

Tuesday, 12 January 2016

Early Morning

I climbed onto the boat at 06:00 this morning as we prepared to make the thirty minute passage across the open ocean. After a rough journey through large swells and the dense, West Coast mist, the silhouette of Malgas Island began to materialise. Before my eyes could make out the details of the island, it was my ears that were assaulted with thousands of Cape Gannets squawking in unison, growing louder with each passing minute.

The boat approached the weathered timber jetty, standing a daunting three meters above the surface of the water, as Park Rangers on the island winched a rusted steel ladder down until it kissed the top of the larger waves. I was instructed to climb onto the nose of the boat and get ready to jump as the captain aligned it with the rungs of the ladder.

After a somewhat terrifying, but successful, leap across the gap between the boat's nose and the suspiciously rickety ladder, I ascended the rungs and stood up to take in Malgas Island in all of its small and humble glory. All five of my senses were wonderfully assailed as I tried to absorb what lay in front of me. Perpetual noise, sulphuric aromas, the taste of seawater in my mouth, beautiful abandoned buildings from another era, and the constant pressure of howling wind enveloping me from all sides. Feeling like a pioneer on a foreign planet, I made my way towards the harsh, rocky surface of the island...

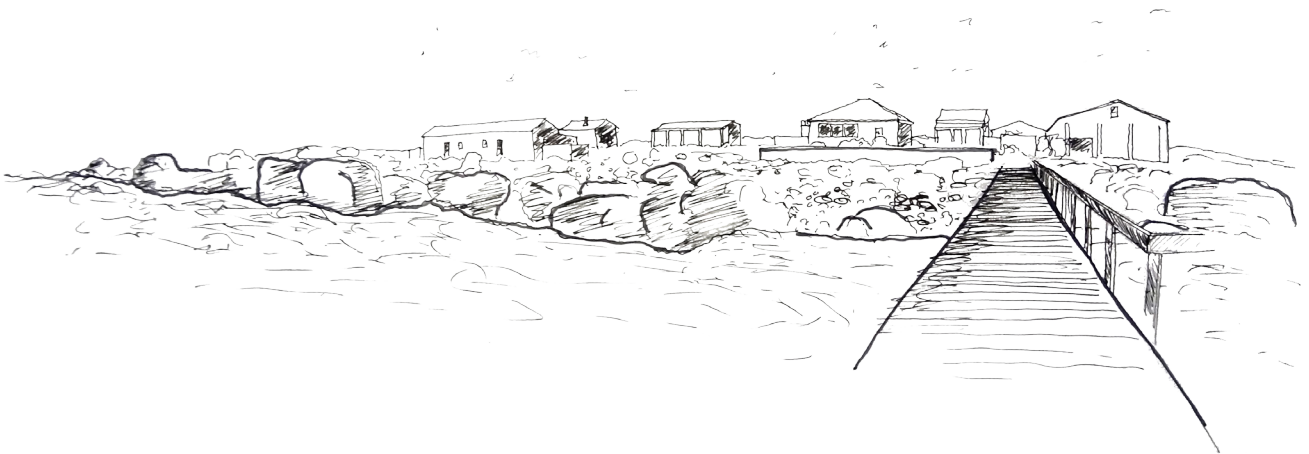


Fig 0,1 - First impression of Malgas Island



Acknowledgements

My wife, Liezl, for her outrageous love, support and encouragement.

My parents, Dave and Wendy, for paving the road under my feet.

Professor Jan Smit, Henri Pretorius, Hein Raubenheimer & Jako Olivier for their expert advice and guidance throughout the year.

The SA National Parks Board, West Coast National Park rangers, and SANCCOB, for protecting this fascinating and precious island.

Senior Park Ranger Pierre Nel, for introducing me to Malgas Island.

Jesus, for going before me and walking beside me.

“The godly care for their animals, but the wicked are always cruel” Proverbs 12:10



A dissertation submitted for fulfilling the requirements of the Masters Degree in Architecture, University of the Free State, 2016

I know that plagiarism is wrong. Plagiarism is creating the impression that someone else's work is my own. Every contribution and quote from other sources in this dissertation has been acknowledged and there is a reference and a source. This dissertation is my own work. I have not copied it, nor will I allow that anybody copy it.

S. Moffett

S.L. Moffett 2011009251

This design dissertation investigates the proposal of a Bird Preservation, Research and Visitors' Centre on Malgas Island in Saldanha Bay. The aim of the project is to assist the South African National Parks Board within the West Coast National Park with the observation, research and preservation of the planet's largest colony of Cape Gannets, whose habitat is the volatile surface of Malgas Island, and whose numbers are decreasing with each passing year. In doing so, the project also aims to draw attention to and memorialise these intriguing creatures that, for most, remain nameless and undiscovered. My interest in the topic of this dissertation stems from a personal fascination with the natural environment, more specifically, with the ocean. I am greatly interested in the fact that oceans are the direct providers and lifeblood to more than two thirds of our planet's inhabitants, both human and otherwise. One species that is particularly dependent on the sea, and which is currently on the verge of extinction, is the *Morus Capensis*, the Cape Gannet.

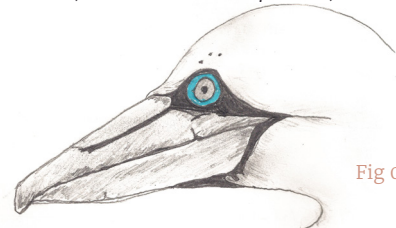


Fig 0,3 Cape Gannet

This study has been organised into four main parts. The first part explores the project's challenges and aims. Here, various challenges were identified by means of an investigation into the typology, topology, morphology and tectonic potential of the design which, in turn, generated problem statements and aims. The second part provides a detailed discussion on the research design and methodology in terms of the various research methods that were used, in-depth investigation, the grounding of various arguments in personal explorations, as well as numerous literature reviews and precedent studies that inform this project. The third part explores the design and tectonic synthesis. The design and construction processes were thoroughly explained and followed, resulting in a final design solution and product. The last part of the dissertation reflects on and evaluates the entire design process and its success or lack thereof.

Key words and phrases:

preservation – ecological ethics – agency – Cape Gannet – vernacular – unassuming architecture – observation – anthropocentric vs ecocentric – sustainable architecture



Fig 0,4 Diving Patterns

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Fig 0,5 Malgas Island

Within our world, we are able to identify two ever-present environments. There is the intentionally-organised, built environment and the spontaneously self-organising, natural environment. My interest in the topic of this dissertation stems from a basic human fascination with the latter. As a 23-year-old white male who has been raised in a financially-privileged home within close proximity to the ocean, I am fully aware that I am not unique in this fascination. I would, however, venture as far as to say that my fascination with the preservation of the natural environment is considerably more than most for two main reasons, the first of which is admittedly selfish and other not. Firstly, with me and my wife expecting a child within a month after this dissertation is due to be published, I would like my child to experience the same captivating, natural environment that I had the privilege of encountering. Secondly, being the nephew of Dame Daphne Sheldrick of the David Sheldrick Wildlife Trust in Kenya has exposed me to the extreme efforts made to conserve orphaned elephants and rhinos, and has given me first-hand experience in the precarious situation in which nature currently finds itself, particularly since the majority of humanity seems intent on destroying it. My personal fascination, however, has always been with the ocean. As will become apparent throughout this dissertation, I am somewhat enchanted by the fact that the sea is both an enormous, encompassing mass of constant solidity and, simultaneously, almost as penetrable, temporary and volatile as the air we breathe. Even more so, I am greatly interested in the fact that oceans are the direct providers and lifeblood to more than two thirds of our planet's inhabitants, both human and otherwise. One species that is currently on the verge of extinction is the *Morus Capensis*, the Cape Gannet. This dissertation proposes the establishment of a Bird Preservation, Research and Visitors' Centre on Malgas Island in Saldanha Bay. The aim of the project is to assist the South African National Parks Board within the West Coast National Park with the observation, research and preservation of the planet's largest colony of Cape Gannets, whose habitat is the volatile surface of Malgas Island, and whose numbers are decreasing with each passing year. In doing so, the project also aims to draw attention to and memorialise these beguiling creatures that, for most, remain nameless and undiscovered.

This dissertation is largely structured around the terms *typology*, *topology*, *morphology* and *tectonics*. Typology refers to the type of building that is proposed in the dissertation, as well as any quantitative research or cognitive interpretation surrounding this matter that was used to generate both the

programming of the design and ontological nature of the type of building that is designed. Topology indicates siting and the related context, analyses and interpretations affecting the siting of the proposed design on a macro, mezzo and micro level. Morphology describes the form and chosen method of form giving concerning the designed structure. Tectonics specifies the actual physicality of the detailed architectural design, as well as the synthesis between the final design and the research undertaken within the dissertation.

As seen in the following diagram, the document's structure has been organised according to the following four parts:

Part 1: Challenges and aims of the project. Challenges were identified by means of an investigation into the typology, topology, morphology and tectonic potential of the design which, in turn, generated problem statements and aims.

Part 2: Investigation and grounding. Through personal investigations, as well as numerous literature reviews and precedent studies, a research methodology was designed.

Part 3: Design and tectonic synthesis. The design and construction processes were thoroughly explained and followed, resulting in a final design solution and product.

Part 4: Reflection and evaluation. The study ends with a reflection on the entire design process and evaluates its success or lack thereof.

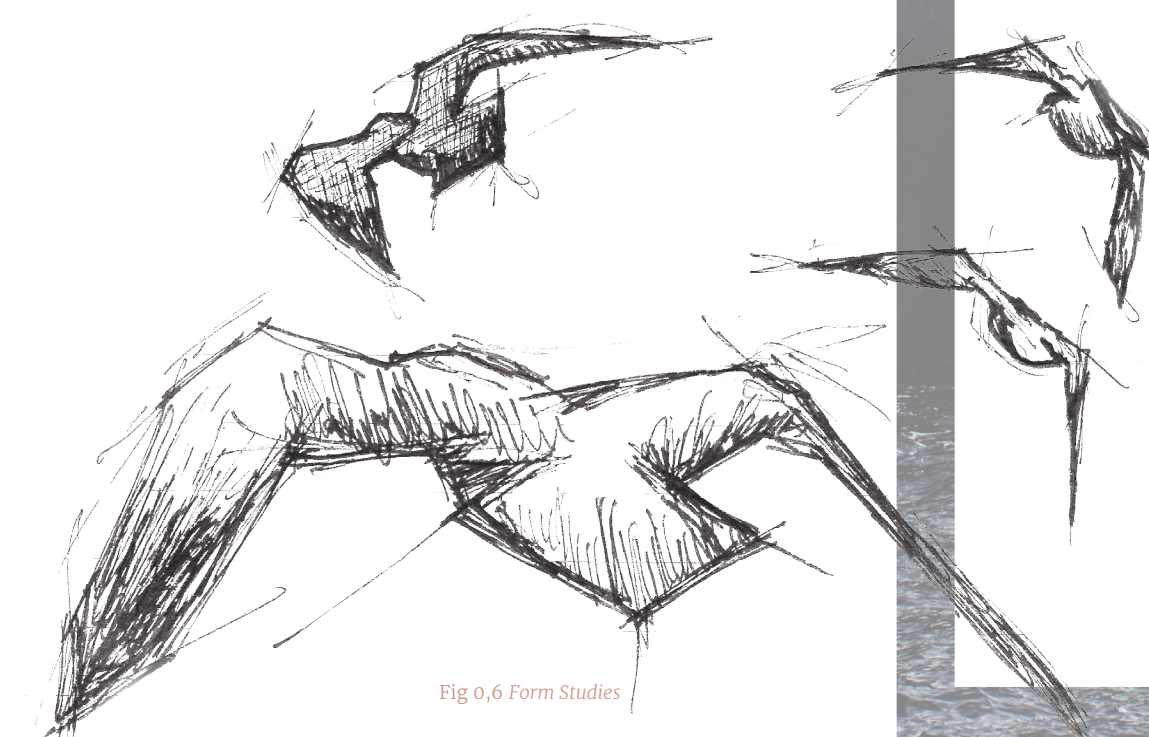
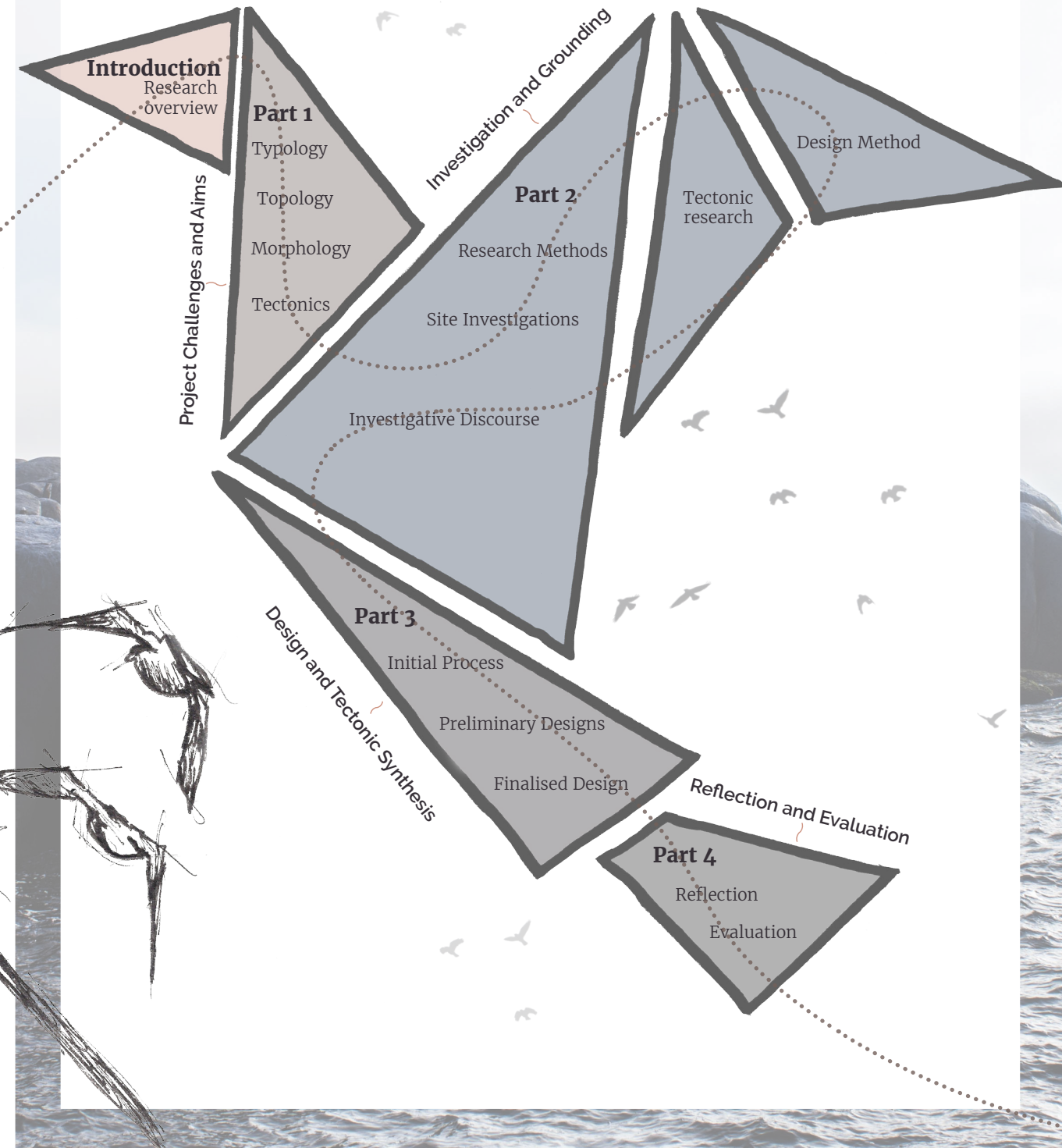


Fig 0,6 Form Studies

Document Structure Diagram



Research Methodology

For the purposes of this exploratory study, the various research methods employed were based on the primary issues addressed in this project, which aimed at achieving the product of a final proposed design. Once the decision had been made with regard to what needs to be designed and for whom (the client and brief), investigations focused on exploring the best location for this design, the motivation for the morphology and form-giving factors of the design, and how the design was assembled in terms of the relationship between structural elements. In other words, the investigations centred on typological, topological, morphological and tectonic aspects. The investigation was related to specific sources of knowledge that would influence the logic of these four factors. The research began with the client, SANPARKS, introducing me to the wonders of Malgas Island.

The following methods of exploratory research were employed throughout the project:

Two 'touchstones' were created, which detected the instinctual essence of the core issues facing the project, from which various concepts were established and developed, providing a conceptual framework. The conceptual framework served as an anchor for the remainder of the project in that it facilitated the organisation of ideas and the making of decisions.

These initial ideas were explored by investigating precedent and case studies of an architectural and theoretical nature in order to become formalised.

Literature reviews relevant to the project's focus areas, together with precedent and personal analyses, were utilised in order to generate an organised discourse.

An interview was conducted with staff members of both the West Coast National Park and SANCCOB in order to generate a realistic and genuine client brief.

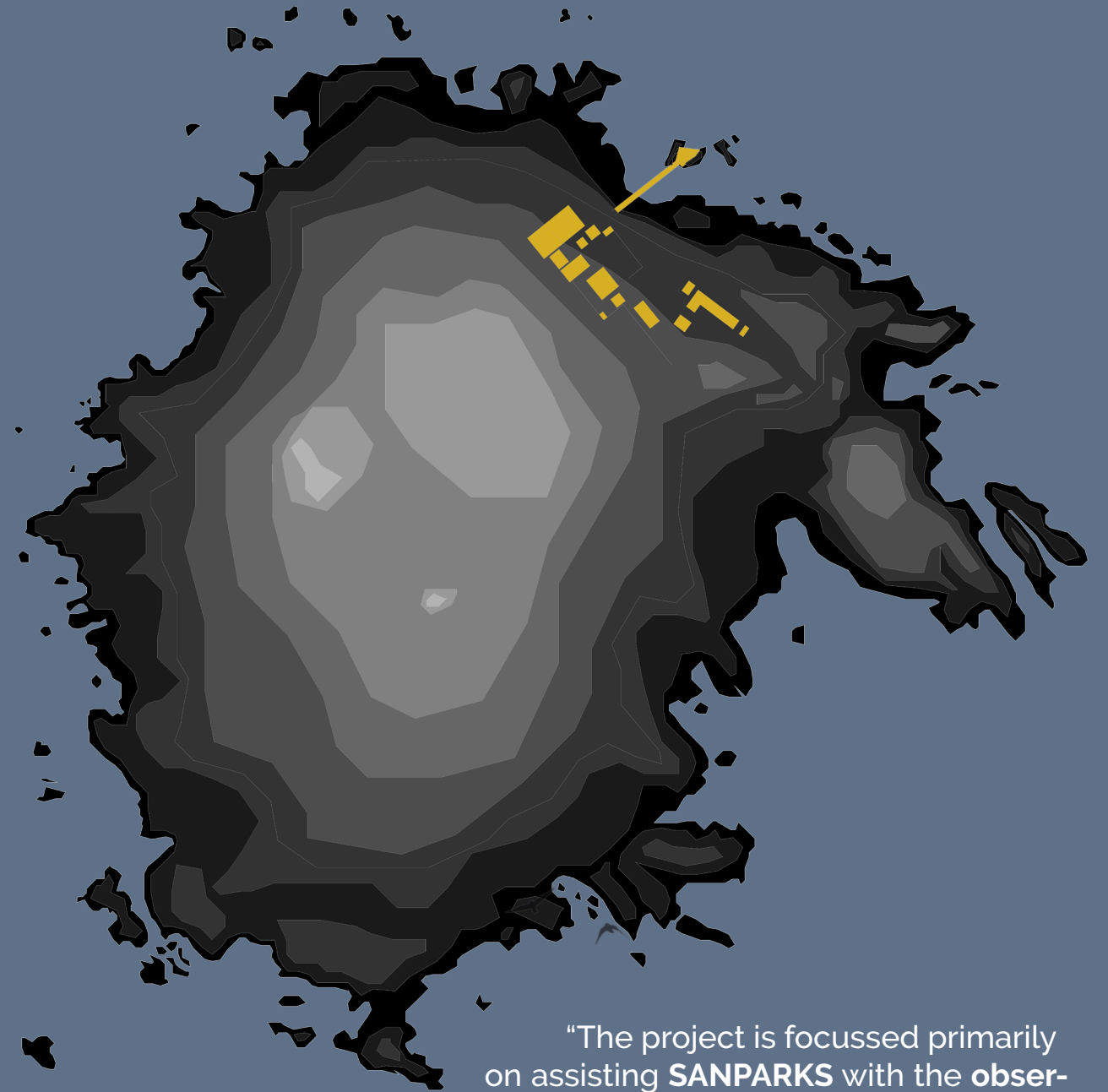
A site investigation and analysis based on quantitative information (existing and interpreted facts and measurements of the actual space on which the design was to be built), as well as qualitative/cognitive information, which focused on a personal interpretation of the phenomenological experience of the site and larger context, were conducted.



Fig 0,7 The Cape Gannet colony on Malgas Island



Fig 0,8 Current state of the existing structures



"The project is focussed primarily on assisting **SANPARKS** with the **observation, research and preservation** of the planet's largest colony of **Cape Gannets**, whose habitat is the volatile surface of **Malgas Island**, and whose **numbers are decreasing** with each passing year."

Fig 0,9 Map of Malgas Island

01

Project Challenges and Aims

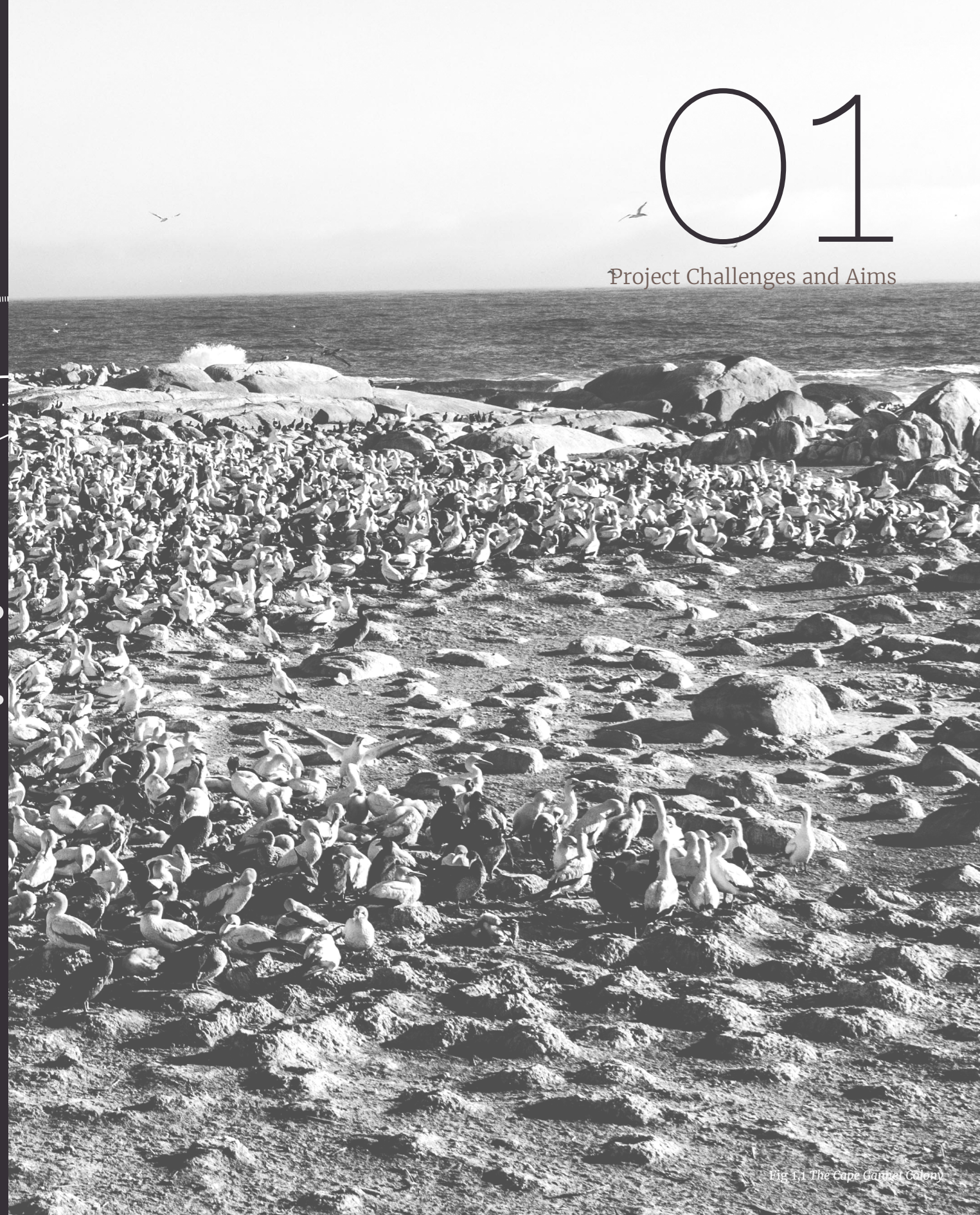
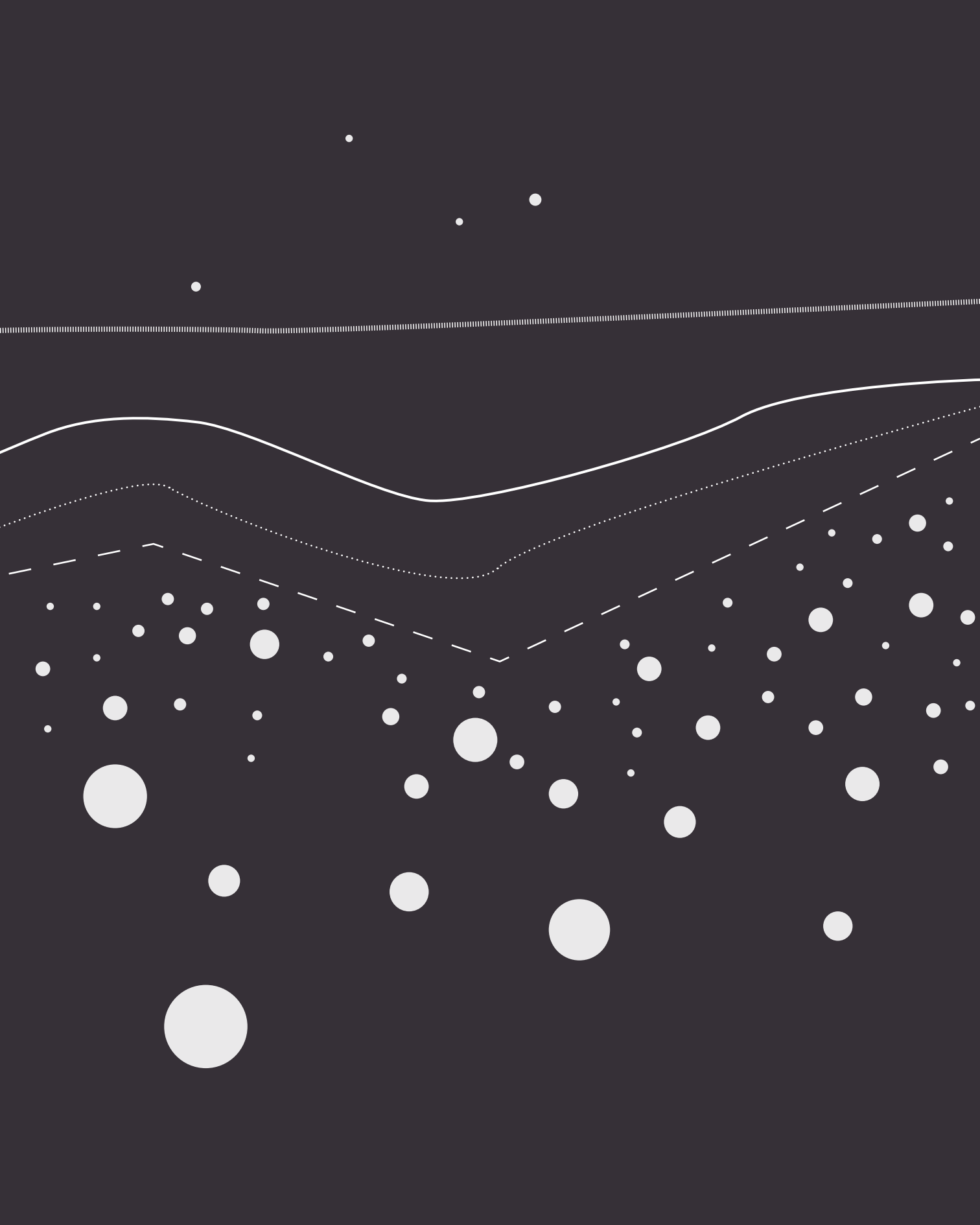


Fig 1.1 The Cape Gannet Colony

Identifying the various interwoven challenges addressed in this study was a messy and somewhat overwhelming task. In order to assist in the readability of the document, I have arranged the following section according to categories, namely typology, topology, morphology and tectonics.

Firstly, an investigation into the typology of a conservation and research architecture was conducted. Questions were raised pertaining to the main underlying purpose or function of the design, as well as what it would provide for both the client and its users. It was through this investigation that parameters were formed around the project and definitions began to take shape.

It was important to maintain a constant investigative stance while bearing in mind the fact that the proposed design was to be located within the West Coast context. The selection of an appropriate site within the secluded context of Malgas Island itself was also imperative. Consequently, the selected site presented numerous challenges, such as working with existing heritage-worthy buildings and a seemingly-desolate and volatile landscape. Decisions needed to be made that introduced healthy limitations with regards to the site's possible expansions in order to tame the site for the sake of the Island's occupants, namely the colony of Gannets. It is important to note that this investigation was the first important step towards realising that I would be largely focusing on ecological ethics since it dealt with the concept of whether the architecture would have a healing or a detrimental effect on the island's ecology.

While identifying challenges with regard to the building type and proposed site, investigations into the appropriate method of generating a form for the design were conducted. Principles aimed at guiding the design process towards a unique and unconventional product were selected. Challenges were identified, specifically with regard to how conceptual ideas and notions become realistic, architectural approaches.

Structural solutions and resolved architectural manifestations were closely linked to the investigations on morphologies. This resulted in challenges with regard to the tectonics of the building and the logic which would be employed to design and detail the proposed project in an appropriate manner.

Fig 1,2 A Cape Gannet dives for its prey
(LeCouer, G. 2015: online)



Typology

It is important to note that the ontology, or essential nature, of the proposed design is that of observation as this is the first and most important step in any preservation effort. The typology of this project, however, is a combination of various typical and recognisable architectural typologies, namely preservation, visitor, living, research and, subsequently, multifunctional. Each of these typologies bears numerous archetypal connotations that need to be addressed. It was the choice of the client and user that determined this combination of typologies, creating the challenge of having a heavily client-led design brief.

Client

The client, SANPARKS, within the West Coast National Park, currently possesses Malgas Island and frequently visits it in order to gather data and intervene when issues arise. As will be discussed later, the buildings that are currently on the island do not sufficiently serve the needs of the client. Senior Park Ranger, Pierre Nel, made it clear that there is a very real need for more advanced research facilities, observation points, a new jetty, visitor facilities, office spaces, more humane space in which the people living on the island can stay, and refurbishment of some of the historical buildings. SANCCOB, which was introduced as an additional client since it rehabilitates any injured or sick birds, stated the need for a small stabilisation area on the island in which such birds can remain until retrieved by one of the organisation's boats, and transported to its headquarters.

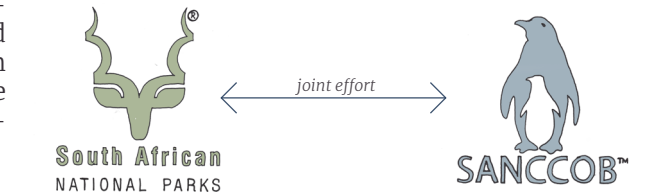


Fig 1,3 Different typologies

Fig 1,4 The two logos

Users

The users of the project include park rangers who will conduct research and observation on the island along with more dedicated nature conservationists and ecologists who will live on the island for up to two months at a time. In addition to these users, the West Coast National Park receives sixty to seventy Environmental Studies students from the University of Cape Town for approximately two weeks per year in order to provide them with fieldwork experience on Malgas Island. Furthermore, bird watchers and nature enthusiasts, such as myself, will be given the opportunity to visit the previously-restricted island on day excursions up to three times per week. This is an effort that will aim to create more awareness around the Cape Gannet colony, and provide additional income. It is important to realise that the aim of the proposed design is first and foremost to serve the original animal inhabitants of the island. A constant awareness should be maintained with regard to the fact that even though they do not use the building itself, the Cape Gannets are to be treated as the most important users of the project.

Rational Design Challenges and Aims

A design methodology that appropriately orders the programming of the building with its numerous functionalities should be generated. A clear distinction will need to be made between areas for public use, semi-public work and research, as well as private living. A strong hierarchy needs to be established with observation elements in order to indicate the importance of the island itself as well as its inhabitants.

Ontological Challenges and Aims

The essence of the proposed project will be to create as many observation spaces as possible in order to allow the users to fully monitor the happenings on the island without having to spread the building out across it. This inevitably means designing spaces that allow for free, unrestricted movement, as well as increasing the altitude from which one can observe. This ontological nature should be interwoven throughout the entire project.

Topology

The site is located among the existing structures found on the north-eastern edge of the island. The existing structures are currently in disrepair, under-used and abandoned. The island itself is very secluded, and is found within the larger context of Saldanha Bay and the West Coast.

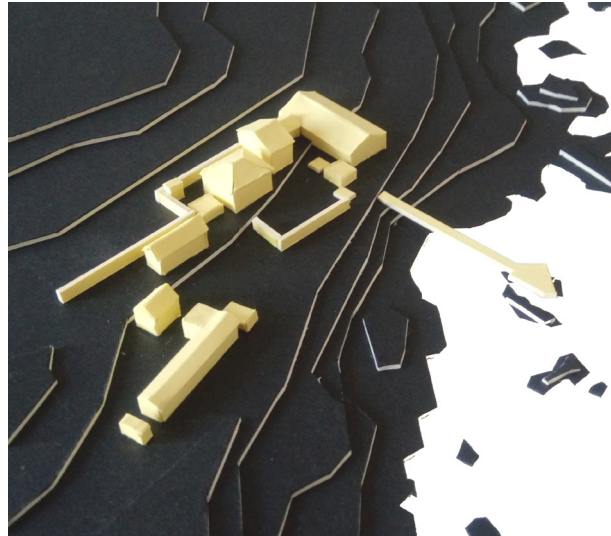


Fig 1,5 Early site model



Fig 1,6 Derived site plan

Quantitative Challenges and Aims

There are three structures and a jetty that are thought to have been constructed as early as 1835 in order to harvest the substance found in the Cape Gannet's nest called *guano*. Through this harvesting, the island lost almost six metres of height above sea level as the multiple layers of *guano* were stripped away. Many decades later, four additional structures were built which included a house and a garden. The architectural style of the earlier buildings represents the unique heritage of the West Coast style and should be conserved, whereas the later buildings hold little architectural value and are to be demolished. The project aims to work within the most historical buildings and lessen the visible footprint of the additional structures.



Fig 1,8 Inside an existing structure



Fig 1,9 Existing jetty supports



Fig 1,10 Inside an existing structure

Ontological Challenges and Aims

A stand needs to be taken on Malgas Island with regard to decreasing the presence of humans and equalising the ratio of population to allocated land. The presence of a personal garden on such a desolate island is not only superfluous but somewhat belligerent as well. There is a desperate need on the site for a certain connectedness between man and nature in which nature dominates and man observes. It is only when this is achieved that the project will be able to address its primary aim of preserving the Gannet colony.

