a multi-dimensional exploration, drawing inspiration from historical and contemporary accounts of the Khoisan, and examine how the potent affects of life-winds are absorbed into architectural atmospheres, becoming the motive force behind the ambiance experienced at this site. The three focal life-winds under scrutiny encompass the ecological life-winds of people, maritime organisms, and the recovering landscape, each offering unique insights into the architectural metamorphosis of Kleinzee.

03

Life-winds of Nama-kwa
Theoretical investigations

Transmission of Affect

3.1 Theoretical Themes

It is abundantly evident that wind sits at the heart of a nexus of ideas and practice among the Southern African 'Khoi' and San peoples (Low 2007, 71). In its many guises, wind is an invisible gift attributed to God. **The gift is not identical but is specific**. Each living entity has its wind, a personalised expression of the breathing Divinity (2007, 72). The different winds define a particular sort of life, which reveals itself in a phenomenology of encounter, embedding itself in the perceiver.

A question was posed earlier: Why can't the *Transmission of Affect* or possession of the different, specific, and manufactured *life-winds* unearthed from the site transfer to architectural atmospheres and tectonics how they are experienced – or even strategically produced? With no intention of wanting to fragment Khoisan ideas further and with the understanding that there is a general need to be specific in the analysis of separate Khoisan linguistic groups – this research intends that a series of associations, themes, and ideas are drawn from historical and recent accounts of Khoisan (2007, 72) to explore poetically better how the various potencies (*affects*) of *life-winds* that are, reclaimed and blown, are absorbed to the architectural atmospheres and tectonics, manifesting as the motive force behind the atmospheres experienced upon visiting the site. Thus, serving as a powerful agent (Böhme, et al. 2014, 65) to deal with a seemingly harsh environment.

The different and specific winds explored in the following sections include the ecological *life-winds* of – people (atmospheric architecture), - animals (maritime organisms), and – a recovering landscape (Farm 654 Portion 1), and how these three One Health and Khoisan inspired entities artfully inform and become embedded into the architectural atmospheres, with the potential to enter or *affect* the residing perceiver (2007, 48) while restoring a sense of health to the site.

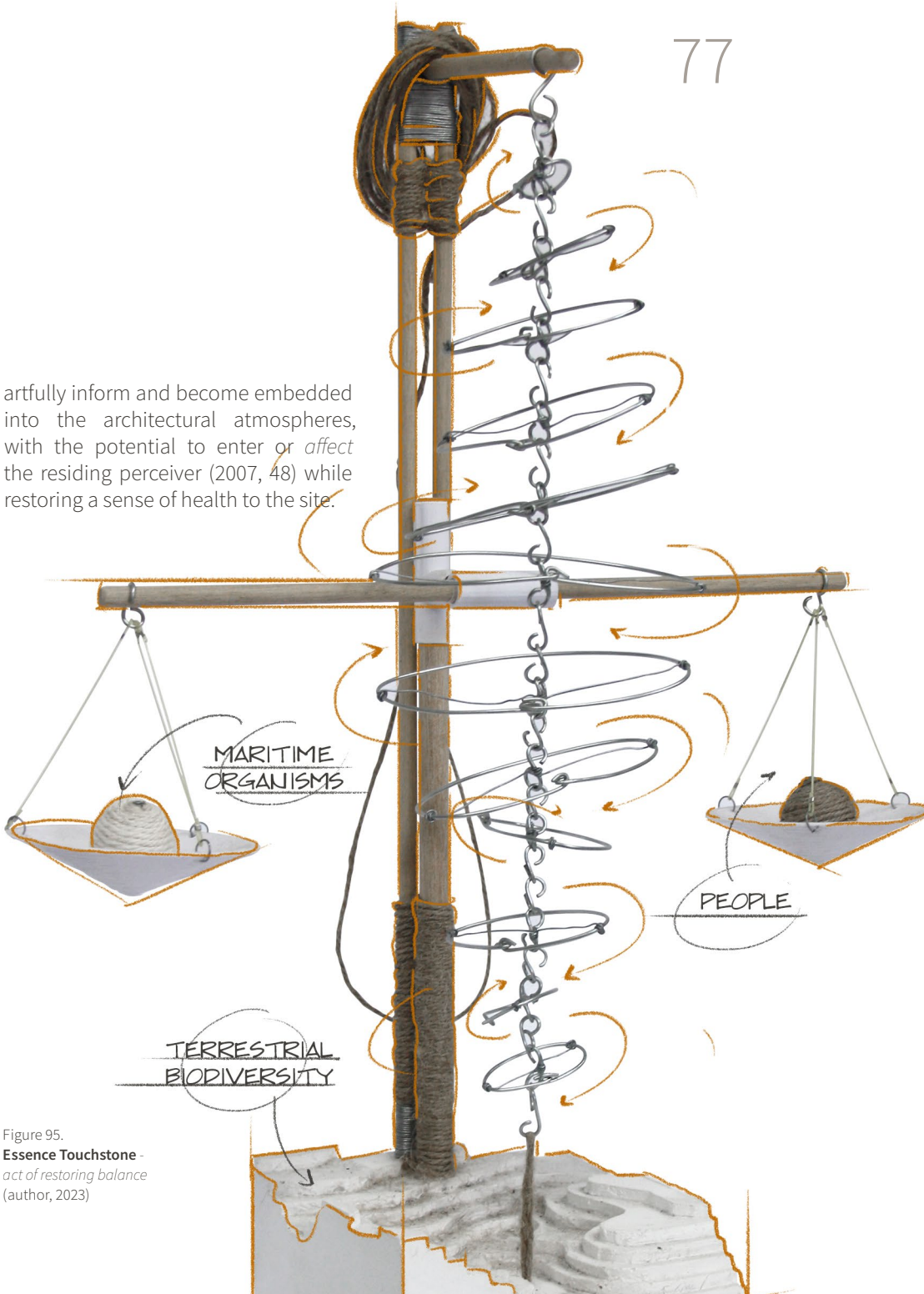


Figure 95.
Essence Touchstone - *act of restoring balance* (author, 2023)

LIFE WINDS OF NAMA–KWA

Life-winds of Nama-kwa
Conceptual drivers

Architectural Atmospheres
Space, power & the sense

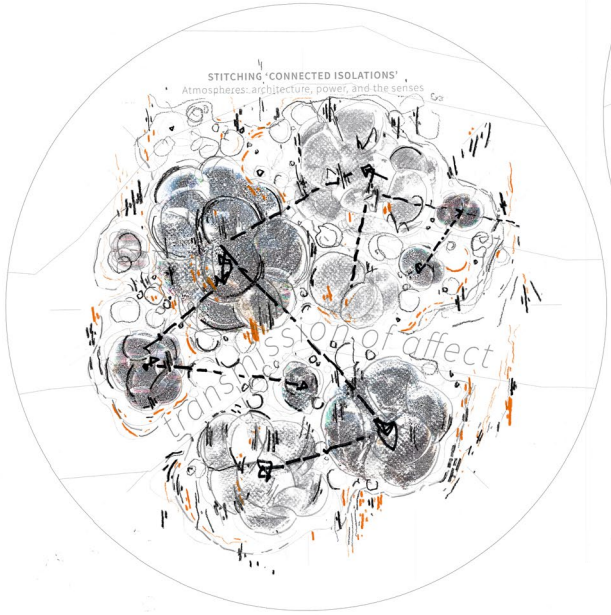


Figure 96. **Life-wind of People** - *architectural atmospheres* (author, 2023)

Maritime embodiment
Multi-sensory experiences

Figure 97. **Life-wind of Maritime Organisms** - *multi-sensory experiences* (author, 2023)

Unearthed Hidden Terrains
Recovery of landscape

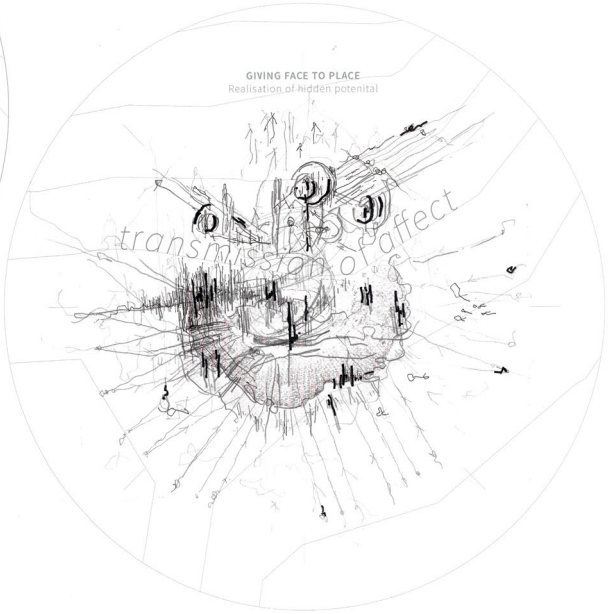


Figure 98. **Life-wind of A Recovering Landscape** - *unearthed hidden potentials* (author, 2023)

Theoretical Underpinnings
Research Question

[Title] **The Transmission of Affect**
[Sub-title] an Aqua[cultural] Development for the Nama-kwa and sojourners on the archetypal mining disturbance in Kleinzee

[RQ]...

How may a **strategically embodied** architectural approach of affect **reconnect** the **transmission**, **absorption**, and **anchoring** of the coastal town's hidden ecological *life-winds* by **leveraging atmo[spheric] configurations**, **multi-sensory maritime embodiments**, and **unearthed hidden terrains** amidst a post-company showpiece.

LIFE WINDS OF NAMA–KWA

LIFE-WIND OF PEOPLE

Introduction

Continuing from the widespread belief that almost everything is given specific transferable characteristics and how these life-winds become internalised, subsequently manifesting as the motive force behind someone or something (Low 2007, 72) - the first theoretical theme explored is the *life-wind* of 'people', which looks at architectural atmospheres: architecture, power, and the senses; and how this specific wind can become embedded within the spatial configurations of the Development.

After the 1925 discovery of diamonds in the semidesert of the northwest coast of South Africa, De Beers Consolidated Mines Ltd. has virtually proclaimed its dominion over the whole region. In the town of Kleinzee, this closed community's stark and startling portrait was evident in the power and hegemonic processes associated with the power once wielded over employees and workers of the prototypical company town of Kleinzee. Like other company towns, Kleinzee was not built for those who lived there. It was a rational result of the decision by a board of directors whose chief goal, while obeying the state's basic rules, was unhindered production at the lowest cost. The people were as much part of the machinery as were the washing plant, the haulage system, and the fences (Figure 99). The system was expected to operate smoothly, and, as far as the company was concerned, harmony could be achieved only if there was loyalty to the company and obedience to the system (Carstens 2001, 45). As mentioned in an analysis of the town and its histories, the feelings held by employees experienced "fenced-in-ness" that developed with the increase in security measures which surrounded the town, excluding the western boundary, the assumption being that entry from the sea was unlikely (2001, 49).

Therefore, as a reflection on the past as well as a projection toward the future, the Development seeks to capture how the *life-wind* of people, more specifically the atmospheres people experience and inhabit - through the material, social, and more ideational sense - may be strategically produced, designed, and staged within the spatial configurations of the post-industrial site (Böhme, et al. 2014, 61, 65); this being an attempt at exacting a form of behavioural control – a subtle form of atmospheric power; combined with stringent biosecurity protocols associated with the aquacultural sector – that occupants of the site and the town, know only too well.

It is a credible assumption that architectural atmospheres are created to *affect* us through the senses – where atmospheric design aims to subtly operate in ways designed to delude people who are consciously aware of it, including the subtle form of power which is creatively and inevitably engrained in the local people (2014, 62). Unlike the palpable politically driven atmospheric design that prevailed in Kleinzee during the peak of its alluvial diamond mining activities - a design strategically fabricated to control movement in and out of the town, which rendered feelings of "fenced-in-ness" (Figure 100) – the atmospheric approach addressed in this theme attempts to institute another approach, which is aimed at providing spatial configurations or *spheres*, as termed by Sloterdijk, that subscribe to an atmospheric approach which produces a multitude of sensory experiences (2014, 78), while at the same time, inviting memories of industrial or politically motivated atmospheric design as recognition of the past, while simultaneously hosting the biosecurity measures essential to a working and compliant aquacultural farm.

LIFE WINDS OF NAMA–KWA

However, instead of the negative effects of the politically motivated control known to the site and town throughout the 20th century and some measure still applicable to the present day, the *Transmission of Affect* that is derived from the *life-wind* of people is an attempt to breathe life back into the site through deliberately produced *spheres*, by strategically ensuring that overall spatial configurations, surfaces, materials, and textures evoke certain multi-sensory experiences. The various *spheres* become a powerful agent of transformation, a vehicle of influence with an atmospheric approach that strategically and positively *affects* the perceiver and supports a specific narrative through the senses (2014, 63). (Figure 101).

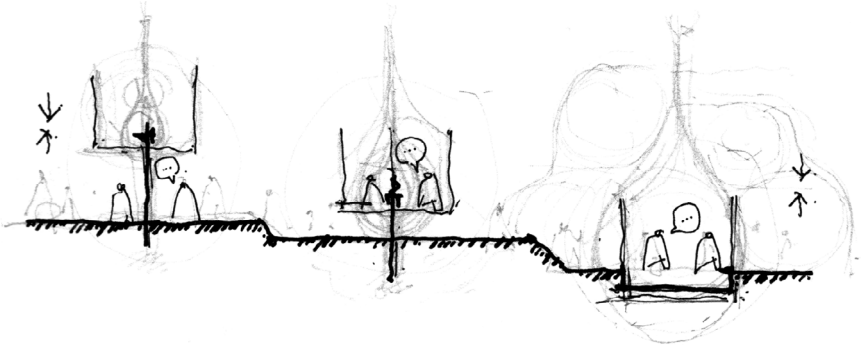


Figure 101. **Transmission of Narrative** (author, 2023)

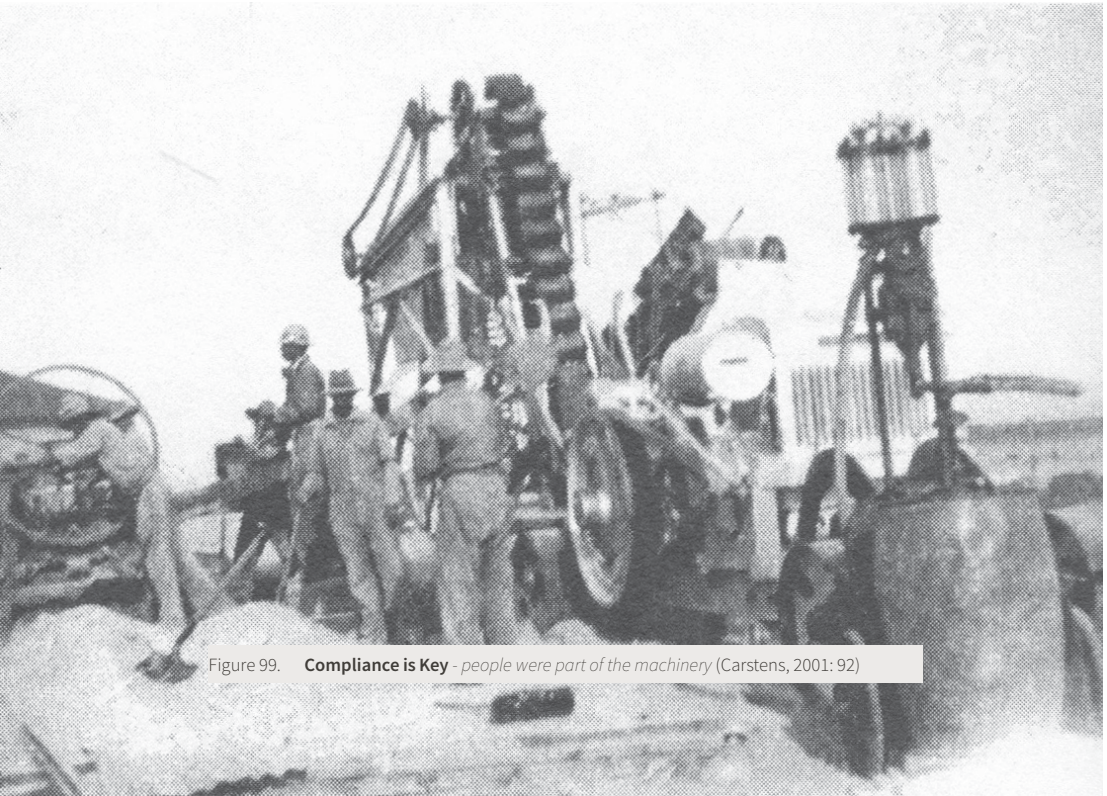


Figure 99. **Compliance is Key** - *people were part of the machinery* (Carstens, 2001: 92)

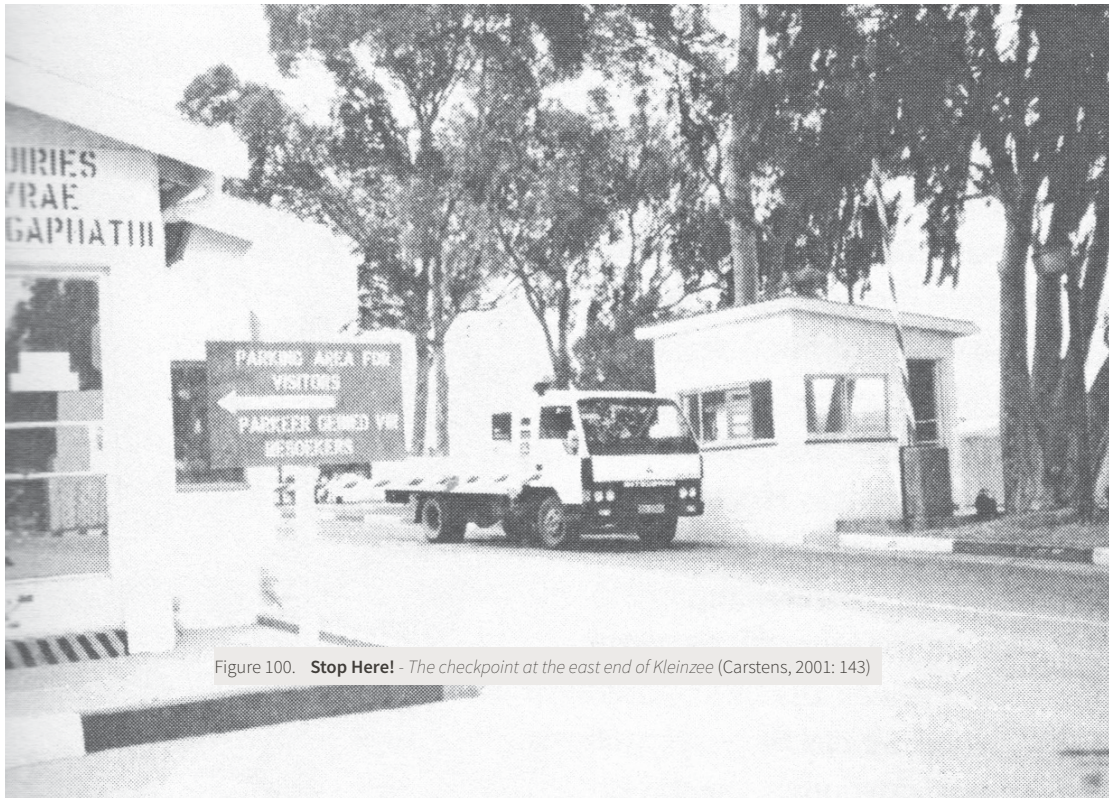


Figure 100. **Stop Here!** - *The checkpoint at the east end of Kleinzee* (Carstens, 2001: 143)

LIFE WINDS OF NAMA–KWA

Voices on the Topic

In The *Transmission of Affect*, Australian philosopher Teresa Brennan (1952-2003) poses the question, "Is there anyone who has not, at least once, walked into a room and 'felt the atmosphere?" (Figure 102). According to Brennan, the "atmosphere" or the environment enters the individual (Brennan 2004, 1). A slightly different angle to the architectural atmospheric focus of the Development, Brennan is in fact suggesting here that when people are present in the same locale and hence share the same atmosphere (Figure 103), a *Transmission of Affect* [of *life-wind*] may take place, in which the affective state of one person, transmits contagiously to others, meaning that the social situation in effect changes the biological constitution of each individual as well as collective persons (Böhme, et al. 2014, 61). In line with the widespread belief in *life-winds* and their specific transferrable characteristics, why can't this *Transmission of Affect* emit from an architectural atmospheric design and thereby affect the social situation within a certain space, changing the environment's constitution and indirectly those who inhabit it? Unlike the miners in Kleinzee, who were blatantly aware of the politically driven atmospheric system that controlled them, we are, perhaps even unwittingly, aware of the characteristics of certain spaces. The idea that the co-presence in a particular locale or - in line with the Development's focus - strategically produced atmospheres gets into the individual (Brennan 2004, 1) and can mould an individual's affective states immediately raises questions about power and politics. The site and programme were and still are well acquainted with this, which will be further unpacked in this theme.

Similarly, yet more in line with the architectural atmospheric focus of the Development, German philosopher Peter Sloterdijk (1947) provides a complimentary and new foundation for discussing space, architecture, and politics and their interrelations in the form of spheres (Böhme, et al. 2014, 61); *spheres* meaning 'the interior, disclosed, shared realm inhabited by people' (2014, 65). He identifies three volumes: *Bubbles, Globes, and Foam* (co-isolated structures). The fundamentals that underpin Sloterdijk's conception of *spheres* is that these spatial configurations, especially Sloterdijk's second volume, *Globes* - provide people with meaning, community, and a sense of immunity (or protection and security), whether in material, social, or a more ideational sense (2014, 65). Due to the power and politics historically associated with the site, and more importantly, the stringent biosecurity measures that are essential to a working and compliant aquacultural farm, the other volume Sloterdijk presents, which is at play in the spatial configurations of the Development, is *Foam*. Inspired by Morphosis and their notion of 'connected isolations', Foam best characterises the complex aggregate of microspheres, or 'co-isolated associations' of *Bubbles* (2014, 66) - as put by Sloterdijk – prevalent in the complex spatial configurations and zoning (public, semi-, private) applied to the Development's overall scheme (Ref. Chapter 4: Design Development).

The following section aims to demystify these spatial configurations or *spheres* – specifically *Globes* and *Foam* - in a more practical sense and further unpack how, through strategically produced atmospheres – the *Transmission of Affect* compound into a multi-sensory experience for both farm worker and visitor.

LIFE WINDS OF NAMA–KWA

Figure 102. **Atmospheric Pressure** - *feeling the atmosphere* (Frank, 2010: online)

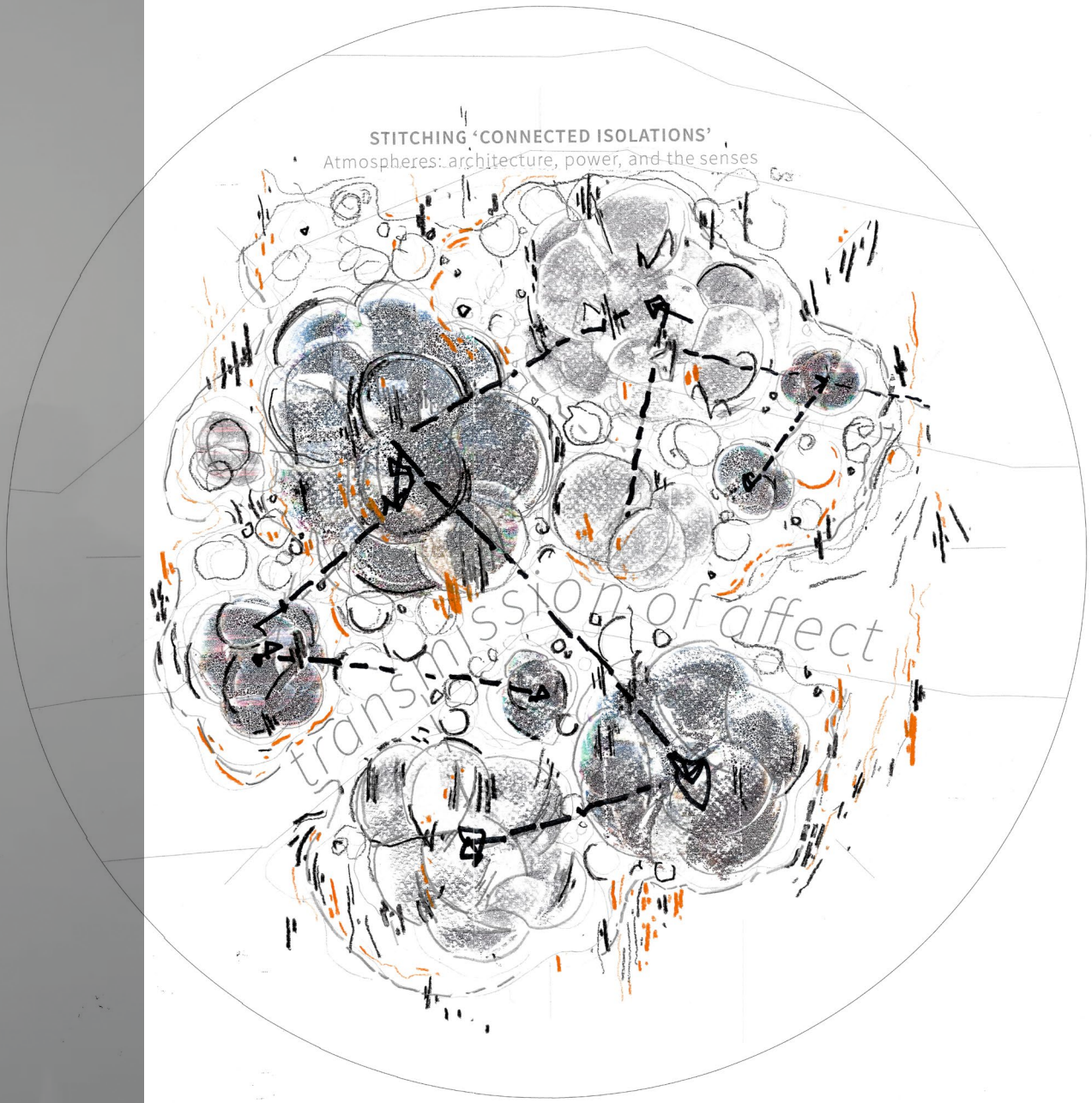


Figure 103. **Life-wind of People** - *co-isolated associations of bubbles* (author, 2023)

LIFE WINDS OF NAMA–KWA

Interpretation and Approach

Finnish Architect Juhani Pallasmaa (1936) (Böhme, et al. 2014, 78) also calls for an 'atmospheric notion of architecture' that considers a multi-sensory experience which subscribes to a subtle form of power that affects the perceiver by working at a non-conscious level produced through sensory design. Similarly with the Development in Kleinzee - through spatial embeddings, the spatial configurations within the building employ an alternative and more positive atmospheric approach. This approach attempts to govern behaviour, desire, and experiences – as a subtle form of power indicative of the site's history and present biosecurity measures required - through interventions in the physical and socio-psychic environment (2014, 62). An approach that is a-typically *spherological* (2014, 61), which Sloterdijk explored to detect the relationships between architectural atmospheres and the senses, as well as how the marriage of the two may further [positively] *affect* people within certain spaces (2014, 62).

As a response, in an attempt at exacting behavioural control – through deliberately produced, designed, and staged atmospheres – throughout the internal spatial experiences of the Development, a particular *Transmission of Affect* takes place without people necessarily being consciously aware of it (2014, 78). The various productions of strategically produced atmospheres experienced throughout the building vary in degree, like 'control'. Some of these atmospheric scenarios are as follows:

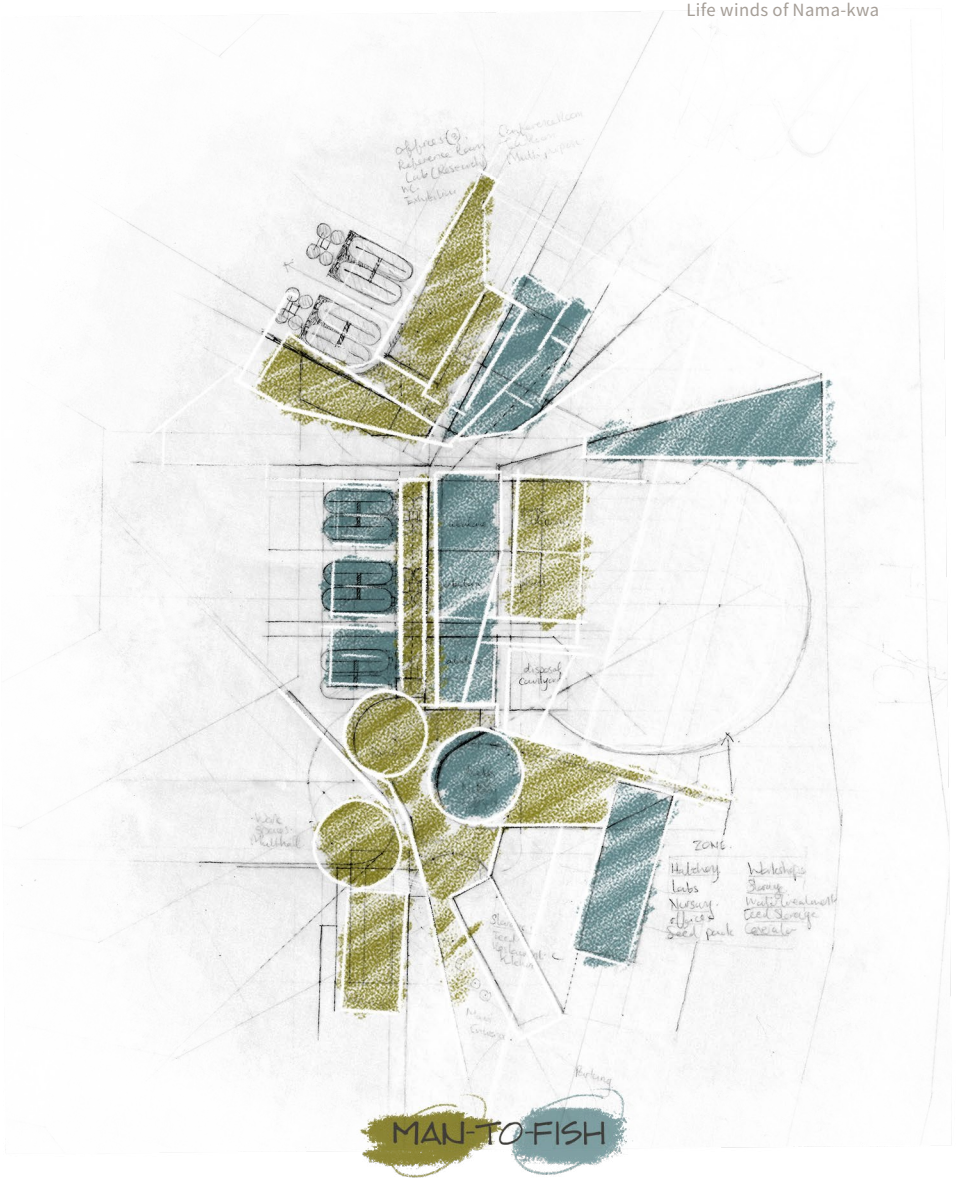


Figure 104. **Man-To-Fish** - *early development of co-isolated associations*(author, 2023)

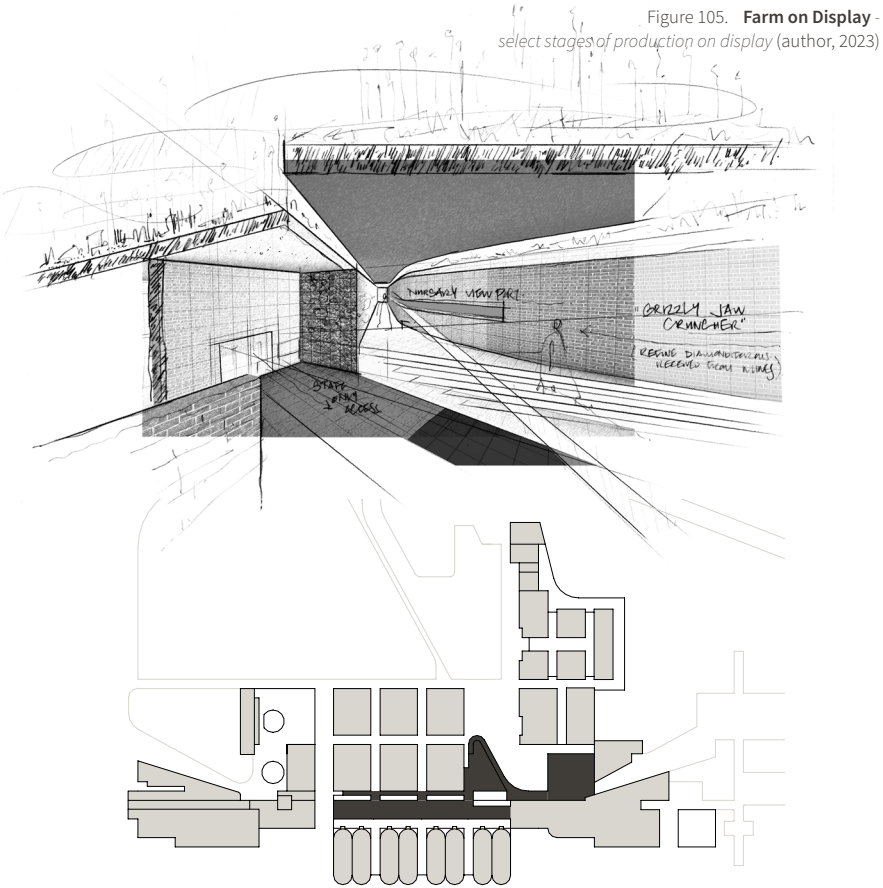


Figure 105. **Farm on Display** - *select stages of production on display* (author, 2023)

Figure 106. **Promenade** - *exhibition route with spatial embeddings of a diamond processing plant* (author, 2023)

In the **first scenario**, where the farm and public zones meet (Figure 123) and the aquacultural activities are focused on exhibition; stringent biosecurity measures still require a distinct and unmistakable separation. Even though the two spheres may be related in certain ways, these spheres are considered as not overlapping for obvious reasons (2014, 66). Consequently, meaning, community, and a common sense of protection concerning this specific scenario take on a *Foam-like* configuration, according to Sloterdijk's concept of *spheres*, and are more particularistic. Although considered part of a whole, the spatial configuration between these two *spheres* is further fragmented into 'co-isolated associations' of *Bubbles - Foam*.

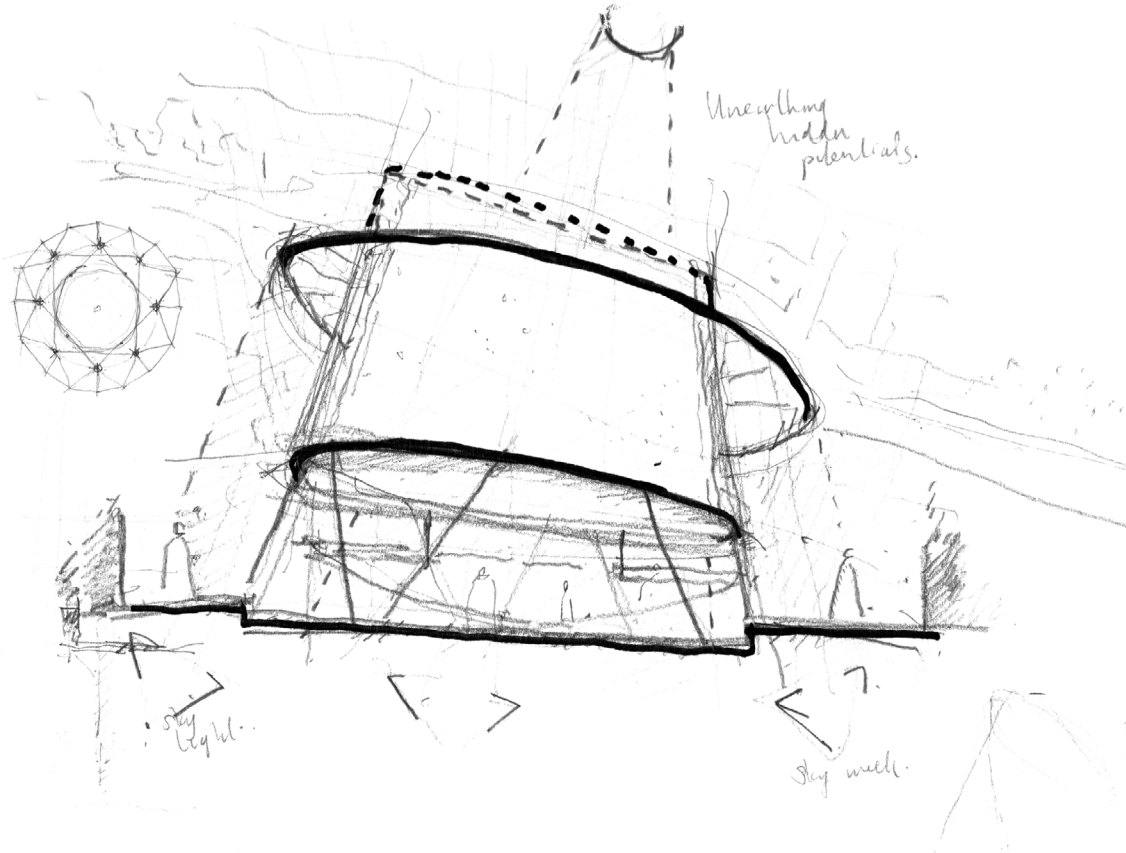
In a **second scenario**, indicative of the site's history, the promenade that visitors assume allowing them to experience select stages of the aquacultural production (Figure 106), have spatial embeddings inspired by an atypical and highly controlled diamond processing plant and the various stages unprocessed diamondiferous goes through therein (Figure 105). Historically, every worker in the mining area was under the eye of a supervisor whose main job was to prevent workers from leaving with diamonds (Carstens 2001, 79). Considering that the need to control still applies, the concept of surveillance and governance over people and the way they behave is rendered visible. "Gate with a light" (2001), is the name given to a set of oculi skylights (Figure 107), bookending the entrance and exit of the looped exhibition promenade. Functioning not solely as a metaphoric protective membrane that figuratively takes on a *Globes-like* configuration inspired by the site's past but explores the relationship between architectural atmospheres and the senses and how the compounding of the two further exacts a multi-sensory *Transmission of Affect* that positively changes the environmental constitution.

LIFE WINDS OF NAMA–KWA

In conclusion, the first theoretical theme, *life-wind* of a people, explores the impact of *life-winds* and architectural atmospheres in the site's transformation into an aquacultural farm. The history of Kleinzee, controlled by De Beers, reflects power dynamics and confinement due to security measures. Inspired by philosophers like Teresa Brennan and Peter Sloterdijk, the concept of the *Transmission of Affect* is central. It suggests atmospheres can influence individuals and social situations. Sloterdijk's *spherological* concepts—*Bubbles, Globes*, and *Foam*—shapes the development's spatial design, aiming to create multi-sensory experiences that influence behavior while adhering to biosecurity protocols. Architect Juhani Pallasmaa's idea of an "atmospheric notion of architecture" aligns with the development's approach, using sensory design to subtly exert power. Various scenarios within the site illustrate how atmospheres can be strategically created to achieve specific outcomes.

In summary, the *life-wind* of a people theme explores how architectural atmospheres can positively impact individuals within the space, reversing historical constraints and control. This approach is grounded in philosophical concepts, offering a multi-sensory *Transmission of Affect* that shapes the site's narrative and environment.

Figure 107.
'Gate with a Light -
people were part of the machinery (author, 2023)



LIFE WINDS OF NAMA–KWA

LIFE-WIND OF ANIMALS
(Maritime Organisms)

Introduction

Continuing from the widespread belief that almost everything is given specific transferable characteristics, and knowing how these *life-winds* become internalised, subsequently manifesting as the motive force behind someone or something (Low 2007, 72) – in attempts to breathe life back into the site and recover a semblance of balance, the second theoretical theme explored is embodiment theory through the *life-wind* of animals. More specifically, this refers to the *life-wind* of maritime organisms (Figure 108) and explains how this specific *life-wind* becomes an embodied poeticised image within the spatial configurations of the development. The poetic image spoken of here refers to an evocative, affective, and meaningful sensory experience that is layered, associative and dynamic, and in constant interaction with memory (Pallasma 2011, 41) Put more plainly, one's perception or understanding of a fish's spine.

As discussed in previous chapters, the mined-out, heavily disturbed area of Kleinzee is suitable for only a few land use types, including land-based aquaculture. More specifically, farming maritime organisms, not freshwater organisms, has proven viable despite its remote location and water scarcity (Massie, Hutchings and Clark 2018, 27).

Serving as an expansion proposal of an existing small-scale aquacultural farm, the development intends to have certain spaces and geometries therein articulated with a direct image quality that integrates the various aspects and dimensions transmitted from the *life-wind* of its maritime organisms, i.e., a fish-like disposition. The *Transmission of Affect* thus occurs through the various fish-like spatial embodiments, which advocate for a sensory architecture that favours existential

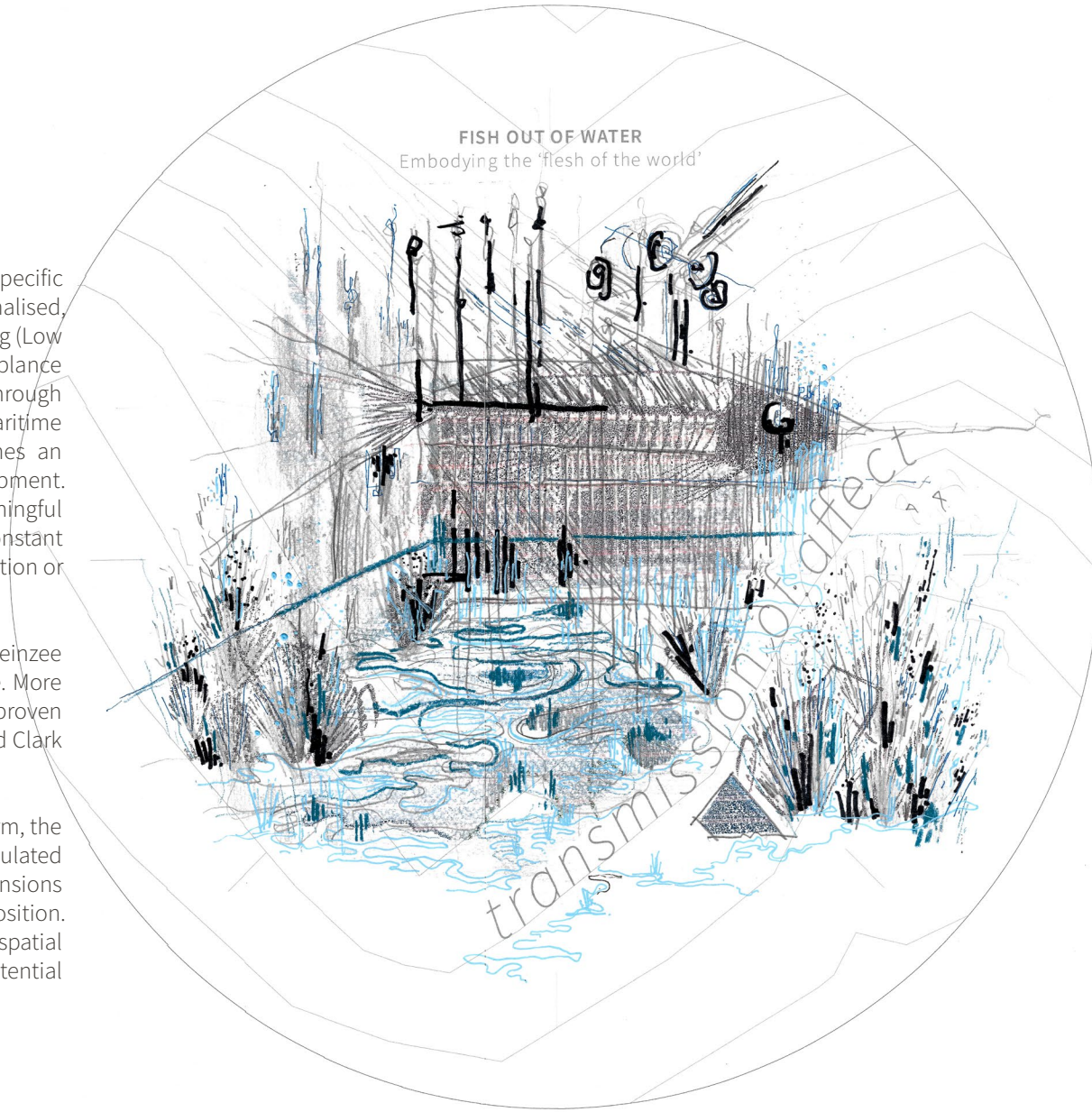


Figure 108. **Life-wind of Maritime Organisms** - *multi-sensory experiences* (author, 2023)

LIFE WINDS OF NAMA–KWA

depth and sincerity in its atmospheric tectonics over an architecture that solely privileges vision. Therefore, strengthening the existential experience (Pallasma 1996, 29) without fully forsaking architecture, as described by Juhani Pallasmaa, which 'offers shapes and surfaces moulded for the pleasurable touch of the eye' (Pallasma 1996, 30).

It is therefore hoped that through a layered and meaningful sensory experience embedded within the spatial configurations of the development - in select areas articulated with a poetic image transmitted from the *life-wind* of maritime organisms (Figure 110) - the development will entice one's senses, imagination, and emotions in an encounter with its spaces and geometries; and - at the same time - direct, scale and frame actions, interrelations, perceptions, and thoughts in those encounters.

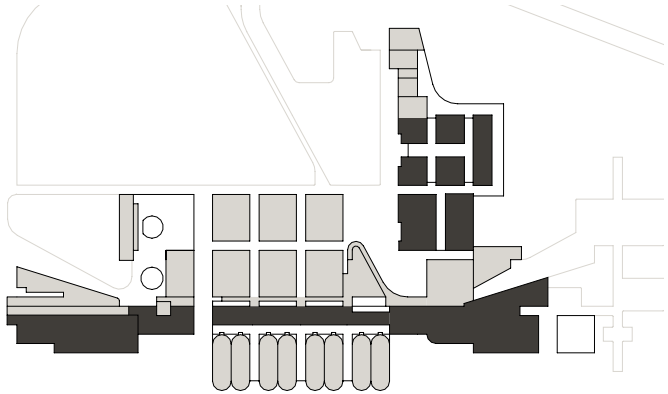


Figure 109. **Spatial Embodiments** - *locations of spatial embeddings of a fish* (author, 2023)

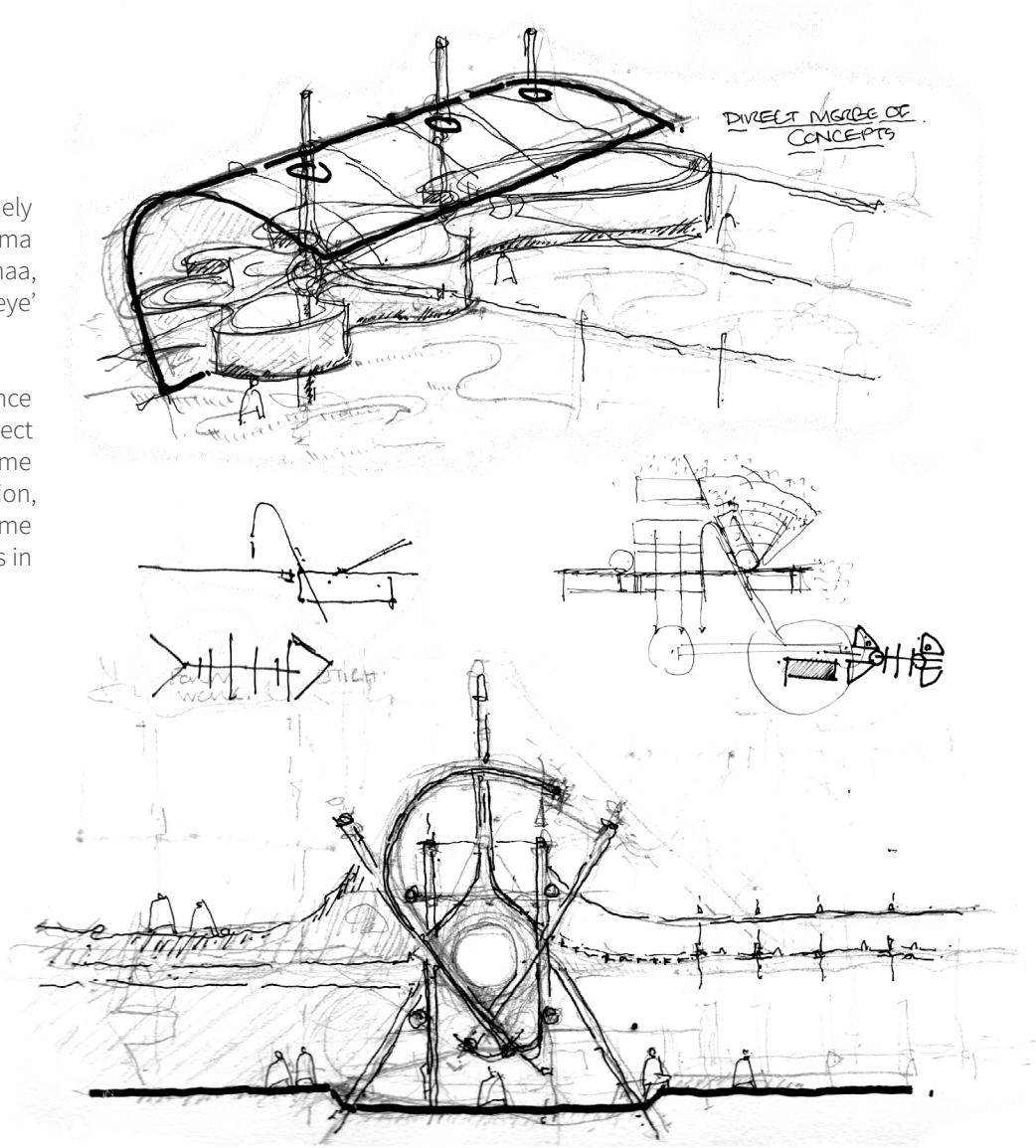


Figure 110. **Poeticised Image** - *spatial embodiments of a fish* (author, 2023)

Voices on the Topic

Poetic images have a life and reality of their own and they develop through unexpected associations rather than rational and causal logic. [True] poetic images are multi-sensory, and they address us in an embodied and emotive manner (Pallasma 2011, 20). Pallasmaa believes all artistic and architectural [*affects*] are evoked, mediated, and experienced through poeticised images, images which, like live creatures, seem to possess a life force (Pallasma 2011, 42). These images are embodied and lived experiences that take place in 'the flesh of the world', becoming part of us, while we too – according to embodiment theory – 'unconsciously project aspects of self onto a conceived space, object, or event'; a thought oddly congruent with the widespread belief that almost everything is given specific transferable characteristics - *life-winds* - that become internalised, subsequently manifesting as the motive force behind someone or something (Low 2007, 72). Consequently, an unconscious exchange or *Transmission of Affect* is instantly implied during a bodily encounter with an embodied architectural structure - in which one enters and occupies the space. The space also enters and occupies one (Pallasma 2011, 42) – mediating other sensory experiences (2011, 53).