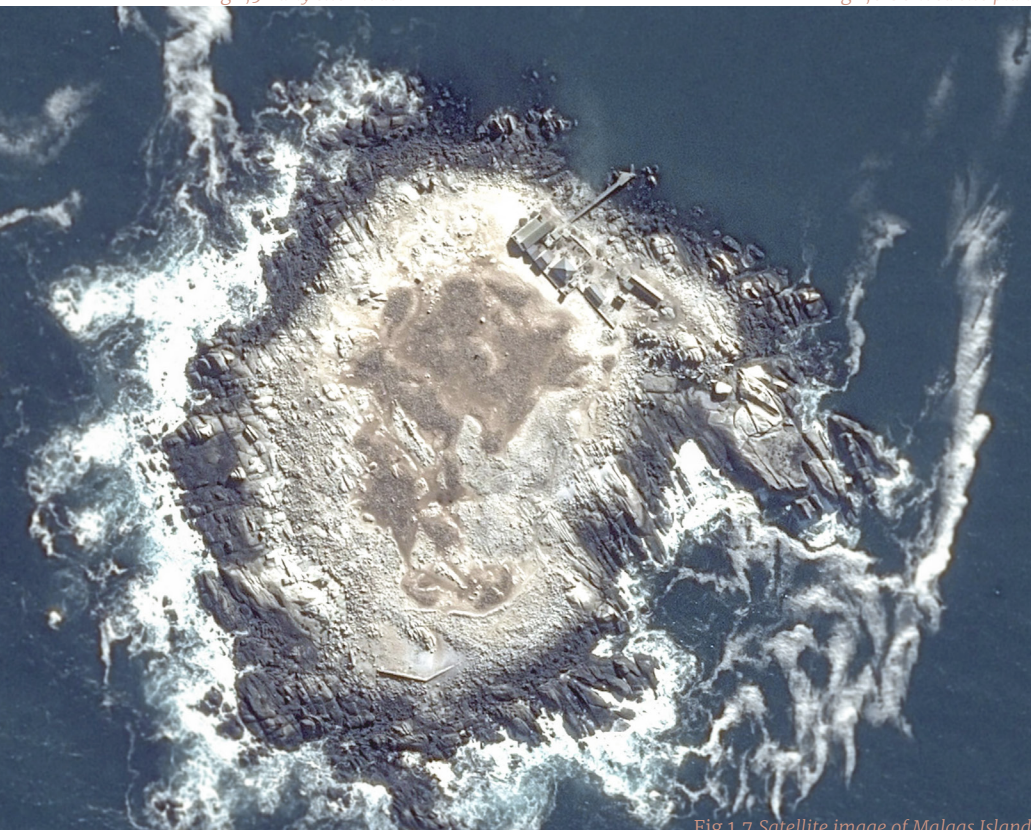
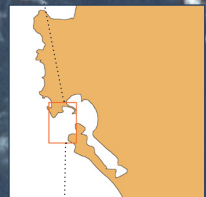
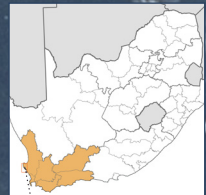


Fig 1,7 Satellite image of Malgas Island (GoogleEarth, 2016: online)



Fig 1,11 One of the oldest structures on site



Fig 1,12 Men load supplies onto the island



Fig 1,13 The current observation point

Morphology

It is my understanding that the existing buildings on the site that are worthy of being conserved are a clear West Coast vernacular and become the first place in which clues are to be found in terms of the proposed design's morphological approach. Ensuring that the existing vernacular structures are both utilised and acknowledged in the project, and that a new architectural language is introduced, is imperative to the success of the design. The island seems to be calling for a project that repurposes the good, removes the bad, and introduces some sort of innovative present.

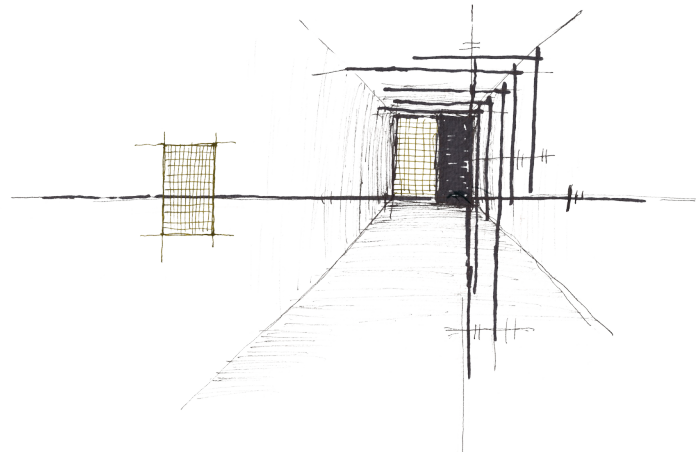


Fig 1,14 A preliminary conceptual sketch indicating ideas relating to existing and introduced structures

Challenges and Aims:

Designing preservation-focused, self-sustainable buildings often becomes a matter of unattractive and crude architecture due to its misunderstood limitations. Contrary to this, designing research-focused buildings often results in an absurdly technologically-advanced building. Bearing in mind that the project focuses on numerous aspects, the form of the building needs to address all the different archetypes while simultaneously creating a unified whole. The form should also attempt to metaphorically mimic the life and character of the ocean which is both solid and penetrable.

Tectonics

The structural approach to a building with sustainability goals on a secluded island must be carefully considered, as the most basic of tasks, such as transporting materials onto the site, are difficult. Each and every structural element must be designed in such a way that it is easy to transport and assemble, as well as being as light as possible on the ecology of the island. At the same time, the choice of such elements and their materials should make both ethical and structural sense in terms of the project.

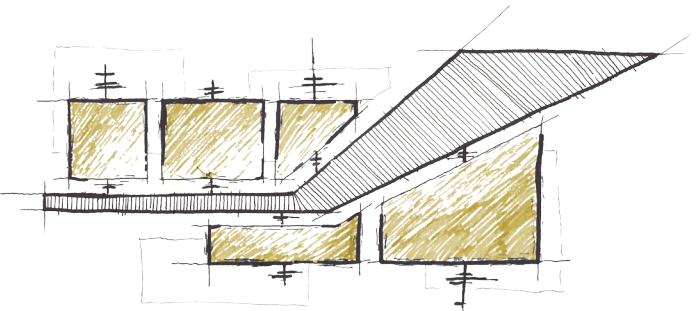


Fig 1,15 A preliminary conceptual sketch exploring a juxtaposition of structural solutions

Challenges and Aims:

Similar to the morphological challenges and aims, the structural resolution of the project needs to assist in creating a building that is true to its West Coast locality, as well as its goal of having both a solid presence, while being transparent and light in nature. Such an approach can only be achieved when elements such as glazing, column-to-ground connections and cladding are explored at an in-depth level.

Research Question

How does an **investigation** into an **architectural intervention** respond to an **endangered species**, an **existing vernacular** and **global sustainability trends** in an **ecologically-ethical** manner?

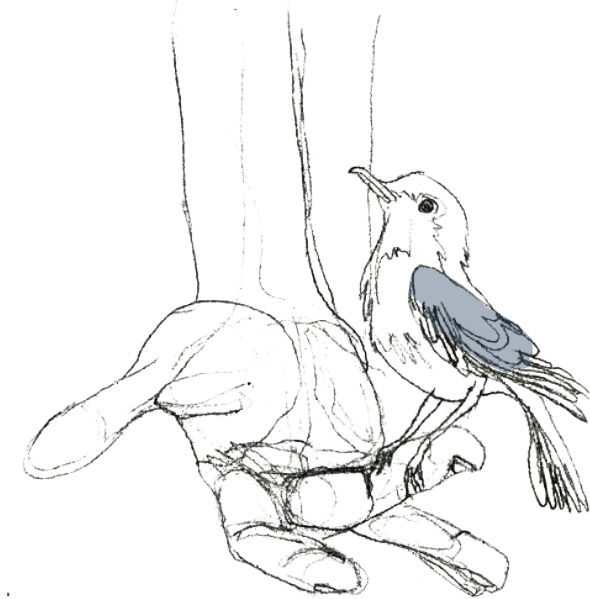


Fig 1,16 Sketch portraying the balance between man and nature

Challenges and Aims:

- Typology:** The project aims to effectively accommodate the multiple, seemingly different and conflicting programme requirements of both the client and user in a unifying manner.
- Topology:** The proposal aims to respond ethically towards the complex elements of nature, people, history and culture found on the site and within the larger context.
- Morphology:** The design aims to present an architectural form that contains a strong presence, a light nature, and a spatial connectivity with the surrounding ecology of the island.
- Tectonics:** The structural resolution of the project aims to indicate, in detail, a fully-dedicated approach to an architecture that is strong enough to survive on a volatile site, yet sophisticated enough not to appear to be dominating.



Fig 1,17 Panoramic view of the majority of Malgas Island

02

Investigation and Grounding

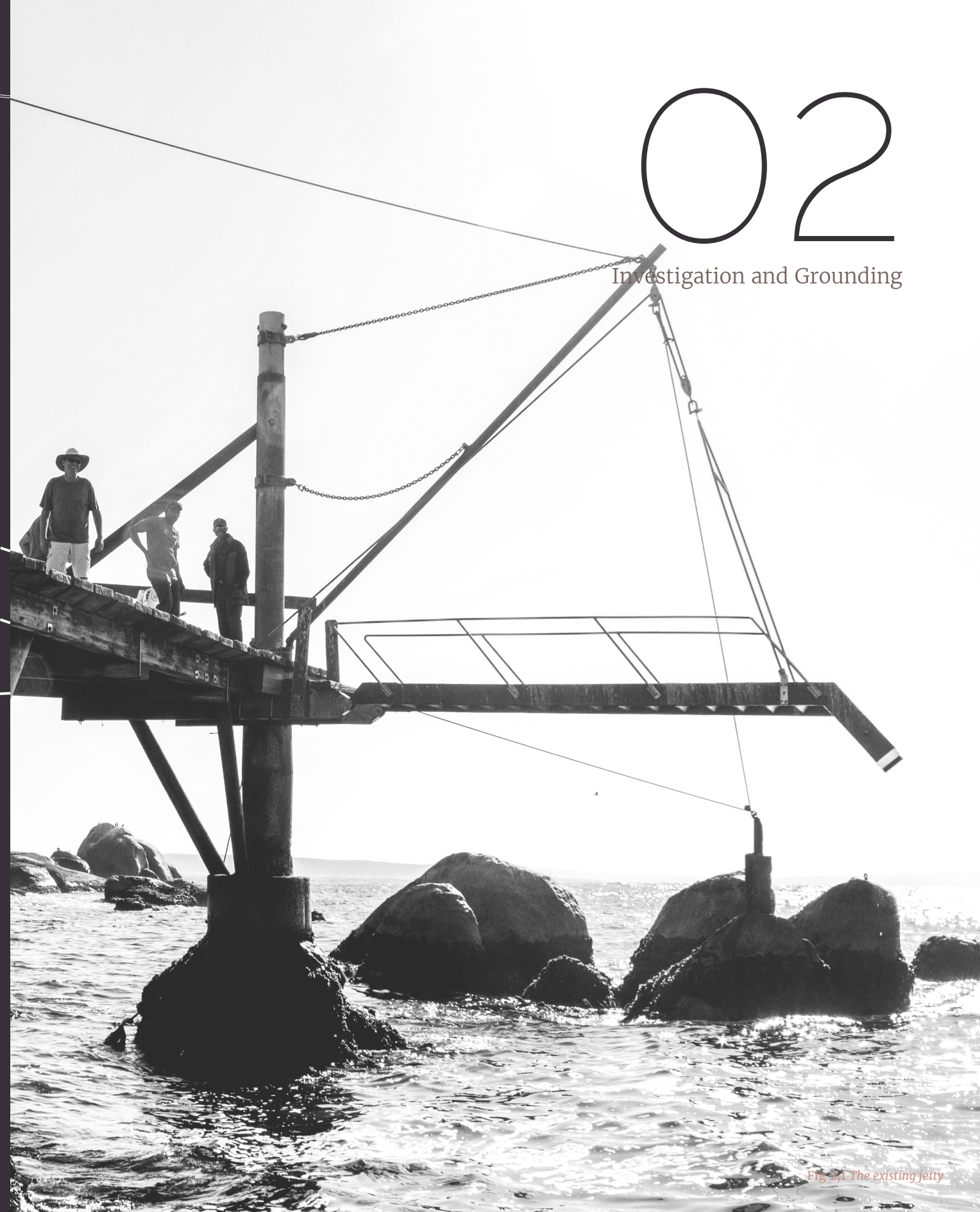
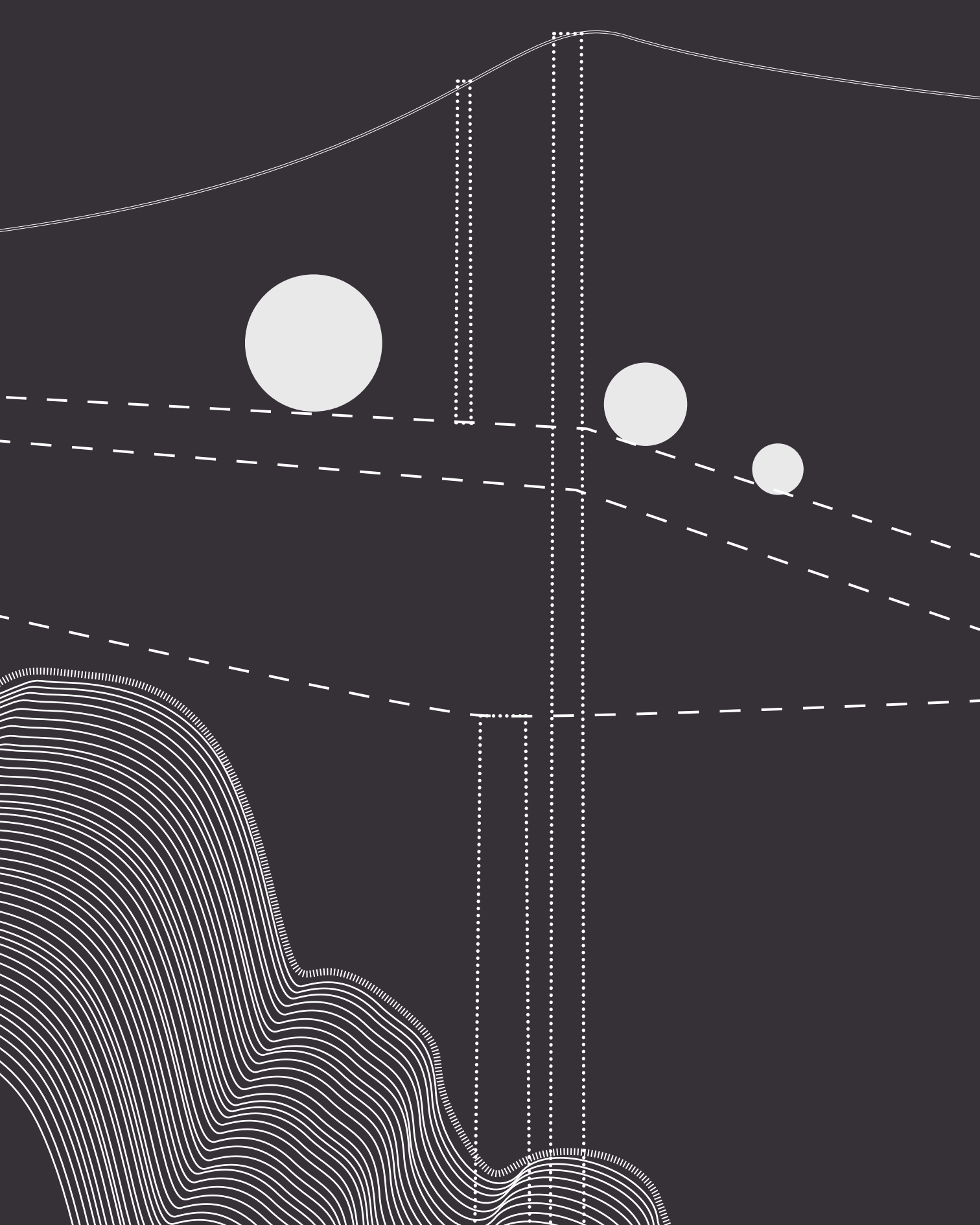


Fig 2.1 The existing jetty

Developing the most effective tactic for managing the project's challenges began with a number of conceptual and speculative explorations and investigations before moving on to more practical and concrete solutions. To begin this process, two touchstones were created as an abstract interpretation of my core ideas concerning the project. Using these touchstones as a point of reference, conceptual ideas were developed into more tangible elements that could be applied to some extent on the actual site. It was during these preliminary stages of the process that I became fully convinced that the notions of ecological ethics are the logical outcome of the project's main argument.

The interviews that were held with members of SANPARKS and SANCCOB are referred to in this section due to their relevance with regard to the foundation of the dissertation's focal discourse, as well as the fact that they fully substantiate the relevance of and necessity for this project. Following this, precedent studies, as well as a case study, that provide useful and relevant examples of the same typology, type of site, form-giving ideas and intended structural resolutions of the proposed design are explored.

Next, the proposed site for the project is investigated through two in-depth lenses, i.e. that of quantitative and cognitive analysis. The former attempts to clearly document the factual aspects of the site and its context such as climate, wind direction, existing buildings, building lines, measurements and existing architectural styles, whereas the latter delves into more qualitative aspects of the site such as my personal spatial experience, 'happy places', vistas and phenomena encountered during my visit to the island.

Following this site investigation is the main discourse and argument of the dissertation. This will be expounded upon in greater depth and divided into a speculative and practical investigation. All of the combined investigations will, inevitably, lead to a design methodology that I will attempt to follow throughout the design process.



Fig 2,2 Cape Gannet diving (Lamoreax, 2011: online)

Touchstones

Two 'touchstones' were created to detect the instinctual essence of the core issues facing the project, and as a point from which to measure further conceptual development.

The initial idea of how to approach the designing of an architectural intervention on Malgas Island was manifested through a construction touchstone. This concrete block with fibre optics cast within it led to the idea of proposing a structure that has a solid, bold presence as well as a light, transparent nature. Initially, I assumed that this would be achieved by lightly applying stereotomic structural methods to the site. I later realised that a more tectonic approach was needed. Nevertheless, this touchstone also served to indicate the simplicity with which I aim to resolve the structural design of the proposal.

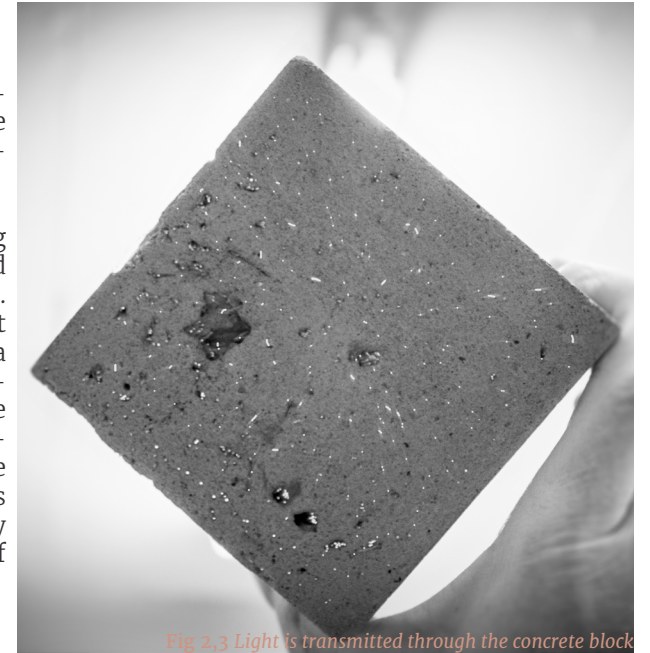


Fig 2,3 Light is transmitted through the concrete block



Fig 2,4 The process



Fig 2,5 The finished touchstone

The design touchstone was expressed in the form of a number of videos that were projected onto a flat surface with the aim of juxtaposing one another. The videos depicted objects falling and breaking in slow motion, followed by them being reverse reassembled, repeating this pattern in an endless loop. Above each of the separate videos were the whole, unbroken objects depicted in their matching video. Below each of videos were the broken pieces that had been collected after the videos had been shot.

I used this touchstone to pose the question as to whether architecture is able to repair that which had been broken by architecture in the past. This question developed into that of how architecture is to respond in an ecologically-ethical manner. Furthermore, the touchstone questioned whether a broken object can ever become exactly what it once was, or whether the process of repair generated something entirely new, such as in the Japanese art of repairing broken jars with molten gold.

The perpetual loop of the videos also served to represent the manner in which ecologies undergo repetitive cycles, especially when they are as volatile and ever-changing as that of Malgas Island. This inevitably calls for an element of consistency and permanence, making the viewer desire the pausing of the videos while the objects are still whole and undamaged.

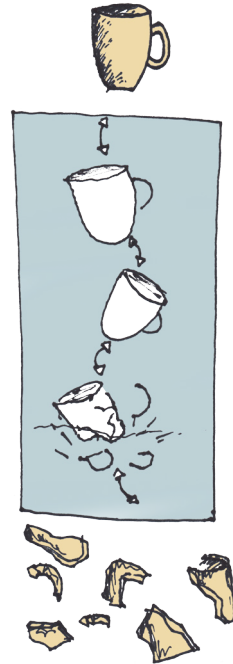


Fig 2,6 Initial sketch

Formative Conceptual Ideas

Once the initial ideas surrounding the project were manifested by means of a touchstone, more formative conceptual ideas were generated through the use of more site-specific sketches and conceptual models. This was achieved by working with an existing abstracted investigation into the main elements of the site plan, as well as the interpreted site section. Although three conceptual ideas were formalised, they all have a clear binding element, namely a clashing of opposites. This, I believe, is largely due to the inherent nature of the site being a depiction of a clash between man and nature, land and sky, predator and prey. As each conceptual idea was explored, it became evident what the conceptual framework for the project needs to be. It is important to understand that the models and sketches were specifically generated to assist more with the morphology of the project than the theoretical underpinning.

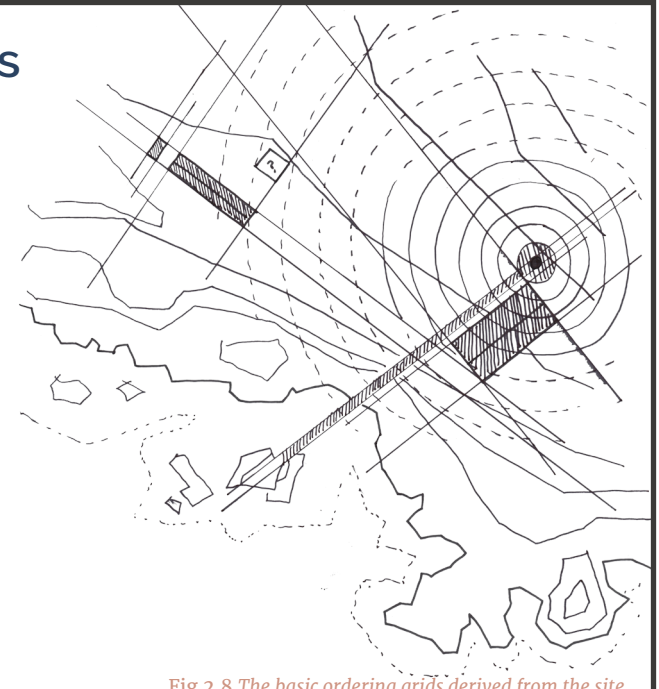


Fig 2,8 The basic ordering grids derived from the site



Fig 2,7 Still of the touchstone in motion

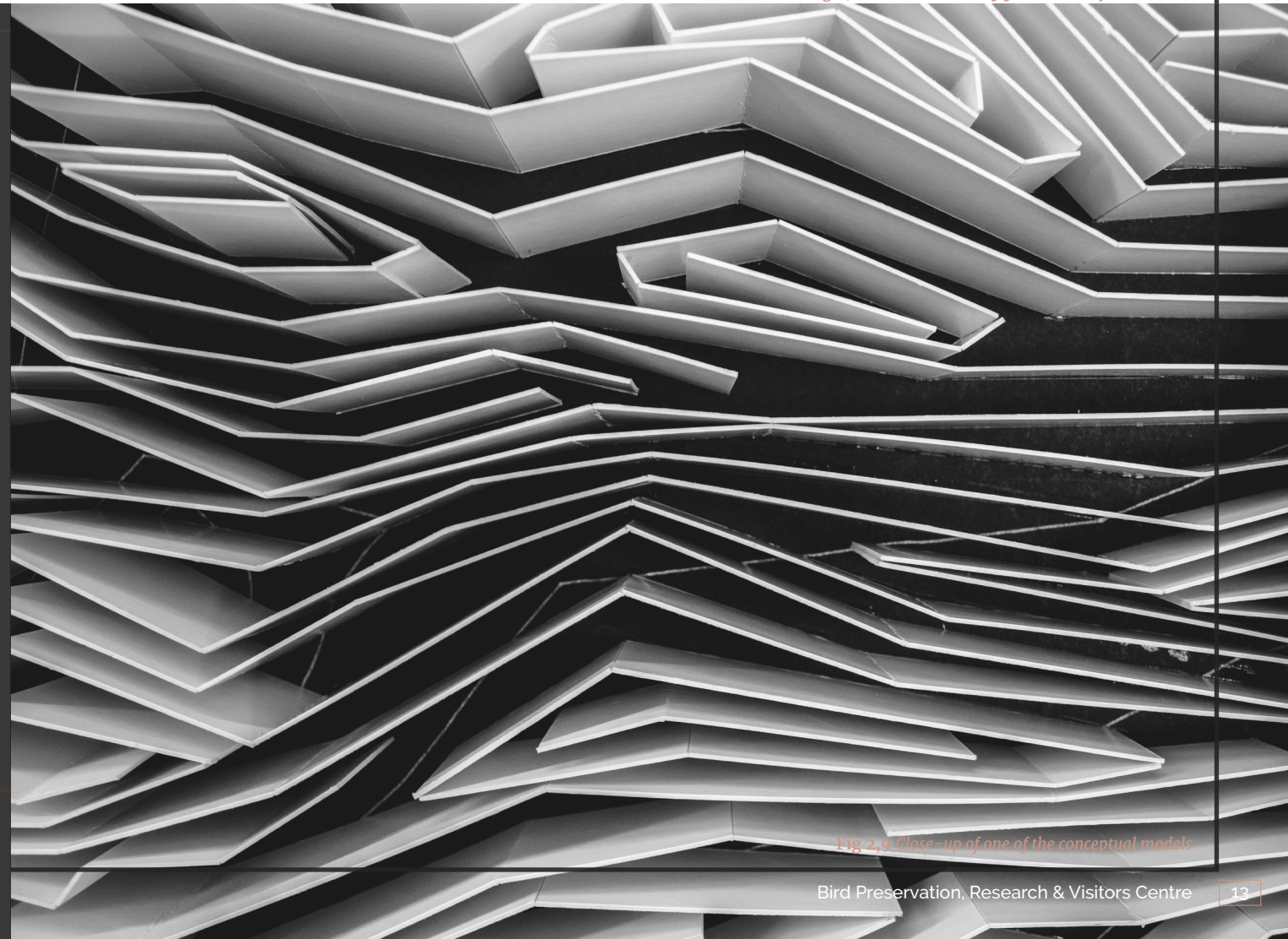


Fig 2,9 Close-up of one of the conceptual models

Tectonics and Stereotomics

The first concept deals with the balance of stereotomic and tectonic elements throughout a design in a sectional manner. This concept is furthered by bearing in mind the idea of the construction touchstone's 'applying stereotomics lightly'. It is also explored due to the need for tall, tectonic elements such as observation towers in the design, as well as a need to work with the highly-stereotomic structures of the existing buildings. The model explores the earth as the ultimate stereotomic element, followed by architecture as the in-between, and tectonic tower elements as well as bird activity as that which reaches beyond the constrictions of the ground into the sky. It is, inevitably, an exploration of balance and hierarchical positioning within the proposed project in order to guide the design process.

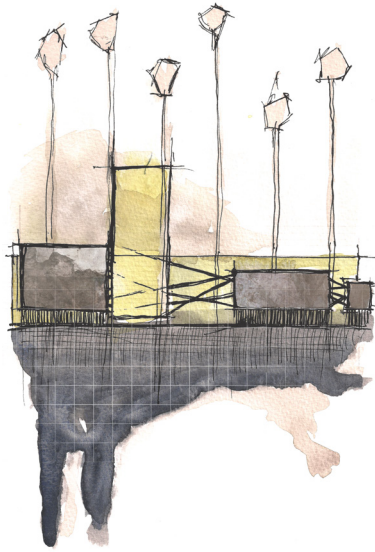


Fig 2,10 Tectonics and Stereotomics sketch

Order and Chaos

The second concept is inspired by two different phenomena found on site. Firstly, the existing buildings are situated on two distinctive grids, creating a clash of ordering lines on the site. Secondly, the Gannet colony has a clearly-designated 'runway' from which to take flight, yet when the birds land, it is in a clearly haphazard manner.

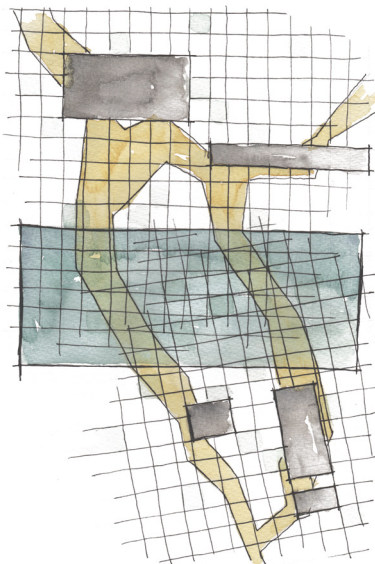


Fig 2,12 Order and Chaos sketch
Bird Preservation, Research & Visitors Centre

Through the above-mentioned occurrences, one is able to experience a clash between order and chaos. The model is an exploration into the binding of these clashing grid-lines and the positioning a proposed design could find within them. It searches for a mid-point between the opposites and principles used to establish order in a possible architectural intervention within the existing structures.

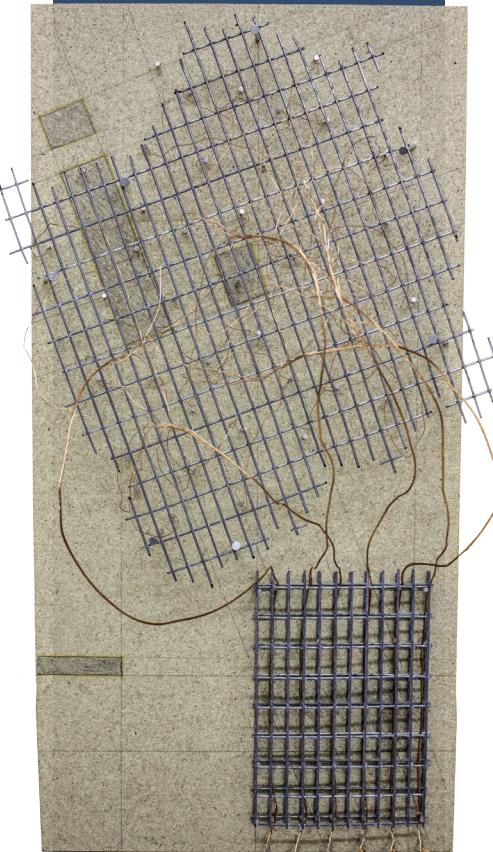


Fig 2,13 Order and Chaos model



Fig 2,11 Tectonics and Stereotomics model



Fig 2,14 Permanence and Ephemerality model

"Whereas three conceptual ideas were formalised, they all have a clear binding element, which is that of a clashing of opposites."

Permanence and Ephemerality

The ephemerality, or volatility, of not only the inhabitants and weather patterns on Malgas Island, but also the surface of the island itself, bring about an instinctual desire for some sort of permanence on the site. It is this desire for permanence that gave rise to the third conceptual idea. This concept questions whether some sort of permanent architectural intervention could disrupt, in a healthy way, the ephemeral qualities of the site, and bring about a sense of security and permanence. This goes hand-in-hand with the underlying principles of the preservation of nature, i.e. that human intervention does not always have to be destructive, but can sometimes be necessary to the survival of an ecological ecosystem.

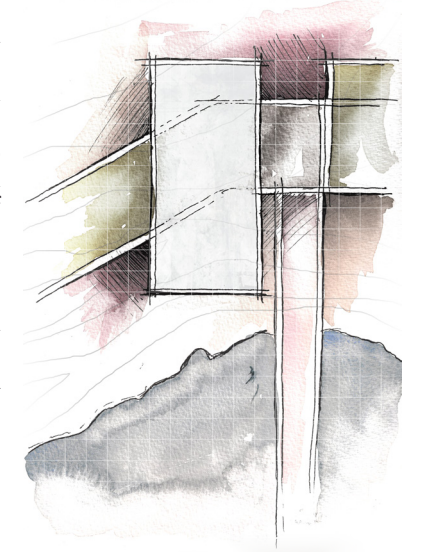


Fig 2,15 Permanence and Ephemerality sketch



Fig 2,16 Permanence and Ephemerality model

Conceptual Framework

The conceptual framework of the project inevitably deals with the questions raised in the problem statement, and does so in a manner which integrates the notions and viewpoints brought forward through the touchstones and formative conceptual models. Furthermore, there needs to be a theoretical underpinning that supports the way in which each of the incorporated typologies of the proposed design is to be answered.

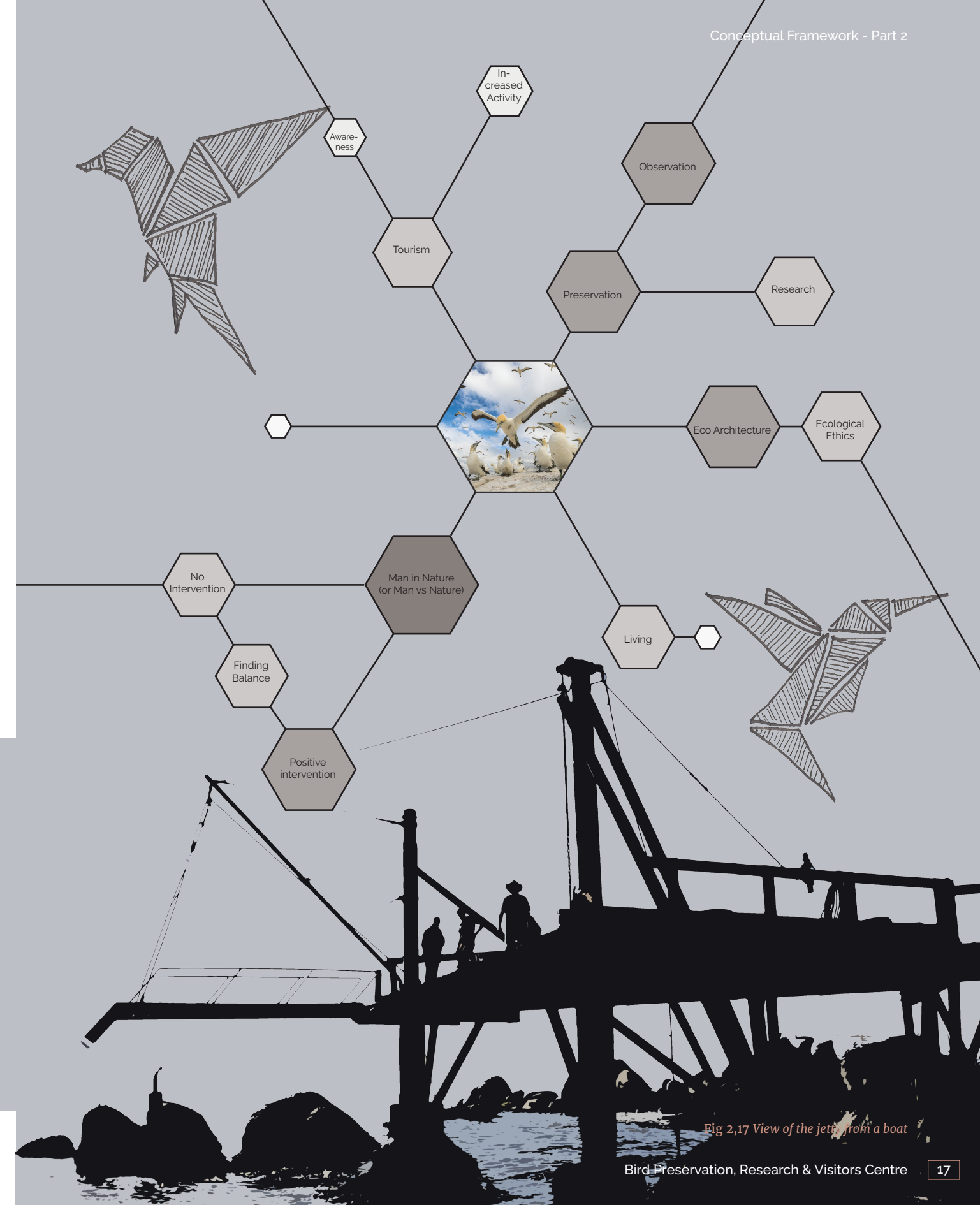
It is clear that the primary purpose of the building should be preservation. This will mainly be achieved by means of observation- and research-driven facilities.

Tourism will become a somewhat unexpected, yet important aspect of the project in that not only will it help to memorialise the Gannet colony, but it will also assist in funding preservation efforts. Allowing visitors onto the island will be a source of disturbance to the island. However, if monitored properly, it could have a very positive effect.

The question as to whether or not a building should be erected will remain unanswered throughout the study. This is due to my inescapable thought that, perhaps, if left completely alone, nature will be able to recover at a much healthier rate than if humans were to intervene. I suspect that the client's authentic need for infrastructure on the island will be enough to quell this apprehension long enough to complete the dissertation and propose an architectural solution.

Addressing the issue of designing an ecologically-ethical structure will undoubtedly move beyond following sustainability guidelines or even exceeding them. Instead, it will focus on the attitude and spirit with which the building is introduced to the island's ecology. In other words, the building's metaphorical presence will be more of an issue than how it supplies itself with water and electricity. This realisation is the first stepping stone towards an ecocentric dissertation.

Lastly, the fact that the project will provide space in which park rangers and nature conservationists can live on the island to conduct on-going research will result in the permanent presence of people on the island. This presents an interesting occurrence of what will essentially be two colonies working together to preserve the ecology of Malgas Island: that of the Gannets, as well as that of people.



“

Addressing the issue of designing an **ecologically ethical** structure will inescapably **move beyond following sustainability guidelines** or even exceeding them, but will rather move towards the **attitude and spirit** with which the building is **introduced to the island's ecology**.

”

Fig 2,17 View of the jetty from a boat

Precedent & Case Studies

Visited Case Study:

CapeNature Landscape Interpretation Centre, Lamberts Bay

Ruben Reddy Architects

2015

Bird Island Nature Reserve, just off the shore of Lambert's Bay on the West Coast, houses a massive breeding colony of Cape Gannets, and is one of only six such colonies in the world. Thousands of these birds, as well as Cape Cormorants, breed and roost on the island which is connected to the mainland by a breakwater, providing rare public access to these seabird colonies. Visiting this building became necessary in order to understand what architecture could look like when secluded on an island full of birds, with little context except that of the surrounding nature. It is from this visit that I first considered timber cladding as an answer to the problem of designing an ecologically sensitive morphology.

The reserve features a modern bird hide that provides an insider's view of the colony (pictured below), allowing one to discreetly watch the birds nesting, feeding and socialising. Bird Island was once also home to a thriving African penguin colony. Gannet dung or guano, a highly-prized ingredient used in fertilisers, was collected in abundance on the island from 1888 to 1990. During this time, penguin eggs were also collected, which all but wiped out the resident colony. Conservationists have erected artificial structures on the island to encourage the penguins to breed once again and, today, the colony numbers have increased substantially. More recently, new structures such as the CapeNature Landscape Interpretation Centre have been introduced. Ruben Reddy sought to manifest the sensitivity of the site into his design by creating a shell of timber cladding around the main structure, an idea that also struck me as being relevant to my proposed site.

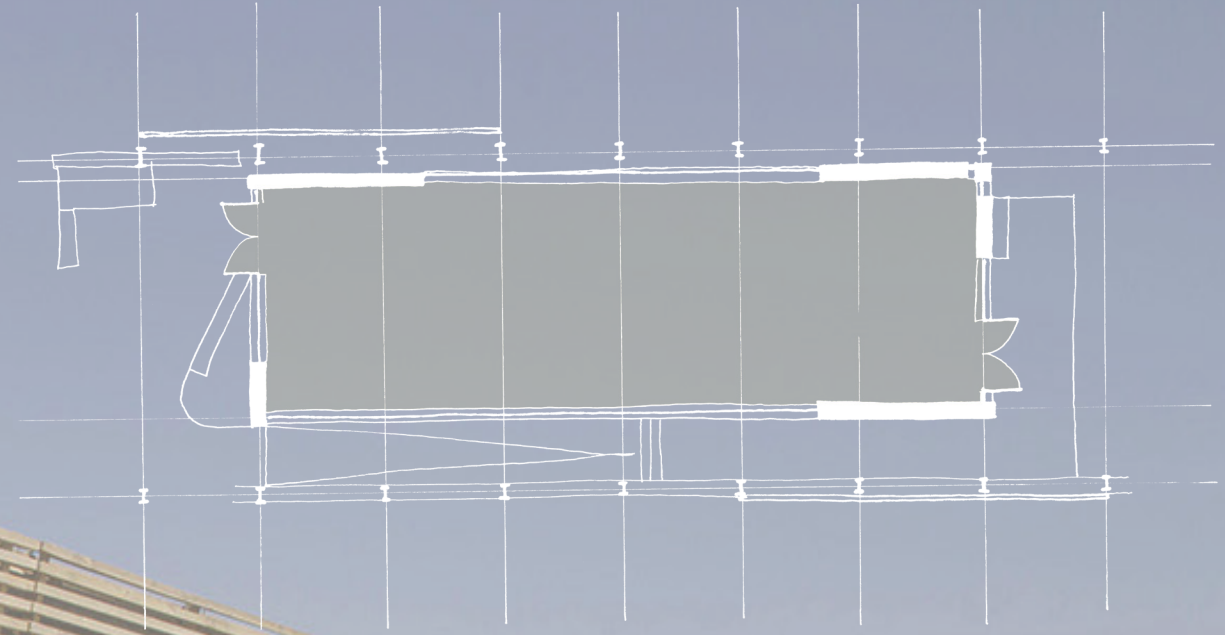


Fig 2,20 Floor plan as derived by author



Fig 2,18 The Cape Gannet colony of Lamberts Bay



Fig 2,19 The bird hide on Bird Island

Lessons Learnt:

- Tourist access is handled in a way that does not disturb the birds;
- Structures are unimposing and light;
- Has begun to access the multi-functional potential, such as tourism and education, as well as research and conservation;
- Has managed to draw attention to the area despite the restricted access; and
- Has not only served its micro-context, but the larger context of Lamberts Bay as well.

Fig 2,21 The Landscape Interpretation Centre

Research Centre in Cape Horn, Chile Ennead Architects Under Construction

Featuring a cladding of pre-weathered steel, the design of the centre draws its inspiration from the dramatic landscape of the site, within the UNESCO Cape Horn Biosphere Reserve on Navarino Island.

The region is a temperate rainforest with a delicate ecology. The centre hosts programmes in education, sustainable tourism, and subantarctic research across a range of disciplines. The building comprises a series of three pavilions, one for each programmatic area, linked by a glazed bridge structure (Dezeen, 2015: online).

Set into the side of a bluff, each pavilion emerges from the land to form a peak, evoking the mountain ranges all around the site.

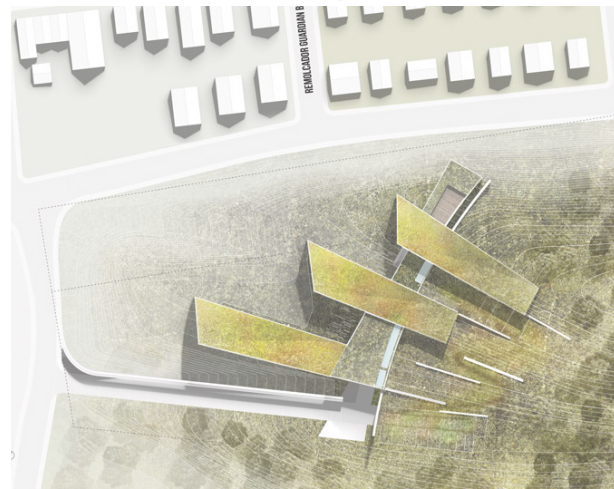


Fig 2,22 Site Plan (Dezeen, 2015: online)



Fig 2,23 Artists Impression (Dezeen, 2015: online)

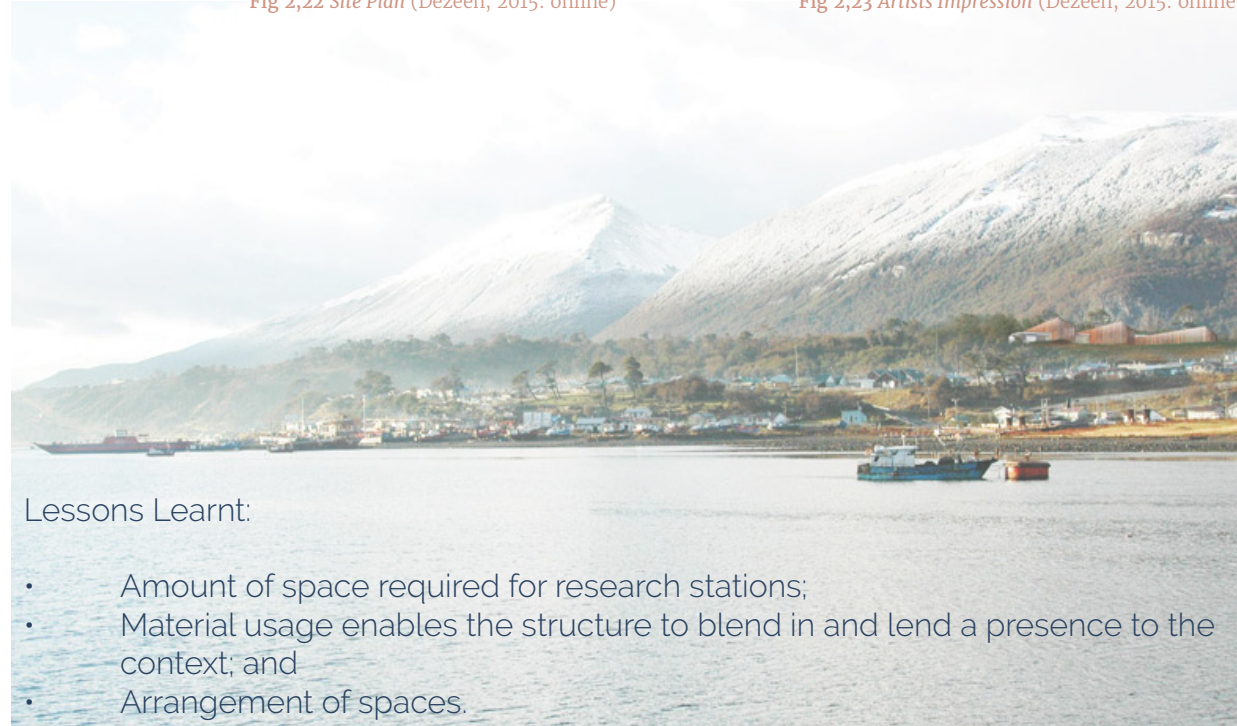


Fig 2,24 View from the sea (Dezeen, 2015: online)

Lessons Learnt:

- Amount of space required for research stations;
- Material usage enables the structure to blend in and lend a presence to the context; and
- Arrangement of spaces.

CRAM Foundation Research Centre, Spain Hidalgo Hartmann Architects 2010

CRAM Foundation is an organisation that is dedicated to the protection of the environment and the species that inhabit it. Its main activity is the clinic and rescue of endangered marine species, which will later be reintroduced to the wild. The Foundation also carries out different lines of work in conservation, investigation and education, all accompanied by social awareness campaigns on the state of the marine environment and its problems.

The new facilities of the CRAM Foundation are located on the former golf course of El Prat de Llobregat. The project incorporates part of the existing constructions, such as two outdoor pools and a building, housing the former Kindergarten of the Golf Club. This building was totally refurbished and is designed in part to serve the administration of the whole complex, and in part to inform and disseminate the visitors of all the activity of the CRAM (ArchDaily, 2015: online).

This design manages to use hard materials, such as concrete and steel, as well as hard geometries in such a way that it makes a bold impact on the site in a sensitive manner. The framed approach allows the structure to have views straight through it, and allows for minimal impact on the actual surface of the terrain.



Fig 2,25 Elevation view (ArchDaily, 2011: online)



Fig 2,26 Aerial view (ArchDaily, 2011: online)



Lessons Learnt:

- Lightness & transparency can still make a strong impression on a site
- Structural detailing leads to aesthetic improvement

Fig 2,27 View from the forest (ArchDaily, 2011: online)

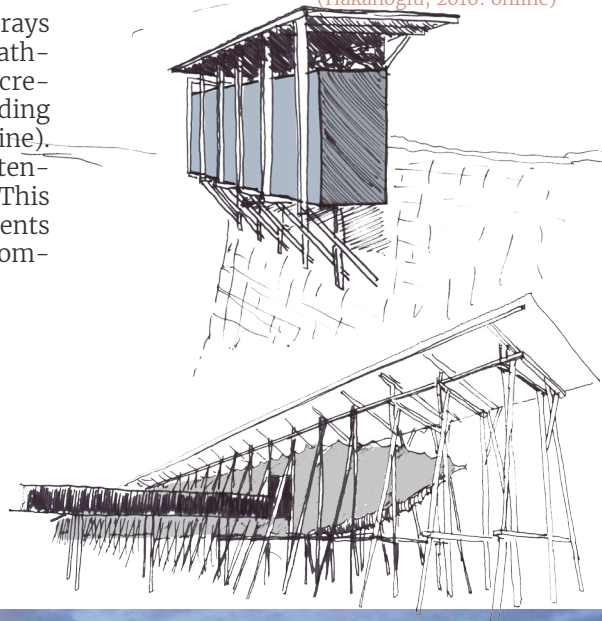
Zinc Mine Museum & Steilneset Memorial Peter Zumthor 2014 & 2012

Peter Zumthor creates intensely surreal spatial experiences, from what I can observe. His utter fascination with meticulously planned-out architectural detailing results in him taking as long as 10 years to design some structures, such as the Zinc Mine Museum in Norway (seen right). He treats the various structures within this design scheme with extreme care, ensuring that their connection with the earth is as light as possible. Despite the design's light and precarious aesthetic, the spaces within the design are housed within solid, stark boxes held within the light timber frames (Hakanoglu, 2016: online). There is a harmony with the surrounding nature, speaking of how the long, thin trees connect with the solid, mountainous ground. This is a fine example of architecture metaphorically mimicking the surrounding nature. This technique of design will hopefully find its way into my dissertation.



Fig 2,28 & 2,29 One of the Zinc Mine Museum structures (Hakanoglu, 2016: online)

Similarly, the Steilneset Memorial, also in Norway, portrays a completely unassuming morphology lightly atop the rather volatile site. This design's unique timber structure creates both a solid facade and a translucent frame, depending on where the viewer is standing (Rosenfield, 2012: online). The spatial experience of the building happens within a tensile fabric structure suspended within the timber frame. This juxtaposition of solid and light, framed and walled elements allows the viewer to move through various different phenomenological experiences while visiting the building.



Lessons Learnt:

- Metaphorical imitation of nature
- An unassuming presence within the context
- Spatial experience within solid structures
- Sensitivity towards the surface of a site



Fig 2,30 & 2,31 Views of the Steilneset Memorial (Rosenfield, 2012: online)

Construction Study (to serve as the manner in which the proposed building shall be analysed in the Technical Report):

Fogo National Park Headquarters, Cape Verde
OTO Architects, 2012-2014

The Fogo National Park Headquarters in Cape Verde no longer exist. Within seven months of the building's inauguration ceremony, the mighty Pico do Fogo volcano erupted, causing heavy lava flows to completely consume a large portion of the island, including the 3 200 m² structure, seen below (Klemetti, 2014: online). A proposal which initially aimed at providing a multi-functional structure within the Fogo National Park to provide a formalised, centralised place in which aspects of research, conservation, education, administration and tourism could take place was put forward. The Cape Verde Minister of Agriculture, financed by the GOPA organisation, commissioned OTO Architects to design a building that would provide the various functions, as well as communicate with the surrounding landscape, namely the crescent formation of mountains, large volcano and dry, sulphurous surroundings.

OTO Architects presented the client with a design that imbues elegance through stereotomics. The natural landscape, which is strikingly marked by the volcano and its crater, possesses a unique and rare beauty, aspiring to become a world heritage site. The idea was therefore to achieve 'a balanced solution, where architecture and landscape become accomplices, complementary to each other'. The mass of the building is comprised of a continuous skin composed of local black masonry block - a mixture of cement and ashes from the volcano (OTO, 2014: online).



Fig 2,32 Time laps of satellite image (GoogleEarth, 2016: online)



Fig 2,33 Soon after construction (OTO, 2014: online)

Environment & Micro-Climate

Due to its positioning slightly north of the equator, the country of Cape Verde is situated within a climate that differs greatly from that of South Africa. The average temperature remains relatively constant throughout the year, an occurrence that would create a tropical climate were it not for the presence of the large volcano and the subsequently strong presence of volcanic ash and dry heat (OTO, 2014: online).

Almost the entire island has been zoned as a protected nature reserve due to the unique environmental and soil properties, as well as an interesting collection of animal species. Apart from the local farming villages and researchers, there is very little habitation of the island, creating quite a desolate and empty landscape.

Fig 2,34 Large scale locality map

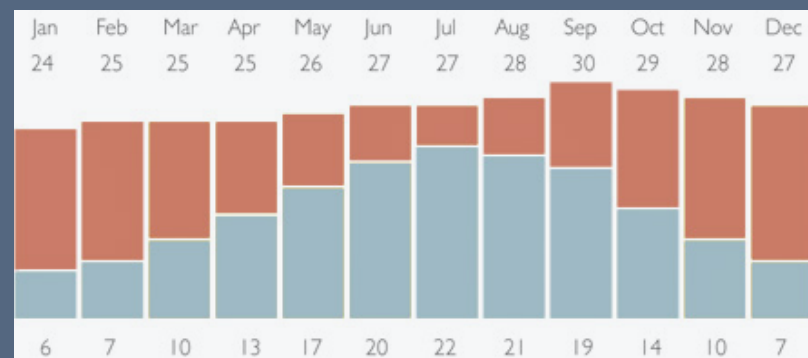
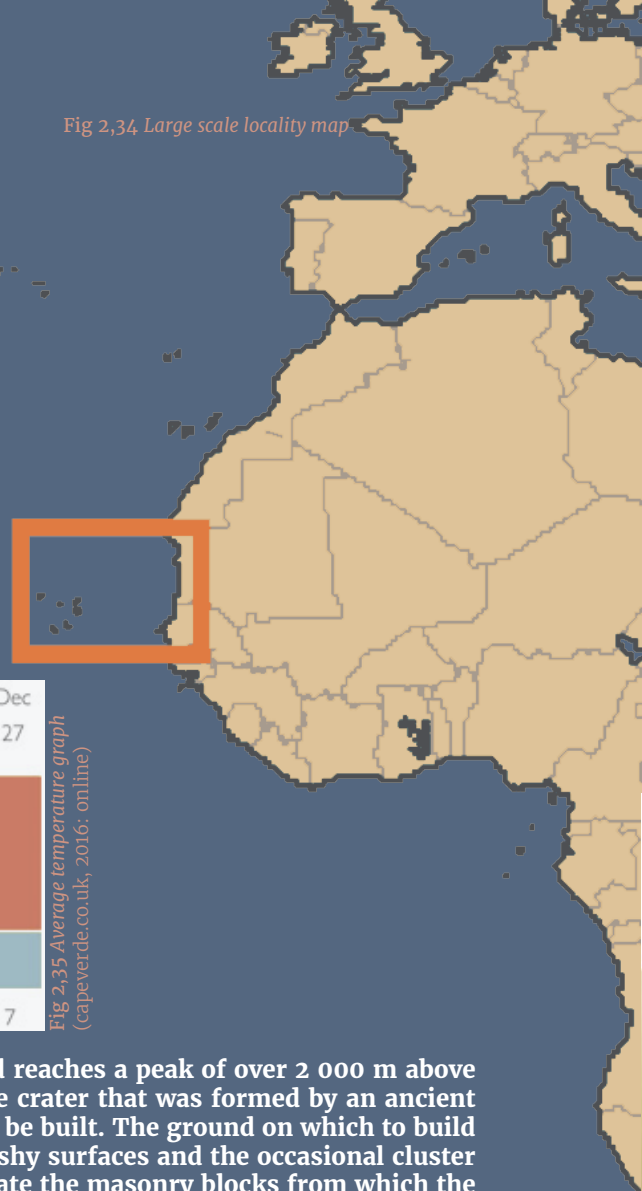


Fig 2,35 Average temperature graph (capeverde.co.uk, 2016: online)

Being a volcanic island, Fogo rises swiftly from the water and reaches a peak of over 2 000 m above sea level on the crest of Pico do Fogo volcano. It is within the crater that was formed by an ancient eruption of the volcano that a site was selected upon which to be built. The ground on which to build within the site largely consists of volcanic rock formations, ashy surfaces and the occasional cluster of grass. The ash found on site was mixed with cement to create the masonry blocks from which the design was constructed (OTO, 2014: online). The all-encompassing walls of the volcanic crater create a strong feeling of restricted vistas, resulting in a carefully-selected orientation for the building, one that looks onto and past the large peak of Pico do Fogo.



Fig 2,36 The building against its backdrop (OTO, 2014: online)

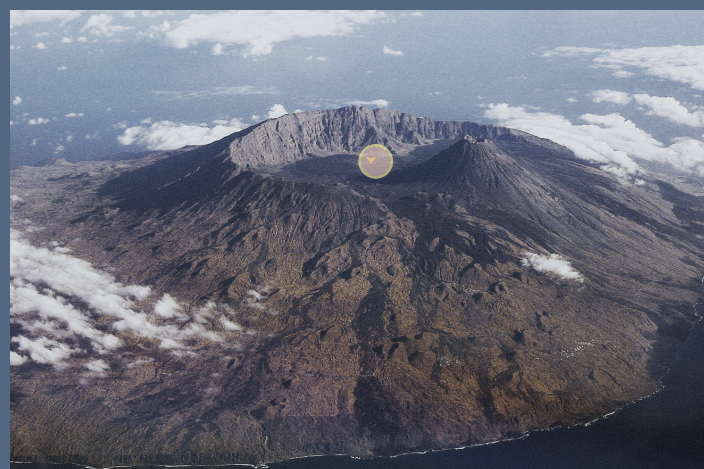


Fig 2,37 An aerial view (OTO, 2014: online)

User Behaviour and Requirements

On Fogo Island, at an altitude of 1 800 metres, in the crater of the volcano, lies a village of about 1 200 inhabitants who live on the fringes of legality, occupying state-owned land where agricultural activities are organised and carried out as a means of subsistence in one of Cape Verde's poorest regions (capeverde.co.uk, 2012: online).

The status of protected area of national interest forced the zoning of farming, with obvious limitations to construction, and introduced rules against the free occupation of the town, generating conflicts of interests and frequent clashes. The outlines for the project emanate from the need to consolidate the identity of this protected region, providing a basis for the conciliation of the population with the new park management. Spaces for the interplay of cultural and recreational activities were thought of as a feasible solution, both for the people of Chã das Caldeiras, as well as for visitors (OTO, 2014: online).

The building, in its short-lived usage, became a place for locals to visit frequently, and use as a public meeting space given its amphitheatre and public rest-room facilities. This became a very important phenomenon due to the fact that the people of Chã das Caldeiras are considered to be extremely poor and practically live off the land provided to them. The National Parks Headquarters became both a social and economic anchor for the people of the surrounding area.

Very few requirements were stipulated by the client as a project brief, but OTO Architects were commissioned to investigate and suggest a structure that could become a source of upliftment for both the Natural Park as well as the local farming communities. While the Headquarters were fully operational, the Natural Park was increasingly valued, which contributed to the enrichment of the social, cultural and economic sectors of the island, which began to integrate harmoniously with, and enhance, the surrounding space as required by the client.

The challenges with regard to the shortage of local resources became an opportunity and the building was made by the people, for the people, using local materials and techniques (OTO, 2014: online). The requirements of the building, developed alongside initial designs and concepts, were successfully fulfilled and effectively executed for the period of time before the volcanic eruption.

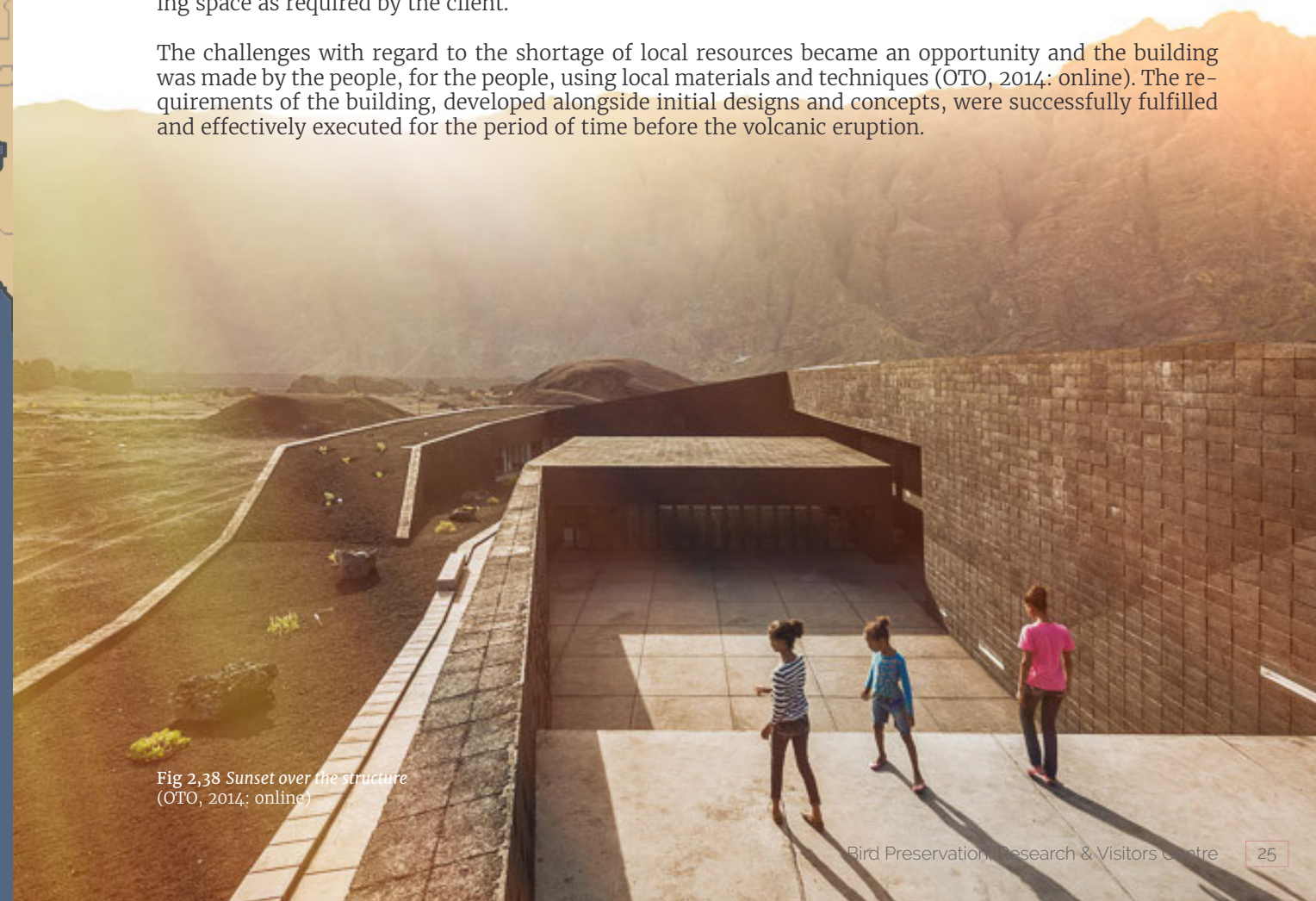


Fig 2,38 Sunset over the structure (OTO, 2014: online)

Site Planning

Positioned alongside one of the three developed roads on the island, the building is accessible to both local users and international researchers and tourists. The chosen site was easily levelled as only several volcanic rock formations and very little shrubbery had to be removed. The building was orientated towards the volcano, resulting in an east-facing main façade. Landscaping was kept to a minimal arrangement of basic indigenous shrubs and volcanic rocks that had been excavated during construction. A vehicular entrance was created from the road, as well as multiple pedestrian routes into and around the building. The feeling experienced as one enters the site is that of entering the surrounding mountainous formations of the old volcanic crater (OTO, 2014: online). The overall effect of the site development is that of an unobtrusive, naturally-formed and inspired technique.

Utility & Space Enhancement

As the design shifts from internalised to externalised spaces, it is utilised in different ways. External spaces are public spaces, whereas internal spaces are more private, research-driven spaces. The building's landscape furniture and external auditorium, as well as its courtyard and mess hall are utilised by the general public. Access becomes more restricted, however, as one moves inward towards the research laboratories and administration offices (OTO, 2014: online). The various layers are designed in such a way that one does not feel restricted to a certain part of the building, but instead remains unaware of the presence of the more private sections of the design. This is achieved through careful spatial design.

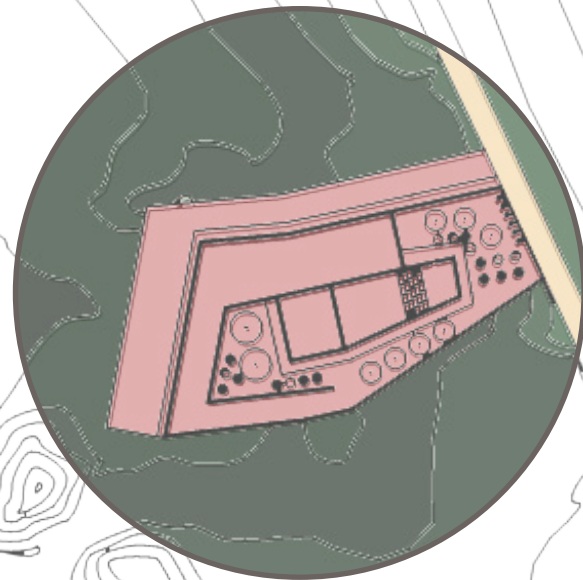


Fig 2,39 Site Plan
(Edited from: OTO, 2014: online)

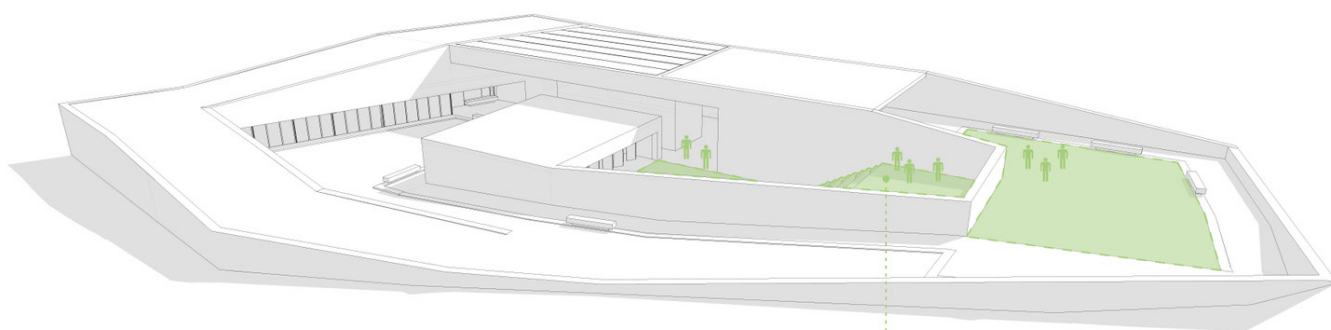


Fig 2,40 Basic 3D morphology
(Edited from: OTO, 2014: online)

SOCIAL INTERACTION
The local community is considered as a driving force for the project, which seeks to develop adequate spaces for social interaction. A caffè and internal/external auditoriums act as stages for cultural and recreational activities.

Spatial Design

Spatial design is one of the most successful aspects of the Fogo National Park Headquarters. This is largely achieved through the way in which circulation paths move continuously from one space to the next, gradually taking the user into the different compartments of the structure. The manner in which external space flows into an internal space is simultaneously profound and soft. Perhaps this is due to the consistent usage of material and subtle change in levels. The gradual angles at which one moves through the building generate a sense of ease as one moves towards another space within the structure (OTO, 2014: online).

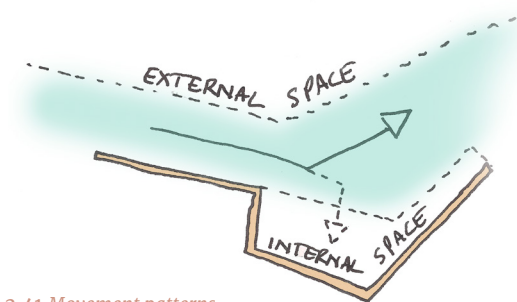


Fig 2,41 Movement patterns

Circulation Techniques

Horizontal movement throughout the building is addressed by gradually revealing new spaces while concealing others. The slightly angled lines of the structure's movement paths and walls create a natural line for users to follow, with as few harsh corners as possible. This creates a strong feeling of natural flow throughout the design, and lends itself to a similar approach to vertical circulation (as discussed under Vertical Circulation). Rather than entering the building's internal spaces at the usual 90 degrees, one is drawn into the building at a diagonal angle instead. The differing height of the external walls serves to draw users and visitors towards the large opening that serves as the main entrance to the structure (ArchDaily, 2015: online).



Fig 2,42 Vertical circulation
(OTO, 2014: online)

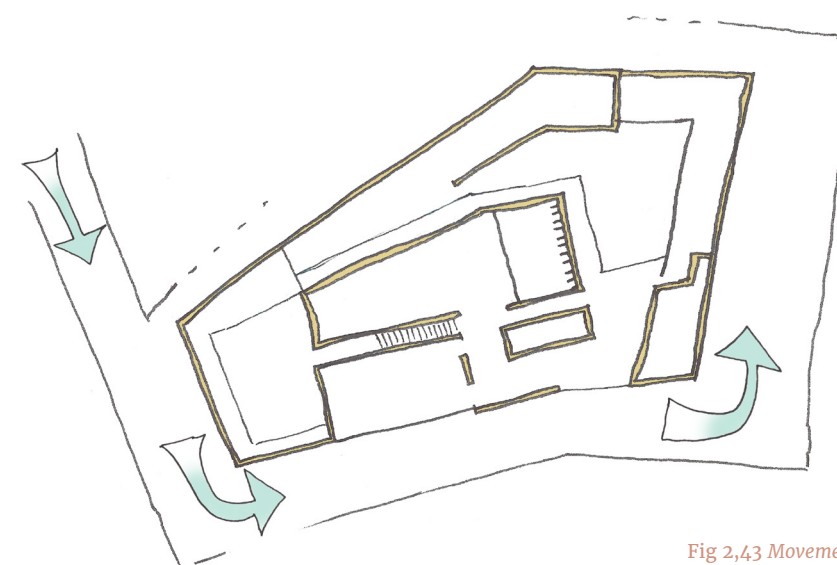


Fig 2,43 Movement patterns around the structure

The vertical circulation is dealt with in a gentle manner that is similar to the horizontal circulation. While stairs are only used to access higher levels of the outdoor auditorium, the rest of the structure makes use of gradually-sloped ramps that wind around and throughout the structure, providing accessibility to all areas of the structure in an unobtrusive manner. Internal ramps are finished with the same floor finishes as the rest of the building, making them seem invisible. The external ramps are covered in paving gravel to assist animals in accessing the limited plantation on the roof of the structure, as well as allowing durable access to services such as solar panels and water collection tanks (OTO, 2014: online).

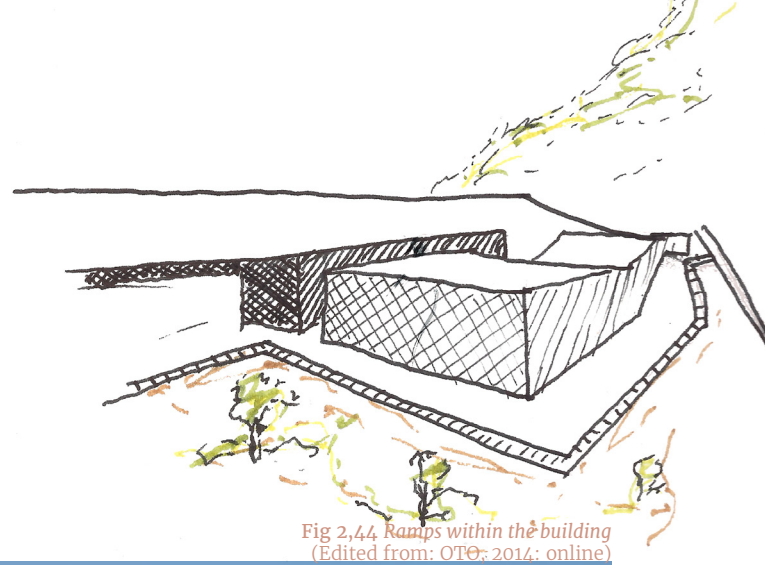


Fig 2,44 Ramps within the building (Edited from: OTO, 2014: online)

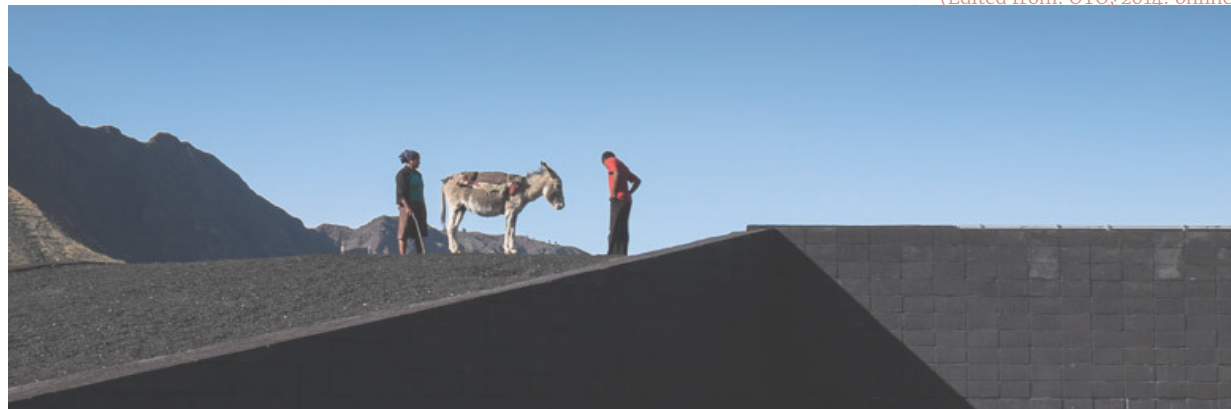


Fig 2,45 Access roof (OTO, 2014: online)

Form and Function

Essentially, the design is a multi-functional structure. Apart from the client's specific requirements – meeting rooms, offices and labs for the park's volcanologists and biologists – the architects enjoyed a great deal of freedom, and took advantage of learning what the inhabitants of the area wanted and needed. Their discussions with locals led to the addition of several facilities to the building, namely an outdoor cafe and, in the cultural sphere, a library, and an open-air and a covered auditorium. Some of these functions were new while others were meant to augment those already in existence in Chas das Caldeiras. The indoor auditorium, for instance, could serve as a cinema, which the town had previously lacked. This covered hall had been set aside for scheduled programmes and events, but its open-air counterpart gave the local population a space in which to freely create, stage and watch their own performances, as they did at the inauguration. In seeking to provide adequate spaces for social interaction, the architects managed to connect with the community, and help people recognise the park's headquarters as 'nos casa' in the land of Djarfogo, another home in their homeland (Martins, 2015).



Fig 2,46 A series of spaces (OTO, 2014: online)

The architects did not limit themselves to the 'form follows function' principle. An aesthetic intention, present throughout the design, showed that they wanted the building to be comfortable, referential and balanced, but also technologically on target. A good example was the way in which they responded to the untamed landscape with walls that enveloped the building in an inward spiral. Extending upwards from a road that had also been destroyed by the eruption, the complex climbed like a protective arm, wrapping itself around its contents and shielding them from the savage surroundings yet, ultimately, inviting visitors to view the vast 'wilderness' in all directions (Martins, 2015). OTO Architects have been quoted as saying 'the design doesn't make sense anywhere else' (OTO, 2014: online).