These poeticised images - rarely a single line of thought but several superimposed strands coinciding (2011, 50) – mostly remain unconscious and unnoticed. In other terms, one may grasp the entity, 'the [overall] anatomy', 'creature-like coherence', or 'overall structure and significance' (2011, 42-43, 53) before or perhaps never identifying its details. Therefore, the act of embedding a poeticised image – in this case, the literal embodiment of a fish-like disposition – is not a meaningless endeavour towards an additive entity with auxiliary qualities and frivolous details but a subtle manoeuvre towards an integrated experience in which the overall entity gives substance to its parts (2011, 51), and context, as well as the layered and meaningful sensory experience within it. Whether fully grasped or not is of no consequence. Consequently, the poetic image that is encountered, in this case, is not just an isolated object or visual unit but something which aims to alter and condition one's experience of space (2011, 123), while at the same time serving a purpose in its contextual response. Some of these responses, later discussed, include - serving as a wayfinding image, a windbreaker, a windscoop and as an extension of the landscape into the man-made image, which is representative of the industrial typology known to the area.

Following the more layered and meaningful sensory experiences tethered to the embodying of poeticised images, Pallasmaa's thoughts on deep architectural experiences come to the fore. They are considered relations and acts rather than physical objects or visual entities (2011, 123). In his seminal work The *Embodied Image* (2011), Pallasmaa calls for two key approaches in manufacturing deep architectural experiences. Firstly, he urges architecture to be an **organising image** - something relational a primary instrument of orientation in the world. Secondly, he calls for architecture to be an **asset of action** – a verb, not solely an object (2011, 121). Consequently, there is a call for the material building within the Development to be choreographed (2011, 123) to meet and successfully respond to the call for architectural experiences to organise images and action assets. This can be achieved through the specific conditioning of structure, space, and light.

The next section aims to unveil how the material building of the Development responds to Pallasmaa's earnest call for an embodied architecture – one that is evoked, mediated, and experienced through a poeticised image – and that is both an *organising image* and an *asset of action*.

LIFE WINDS OF NAMA–KWA

"All artistic structure is essentially 'polyphonic', it [emerges] not in a single line of thought but in several superimposed strands at once."

Anton Ehrenzweig
(Ehrenzweig cited in Pallasmaa, 2011: 50)

Interpretation and Approach

For the material building of the Development to successfully respond to the call of becoming an *organising image* and an *asset of action* within the multi-faceted post-industrial setting of Kleinzee, the architecture essentially must, according to Pallasmaa, emerge as an extension of the landscape into the man-made realm, and not stand as an isolated self-sufficient artefact (Pallasma 1996, 28). This theme is further 'unearthed' in the *life-wind* of a recovering landscape following and subsequent explorations of the SiteDAte (Ref. Chapter 2 – SiteDAte: alternative site analysis).

British theorist Anton Ehrenzweig (1908-1966) held the opinion that "all artistic structure is essentially 'polyphonic', it [emerges] not in a single line of thought but in several superimposed strands at once" (2011, 50). This statement aptly encapsulates the highly abstracted and condensed experiential entity - which fuses the multiplicities that govern the overall architectural output of the material building of the development and conditions the spatial experience thereof - into a singular lived poeticised image: **the spine of a fish**.

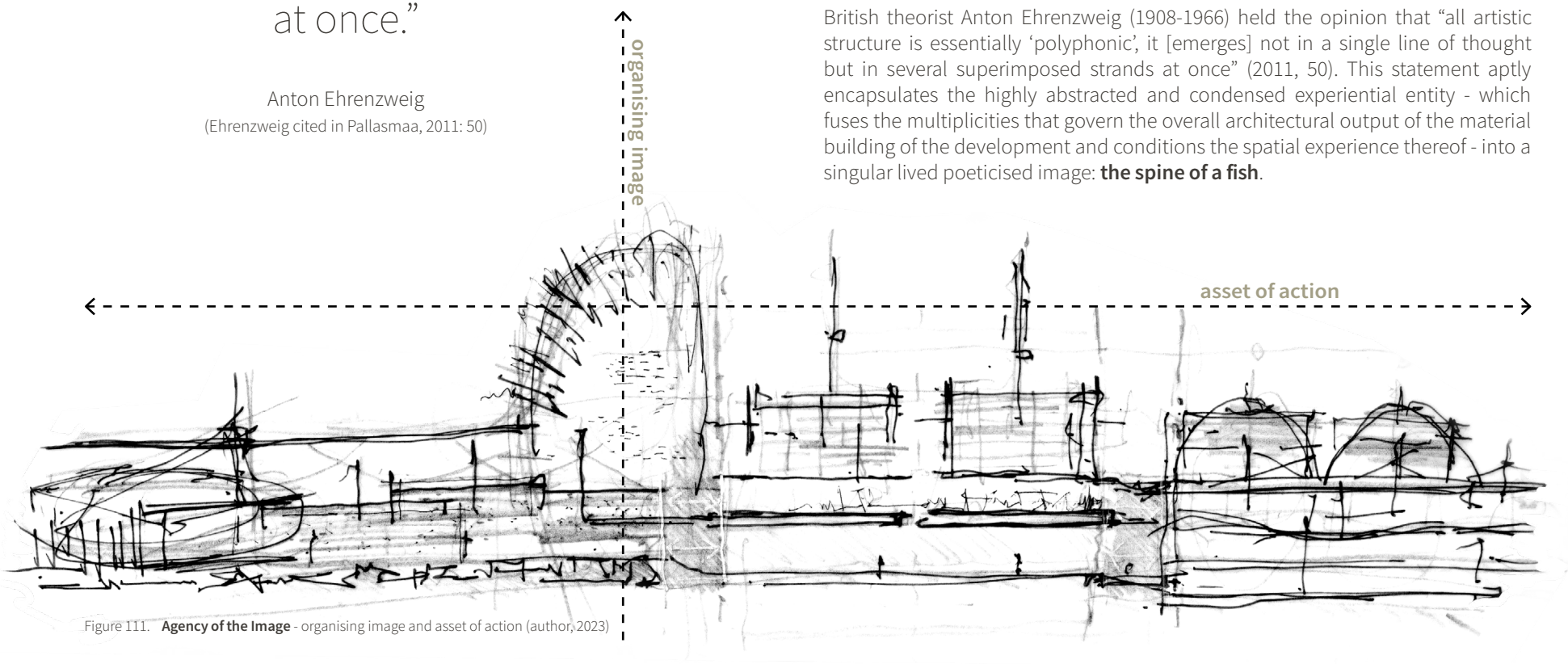


Figure 111. **Agency of the Image** - organising image and asset of action (author, 2023)

LIFE WINDS OF NAMA–KWA

This poeticised image of a fish's spine emerging out from the landscape prevails firstly as an **organising image** (Figure 111) over the whole Development, due to its emphasised verticality, as well as horizontal prominence (Figure 111) across the span of the material building of the Development. Much like the vertebra is connected to ancillary bones and muscle tissue, the spine of the Development groups everything by organising and holding the parts in place. It is not experienced as a collection of isolated visual pictures but as a cohesively fused 'material and spiritual presence' that hosts a multitude of physical and mental structures (Pallasma 2011, 30) that are intended to address the perceiver in an embodied and emotive manner (2011, 20). As the material building emerges from the landscape, 'hauling' along with it a semblance of bygone images of industrial plants and machinery (Figure 112), it transitions and is abstracted into a more animistic expression (Figure 113), the likeness of the spine of a fish. Such abstraction - whether fully comprehended or not in encountering the embodied spatial configurations it applies to - is held together by its creature-like coherence and meaning (2011, 53). As a result, a strengthened architectural existential experience achieved through the embodiment of the *life-wind* of maritime organisms becomes the primary instrument of orientation (2011, 120) once again on the site in Kleinzee.

Secondly, for the material building of the development to be considered a deep architectural experience, it should also become an **asset of action** over merely being a visual entity. Instead, according to Tadao Ando (1941), tension should exist between the functionality and 'uselessness' of the building (Pallasma 1996, 44). In response to this notion, through the poeticised image of a spine, the material building attempts to alter and condition the spatial experience, frame and structure, articulate and relate, separate and unite, prohibit and facilitate (Pallasma 2011, 123). Not only does it attempt to fulfil such acts, it also in acknowledging the climatic character and stresses of the site, becomes an asset in mitigating the

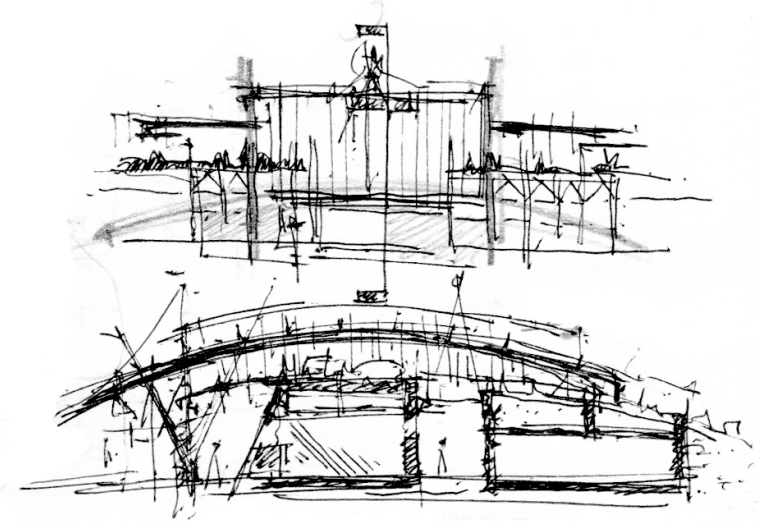


Figure 113. **Condensed Experiential Image** - the fusion of the poeticised image of maritime organisms and industrial wash plant emerging from the natural landscape (author, 2023)

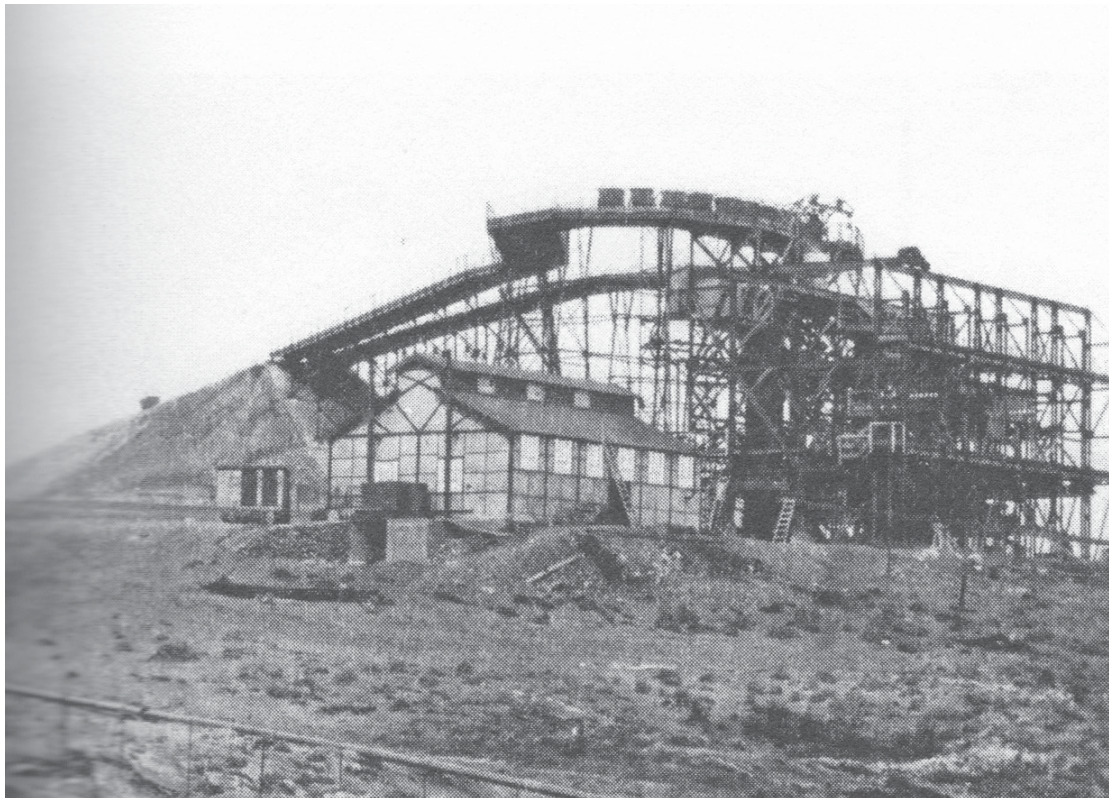


Figure 112. **Industrial Linkages** - *emerging as an extension of the landscape into the man-made realm, washing plant and power station 1930s* (Carstens, 2001: 89)

LIFE WINDS OF NAMA–KWA

desiccating winds known to the area. A move inspired by Glenn Murcutt's Mining and Minerals Museum in Broken Hill (Ref. Chapter 2 – Macro Analysis: Industrial Character). Doubling up both as a windbreaker and windcatcher that, through the process of evaporative cooling, ventilates the aquacultural activities behind, the spine of the material building is more than a mere visual entity. However, it is rather a functional *asset of action*. Therefore, the spine is not merely a romantic desire to mimic past industrial forms but form to be used to a rational end.

In conclusion, the second theoretical theme, *life-wind of animals* (maritime organisms), explores how this specific *life-wind* becomes embodied within the Development in Kleinzee. This essentially integrates the essence of fish into the spatial configurations, aiming to create evocative sensory experiences layered with affective qualities and memory interactions. Pallasmaa's concept of poeticized images plays a central role. These images, often unnoticed, aim to alter one's spatial experience and serve various purposes within the Development. In essence, the material building embodies the *life-wind* of maritime organisms, creating a deeply experiential architecture engaging the senses, emotions, and actions of its occupants while integrating with the landscape and fulfilling functional needs.

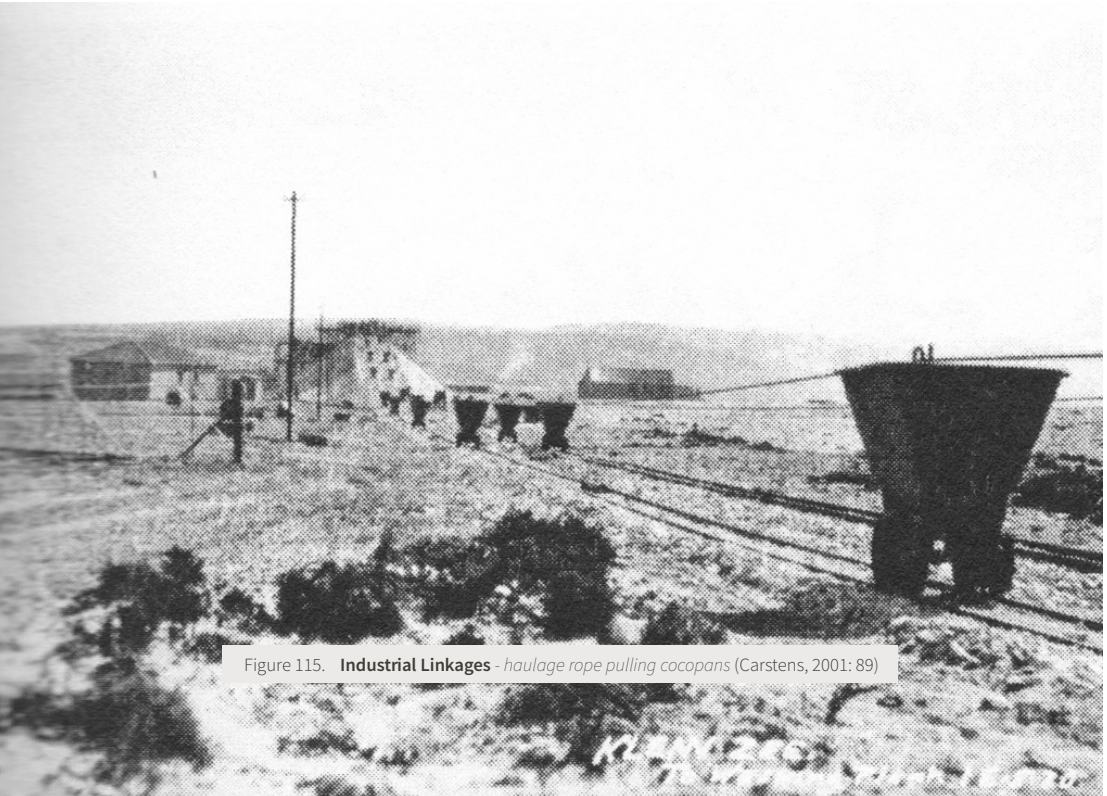


Figure 115. **Industrial Linkages** - *haulage rope pulling cocopans* (Carstens, 2001: 89)

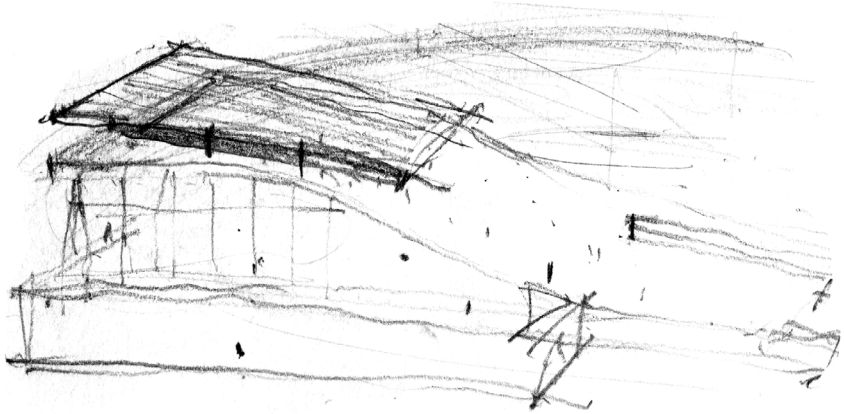


Figure 114. **Emerging from the landscape** - development of visitor's centre

LIFE WINDS OF NAMA–KWA

LIFE-WIND OF A RECOVERING LANDSCAPE

Introduction

Continuing from the widespread belief that almost everything is given specific transferable characteristics, and determines how these *life-winds* become internalised, subsequently manifesting as the motive force behind someone or something (Low 2007, 72) - in attempts to breathe life back into the site and recover a semblance of balance - the third theoretical theme explored in attempts to breathe life back into the site and recover a semblance of balance is the *life-wind* of a recovering landscape (Figure 116). In this case, the term 'recovery ' involves less recuperation and restoration (stitching and patching over) and more of an extension and realisation of the landscape's hidden potential (Corner 1999, ix).

The site and the condition of its terrestrial environment, as has been stated, has gone through a period of *abbau*, the 'unbuilding of the world' (Carstens 2001, 3), where much of the area has been mined down to the bedrock and has to date not had its topsoil returned to the various mining sites. Instead, it was left as numerous mine tailings (mounds). This neglect and wanton disregard towards the environment resulted in the 'draining' of the site's *life-wind*, with its character and strength nearly diminished. Therefore, a call has been sounded to reactivate this post-company showpiece (Carstens 2001), and recompense the inappropriate displacement of its 'wind' (Low 2007, 70) – to breathe life back into it. This active recovery should look forward rather than describe the past and current conditions (Corner 1999, 12).

By embracing the various readings unearthed upon visiting the site and the subsequent explorations of the SiteDAte (Ref. Chapter 2 – SiteDAte: alternative site analysis) and its imagined terrain, the development's building seeks to absorb

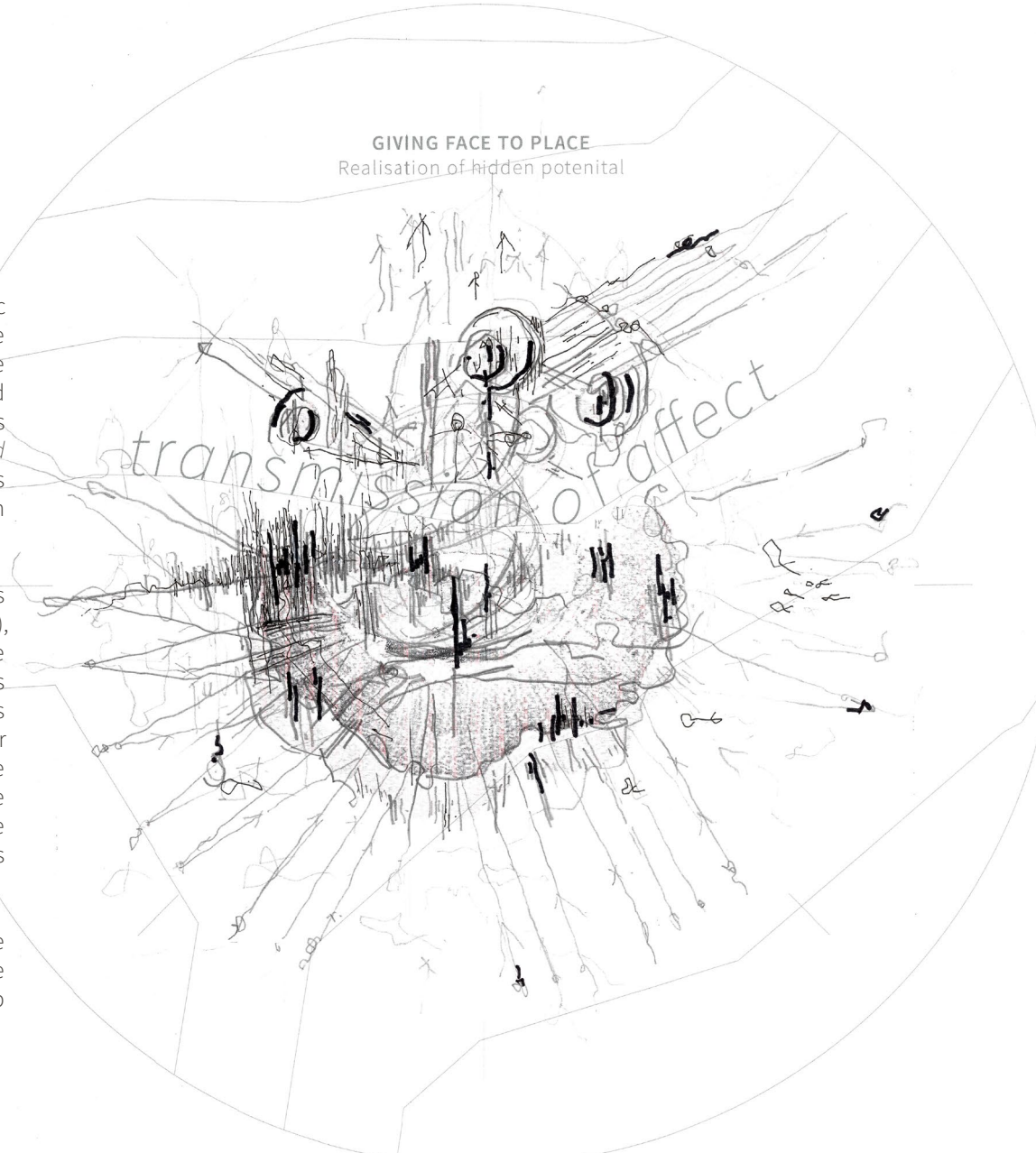


Figure 116. **Life-wind of A Recovering Landscape** - *unearthed hidden potentials* (author, 2023)

LIFE WINDS OF NAMA–KWA

the *life-wind* of the site's recovering landscape, by absorbing both old and new identities hidden in the site's disturbed ecology. It is through the readings that the very nature of the landscape and its associated industrial typologies of old are reimagined - thus rethinking to imagine what the landscape and subsequent building might become (Corner 1999).

DCA hopes that the efforts of the Development manage to counter the limitations of typical remediation (Wennerstrom 2021, online) while avoiding an overt simplification of environmental concerns by allowing the natural stresses on the environment and the response thereof to unearth incredible emotional power and sense of place (Murcutt 1992, 170) in Kleinzee.

> "To recover and renew the language of landscape is to discover and imagine new metaphors, to tell new stories, and create a new landscape."
>
> Anne Whinston Spirn
> (Spirn 2001, 43)

Voices on the Topic

UK-based landscape architect and theorist James Corner (1961) understands landscape to have the capacity to critically engage the political programmes that operate in a given society (Corner 1999, 1). In reference to the site and neighbouring town's historically known activities of prospecting and the political agendas associated with it - of ruthlessly unearthing the contents of a 'closed community' and making the unseen seen for capital gain, the *Transmission of Affect* in this imagined case would be for the building to enable and embody the prevalent differences and competing forces discovered within the site's landscape - both current and historical – thus revealing the language of the landscape in a culturally enriching manner.

Discoverers - namely Bachelard, Foucault, Deleuze, and Lefebvre, among many others, stated that the importance of place is a conviction that place itself is no fixed thing: it has no steadfast essence (Casey 1998, 289). When reading their collective works, one would learn to acknowledge and appreciate more fully the many faces of place to be found within and around us (1998, 287). Similarly, (Corner 1999, 4) considered landscape an ongoing medium of exchange embedded and evolved within different societies' imaginative and material practices at different times. Therefore, the various types of thickening of layers (or faces) of the site's landscape that has accrued over time (1999, 4), is intended to condition construction, and the reverse applies; the nature of construction conditions the play of the landscape (1999, 7).

Glenn Murcutt (Murcutt 1992, 184), when discussing the logic behind proposing *malqafs* (Figure 117) – a formal alteration of a windscoop, based on Egyptian architect Hassan Fathy's interpretation (1992, 178) - for the Mining and Minerals

Museum in Broken Hill (Figure 118) (Ref. Chapter 2 – Macro Analysis: Industrial Character), justifies their incorporation not because of a romantic desire to mimic past forms but to use the form to a rational end. Therefore, the emphasis for the project shifts from the landscape that was left as a byproduct of industrial plunder to a symbiotic trade-off (Figure 138) between landscape and built form, thus acting as an agent producing and enriching culture, and that which serves as a well-articulated response to environmental stresses, including the cultural and natural processes that undergird the richness of life on earth (Corner 1999, 12). The focus, as Corner and Murcutt put it, is therefore upon the agency of landscape – how it works and what it does, rather than solely upon its appearance (1999, 4). Instead, it is an issue of strategic instrumentality, where form is still important, but less as appearance and more as an effective disposition of parts which read the language of its environment and continually acknowledges the physical and climatic character of its site (Murcutt 1992, 173). In essence, the building becomes an environmental instrument. Murcutt (1992, 169), believed that there is integrity that operates within a landscape, which presents warning and provides inspiration. The next section aims to demystify the 'effective disposition of parts'. It explains how the recovering landscape and built form symbiotically respond to the environment – drawing their combined power from its innate language, environmental stresses, and expressions accrued over time (Corner 1999, 4), as unearthed within the alternative site analysis - SiteDAte.

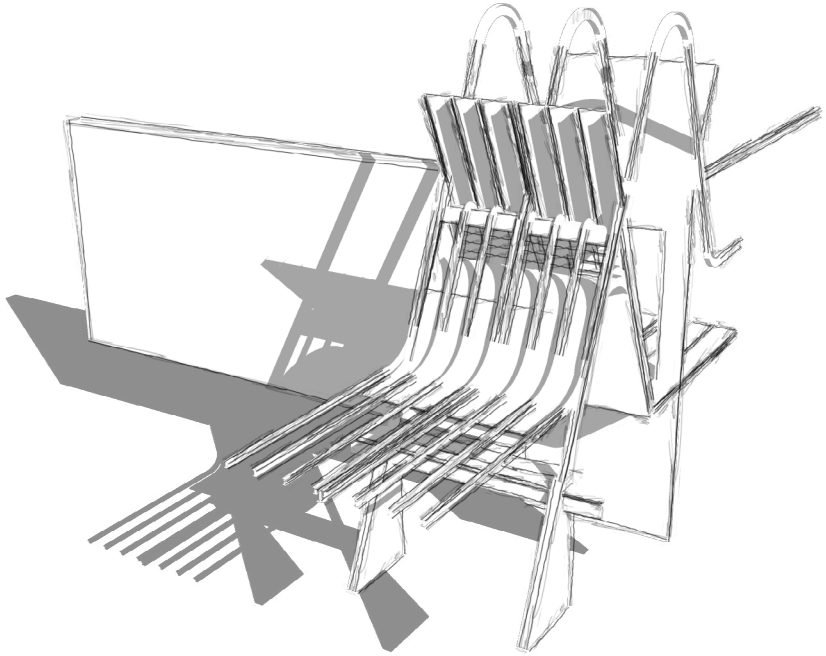


Figure 117. **Windscoops** - *Development's response to the prevalent stresses on site* (author, 2023)

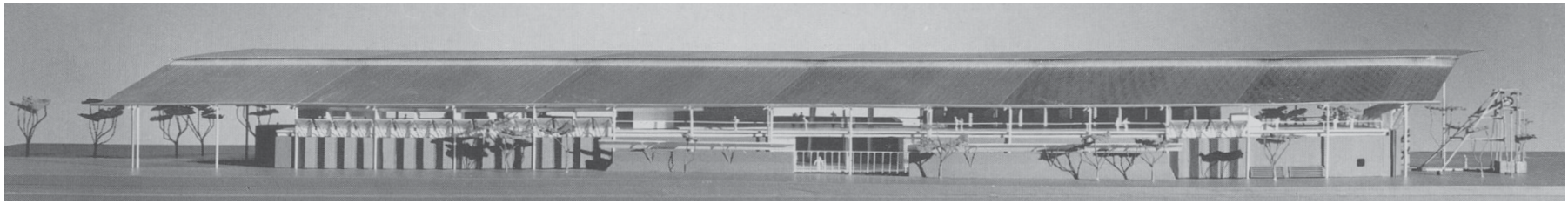


Figure 118. **Malqafs** - windscoops of Mining and MInerals Museum, Broken Hill (Murcutt, 1992: 185)

LIFE WINDS OF NAMA–KWA

Interpretation and Approach

Corner (Corner 1999, 12) understands landscape to be inherited, not made, and demands to be remade, recovered, cultivated, and projected towards new ends. This statement is further supplemented by Murcutt's musings of whether intervening is a good thing or not. Similar to sentiments shared in the EIA in 2018, Murcutt's thoughts teeter between two lines of thought.

> "On the one hand, if we do something to the land, the results of that intervention will show up, perhaps not immediately but over time, and the problem that we've created will define itself. But this legibility also provides an incredible array of solutions to difficulties we face when we attempt to occupy land" (Murcutt 1992, 169).

Considering the sobering reality that the landscape of the site has been severely altered as a result of a hundred years of diamond mining. Characterised by numerous mine tailings, depressions filled with seawater seepage, bare bedrock, not to mention the impacts upon the social and socio-economic standings in Kleinzee; it has resulted in the scenario of having nothing left but a negative residue. This presents nothing but opportunity.

Project D.I.R.T, an experimental studio led by landscape architect Julie Bargmann (1958), has proved this possible. Principally focused on contaminated, neglected, and forgotten post-industrial sites – her methodology as a designer critically addresses the social and ecological imperatives to reclaim degraded land and counter the limitations of typical remediation by offering more dynamic modes of regeneration. According to Bargmann, unearthing the raw ingredients of design from waste and wastelands defines her life's work. Recognising that toxic or post-industrial sites become isolated by necessity but do not go away, D.I.R.T. is driven to find ways to reconnect them - physically, socially, and culturally.

Similar to Bargmann's methodologies, the development in Kleinzee looks towards reframing the industrial landscape and reclaiming the degraded landscape through a design process that attempts to reconnect and stitch industrial and social histories together, address issues of social inequity, cultural neglect, and regarding this theme - environmental degradation. With each decision being made, the hope is that they collectively supplement the design to become as 'light on the site' as possible (Wennerstrom 2021, online) without severing its ties with its industrial links (Ref. Chapter 6 – Technical Report).

Because of the sheer size, in both scale and scope – the symbiotic trade-off relationship fabricated to exist between the buildings and the landscape is intended to serve as host (Figure 119), as a metaphor for inclusive multiplicities and pluralisms that enable and embody the prevalent differences and competing forces known to the site and environment – to play out in new ways (Corner 1999, 1). Therefore, the active renewal and unearthing of the site's hidden potential, reflected in the *Transmission of Affect* of the *life-wind* of a recovering landscape - into and beyond the building - aims to draw its strength and delicacy from the two [approaches] that Corner (1999, ix) mentions concerning landscape development. Both approaches are represented as the continuation of an ongoing 'project' of layering, ideas, and artefacts (1999, x).

The first [approach] is **recollection**, which is the apparent recovery of landscape or its appearance in the cultural sphere after years of relative neglect and indifference (1999, x). This active retrieval of memory and the cultural enrichment of place and time – how landscape serves as an agent that produces and enriches culture – drives this [approach] (1999, 12). This couples well with Murcutt's justifications of incorporating an industrial typology not because of a romantic desire to mimic past forms or give prominence to appearances but to use the form to a rational end (Murcutt 1992, 178), and emphasise landscape as an effective disposition of parts. Therefore, an approach to landscape development concerning recollecting reads the language of its environment without renouncing its inextricable bond with cultural ideas, or in this case, its industrial images (Corner 1999, 7). In other words, the *Transmission of Affect* of a recovering landscape's life-wind serves as a *recollection* of the industrial typological layers accrued over time yet does not ignore the environmental stresses on the site.

The second [approach] to landscape development Corner proposes (Corner 1999, x) is **invention**, which is the very nature of the landscape itself, rethinking what landscape is – or might yet become. Therefore, an [approach] which reads the language of its environment – as captured in the SiteDAte (Ref. Chapter 2 – SiteDAte: alternative site analysis) - continually acknowledging its site's physical, climatic character, and stresses in new connective ways. Like Bargmann, the Development's landscape developmental response attempts to counter the limitations of typical remediation – defined as "correcting a fault" – and offers a more dynamic mode of regeneration. It is an [approach] that is not considered to be restrictive, uninspired, and shallow in reading the language of the landscape of a post-industrial site (Wennerstrom 2021, online) but one that not only embraces the naturalistic and phenomenological experiences captured while on-site but one which, as defined by Corner (Corner 1999, 2), aligns the diverse and competing environmental forces into newly liberating and interactive alliances.

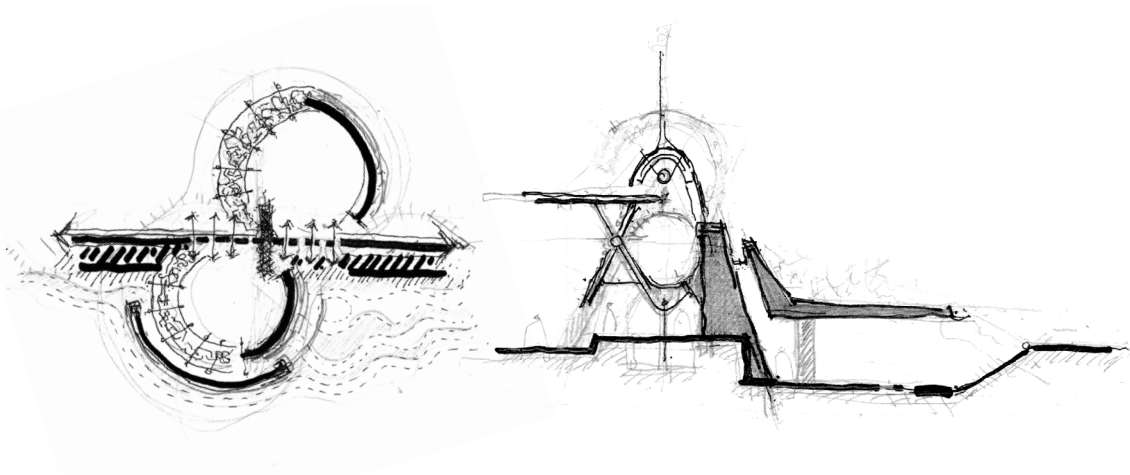


Figure 119. **Lichen Learnings** - symbiotic trade-off (author, 2023)

LIFE WINDS OF NAMA–KWA

The English writer John Ruskin (1819-1900), who had set a precedent in how one should see the landscape, challenged that the act of "appreciating landscape as an aesthetic object cannot be an occasion for complacency or untroubled contemplation; rather, it must be the focus of a historical, political, [and] aesthetic alertness to the violence and evil written on the land…" (Corner 1999, 11). Through a phenomenological site experience, which involved critically documenting the relative patterns and systems that govern the site, it allowed the design process to emerge, where Corner's approach of invention for landscape development influenced what characteristics of the recovering landscape's *life-wind* were included in the T*ransmission of Affect*. This *invention* invokes less recuperation and restoration but more the extension and realisation of the landscape's hidden potential (Corner 1999, ix).

Therefore, as stated earlier, the various thickening of layers the site's landscape has accrued over time (Corner 1999, 4), is intended to condition construction and how the construction, in turn, will condition the play of landscape ideas (Corner 1999, 7).

The chapter to follow aims to demystify this ' effective disposition of parts' and explain how the recovering landscape and built form symbiotically respond to the environment – drawing their combined power from its innate language, environmental stresses, and expressions accrued over time (Corner 1999, 4) as unearthed within the alternative site analysis - SiteDAte.

"…appreciating landscape as an aesthetic object cannot be an occasion for complacency or untroubled contemplation; rather, it must be the focus of a historical, political, [and] aesthetic alertness to the violence and evil written on the land…"

– John Ruskin

(John Ruskin cited in Corner, 1999: 11)

Figure 120. **To A Rational End** - Mining and Minerlas Museum (Murcutt 1992)

Design Synthesis

3.2 concepts and theories synthesized

+ "Linear Chaining" - *linear sequence of rooms, controlled circulation, clear orientation, separate entrance, and exit*

01 Exploring Standard Aquacultural Facility types

+ Culture & Grow
+ Seawater Intake
+ Water Store
+ Broodstock
+ Holding Facility
+ Live Feed Culture
+ Nursery Rearing Facility
+ Laboratories
+ Feed & Chemical Store
+ Aeration Facility ("Blow House")
+ Wastewater Treatment
+ Workshops
+ Staff Facilities
+ Grow-out Farm
+ Processing Facilities

+ STANDARD NEEDS

Basic facility requirements

02 Learnings Exisiting Aquacultural Farm

+ Admin block
+ Courtyard(s)
+ Feed container
+ Grading facilities
+ Seaweed (Ulva) baths
+ Water reservoirs & pump houses
+ Blow house
+ Water Treatment Storage - Solar Dam
+ Pump house
+ Septic tank & trickling filter system units

Learnings from an existing EIA

+ Staff Infrastructure (expansion)
+ Abalone Farming Area (expansion)
+ Seaweed (ulva) Farming Area (expansion)
+ Integrated Multi-trophic (IMTA) Fish Farming Area
+ Wastewater Treatment - septic tank and trickling filter system units (expansion)
+ Hatcheries

+ BASIC TO ROBUST

+ Untapped resource on a post-company parcel of land

03 *Life-wind* of **People**

+ Space, architecture, & **politics**; and their interelations in form of *spheres*
+ S*pheres* provide meaning, community, and immunity
+ *Transmission of Affect* - strategically affecting environment
+ '**Co-isolated associations**' - *Foam*

Diamond Processing

+ Embodying the mechanical process to control circulation

+ ATMOSPHERIC POWER

+ strategically produced, designed, and staged atmospheric experiences

04 *Life-wind* of **Maritime Organisms**

+ Organizing Image - *primary instrument of orientation*
+ Asset of Action - *tension between functionality & 'uselessness'*
+ A singular lived **poeticized image** of a **spine**
+ Highly abstracted & condensed experiential entity
+ Conditioning of structure, space & light

+ STRENGTHEN EXISTENTIAL EXPERIENCE

+ multi-sensory architectural experiences

05 *Life-wind* of a **Recovering Landscape**

+ Recollection - *agency of landscape enriching culture*
+ Invention - *acknowledge stresses of the landscape*
+ Recovering more an act of extension & realization of **hidden potentials**
+ Renew the language of place
+ Effective disposition of parts which **embrace** naturalistic & phenomenological experiences
+ Landscape conditions the construction

+ CONDITIONING 'PLAY' OF LANDSCAPE

+ reactivating a post-industrial landscape

06 **Identifying** the standard exhibition type

+ "Round Tour (loop)" - *similar to "linear chaining", controlled circulation leads back to entrance*

Exhibition (public)
+ Entrance, Reception, WC
+ Restaurant, Shop, Conference Room, Exhibition Area
Admin (private)
+ Admin, Director, Catalogues, Copy Room, Library, Archive

+ SEQUENCED EXPERIENCE

+ controlled circulation of curated activities

3.3 Conclusion

"Whether a particular project is naturalistic, rectilinear, curvilinear, formal, or informal is irrelevant; what matters is how form and geometry of a project make sense with regard to the specific issues it is trying to address and the effects it is trying to precipitate" (Corner 1999, 4). In the realm of architectural exploration, the landscape of Kleinzee emerges as a captivating canvas intertwined with the *life-winds* of its indigenous peoples, the delicate poetry of its wildlife, and the profound transformation of its recovering terrain. It is apparent now that each living entity, from humans to animals, possesses its own unique wind, shaping the phenomenology of encounters and embedding itself in the perceiver's consciousness. This essay poses a compelling question: Can the *Transmission of Affect*, encapsulated within these distinct *life-winds*, be transmitted into architectural atmospheres and tectonics, thus reshaping the way they are experienced and strategically produced? The section has lain the ground for a multidimensional exploration, an approach that draws inspiration from historical and contemporary accounts of indigenous peoples, and examines how the potent affects of *life-winds* are absorbed into architectural atmospheres, becoming the motive force behind the ambiance experienced at the site. In concluding the theoretical explorations, the journey continues into the realm of design, exploring how to best incorporate prior learnings in the next chapter 4, Unearthing Hidden Potentials: Design Development.

Figure 121.
New Begininngs -
recorded on site
(author, 2023)

Figure 122.
Lichen -
recorded on site
(author, 2023)

The groundwork of the Development was developed from inception throughout chapters 1, 2 and 3, with the accompaniment of the numerous informants, which were all strategically coordinated to become the fundamental backbone for the specifying and making the Development's architectural design. The process that has assisted in coming to a design synthesis include the careful selection of appropriate precedent studies, the numerous design decisions made and the development of the Development through thorough diagrammatic, scaled sketches and 3d massing that were all carefully informed by the programmes requirements, contextual analysis, theoretical themes, and concepts, as well as basic principles applied. In chapter 4, earlier theoretical themes are reintroduced through site adapted conceptual models, that abstractly convey the three theoretical drivers instrumental to the development of the Development. Due to the richness of their contributions, a decision was made to amalgamate all three to collectively inform the design decisions going forward. Through reiterative processes, the following section illustrates the essential and beneficial concept of the "*Transmission of Affect*" that has contributed to the Development's scheme and architectural gestures. Due to the complexity and constraints of the site, the following sections only highlight the most important milestones that had influenced the design up to this point.

04

Unearthing hidden potentials
Design development

UNEARTHING HIDDEN POTENTIALS

Conceptual Informants

4.1 Life-winds of the Nama-kwa

"...Wind in its many guises, is an invisible gift attributed to God. The gift is not identitcal but specific. Each living entity has its own wind which is a personalized expression of the breathing divinity..."

– Chris Low
(Low, 2008: 71-72)

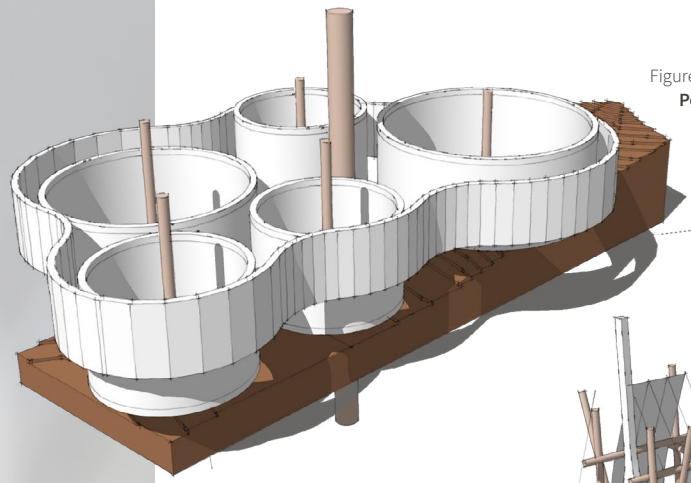


Figure 123. **Life-wind of People** (author, 2023)

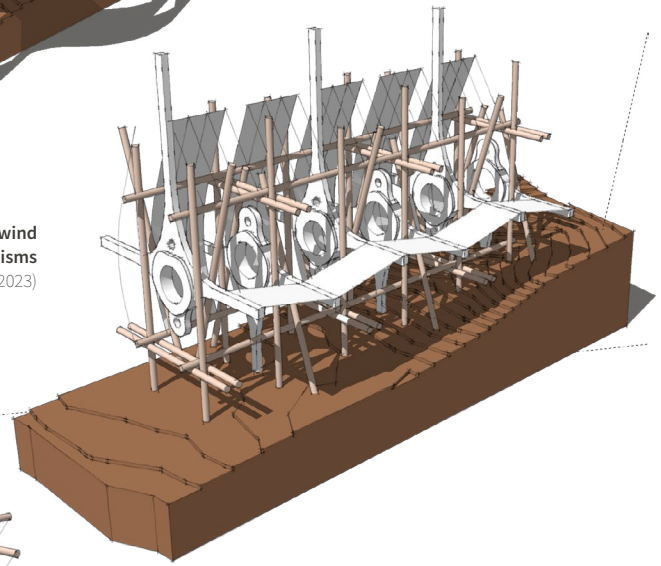


Figure 124. **Life-wind of Maritime Organisms** (author, 2023)

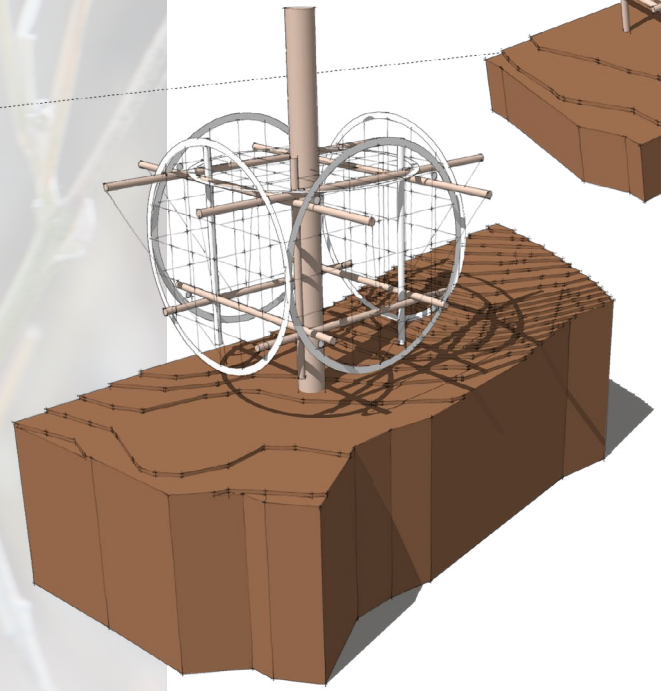


Figure 125. **Life-wind of A Recovering Landscape** (author, 2023)

UNEARTHING HIDDEN POTENTIALS

Touchstones
4.2 Structural informant

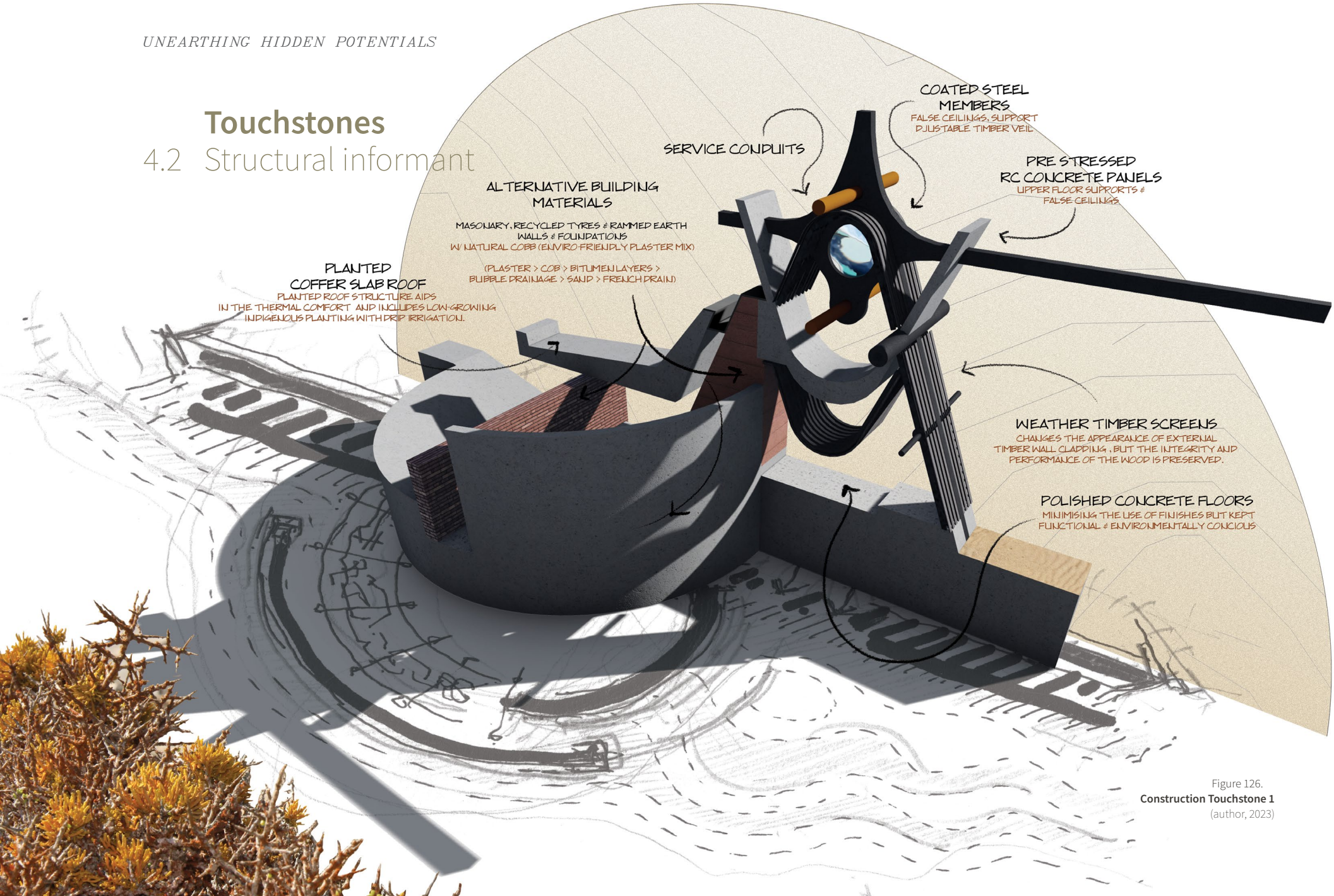
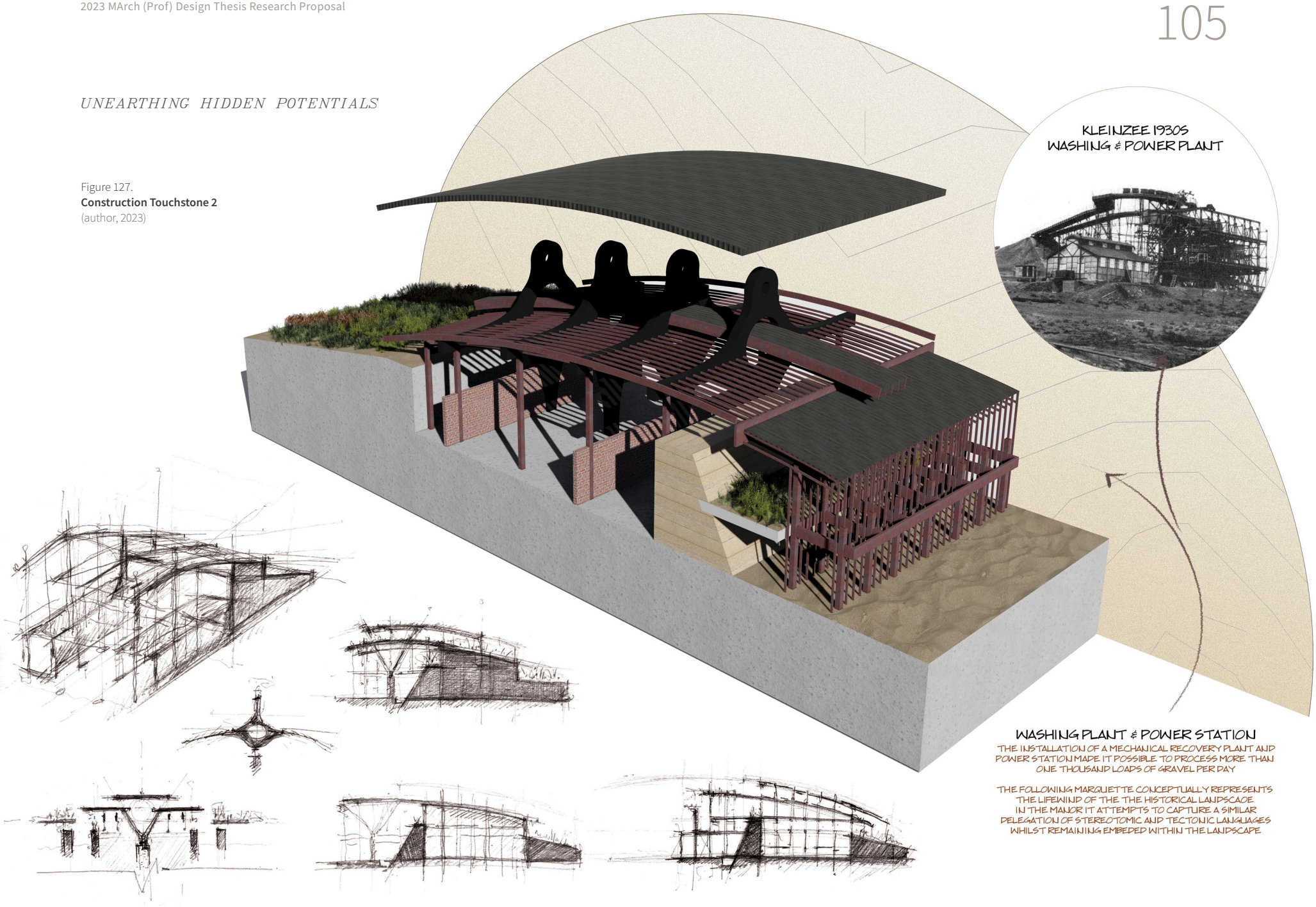


Figure 126.
Construction Touchstone 1
(author, 2023)

UNEARTHING HIDDEN POTENTIALS

Figure 127.
Construction Touchstone 2
(author, 2023)



UNEARTHING HIDDEN POTENTIALS

‘Used to a Rational End’
4.3 Design Development no. 1

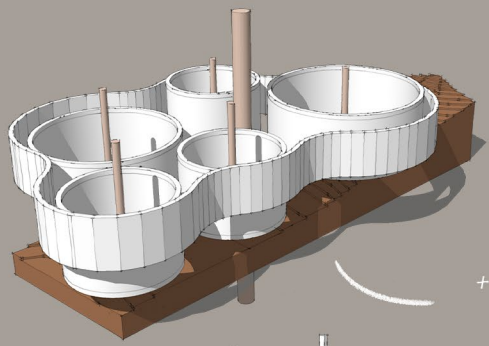
“I believe in removing architecture from function after ensuring the observation of functional basis. In other words, I like to see how far architecture can pursue function and then, after the pursuit has been made, to see how far architecture can be removed from function. The significance of architecture is found in the distance between it and function”.”