Fig 2,47 The building's exterior (OTO, 2014: online)

Design Detailing

Most of the Fogo National Park Headquarters was completely accessible to disabled users due to its use of large, gentle ramps that move between the two levels of the structure. There was a very minor need for this feature, however, due to the fact that wheelchairs are regarded as luxuries that cannot be afforded by most local users, no allowance was made for disabled toilets in the design.

Accessibility in terms of 'openness' and freedom of use is worth mentioning as the building was designed to become a bridge between rural local users and their government. It became a design that freely opened itself up to the local users, allowing them to explore it on every level, providing shelter during their daily travels, and giving them a space to meet and be entertained.



Fig 2,48 A light shaft allows interaction (OTO, 2014: online)



Fig 2,49 The gentle ramps encourage movement (OTO, 2014: online)

Structural System & Details

The structural method used was perhaps the largest contribution to the building's success and merit, not only because it meant that the architects were employing local techniques in an immensely creative manner, but also because it led to the aesthetic appearance of a striking, yet unassuming, design within the desolate landscape.

The structure speaks the language of stereotomics: heaviness, solidity, mass, and load-bearing. The mass of the building is comprised of a continuous skin, composed of local black masonry block - a mixture of cement and ashes from the volcano. Ashes are also used to cover the roof and exterior areas, blending nature and construction in a natural symbiosis. During the daytime, the long walls outline the building and blend in with the road, suggesting the existence of spaces through an interplay of shadows, all of which is due to the application of the chosen structural method.

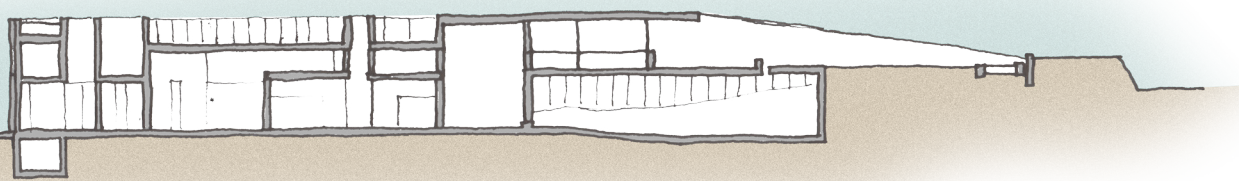


Fig 2,50 A section through the building

Despite the building's humble appearance and ability to blend in with its surroundings on an exterior level, it does not shy away from a bold plan and sectional design. From substructure to superstructure, the structural method is continuous and strongly monolithic, providing the opportunity to create strong spatial enclosures within the building, as well as a sense of continuing the landscape throughout the design.

Some merit should be given to the structural integrity of the stereotomic, concrete-block design due to the fact that when the lava struck, the southern wall of the structure held out for an entire three days before buckling under the weight of the molten rock and allowing the eventual collapse and submersion of the building (Martins, 2015).



Fig 2,51 Lava exposes the structural elements (OTO, 2014: online)



Fig 2,52 Cross section (OTO, 2014: online)

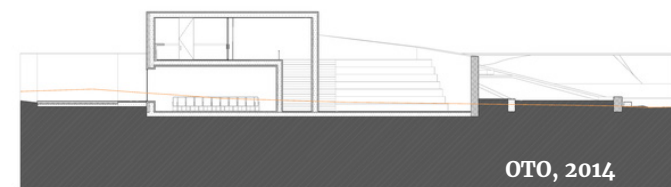


Fig 2,53 Cross section (OTO, 2014: online)

Interpreted Structural Details

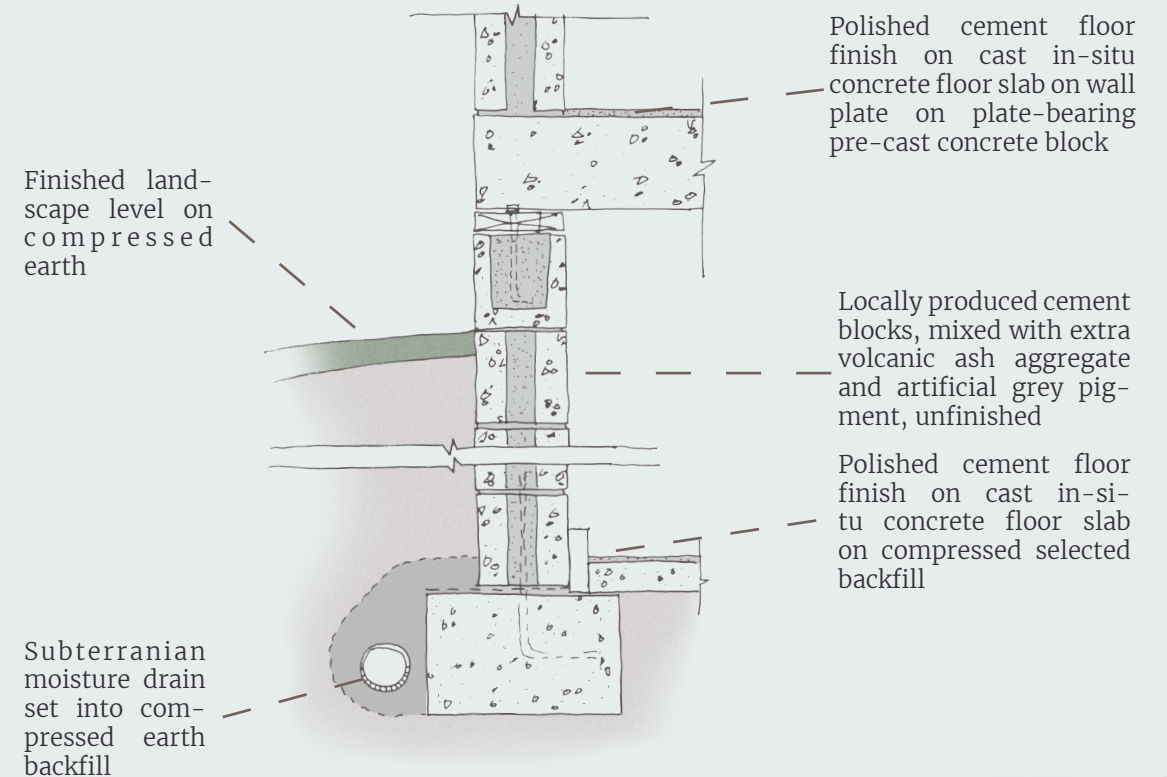


Fig 2,54 Typical wall-to-floor

Gable wall capped with dark slate tiling using local plaster

Volcanic ash stones on mild steel angle on water-proof membrane on cast in-situ roof slab

Plaster and paint ceiling finish

Locally produced cement blocks, mixed with extra volcanic ash aggregate and artificial grey pigment, unfinished

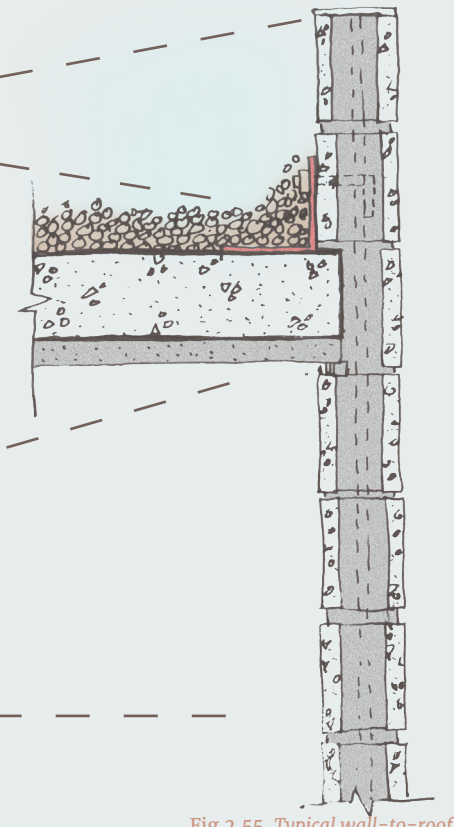


Fig 2,55 Typical wall-to-roof

Sustainability

Another driving force behind the final building was the need for an off-grid, self-sustaining building. This inevitably touched on every facet of sustainability: environmental, cultural and material.

These requirements were largely due to a location with no connections to water, sewage or electricity networks. The architects also had to contend with the shortage of materials on site, not to mention the difficulties and costs associated with transporting them.

In addressing the need for a self-sustaining building, the architects worked with engineers, Maria Joao Rodrigues and Joao Parente to develop various solutions. The building's LED-based lighting system was powered by photovoltaic roof-mounted solar panels. Integrated into the façade was a system for the passive control of indoor temperatures (Martins, 2015).

Rainwater was collected, using the relatively large surface area of the main roof structure, and guided into several large water storage tanks positioned underneath one another in the building. This water was then recycled and utilised for domestic and irrigation purposes. Thereafter, even the grey-water itself was collected and recycled. The inclusion of a small standby generator and a backup clean-water tank averted possible emergencies (Martins, 2015). This water collection method solidified the design's total independence on such a desolate site, providing a working example of the possibility of sustainable technology in contemporary architecture globally.



Fig 2,56 Electric sustainability (OTO, 2014: online)

Fig 2,57 Water sustainability (OTO, 2014: online)

Conclusion

The Fogo National Park Headquarters was an immense success during its short life span. It not only served as an example of effective, site-driven architecture, but also managed to serve the community of users and visitors in the most proficient of ways. From material usage to structural integrity, the design achieved success on a practical and architectural level, displaying the need for thorough contextual research and knowledge of local construction methods. Ultimately, an investigation into OTO Architects' award-winning project has led to a larger understanding of stereotomic structure that manages a sensitive approach as well as a site-specific form and structural system. Despite its tragic end, what began as a rather scary idea - the realisation of an important structure in the midst of a virginal landscape - remains a momentous, worthwhile endeavour for the architects, and an example of how considerate architecture can be employed to create positive bonds between people and space.

Lessons Learnt:

- Sustainable passive systems can lend an immense amount of creativity towards a design.
- Methods of metaphorically mimicking a structure's surroundings
- Nature must be allowed to dominate, and even destroy buildings, in some cases

Fig 2,58 The building in the starlight (OTO, 2014: online)

Interviews

Two interviews were conducted in order to gain an understanding as to the preservation needs on Malgas Island. The underlying question posed in both interviews was: 'If anything could be done in order to assist nature preservation efforts within the West Coast National Park, what would it be?'. This, together with more practically-oriented questions, led to the compilation of the following information.

Pierre Nel, South African National Parks Board

06 January 2016

12:30

It was during this interview that Malgas Island and its need for proper infrastructure were introduced to me. I was informed of the existing buildings on the island which dated back to as early as 1835. At the same time, I was made aware of their inability to meet the needs of the researchers, and the preservation efforts of the park rangers. Ultimately, SANParks needs buildings that lend themselves to their users, not inherited guano warehouses from the 1800s. As romantic as it might sound to conserve all of these existing buildings, the harsh reality is that the numbers of Cape Gannets on the island are dwindling, and sentiment must take second place before time to intervene runs out.

The need for accommodation, tourism and information centres, research laboratories, preservation offices, stabilisation and treatment units, and observation towers was identified during the interview. Ideally, these would be contained within both selected existing structures, as well as through the introduction of a new structure on the island.

Most importantly, perhaps, I could not help but become passionate about Malgas Island, as well as thoroughly motivated to do justice to the opportunity presented to me. I could not help but throw myself wholeheartedly into the task that now lay before me.



Fig 2,59 Business card

Representative from SANCCOB

12 January 2016

14:00



Fig 2,60 Edited SANCCOB logo

the island due to the lack of professional staff and the large amounts of fresh water needed for this

The need for a stabilisation and treatment space in the proposed project is based on SANCCOB's need to retrieve the stabilised birds and transport them safely to their headquarters in Table View in order to be rehabilitated. During this interview, it became apparent that the birds could not be fully rehabilitated on

process. It was discovered, however, that only last year, over 180 Cape Gannets were received from Malgas Island for rehabilitation. This process could be made much safer and quicker for the birds if they were to be stabilised on the island itself before being transported.

The main rehabilitation focuses on juvenile birds which have been left behind on the island due to irregular breeding patterns that lead to them missing the migration. They are then taken to SANCCOB in order to gain enough weight and strength to join the migration as soon as possible. It also became clear that the research facilities on the island should include offices, medicine storage spaces, cold rooms, durable laboratory surfaces, as well as space for sick or injured birds to acclimatise to such alien surroundings.

Site Investigations

Visiting the fascinating Malgas Island in its current state is nothing short of a thrilling adventure. The journey began in Mykonos Mariner, in which a thirty-minute journey across the sea ensued. After this journey, which included the spotting of dolphins and seals, the boat approached the existing jetty, which currently stands a daunting three metres above the ocean's surface. Due to the ever-present wind, I was instructed to climb onto the nose of the boat while a ladder was winched down from the jetty by the people currently completing a long shift on the island. As a result of being unable to anchor or fasten the boat to the jetty, it was then guided as closely as possible to the ladder. Upon the signal, I had to make the leap from the boat and grab hold of the cold metal rungs of the ladder. As soon as I had climbed the ladder and found my footing on the weathered timber jetty, Malgas Island stood before me in all its small and humble glory.

During my visit to this highly-restricted island, I was able to soak in as many phenomenological experiences, felt overwhelmed by the raw natural beauty that surrounded me, and completed a rough survey of the existing buildings on the island. This survey was important as the buildings have no existing plans, let alone an overall site plan. It was also important to establish the ideal positioning for a proposed design among all of the historical structures. Once the visit was over, however, a more in-depth, reflective site investigation could take place.

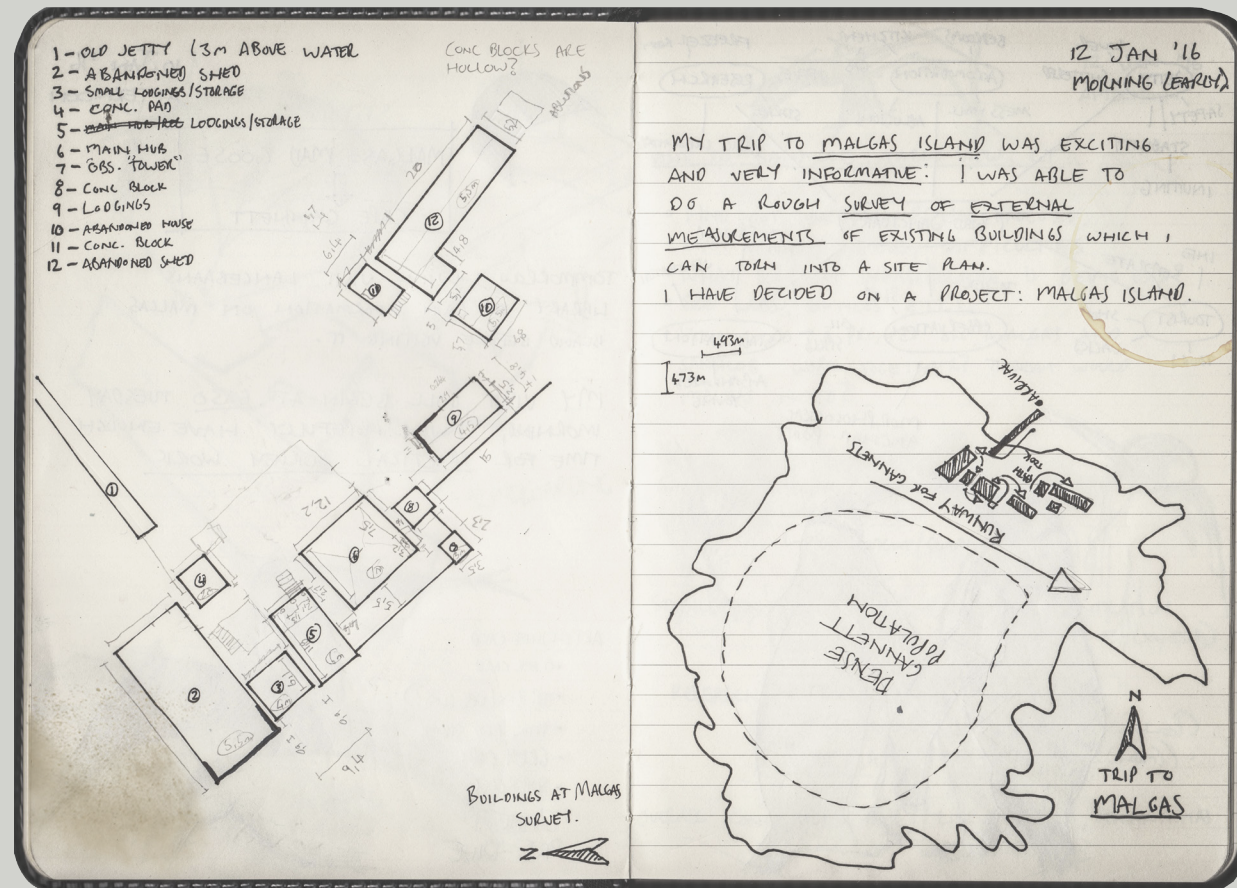


Fig 2,61 Scanned pages from my journal

Quantitative Analysis

As previously mentioned, the small, 8,9 hectare island contains 25% of the planet's Cape Gannets. The existing structures on the island date back to as early as 1835, with a number of the structures being introduced at a later stage. The earliest buildings to be constructed on the island include the two warehouses and kitchen, whereas the latest buildings are the living units. The small area inhabited by people makes up a mere 2,6% of the island's total surface (still too large a space for the number of people who once inhabited it). It is extremely important that the proposed project does not exceed the bounds of the site already in existence as this would radically disturb the bird colony's breeding space and patterns.

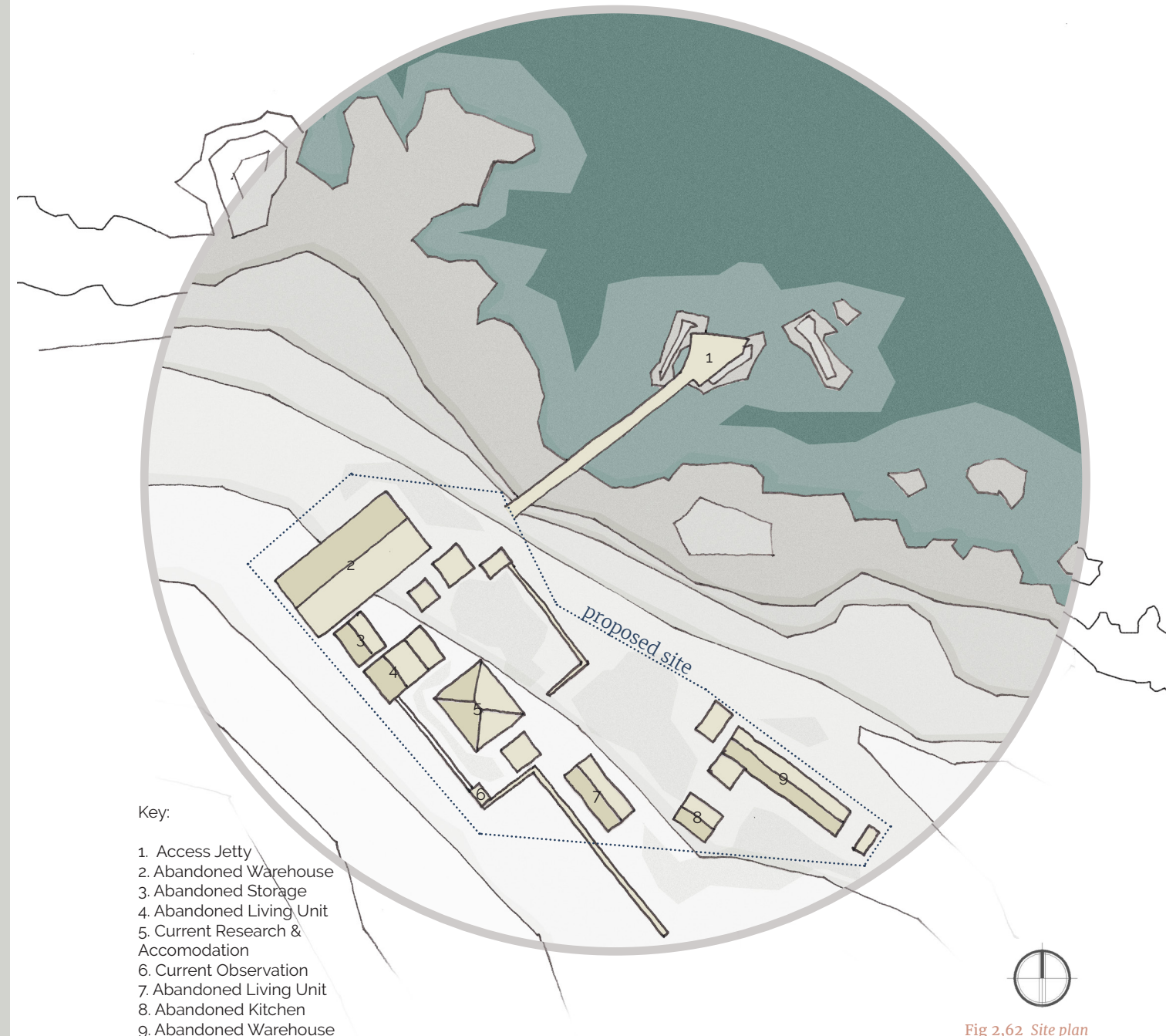


Fig 2,62 Site plan

Two site sections were generated using surveyed measurements. These drawings indicate the evident flat surface area on which the existing buildings have been constructed.

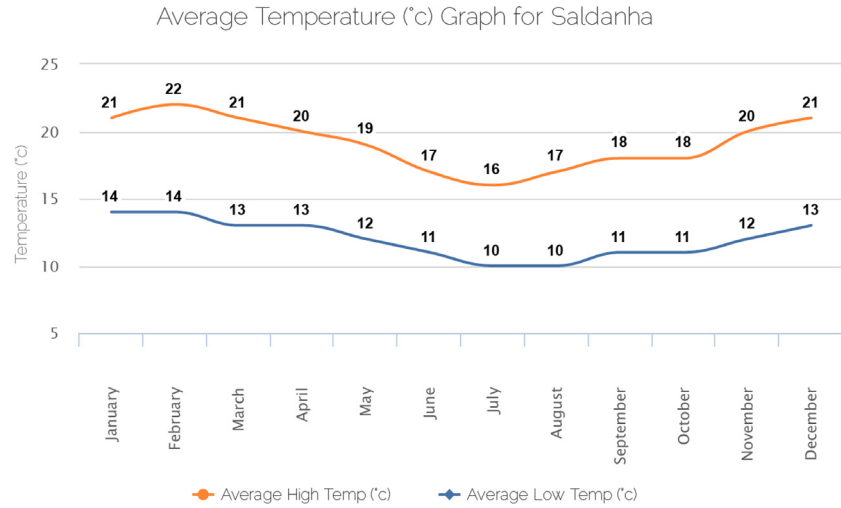


Fig 2,75 (Adapted from: WorldWeather, 2016: online)

Following this was an investigation into the average temperature and rainfall of the area, which will aid the structural resolution of the building.

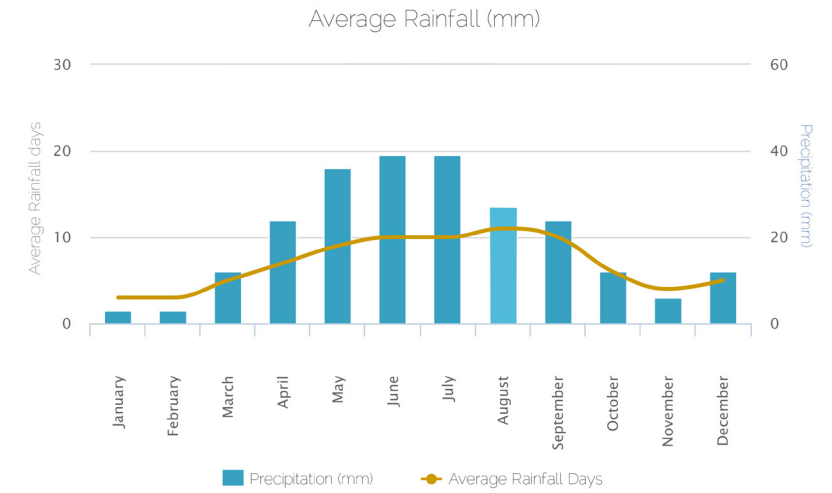


Fig 2,76 (Adapted from: WorldWeather, 2016: online)

Graphs drawn using: www.worldweatheronline.com/saldanhaweatheraverages

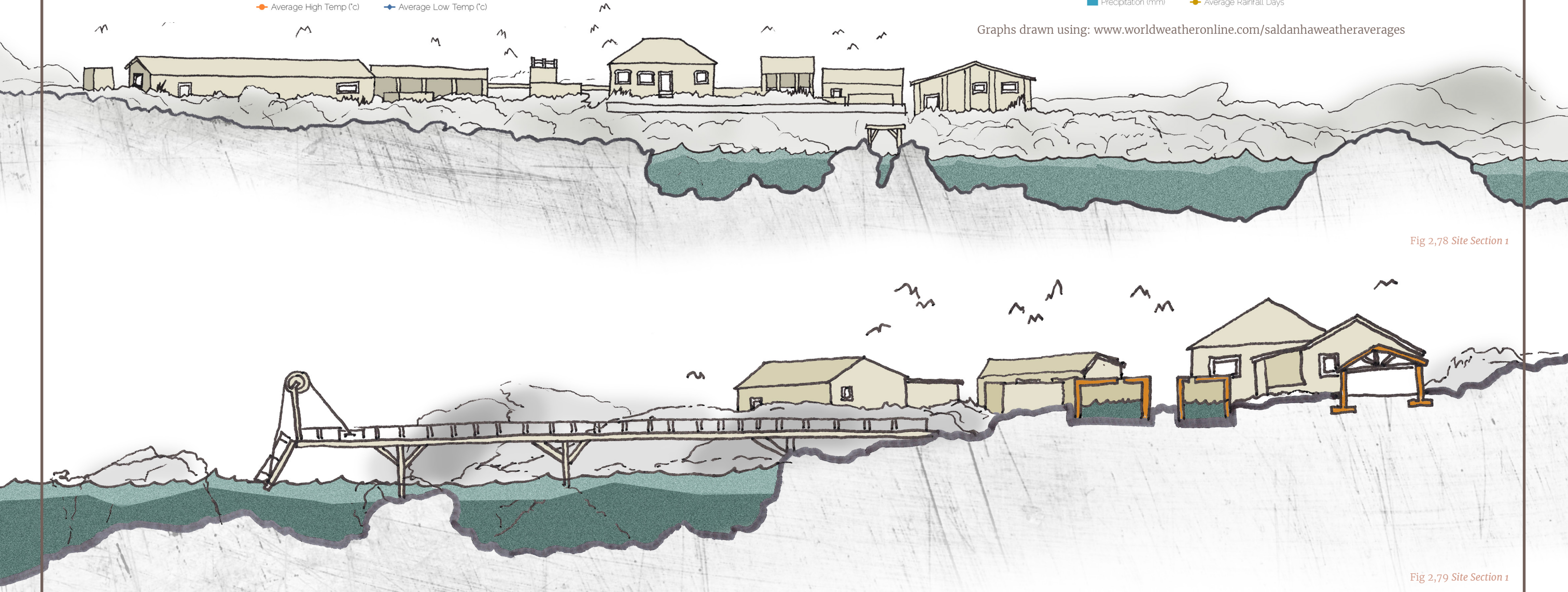
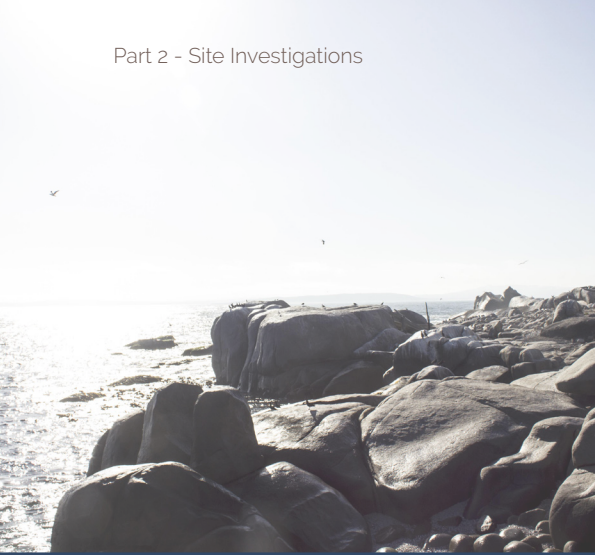


Fig 2,78 Site Section 1

Fig 2,79 Site Section 1



The precious ecosystem of **Malgas Island** contains a number of **threatened** and **endangered** bird species. It is an ecosystem that, without question, is in need of **serious intervention and awareness.**

Fig 2,80 Collage of site photos



Cognitive Analysis

Malgas Island was a wonderfully picturesque place in which to find myself. It is not, however, as permanent and unchanging as one might think from looking at the photographs of the island. As is the case with most alluring landscapes, Malgas Island has an extremely volatile ecosystem. All five of my senses were simultaneously assaulted and captivated for the duration of my visit to the island. The smell of the Cape Gannet colony is overwhelming, as is the noise. The noise, however, can only be heard through breaks in the howling wind, which competes with the crashing waves. The surface of the island is littered with feathers and rocks, presenting my feet with both hard and soft sensations simultaneously. A constant taste of salt lingers in the air, mixed with the occasional undertone of sulphurous bird-dung. Primarily, however, there are so many directions in which to gaze and process at once that it is somewhat overwhelming. The beauty of the semi-ruined buildings juxtaposed against the seemingly-untouched natural ecosystem makes for a slightly unreal spectacle. It was not long before I searched for a place in which to sit and rest, and simply absorb the symphony of information surrounding me.

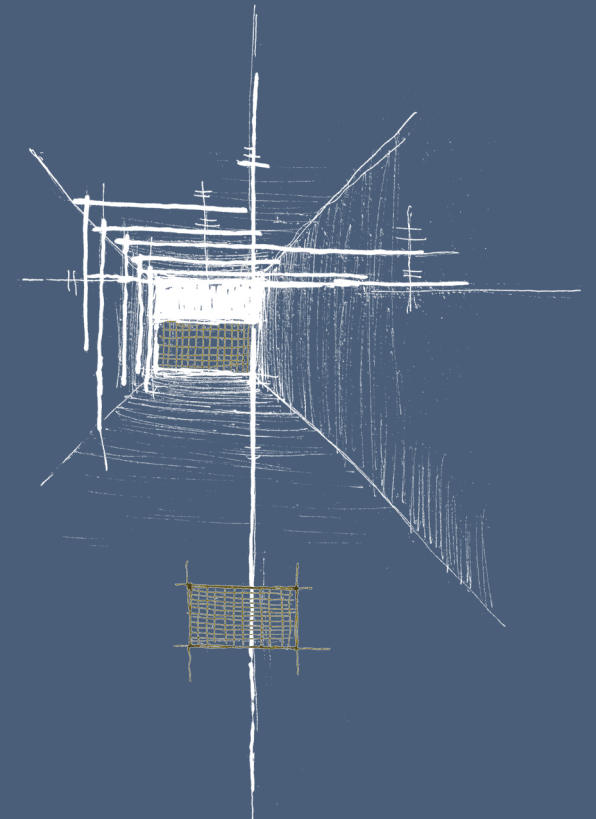


Fig 2,81 Conceptual sketch regarding the multitude of phenomena on site

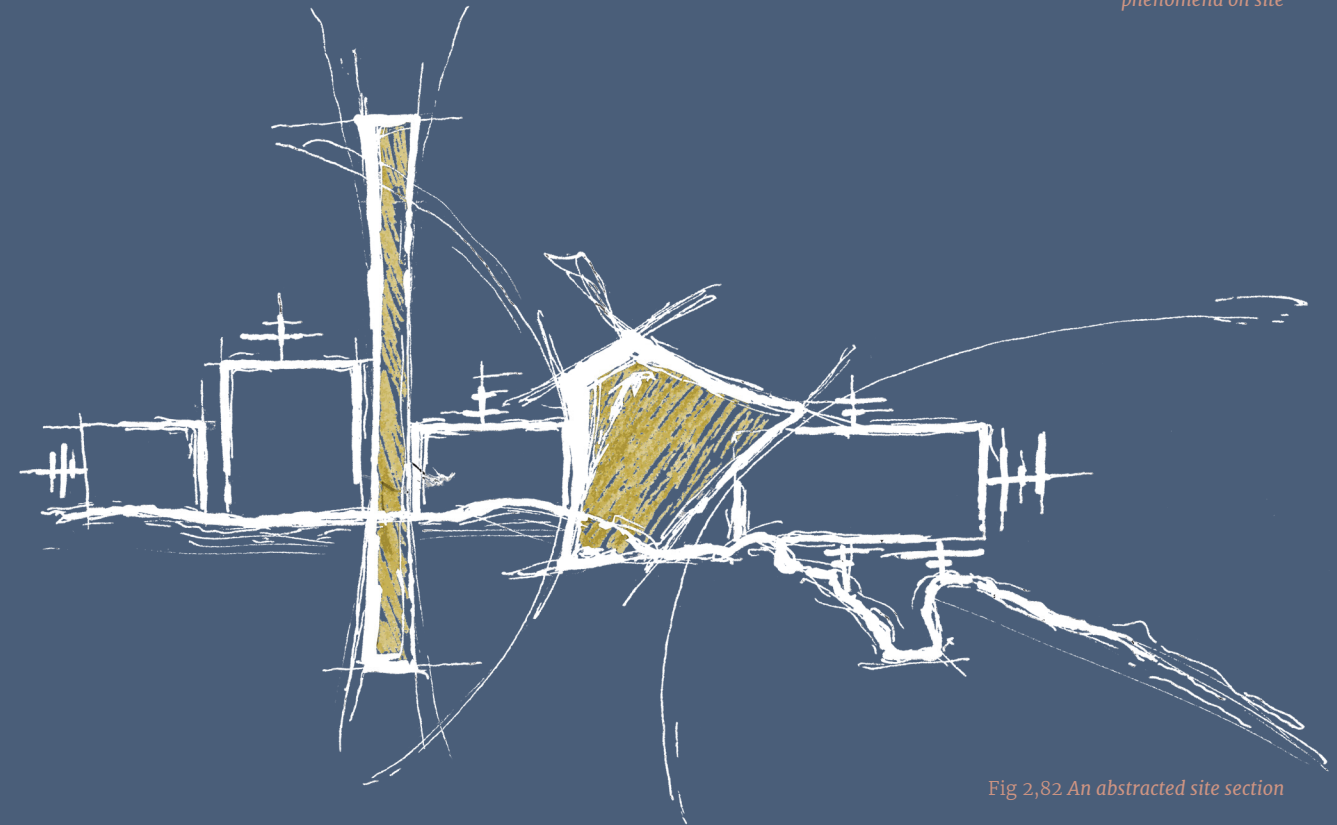
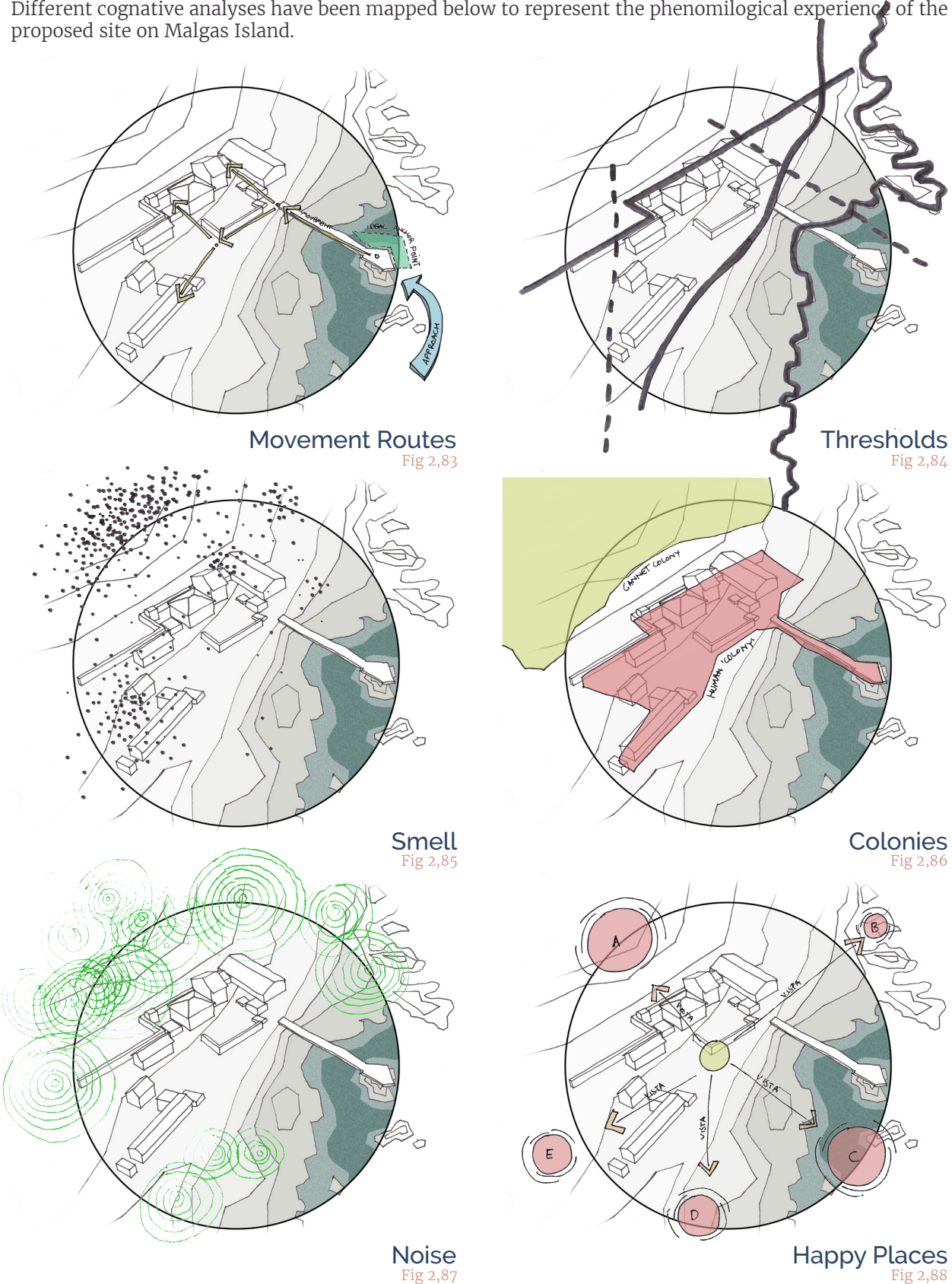


Fig 2,82 An abstracted site section

Different cognitive analyses have been mapped below to represent the phenomenological experience of the proposed site on Malgas Island.