– Tadao Ando
(Ando cited in Pallasmaa,1996: 44)

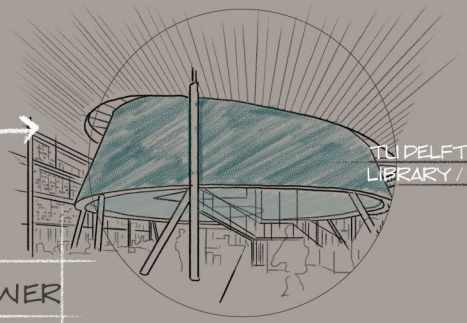
Vertebrae -
sights in Kleinzee
(author, 2023)

Figure 128.
Weathered -
sights in Kleinzee
(author, 2023)

LIFE-WIND OF PEOPLE



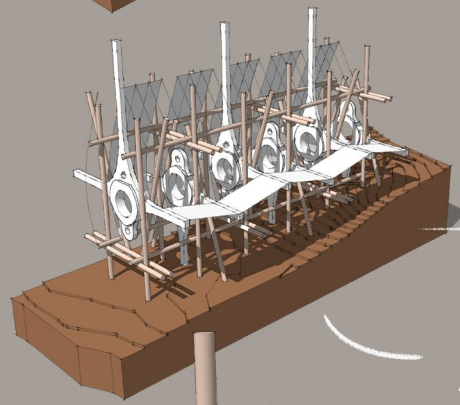
+ ATMOSPHERIC POWER



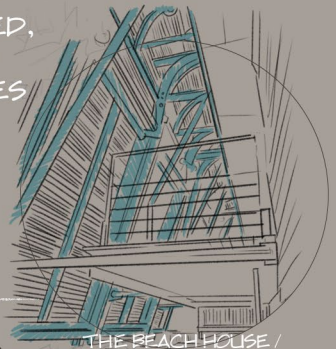
TU DELFT CENTRAL LIBRARY / MECANOO

+ STRATEGICALLY PRODUCED, DESIGNED, AND STAGED ATMOSPHERIC EXPERIENCES

LIFE-WIND OF MARITIME ORGANISMS



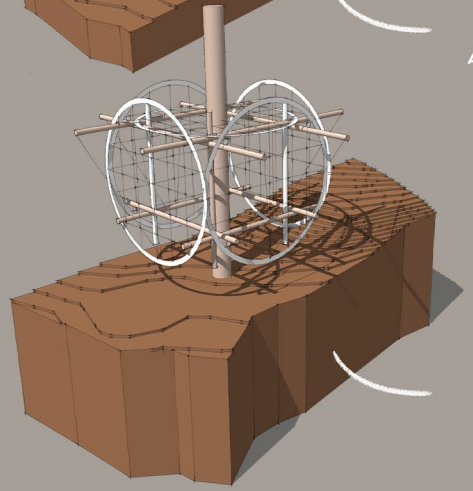
+ STRENGTHENED EXISTENTIAL EXPERIENCE



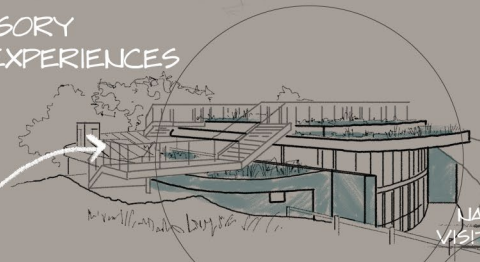
THE BEACH HOUSE / DESIGNWORKSHOP

MULTI-SENSORY ARCHITECTURAL EXPERIENCES

LIFE-WIND OF A RECOVERING LANDSCAPE



+ CONDITIONING 'PLAY' OF LANDSCAPE



NATIONAL PARK VISITOR'S CENTRE / LOOP

HELDERBERG ENVIRO. CENTRE / EBESA

REACTIVATING A POST-INDUSTRIAL LANDSCAPE

UNEARTHING HIDDEN POTENTIALS

Tension between form / function
Design Development no. 1

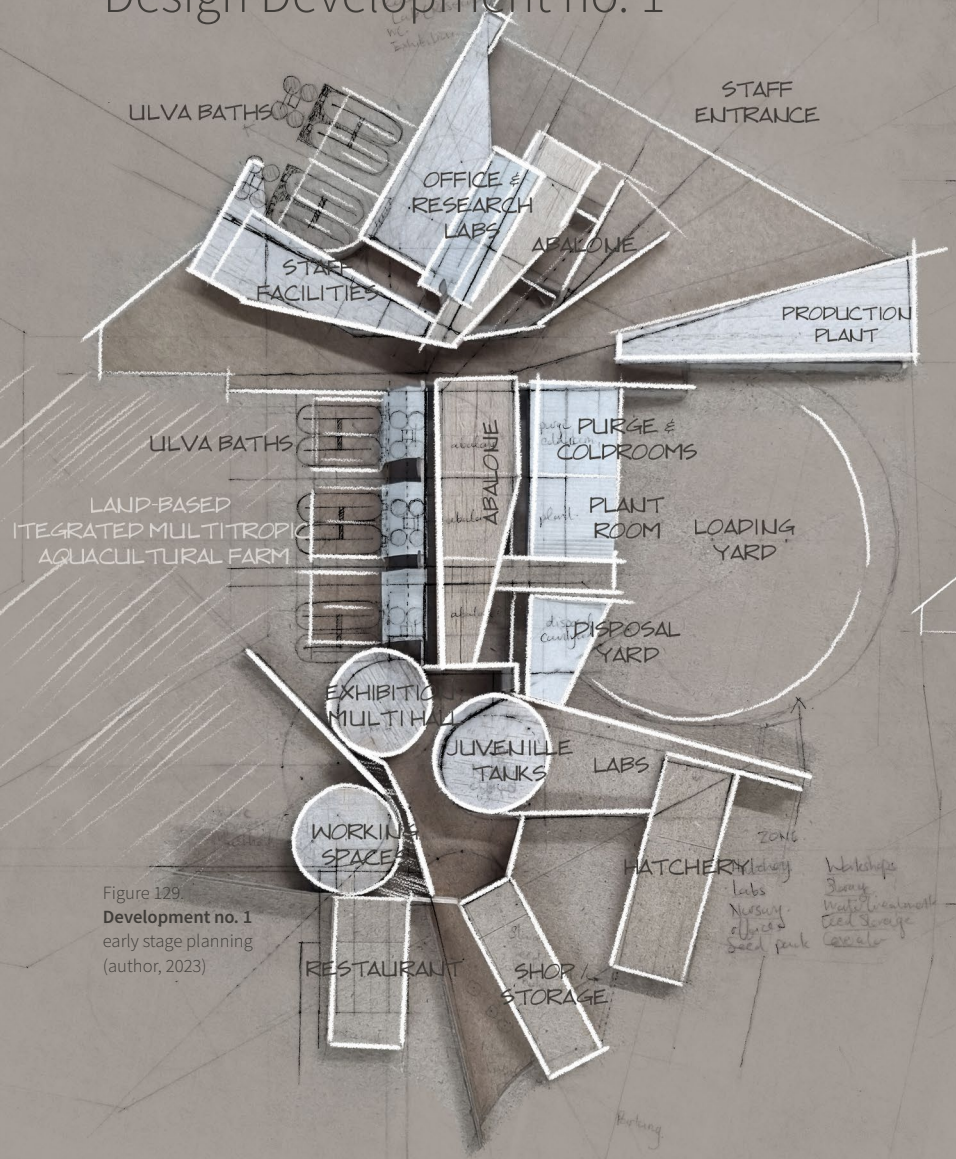
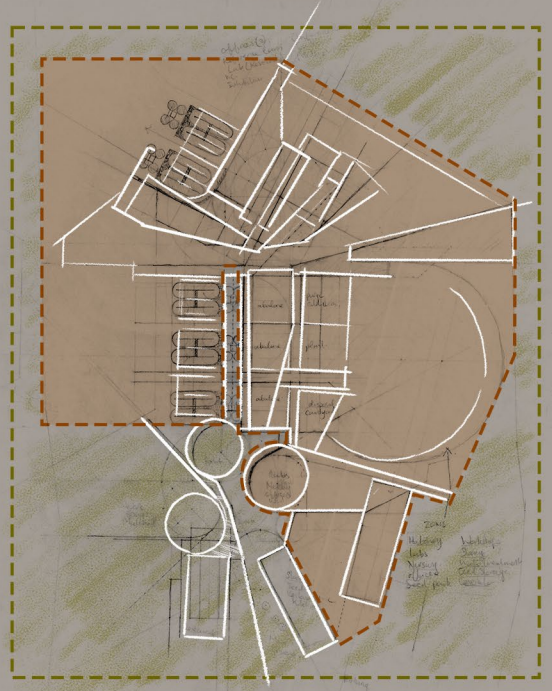


Figure 129.
Development no. 1
early stage planning
(author, 2023)

PUBLIC - PRIVATE - SERVICE

CIRCULATION

MAN-TO-FISH



AREAS OF CONTROL

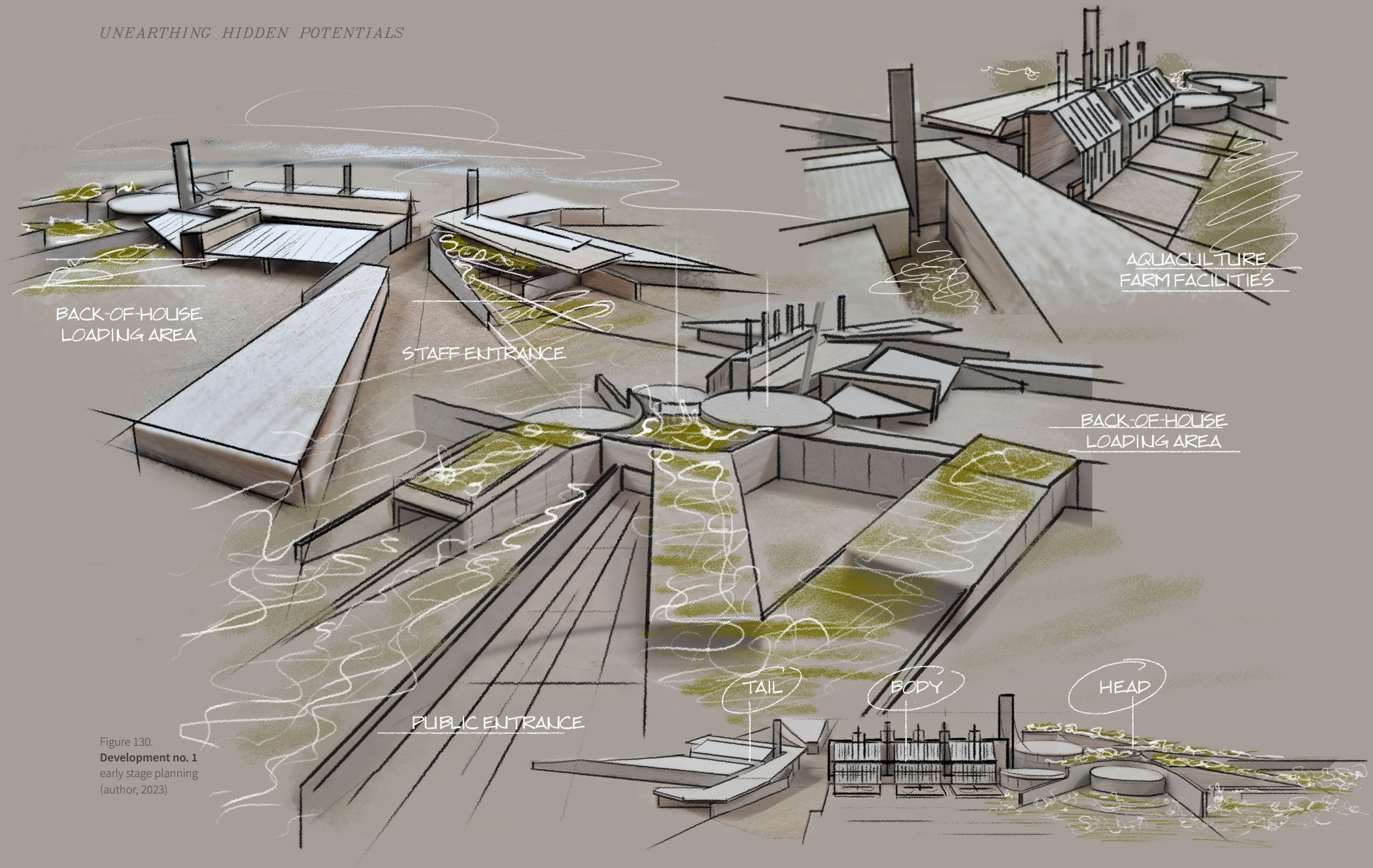


Figure 130.
Development no. 1
early stage planning
(author, 2023)

UNEARTHING HIDDEN POTENTIALS

Design Development no. 2

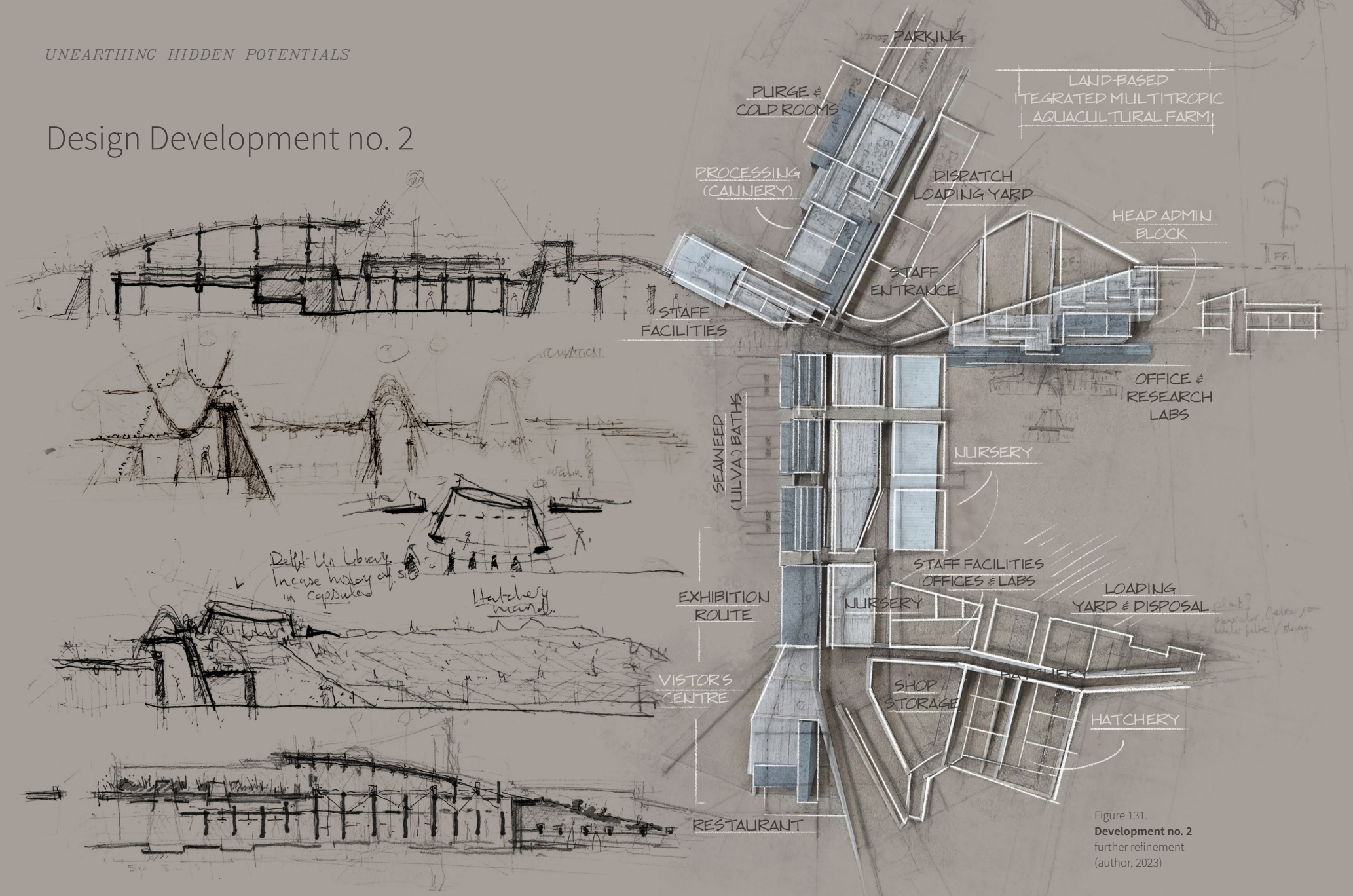
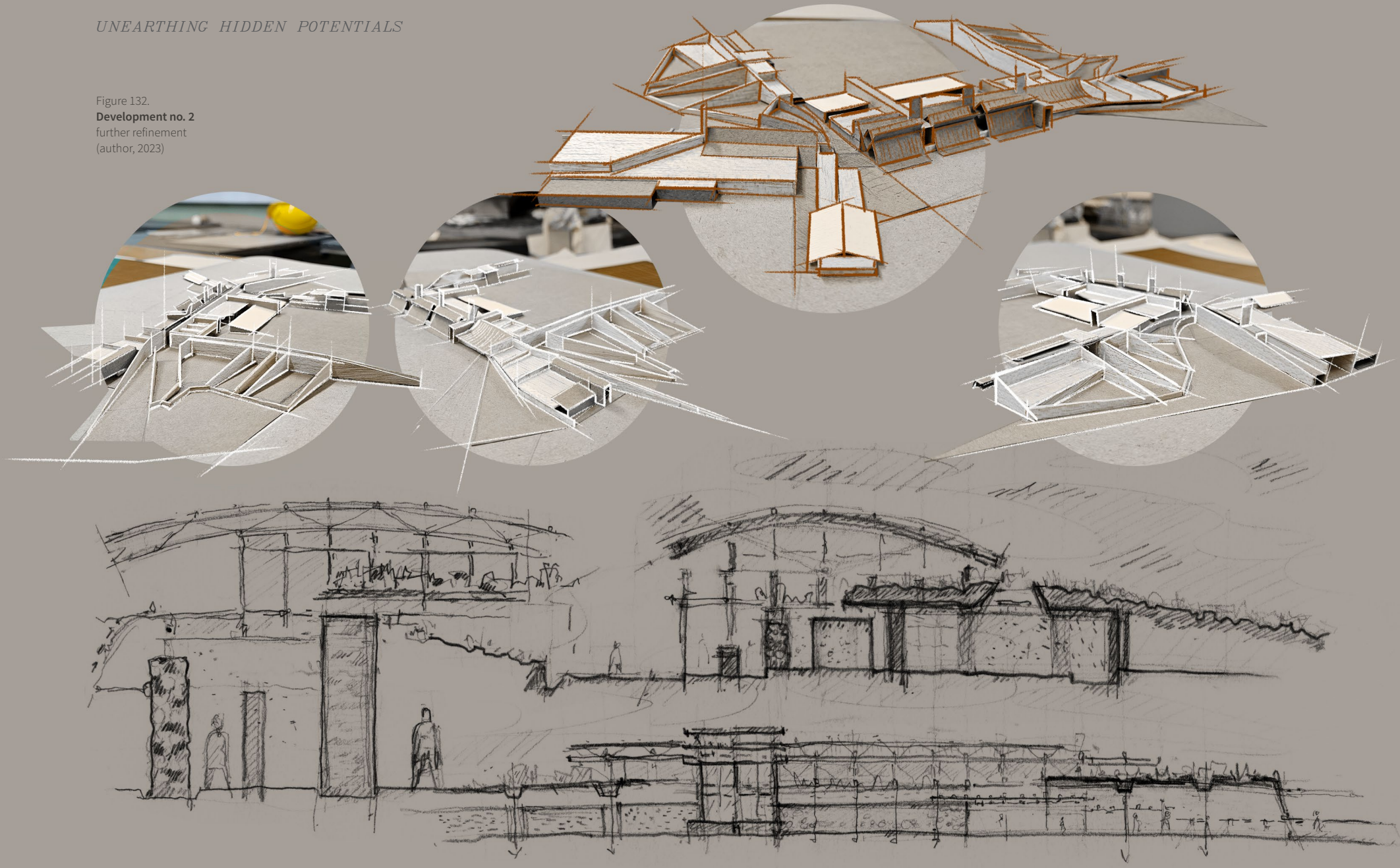


Figure 131.
Development no. 2
further refinement
(author, 2023)

UNEARTHING HIDDEN POTENTIALS

Figure 132.
Development no. 2
further refinement
(author, 2023)



UNEARTHING HIDDEN POTENTIALS

Design Development no. 3

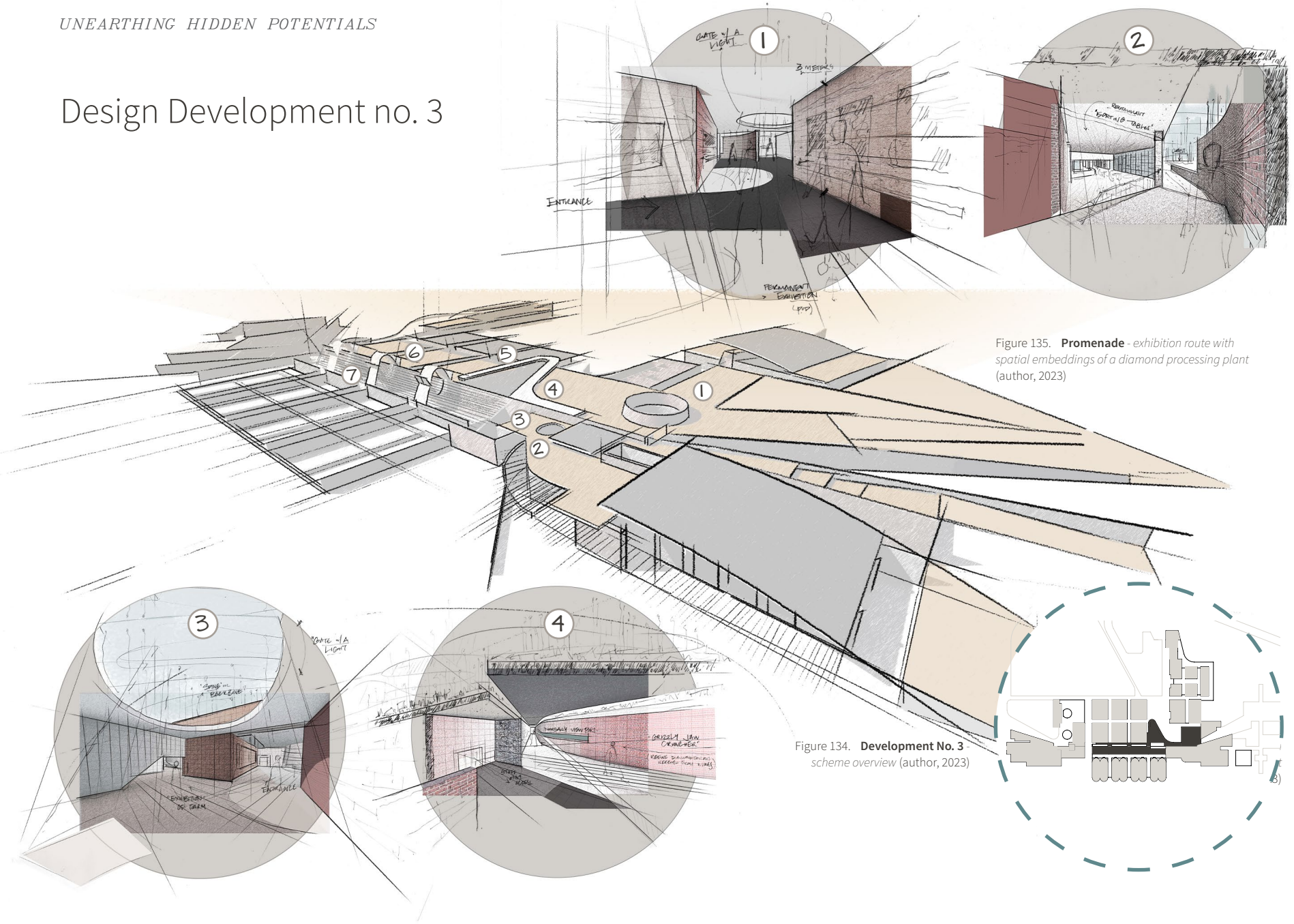
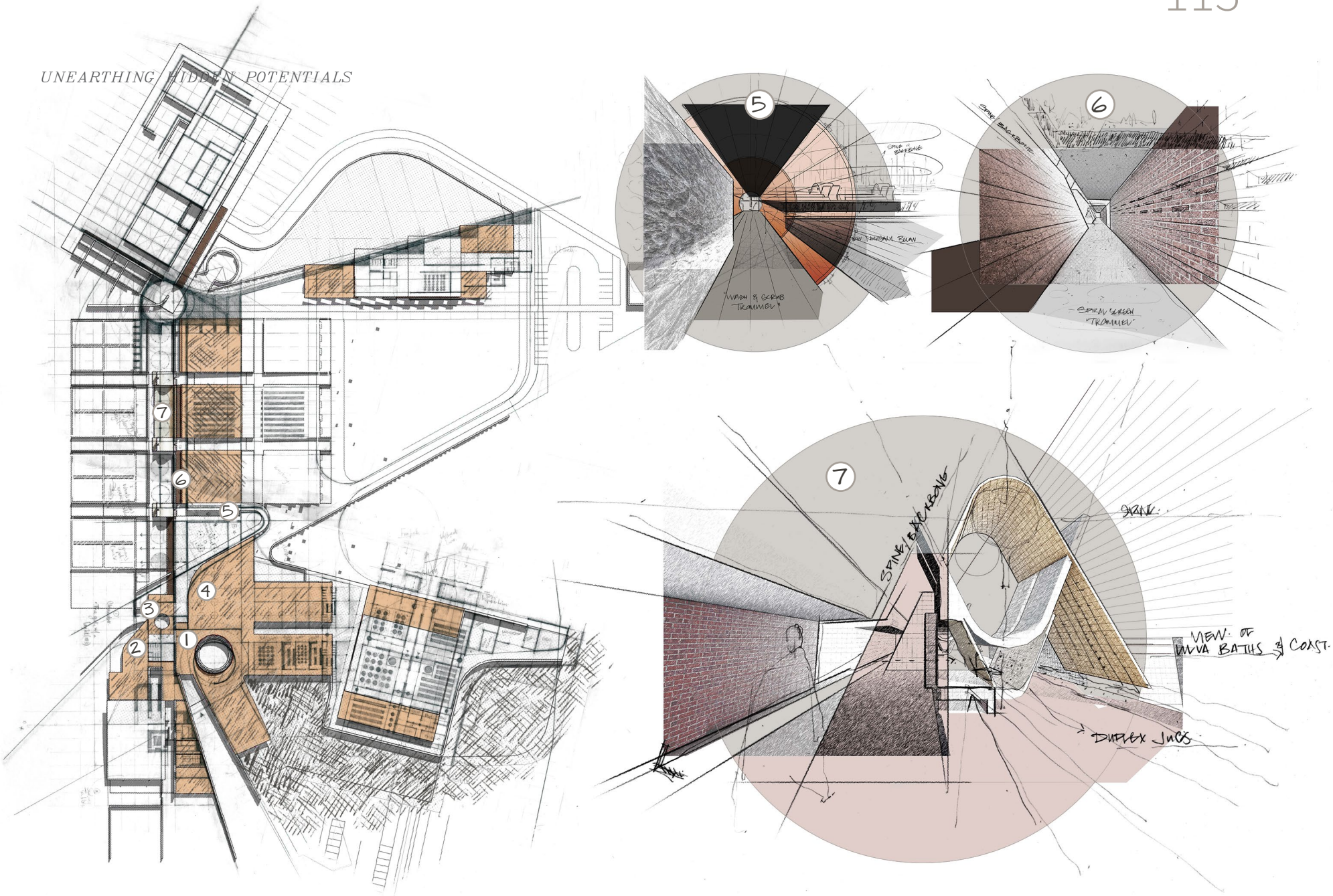


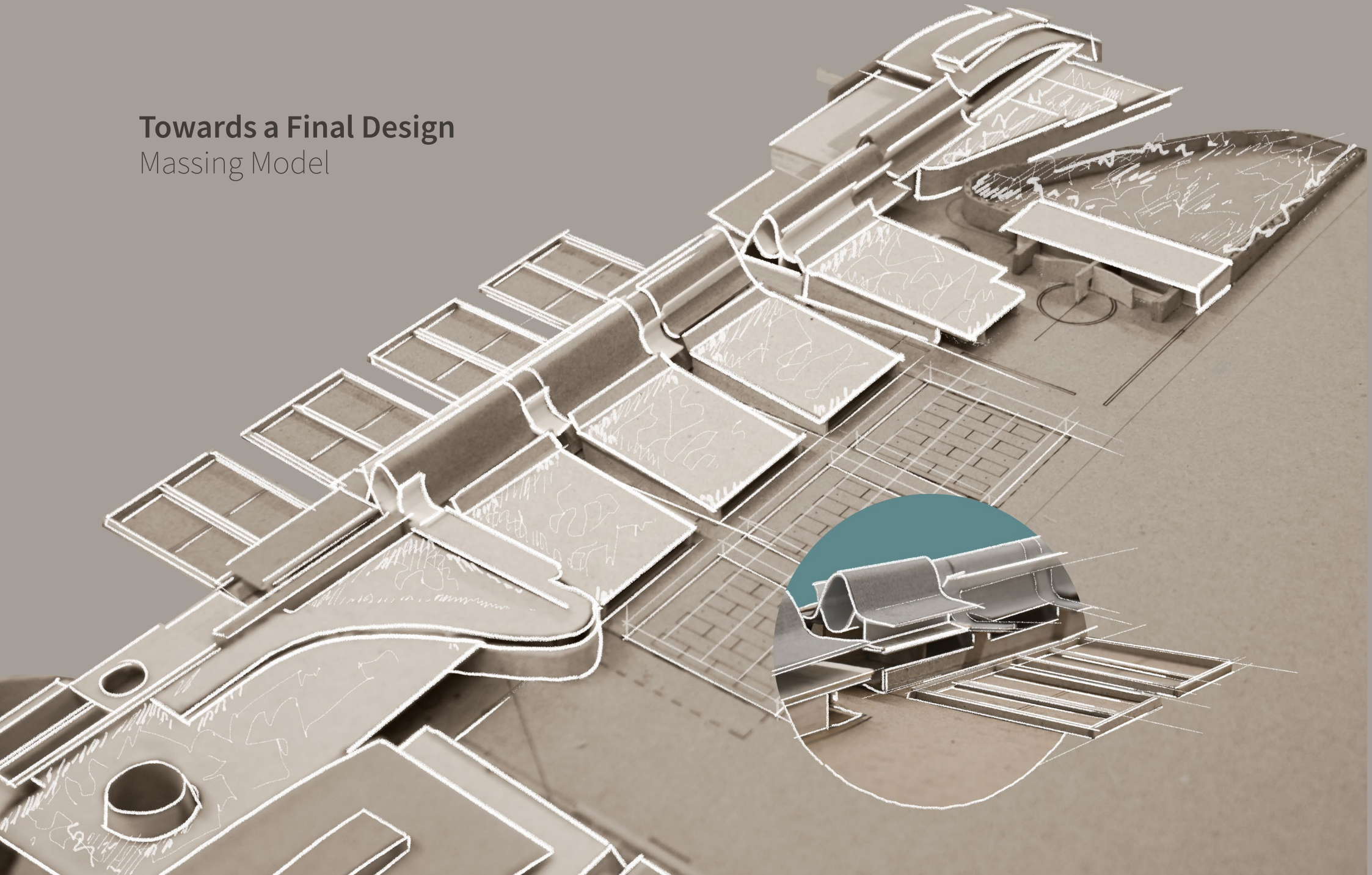
Figure 135. **Promenade** - *exhibition route with spatial embeddings of a diamond processing plant* (author, 2023)

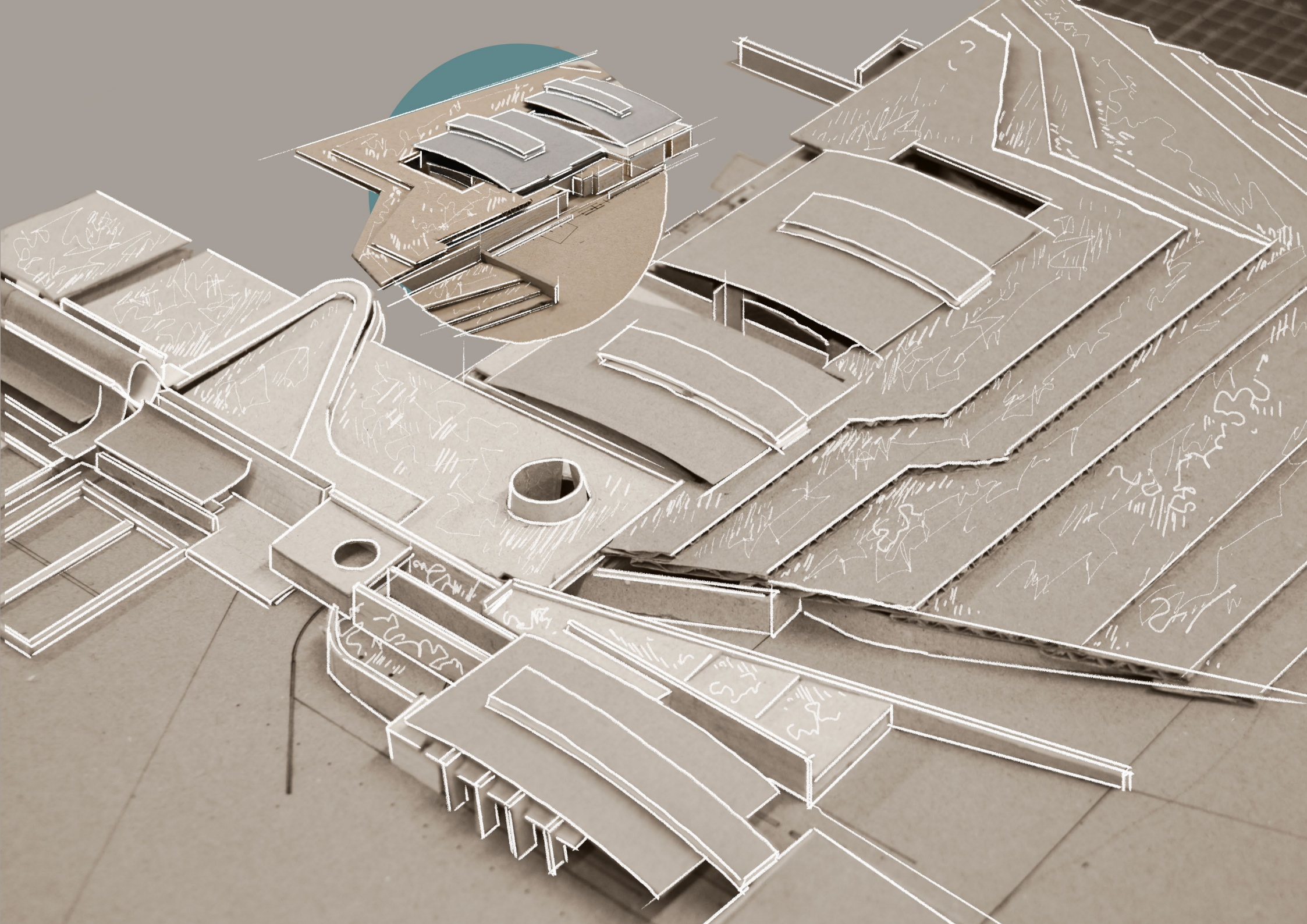
Figure 134. **Development No. 3** - *scheme overview* (author, 2023)

UNEARTHING HIDDEN POTENTIALS



Towards a Final Design
Massing Model





Design Development no. 4
Spatial Planning

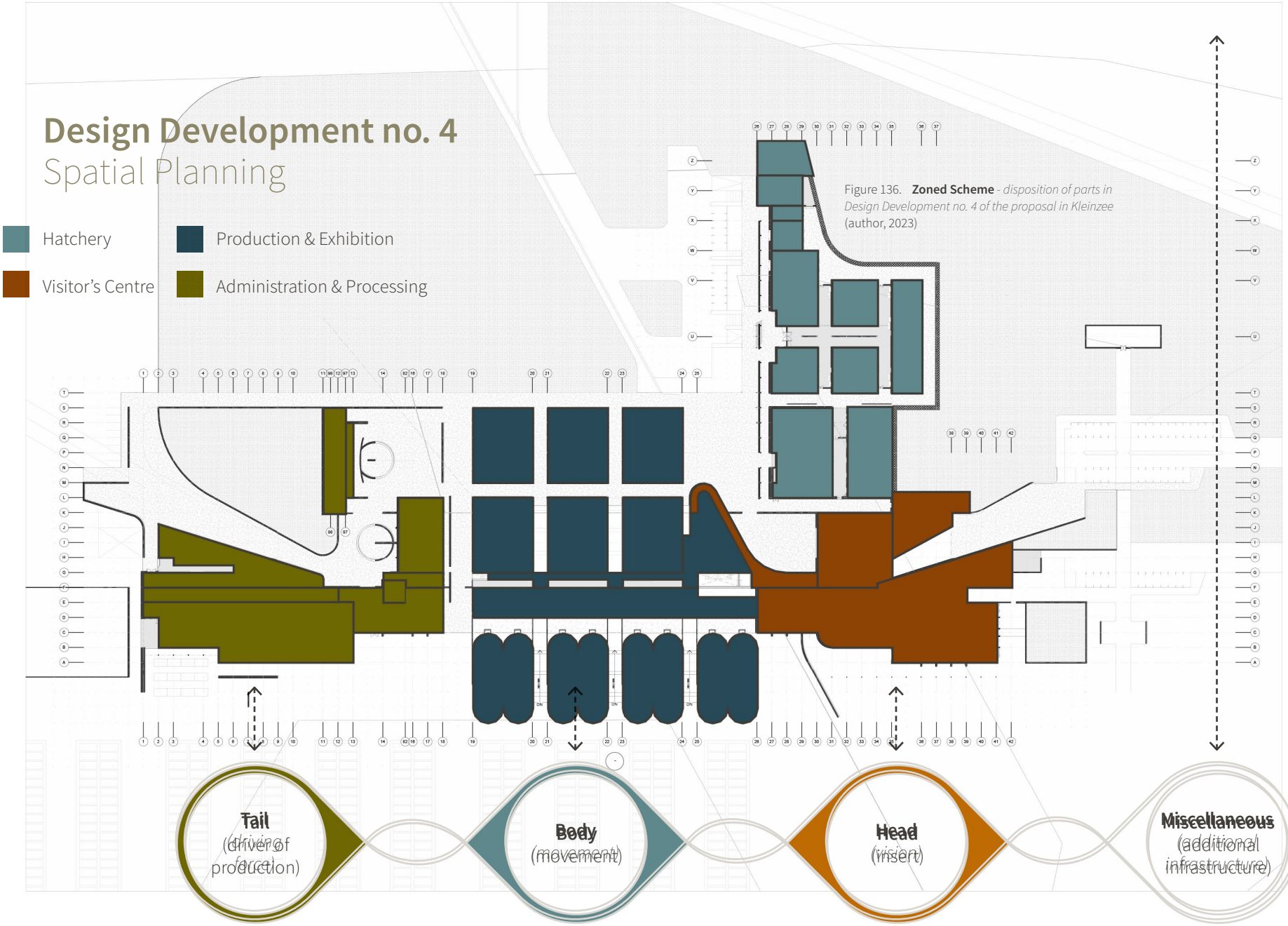


Figure 136. **Zoned Scheme** - *disposition of parts in Design Development no. 4 of the proposal in Kleinzee* (author, 2023)

UNEARTHING HIDDEN POTENTIALS

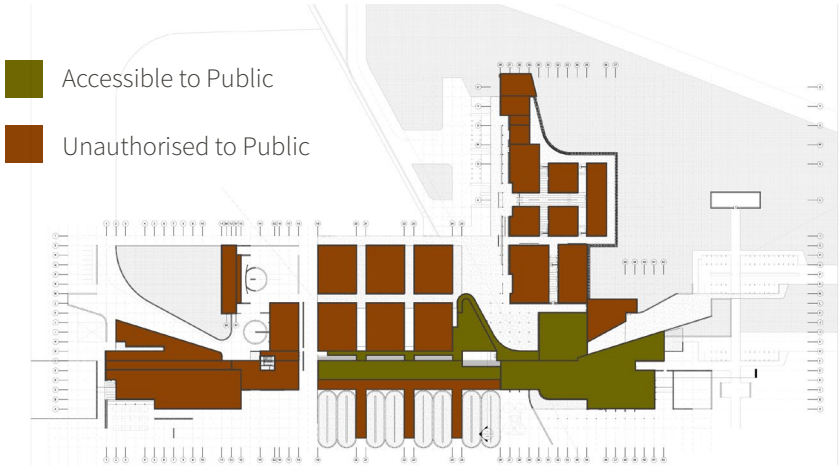


Figure 137. **Access Denied** - *disposition of parts in Design Development no. 4 of the proposal in Kleinzee* (author, 2023)

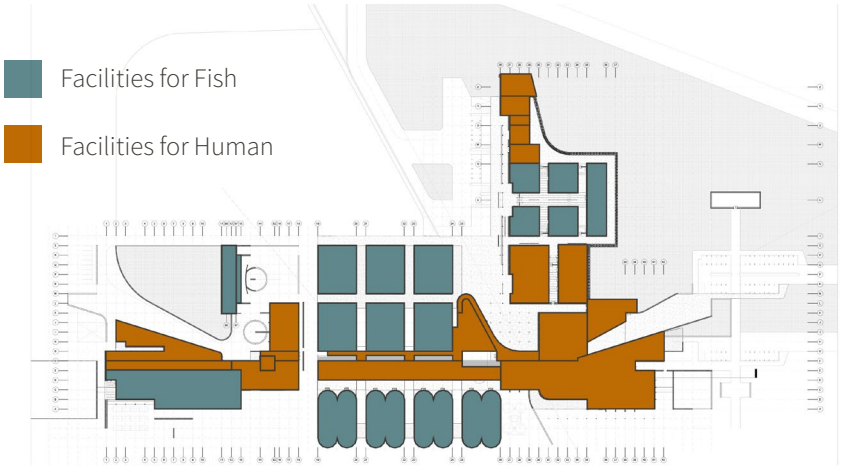


Figure 138. **Two Worlds Collide** - *disposition of parts in Design Development no. 4 of the proposal in Kleinzee* (author, 2023)

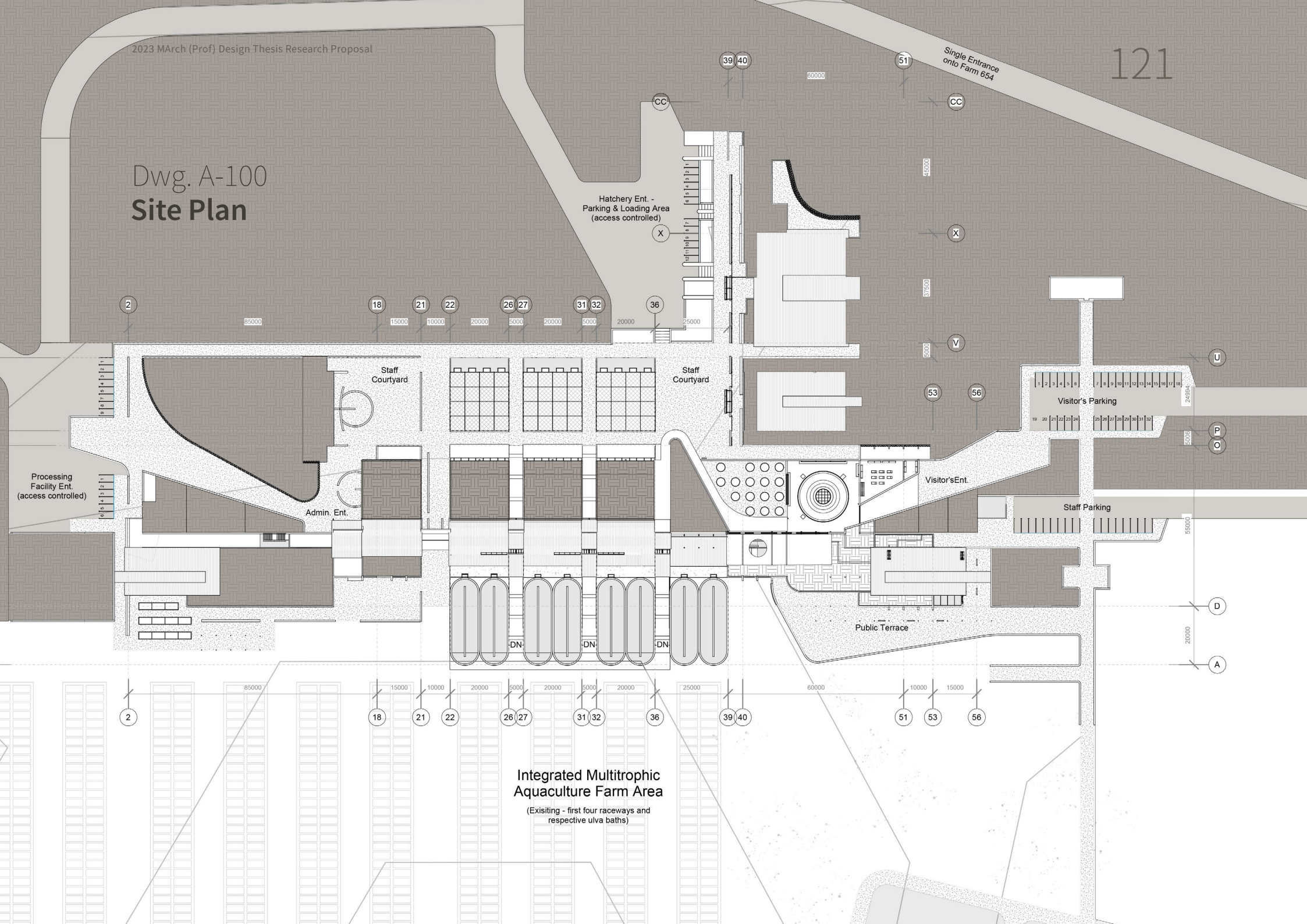
Figure 139.
Life Flows -
abalone farm in Kleinzee
(author, 2023)

Figure 140.
Fauna & Foam -
the ocean pushes back
(author, 2023)

05

Transmission of Affect
Final Design

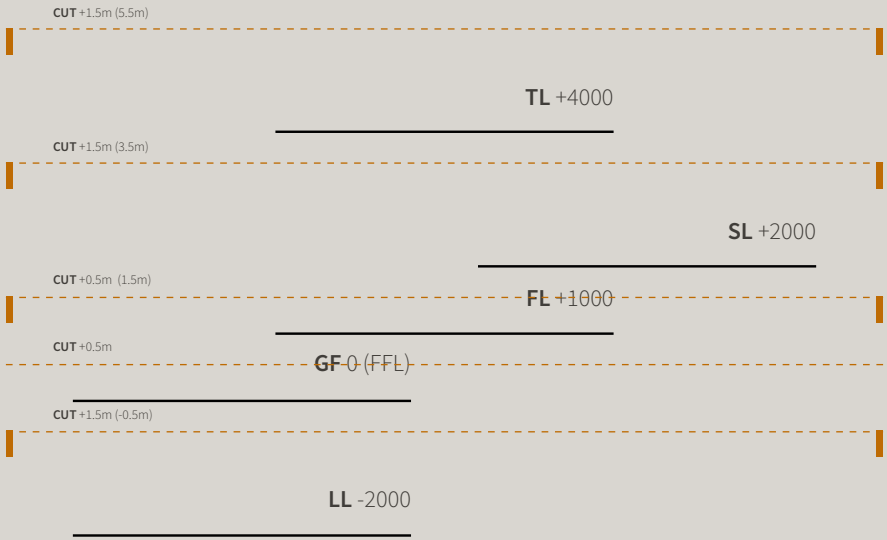
Dwg. A-100
Site Plan



Integrated Multitrophic Aquaculture Farm Area

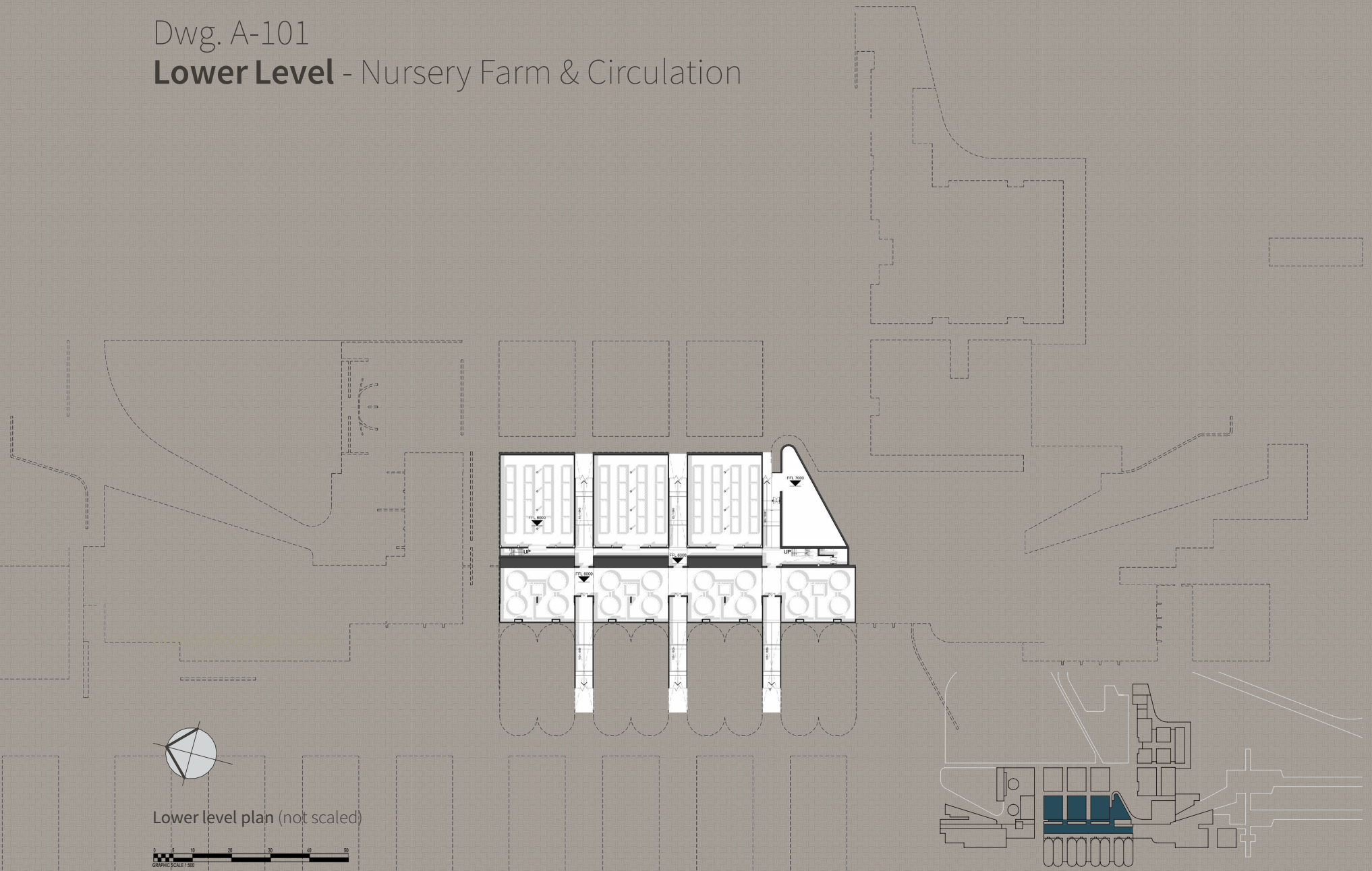
(Exisiting - first four raceways and respective ulva baths)

Dwg. Level
Section Cuts



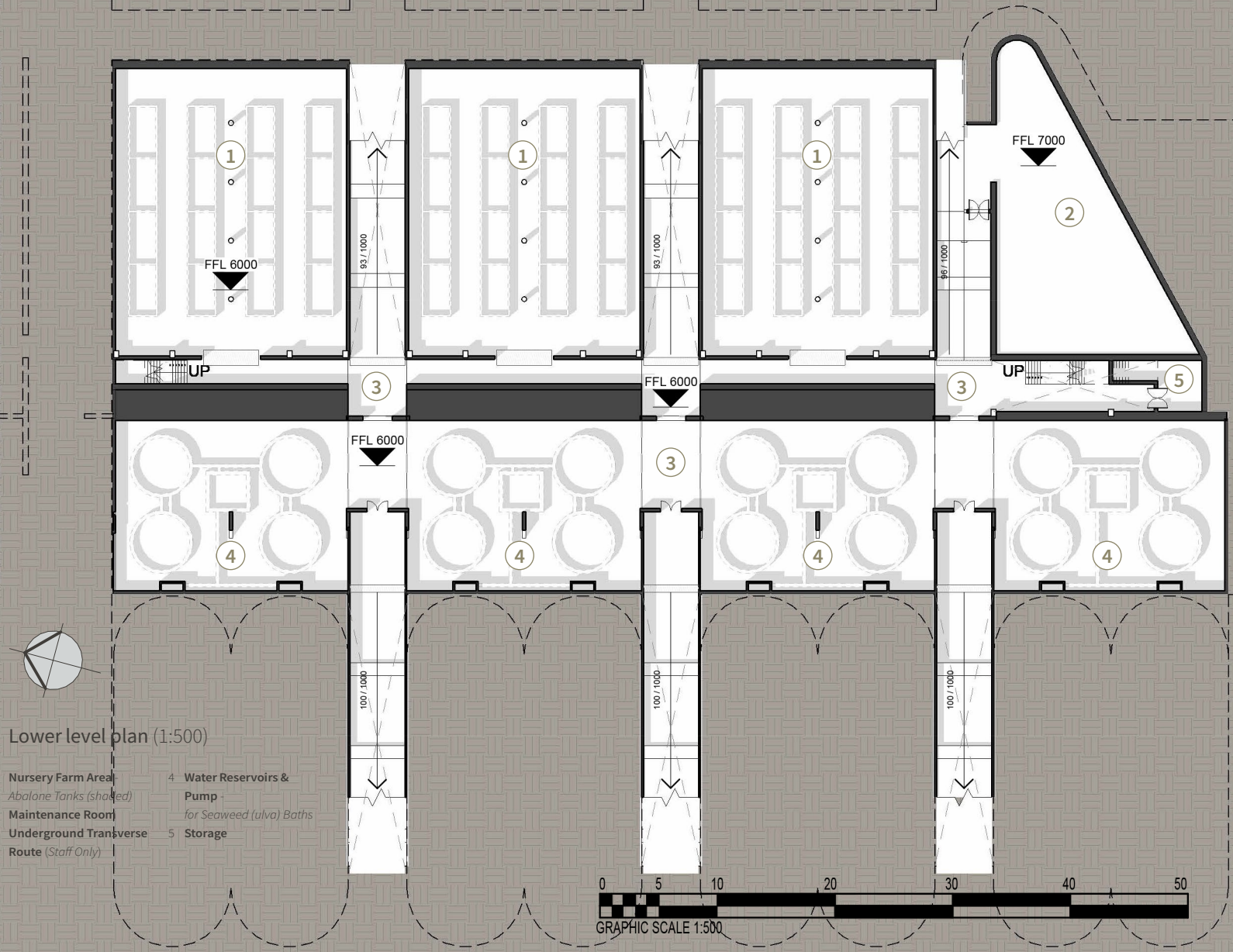
Dwg. A-101

Lower Level - Nursery Farm & Circulation



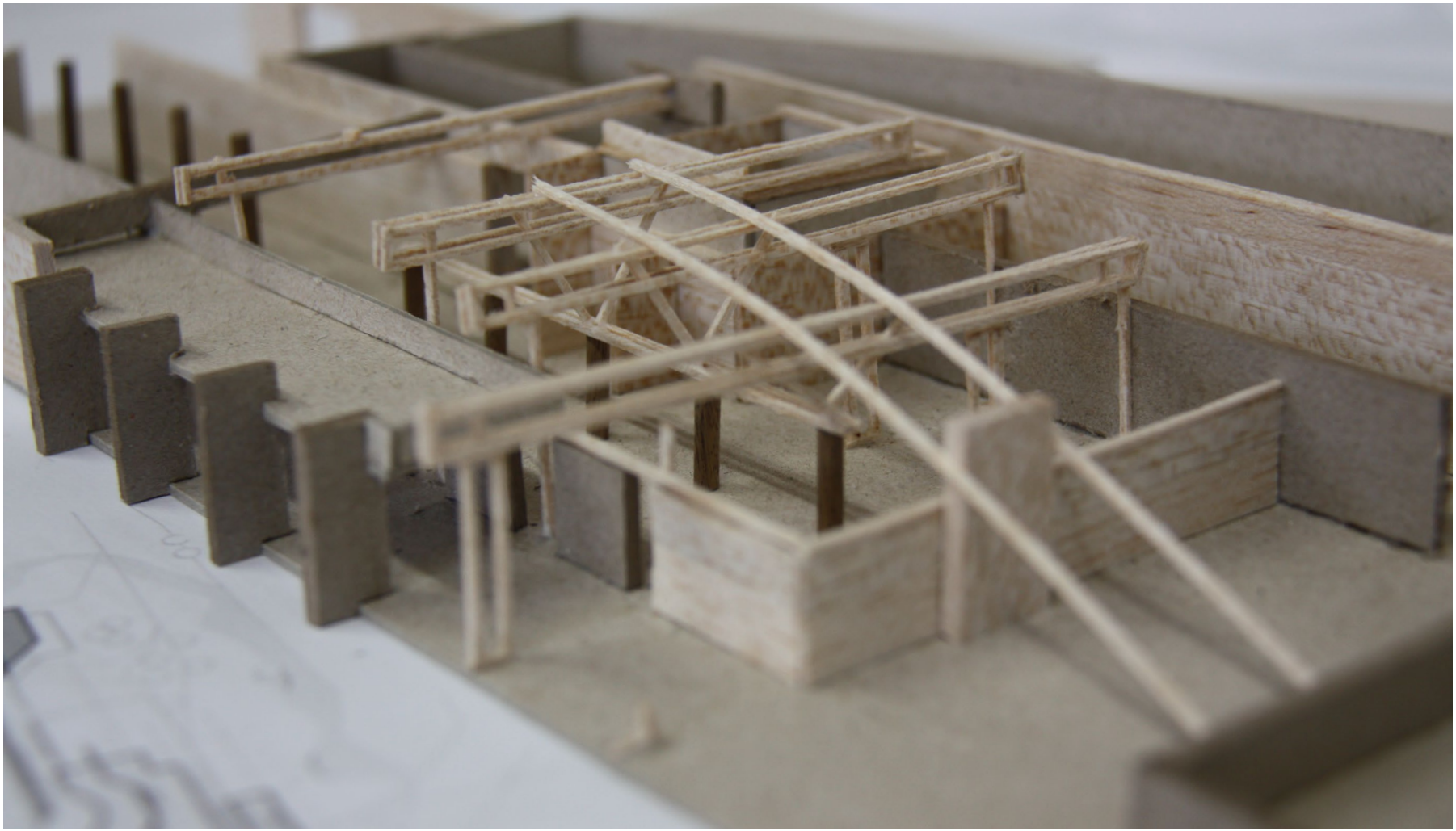
Lower level plan (not scaled)

GRAPHIC SCALE 1:500



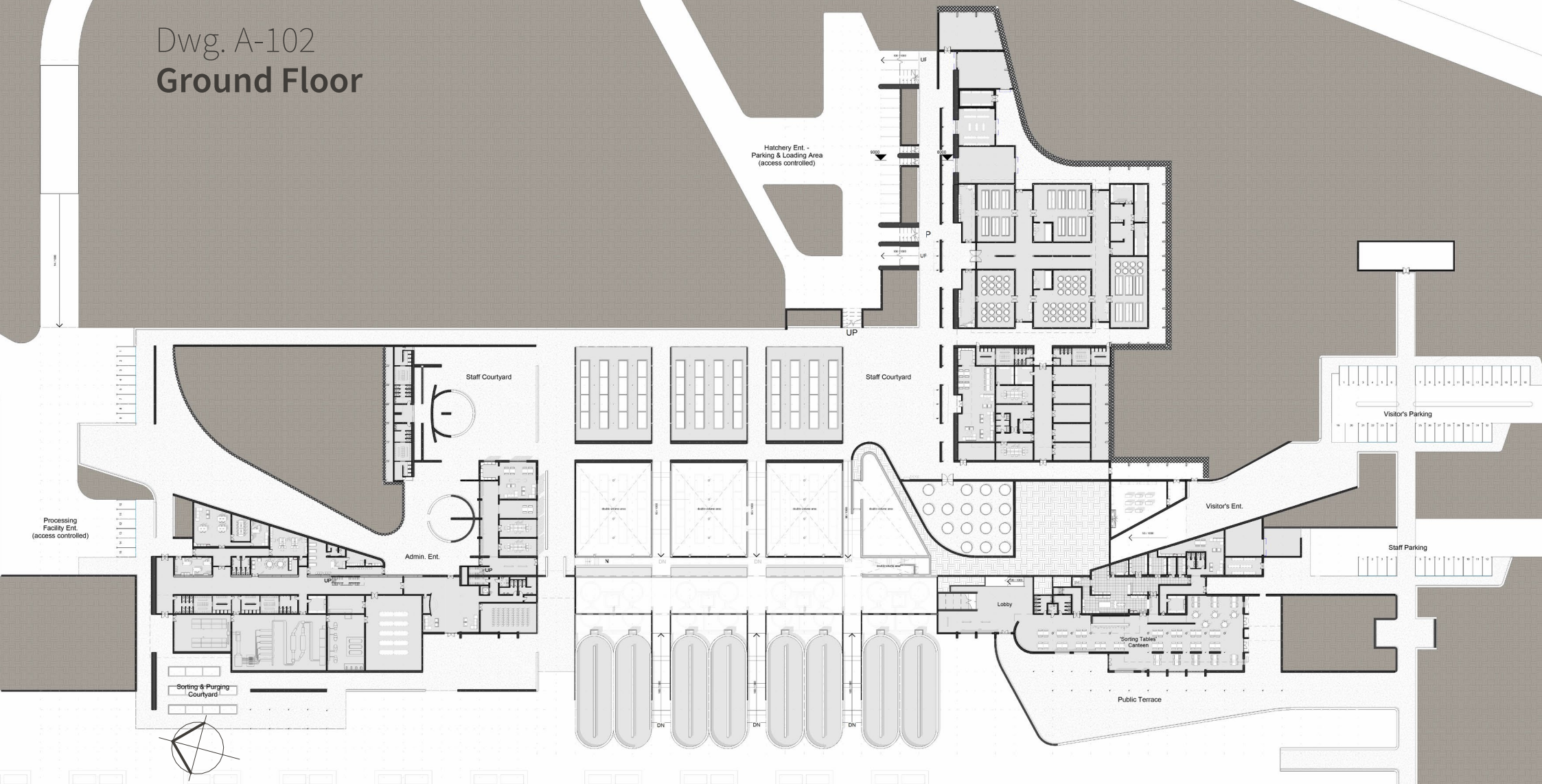
Lower level plan (1:500)

1 **Nursery Farm Area** - *Abalone Tanks (shaded)*
2 **Maintenance Room**
3 **Underground Transverse Route** (*Staff Only*)
4 **Water Reservoirs & Pump** - *for Seaweed (ulva) Baths*
5 **Storage**



Visitor's Centre - **'Sorting Tables' Canteen**

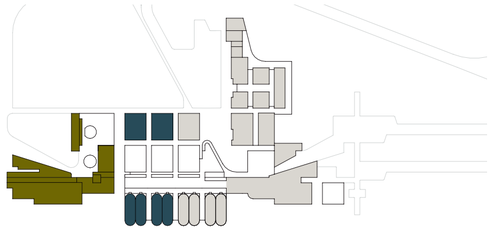
Dwg. A-102
Ground Floor



Ground floor plan (not scaled)

GRAPHIC SCALE 1:500

Integrated Multitrophic
Aquaculture Farm Area
(Exisiting - first four raceways and
respective ulva baths)



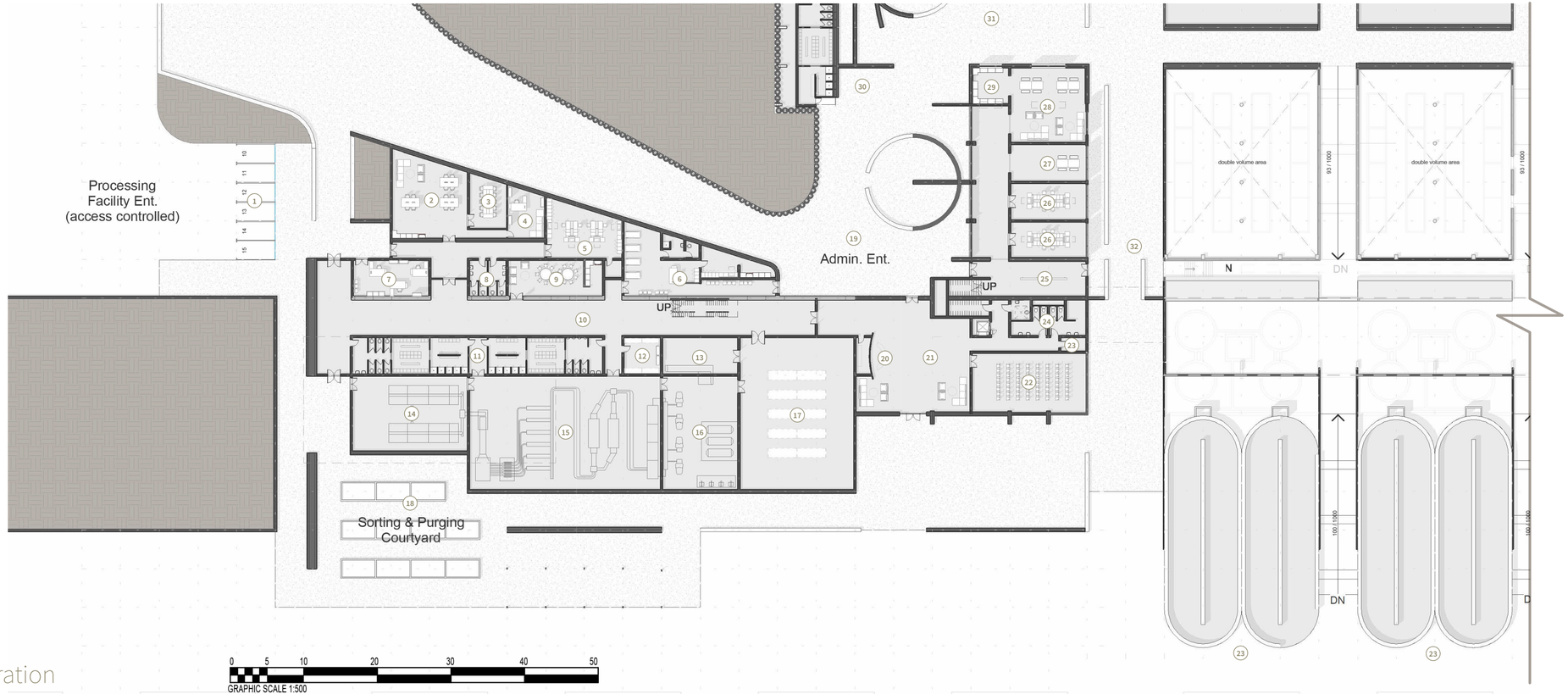
Ground floor plan (1:500)

Processing Facility

1 Dispatch Yard / Staff Parking
2 Administration
3 Meeting Room
4 Manager's Office
5 Laboratory
6 Nursing Station
7 Dispatch Offices
8 Public WC
9 Staff Room
10 Service Corridor
11 Staff WC (Biosecure)
12 Office
13 Packing Room
14 Grading Room
15 Processing Room
16 Washing Room
17 Cold Storage
18 Purging Courtyard

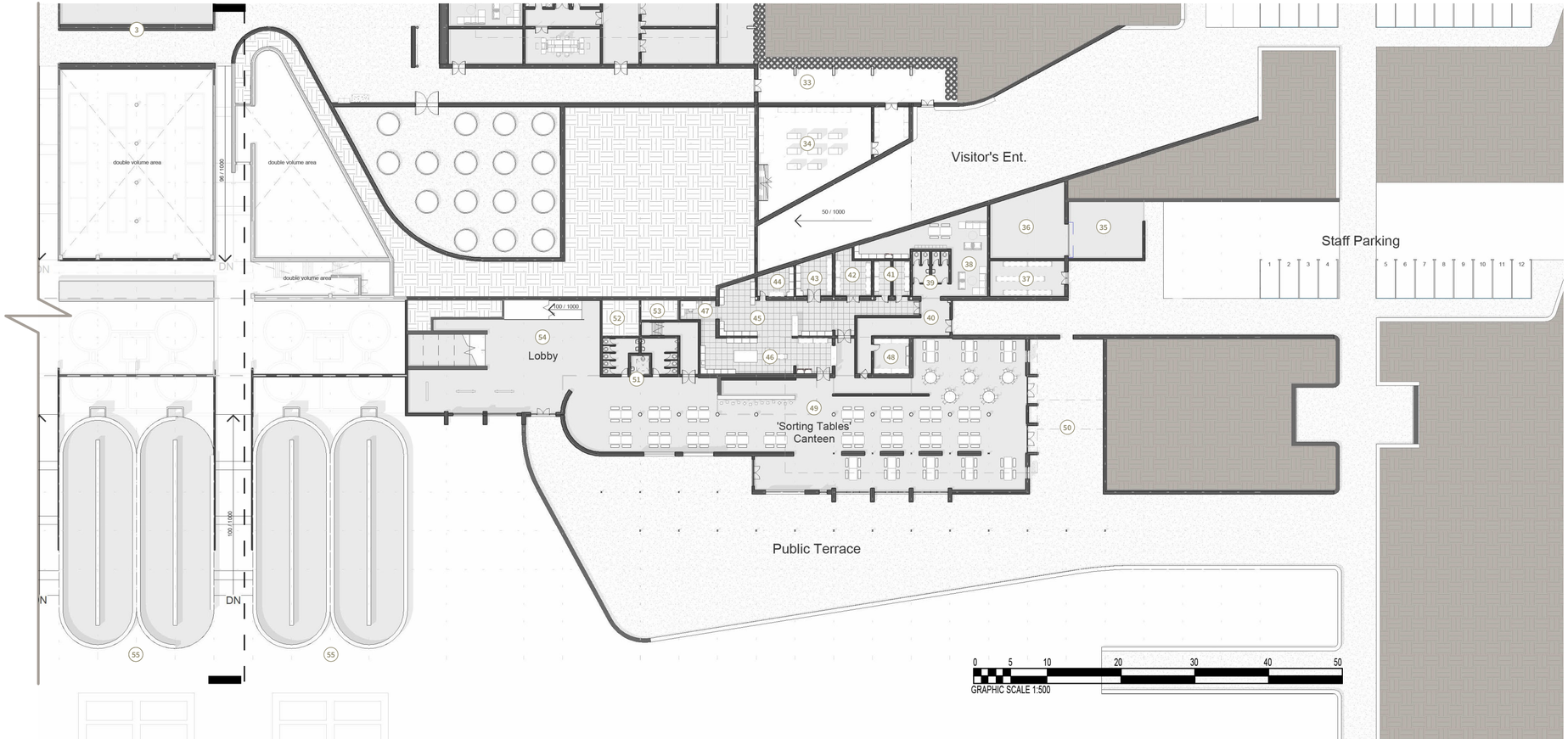
Administration

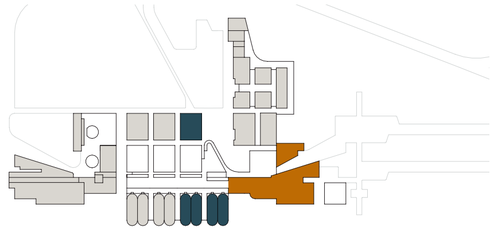
19 Entrance Courtyard
20 Administration
21 Exhibition Hall
22 Training Room
23 Storage
24 Public WC
25 Lobby
26 Laboratory
27 Reference Room
28 Staff Room
29 Staff Kitchen
30 Staff WC
31 Courtyard
32 Service Road



Dwg. A-102

Ground Floor (+) - Processing & Administration



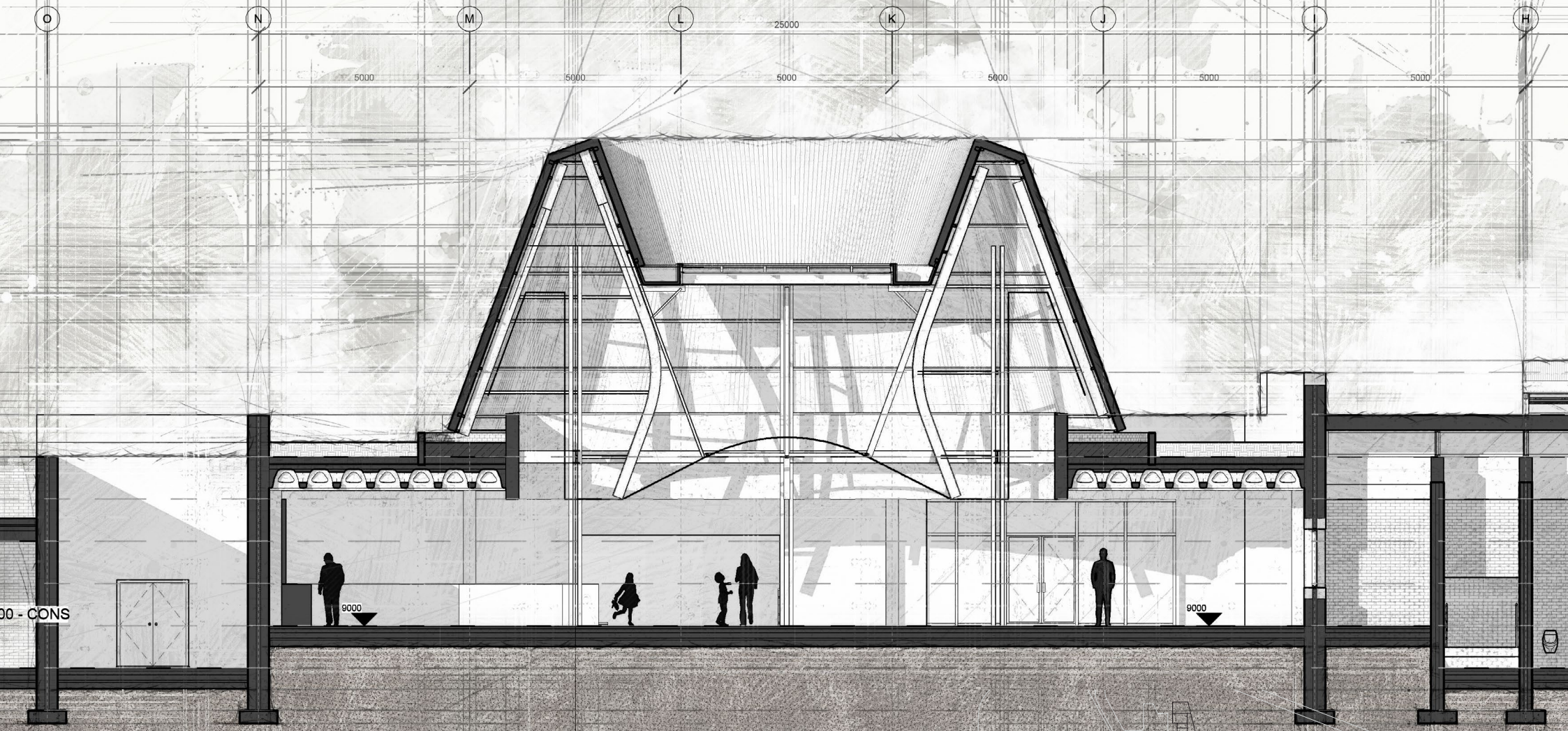


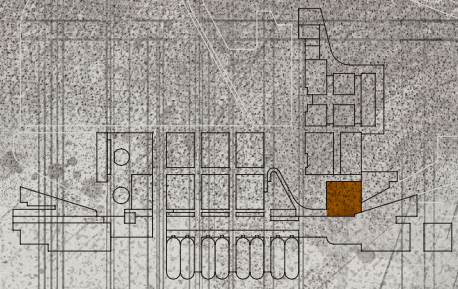
Ground floor plan (1:500)

Kitchen
33 Service Corridor
34 Shop / Cafe
35 Service Yard
36 Disposal Area
37 Storage
38 Staff Room
39 Staff WC
40 Staff Entrance
41 Cold & Dry Rooms
42 Storage
43 Scullery
44 Pantry
45 Preparation Area
46 Cooking Area
47 Office
48 Maintenance Room
49 'Sorting Tables' Canteen
50 Patio

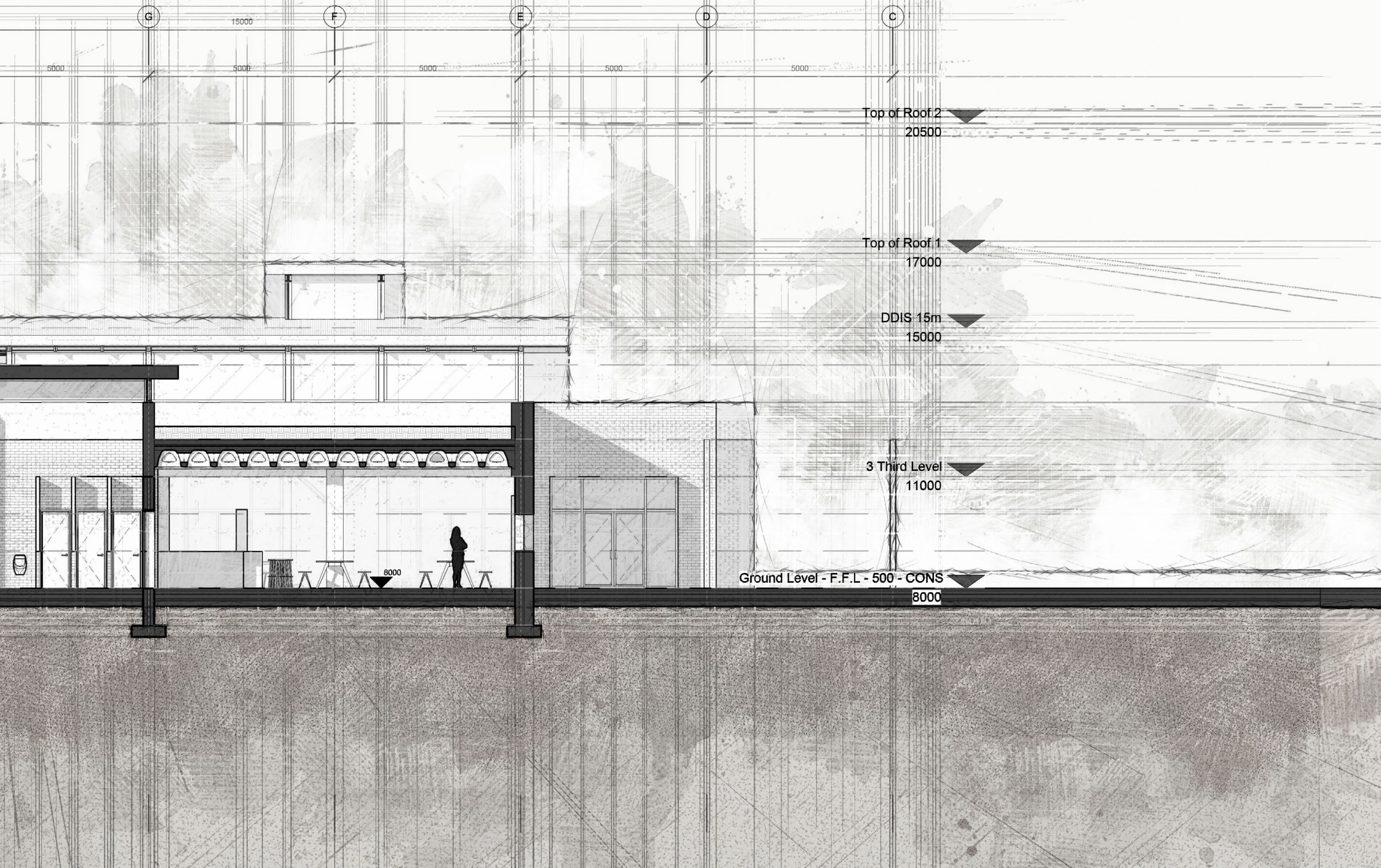
Reception
51 Public WC
52 Office
53 Ticket Office
54 Lobby
55 Seaweed (*ulva*) Baths

Dwg. A-102
Ground Floor - Visitor's Centre

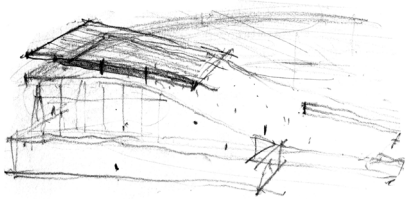


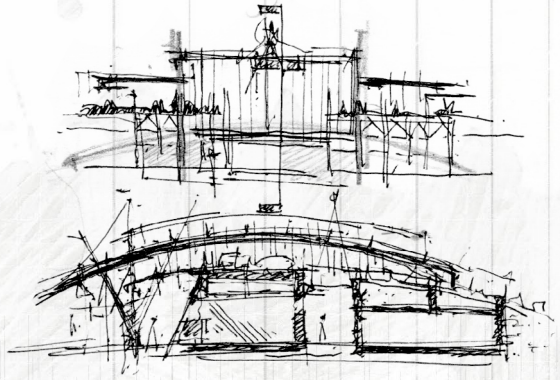


Permanent Exhibition - **‘Gate with a Light’**

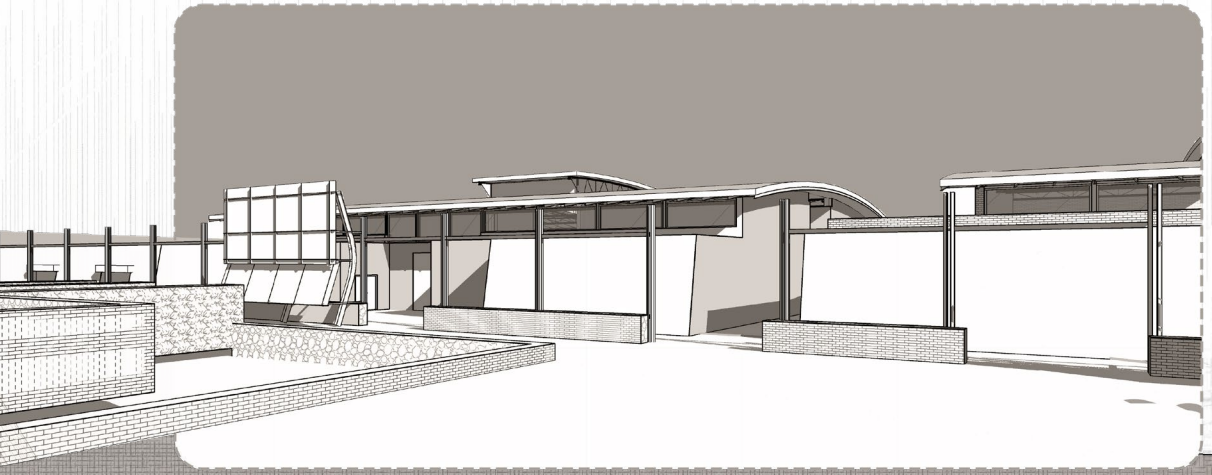

G
F
E
D
C
15000
5000
5000
5000
5000
5000
Top of Roof 2
20500
Top of Roof 1
17000
DDIS 15m
15000
3 Third Level
11000
Ground Level - F.F.L - 500 - CONS
8000
8000

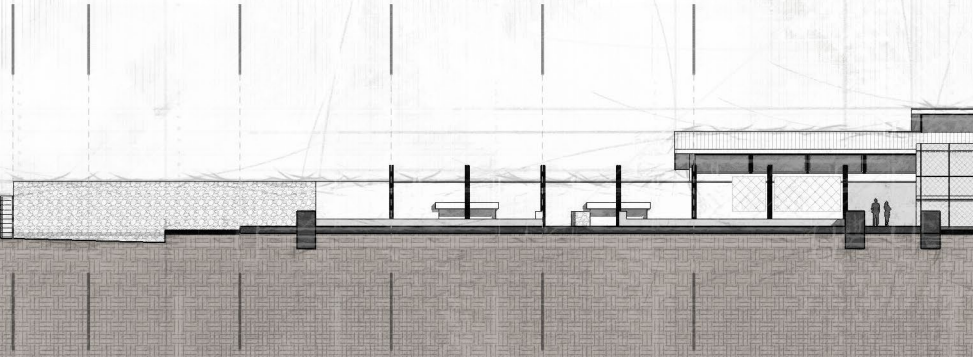
Permanent Exhibition - **‘Gate with a Light’**



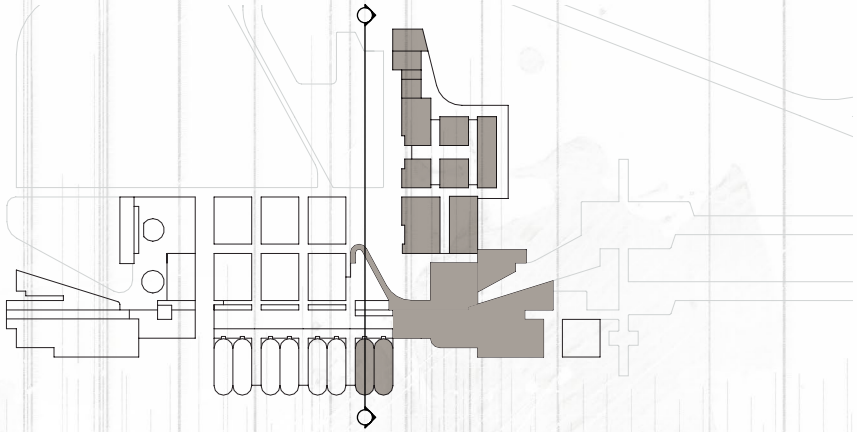


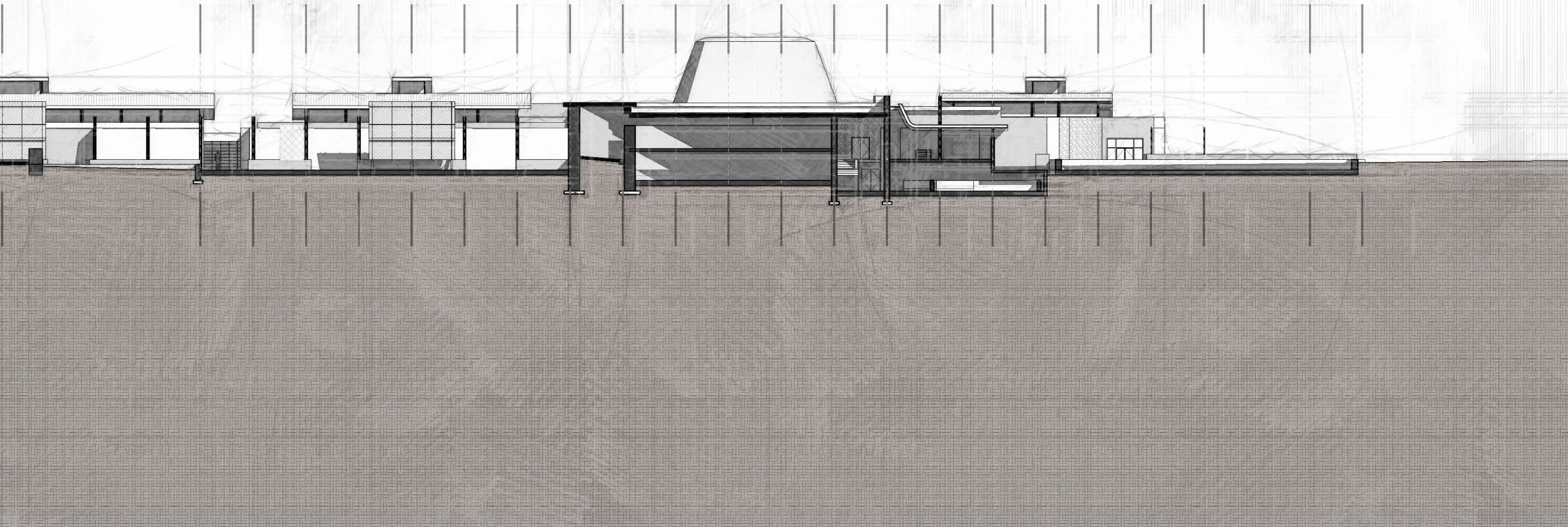
Fg. **Condensed Experiential Image**
the fusion of the poeticised image of maritimes organisms and industrial wash plant emerging from the natural landscape (author, 2023)



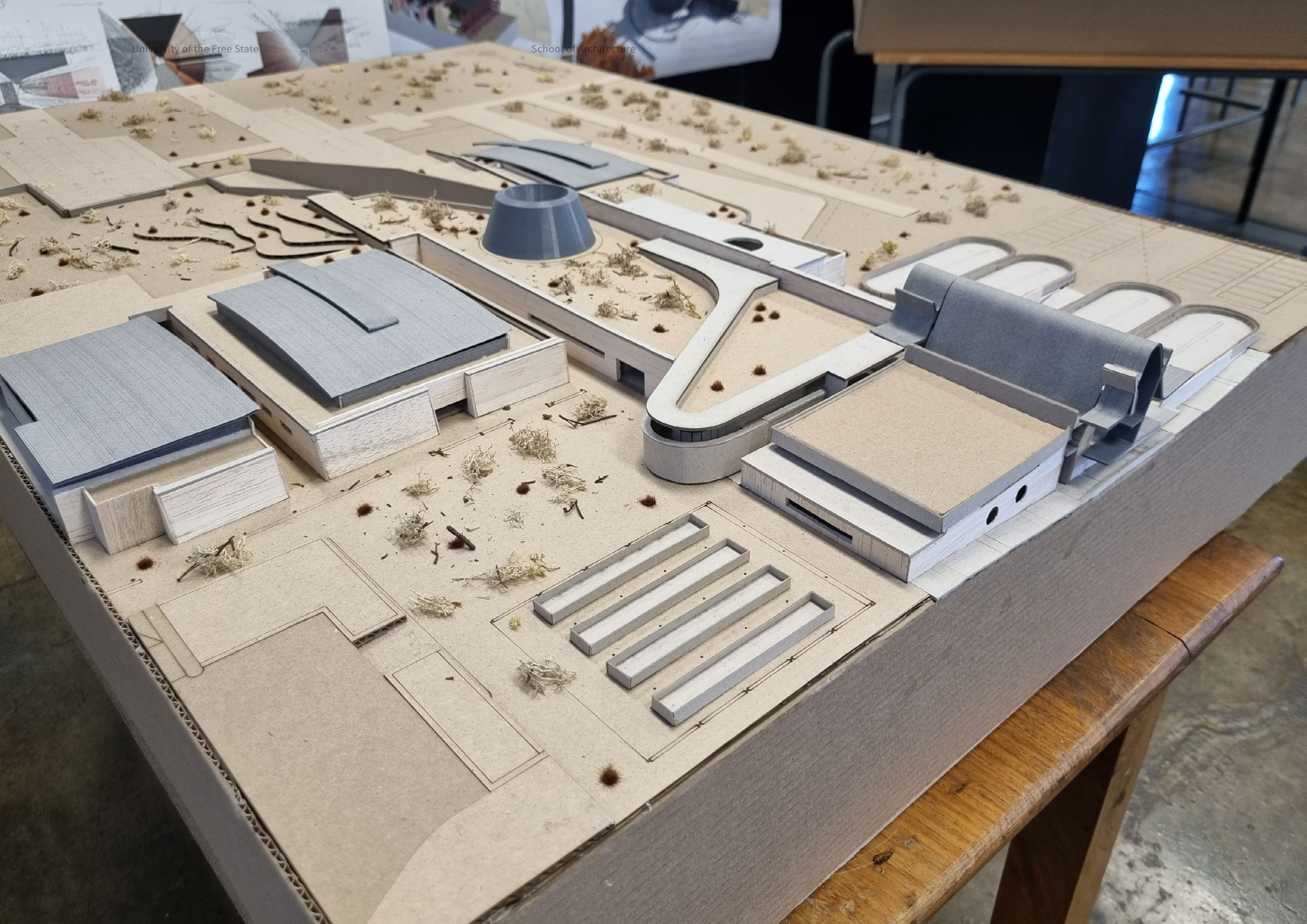


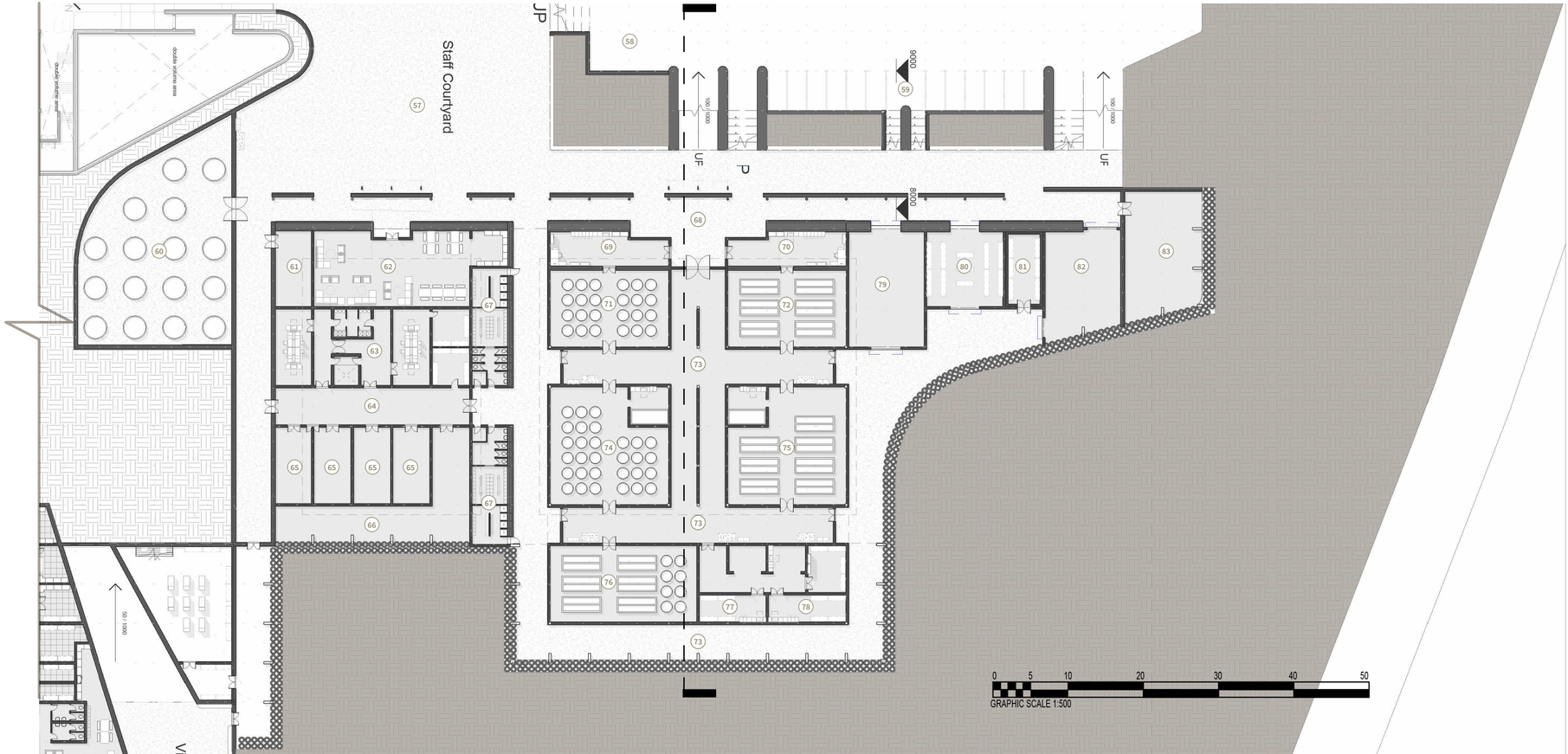
Sectional Elevation - **Hatchery & Spine**