Texture Exploration on Malgas Island

The overwhelming number of sensations felt by a visitor to Malgas Island can be largely attributed to the number of different textures encountered on the small island, as well as the distinct smell and noise emitted by the Cape Gannet colony. Some of the textures, such as that of the surrounding ocean, permanently shift from calm to rough, depending on the day, hour, or even which side of the island one visits. The fact that the existing buildings are both many years old and abandoned contributes to a number of weathered characteristics seen in the walls, floors and roofs of the structures.

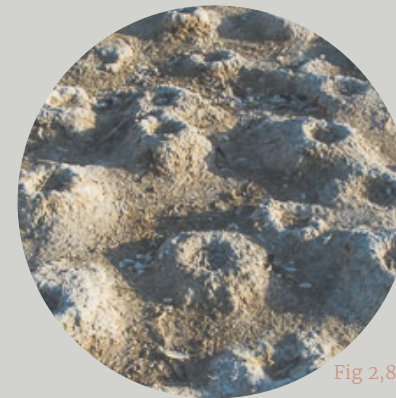


Fig 2,89

Guano Nests



Fig 2,90

Weathered Timber



Fig 2,91

Weathered Fibre-Cement



Fig 2,92

Weathered Brick



Fig 2,93

Rough Seas



Fig 2,94

Typical West Coast Rock



Fig 2,95

Smoothed Rock Formations



Fig 2,96

Weathered Concrete



Fig 2,97

Calm Seas

Malgas Island's secluded nature contributes greatly to both its attraction and the threat of being forgotten. The challenge, when designing an architectural intervention, will clearly be to embrace the mysterious and isolated characteristics of the island, as well as to create a landmark that will both attract more visitors to the island and protect it from the increasing number of visitors.


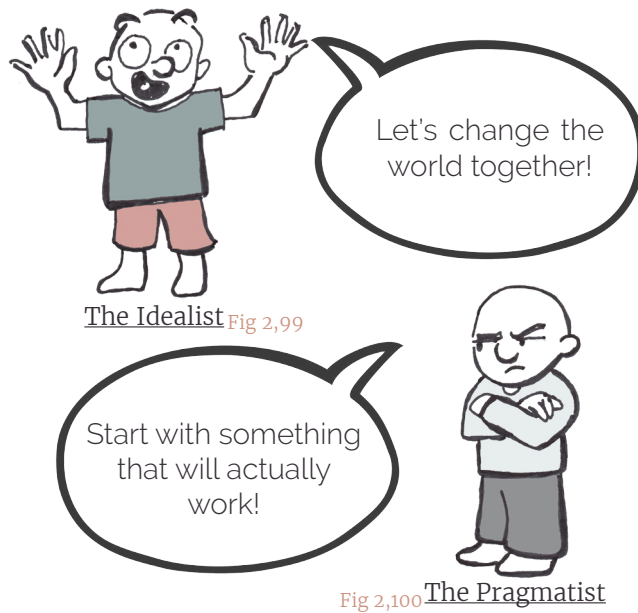
Up to this point, the conservationists and park rangers involved on Malgas Island have been fighting to keep unwanted visitors away from the precious ecosystem contained on the island and surrounding waters. It is, perhaps, by inviting selected visitors that this will become an easier task. 



Fig 2,98 Not only is the island secluded, but restricted

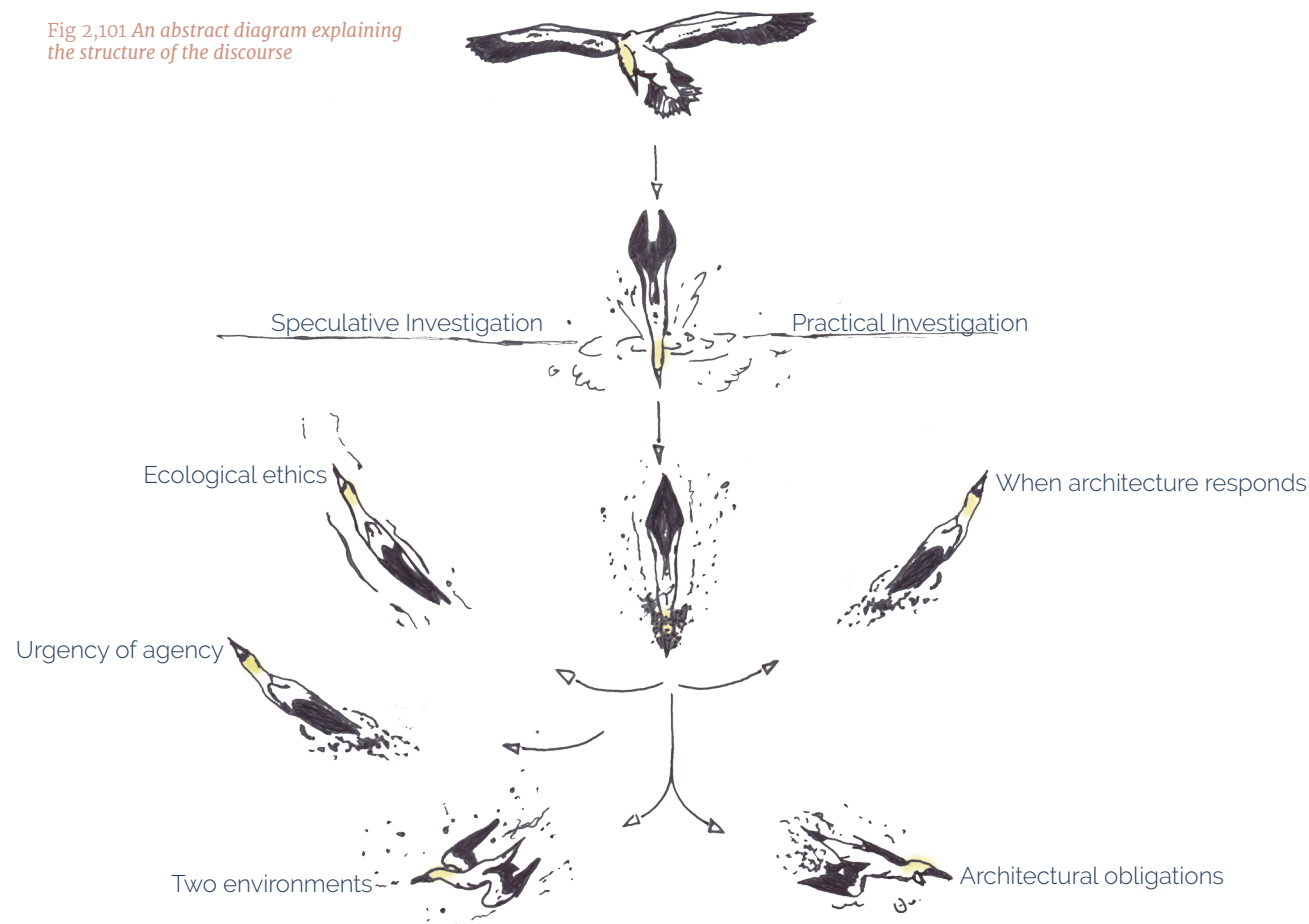


It feels appropriate at this point to provide the reader with a formal introduction to my brain. It is similar to most other humanoid brains on the planet, and can be divided into two parts. I prefer to label the first part the Idealist, whose solitary aim in life is to provide a constant supply of hope, enthusiasm, and enthusiastic ideas. The Pragmatist, however, is the somewhat more dominant half, and ensures that the ideas are always kept in check and cross-referenced against what he believes is possible to achieve. The reason for this slightly personal account is to illuminate the methodology behind the following discourse's structure. The investigation has been divided into two parts, which rely on one another for relevance. Firstly, there is a speculative investigation in which ideals and principles surrounding the topology and typology of the project are explicated. Secondly, the morphological epitomes of the project are expounded upon in the practical investigation.



Throughout the investigation, precedent studies of relevant buildings will be discussed. However, the nature in which the project revolves around an ecologically-ethical foundation makes this a rather difficult effort. This is due to the fact that the ultimate goal of authentic ecological ethics is to leave nature completely untouched, nullifying most architectural precedents and, admittedly, this entire project. This is a curious predicament that will be expanded upon throughout the discourse.

Fig 2,101 An abstract diagram explaining the structure of the discourse



Lexicon

Many words and phrases that are unique to the field of ecological ethics are used throughout the discourse. I feel compelled to provide my understanding with regard to their definitions.



- Anthropocentric: regarding humankind as the main or only element of concern within existence
- Ecocentric: regard and concern for both humans and non-humans
- Ecocide: the wholesale destruction of life and the source of life, including ours – an earth able to provide a liveable home
- Ecology: interrelationships between everything in the surroundings (hence, it is called ecological ethics rather than environmental ethics); it is focused on all nature, including all other species, besides human beings.
- Environment: that which surrounds
- Genius loci: a very personal and subjective interpretation of the spirit contained within a place
- Instrumentalist: a belief based on something's potential value for human beings, such as trees used to make paper
- Intrinsic: the value of something within itself, regardless of usefulness or potential.
- Milieu: a design's siting, orientation and location from an objective standpoint
- Pneuma: open-ended, non-prescriptive, and carefully researched-based design (originating from Hasdell, 2008:93)
- Preservation: the maintenance and protection of a natural phenomenon, not to be confused with conservation, which is architecturally related



Fig 2,102 Two of the more prominent existing buildings on the site

Speculative Investigation

We are living in an era in which ‘human society dares to think of the welfare of the whole human race as a practical objective’ (Mau, 2008:15). In other words, there is hope among many that a difference can be made on this planet. Realising this is important because, contrary to this hope, many are being raised in an apocalyptic culture and are because of this losing their ability to imagine a future. It is not always possible to quantify or put into words the hope we all possess as it is embedded within our deepest belief systems and is a heart-issue among most people. I have decided that this dissertation will be hopeful while exploring the various underlying issues and questions that confront the proposed project. Starting with an exploration into the ideals of ecological ethics, or the new Green Virtue Ethic, working through the idea of agency and, finally, searching for the meeting point between the natural and the built environment, the goal of the theoretical discourse is to provide a foundation from which a practical and appropriate design solution can be constructed.



Fig 2,103 Gannets diving

Ecological Ethics

‘The current human impact on nature is driven by institutionalized ideas and values which embody a very familiar ethic, according to which the consequences of this impact simply do not matter’ – Peter Curry (2011:12).

Although the subject of ecological ethics is vast enough to constitute an entire book, rather than the meagre sub-heading within a dissertation, it is the unequivocally logical baseline for any design such as the one being proposed. The design aims to respond urgently to a vulnerable ecology on Malgas Island, and to become an instrument through which people can make the values of ecological ethics evident. It is undeniable that human beings have a profound involvement within our natural world (Curry, 2011:6), and it is the idealistic hope of this proposal that ‘*profound involvement*’ be an element that can be harnessed and concentrated towards the protection of our natural world. An understanding of Ecological Ethics is indispensable since, environmentally, all previously-established ethics are quite noticeably inadequate. Ethics that are only concerned with human beings ‘encourages our powerful susceptibility to limited sympathies, short-termism and greed’ (Curry, 2011:3). Furthermore, it should be established that to treat the natural world in an ethical manner means loving and respecting it for its own sake, not only ours (Curry, 2011:7).

History, or lack thereof

My understanding of ethics is that of generating the most multifaceted and comprehensive discussions in order to establish the most rudimentary and comprehensible principles by which to live. In this study, I will not attempt to explain the history of ethics itself. Rather, I will discuss the influences and factors from which Ecological Ethics arose.

Ethics are, and have always been, determined according to what is valuable or of value (Curry, 2011:5). It has been the long-standing historical perspective of ethics that human beings contain intrinsic value, creating a globally-anthropocentric attitude. Yet, in recent years (albeit a few hundred), people have come to realise that “the world is fundamentally different today than it was yesterday. Our global paradigm is characterised by crumbling energy regimes, dwindling raw materials, fading geopolitical boundaries, global warming, and the radical transformation of our physical environment” (Brownell, 2008:221).

This all-too-sudden realisation led to a renewed thinking that was, perhaps, best summarised by Lewis Mumford in 1967 when he stated that ‘All thinking worthy of the name must now be ecological’ (Papanek, 1995:17). Emerging from the rather chaotic acceptance of the global eco crisis, Ecological Ethics was born, with its main concern being that of the possible resolution or, at least mitigation of, the ecocide. This emersion was, of course, compelled by a myriad of other factors, from the social and political to the technological and aesthetic (Tidler, 2008:7).

Ecological Ethics does not, it would seem, have much of a history. It started as an anthropocentric, survival-instinct reaction to the reality of a dying inhabitable world, and has moved toward a realisation that ‘as long as human needs are our only concern, we shall fail both ourselves and the rest of life’ (Curry, 2011:14. Emphasis added). It moved from the instrumentalist outlook on resources towards the ecocentric outlook on realising the intrinsic value of all life within every ecology. Naturally, different commitments to the field of ecological ethics, shades of green, if you will, each with their own valuable principles and possibilities exist.

Shades of green



Fig 2,105 Different shades of green

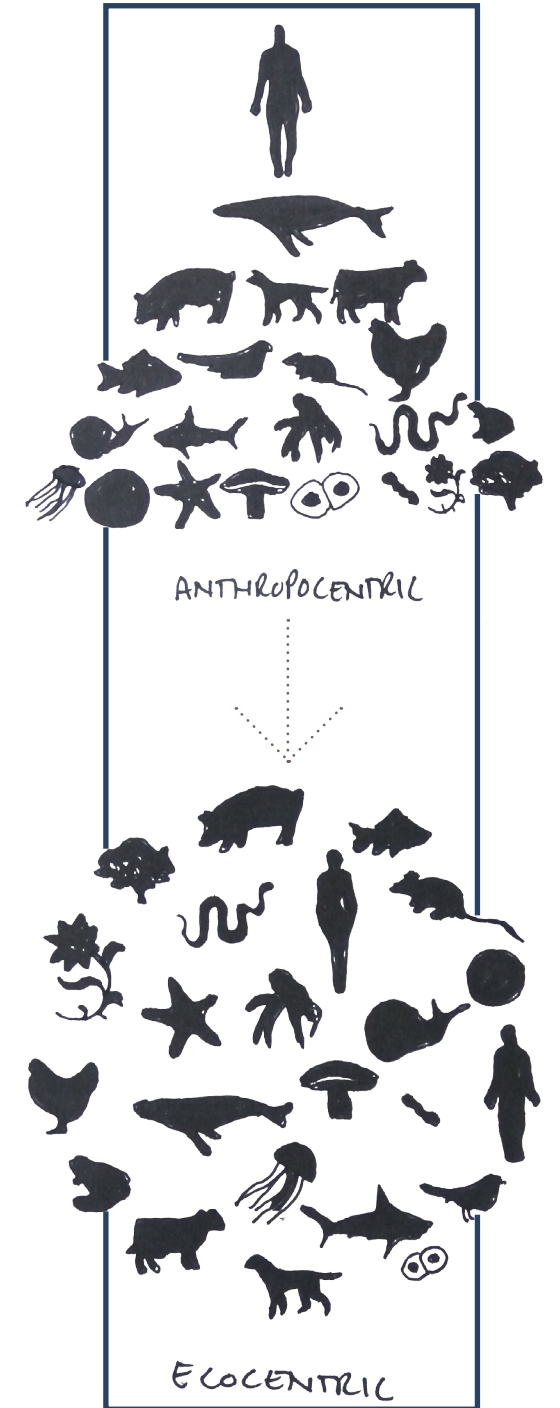


Fig 2,104 The ideas behind ecological ethics

It is clear that there is a new school of ethics, namely the Green Virtue Ethic. Within this school, there are various 'classes' that have different answers to the driving question: How should human beings behave in relation to non-human nature? These are classified as 'Light-green Ethics', 'Mid-green Ethics' and 'Dark-Green Ethics (or Deep Ecology)'.

Light-green ethics are, unfortunately, anthropocentric, and for that reason focused on the natural environment's direct value to human beings (Curry, 2011:61). The main inspiration behind this category of ethics is the ultimate survival and longevity of the human race, and leads toward a more sustainable plundering of natural resources, but plundering nonetheless. Whereas this is an improvement on a totally human-dominated ethical basis, it still appears to miss the point of a balanced ecology, and places human beings far above the rest of creation.

Mid-green ethics assumes that some natural items have intrinsic value, but wherever they happen to conflict with human interests or survival, the latter must take precedence (Curry, 2011:71). This speaks of a communication and synergy with the natural environment, while being biased in favour of the human race. Due to its naturally disruptive nature, I will present the argument that architecture is unable to progress beyond this level of ethics, as will be expanded upon later.

Dark-green ethics, or Deep Ecology, refers to a completely and holistically ecocentric value system, to the point of becoming anti-anthropocentric (Curry, 2011:91). Deep Ecology aims to achieve two things: to recognise the value of the integrity of all species (both human and non-human), as well as ecosystematic places, and to allow for man to lose in a conflict of interests between the human and the natural (Curry, 2011:92).

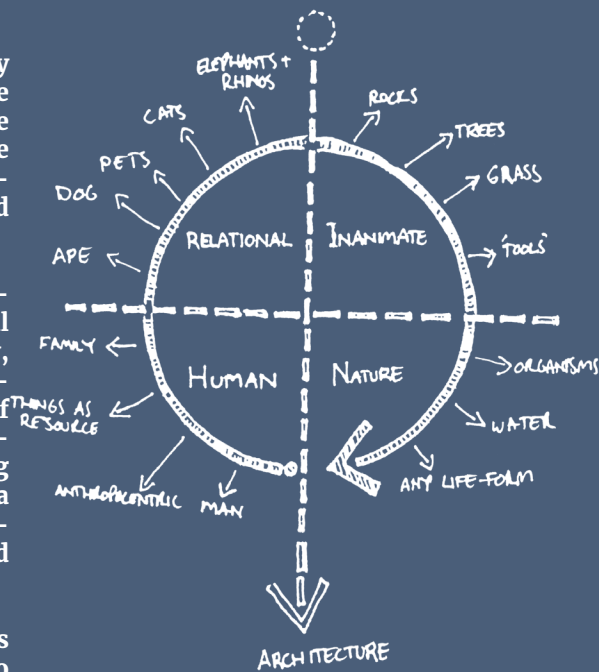


Fig 2,106 Architecture's place in the spectrum

a bias toward only the natural environment. This is logical because ecological ethicists have had a yearning to escape from the almost entirely anthropocentric focus that has pervaded traditional ethical attitudes and have consequently intentionally directed their attention to non-human ecologies in an attempt to redress this imbalance (Fox, 2000:3). This, however, is wrong for two reasons: firstly, 'the development of any truly comprehensible ecological ethics must address questions that arise in all kinds of environments: both built and natural'. Secondly, "whereas intentionally organised environments have not been human's dwelling places from the beginning of time, it is where we dwell now, draws mightily from the natural ecology and therefore has a large impact on it" (Fox, 2000:3).



Fig 2,108 Depiction of two extremes (Edited from Wood, 2016: online)

The pendulum effect



Fig 2,107 The eternal pendulum

Humanity seems to straddle a giant pendulum, starting at one extreme, passing all too briefly at full speed past a happy medium, and swinging towards the next extreme only to repeat the process into the depths of infinity. With regard to Ecological Ethics, we see a very earnest and real initiative. Yet at one side of the pendulum, we see a half-hearted, uncommitted attempt at change, and at the other side, a completely unrealistic, unattainable ideal. Many share this opinion, such as liberal democrat and French scholar, Luc Ferry (1995:27), who shows sympathy with Deep Ecology's basic goal of protecting natural phenomena from human destruction, while, at the same time, offering many sharp criticisms, maintaining that it is incapable of providing guidance in moral decision making. With activists

such as J.M. Coetzee stating that the slaughter of livestock is a worse transgression than anything the Third Reich was capable of (Curry, 2011:85), the extremity of the pendulum's swing in this regard is clear. In my opinion, a happy medium is to be found in the idea of mid-green ethics. This is because it requires a large commitment to all natural ecologies and yet also allows for the survival of the human race, to which I, and any reader of this document, belong.

The ugly truth of Ecological Ethics is not that there is an eco-crisis, but rather the fact that there is

The Urgency of Agency

"Progressive architectural thought and production has both contributed and responded to the prevailing conceptions of agency, and this has greatly affected the discipline's very conception of the environment and its own environmental potency" (Colma, 2008: 147)

Agency is a term that usually refers to an element, species, ecosystem or 'thing' of concern. However, one can also refer to 'moral agents' when discussing species that are required to gain an understanding of the morally-correct thing to do which, usually, of course, includes human beings. In each ecosystem, for example, there are species that are agents of larger concern than others due to their endangered or vulnerable status. In the built environment, the proclaimed value of an enlightened architectural ecology is that it perceives a possibility for various contemporary work that, manifested at all scales of practice, could still be assessed for the largely singular character of agency in its reaction to the socio-environmental challenges of our time (Colma, 2008:148).

Peter Zumthor perfectly captured the idea of Agency in his design of the Serpentine Gallery Pavilion by illustrating how architecture can be entirely focused on the protection and preservation of nature. By creating a completely inconspicuous structure, it is not the building's façades that are precious, but rather the flourishing garden of various plant types within. In this case, the inner garden is an agent of concern, and architecture has been used to both honour and protect it.

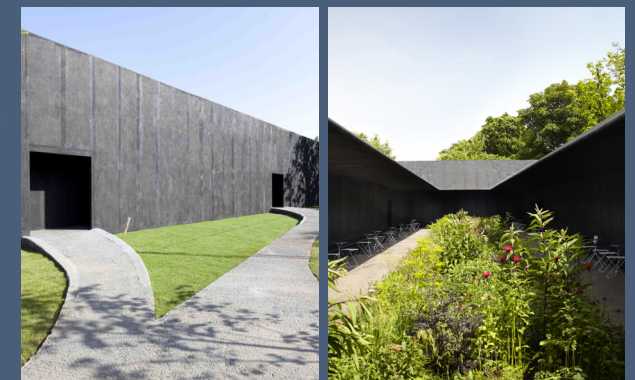


Fig 2,109 Serpentine Pavilion (ArchDaily, 2014: online)

Within the small, isolated ecosystem of Malgas Island, there is a main agent of concern, surrounded by many other species of agency, including human beings. It is with this knowledge that I would like to properly introduce to the discourse the Cape Gannet, the reason for this dissertation's existence.

Morus Capensis, the Cape Gannet

The *Morus Capensis* is a well-known bird among passionate bird-watchers, nature enthusiasts and environmental scientists. The species is officially listed as ‘vulnerable and threatened’ since “it has a very small breeding range on just six islands, and the over-exploitation of its prey by human fisheries – compounded by pollution – is causing a continuous decline in the quality of surrounding waters for foraging” (BirdLife International, 2012: online).

Due to the harvesting of the bird’s nests and dung, called ‘guano’, the species saw a near 2% decrease in population per year between 1956 and 1957, as well as between 2005 and 2006, which is equivalent to a total decrease of almost 50% over a 60-year period (BirdLife International, 2012: online). There are currently fewer than 150 000 breeding pairs in the world, over 25% of which dwell on Malgas Island. Interestingly, the word ‘Malgas’ can be directly translated from early Afrikaans as ‘Mad Goose’, another name for the Cape Gannet. Some of the birds (mainly adult males) continue to use their chosen island as a roosting site throughout the non-breeding season. However, most adults disperse up to 3 300 km from the breeding colonies, moving along the African coast for about three months during the non-breeding season. Juveniles disperse northwards in April, travelling up to 4 000 km towards the equator where they may remain for over a year, returning to breed at around four years of age. Breeding occurs between September and April in large colonies of up to 5 000 pairs, although they also nest in much smaller groups (BirdLife International, 2012: online). An understanding of these migratory and breeding patterns is imperative as it affects the sensitivity and manner in which the proposed design is to be implemented.

Ecological ethics claims to be concerned with all ethical questions that arise with respect to a moral agent’s interactions with any and all aspects of his or her surroundings. This includes other human beings “since environmental ethics typically begins with an analysis of the reasons why we believe humans to be deserving of moral consideration and why we have, until quite recently, denied such consideration to the non-human world” (Fox, 2000:1). I will attempt to give such consideration to the colony of *Morus Capensis* on Malgas Island in Saldanha Bay, as well as the entire site itself.

The site

Perhaps the least discussed agent of concern, globally, is that of landscapes. Despite the fact that landscape discourse has shifted from landscape-as-picture to landscape-as-process in recent years, a drastic re-thinking in terms of the agency of landscape is desperately needed (Shannon, 2012:626, 637). Malgas Island can easily be considered to be an ecotone, i.e. a zone of great ecological tension (Amidon, 2008:172).

In 1835, when the first human beings explored and began to harvest the guano on Malgas Island, the island stood almost six metres higher than the ocean. After the harvesting had been completed, the landscape of the island looked vastly different and stood a mere five metres above sea level. The island has since managed to regain two metres of its original height, but is continuously growing due to the new mass of guano layered onto its surface with each passing year. This phenomenon creates a tension between the permanence of landscape and the fragility of an island landscape. The emerging discourse is consequently brimming with terminology of change, dynamics and indeterminacy in contrast with permanence, reserve and long-term regeneration (Shannon, 2012:629). Seeing the site as an agent of concern leads to the natural conclusion that the proposed design should rest as lightly as possible, as though it were being attached to an actual, volatile, living organism.



Fig 2.110 Malgas Island Gannet colony

The other/s

In the wisdom of any Nintendo 'Quit Screen' message: *everything not saved will be lost*. Other agents of concern on the island, in no particular order, include penguins, seagulls (although these are seen by many of the researchers as a pest and detrimental to the survival of other bird species), oyster catchers, seals, human beings, crayfish, and an assortment of shrubbery and other bird species. Interestingly, there are proposed culling actions of seals on islands such as Malgas Island due to the fact that seals are killing so many of the Cape Gannet juveniles (BirdLife International, 2012: online).

In my opinion, such intervening activity is where the true concept of moral agency is tested. The fact that the seals threaten the survival of the bird colonies is due to the imbalance caused by human beings as a result of over fishing of the colony's food sources, and yet now that the imbalance is in place, it becomes necessary to find ways in which to assist the dwindling population of birds. However, assuming the role of moral agency does not necessarily ethically entitle us to kill another species to try and right the wrongs caused by ourselves. In doing so, the seals' agency is removed and, instead, a label of 'threat' is placed upon them. The dilemma is an ethical one, and leads to the realisation that without such intervention, a bird species could become extinct, and yet with such intervention, other ramifications of imbalances within ecosystems could be incurred. Nevertheless, it is hopeful to note that the agency of the human species on the island is not considered to be too important as we no longer have anything to gain from plundering the island's resources. All that remains for us on Malgas Island is that which we can give back.

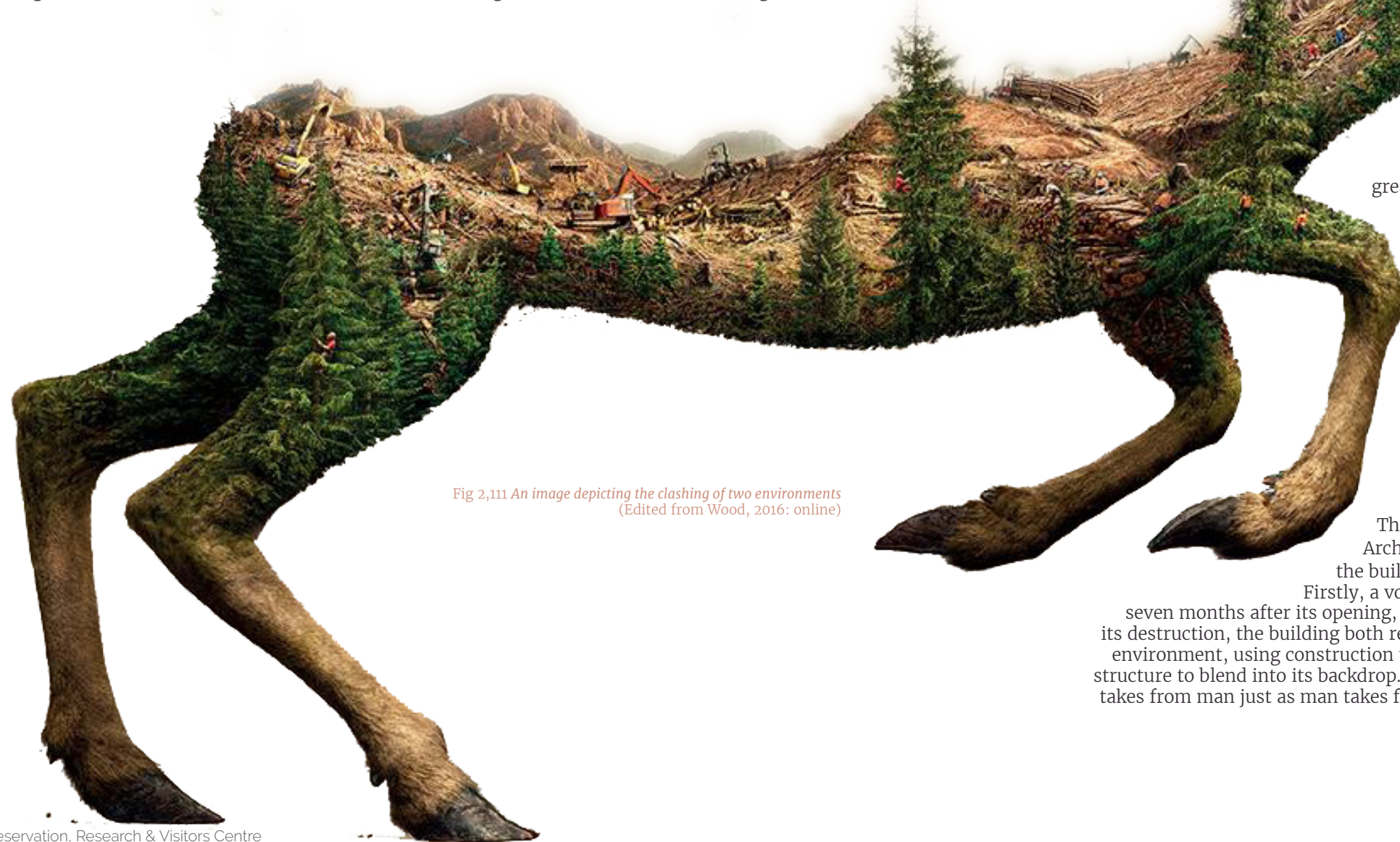


Fig 2,111 An image depicting the clashing of two environments
(Edited from Wood, 2016: online)

Two Environments, or 'frenemies'

“When you look out of your window, you may see, on the one hand, trees, the sky and, perhaps, some birds; on the other hand, houses, roads and cars. The two environments constantly present: the spontaneously self-organising natural environment and the intentionally organised built environment” - Fox, W (2000: 2)

Up until now, I have focused the discourse almost entirely on the natural environment, while making it clear that in any truly ecological discourse, the bias towards it must be broken. This will now be done, and an attempt to compare the value of both the built and the natural environments shall be made. It is important to take into consideration the built environment due to the fact that it makes up a large percentage of the planet's habitable surface. Since Richard Stein's 1978 study, it has also become clear to environmental scientists that the greatest energy extravagance results from the manner in which buildings were produced (Ingersoll, 2012:578). At the same time, this seemingly-destructive element we call architecture can, perhaps, be seen as 'a mediating entity that regulates flows and balances in an ecological field' (Hasdell, 2008:93).

The term 'frenemies' best describes the relationship between the two environments discussed above in that, whereas they seem to attack one another, they are, simultaneously, of great help to one another. An image of politicians posing for a photograph depicting a fake handshake during times of tension between their respective countries comes to mind. It is important to begin by exploring the clashing of interests between the two environments before realising how each can contribute greatly to the wellbeing of the other.

The Fogo National Park Headquarters in Cape Verde, designed by OTO Architects, is a brilliant example of the 'frenemy' relationship between the built and natural environment, for two reasons.

Firstly, a volcanic eruption entirely covered the building in lava approximately seven months after its opening, creating an example of nature's victory over man. Secondly, before its destruction, the building both respected and mimicked the surrounding mountainous and secluded environment, using construction that consisted of concrete mixed with volcanic ash that allowed the structure to blend into its backdrop. The lesson that should be learned from this building is that nature takes from man just as man takes from nature, the only difference being that the former is not an unstoppable force and should perhaps be kept in check.

A clashing of interests

In order to advance the size of the built environment, something must, of course, be built. This requires, among many other things, the clearing of a site, destructive gathering and assembly of materials, and the continued consumption of natural resources in order to service a finished building. From the outset, this process appears to set the built environment against nature, a fact that simply cannot be swept under the metaphorical rug. It would seem that ‘every act of building betrays the environment, as it requires the displacement of “natural” relationships’ (Ingersoll, 2012:574). It is clear that architecture has always been perceived as something which seeks to invite the aid of the natural world in order to deter its assaults. It has very seldom considered its own attacks on nature (Williamson & Radford, 2000:64). It is equally important to understand the attacks by the natural environment on the built one.

The main reason for human beings, or other species, to create shelter is to ward off the fluctuating conditions and attacks of the natural environment. It is through this necessity that the built environment came into being. Whether it is the strengthening of ships that need to travel through icy waters or the expandable joints that need to make allowances for earthquakes in multi-storey buildings, the built environment is one which is just as strong on the defence as it is on the offense. Hurricanes, tsunamis, earthquakes, storms, floods, avalanches, volcanic eruptions, and sinkholes are but a few of the attacks (some would say defences) that nature has launched against the built environment.

The following questions then arise: Where is the meeting point? Where do the built and natural environments harmonise? It is very clearly important to ‘find a balance, a synergy, between addressing ecological ethics in the self-organising natural world and ecological ethics with regard to architecture and building’ (Fox, 2000:5). Perhaps this synergy is best found in truly vernacular structures.



Fig 2,112 Gannets juxtaposed against buildings on Malgas Island



Fig 2,113 Nature has clearly had an effect on the existing structures



Fig 2,114 Current observation point

The vernacular

Vernacular ‘architecture’ is, perhaps, best described and defined as ‘the architectural language of the people with its ethnic, regional and local dialects: the product of non-experts’ (Maudlin & Brown, 2012:342). From this definition, we are able to establish that the driving factor behind most vernacular structures is a need to adapt to a specific climate and environment, followed later by an aesthetic inclination and cultural significance. In fact, vernacular is not considered as architecture; it is ‘other’. This is due to the fact that architects did not design it; it was naturally generated from a basic understanding of needs and resources (Maudlin & Brown, 2012:344). The ingredients of vernacular structures came as gifts of nature, yet one must admit they were rarely assembled without being reworked through human agency, often damaging the environment (Ingersoll, 2012:574). Nevertheless, it is easy to find an honesty and innocence in the construction of most vernacular structures, making them aesthetically pleasing and precious to this day.

On Malgas Island, there exists a number of abandoned structures, three of which are easily identifiable as truly vernacular West Coast structures and, consequently, historically significant, having been constructed sometime between 1835 and 1860. On the other hand, there is something remarkably sinister behind the construction of these structures, namely that they were placed on the island in order to harvest the abundance of guano and that, in doing so, they would almost bring an end to the Gannet population of the island. If the statue of a dead man, such as Cecil John Rhodes, should be removed due to a feeling of inadequacy it allegedly imposes onto selected passers-by, I would argue that it is justifiable to demolish the vernacular structures of Malgas Island as a symbolic gesture to the Gannet colony. Although, perhaps, a reworking of the existing structures into something else would be more appropriate, indicating a sense of reconciliation and healing, bringing about a sense of closure to the island.

The Market Hall in Ghent, designed by Marie-José Van Hee, Robbrecht and Daem, provides an example of contemporary architecture being placed adjacent to a rather intimidating existing vernacular context. Yet, the manner in which the architects nodded at that which was already in existence in a respectful yet contemporary way is definitely worth appreciating.