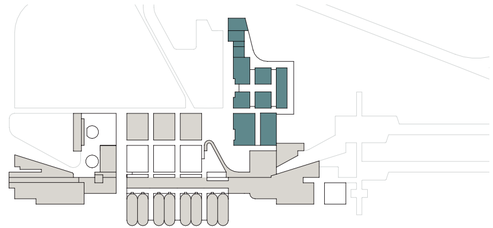




University of the Free State School of Architecture



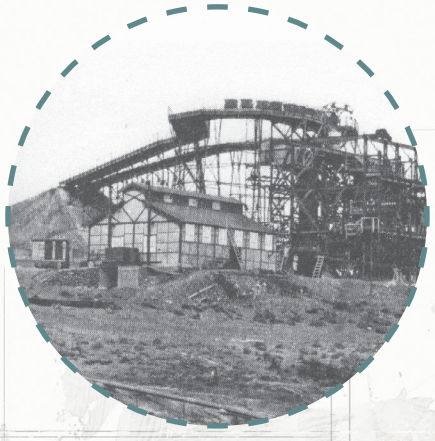




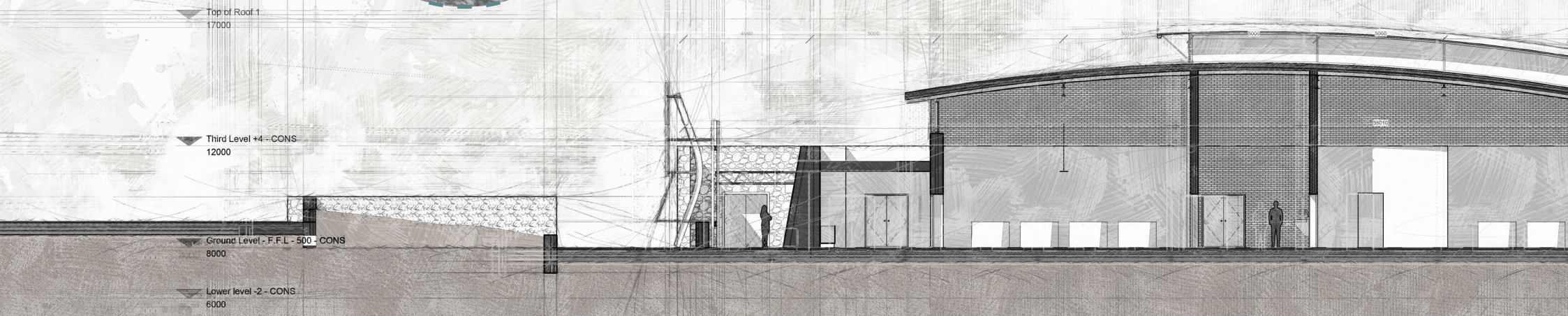
Ground floor plan (1:500)

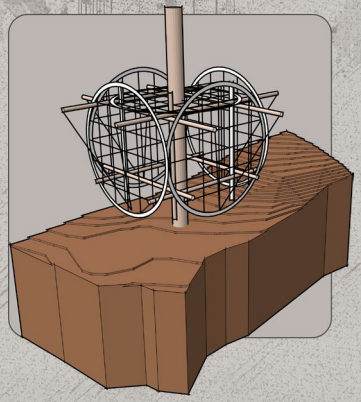
57 **Courtyard**
58 **Broodstcok Reception** *(Inspection Yard)*
59 **Parking / Deliveries**
60 **Nursery Settlement Facility** (Fin Fish)
61 **Storage**
62 **Staff Hall**
63 **Laboratory**
64 **Circulation**
65 **Live Feed Culture Rooms**
66 **Storage**
67 **Staff WC** (Biosecure)
68 **Entrance to Hatchery**
69 **Records Office** *(Fin Fish)*
70 **Records Office** *(Abalone)*
71 **Quarantine Facility** *(Fin Fish)*
72 **Quarantine Facility** *(Abalone)*
73 **Circulation**
74 **Conditioning Facility** *(Fin Fish)*
75 **Conditioning Facility** *(Abalone)*
76 **Spawning & Incubation Facility** *(Fin Fish)*
77 **Induction & Spawning Facility** *(Abalone)*
78 **Incubation & Larval Rearing Facility** *(Abalone)*
79 **Storage**
80 **Workshop**
81 **Cold Room**
82 **Disposal Area** *(covered)*
83 **Plant Room**

Dwg. A-102
Ground Floor- Hatchery (production)

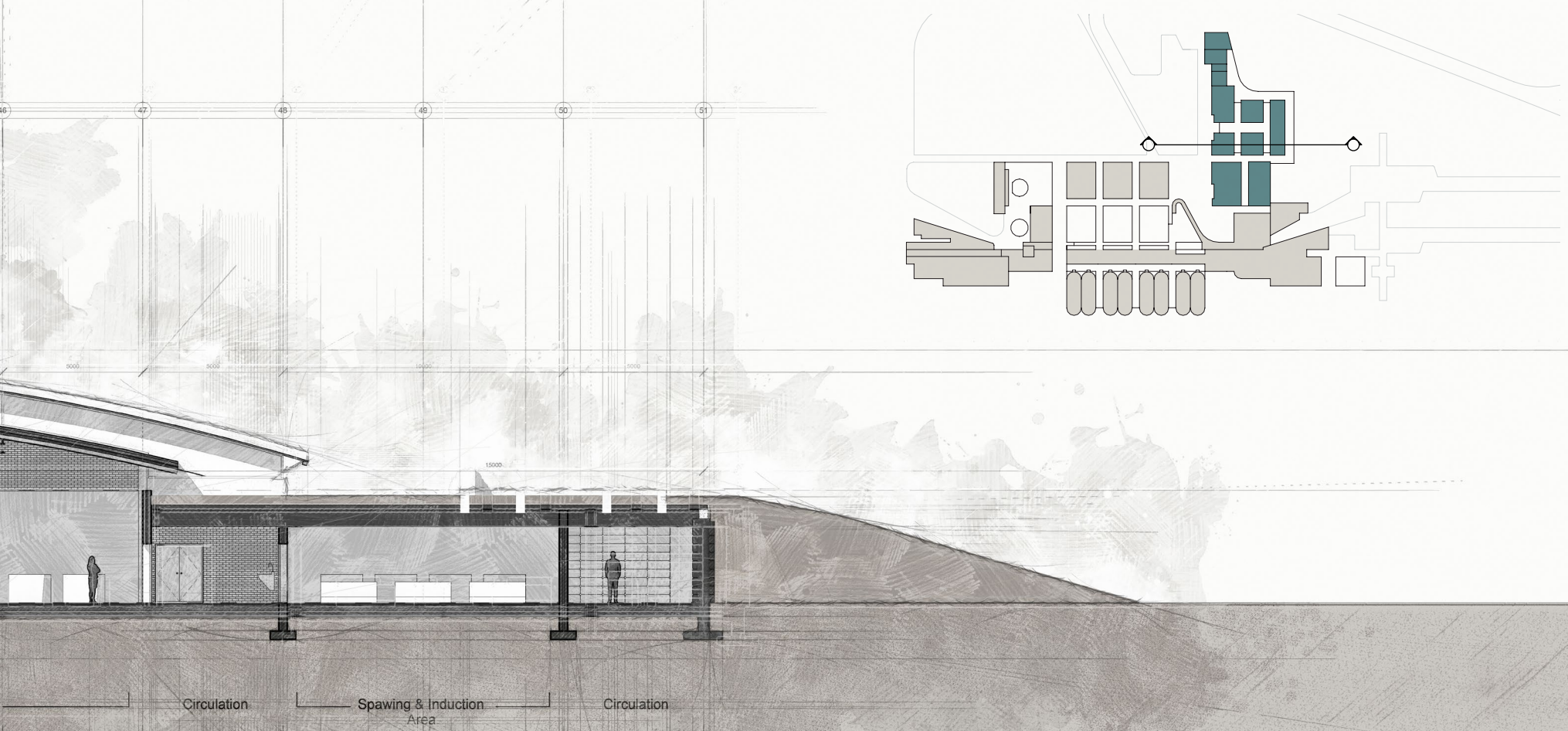


Fg.
Wash Plant and Power Station
mechanical plant installed 1930s
(Carstens, 2001: 89)





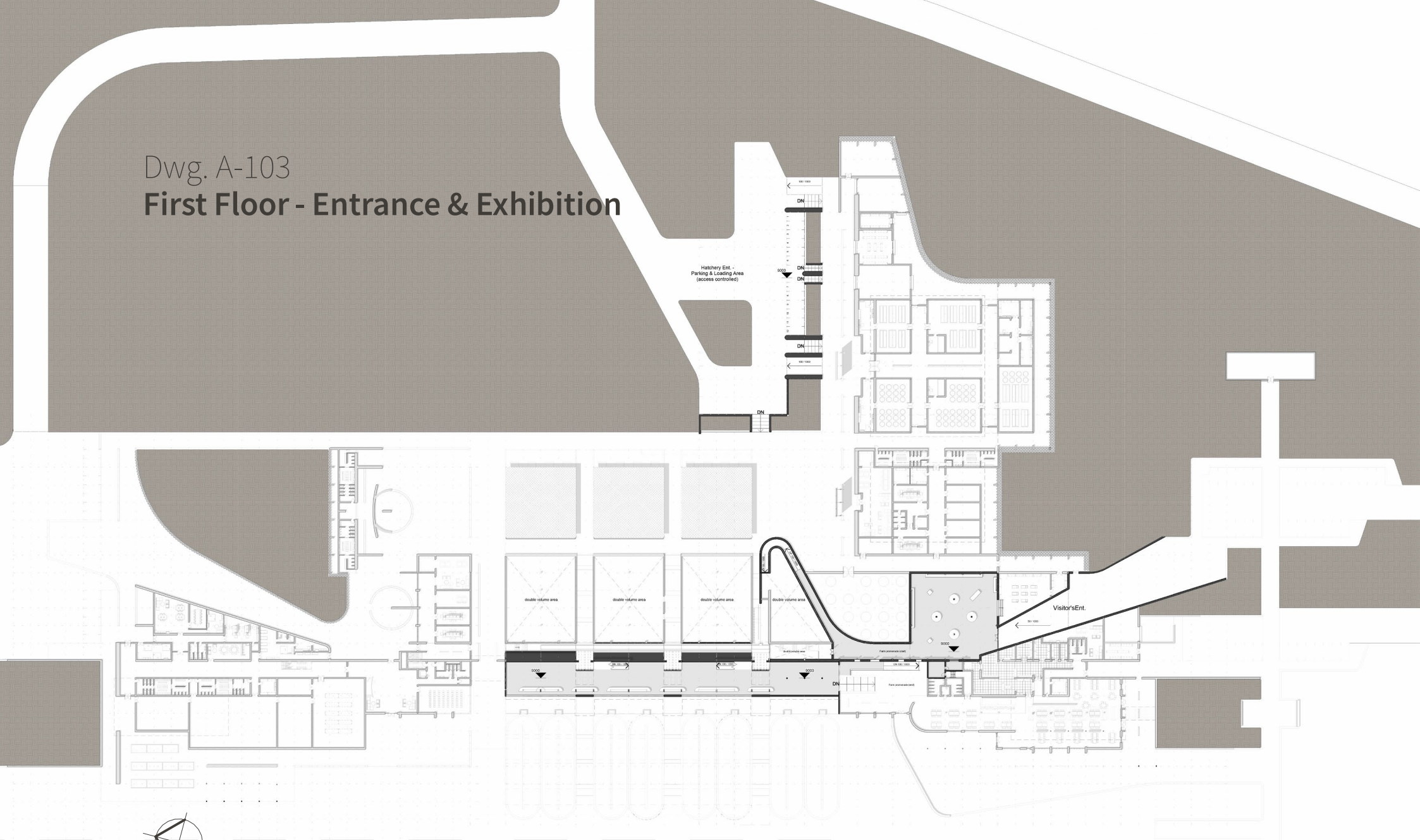
Fg.
Life-wind of A Recovering Landscape
(author, 2023)



Section through the **Hatchery**

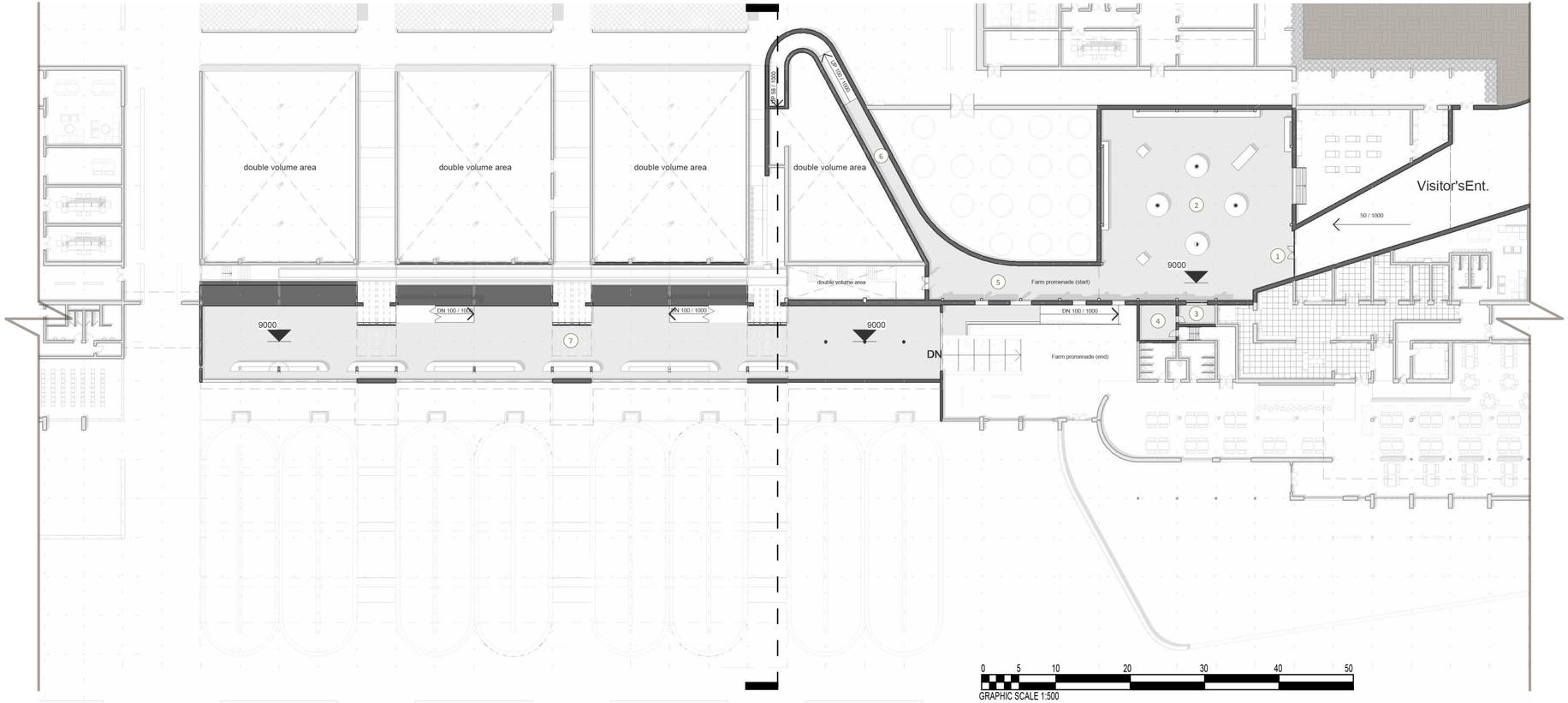
Dwg. A-103

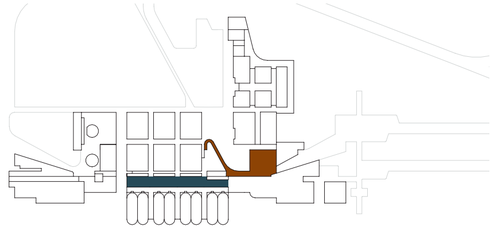
First Floor - Entrance & Exhibition



First floor plan (not scaled)

0 5 10 20 30 40 50
GRAPHIC SCALE 1:500





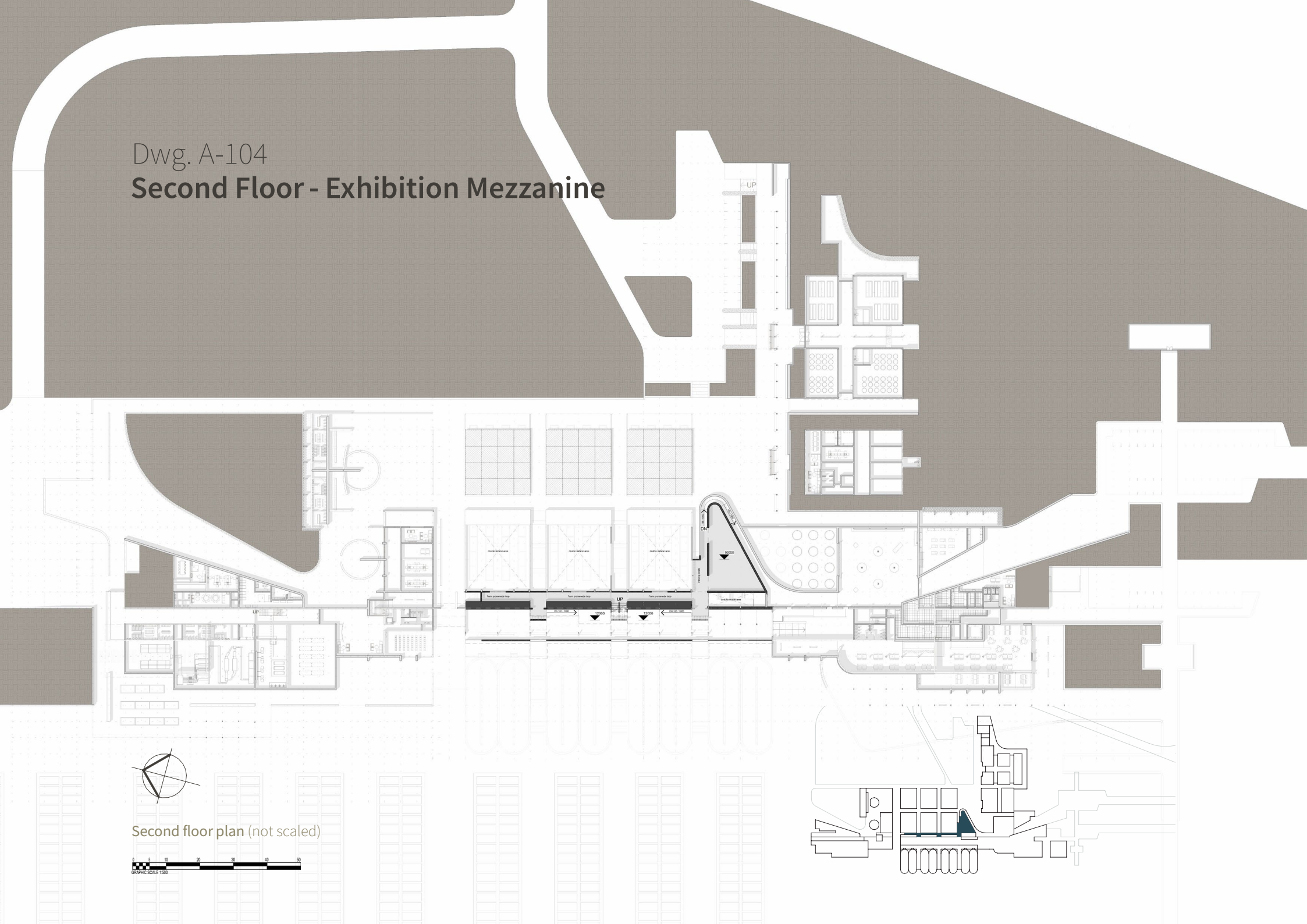
First floor plan (1:500)

1 **Visitor's Entrance**
2 **Exhibition** (*memory*)
3 **Reception** (*ticket office*)
4 **Office**
5 **Exhibition Route** (*start*)
6 **'Grizzly Cruncher' Corridor** (*view nursery settlement*)
7 **Exhibition** (spine)

Dwg. A-103
First Floor - Entrance and Exhibition

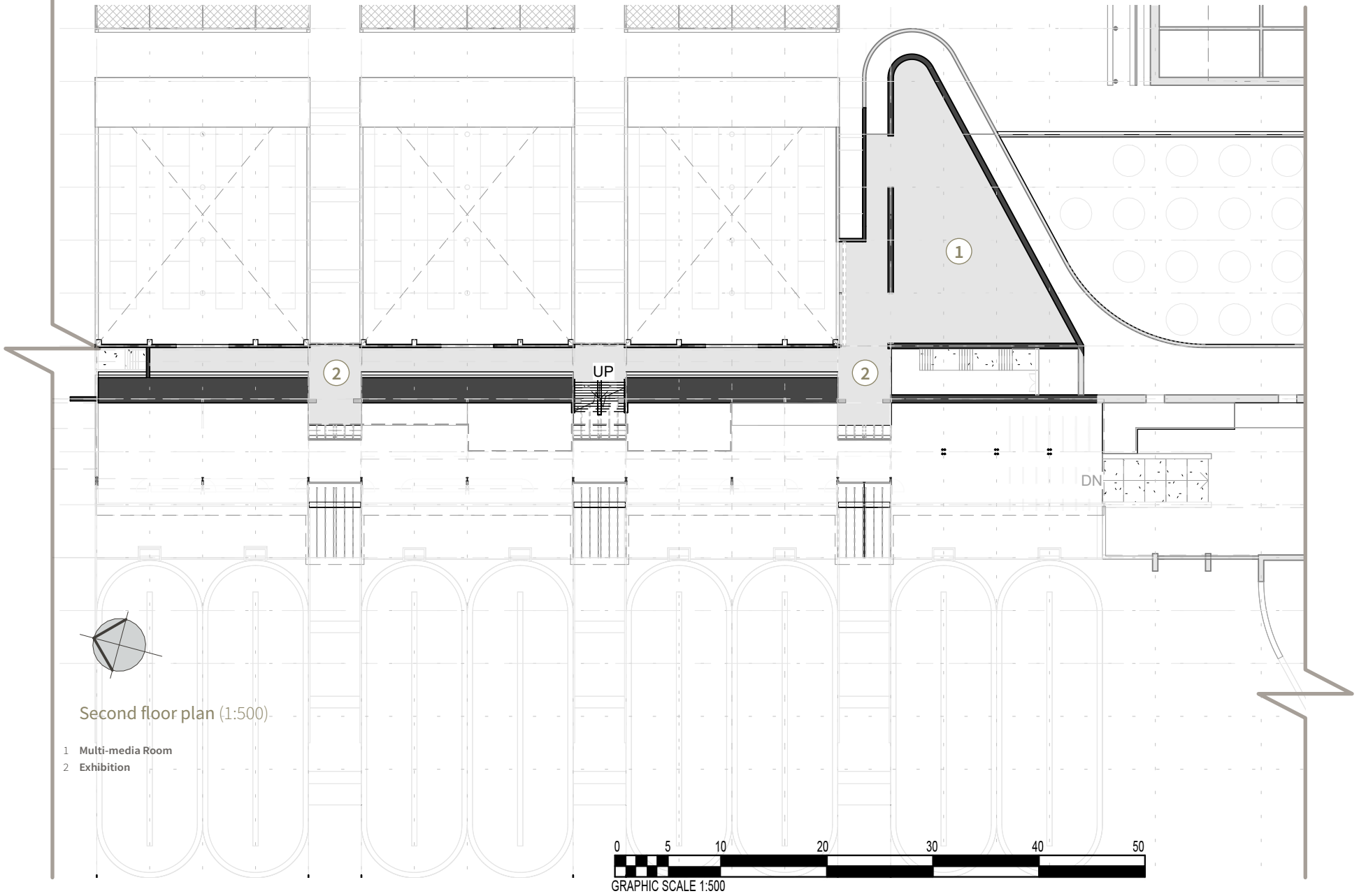
Dwg. A-104

Second Floor - Exhibition Mezzanine



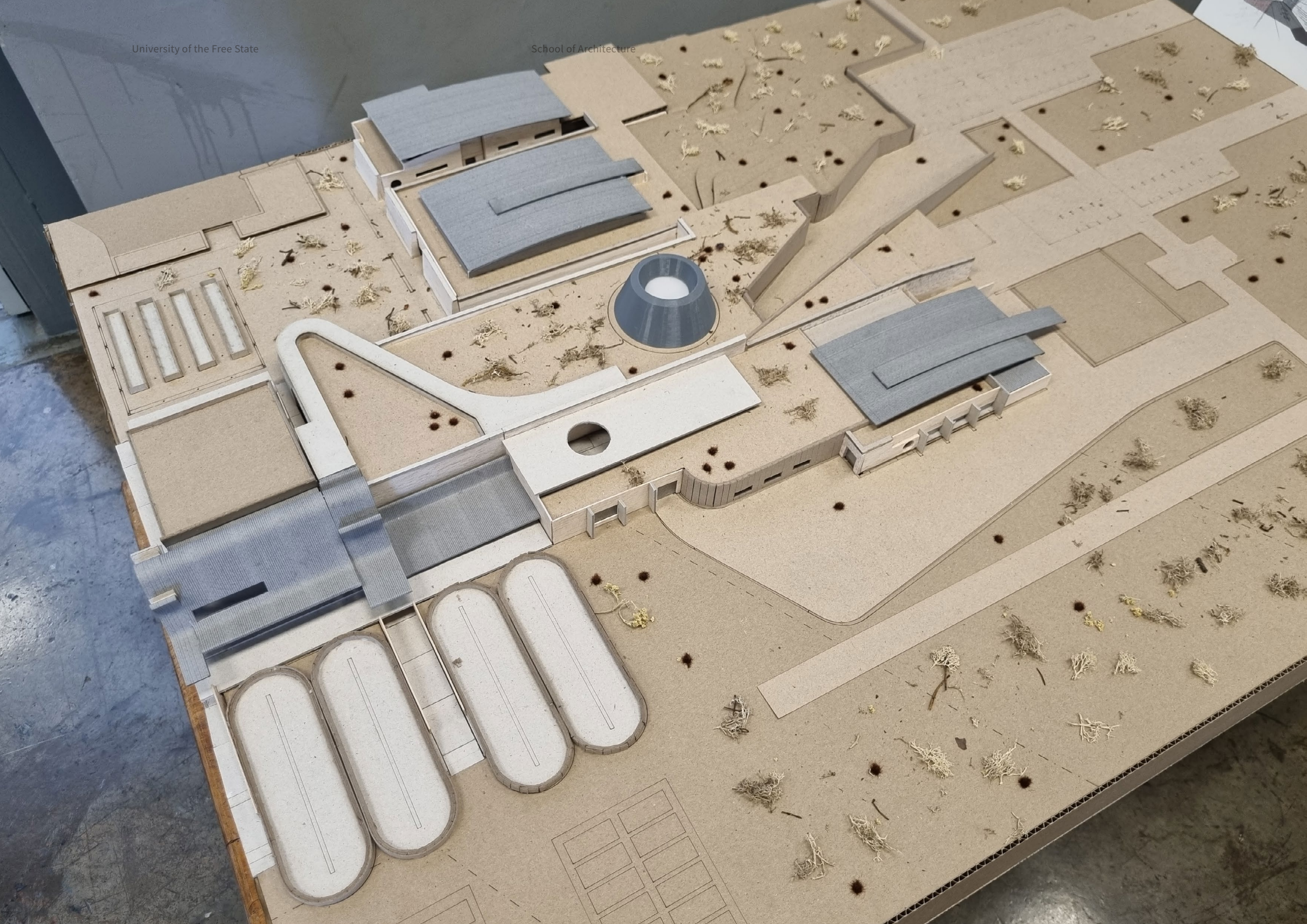
Second floor plan (not scaled)

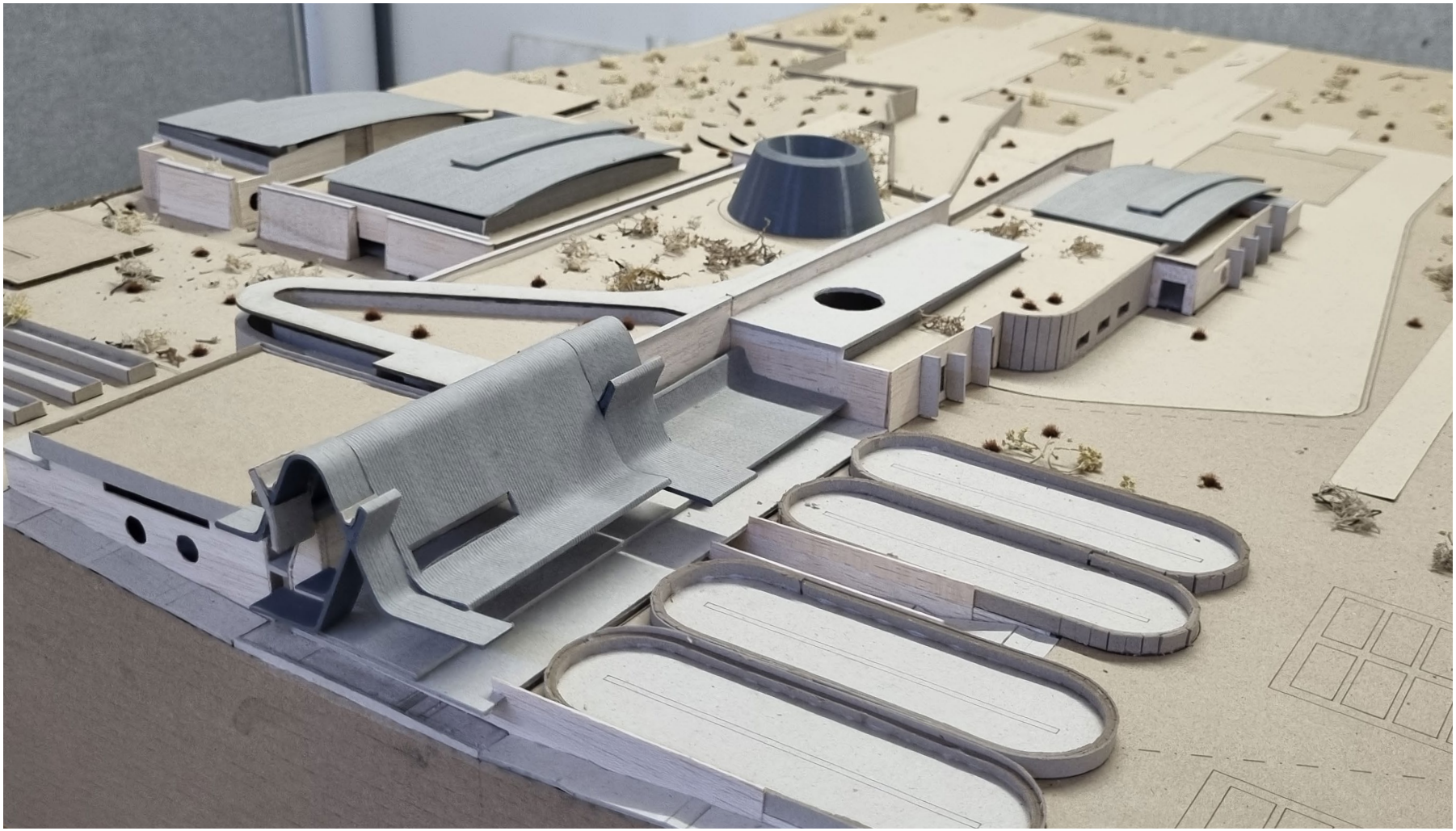
GRAPHIC SCALE 1:500



Second floor plan (1:500)

1 **Multi-media Room**
2 **Exhibition**





Asset of Action / Organising Image - **Spine**

Top of Roof 2
20500

Third Level +4 - CONS
12000

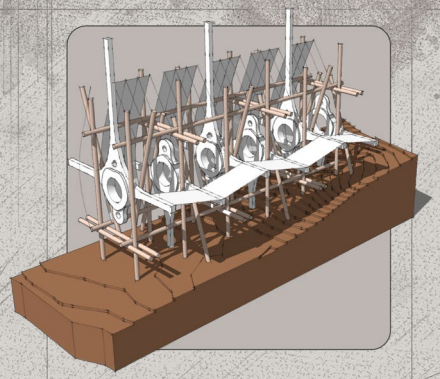
Second Level +2 - CONS
10000

First Level +1 - 500 - CONS
9000

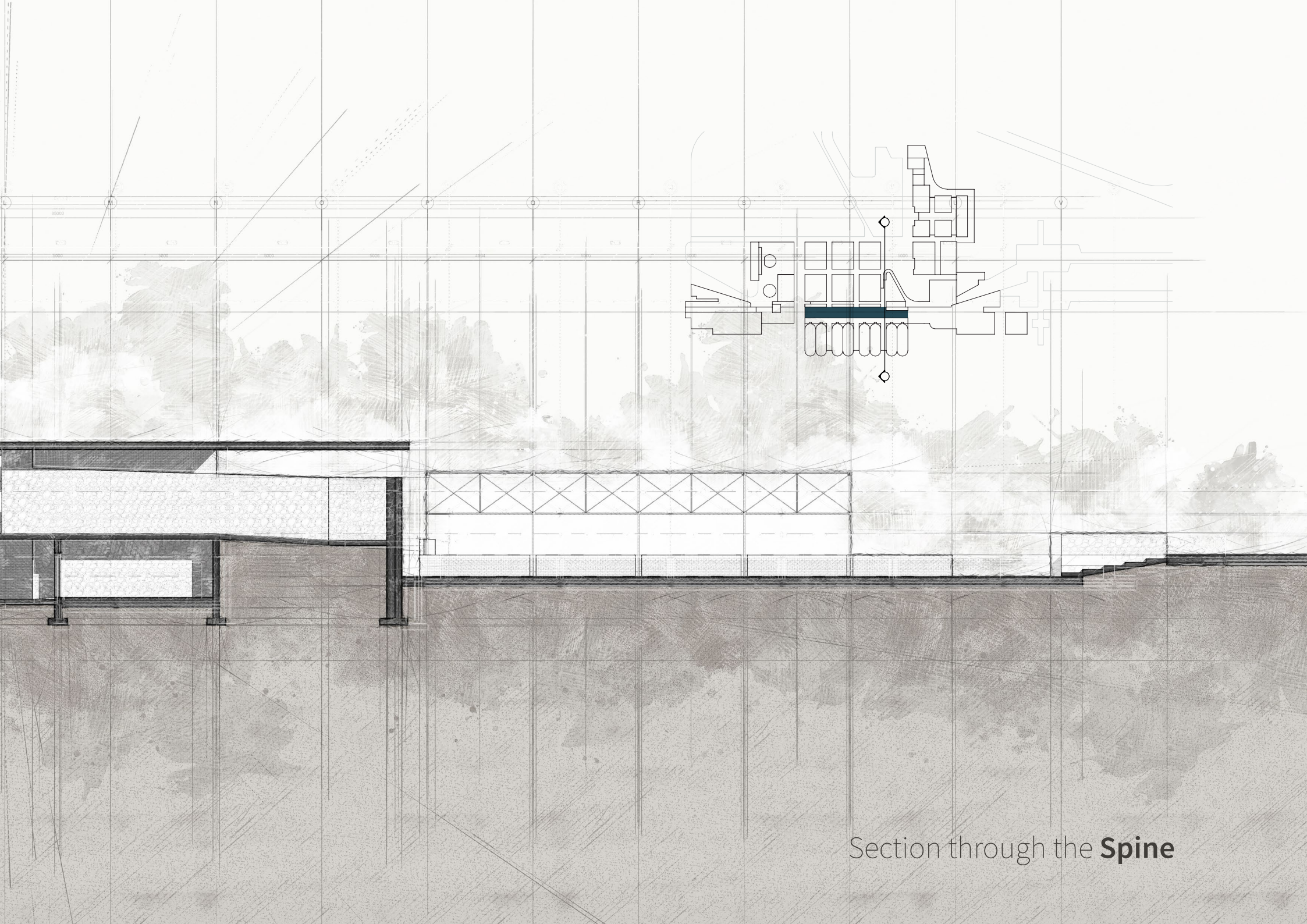
Ground Level - F.F.L - 500 - CONS
8000

Lower level -2 - CONS
6000

T.O.F
4000



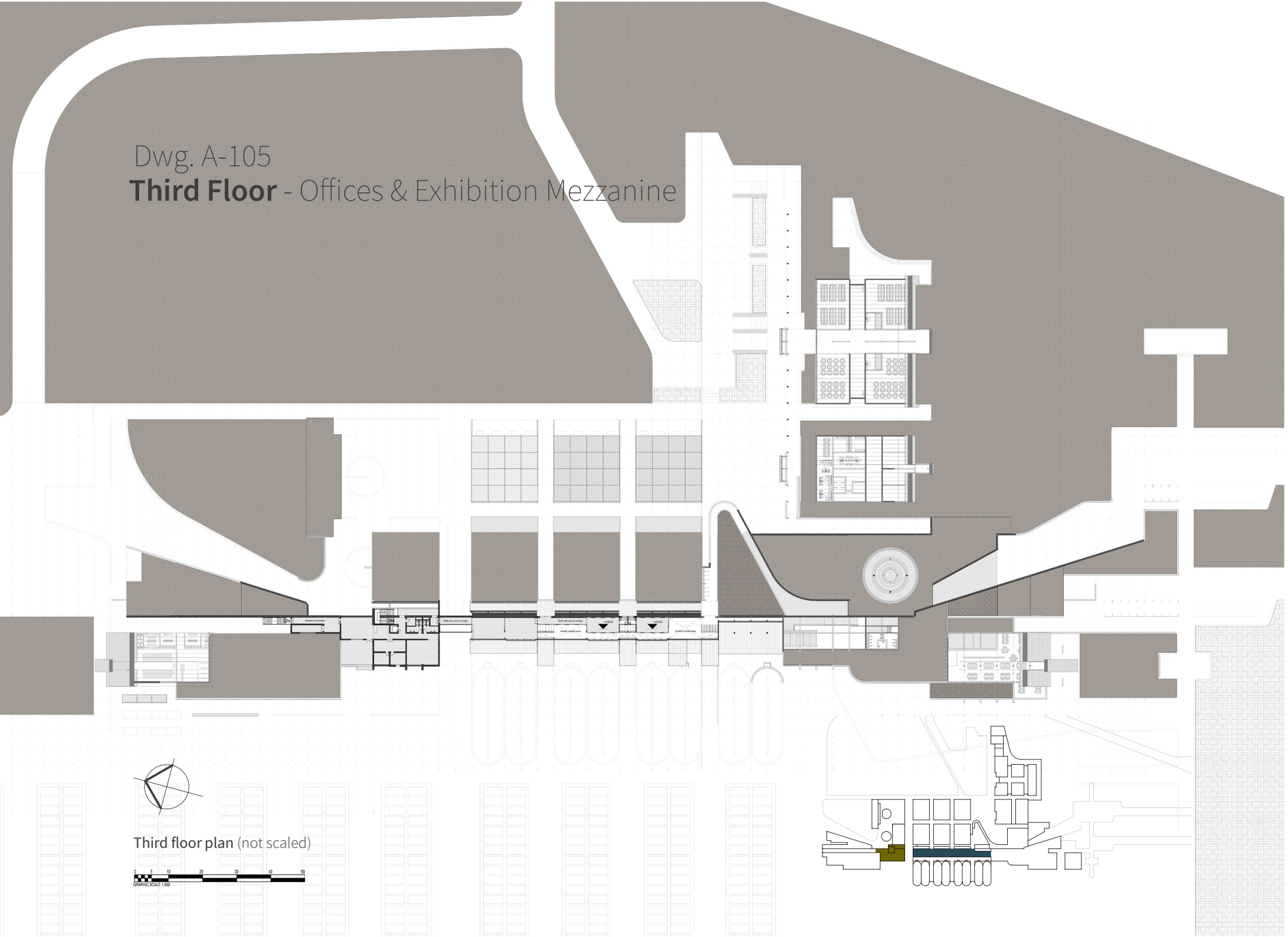
Fg.
Life-wind of MaritimeOrganisms
(author, 2023)



Section through the **Spine**

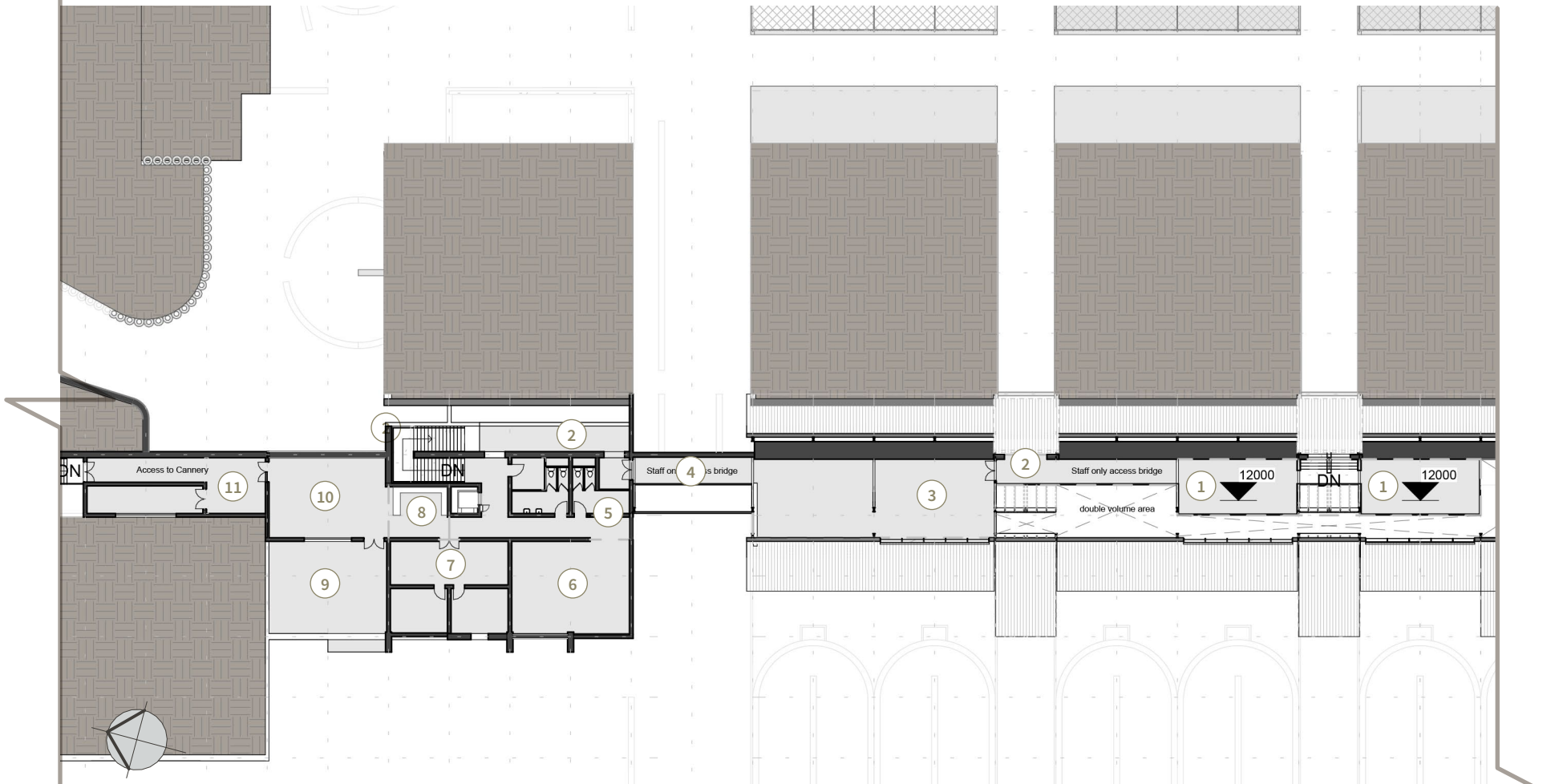
Dwg. A-105

Third Floor - Offices & Exhibition Mezzanine



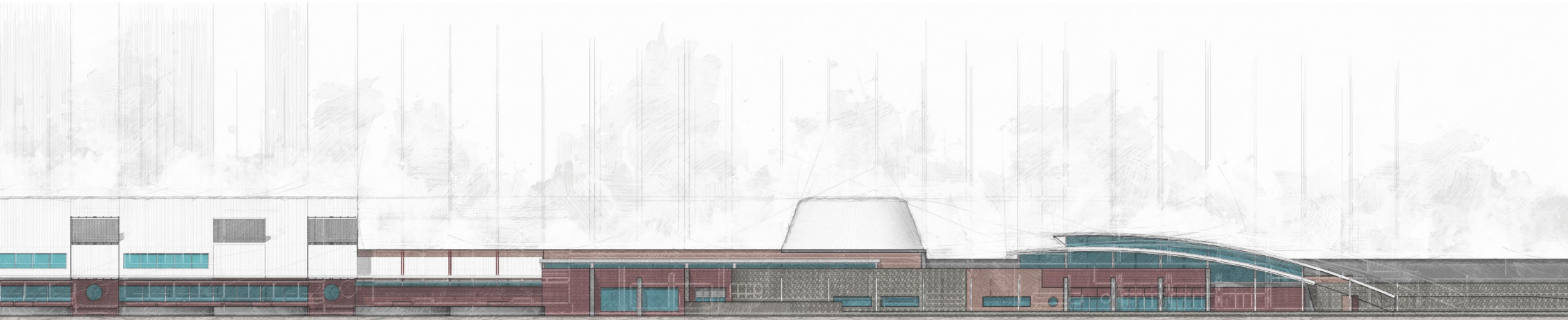
Third floor plan (not scaled)

GRAPHIC SCALE 1:500



Third floor plan (1:500)

1 **Vantage Point** (*lookout mezzanine*)
2 **Circulation**
3 **Open Floor Offices**
4 **Circulation Bridge**
5 **WC**
6 **Conference Room**
7 **Office Cluster**
8 **Kitchen**
9 **Outdoor Courtyard**
10 **Lounge**
11 **Control Room**



West Elevation

06

Symbiotic Trade-off
Technical Report

D

6.1 Material Specifications
6.1.1
Environmental Centre

Somerset West, Cape Town / Ebesa Architects

Based on expert findings reported of in the EIA executed by professional environmental assessment practitioners – the nature of the receiving environment (Farm 654 Portion 1), has been severely disturbed by open cast mining of alluvial diamonds over the past 100 years, the terrestrial biodiversity has either been recovering in select areas very slowly or not at all. To mitigate any further damage to the landscape, alternative construction methods and materials have been specified in the construction of the Development as far as possible. These efforts, although contribute in part, are intended to serve as carbon sinks and reduce environmental impacts. The Development is unlikely to contribute significantly to the cumulative loss of rehabilitation potential (Massie, Hutchings and Clark 2018, 321-322), instead attempts to serve as host in breathing life back into the disturbed ecology of Kleinzee, through the appropriate selection of materials.

The following unpacks the various construction methods and alternative methods specified in various precedent buildings and further explores various materials to be specified in the construction of the Development.