Fig 2,115 Market Hall in Ghent (ArchDaily, 2015: online)



Fig 2,116 Market Hall in Ghent (ArchDaily, 2015: online)

Human vs humane, or the human condition

In his book *The Green Imperative*, Papanek (1995: 7) suggest that “the joy and playfulness we find in completing a design comes from a deep, human trait-based need to bring order out of chaos or even to discover the underlying system of chaos itself. To bring meaning and pattern into a world that seems random and confused.” In other words, human beings have always built, and always will build. Suggesting, as many Deep Ecologists do, that all advances of the built environment should come to a halt, is unrealistic thinking at best. The human condition is to conquer and subdue, yet this does not have to be completely destructive. I would propose that it is possible to be both human in nature and humane in approach, not only in architecture, but in all aspects of life. Being human means that mistakes will inevitably be made. However, being humane is the spirit with which we continuously attempt to better ourselves. It is possible that an ethical design standard could be reached that is human in scale, humane in approach and embedded in social and ecological responsibility (Papanek, 1995:235). It is with this hopeful, perhaps idealistic, attitude that the proposed design shall be practically investigated and approached.

Practical Investigation

It is time for the dissertation to become pragmatic in nature, while standing on the platform of previously discussed ethical and environmental issues. This is an extremely important stage of the discourse as, although initially seen as solely an ethical issue, ecology and sustainability have become large technical, political, and legal areas of discussion as well (Ingersoll, 2012:573). Furthermore, “ideas about sustainability have been travelling fast, across disciplines, ideologies and geographies, shifting from a residual notion of ecological balance, through an emergent critique of modernization and the identification of alternative modes of design to a point where we might now arguably identify sustainability as the dominant mode of architectural culture” (Guy, 2012:556).

At the same time, it is just as important to realise the dangers of becoming solely pragmatic as Professional Ethics and Professional Codes of Conduct do not constitute design ethics; design ethics must come from a deeper level of concern within each individual (Papanek, 1995:69).

Any form of ethics must, at one point or another, become consequentialist, meaning that research should be done on the practical implications and results of the applied ideals of ethical beliefs. It is also important to note that observation, in itself, is always a kind of intervention (Curry, 2011:13). Firstly, I will explore how architecture responds to ecological ethics and site-specific needs and issues. This will be followed by a discussion on the obligations to architecture in the current age of sustainability and ecological concern we now live in.



Fig 2,117 Gannets diving

When Architecture Responds

“We no longer ask, ‘How does it look?’ or ‘How does it work?’ We are more interested now in the answer to, ‘How does it relate?’” – Papanek, V (1995: 7)

Response. Reaction. Ultimately, this is where the road of architecture divides into varying degrees of success. When faced with social, environmental and site-specific issues or, perhaps, even crises, how shall architecture best respond? Beginning at the time when pen meets paper for the first time in the wanderings of conceptual sketches and concluding with the last drop of varnish landing on timber doorframes, the entire process of design and production is a response to a presented conundrum. Yet, it is in today’s times that, more than ever, in addition to function and form, ‘architecture must now be imbued with foresight’ (Brownell, 2008:221). Foresight venerates the future well-being of not only the current ecology but also the lives of the individuals (in this case, the Gannet colony) beyond the targeted occupants of the design (Brownell, 2008:222). Surely what comes after the realisation of the task at hand is a definite need for a step away from the plain statements of fact and toward a realistic engagement with multiple possibilities (Guy, 2012:571). For example, realising that no direct artificial light may shine onto the Gannet colony of Malgas Island at night is a mere statement of fact, whereas the real question lies in coming up with an effective solution to the problem. Decisions need to be made swiftly and with great consideration as ‘designers [no longer] have the luxury of inaction or cynicism’ (Mau, 2008:14).

Once again, Peter Zumthor provides insight into a respectful response to site with his Steilneset Memorial design. The building’s connection with its volatile site and the juxtaposition of both a large solid form and its light, transparent and exposed structure, make an equal contribution to the project’s ecological success.

Architecture is, without a doubt, undergoing one of the most important and unparalleled changes in its history, both in the eyes of its creators and its users. Given the recent cognizance of humankind’s irrefutable impact on the health of our planet, together with the fact that structures use approximately half of all resources, a new task has arisen that architecture must address (Brownell, 2008:221). On Malgas Island, the proposed design needs to respond to a vulnerable species, past trespasses, an existing vernacular, a volatile climate and the global trend of sustainability. The first step towards this response is a personal understanding of the chosen site.

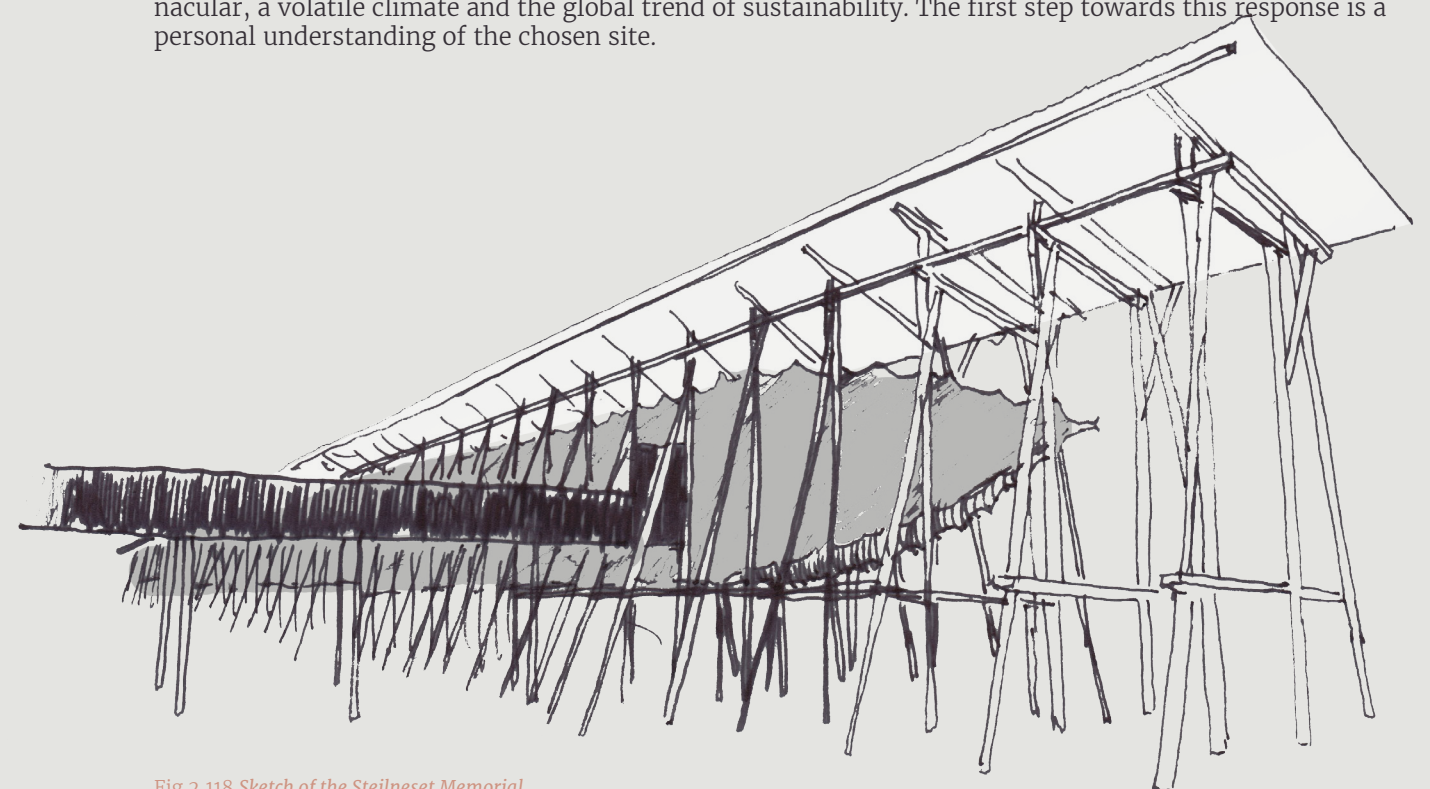


Fig 2,118 Sketch of the Steilneset Memorial

Pneuma and other foreign words

It could be said that the genius loci of a site has had very strong influences on the development of ecological approaches within design fields. This comes as a result of having made use of passive principles, such as orientation and massing, or through concepts such as the ‘ecological footprint’ of buildings and even cities (Hasdell, 2008:93). My understanding of genius loci and milieu, however, calls for what is classified as pneuma (Hasdell, 2008:93). As architectural theorist, Guy (2012:561), describes the situation: “We need to more critically explore how these differing ideas of nature connect to alternative design practices and, in turn, how these visions or blueprints of sustainable architecture travel across time and space, and with what effects when they touch down in specific places.”

If architecture can be understood to link the external, natural world at large with the regulated, controlled, and inhabited inner life of a specific location, then architecture’s response to its milieu implies a great appropriateness within locale, context, or region (Hasdell, 2008:93). In the case of Malgas Island, this inevitably means a successful communication with the existing vernacular structures, as well as a self-sufficient design approach in terms of sustainability and footprint. This self-sufficiency brings a biological element to the project, and it is when architecture becomes reactive, responsive, and adaptive in relation to its milieu that it becomes ever more biological in operation (Hasdell, 2008:93). Equally important is the experience of the building for its users, as the secluded, natural condition of the site should not be lost yet, at the same time, it should not dominate. In my opinion, this is an issue in many designs today and, while the means for realising ecological experiences ‘have become an increasingly sophisticated and theorised aspect of architectural production, progressive architectural practice has severed the tether binding ecological experiences to the replication of found natural conditions’ (Colma, 2008:150). The manner in which one approaches the design of the building envelope perhaps becomes the most essential aspect of the design in this sense.

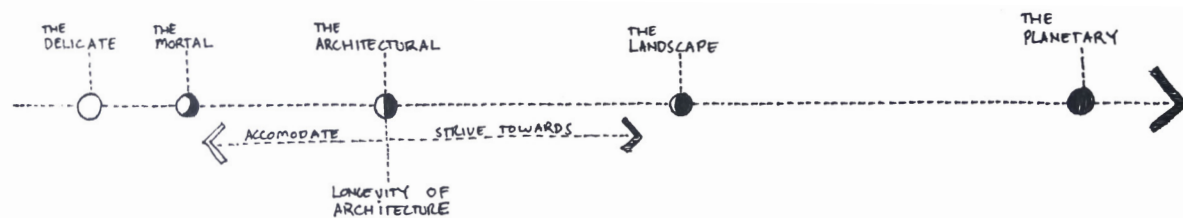


Fig 2,119 Where architecture fits on the timeline

Towards a building envelope

Theorists, Kieran, Timberlake and Bates (2008:212), formulated a process to design an ecologically-responsible building envelope, which came to the following conclusion:

- Systematically and comprehensively explore the environmental context;
- Use past-project precedents to address the opportunities identified in the site analysis;
- The site-specific nature of architecture means that many opportunities are likely to be unique;
- Design and construction; and
- Post-occupancy analysis helps determine the success of the project.

The building envelope is perhaps where architecture becomes mostly pragmatic in nature. Yet with such an ecologically-focused architecture, one has to be both pragmatic and personally concerned with the design of one’s building, rather than simply being focused on checking boxes and scraping past the required green standard (Williamson & Radford, 2000:72). Ecological design requires architects and designers to look beyond the building itself, and to consider the impact the building has on its site, its users and its surrounding ecosystem. Truly ethical design is required by nature to be environmentally sound, making a light footprint, which is ecologically benign, imposing itself as subtly as possible into its surroundings (Papanek, 1995:235). It is apparent that there is a great need to open up and explore the language used to talk about sustainability, the techniques and technologies employed, the processing and placing of design innovation and the architectural practices that result (Guy, 2012:558). Stemming from a core ecological ethic, a project such as the one proposed, should have the integrity to remain true to its core ethic, down to the last detail. Whether it be sewage removal or the type of floor tiles specified in the kitchen, there needs to be a successfully and fully-integrated ethic throughout the project from which the building envelope can be drawn. This, perhaps, should become more than just a goal; it should become an unavoidable obligation.

Architectural Obligations

‘There may well be as many types of relationship between nature and architecture as there are architects and buildings’ (Guy, 2012:559).

It has become clear that there are certain obligations facing architecture and, by extension, its creators. There must be a compulsion to serve the surrounding ecologies instead of plundering them. There is also an undeniable responsibility to move away from a ‘better-than-nothing attitude and to create structures that are entirely self-sustainable’ (Woolley, 2000:51). A call has been made by all ecologically-minded architects and designers to strive towards an attitude of zero compromise, rather than simply zero carbon emissions. It is in this, however, that the conundrum lies: can architecture ever truly have a positive environmental impact? This, of course, is the quietly lurking doubt underlying this entire project.

“ A truthful response is, of course, that ‘sustainable growth’ is not infinitely possible. We live in a finite world, and therefore infinite growth must stop at some point (Curry, 2011: 228) ”

To build, or not to build – that is the question

Papanek (1995:235) suggests that, globally, sustainability efforts can be either helped or hindered by design. Yet, if a building is constructed, can it ever be truly sustainable? Is a sustainable building not simply perpetually paying off its debt for the resources it took out of the earth in the first place? And, if so, would it not be better to simply bring all further infrastructure to a halt? These are serious questions that need to be addressed in a dissertation far more specialised than the one which they have undertaken, yet the proposed project does have answers for them, albeit, perhaps, ones that will be found wanting. A truthful response is, of course, that ‘sustainable growth’ is not infinitely possible. We live in a finite world and infinite growth must stop at some point (Curry, 2011:228).

The aim of the project, however, is not an absolute, uncompromising attempt at a zero emissions building; it is an investigation into the design of a structure that assists the effort of a more ecologically-ethical future. It is an investigation into appropriate response, not a debate as to whether there should be a response at all. This dissertation takes the stance of Papanek (1995:235) when he states that ‘design, when nourished by a deep concern for the planet, environment, and people, results in a moral and ethical viewpoint’.

‘To build, or not to build’ must be answered with a resounding ‘to build’. Humanity will never cease to expand and develop the built environment until it is no longer possible and needs, at the very least, examples of how to ethically approach such a task and orient it towards non-human nature.

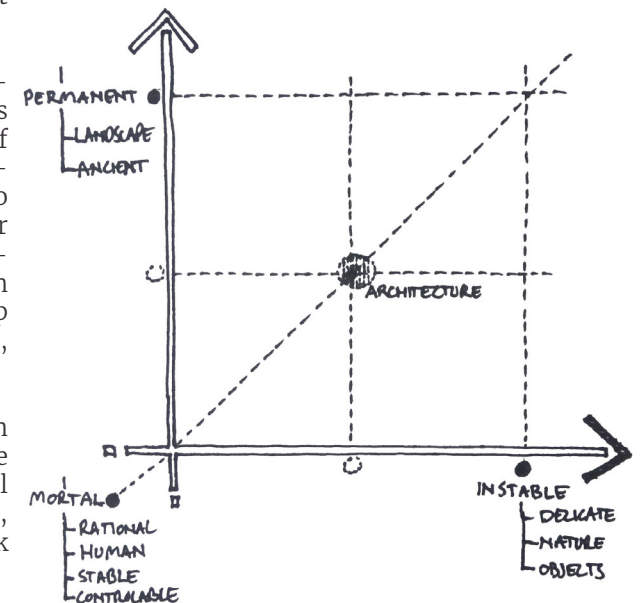


Fig 2,120 Where architecture fits between man and nature

An unassuming architecture

“The aesthetic strength of our architecture should be the result of our efforts to understand and assume responsibility for the environmental consequences of our buildings through research, design, and performance” (Kieran, Timberlake & Bates, 2008: 211)

There are undeniable aesthetic demands in any form of truly ecological design (Latz, 2008:189). In brief, these demands include the fact that the design itself is second to the surroundings in which it finds itself. Architecture that is unassuming, humble, modest and vulnerable needs to be created. The challenge is to achieve this effect while implementing a contemporary and unique style.

Material usage is of considerable importance as it will have one of the greatest effects on the design’s apparent vulnerability. Timber, for example, can be treated in such a way that it fades in colour and cracks over time yet remains structurally sound, giving way to nature enough to sympathise with it and yet not enough to be effortlessly destroyed by it.

Besides the Fogo National Park Venue by OTO Arquitectos discussed earlier, one can find a very accomplished example of unassuming architecture in Peter Zumthor’s Zinc Mine Museum. In this humble design, the remarkably unadorned structures are made beautiful by their intricate and delicate structural detailing, allowing themselves to be overpowered by the natural beauty that surrounds them.

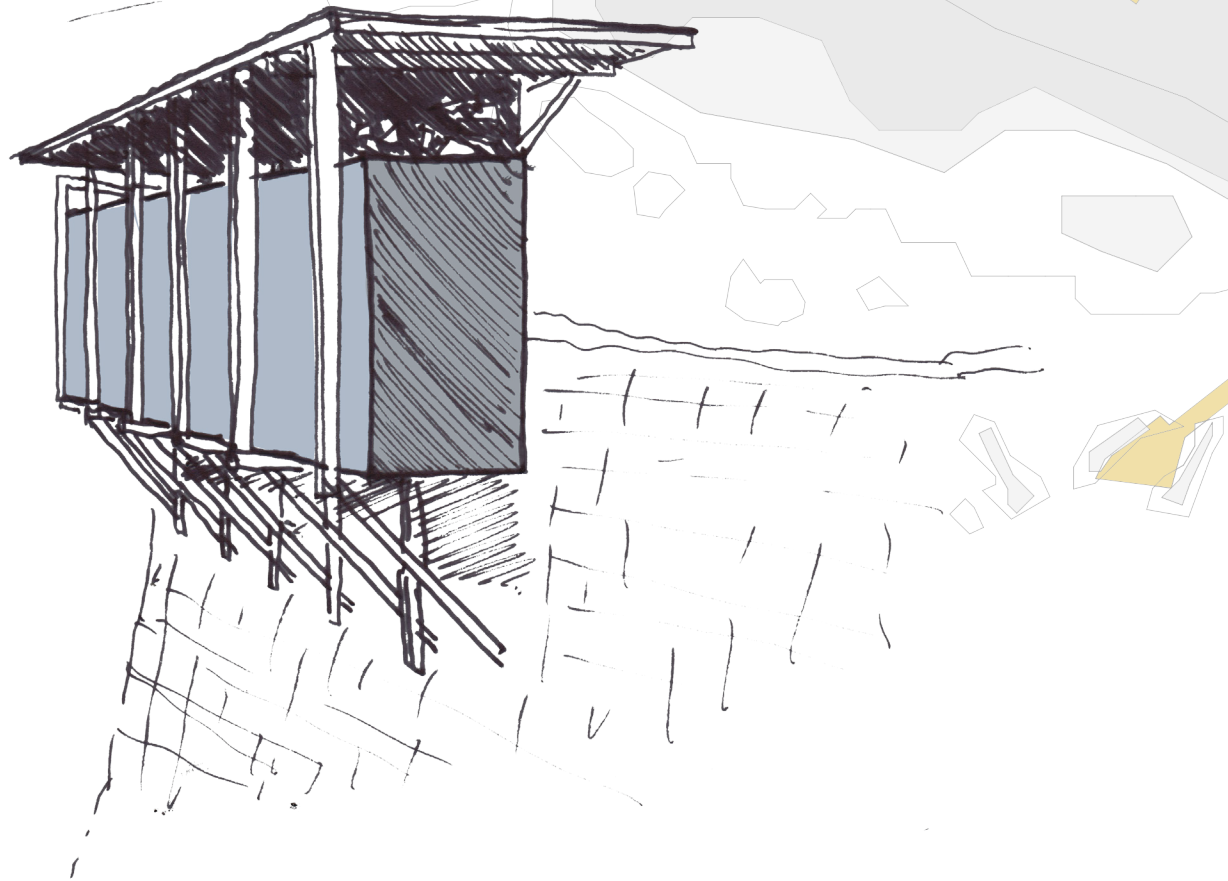


Fig 2,121 Sketch of the Zinc Mine Museum

Giving back/ claiming back

In light of all the challenges and obligations of ecologically-ethical architecture discussed above, there are some serious pragmatic and mathematical steps that need to be taken. This is due to the fact that the ecocrisis is a very real concern, and the demand for ecological concern within architecture is similar to the demand for a housing solution in the late nineteenth-century (Ingersoll, 2012:573). I made the following calculations to set concrete goals for myself with regard to the design methodology in terms of balancing the population with the allocated land ratio. They conclude, and are a part of the results of the practical investigation of the dissertation’s discourse.

Before intervention:

Human space = 3350m², 2,6% of the island
 Human:Gannet Population = Aprox. 1:200
 Human:Gannet Land usage = Aprox. 1:50

After Intervention:

Human space = 1600m², 1,2% of the island
 Human:Gannet Population = Aprox. 1:210
 Human:Gannet Land usage = Aprox. 1:100

Space is made for more than 1000 breeding pairs

It is by means of both these extremely pragmatic guidelines, as well as the previously-discussed speculative principles, that I am able to generate a design methodology.



Fig 2,122 Aerial view of Malgas Island.
 (Homebrew Films Company, 2012: online)

Design Methodology

What has become clear through this research is that, for human beings, every step backwards is another step forwards for the Cape Gannet colony. However, too many steps back could result in the extreme vulnerability and ultimate downfall of Malgas Island's precious ecology. As I approach the crux of the entire dissertation, the design of an architectural intervention, I plan to work with this realisation in mind. Furthermore, I gathered many different design strategies from each stage of my research.

The touchstones provide principles according to which the design method of the project should constantly be measured. They call for a design that focuses primarily on the island's natural inhabitants rather than the building's human users. The touchstones also conceptualise a design that has both a strong presence on the island but which as aesthetically unassuming. There is a structural purity and simplicity in the construction touchstone that should be visible in the final design, calling for an uncompromising and uniform structural system.



Fig 2,123 The timeline of nature

The formative conceptual ideas emerged by applying different speculative approaches to a representation of the actual site. They call for a careful balance between stereotomic elements and lighter tectonic elements throughout the design, while considering the site itself as part of the design. The reconciliation of the two clashing grid systems on the existing site plan also explored how to introduce and present order, in order to bring a metaphorical security to the site. Importantly, the volatile and constantly-shifting conditions of the site were identified, and a need for permanence among the ephemerality was generated.

The conceptual framework for the project realised the need to effectively incorporate the various typological functions of the design, as well as a number of the existing buildings into an organised whole. More importantly, it became clear that the spirit and attitude with which the building imposes itself onto the site will become the most important morphological trait of the dissertation. If the structure is approached in the same way as

the first buildings on the site were approached, it is difficult to perceive how anything could be ethically accomplished.

Solutions to a preservation-focused, yet multifunctional design, were examined by means of precedent studies of existing buildings of the same nature as that of the proposed project. It is through all of these examples that the idea of an unassuming architecture without too many pre-set agendas became the only way in which to move forward. The design should aim to stand as its own entity, while metaphorically mimicking its surroundings.

An in-depth site investigation allowed me to immerse myself in Malgas Island. It is through the site analysis that the positioning of the design, as well as a full understanding of the existing site conditions, were realised. Throughout the design process that lies ahead, a constant referral back to both the quantitative and cognitive site analyses will be made in order to maintain a true connection with the island. Whereas the island

itself is highly secluded, surrounded only by a vast ocean, the design should fully engage with its context.

Essentially, the discourse of the dissertation becomes the foundation upon which a design methodology is established. Throughout the discourse, a genuine sympathy towards and consideration of the natural environment and all that lies within was established as the most important attitude with which to design an architectural intervention.

By combining both the speculative principles and the practical guidelines proposed throughout the discourse, I believe it will be possible to bring to fruition a morphology that becomes merely an extension of these discussions: ecologically ethical, human in scale, humane in approach, respectful of the vernacular, unassuming in presence yet strong in impact, fully sustainable and small enough in scale to give a portion of land back to the Gannet colony.



Fig 2,124 The effect of mankind

Fig 2,125 The picturesque beauty of Malgas Island

03

Design and Tectonic Synthesis

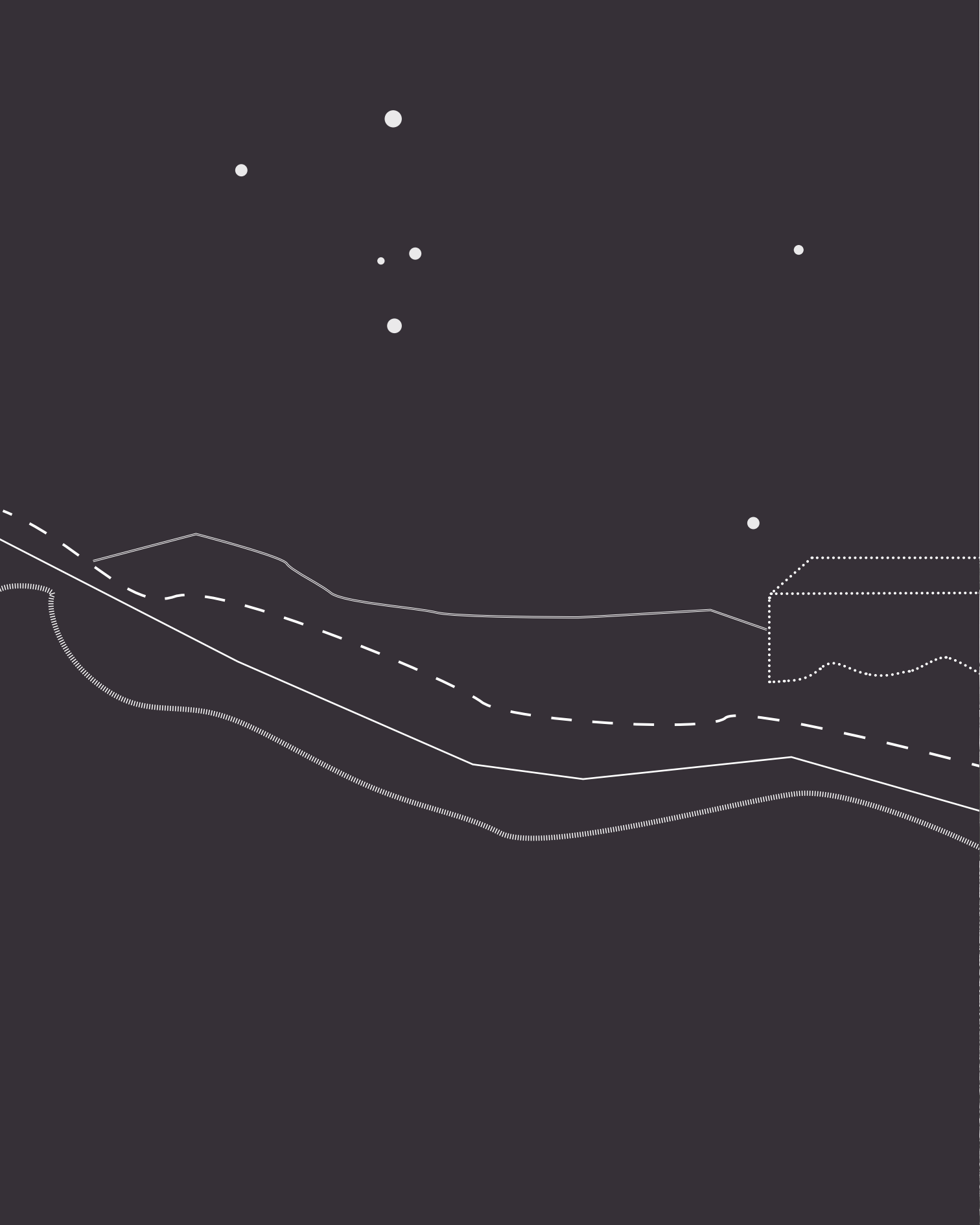


Fig. 3-1 View from the jetty

The development of the design proposal was, in reality, interwoven with each step of the research methodology, discourse investigations, and any structural development. I have, however, structured the dissertation in a linear format in order to eliminate any confusion that an accurate representation of this co-dependant process would inevitably bring. It should be noted that each step and progression of the design proposal occurred alongside the various analyses and investigations discussed in Part 2. The touchstones and conceptual ideas are the foundation upon which the initial design sketches were made. The site analyses allowed for the development of guidelines and limitations that needed to be applied to the building's layout. The speculative and practical discourses served as constant reminders to design according to certain principles and ethical viewpoints. Two aspects of the design process that relied heavily on one another were the morphological and structural developments. This is due to the proposed site's secluded nature requiring an architecture that, in addition to achieving aesthetic correctness, has an easily-comprehensible and assembled structural system.

The design process that I follow begins with general, plan-focused, layout sketches in order to determine the estimated size and positioning of the building. From this point, the design is developed by drawing various developmental options pertaining to plan, section and elevation. The three-dimensional design development is interwoven throughout the entire process by means of physical models. Models are an effective communicator of ideas due to the fact that they can be used to understand plan, section, elevation and overall aesthetic at the same time. Furthermore, these models best depict the influences of the analyses and investigations that were conducted in Part 2. Towards the end of the process, more finalised drawings are made, using an architectural computer program and which can be tweaked as the focus begins to shift towards smaller, more technical issues.

Throughout the design and tectonic development, there are certain moments in which the design halts, becomes uncertain, and pivots toward a different morphological direction. This is due to the realisation that certain preconceived ideas about what the design should be needed to be kept in check and, at times, removed. Taken as a whole, Part 3 is the design and technical process of the dissertation compiled into a linear narrative, and culminating in a final presented solution.

Fig 3,2 A Cape Gannet catches its prey (Shucksmith, 2015: online)

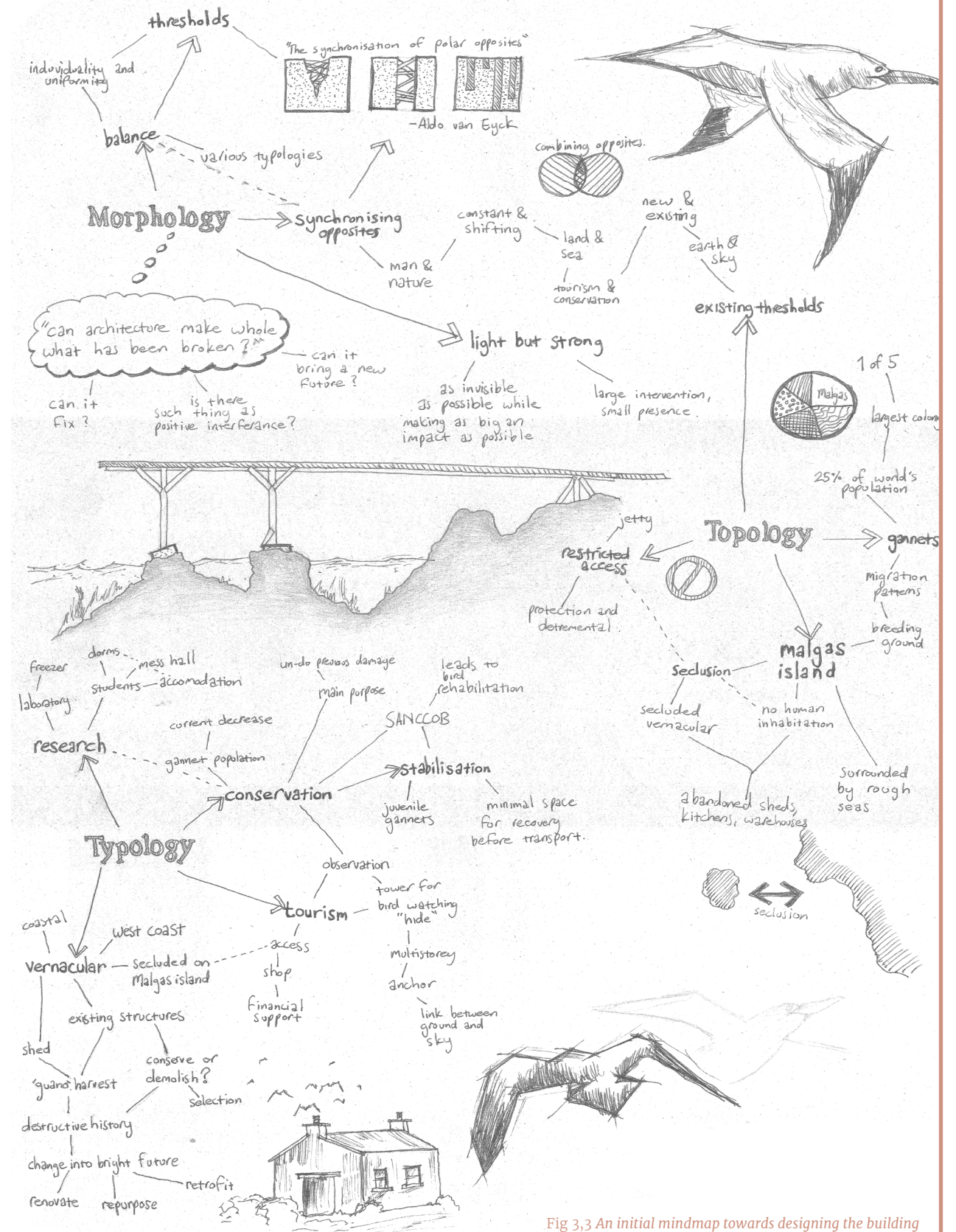
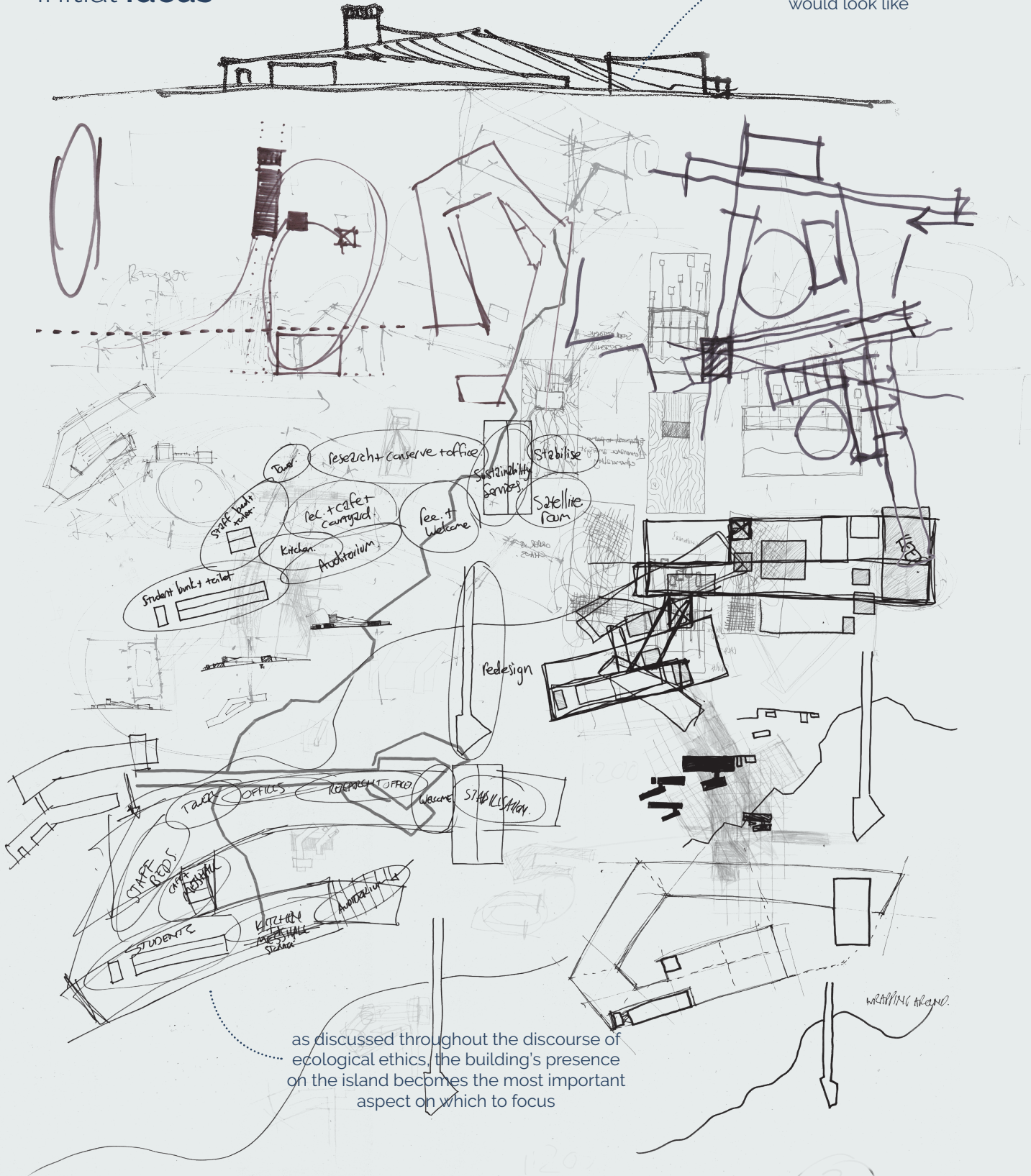


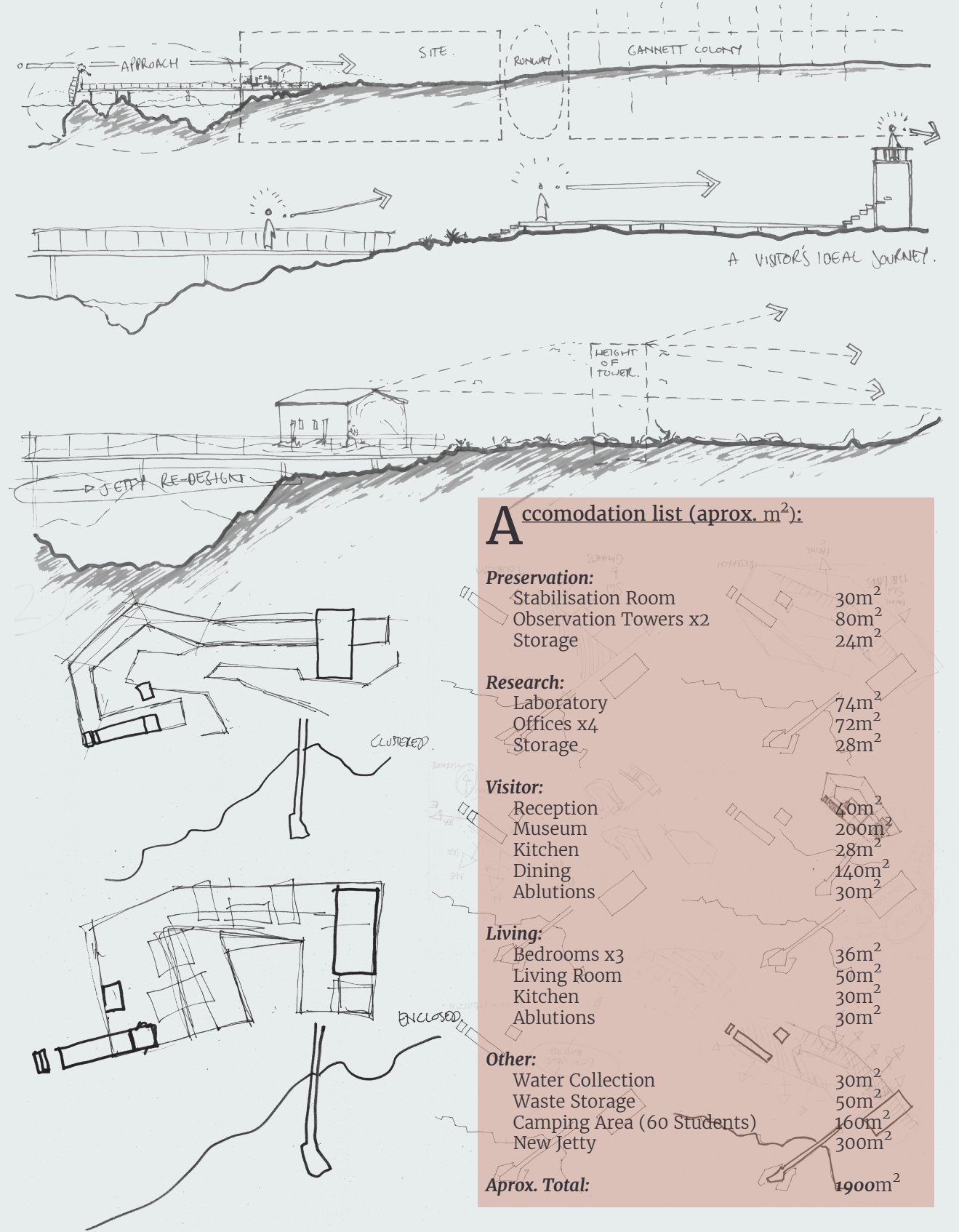
Fig 3,3 An initial mindmap towards designing the building

Initial Ideas

frist ideas on what an unassuming elevation would look like



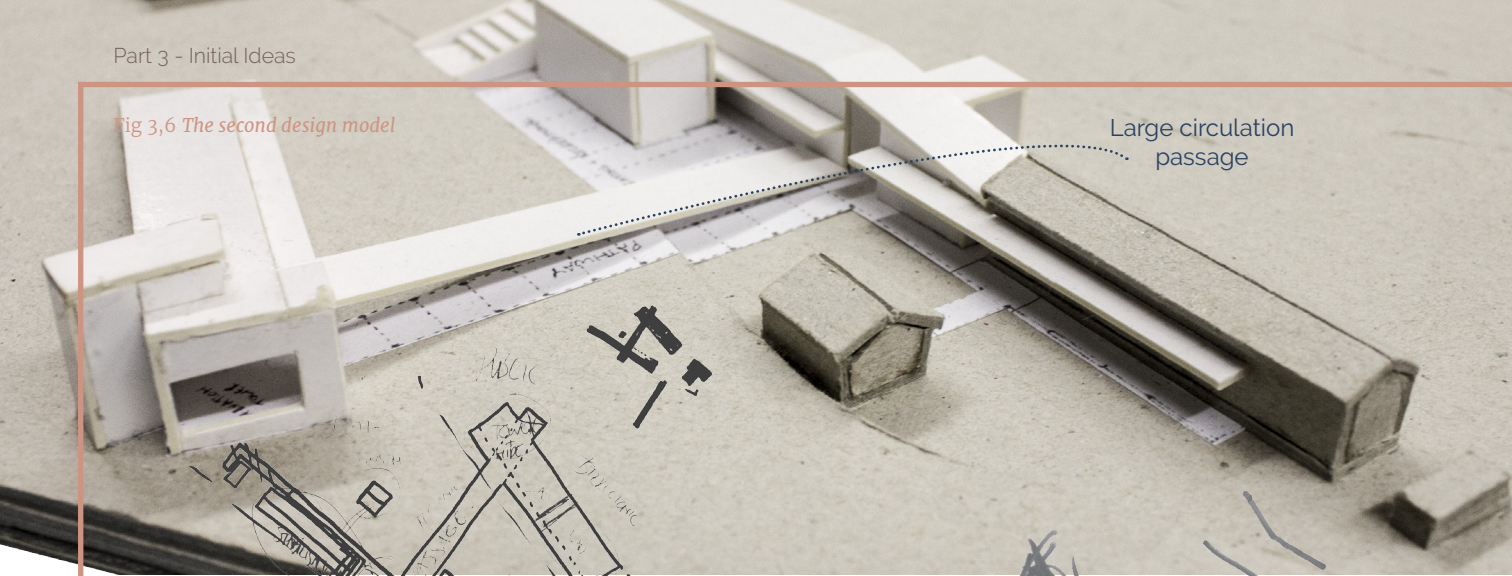
as discussed throughout the discourse of ecological ethics, the building's presence on the island becomes the most important aspect on which to focus



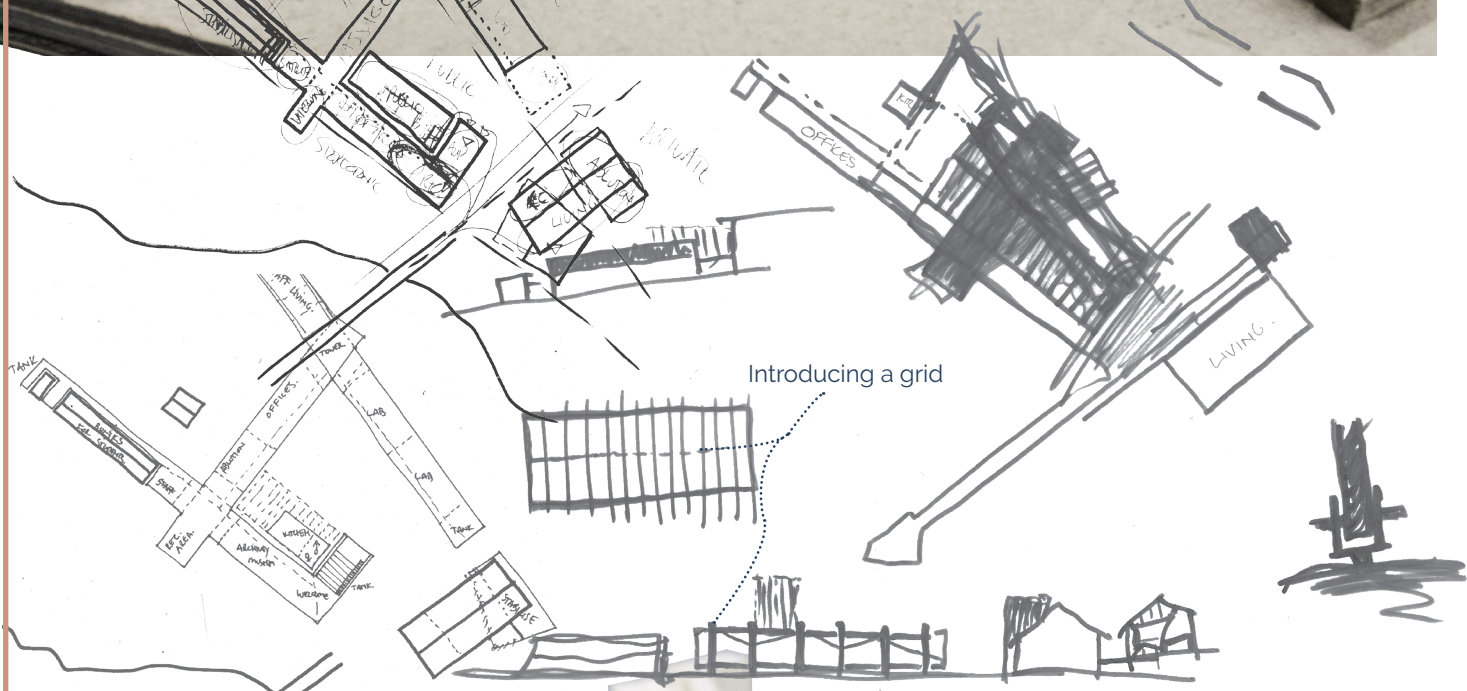
Accommodation list (aprox. m²):

| | | |
|----------------------------|--|--------------------------|
| Preservation: | | |
| Stabilisation Room | | 30m ² |
| Observation Towers x2 | | 80m ² |
| Storage | | 24m ² |
| Research: | | |
| Laboratory | | 74m ² |
| Offices x4 | | 72m ² |
| Storage | | 28m ² |
| Visitor: | | |
| Reception | | 40m ² |
| Museum | | 200m ² |
| Kitchen | | 28m ² |
| Dining | | 140m ² |
| Ablutions | | 30m ² |
| Living: | | |
| Bedrooms x3 | | 36m ² |
| Living Room | | 50m ² |
| Kitchen | | 30m ² |
| Ablutions | | 30m ² |
| Other: | | |
| Water Collection | | 30m ² |
| Waste Storage | | 50m ² |
| Camping Area (60 Students) | | 160m ² |
| New Jetty | | 300m ² |
| Aprox. Total: | | 1900m² |

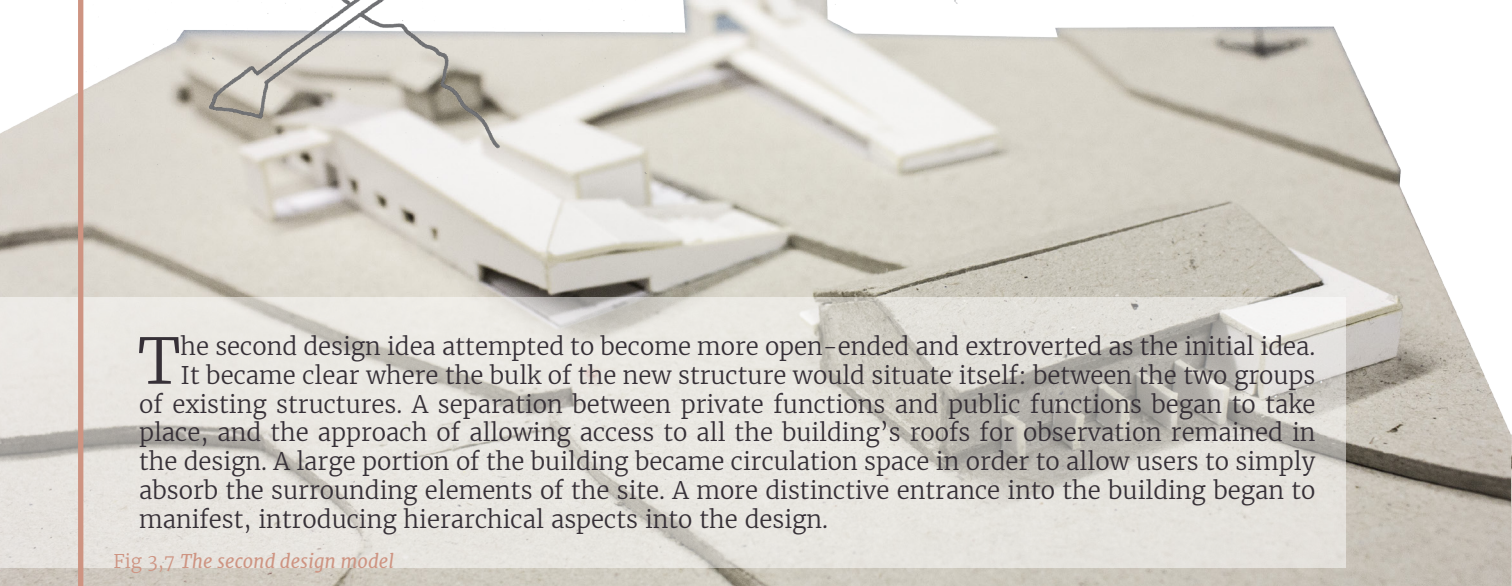
Fig 3,6 The second design model



Large circulation passage

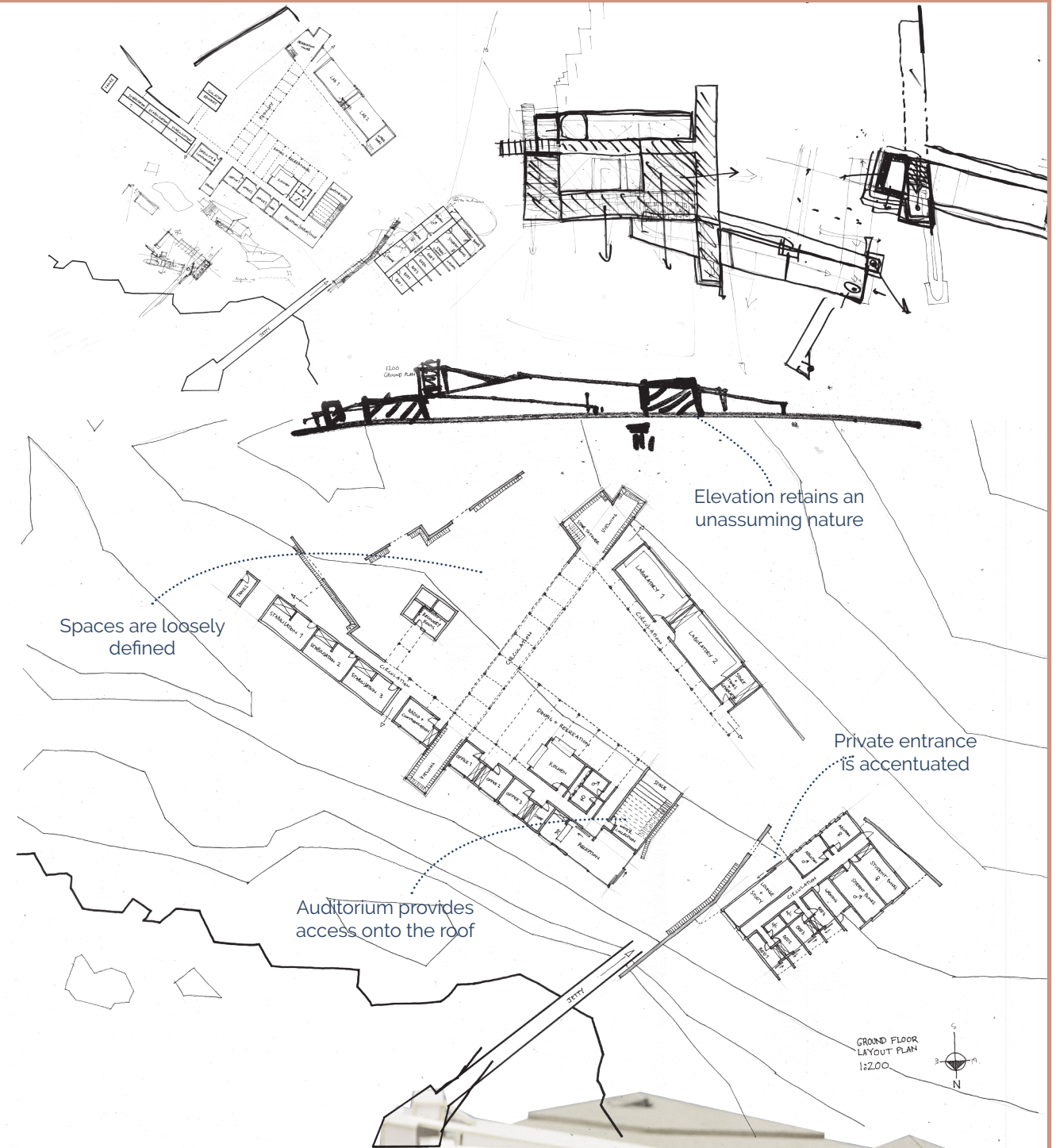


Introducing a grid



The second design idea attempted to become more open-ended and extroverted as the initial idea. It became clear where the bulk of the new structure would situate itself: between the two groups of existing structures. A separation between private functions and public functions began to take place, and the approach of allowing access to all the building's roofs for observation remained in the design. A large portion of the building became circulation space in order to allow users to simply absorb the surrounding elements of the site. A more distinctive entrance into the building began to manifest, introducing hierarchical aspects into the design.

Fig 3,7 The second design model



Spaces are loosely defined

Elevation retains an unassuming nature

Private entrance is accentuated

Auditorium provides access onto the roof

GROUND FLOOR LAYOUT PLAN
1:200



Fig 3,8 The second design model

Towards a Realised Design

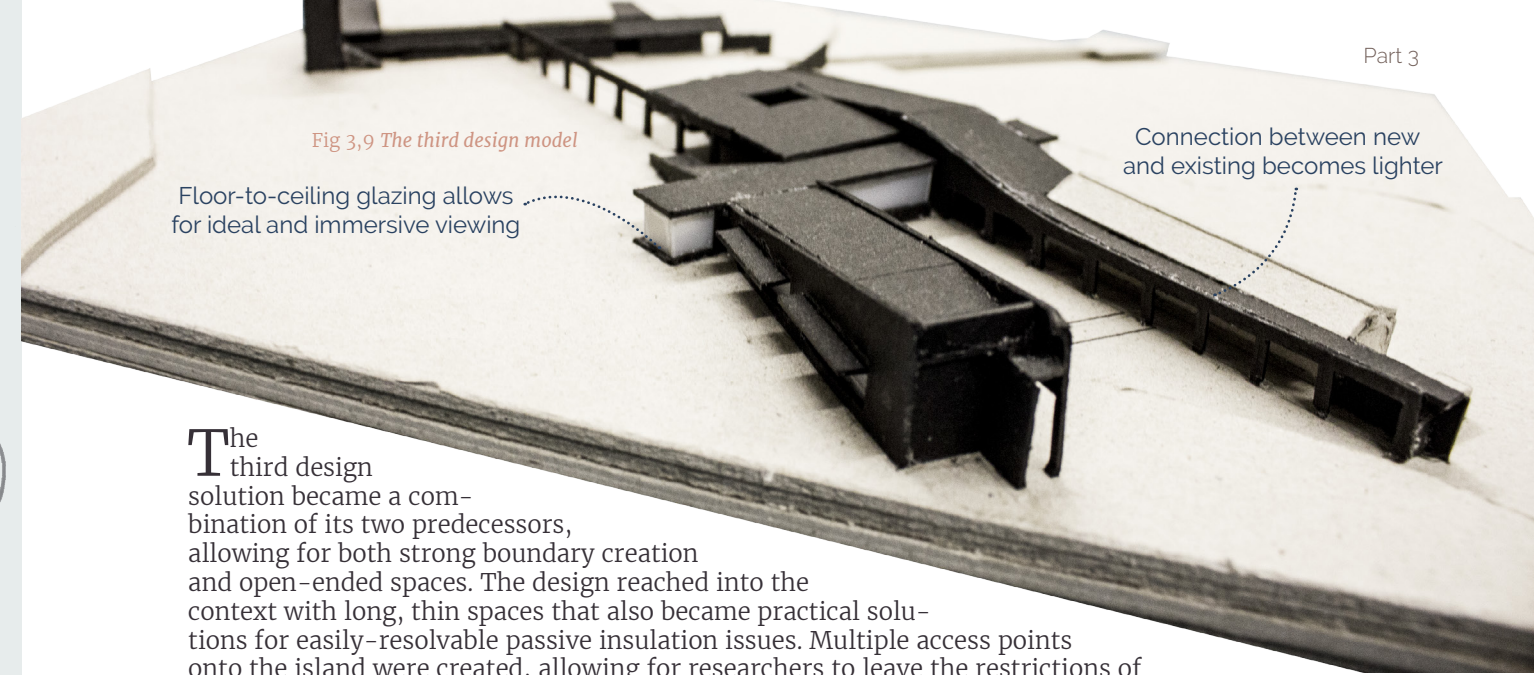
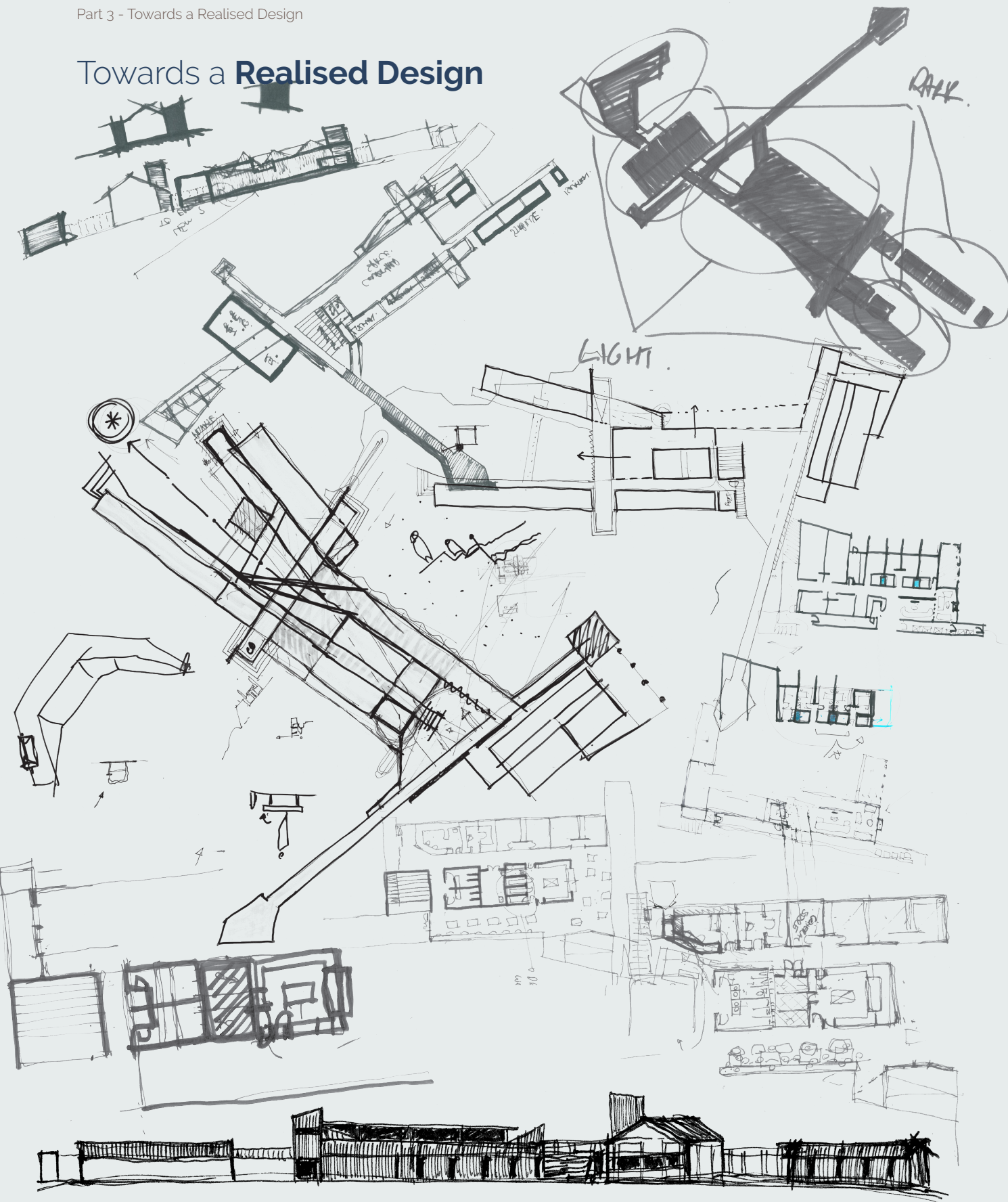
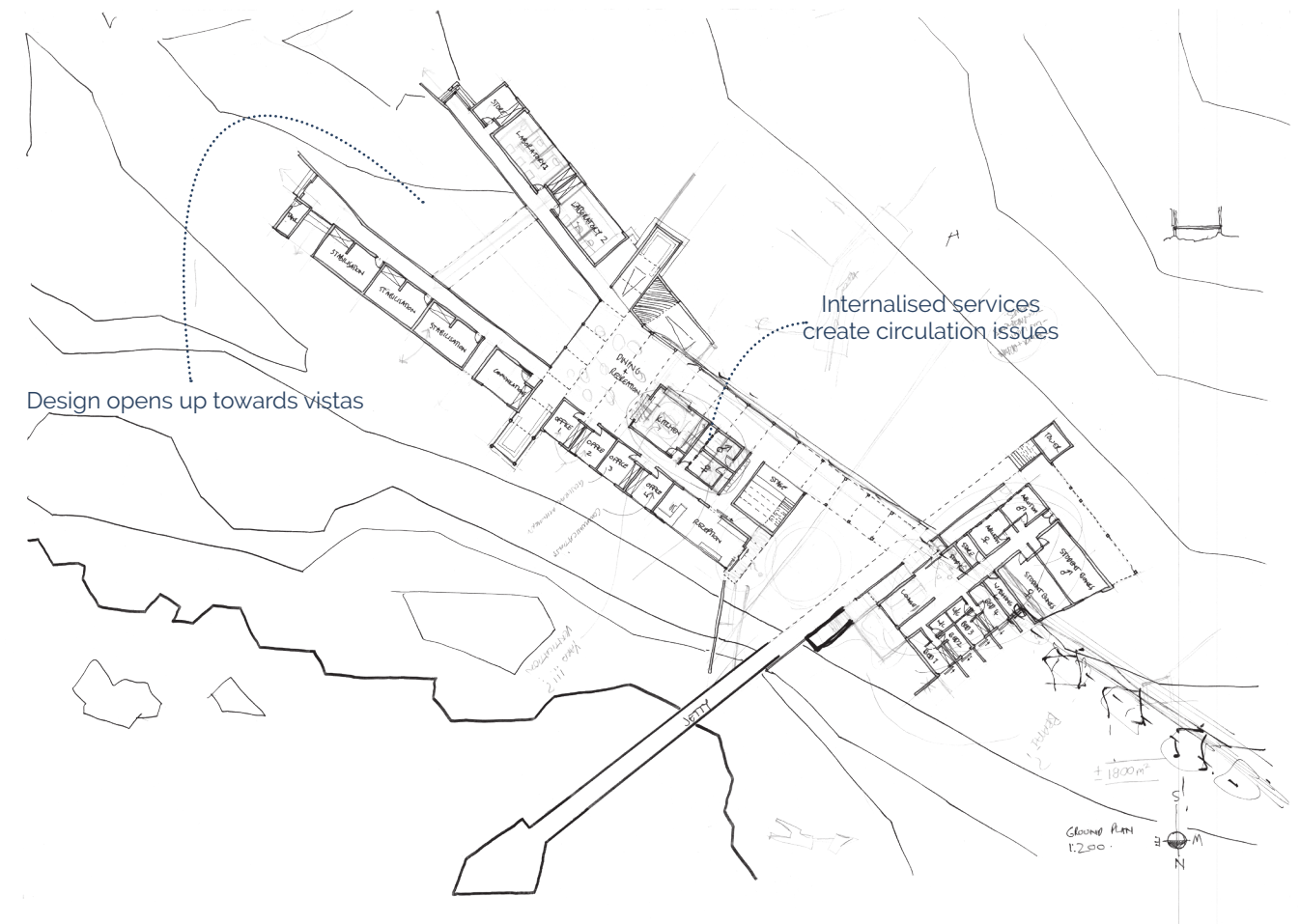


Fig 3,9 The third design model

Floor-to-ceiling glazing allows for ideal and immersive viewing

Connection between new and existing becomes lighter

The third design solution became a combination of its two predecessors, allowing for both strong boundary creation and open-ended spaces. The design reached into the context with long, thin spaces that also became practical solutions for easily-resolvable passive insulation issues. Multiple access points onto the island were created, allowing for researchers to leave the restrictions of the introduced architecture with ease when needed. Two observation towers were introduced, one of which rose out of the path that entered the island and the other that became part of the sloped accessible roof of the laboratories. It was at this stage that I began to believe that I was close to a final design solution.



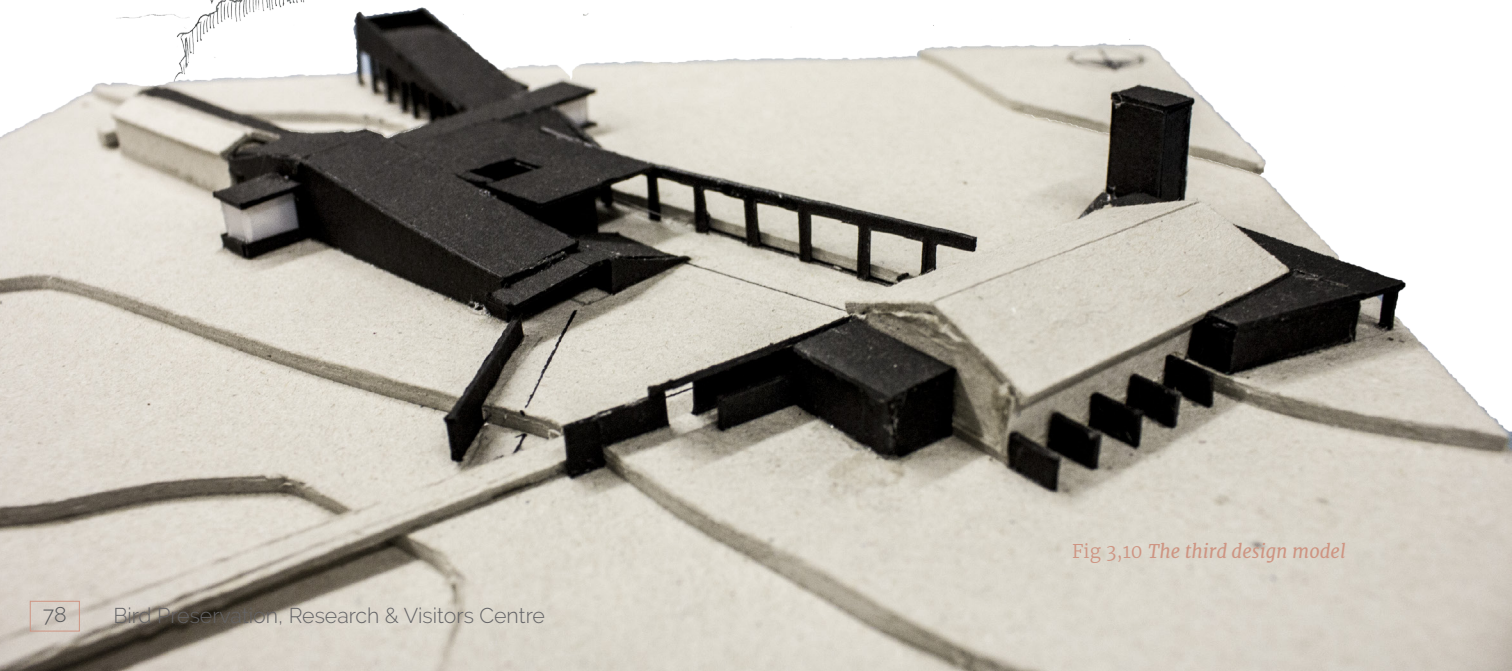
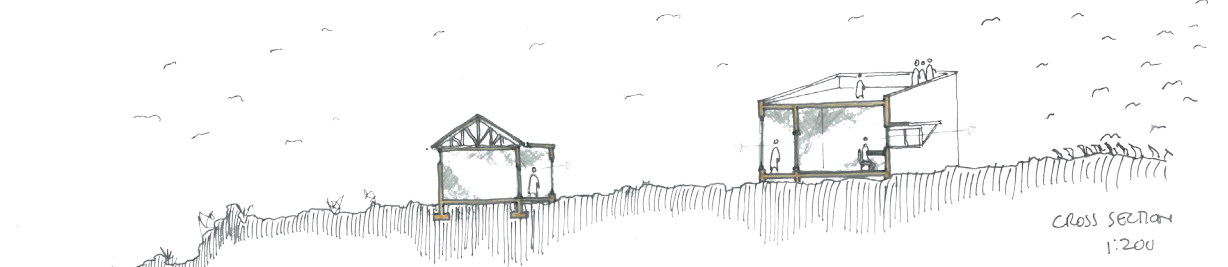
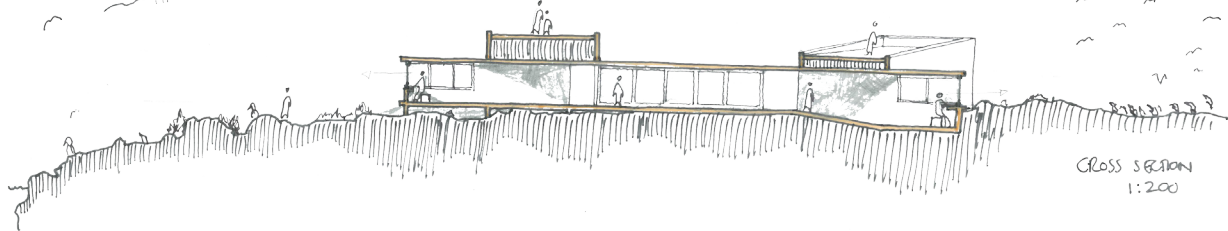
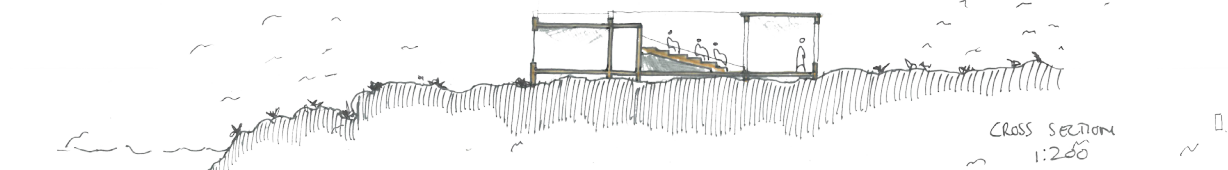
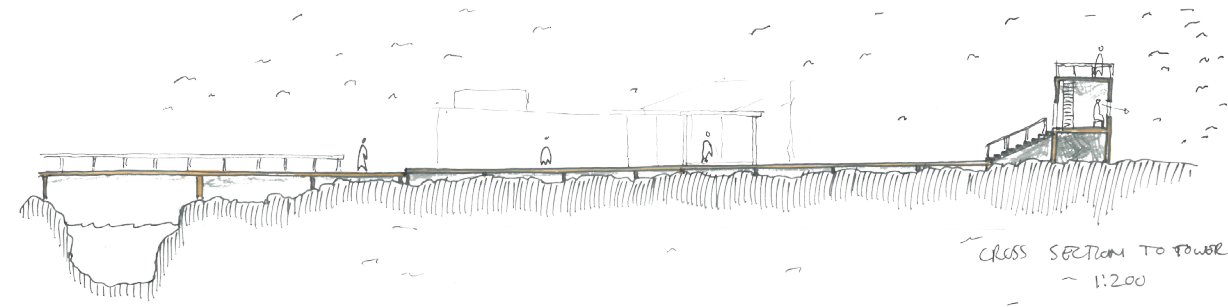
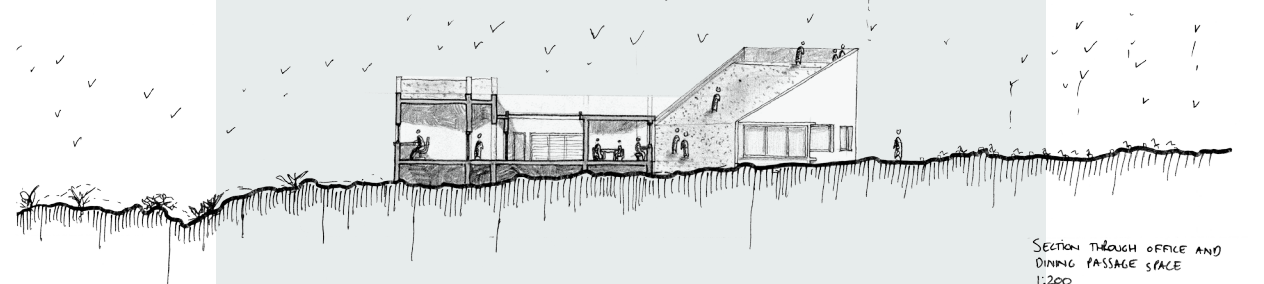
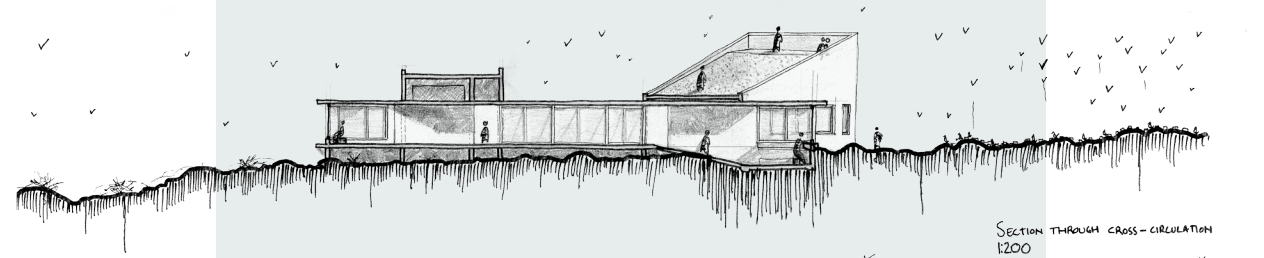
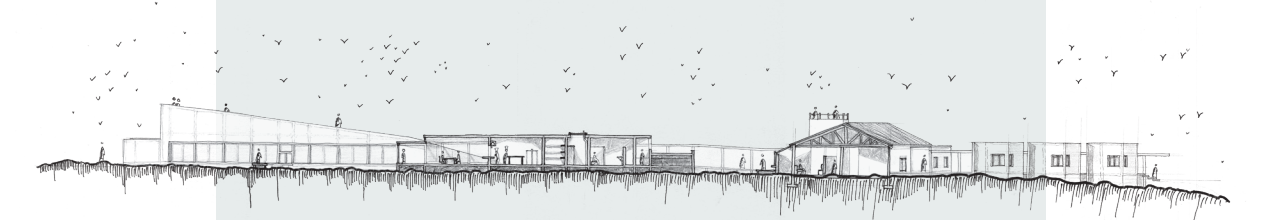


Fig 3.10 The third design model



Furthering the ideas of the previous collection of models and drawings, more resolved and articulated drawings were generated in order to explore the true potential of the design. A manner of touching the topography of the site lightly yet creating a solid, heavy architectural presence was explored through a stereotomic design. Focus was also placed on circulation routes throughout the design's area, allowing for the illusion of free movement, yet in reality restricting visitors to certain areas of the island. The design also made allowance, through the demolition of existing structures, for a large number of Gannet breeding pairs to inhabit previously inaccessible spaces.