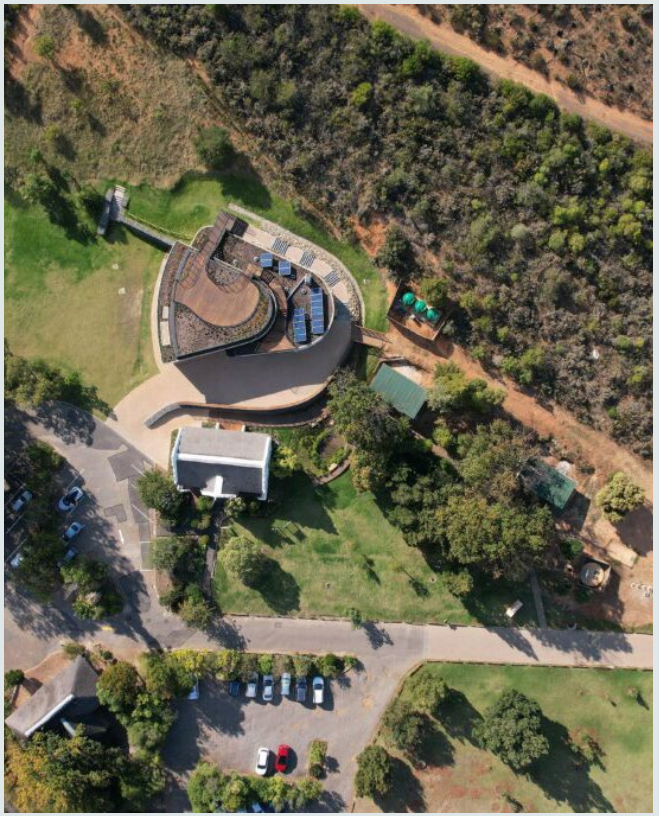


Figure 142. Helderberg Nature Reserves Environmental Centre in Cape Town (Scape, 2021: online)

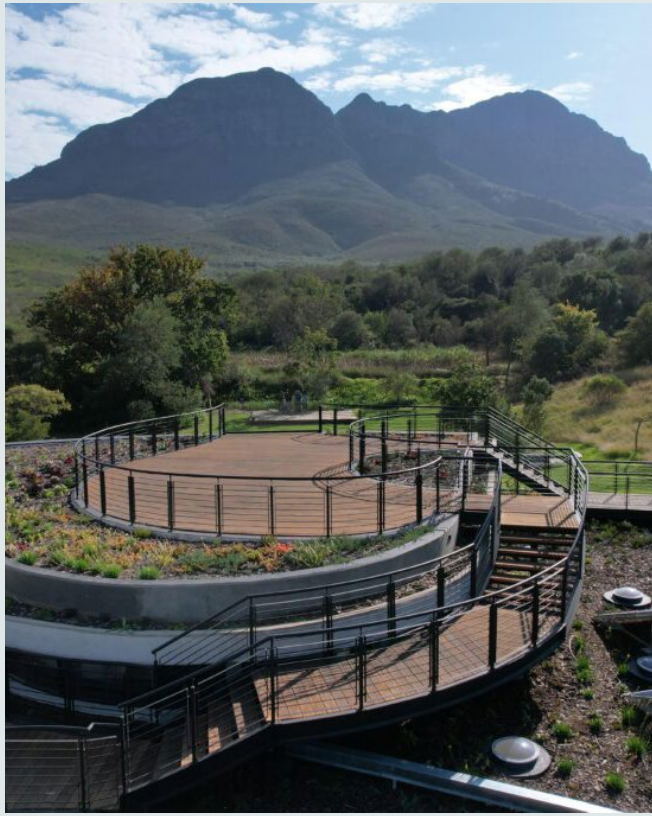


Figure 143. Helderberg Nature Reserves Environmental Centre in Cape Town (Scape, 2021:online)

Environment

Helderberg Nature Reserve's new Visitors Centre and Educational Facility is located on the slopes of the Helderberg Mountains overlooking the False Bay region in the Western Cape. It is an area characterized by a warm and temperate climate (Csb)

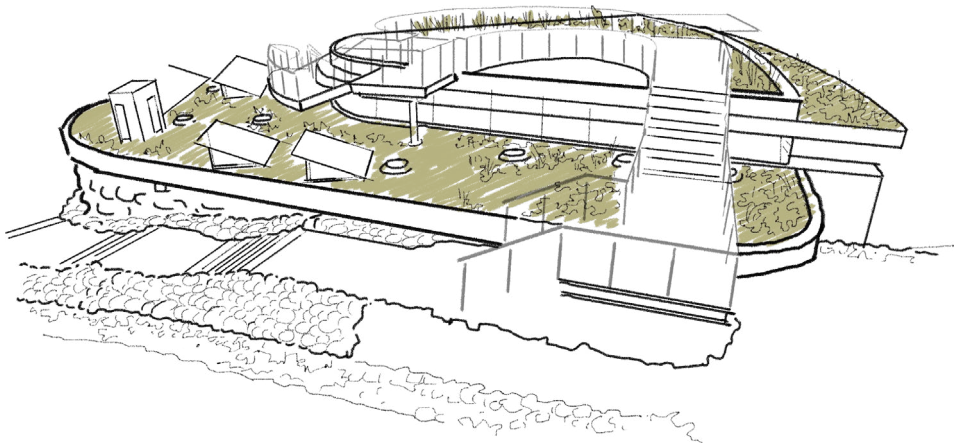
Building Requirements

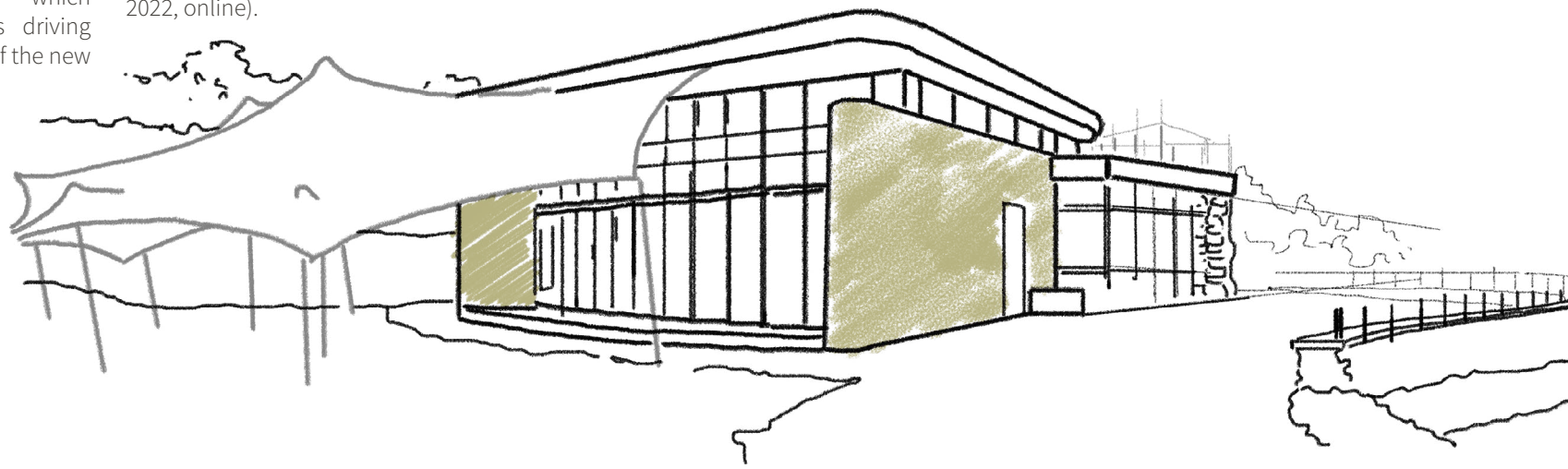
The centre provides additional services to the current facilities on site, including a multipurpose space and two-tier roof garden. The brief required the use of both conventional and unconventional green technology solutions to reduce the carbon emission of the building and encourage a renewable resource thinking approach to the project (Immelman 2022, online) which compliments the intentions driving the design and construction of the new Development in Kleinzee.

Form and Function

Biophilic Design is central to the design scheme of the centre which is revealed through the form, orientation of the building, use of natural or recycled materials and the expression thereof, the harnessing of natural sunlight and passive ventilation that filters through the internal spaces and roof garden that is intended to encourage human engagement with the natural environment and aid with thermal comfort (NWE Consulting Engineers 2022, online). To demonstrate alternative construction methods, the design showcased three approaches where waste was used in the wall construction. The concept for the enclosure is based on two curved walls, one fitting into the other (Immelman 2022, online).

Figure 144.
Environmental Centre - *key moments*
(author, 2023)



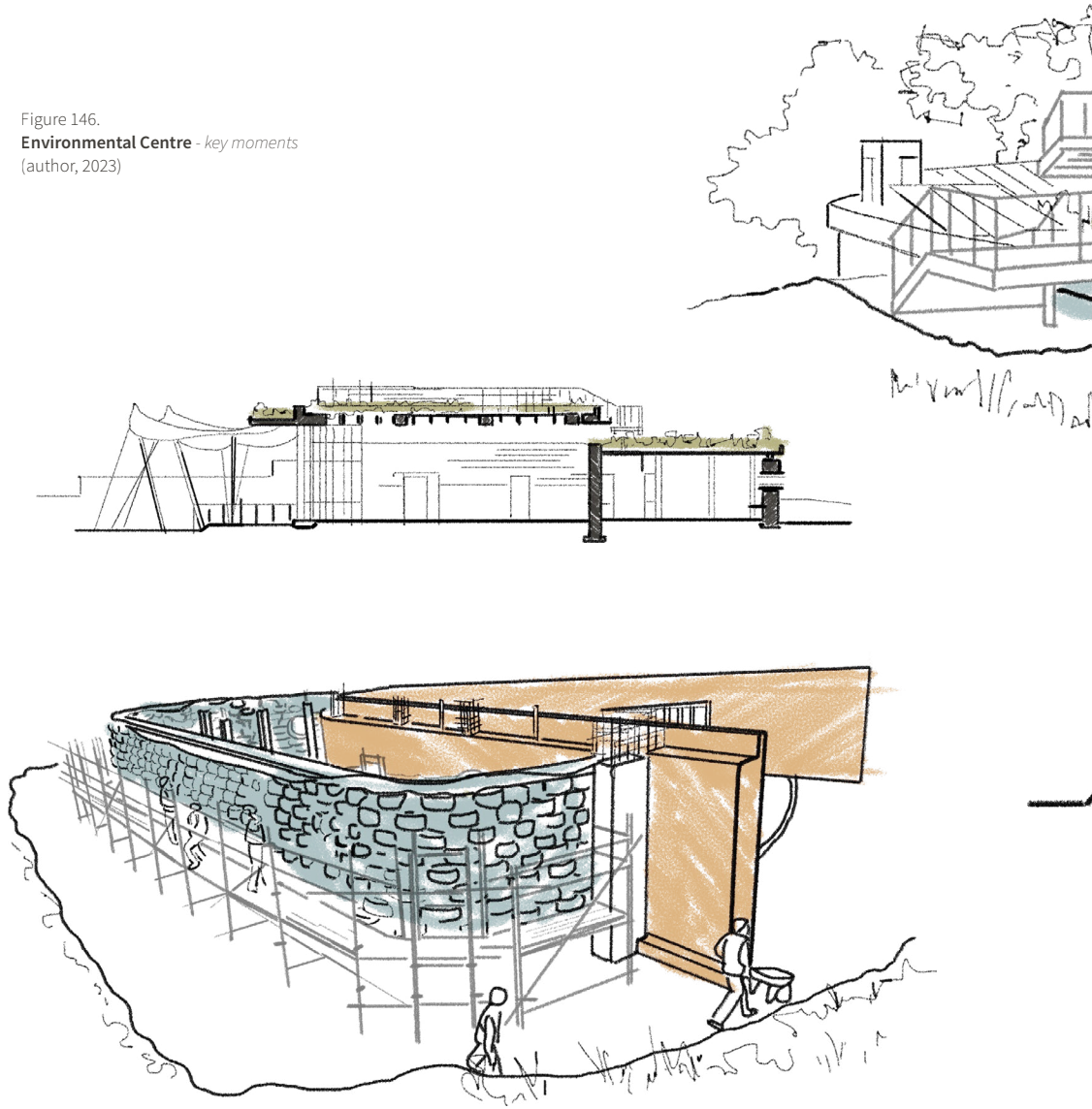


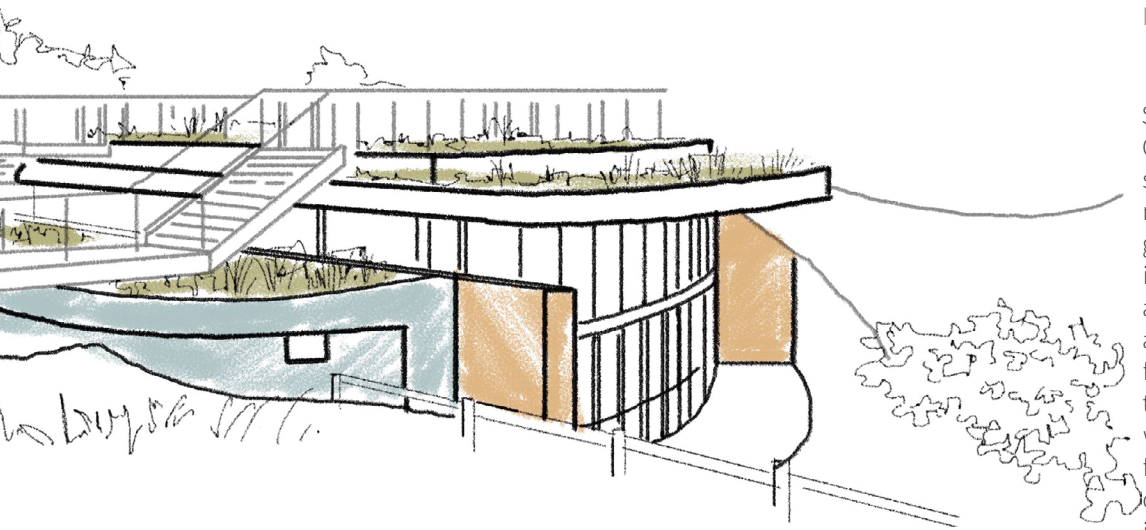
Structural System

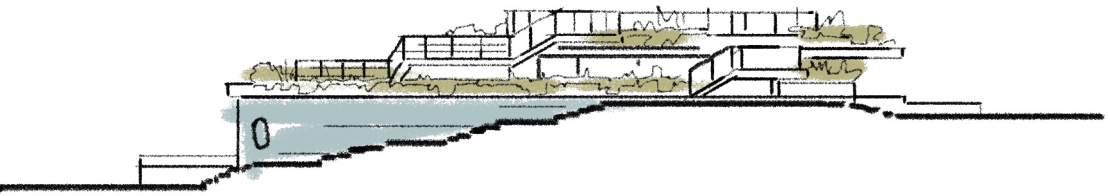
The three approaches spoken of include the inclusion of an inner curved wall and foundations constructed from rammed earth and repurposed rubble, the outer retaining wall constructed from repurposed tires and cob filled with compacted building rubble and ecobricks made from plastic bottles filled with waste, and the internal walls constructed from ecobricks stacked inside a frame to make the walls. Natural cob was also used to plaster over the ecobricks instead of conventional cement-based plaster. The inner rammed earth wall, 600mm thick and coated with a protective layer to reduce weathering, housed the structural columns needed to support the coffer roof slab and ensure the hall was free of any columns. The outer layer of the building envelope made of tires and cob, which sits atop a base that ranges from 400 to 800 mm in width, needed extensive waterproofing due to its encroachment into the embankment. The wall received a layer of plaster to secure the cob and provided a substrate to apply bitumen layers. Additionally - a bubble drainage layer, sand and French drain were added before the embankment was re-established. The roof structure, designed to span the entire hall area, carry people, as well as low growing indigenous planting with drip irrigation.

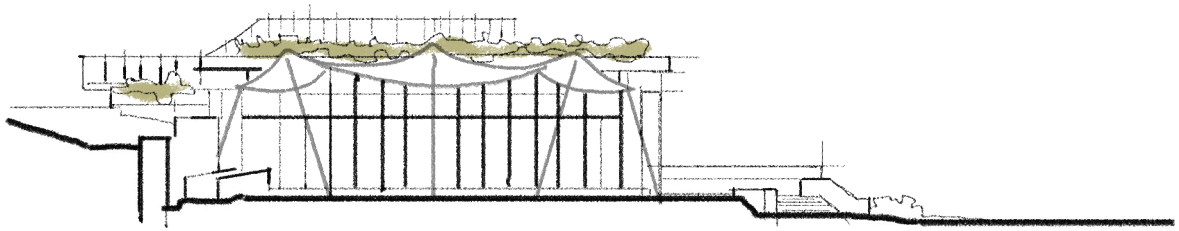
The three wall types showcase the principle of carbon burying, achieved through using materials harnessed either from the site or that would otherwise have become a burden in a landfill if not reused or repurposed. The Development, much like the centre, serves as a carbon sink that mitigates waste (Immelman 2022, online) where a similar approach of site located (mine tailings) or repurposed (tires) materials have been utilized.

Figure 146.
Environmental Centre - *key moments*
(author, 2023)









Building Services

Similar to the Development, the Centre's integrated water treatment system serves the new facility and mitigates the burden of the wastewater generated by the existing facility, which includes the new facility, restaurant, ablutions, the visitor's centre, as well as the rainwater captured by the new facility. The wastewater is directed towards the underground black water treatment system of the new facility where it passes through a four-chamber treatment system. The water is processed and stored for the flushing of toilets. This ensures minimum water usage and zero water wastage.

Learnings

Reduce carbon emissions of the building through carbon burying and encourage a renewable resource thinking approach - **rammed-earth wall**, **repurposed tires and cob wall**, **adobe** or **ecobrick and cob walls**.

Passive Design Approach – form, orientation, natural or repurposed materials, harnessing natural light and passive ventilation.

Two-way structural coffer slab with concealed supports that allow for uninterrupted and flexible spaces beneath, host a planted roof that encourages human engagement with the natural environment by serving as host to indigenous plants, whilst providing thermal comforts to the facilities below.

Integrated Wastewater Treatment System – black water treatment system (four chamber process) which uses bacteria and microorganisms to break down solids and treat the wastewater.

Retaining Tire Wall

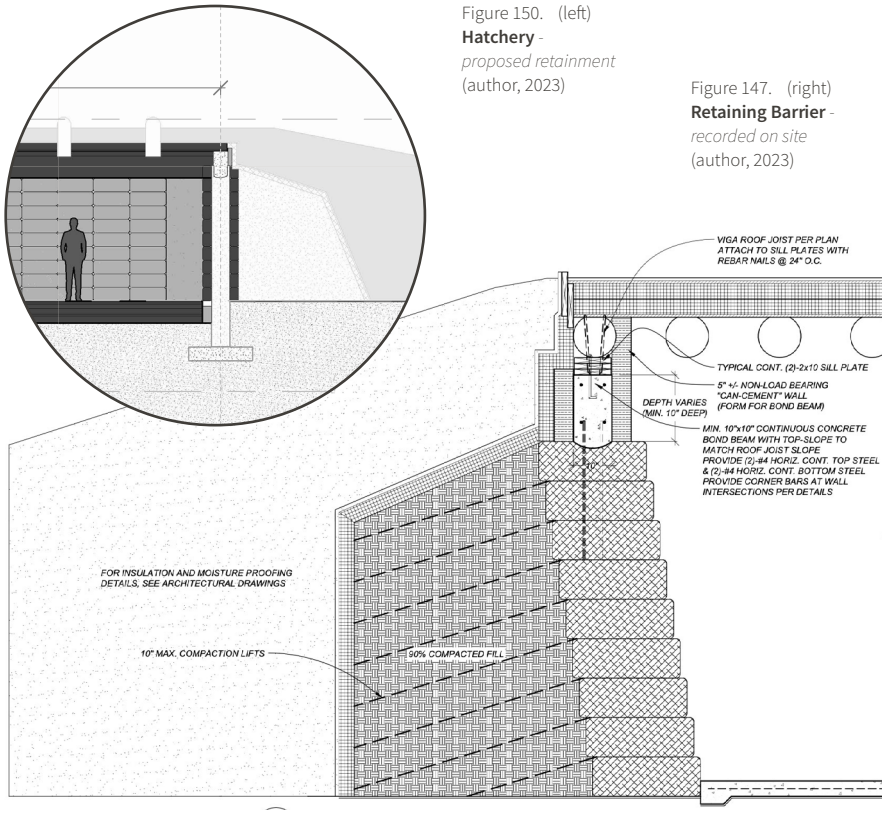


Figure 150. (left) **Hatchery** - *proposed retainment* (author, 2023)

Figure 147. (right) **Retaining Barrier** - *recorded on site* (author, 2023)

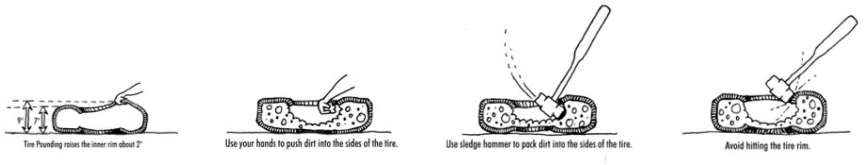


Figure 148. (above & left) **Tire Walls** - *rammed earth encased in steel-belted rubber (recycled automobile tires)* (Pangea Builders, n.d.: online)

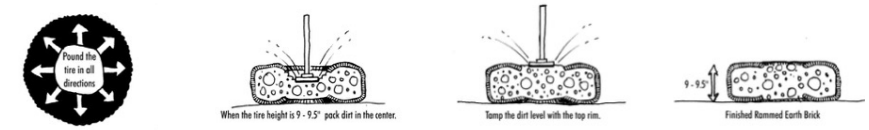
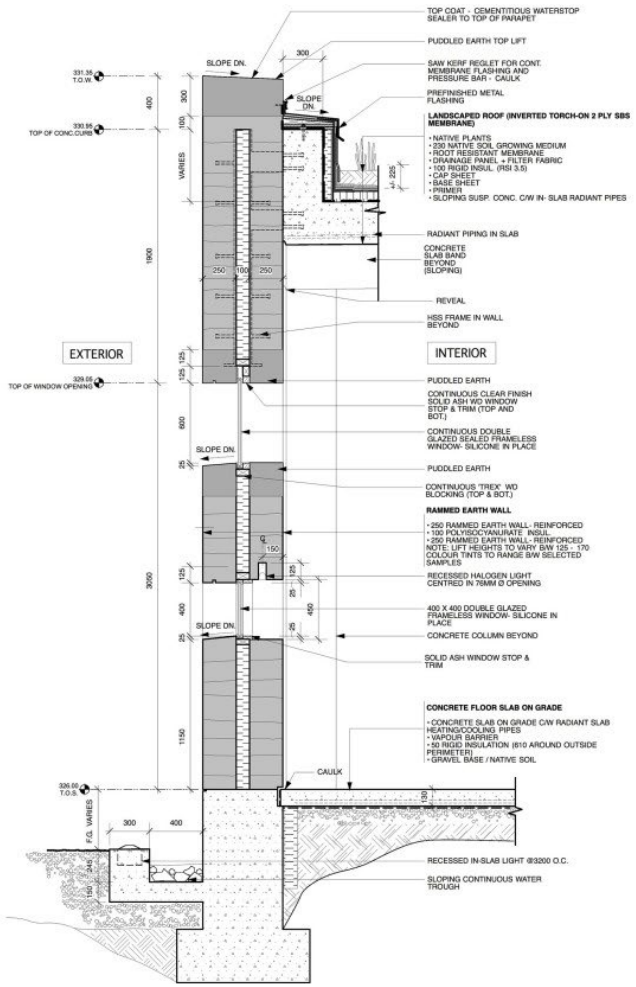


Figure 149. (right) **Retaining Barrier** - *recorded on site* (author, 2023)

Figure 152. (left) **Mine Tailings** - *localised material* (author, 2023)



Rammed Earth Wall

Figure 151. (left) **Nk'Mip Desert Cultural Centre** - *rammed earth* (Dialog, 2014 online)

E

6.1.2

Klockarebackens Chapel

Höör, Sweden / Bernt Nyberg, 1972

Figure 153.
Klockarebackens Funeral Chapel in Höör
(Hall, 2022: online)

Figure 154.
Klockarebackens Funeral Chapel in Höör
(Hall, 2022: online)

Nyberg's Klockarebackens Funeral Chapel in Höör is one of the few remaining buildings of Nyberg's body of work that is still relatively intact, and which exhibits an exacting quality that shows unique technical and aesthetic prowess, as well as a precise exercise in balance of geometry and material (Hall 2022, online).

Form and Function

A simple conceptual approach with clear geometry that houses two roof structures - one enveloped within the main mass and the second free in the landscape, both inscribed within two squares. These moments are linked through a series of formal and material thresholds and sequences whilst gracefully accommodating a working funeral home and flexible worship space above (2022, online).

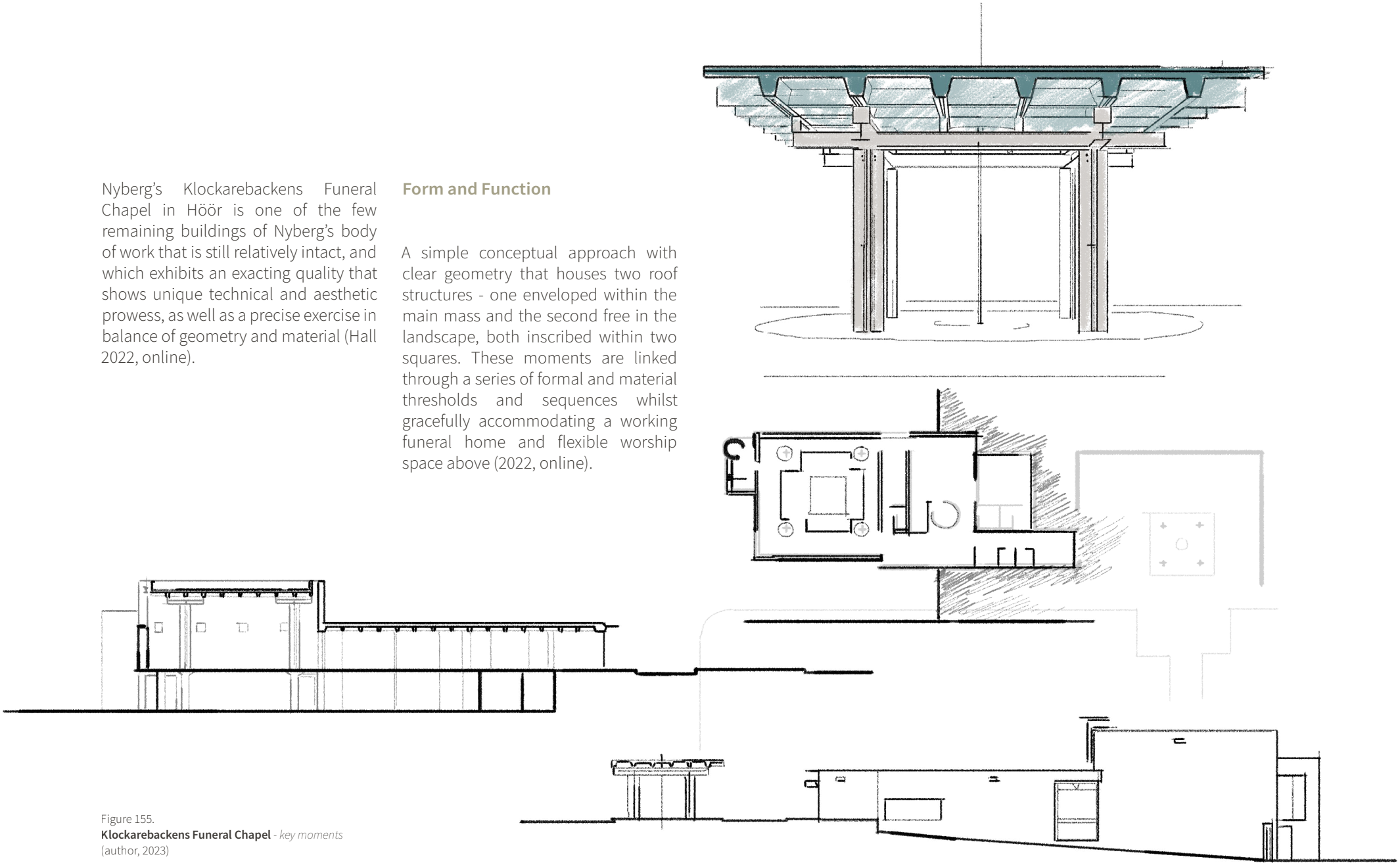
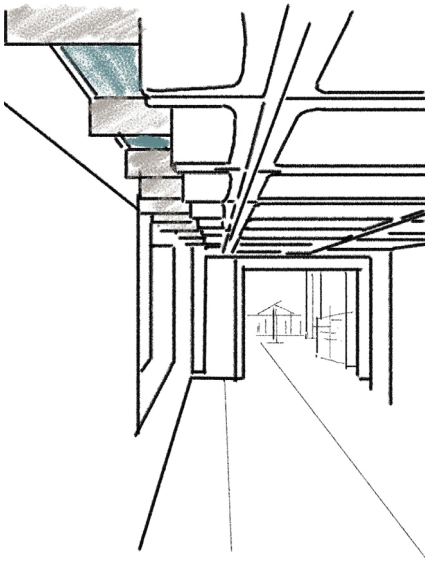


Figure 155.
Klockarebackens Funeral Chapel - *key moments*
(author, 2023)

Structural System

The two roof structures are comprised of coffered slabs supported by pillars of weathering steel angles bolted together in a cruciform pattern which each respectively blossom in four directions before meeting the slab. With precision, the same thin steel plates that connect the brick shell and roof slab, holding it in place, serve to isolate and exaggerate a reveal between the column capitals and coffer slab they support. The two radically contrasting systems of the brick enclosure and structural coffer slab, meet at impossibly thin steel plates. In keeping with Nyberg's attitude towards making the most of a joint, the gap created by this meeting holds a dense concentration of evocative detailing – thus making the most of the reveal (2022, online).



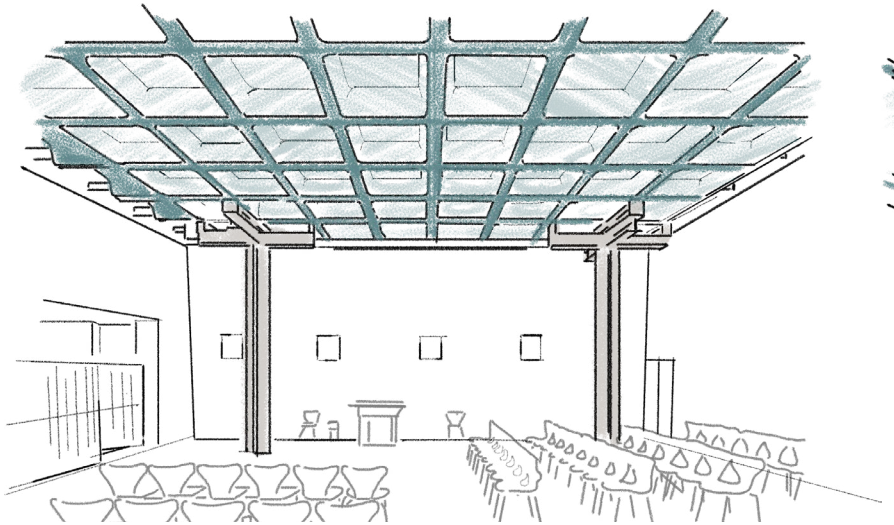
Utility and Space Enhancement

No matter how dull the Swedish winter gets, the atmospheric design in the Chapel remains bright. The interior lighting embed within the slab's coffers contrast the cool temperate daylighting that filters through the steel plated spines in the gap between the structure and enclosure. Akin to the Development, every detail of the chapel is about making the most of the reveal. The manor in which the sun's movement traces the raw surface of the brick enclosure, creates extreme contrasts of daylighting conditions, its subtleties somewhat glacial in pace (2022, online).

Learnings

Unique technical and aesthetic prowess - stereotomic meets tectonic structuring.
Making the most of the joint and artfully addressing the way contrasting materials come together and connect to service an atmospheric design which is multi-sensory and enhances the user's experience.

Two-way structural coffer slab with supports - the use of a coffer slab with weathered steel pillars that allow for uninterrupted and flexible spaces beneath.



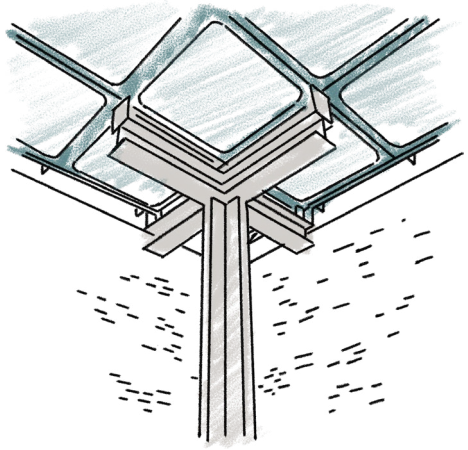
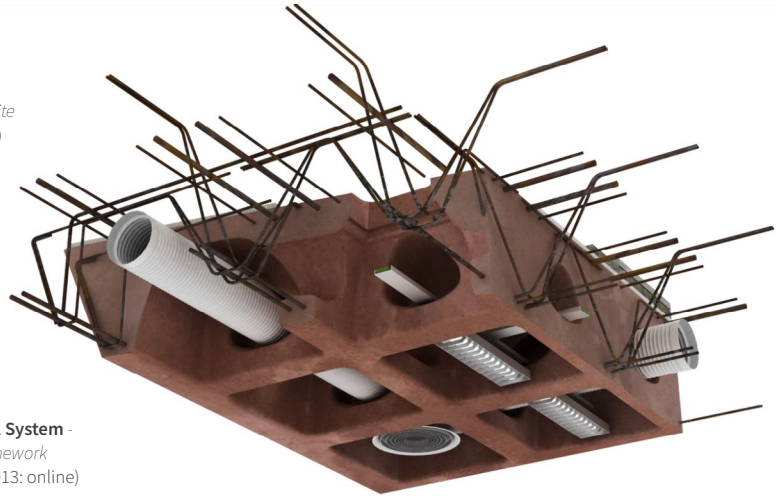


Figure 156.
Klockarebackens Funeral Chapel - *key moments*
(author, 2023)

Structural Holedeck Slab

(left)
Errosion -
recorded on site
(author, 2023)



(left)
Bidirectional System -
standard framework
(Holedeck, 2013: online)

Figure 158. (right)
Holedeck Cross-section -
constitution of Holedeck
(Holedeck, 2013: online)

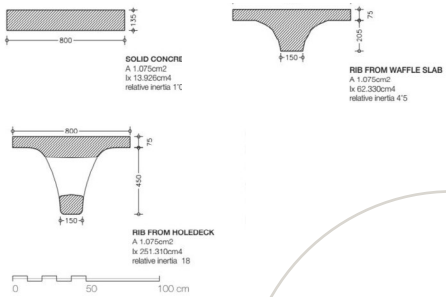
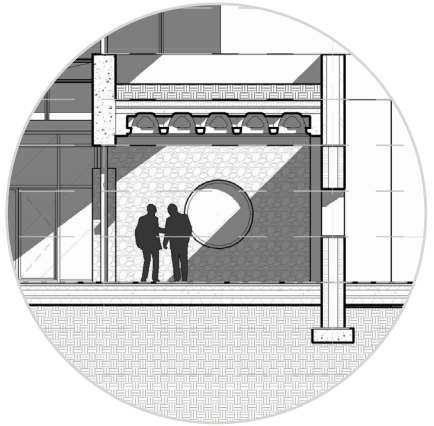
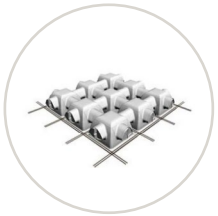


Figure 157. (below)
Holedeck Slab -
process of Holedeck
(Holedeck,n.d.: online)

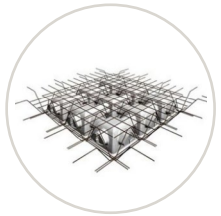
Figure 159. (right)
Canteen - *proposed Holedeck slab*
(author, 2023)



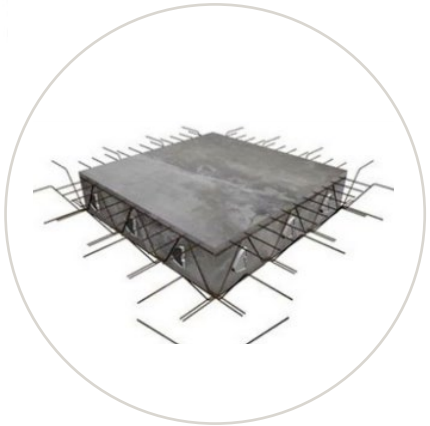
1



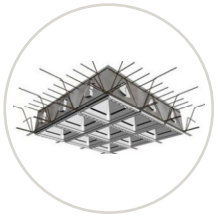
2



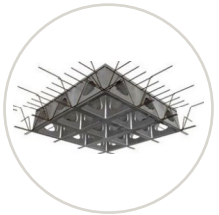
3



4



5



4

4

E

6.1.3

Central Library TU Delft

Delft, Netherlands / Mecanoo Architects, 1989

Figure 160.
TU Delft Central Library in Delf
(Mecanoo architecten, n.d.: online)

Figure 161.
TU Delft Central Library in Delf
(Mecanoo architecten, n.d.: online)

Building Requirements

Completed in 1989, the Central Library at TU Delft, designed by Mecanoo Architects (Mecanoo Architecten n.d.) was needed by the university to breathe atmosphere into campus where students and staff could meet informally amidst nature (Mecanoo Architecten n.d.).

Structural System

The mass of the planted roof is supported by slender steel columns in a large hall enclosed with canted, fully glazed walls. The cone – almost 30 metres in diameter at its base (van Leeuwen 2017, online) and which emerges from grade - is articulated from a 1500 mm apex. The cone is supported by six slender steel rods which extend down to ground level (Mecanoo Architecten n.d., online) and which support the four levels of concrete floor which host the tiered study areas. However, the cone is only supported at its perimeter, enabling a vast column free space at ground floor level (2017, online).

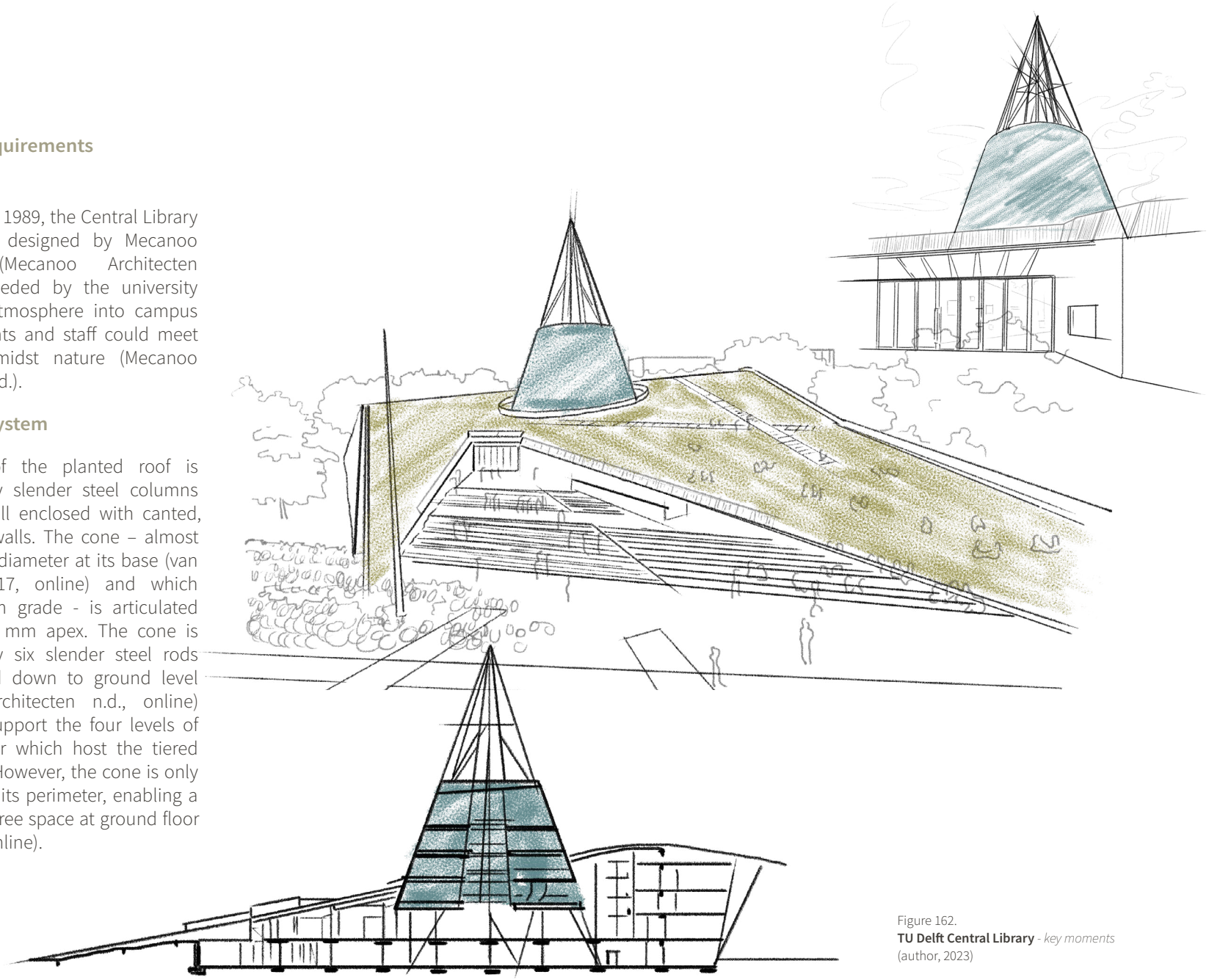
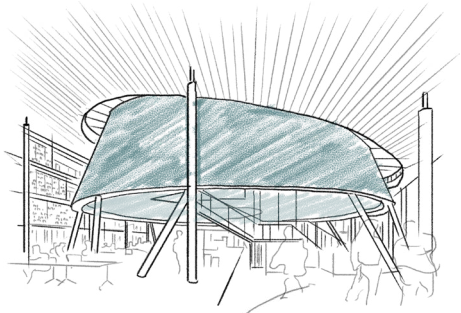
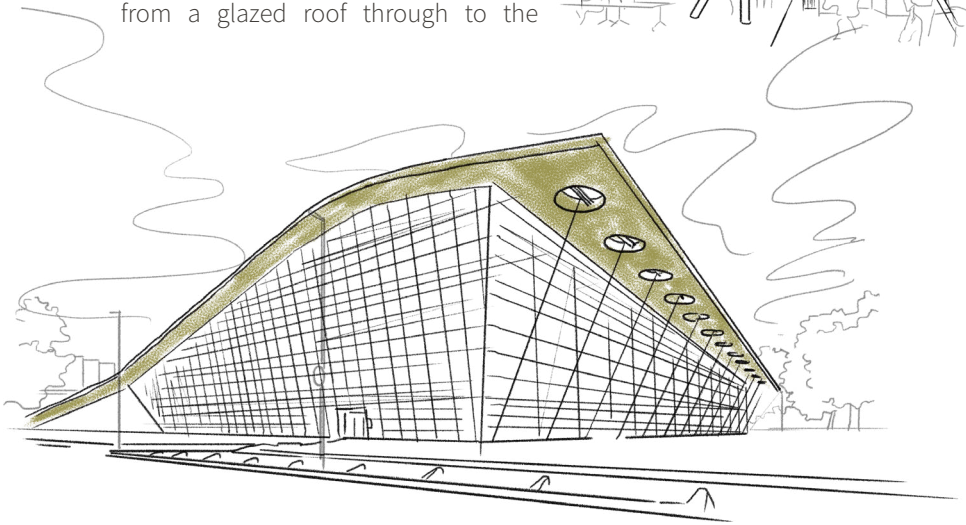


Figure 162.
TU Delft Central Library - *key moments*
(author, 2023)

Form and Function

The library comprises of two main components – the first being a vast lawn-that can be walked upon - lifted on one edge like a sheet of paper, shaping the roofscape of the library's new addition. The grass roof is freely accessible and creates a new and exciting amenity for the whole campus. The second component, almost completely isolated from the rest of the library's structure is a large conical structure which pierces the green expanse and is adorned with glazing in the plane of the roof. The cone houses four levels of study spaces connected by a helical stairwell. A central void down the centre of the cone provides daylighting from a glazed roof through to the internal reading spaces. Extending forty metres above grade, the cone acts as a beacon on the campus throughout the day and night. The rich light that floods into the heart of the building through the numerous layers of glass helps to activate the vast interior space (Mecanoo Architecten n.d., online).





Building Services

The façades, which play a crucial part in the environmental strategy of the building, consist of an outer double-glazed unit, a 140mm wide ventilated air cavity, and an inner leaf composed of toughened glass. Air is supplied into this cavity from the various floor levels and later siphoned out of windows higher up on each floor. To prevent unnecessary disruption of the air flow within this cavity, the windows incorporated into the façade are kept small. The building is less susceptible to variations in temperature due to the density of the planted roofs mass which provides the building with significant insulating properties as well as excellent soundproofing, and gradual evaporative cooling held by the vegetation (Mecanoo Architecten n.d.). This is especially applicable to the Development where climatic and programmatic needs require it. The library also harnesses ground water cooling and heating which is stored in a layer of sand roughly 70 metres below grade.

Figure 163.
TU Delft Central Library - *key moments*
(author, 2023)

Learnings

Unique technical and aesthetic prowess – stereotomic meets tectonic structuring. Making the most of the joint and artfully addressing the way contrasting materials or structures come together and connect to service an atmospheric design which is multi-sensory and enhances the user's experience.

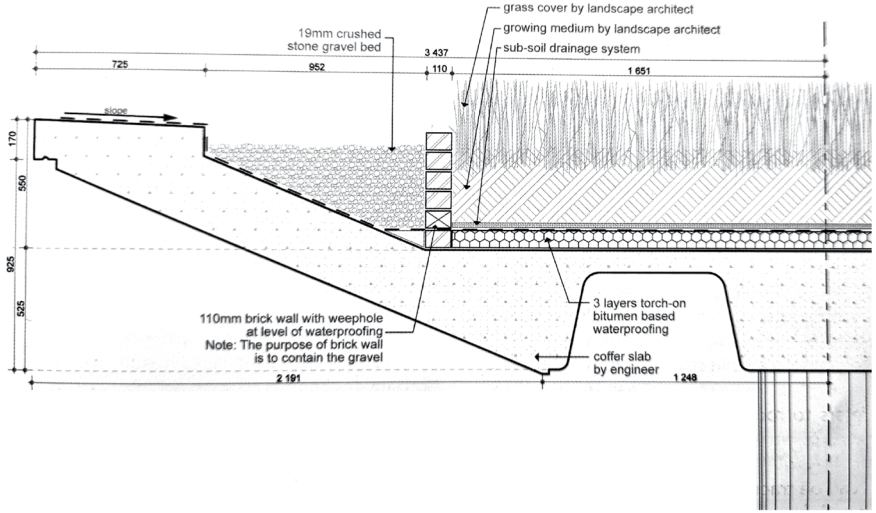
Hierarchy of form - using alternating heights applied to form to serve as a beacon to the site and provide internal spaces with natural lighting that floods in from above.

Incorporate passive design strategies - (1) The use of earth sheltering provides the building(s) with insultation, soundproofing and evaporative cooling. (2) The use of a passive and active double skin façade system with small outlets and solar shading to assist with temperature fluctuations and the avoidance of unnecessary energy consumption for heating and cooling.

Enable vast uninterrupted spaces - using alternating heights applied to form to serve as a beacon to the site and provide internal spaces with natural light.

Figure 164. (below)
Intensive Planted Roof -
substrate depth exceeds 300mm.
(Holm Jordaan Architects, 2022: 295)

Earth Sheltering



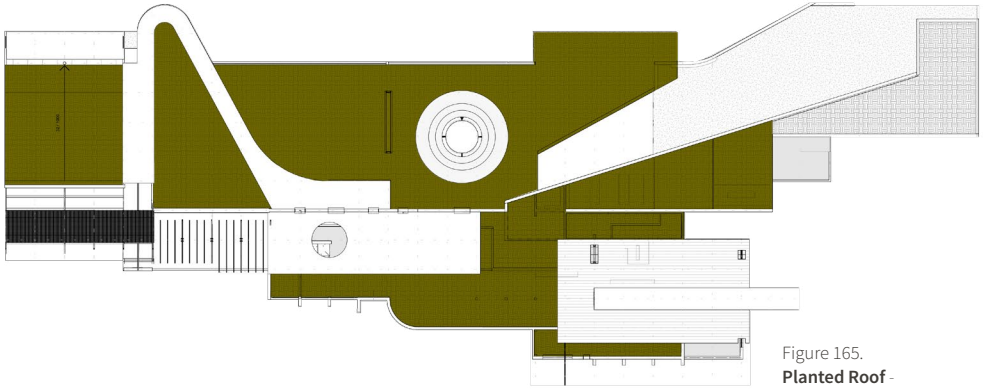


Figure 165.
Planted Roof -
Development's roposed roof
(author, 2023)

1 2

Figure 166. **Plant Species** - *recorded on site* (author, 2023)

6.2 Aquaculture

6.2.1 culture and growing

General Layout

A marine molluscs/fish hatchery is a complex system consisting of various units like:

+ seawater intake,
+ water treatment and storage
+ broodstock holding
+ live feed culture facilities
+ breeding & larval rearing facilities
+ nursery rearing facilities
+ laboratories
+ feed & chemical storage
+ aeration facilities
+ wastewater treatment & disposal facilities
+ workshops, and
+ staff facilities

Therefore, the proper design will lead to convenience, ease of use, effective use of the full production capacity, hygienic working conditions, cost-effectiveness, and biosecurity (Jayakumar and Abdul Nazar, n.d.: 53). Furthermore, biosecurity is critical, and risks are high, which could jeopardise the entire operation if not implemented correctly (Anchor Environment, 2018: 15).

While designing the hatchery, positioning of various units at suitable places plays an important role in the easy and economic operation of the hatchery. The need to avoid noise and vibration, as well as the entry of unauthorized persons and visitors into certain bio-secured areas, is paramount (Jayakumar and Abdul Nazar, n.d.: 53).

In essence, due to the sensitivity regarding such operations, every section of the hatchery should have a separate entry to avoid cross-contamination from one section to another, as well as proper fencing/ compound wall around the whole hatchery to avoid unauthorized entries (Jayakumar and Abdul Nazar, n.d.: 62).

To ensure fast, efficient, and reliable year-round reproductive conditioning and spawning, the stock must be maintained with minimal stress and within their respective narrow temperature ranges. Therefore most units within the hatchery require controlled temperature-conditioning facilities and an uninterrupted supply of near-oceanic quality seawater (Heasman, M and Savva, N, 2007: 31).

Aquaculture Hatchery

Example facility layout

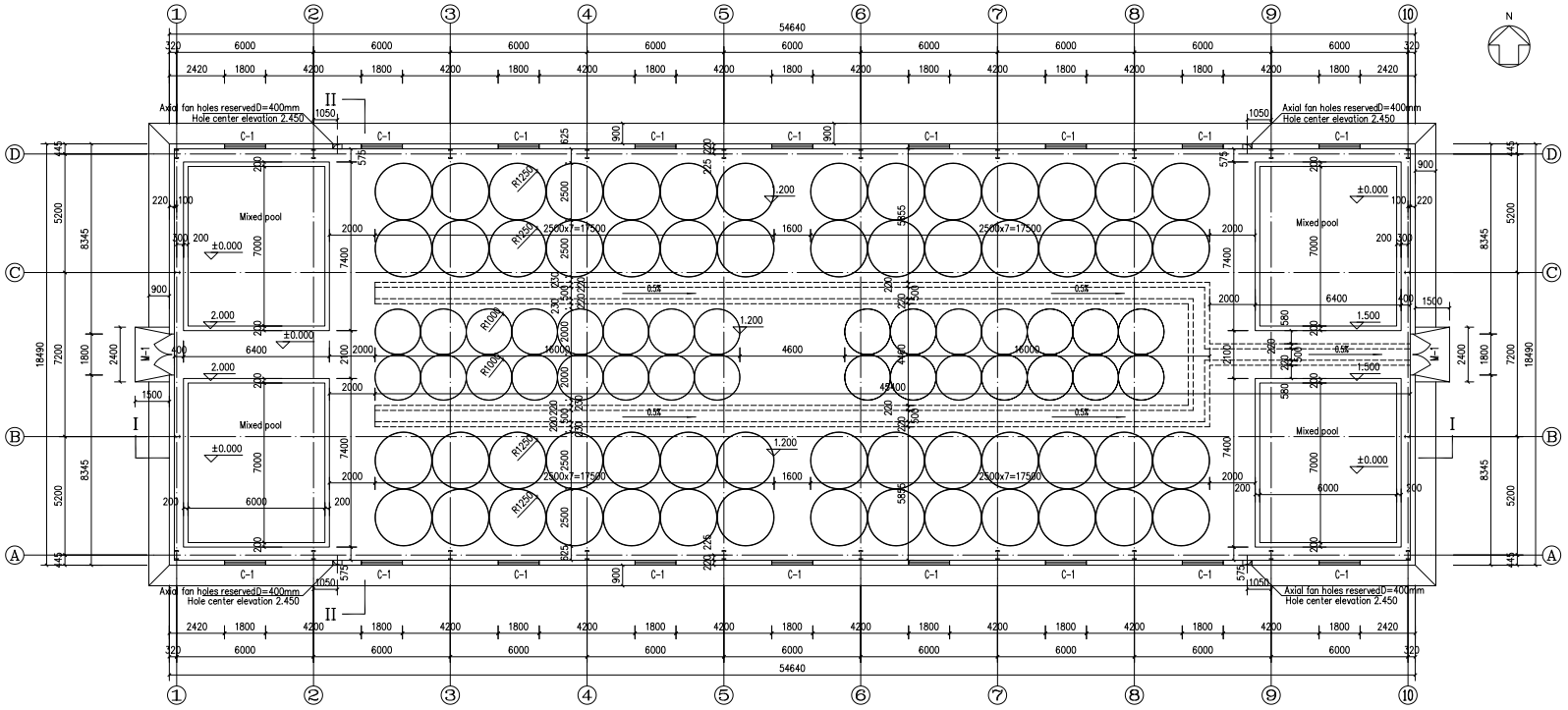
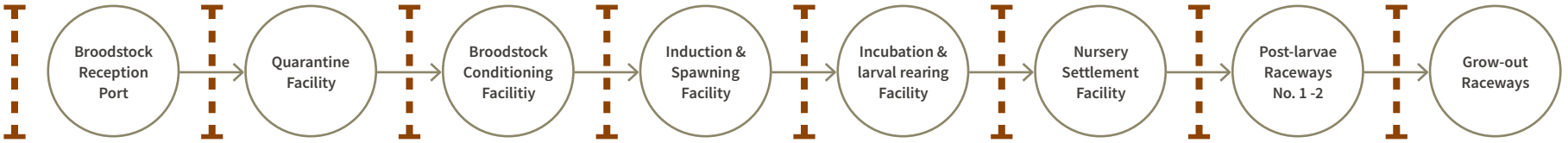


Figure 167. *A-typical example of an aquacultural hatchery facility* (Grobler, 2023: correspondence)

Abalone - Growing/Culture
Facility Requirements



Delivery zone

Reception port (covered)

Storage & cleaning *(capturing cages)*

Wash-in station *(employees)*

Culling trough – *produce disposal*

Quarantine Tanks *(supplied w/ ambient filtered seawater, s*hade-cloth w/ *daytime shelter)*

Feed sorting & storage *(micro-algae, red/brown seaweed (kelp), Abfeed)*

Broodstock cleaning station *(running seawater) w/ storage (salt & wire brush)*

Assessing area – *marked, measure, weigh, sexed*

Office *(receive and record-keeping)*

Storage & cleaning *(2 weekly & ourge)*

Wash-in station *(employees)*

Assessment station

2 Independent Conditioning Units (ref. 2007: 82)

Feed sorting & storage *(feed broodstock a conditioning diet)*

Office *(receive and record-keeping)*

Plant room *(stand-by generator)*

Storage & cleaning *(chemicals, sterilising supplies)*

Wash-in station *(employees)*

Spawning-incubation Room *(shelves, storage, disposal shoot, buckets, washing, desk/office)*

Office *(receive and record-keeping)*

Storage & cleaning *(chemicals, sterilising supplies)*

Wash-in station *(employees)*

Spawning-incubation Room *(larvae-rearing container, storage, disposal shoot, buckets, washing, desk)*

Office *(receive and record-keeping)*

Storage & cleaning *(chemicals, sterilising supplies)*

Wash-in station *(employees)*

Wash-in station *(equipment)*

Assessing area – *record & track tag numbers*

Settlement Tanks *(shaded & non-shaded tanks & areas)*

Wash-in station *(employees)*

First nursery raceway *(1-5mm, 5-months)*

Second nursery raceway *(5-15mm, 3-months)*

Feed sorting & storage *(feed broodstock a conditioning diet)*

Wash-in station *(employees)*

First nursery raceway *(1-5mm, 5-months)*

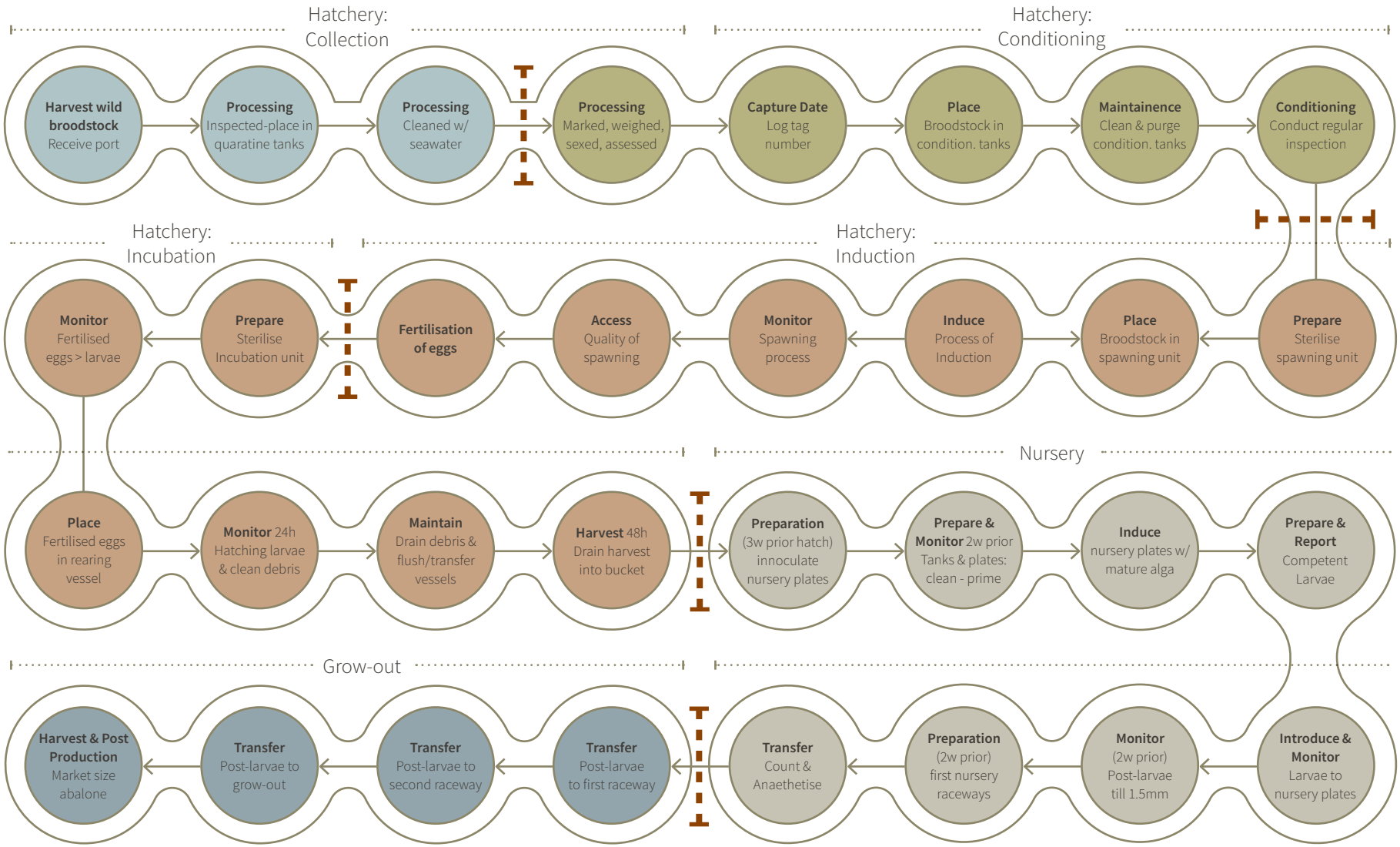
Second nursery raceway *(5-15mm, 3-months)*

Feed sorting & storage *(feed broodstock a conditioning diet)*

Grow-out tanks *(80-90mm, 3-5 years)*

Abalone - Growing/Culture

Reception of Broodstock to Transportation



Fin Fish - Growing/Culture
Facility Requirements

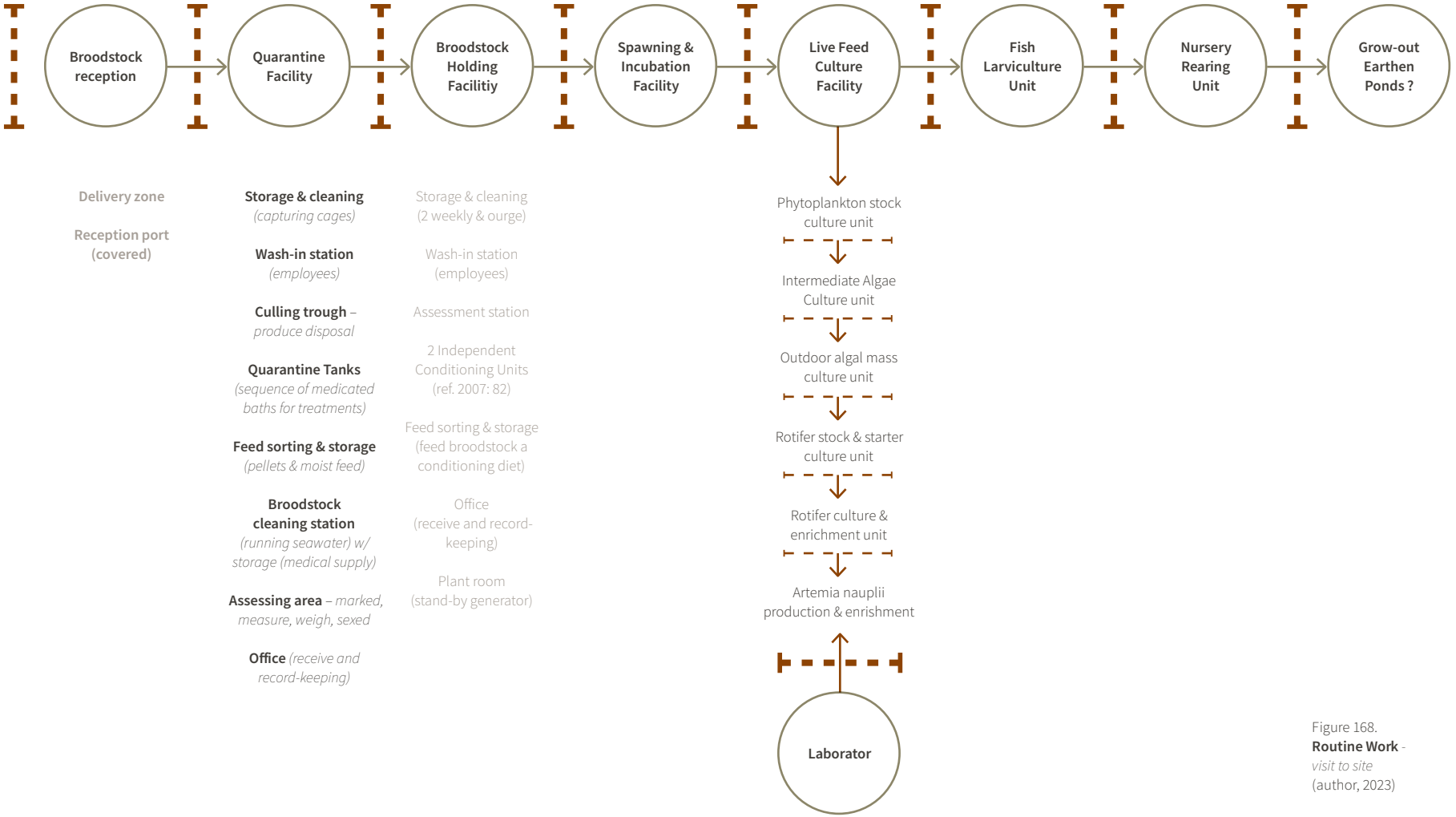


Figure 168.
Routine Work -
visit to site
(author, 2023)


KELP ONLY

Aquaculture - Growing/Culture
Design prompts

Floors and Walls

Due to the high-risk factors pertaining to Aquaculture, and the need for strict hygiene and controlled temperature conditioning, the hatchery's floors and walls need to be:

+ Walls must be structurally sound and functionally finished. Wall protection, for example, may be necessary to avoid trolley damage, or splashbacks may be required behind sinks and hand-washing basins.
+ The surfaces of the walls and flooring must be, continuous and in some instances, smooth. This may need the use of coving, which involves introducing curved edges.
+ Simple to clean, sterile, and resistant to regular application of chemical disinfectants (Heasman, M and Savva, N, 2007: 36).
+ Floor drains should be provided throughout the hatchery for regular hosing of facilities and equipment, as well as full-drain downs, water change and cleaning of holding tanks to remove detritus and surface biofilms (2007: 83). Drains must have grills or water traps to keep insects, rats, and other pests out.

Lighting controls

Each unit within the hatchery requires specific lighting conditions – whether it is full shading, rooms with controlled temperatures with light and dark cycles, or adequate natural lighting to induce photosynthetic processes for algae cultures and nursery diatom plates – the solutions can be simple yet functionally practical.

The following listed are but some measures to consider in order that such requirements are accounted for:

+ Adequately insultated materials of specific zones within the hatchery to maintain controlled temperature-conditioned facilities due to the narrow temperature ranges required within each unit.
+ Separate the various units to avoid high and/or variable light intensities, and adhere to strict lighting requirements, ensuring sufficient lighting arrangements are provided for where needed either through transparent roofing, daytime sheltering, shade-cloth, or more controllable settings such as operable light vents or more artificial light sources.

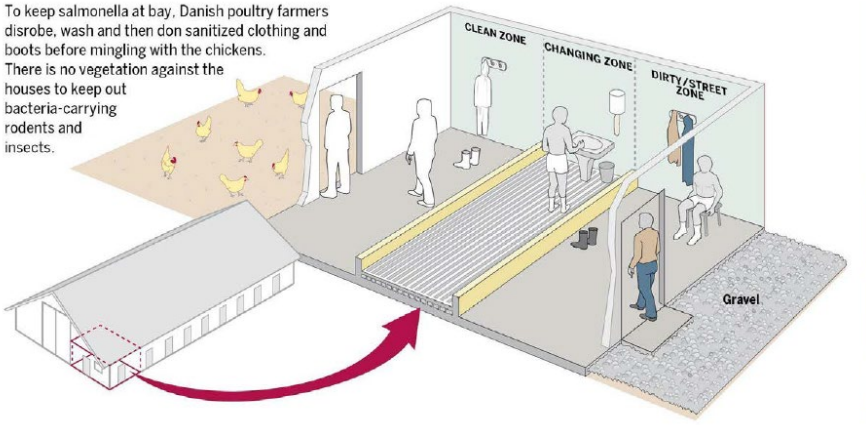
Bio-security

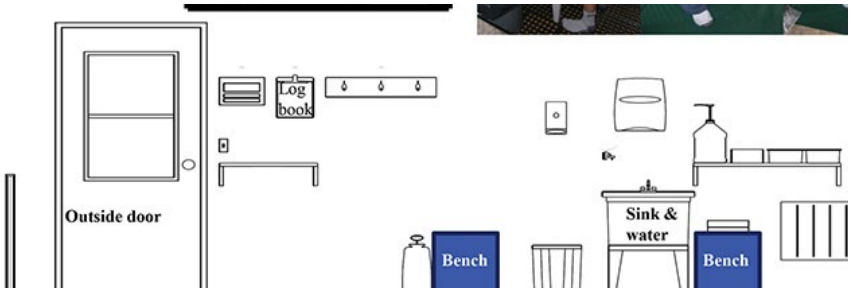
A marine fish/molluscs hatchery is a complex system consisting of various units like seawater intake, water treatment and storage, broodstock holding, live feed culture facilities, a larviculture unit, nursery rearing, laboratories, feed and chemical storage, aeration facilities, wastewater treatment and disposal, as well as workshops and staff facilities.

Therefore, the proper design will lead to convenience, ease of use, effective use of the full production capacity, hygienic working conditions, cost-effectiveness, and biosecurity (Jayakumar and Abdul Nazar, n.d.: 53). Furthermore, biosecurity is critical, and risks are high, which could jeopardise the entire operation if not implemented correctly (Anchor Environment, 2018: 15).

While designing the hatchery, positioning of various units at suitable places plays an important role in the easy and economic operation of the hatchery. The need to avoid noise and vibration, as well as the entry of unauthorized persons and visitors into certain bio-secured areas, is paramount (Jayakumar and Abdul Nazar, n.d.: 53).

In essence, due to the sensitivity regarding such operations, every section of the hatchery should have a separate entry to avoid cross-contamination from one section to another, as well as proper fencing/ compound wall around the whole hatchery to avoid unauthorized entries (Jayakumar and Abdul Nazar, n.d.: 62).





6.5 Systems
6.5.1
Biosecurity Regulations

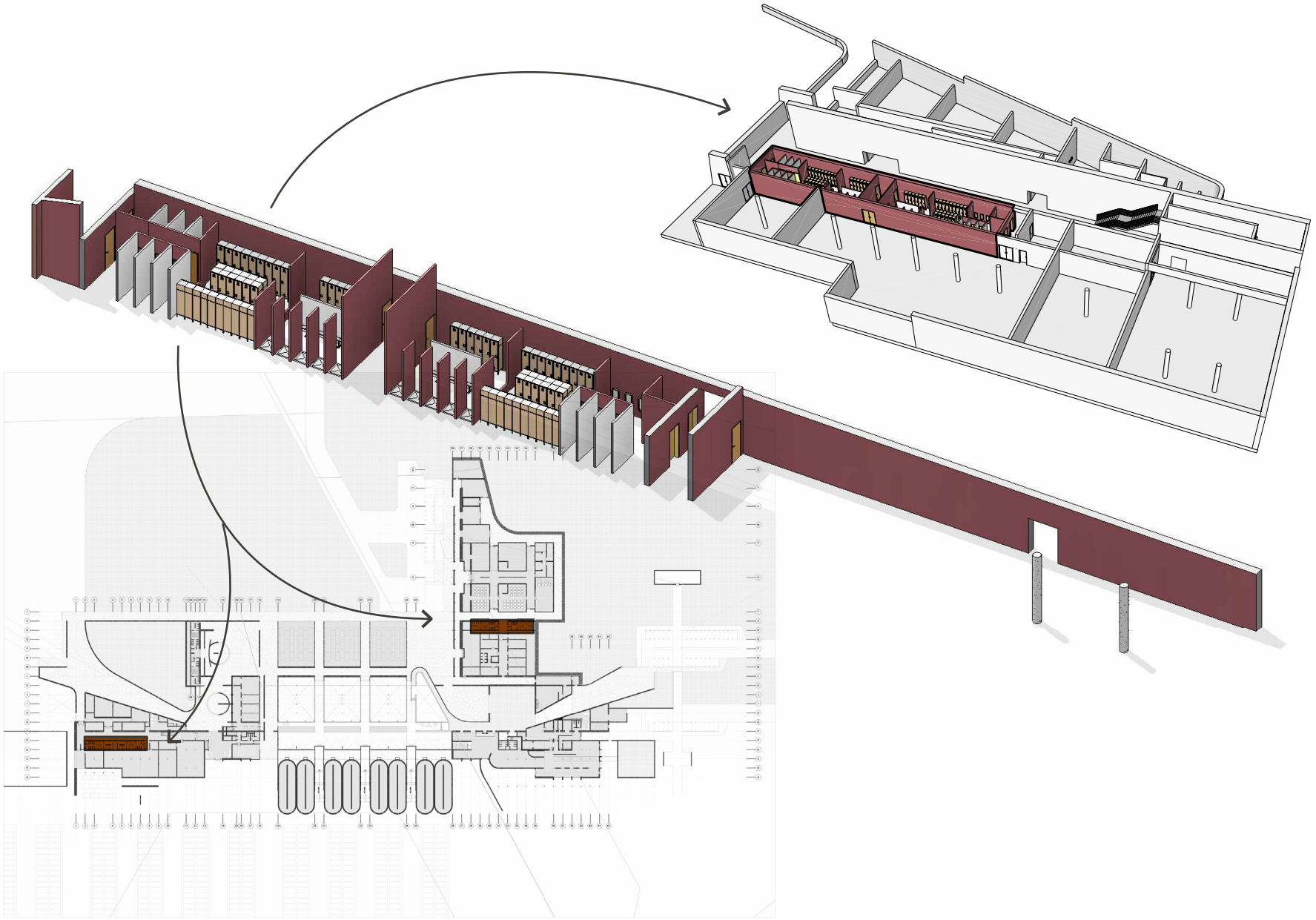
Biosecurity is a key management tool and an essential part of any successful aquacultural production system: it can be defined as the planning and implementation of a set of measures to protect stock against the introduction of unwanted organisms through cross-contamination of either other species or the access of unauthorized persons to the farming areas (Lera 2023, online).

Therefore, the implementation of all mitigation measures – including public awareness and control, and the comprehensive training of staff - to ensure biosecurity on the farm is essential (Massie, Hutchings and Clark 2018, 62, 65). The three aspects of biosecurity addressed in the Development's biosecurity proposal is the structural and operational (staff and visitors) measures, as well as the alternative production system selected which involves an Integrated multi-trophic aquaculture (IMTA) system that is partially recirculated. The RAS system, to be further unpacked, uses the by-products, including waste, from one aquatic species as inputs (fertilizers, food) for another (2018, 83).

Due to stringent biosecurity protocols essential to a working aquaculture farm, the need to control, separate and limit access to certain spheres is needed. This requirement ties in with the first theme of the Life-wind of People (Ref. Chapter 3 – Theoretical Essay: Life-wind of People) which looks at architectural atmospheres and the notion of strategically produced, designed, and staged spheres within the spatial configurations of a postindustrial site. Since the Development is to a degree a type of demonstration farm, the design attempts to integrate the visitors route with certain stages of the farm without them intersecting. The subtle form of atmospheric power is exacted through Sloterdijk's spherical concept of 'co-isolated associations' called Bubbles. That although the two spheres are related in certain ways, are considered, and strategically made to not overlap (Böhme, et al. 2014, 66), but remain as connected isolations.

Since people are the most common animate factor involved in disease transmission, the farm must have single or controlled access and be equipped with a properly designed changing rooms for farm employees. Following the concept of "dirty zone" and "clean zone", a physical barrier must clearly delimit the separation between both zones (Lera 2023, online). Changing rooms should be equipped with showers before entering the farm or critical zones.

It is particularly important that farm personnel should strictly comply with the established rules, and regularly wash and disinfect hands before starting daily work and during (2023, online). The provision of footbaths and stations for the regular cleaning and disinfection is provided regularly throughout the farm to reduce the number of cross-contaminants and ensure compliance is upheld.



6.5.2
Aquacultural System

Overview

As previously discussed, various alternative technologies were considered for the Development's production system, but findings showed that an Integrated multi-trophic aquaculture (IMTA) system was the better alternative to address biosecurity risks, mitigate high installation, and running costs (Massie, Hutchings and Clark 2018, 19). Using the by-products, including waste, from one aquatic species as inputs (fertilizers, food) for another, Diamond Coast Aquaculture (DCA) intend combining fed aquaculture (finfish and abalone) with inorganic extractive (seaweed) and organic extractive (oysters, sea cucumbers and sea urchins) aquaculture to create balanced systems for environmental remediation (biomitigation), economic stability and social acceptability (2018, 83).

IMTA System

Seawater is pumped (a) into the solar dams (b) where the water is heated to the appropriate temperature for abalone culture. The heated seawater is then pumped to the abalone (c) and seaweed clusters (d). The amount of water extracted from the solar dams depends on how much of this water is recirculated within the abalone-seaweed clusters. It is estimated that between 40 to 50 percent of the water is regularly recirculated, but can be pushed to 70 percent, if required. To mitigate bio risks, each abalone-seaweed cluster operates separately. At maximum of the proposed expansion, 50 percent of the effluent from the abalone-seaweed cluster is diverted to the finfish tanks (e). Seaweed tanks (f) connected to the finfish are fitted with screens to filter majority suspended solids in the effluent, which the sea cucumbers, sea urchins and flat fish remove as much of the remaining particles as possible. It is predicted that 100 percent of the remaining effluent is diverted via a new effluent pipeline into the final effluent stream (g), which is discharged into a cofferdam just north of the DCA development (2018, 166) either.

Water Treatment: Septic Tank and Trickle System Units

The current abalone farm includes one septic tank and trickling system unit with the capacity to process 6000 litres of sewage per day and which services approximately 50 staff currently working on the farm. The expansion to 300 staff thus requires two additional septic tank and trickling filter system units to accommodate this increase. Situated east of the main farming area, precisely 1040m from the high-water mark, the units will occasionally need to be partially emptied of solids by means of a vacuum truck and disposed of at the Kleinzee Sewage Works (2018, 166).

Water Treatment
Septic and Trickling Filter System

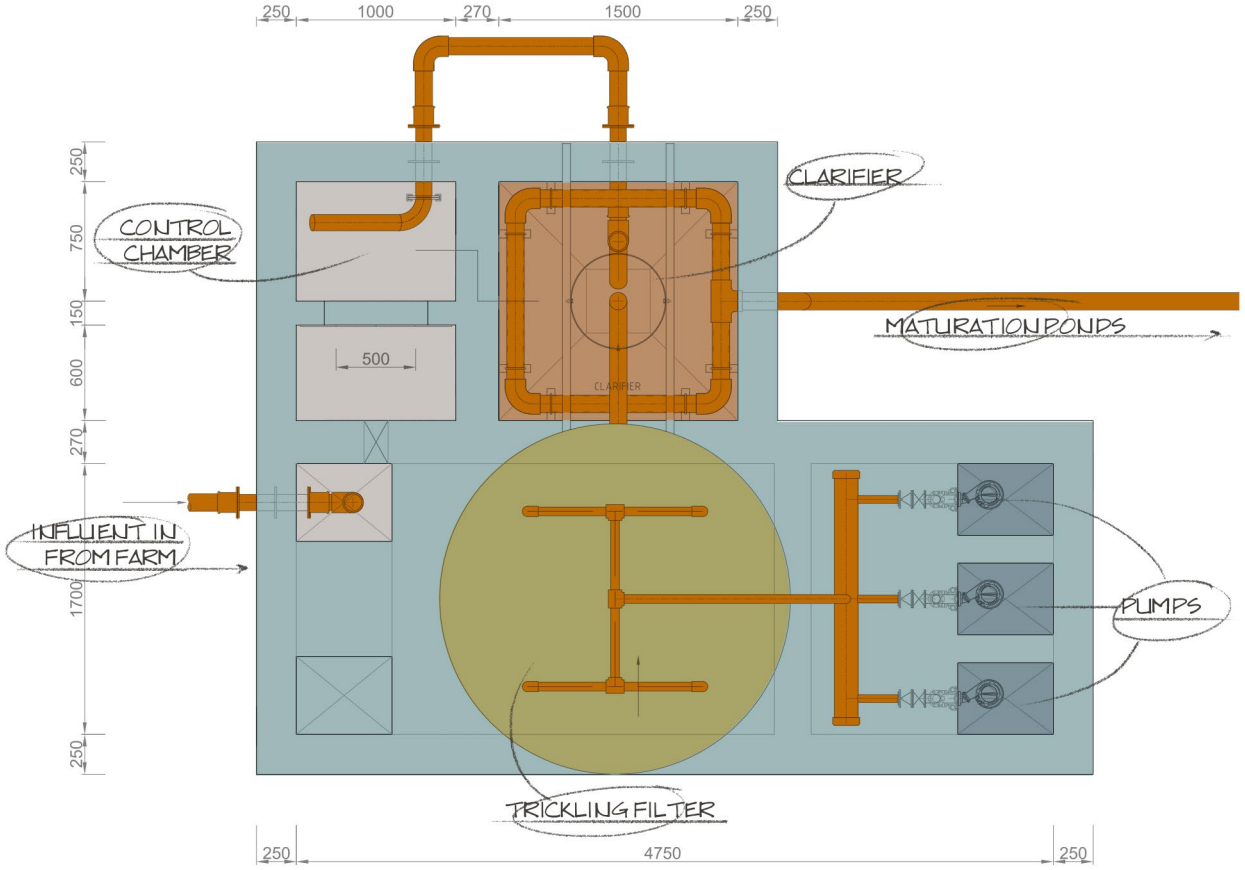


Figure 169. Water treatment system proposed in cludes a septic and trickling filter system (Massie, et. al., 2018: 140, adapted by author)

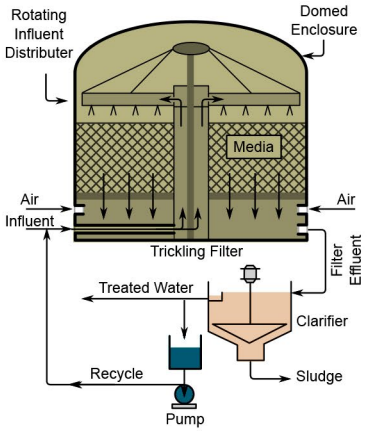


Figure 170.
Trickling filter system
(Wikipedia, 2023: online)

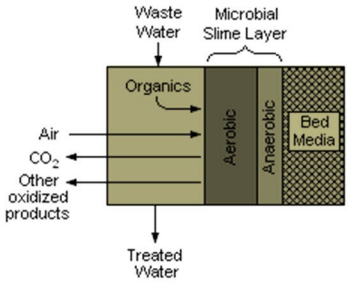


Figure 171.
Trickling filter system - cross section
(Wikipedia, 2023: online

Integrated Multi-trophic Aquaculture (IMTA) System (Source)

The adjacent systems schematic is based on expert field observations and desk-top analysis executed by professional environmental assessment practitioners - Anchor Environmental Consultants (Pty) Ltd. Based on their findings, it was revealed that the an Integrated Multi-trophic Aquacultural (IMTA) System was the better alternative to address biosecurity risks, mitigate high installation, and running costs (Massie, Hutchings and Clark 2018, 19).

These findings subsequently informed the overall schematic of the proposed Development.

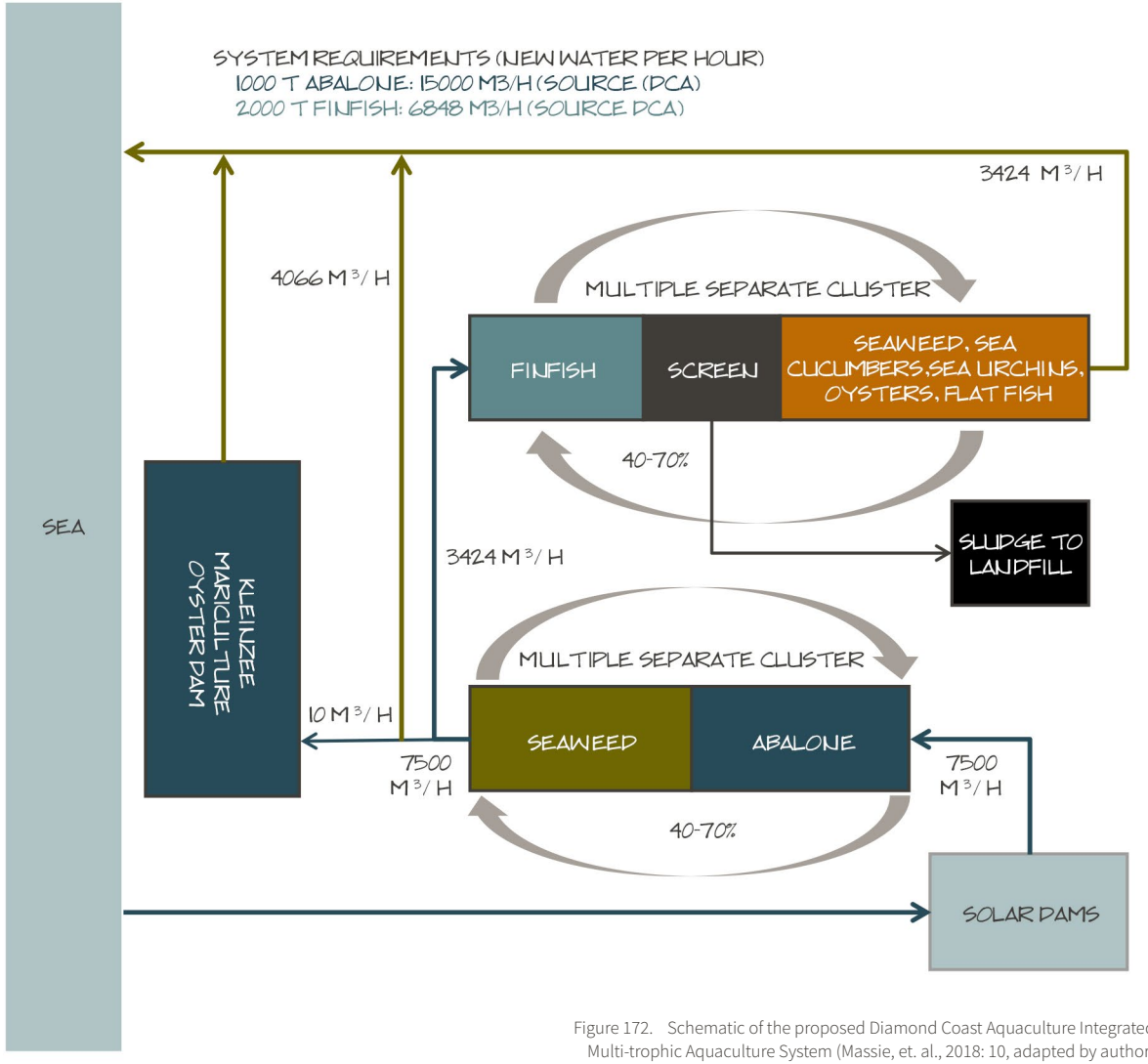
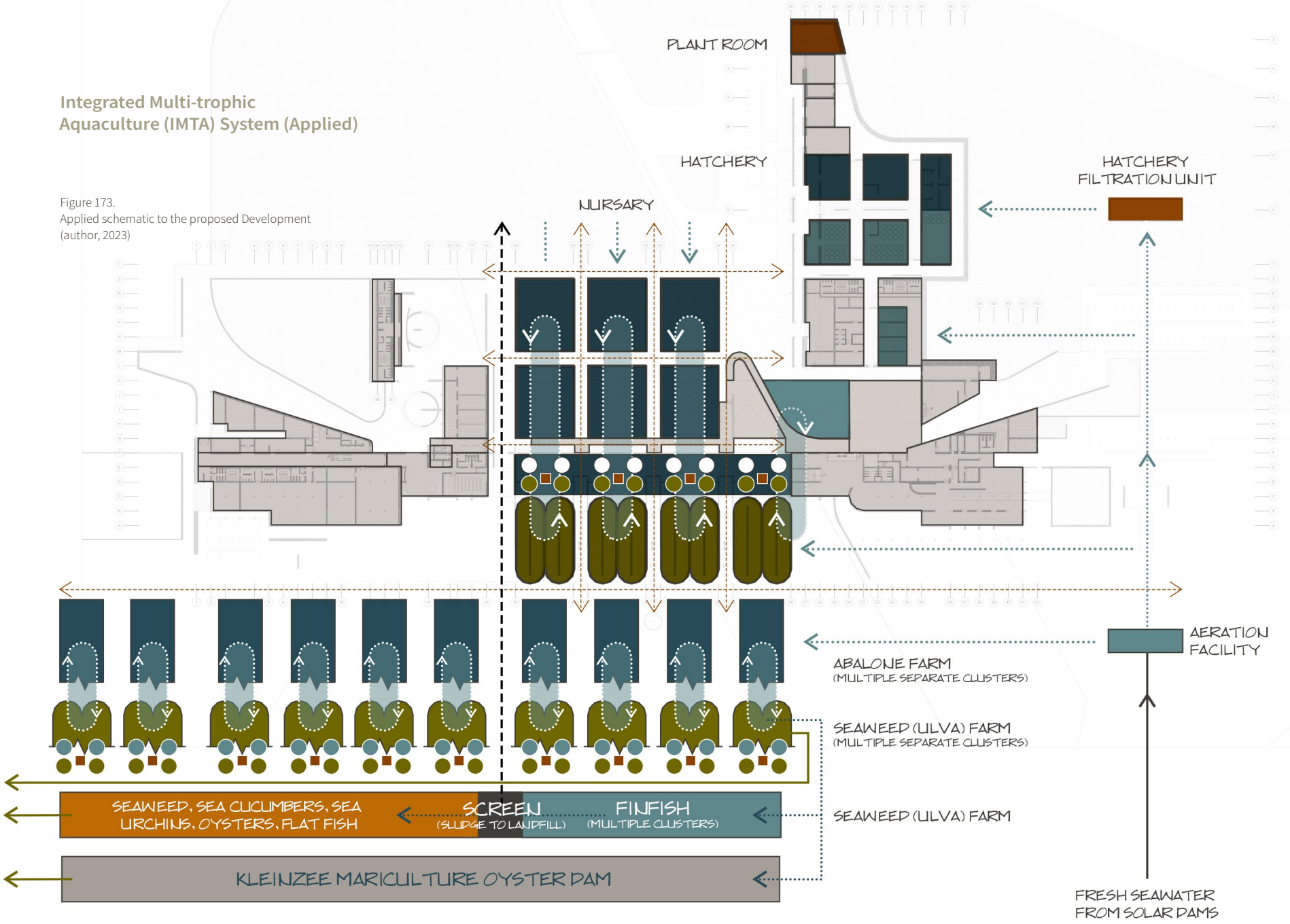
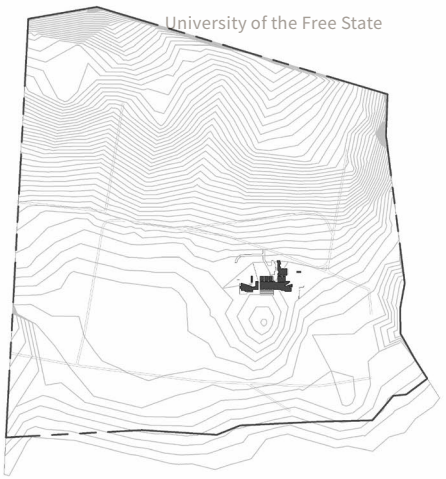


Figure 172. Schematic of the proposed Diamond Coast Aquaculture Integrated Multi-trophic Aquaculture System (Massie, et. al., 2018: 10, adapted by author)

Integrated Multi-trophic Aquaculture (IMTA) System (Applied)

Figure 173.
Applied schematic to the proposed Development (author, 2023)





12000
11000
10000
9000
8000
7000
6000

Single Entrance onto Farm 654

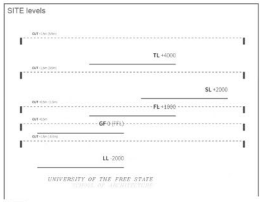
Hatchery (Grow)
Staff Courtyard
Abalone Nursary
Staff Courtyard
Hatchery (ancillary)
Visitor's Parking
Visitor'sEnt.
Staff Parking
Admin. Ent.
Farm 654 Portion 1
Proposed New Industrial Building
9998 m²
Production & Administration
Visitor's Centre
Public Terrace

Integrated Multitrophic Aquaculture Farm Area
(Exisiting - first four raceways and respective ulva baths)

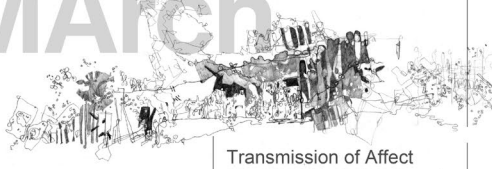
Solar Dam (Existing)
Solar Dam (new addition)
Solar Dam (new addition)

0 5 10 20 50 Metres
GRAPHIC SCALE 1:1000

SITE levels



MArch



Transmission of Affect

Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date	Scale	Drawn by
NOV '23	1 : 1000	JODIA STEENKAMP

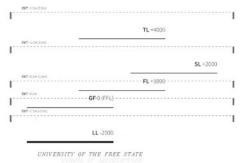
Project: TRANSMISSION OF AFFECT

Drawing: SITE PLAN

Drawing No.: CO

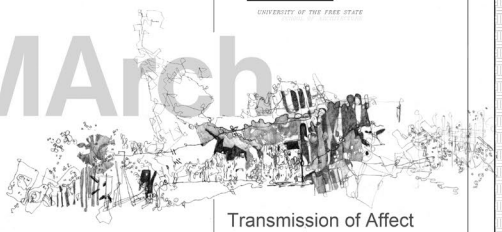
NOTES:

SITE levels



UNIVERSITY OF THE FREE STATE

MArch



Transmission of Affect

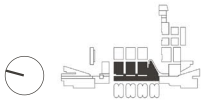
Aquaculture & Tourism Development

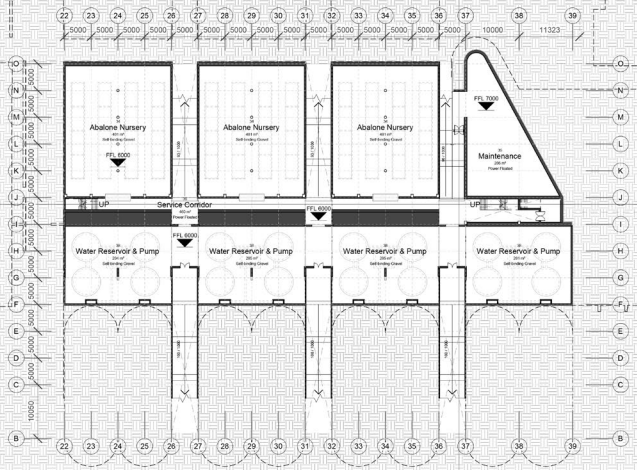
KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date	Scale	Drawn by
NOV '23	1:500	JODIA STEENKAMP

Project: TRANSMISSION OF AFFECT

Drawing: LOWER FLOOR PLAN — Drawing No.: C1

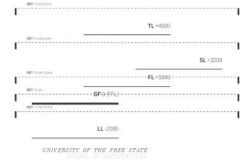




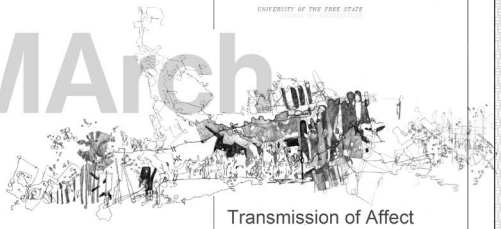
University of the Free State
School of Architecture

NOTES:

SITE levels



MArch



Transmission of Affect

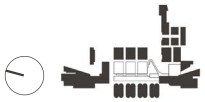
Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date	Scale	Drawn by
NOV '23	1:500	JODIA STEENKAMP

Project: TRANSMISSION OF AFFECT

Drawing: GROUND FLOOR PLAN — Drawing No. C2



Single Entrance onto Farm 654

Hatchery Ent.
Parking & Loading Area
(access controlled)

Plant Rm
Disposal Rm
Cold Store
Dry Store
Workshop
Service Corridor
Record Rm
Quarantine
Abalone Condition
Common
Induce / Incubate etc.
Fin Fish Condition
Induce / Incubate
Hatchery Conditioning Unit

Staff Courtyard
Abalone Nursery
Abalone Nursery
Abalone Nursery
Staff Courtyard

KITCH
Staff WC
Laboratory
Staff Room
Nursery Stor
Live Feed Stor
Live Feed
Live Feed
Live Feed

Visitor's Parking

Processing Facility Ent. (access controlled)

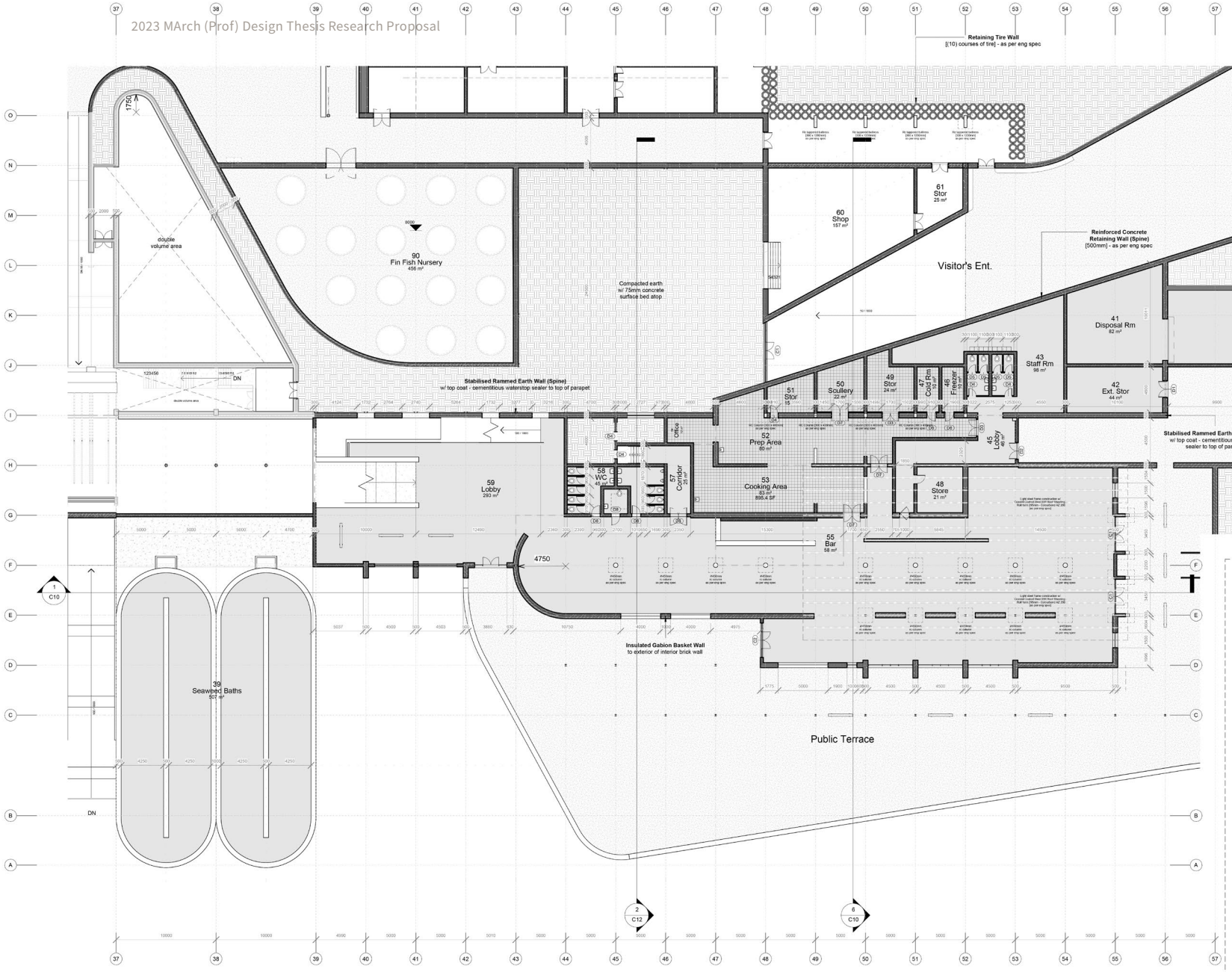
Open Office
Meet
Office
Laboratory
Passage
Dispatch
Staff Rm
Nursing Rm
Service Corridor
Admin. Ent.
Staff Rm
Reference Rm
Corridor
Laboratory
Laboratory
Lobby
WC
Reception Hall
Training Rm
WC
Stor
Packing Rm
Grading Rm
Main Processing Rm
Washing Rm
Storage
Sorting & Purging Courtyard

Fin Fish Nursery
Compacted earth w/ 75mm concrete surface bed atop
Shop
Stor
Visitor's Ent.
Staff Rm
Disposal Rm
Service Yard
Ext. Stor
Staff Parking
Sculllery
Stor
Stor
Office
Prep Area
Corridor
Cooking Area
Bar
Store
Lobby
WC
Public Terrace

Seawater Baths
Seawater Baths
Seawater Baths
Seawater Baths

Integrated Multitrophic Aquaculture Farm Area
(Exisiting - first four raceways and respective ulva baths)

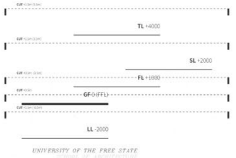
GRAPHIC SCALE 1:500



GRAPHIC SCALE 1:200

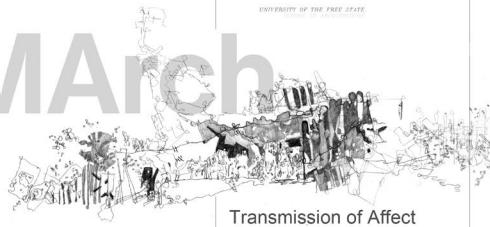
NOTES:

SITE levels



UNIVERSITY OF THE FREE STATE

MArch

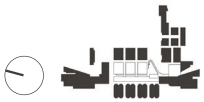


Transmission of Affect

Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date: NOV 23	Scale: 1:200	Drawn by: JODIA STEENKAMP
Project: TRANSMISSION OF AFFECT		
Drawing: GROUND FLOOR PLAN		Drawing No.: C6



University of the Free State
School of Architecture

NOTES:

SITE levels

MArch

Transmission of Affect

Aquaculture & Tourism Development

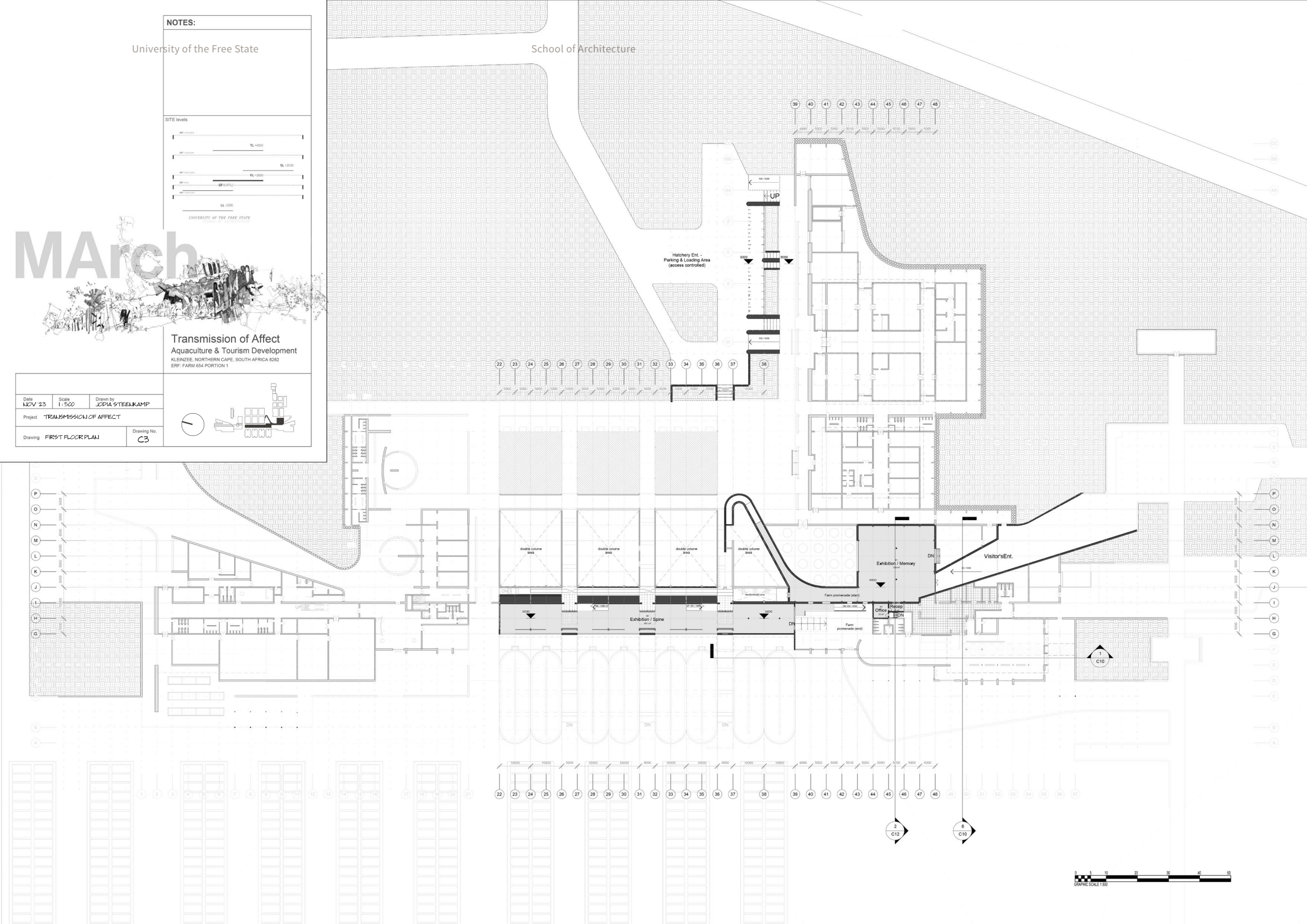
KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

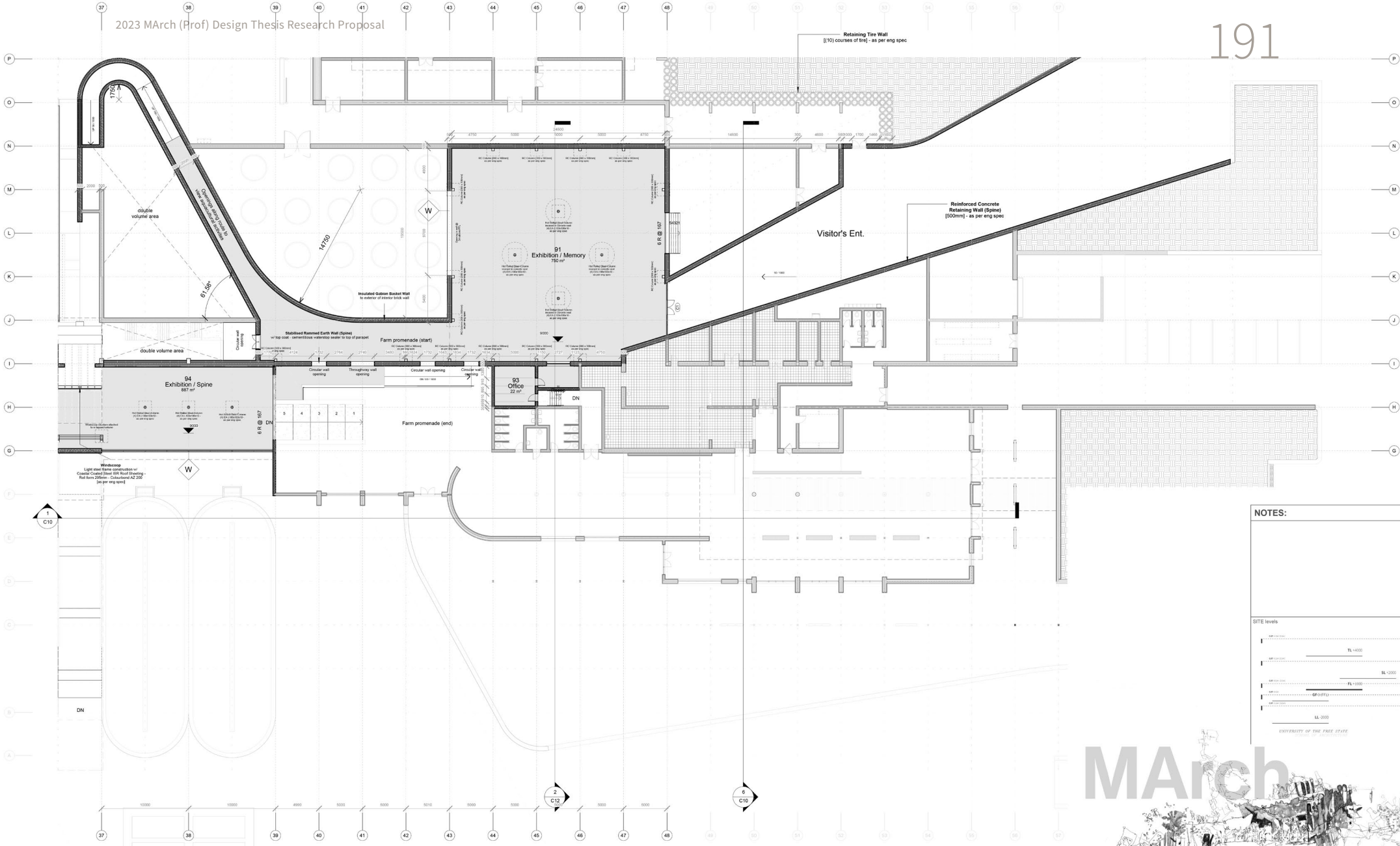
Date	Scale	Drawn by
NOV '23	1:500	JODIA STEENKAMP

Project: TRANSMISSION OF AFFECT

Drawing: FIRST FLOOR PLAN

Drawing No.: C3



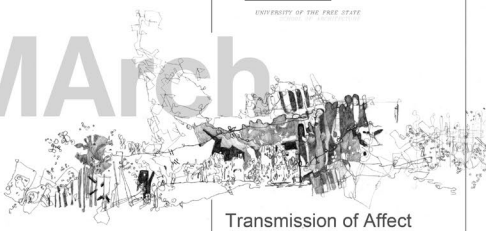


NOTES:

SITE levels

UNIVERSITY OF THE FREE STATE

MArch



Transmission of Affect

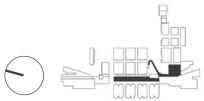
Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date	Scale	Drawn by
NOV 23	1 : 200	JODIA STEENKAMP

Project TRANSMISSION OF AFFECT

Drawing FIRST FLOOR PLAN | Drawing No. C7



University of the Free State

School of Architecture

NOTES:

SITE levels

MArch

Transmission of Affect

Aquaculture & Tourism Development

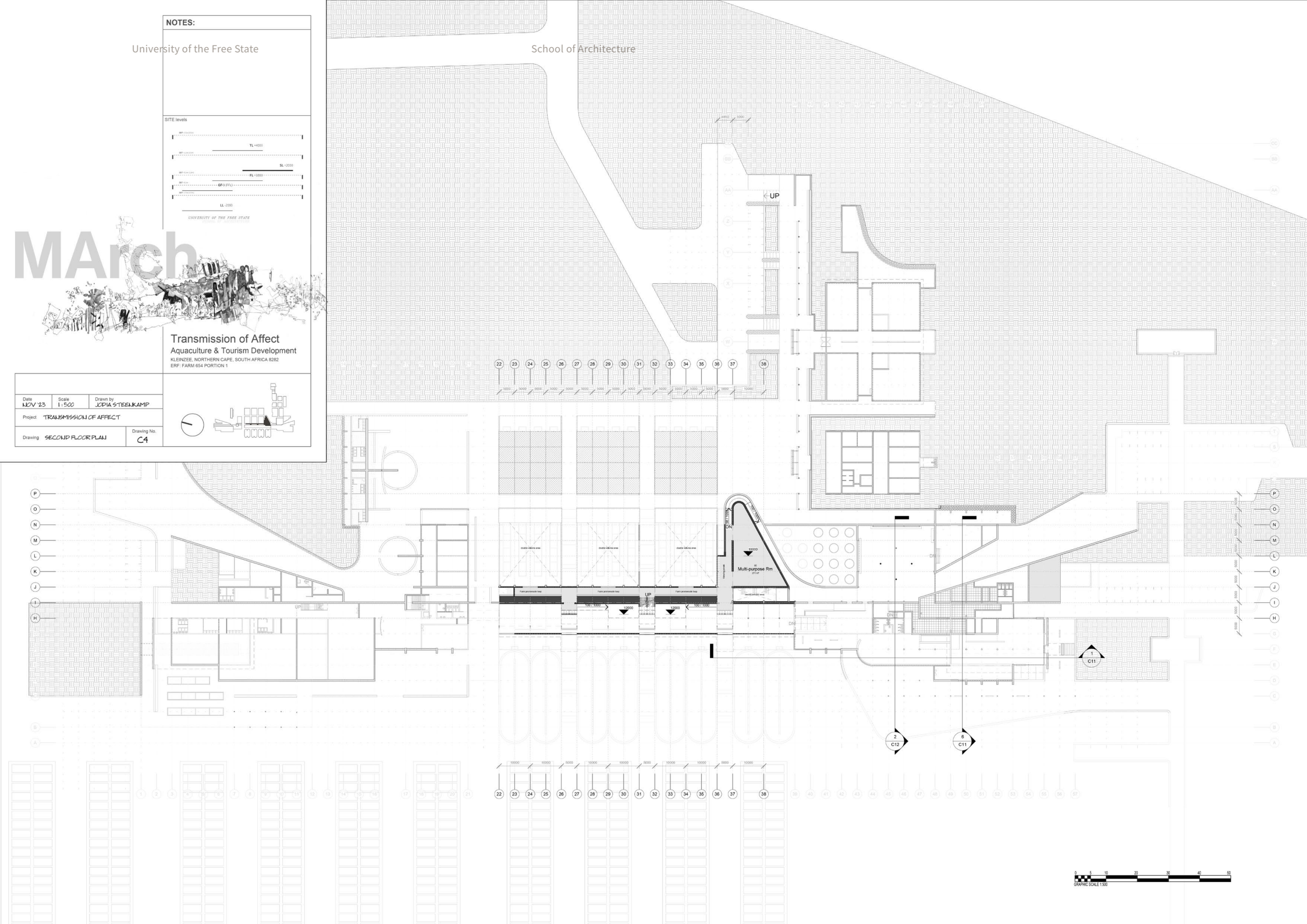
KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

Date	Scale	Drawn by
NOV '23	1 : 500	JODIA STEELKAMP

Project: TRANSMISSION OF AFFECT

Drawing: SECOND FLOOR PLAN

Drawing No.: C4

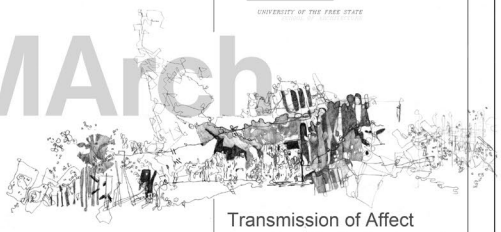


NOTES:

SITE levels

UNIVERSITY OF THE FREE STATE

MArch



Transmission of Affect

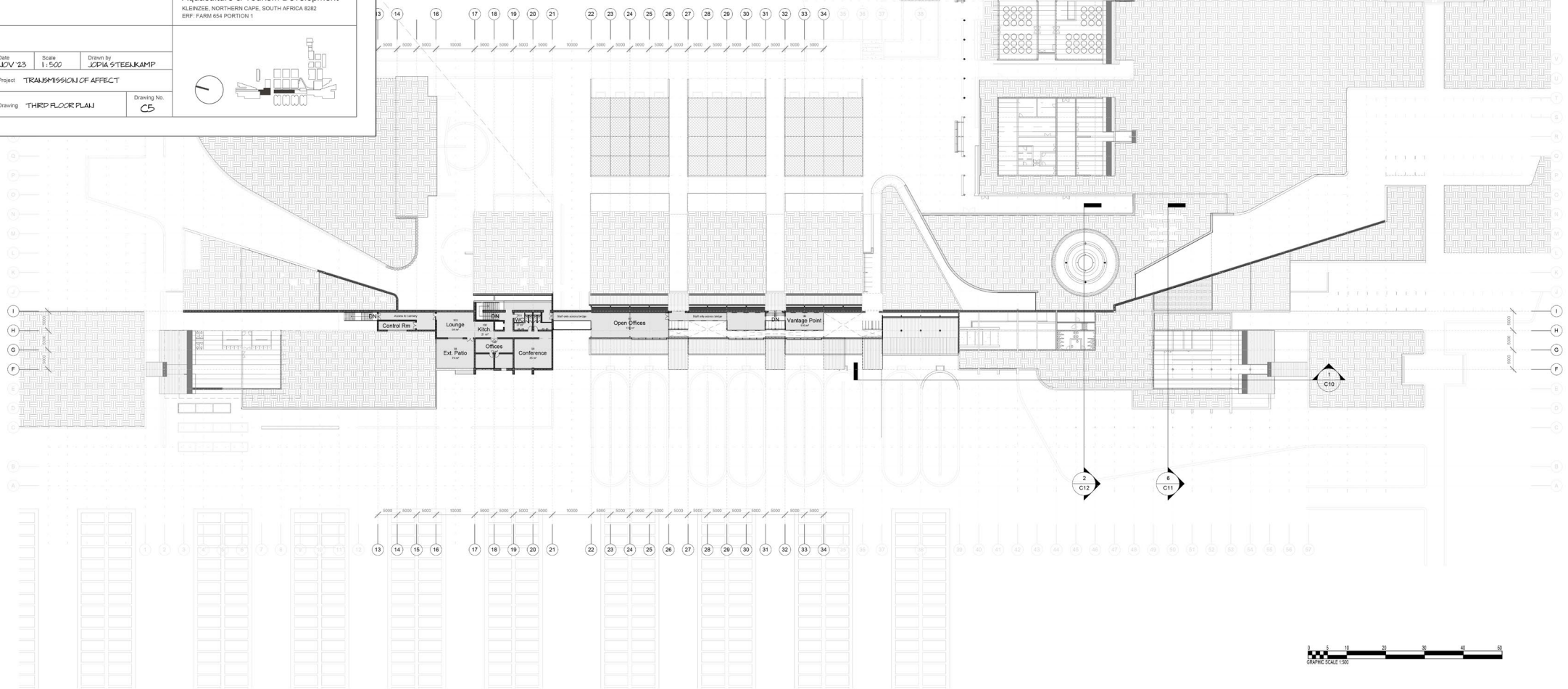
Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FARM 654 PORTION 1

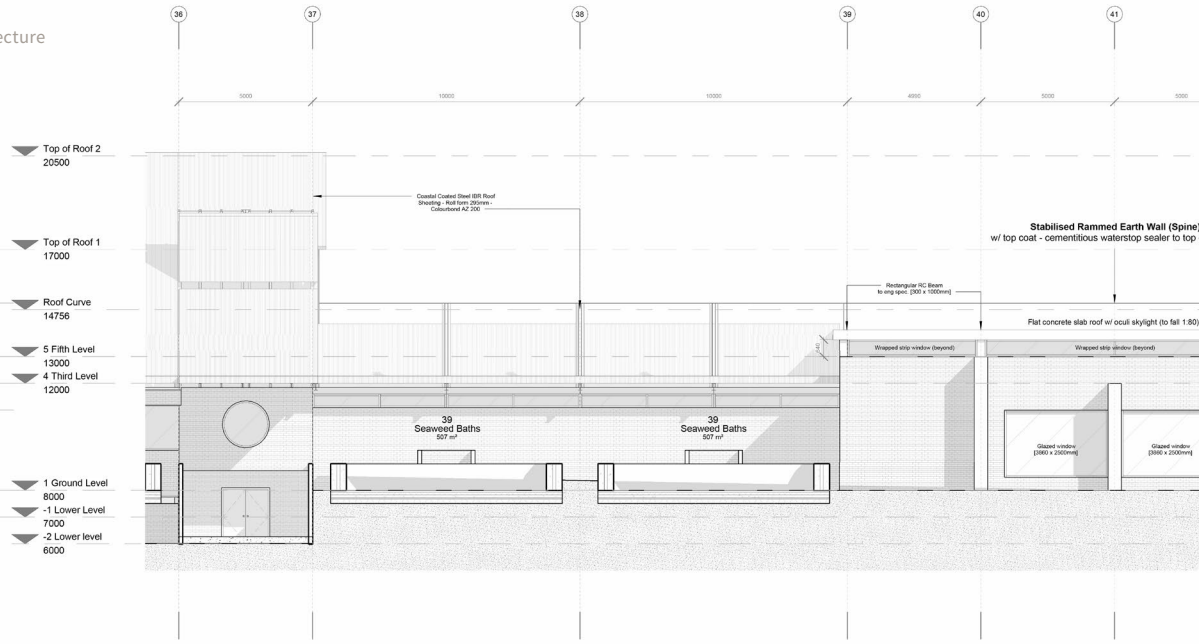
Date	Scale	Drawn by
NOV '23	1:500	JOPIA STEENKAMP

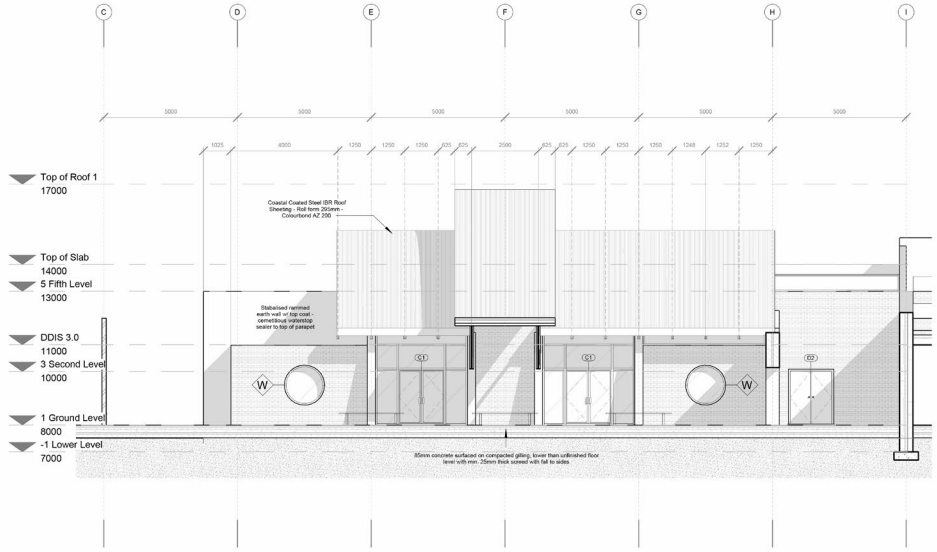
Project: TRANSMISSION OF AFFECT

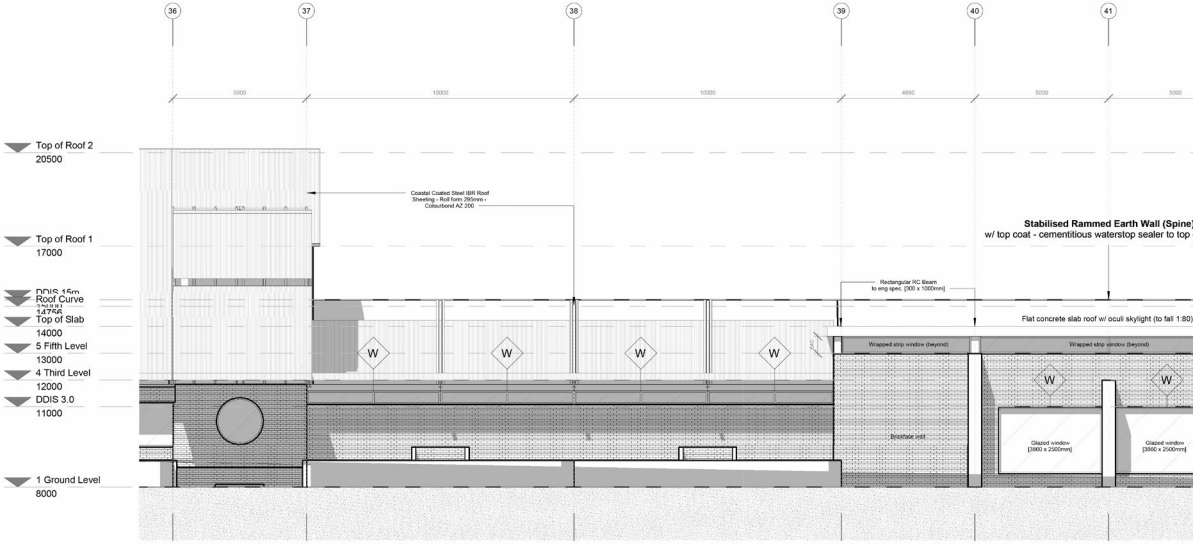
Drawing: THIRD FLOOR PLAN — Drawing No.: C5

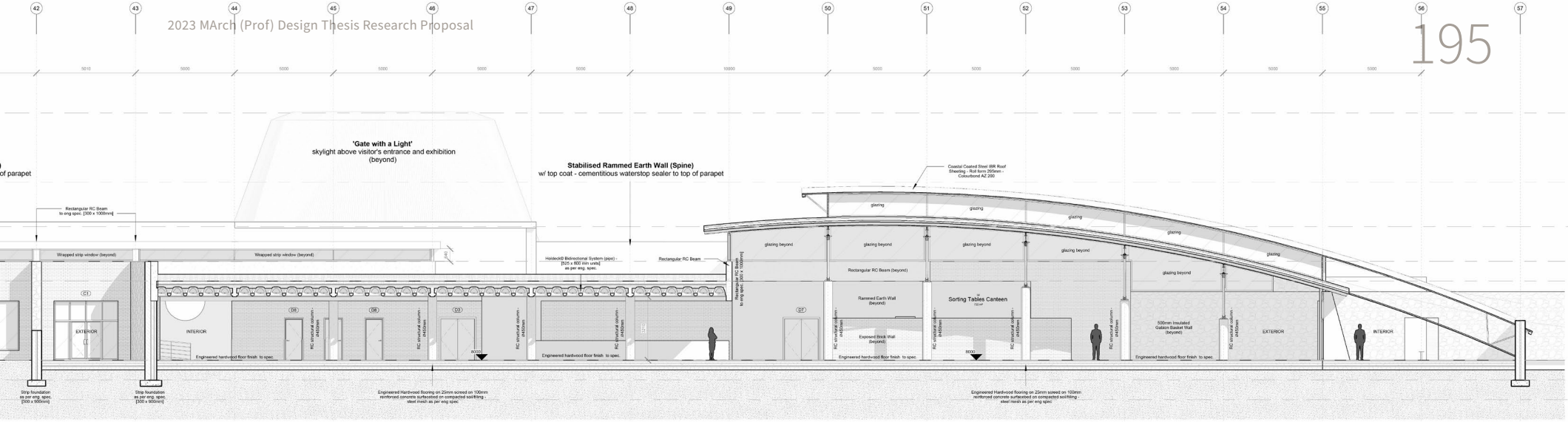


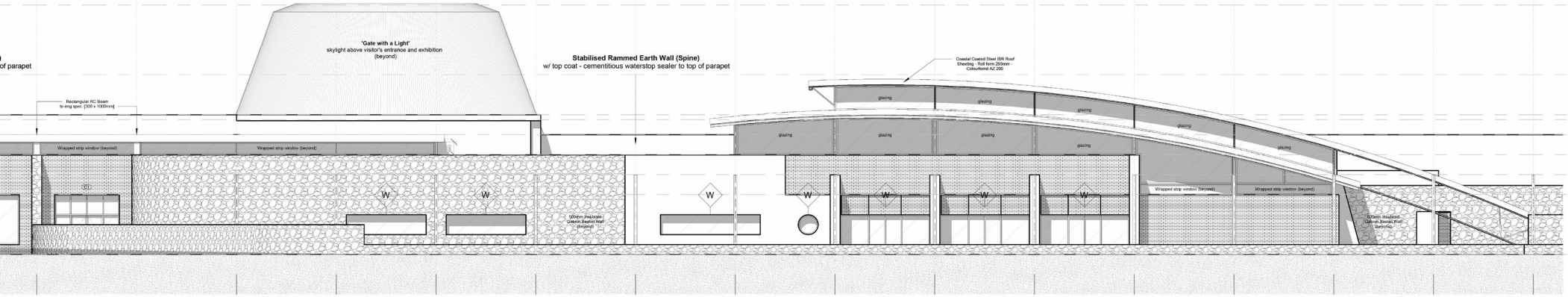

I
H
G
F
E
D
C
Top of Roof 1
17000
DDIS 15m
15000
5 Fifth Level
13000
4 Third Level
12000
DDIS 3.0
11000
1 Ground Level
8000
-1 Lower Level
7000
Coastal Coated Steel IBR Roof Sheeting - Roll form 295mm - Colourbond AZ 200
Holdenkit® Bidirectional System (pipe) - [525 x 800 mm units] as per eng. spec.
Rectangular RC column to eng spec. [750 x 1775mm]
Stabilised rammed earth wall w/ a brick parapet wall
INTERIOR
EXTERIOR

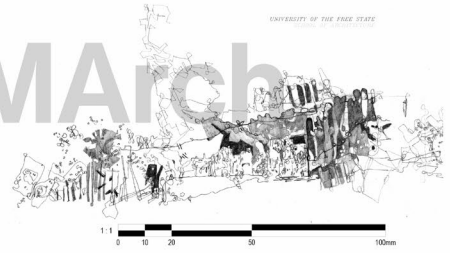

36
37
38
39
40
41
Top of Roof 2
20500
Top of Roof 1
17000
Roof Curve
14756
5 Fifth Level
13000
4 Third Level
12000
1 Ground Level
8000
-1 Lower Level
7000
-2 Lower level
6000
Coastal Coated Steel IBR Roof Sheeting - Roll form 295mm - Colourbond AZ 200
Rectangular RC Beam to eng spec. [300 x 1000mm]
Stabilised Rammed Earth Wall (Spine)
w/ top coat - cementitious waterstop sealer to top
Flat concrete slab roof w/ oculi skylight (to fall 1:80)
Wrapped strip window (beyond)
39
Seaweed Baths
507 m²
Glazed window [3960 x 2500mm]


C
D
E
F
G
H
I
Top of Roof 1
17000
Top of Slab
14000
5 Fifth Level
13000
DDIS 3.0
11000
3 Second Level
10000
1 Ground Level
8000
-1 Lower Level
7000
Coastal Coated Steel IBR Roof Sheeting - Roll form 295mm - Colourbond AZ 200
Stabalised rammed earth wall w/ top coat - cementitious waterstop sealer to top of parapet
85mm concrete surfaced on compacted gilling, lower than unfinished floor level with min. 25mm thick screed with fall to sides.


36
37
38
39
40
41
Top of Roof 2
20500
Top of Roof 1
17000
Roof Curve
14756
Top of Slab
14000
5 Fifth Level
13000
4 Third Level
12000
DDIS 3.0
11000
1 Ground Level
8000
Coastal Coated Steel IBR Roof Sheeting - Roll form 295mm - Colourbond AZ 200
Rectangular RC Beam to eng spec. [300 x 1000mm]
Stabilised Rammed Earth Wall (Spine)
w/ top coat - cementitious waterstop sealer to top
Flat concrete slab roof w/ oculi skylight (to fall 1:80)
Wrapped strip window (beyond)
Brickface infill
Glazed window [3960 x 2500mm]







Transmission of Affect

Aquaculture & Tourism Development

KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282

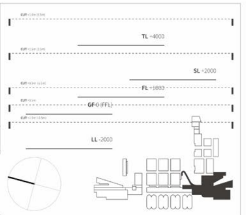
ERF: FAMR 654 Portion 1

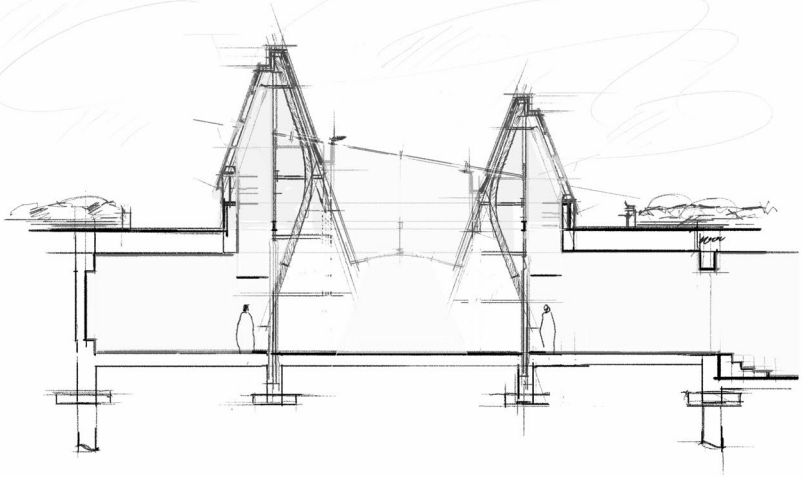
Date	Scale	Drawn
NOV 23	1 : 100	JODIA STEENKAMP

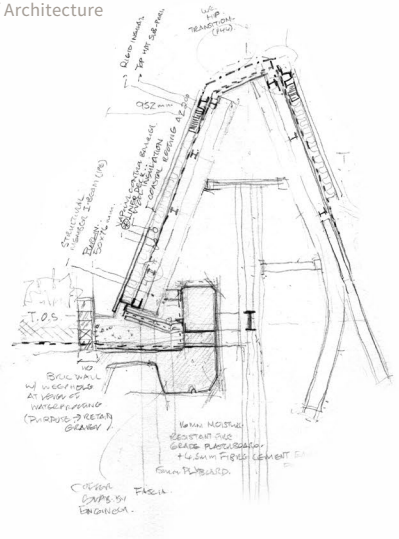
Project Title: TRANSMISSION OF AFFECT

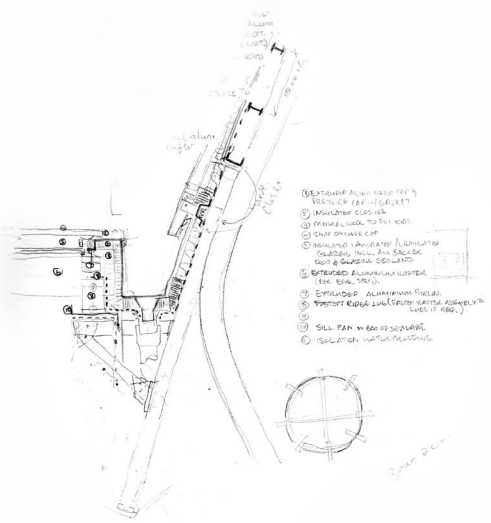
Drawing: VISITOR'S CENTRE

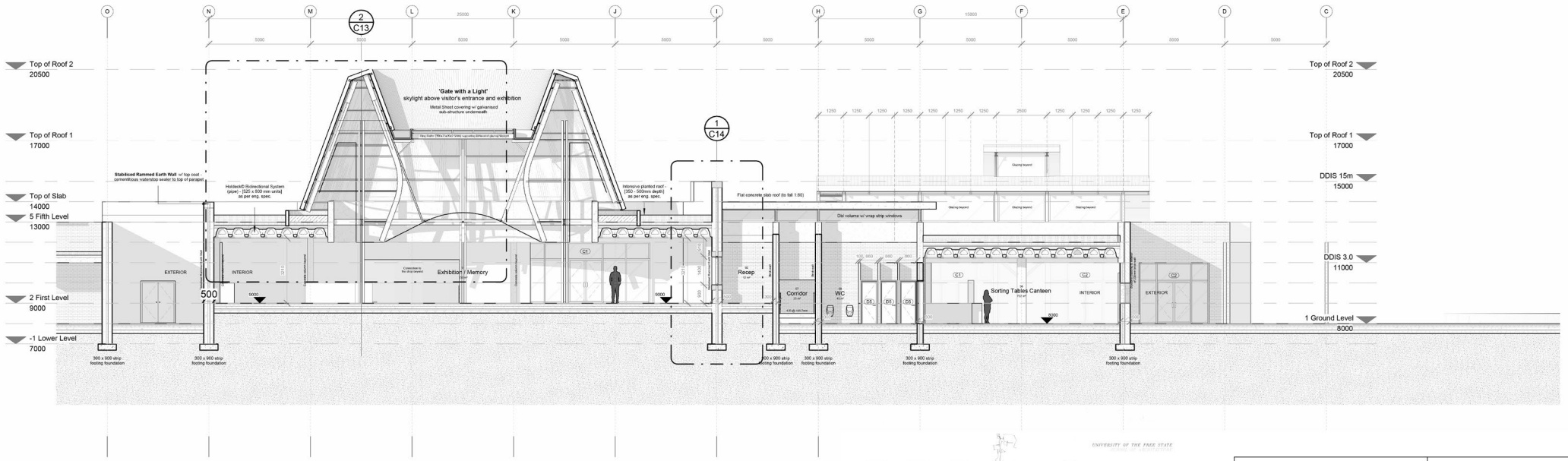
Rev. No.: C10

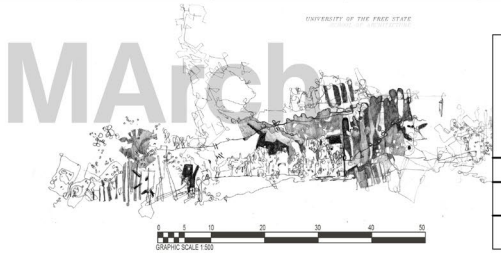












Transmission of Affect

Aquaculture & Tourism Development

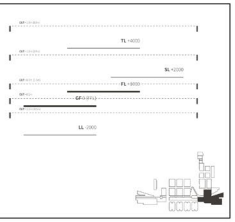
KLEINZEE, NORTHERN CAPE, SOUTH AFRICA 8282
ERF: FAMR 654 Portion 1

Date	Scale	Drawn
NOV '23	1:100	JOPIA STEENKAMP

Project Title: TRANSMISSION OF AFFECT

Drawing: GATE WITH A LIGHT

Rev No. C10



07

Works Cited

-

WORKS CITED

+ Birdfact. n.d. *Little Egret*. Accessed October 8, 2023. <https://birdfact.com/birds/little-egret.>

+ Bleuscape. 2014. *Silver City Museum – An Un-built work by Glenn Murcutt. 14 July*. Accessed July 22, 2023. <https://www.bleuscape.com.au/blog/silver-city-museum-an-un-built-work-by-glenn-murcutt/.>

+ Böhme, G., Borch, C., Eliasson, E., and Pallasmaa, J. 2014. "Atmospheres, Art, Architecture: A Conversation between Gernot Böhme, Christian Borch, Olafur Eliasson, and Juhani Pallasmaa." I*n Architectural Atmospheres : On the Experience and Politics of Architecture, edited by Christian Borch*, 90-107. Basel. Accessed March 11, 2023. < https://www.degruyter.com/document/doi/10.1515/9783038211785/html?lang=en>
.

+ Bolus, L. and Herre, A. n.d. *Genus Amphibolia*. Accessed October 8, 2023. <https://casabio.org/taxa/amphibolia.>

+ Brennan, T. 2004. *The Transmission of Affect*. New York: Cornell University Press.

+ Cambridge Dictionary. n.d. *Affect*. Accessed September 14, 2023. <https://dictionary.cambridge.org/dictionary/english/affect?q=Affect.>

+ Carstens, P. 2001. *In the Company of Diamonds*. Ohio, Athens: Ohio University Press.

+ Casey, E. 1998. "Giving a Face to Place in the Present." Chap. 12 in *The Fate of Place*, by Edward S. Casey, 285-330. Los Angeles, California: University of California Press.

+ Chen, Wenbow. 2021. *Wenbowchen Photography*. 27 June. Accessed October 7, 2023. <https://wenbochenphoto.tumblr.com/post/655143476253589504/didelta-spinosa-of-northern-cape-one-of-the-two.>

+ Chief Directorate: Surveys and Mapping. 2007. *2916DB & 2917CA Kleinzee.* Chief Directorate: Surveys and Mapping. Cape Town: Chief Directorate: Surveys and Mapping. Accessed May 15, 2023. Boon, M. (2023) Email to Jodia Steenkamp, 15 May.

+ ConservationTrust, Overberg Renosterveld. n.d. *A new Drosanthemum Species for Overberg Renosterveld*. Accessed October 8, 2023. <https://overbergrenosterveld.org.za/new-drosanthemum-species/>.

+ Corner, J. 1999. "Recovering Landscape as a Critical Cultural Practice." Chap. 1 in *Recovering Landscape*, edited by James Corner, ix-23. New York: Princeton Architectural Press.

+ Davies, G. and Brother, D.. 2005. *Eight new species of Scrapter (Hymenoptera: Apoidea: Colletidae)*. African Invertebrates (Research Gate) Vol. 46: 143. Accessed October 5, 2023. <https://www.researchgate.net/publication/259841395_Eight_new_species_of_Scrapter_Hymenoptera_Apoidea_Colletidae_with_descriptions_of_S_albifumus_and_S_amplispinatus_females_and_a_major_range_extension_of_the_genus>.

+ DCA. n.d. E*xisiting Aquaculture Facilities in Kleinzee*. Kleinzee: DCA. Accessed May 15, 2023. Boon, M (2023) Email to Jodia Steenkamp, 15 May.

+ de Beer, C. 2009. 81. *Beach House (2005)*. In 10 years + 100 buildings : Architecture in a Democratic South Africa, by 'Ora Joubert, 362-363. Cape Town: Bell-Roberts Publishing.

+ Ebedes, G.. n.d. *Ruschia maxima*. Accessed October 7, 2023. <https://www.plantbook.co.za/ruschia-maxima/>.

+ NWE Consulting Engineers. 2022. *NWE Consulting Engineers*. 21 July. Accessed September 9, 2023. <https://www.facebook.com/nweconsulting/>.

+ Fielding, P. 2017. *Munciple Management Planning*, East London: Namakwa District Muncipality.

+ Frank, T. 2010. *Atmospheric Pressure - feeling the atmosphere*. Copenhagen: ARKEN Museum of Modern Art. Accessed September 6, 2023. <https://olafureliasson.net/artwork/din-blinde-passager-2010/>.

+ Hall, M. 2022. *HIC Arquitectura*. 17 December. Accessed August 3, 2023. ,https://hicarquitectura.com/2022/12/bernt-nyberg-klockarebackens-funeral-chapel-hoor-sweden/>.

+ Harris, S. and Hoare, D. 2022. *Tetragonia fruticosa*. December. Accessed October 7, 2023. <https://pza.sanbi.org/tetragonia-fruticosa>.

+ Heasman, M and Savva, N.. 2007. *Manual for Intensive Hatchery Production of Abalone: Theory and practice for year-round, high density seed production of blacklip abalone*. Manual, NWS Department of Primary Industries, Fisheris Research and Development Cooporation, Corlette: NSW Department of Primary Industries, [insert]. Accessed May 24, 2023. <https://www.lib.washington.edu/msd/norestriction/b67512665.pdf>.

+ Helme, N. 2023. *Cladoraphis cyperoides (Thunb.) S.M.Phillips*. 6 March. Accessed October 7, 2023. <https://www.gbif.org/occurrence/3747327600>.

+ Magic Garden Seeds. n.d. Ice plant (Mesembryanthemum crystallinum). Accessed October 8, 2023. <https://www.magicgardenseeds.com/The-Good-To-Know/Ice-plant-%28Mesembryanthemum-crystallinum%29-A.MES012>.

+ Immelman, R. 2022. I*nnovative green Helderberg Environmental Centre opens its doors*. 4 June. Accessed July 20, 2023. <https://www.capetownetc.com/news/innovative-green-helderberg-environmental-centre-opens-its-doors/>.

+ Jaison, M. n.d. *Greater Flamingo*. Accessed October 8, 2023. <https://ebird.org/species/grefla3>.

+ Jayakumar, R. and Abdul Nazar, A. K. 2013. *Marine fish hatchery concept, design and construction*. Central Marine Fisheries Research Institute. <Accessed May 29, 2023. http://eprints.cmfri.org.in/9709/>.

+ Jorge F., Peixcoto, M., Mateus, R. and Gervásio, H. 2019. *Life cycle analysis of environmental impacts of earthen materials in the Portuguese context: Rammed earth and compressed earth blocks*. Edited by Baoshan Huang. Journal of Cleaner Production (Science Direct) 241: online. Accessed September 11, 2023. <doi:https://doi.org/10.1016/j.jclepro.2019.118286>.

+ Ken and Nyetta. 2017. *Red Knobbed Coot showing its namesake characteristic*. 6 September. Accessed October 8, 2023. <https://commons.wikimedia.org/wiki/File:Red_Knobbed_Coot_showing_its_namesake_characteristic_%2829813821997%29.jpg>.

+ Kretzer, A. 2021. “Beyond the Haze of Carnival Candles: Cinematic Space in Architectural Design Education.” In *Handbook of Research on Methodologies for Design and Production Practices in Interior Architecture* (Advances in Media, Entertainment and the Arts, by Ervin Garip, edited by S. Banu Garip, 23. Stuttgart: IGI Global.

+ Lera, R. 2023. *Biosecurity at the poultry farm: a basic tool to ensurepoultry health and welfare*. 26 January. Accessed July 17, 2023. <https://layinghens.hendrix-genetics.com/en/articles/biosecurity-at-the-poultry-farm-a-basic-tool-to-ensure-poultry-health-and-welfare/>.

+ Levitskiy, A. n.d. Yellow-billed Duck. Accessed October 8, 2023. <https://www.waterfowl.org.uk/wildfowl/true-ducks/yellow-billed-duck/>.

+ Low, C. 2007. *Khoisan Wind: Hunting and Healing*. The Journal of the Royal Anthropological Institute (Royal Anthropological Institute of Great Britain and Ireland) 13: 71-90. Accessed March 2, 2023. <http://www.jstor.org/stable/4623121>.

+ Makola, Thabeng. 2021. Pteronia incana. August. Accessed October 7, 2023. <https://pza.sanbi.org/pteronia-incana>.

+ Massie, V., Dr. Hutchings, K. and Dr. Clark, B. 2018. *Proposed upgrades to the Diamond Coast Aquaculture facility Kleinzee, Northern Cape - Final basic assessment report*. Environmental Impact Assessment, Cape Town: Anchor Environmental. Accessed December 1, 2023. <Swart, C. (2023) Email to Jodia Steenkamp, 21 Febrary)>.

+ Mecanoo Architecten. n.d. Central Library TU Delft. Accessed June 13, 2023. <https://www.archiweb.cz/en/b/centralni-vedecka-knihovna-technicke-univerzity-v-delftu>.

WORKS CITED

+ Murcutt, G. 1992. *The Mining Museum of Broken Hill*. Perspecta (The MIT Press) 27: 168-185. Accessed May 30, 2023. <http://www.jstor.org/stable/1567182>.
Neufret, E. and P. 2012. *Neufert: Architects' Data*. Vol. Fourth Edition. Oxford: Jogn Wiley & Sons, Ltd.

+ NWE Consulting Engineers. 2022. *NWE Consulting Engineers*. 21 July. Accessed September 9, 2023. <https://www.facebook.com/nweconsulting/>.

+ Oliver, Roger. 2023. *Didelta carnosa var. tomentosa*. June. Accessed October 7, 2023. <https://pza.sanbi.org/didelta-carnosa-var-tomentosa>.

+ Pallasma, J. 2011. T*he Embodied Image: Imagination and Imagery in Architecture*. West Sussex: John Wiley & Sons Ltd.

+ Pallasmaa, J. 1996. *The Eyes of the Skin: Architecture and the Senses*. Vol. Polemics. London: Academy Group Ltd.

+ Pintos, P. 2021. *Thy National Park Visitor Center / LOOP Architects*. 21 October. Accessed September 9, 2023. <https://www.archdaily.com/970439/thy-national-park-visitor-center-loop-architects?ad_source=search&ad_medium=projects_tab>.

+ Pliteq. 2022. *9 Building Materials – How Much Do They Pollute Our Environment?.* 7 January. Accessed September 11, 2023. <https://pliteq.com/news/building-vs-carbon-footprint/#:~:text=Rammed%20Earth&text=It%20is%20considered%20to%20be,a%20unique%20and%20beautiful%20aesthetic>.

+ Savannah Environmental. 2012. *Heritage impact Assessment for the proposed eskom Kleinsee wind energy facility, Namakwaland Magisterial District, Northern Cape*. National Heritage Resources Act (No. 25 of 1999) as part of an EIA, Cape Town: Svannah Environmental (Pty) Ltd.

+ Scape. 2022. *Reinventing Environmental Education*. 12 August. Accessed July 20, 2023. <https://scapemagazine.co.za/build/reinventing-environmental-education/>.

+ Schmiedel, U. 2007. *Galenia fruticosa (L.f.) Sond*. 18 September. Accessed October 8, 2023. <https://www.southernafricanplants.net/plantdata_sub.php?Extern_ObsID=S27&Mspec_ID=2642>.
Spirn, A. 2001. *One with Nature: Landscape, Language, Empathy, and Imagination*. International Cosmos Prize 2001. Osaka. Accessed April 15, 2023. <https://web.mit.edu/spirn/www/newfront/2005/cosmoseng.pdf>.

+ Starr, K. and F. 1999. *Eragrostis paupera (habit). Location: Midway Atoll, Spit Island*. 23 June. Accessed October 8, 2023. <https://fr.wikipedia.org/wiki/Eragrostis#/media/Fichier:Starr_990623-0918_Eragrostis_paupera.jpg>.

+ van Leeuwen, R. 2017. *Structural Engineering Blog*. 17 April. Accessed July 11, 2023. <https://robbievanleeuwen.github.io/engineering%20journalism/tu-delft-library/>.

+ SA Venues. n.d. *African Darter*. Accessed October 8, 2023. <https://www.sa-venues.com/wildlife/birds_african_darter.php>.

+ Wennerstrom, N. 2021. *Julie Bargmann Wins the Inaugural Cornelia Hahn Oberlander International Landscape Architecture Prize*. 14 October. Accessed Month 11, 2023. <https://www.tclf.org/julie-bargmann-wins-inaugural-cornelia-hahn-oberlander-international-landscape-architecture-prize>.

+ WHO and FAO. 2009. *Code of Practice for Fish and Fishery Products*. Edited by First edition. Rome. Accessed May 22, 2023. Dr. Fouche, C. (2023) E-mail to Jodia Steenkamp.

+ Wildlife Den. n.d. *Wildlife Den*. Accessed October 7, 2023. <https://www.wildlifeden.com/projects/kapok-bos/>.

+ Design Workshop. n.d. N*ew Beach House at Plettenberg Bay*. Accessed May 9, 2023. <https://www.designworkshop.co.za/project/new-beach-house-namma#>.

SafeAssign Originality Report • Submitted on Tue, Oct 10, 2023, 8:31 PM

Final Document - text only for Turnitin

ATRE7904 MAIN On

Jodia Steenkamp

Total Score: 1 % Low risk

Submission UUID: 75c3af59-a5b5-95dd-f110-6439c285b756

Total Number of Reports	Highest Match	Average Match	Submitted on	Average Word Count
1	1 %	1 %	10/10/23	19,533
	MArch ATRE 7904 FINAL 2017164779 St...		08:31 PM GMT+2	Highest: MArch ATRE 7904 FINAL 2017...

Attachment 1 1 %

Word Count: 19,533
Source: MArch ATRE 7904 FINAL 2017164779 Steenkamp .docx

Global database (3) 1 %

- 2 Student paper
- 3 Student paper
- 6 Student paper

Internet (3) 0 %

- 4 tobh
- 1 tips
- 5 northern-cape

Top sources (3)

- 2 Student paper 1 %
- 3 Student paper 0 %
- 6 Student paper 0 %

Thank you

MARCH 2022

JODIA STEENKAMP (2017164779)