The struggle of using the existing structures on site became a large issue as the aim was to incorporate yet respect the architectural style of these vernacular structures. In this aspect, the proposed design began to falter and weaken, as it began to consume the existing structures into its onolithic form. Nevertheless, it provided strong basic ordering principles by which the design should be realised and resolved.

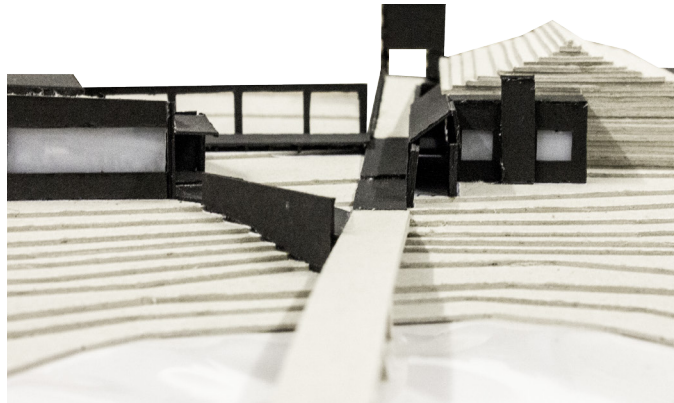


Fig 3,11 View from the jetty

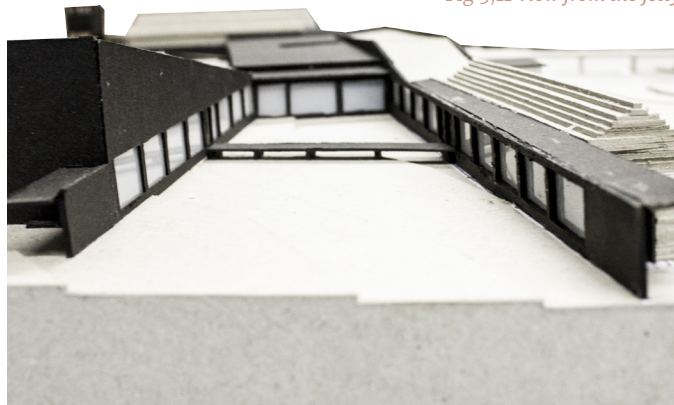


Fig 3,12 View from the eastern side of the island

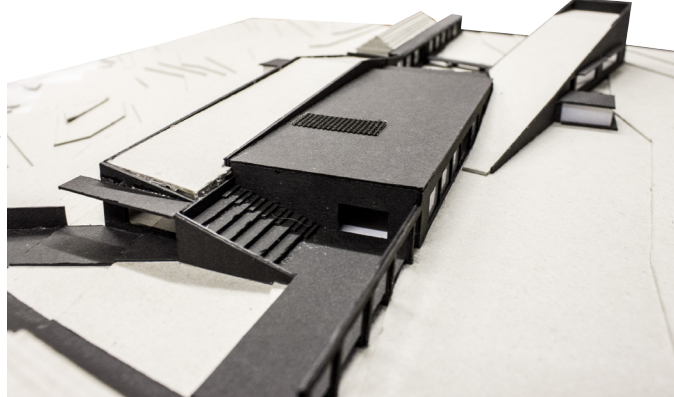


Fig 3,14 View from observation tower

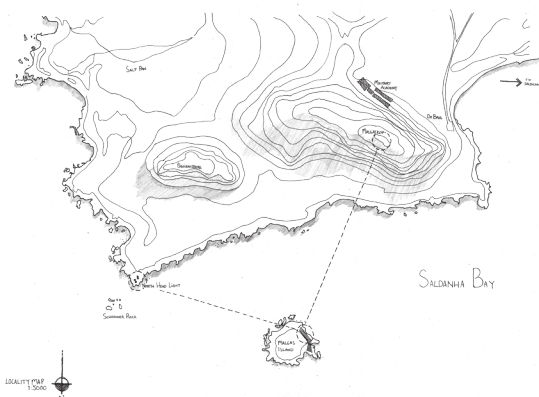


Fig 3,13 Locality map

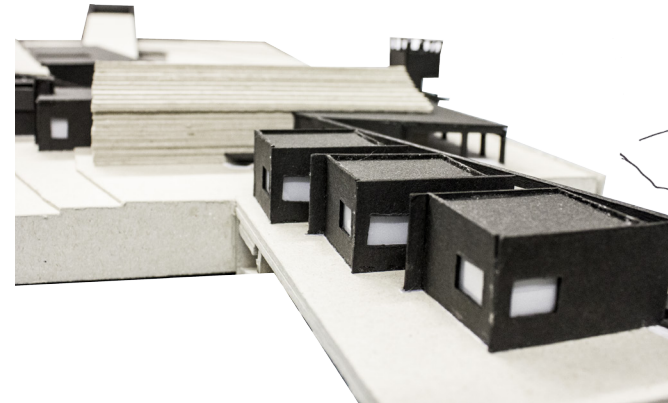


Fig 3,16 View of accomodation units

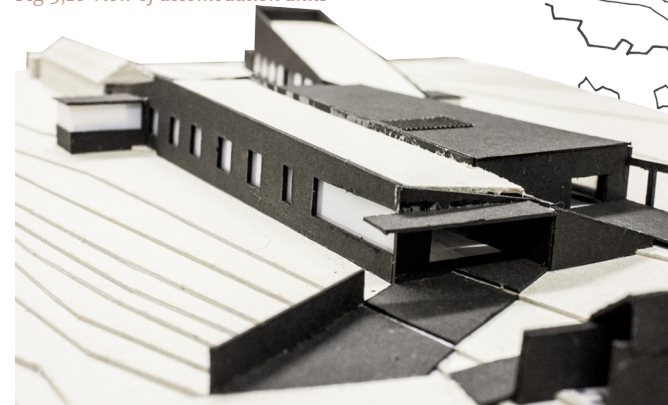


Fig 3,17 View of main entrance

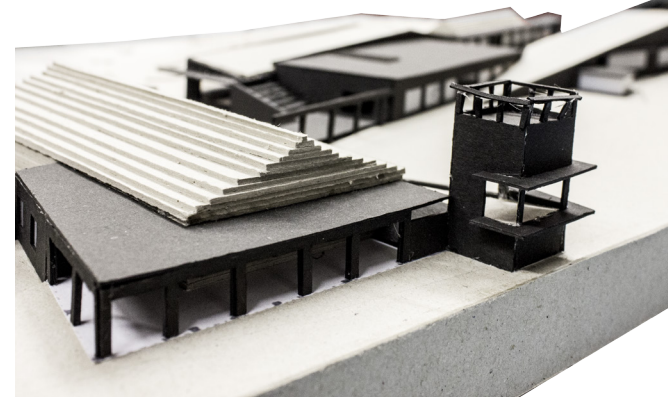


Fig 3,18 View of main observation tower

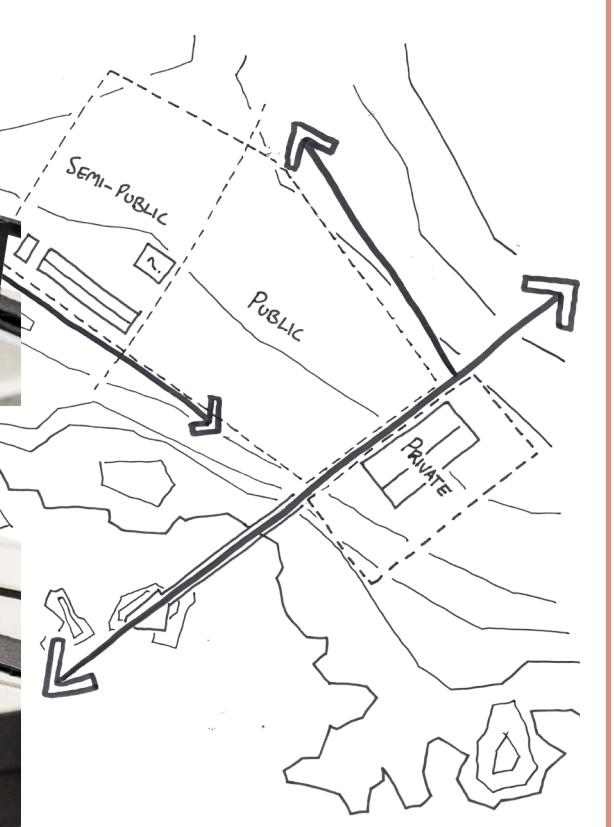


Fig 3,19 Sketch indicating private and public designation

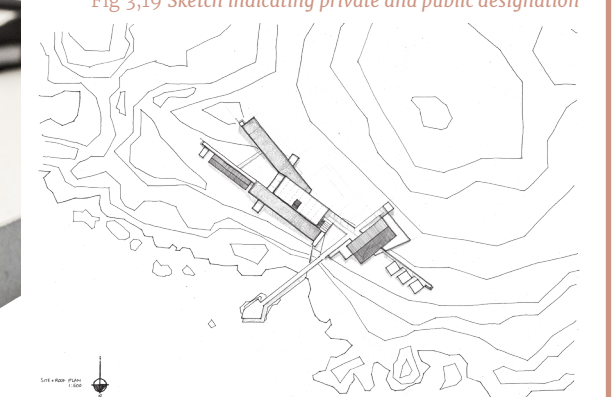


Fig 3,20 Sketch site plan

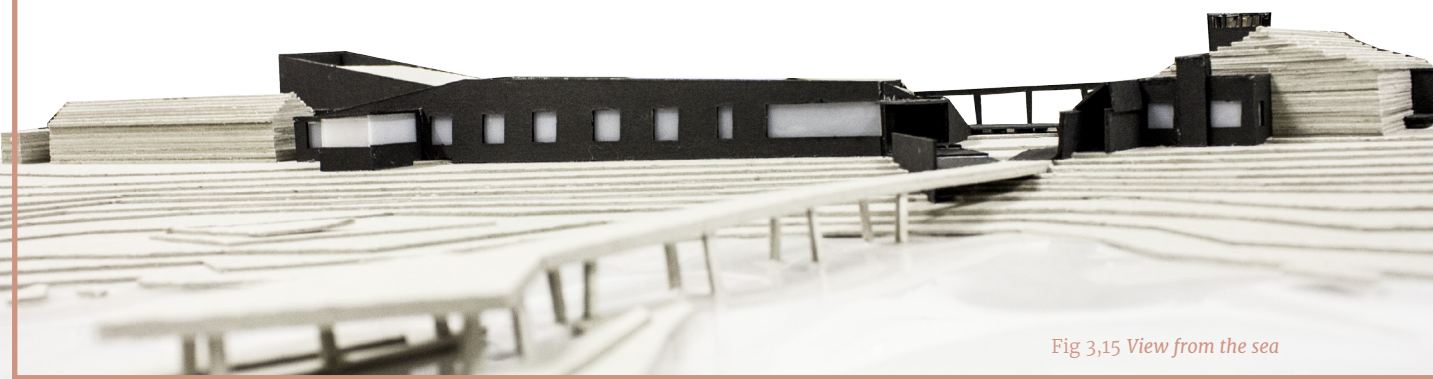


Fig 3,15 View from the sea



Fig 3,21 View from the bird colony

The structural concept behind the design proposal is that practically every single element can be prefabricated off-site and assembled on-site. This is something that is not commonly found when considering stereotomic designs, and requires an extremely detailed structural resolution.

The building process was conceptualised into different stages, as pictured in the drawings below.

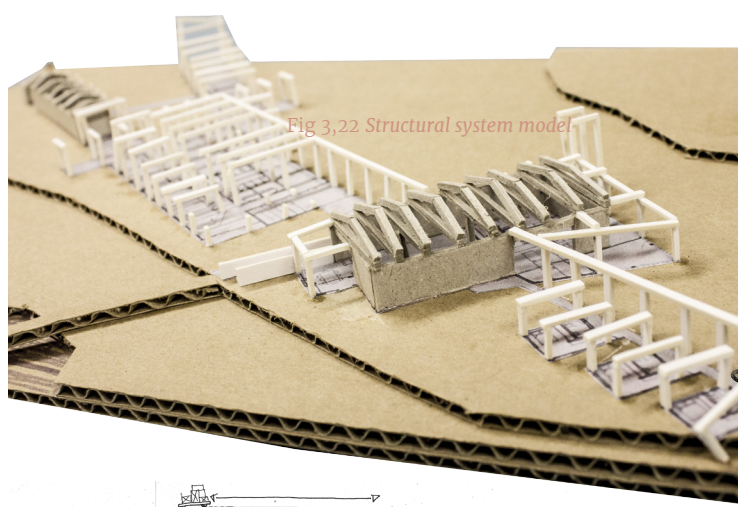


Fig 3.22 Structural system model

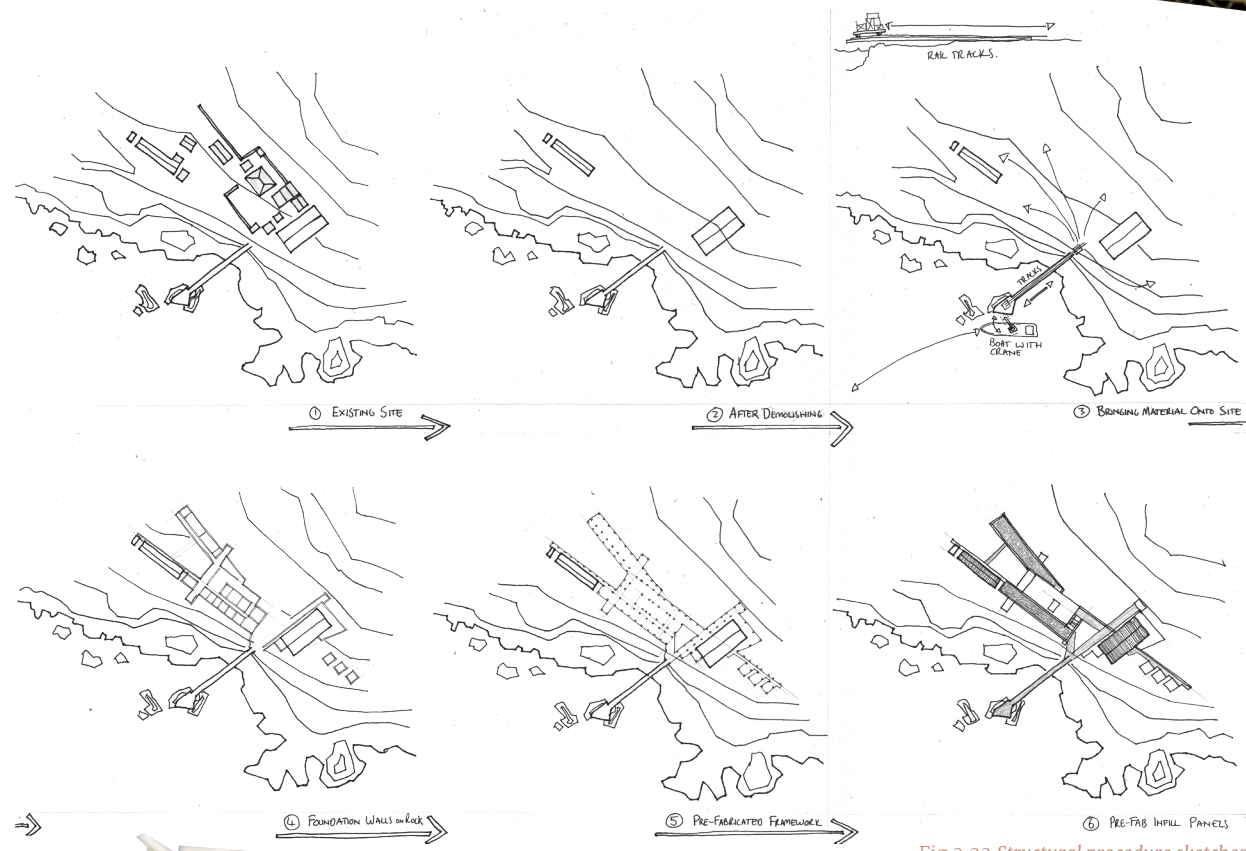
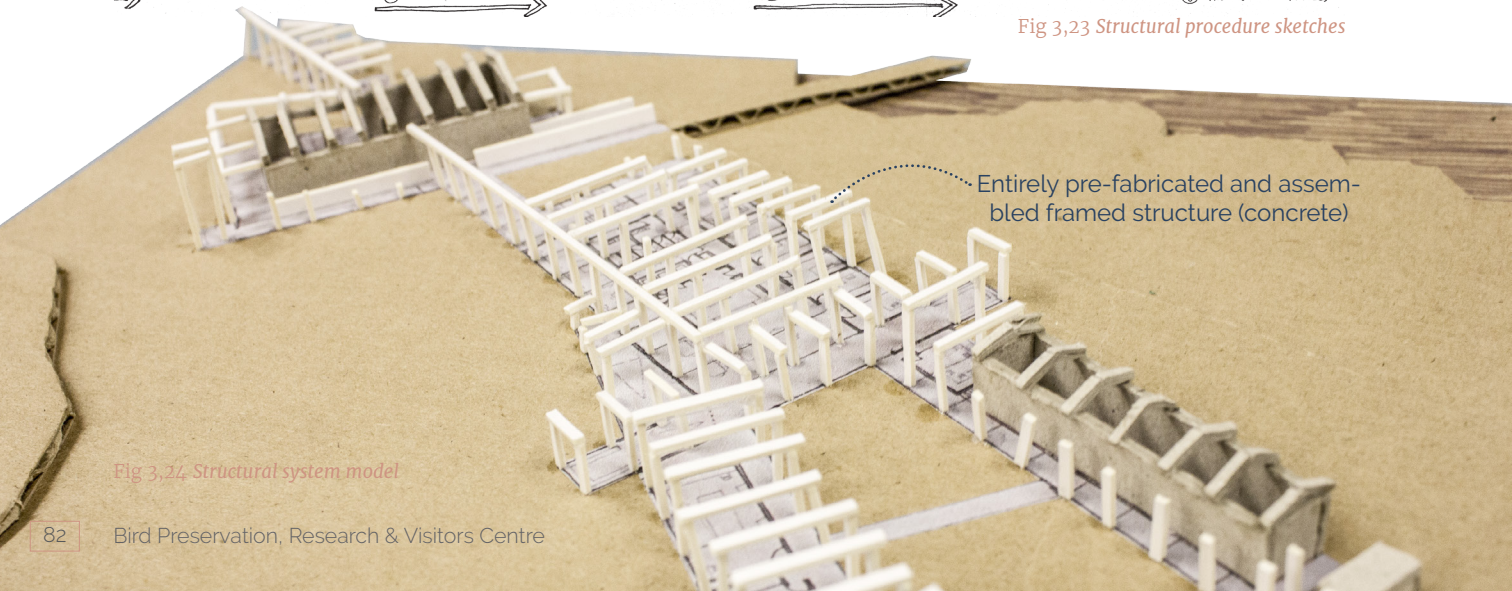


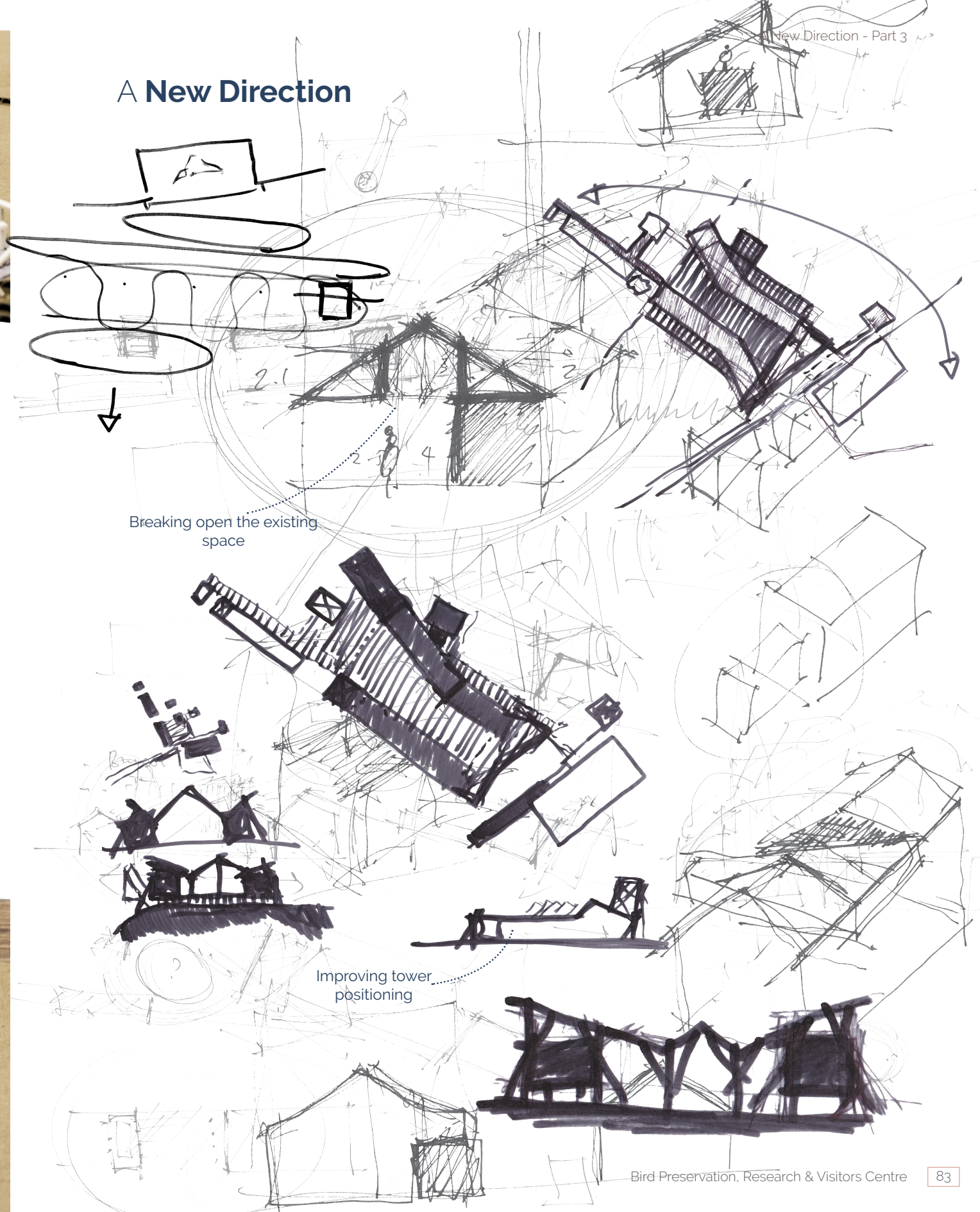
Fig 3.23 Structural procedure sketches



Entirely pre-fabricated and assembled framed structure (concrete)

Fig 3.24 Structural system model

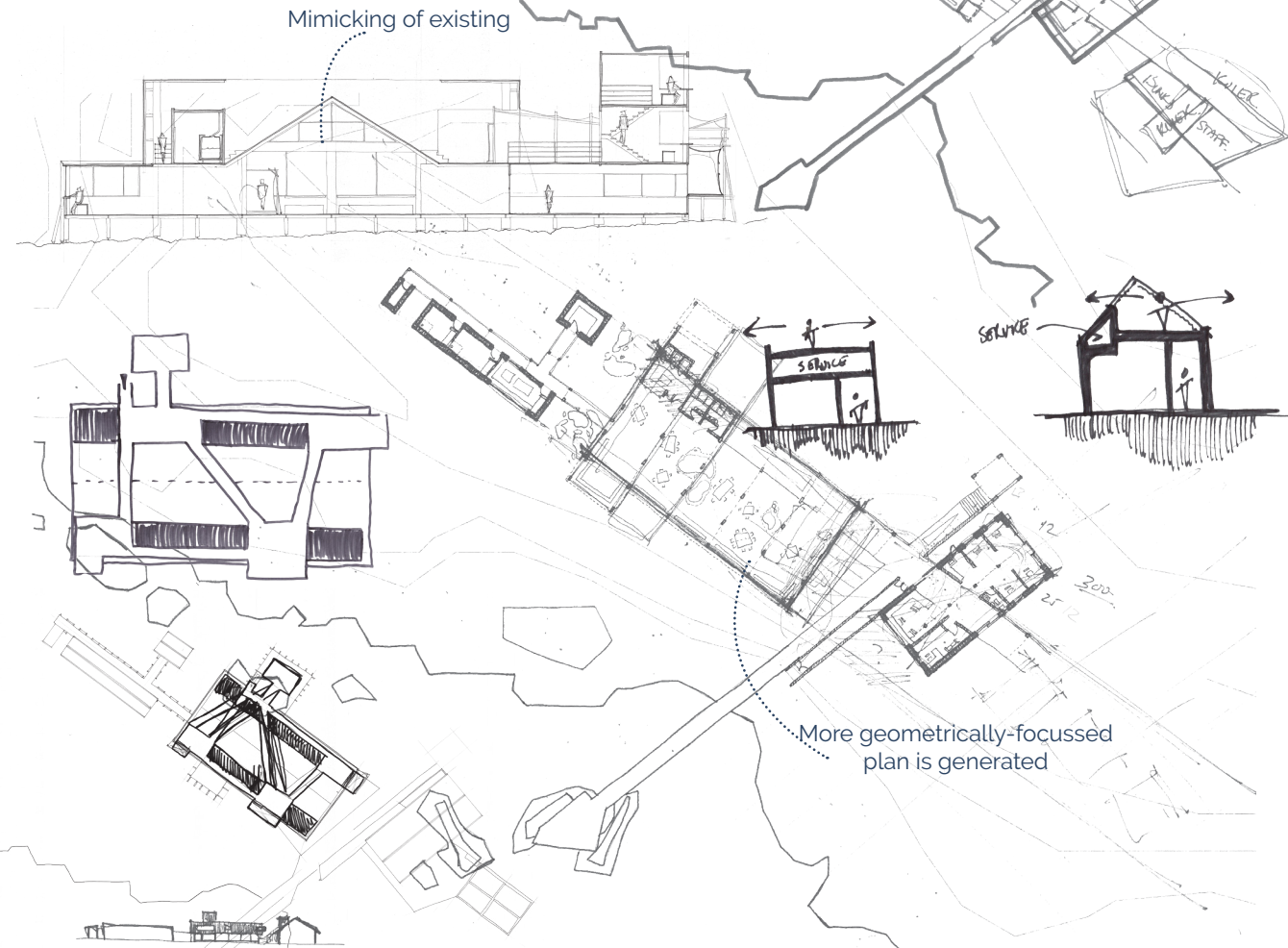
A New Direction



Breaking open the existing space

Improving tower positioning

Doubt is a curious aspect of the design process. One moment it makes you reconsider an aspect or two of a design, the next moment, it makes you pivot into a new direction. With the realisation that a stereotomic approach to the building is practically impossible to be ethically approached, a lighter, more tectonic approach was considered. The relationship between existing and new was also greatly reconsidered.

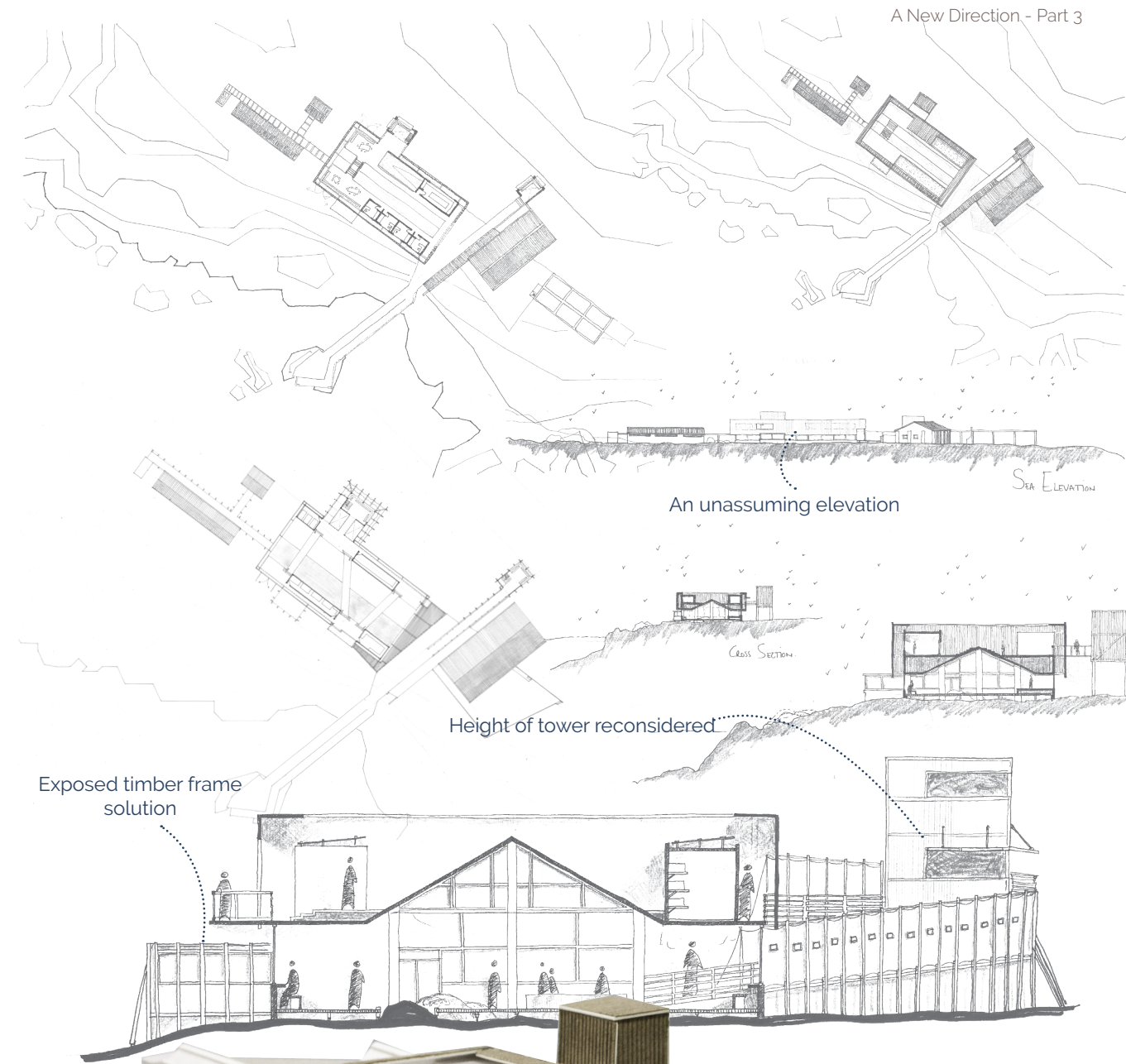


Mimicking of existing

More geometrically-focussed plan is generated

More ideas on mimicking the existing roof pitches

Fig 3,25 Conceptual model



An unassuming elevation

Height of tower reconsidered

Exposed timber frame solution

Existing and new structures allow one another complete self-expression

Fig 3,26 Model indicating new design direction

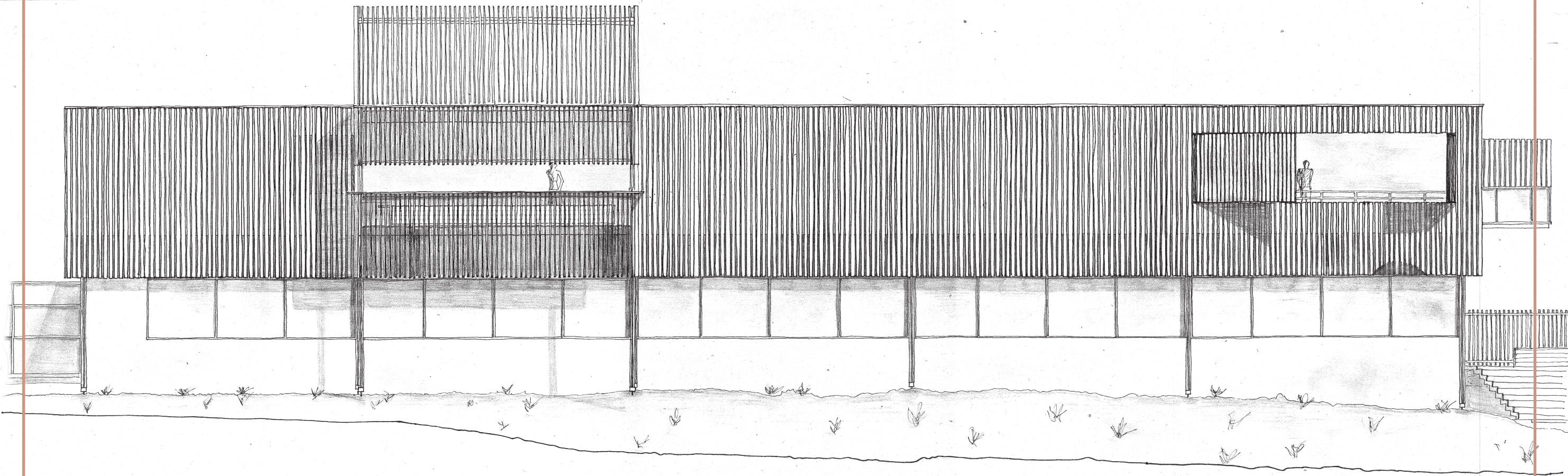


Fig 3,28 New design elevation

An unassuming architecture has been sought after throughout the project's development, due to the need for an ecologically ethical approach. It is through a seemingly monotonous and 'plain' facade that the building achieves this effect. By simply varying in transparency in the cladding, the design begins to assimilate with its surrounding context. Yet on plan, there is nothing unassuming about a straight interrupted line, but rather something very strong. This gives the architecture a strong impact yet an unassuming presence on the site.

The driving idea behind the new design approach is that the existing buildings get touched lightly, the introduced structures metaphorically imitate the existing vernacular forms, and the site gets impacted as little as possible, whilst at the same time the amount of horizontal space covered by the design is minimised.

The cladding surrounding the roof-scape tells a story. It places the building's users within a cage, able to observe the surrounding birds who are free to move where they please. It challenges and turns on its head the idea that nature should be in a cage and mankind should be free. This is in an attempt to shift the paradigms of the buildings users.

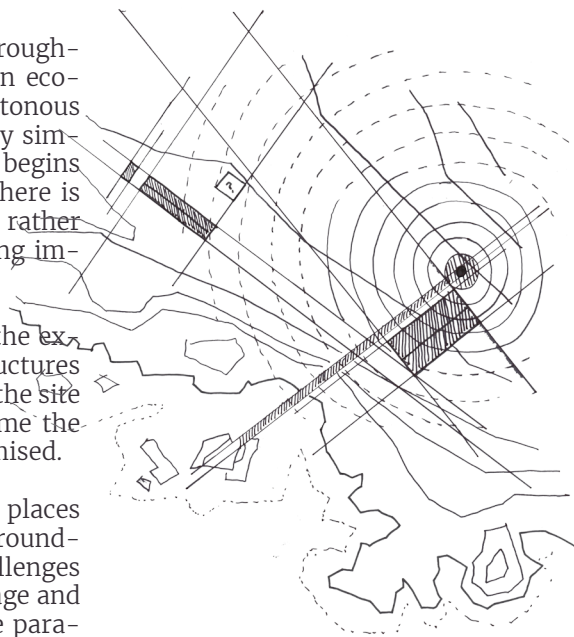


Fig 3,27 Sketch indicating organised grids on site

Exposed timber structure lightly connects the various existing buildings

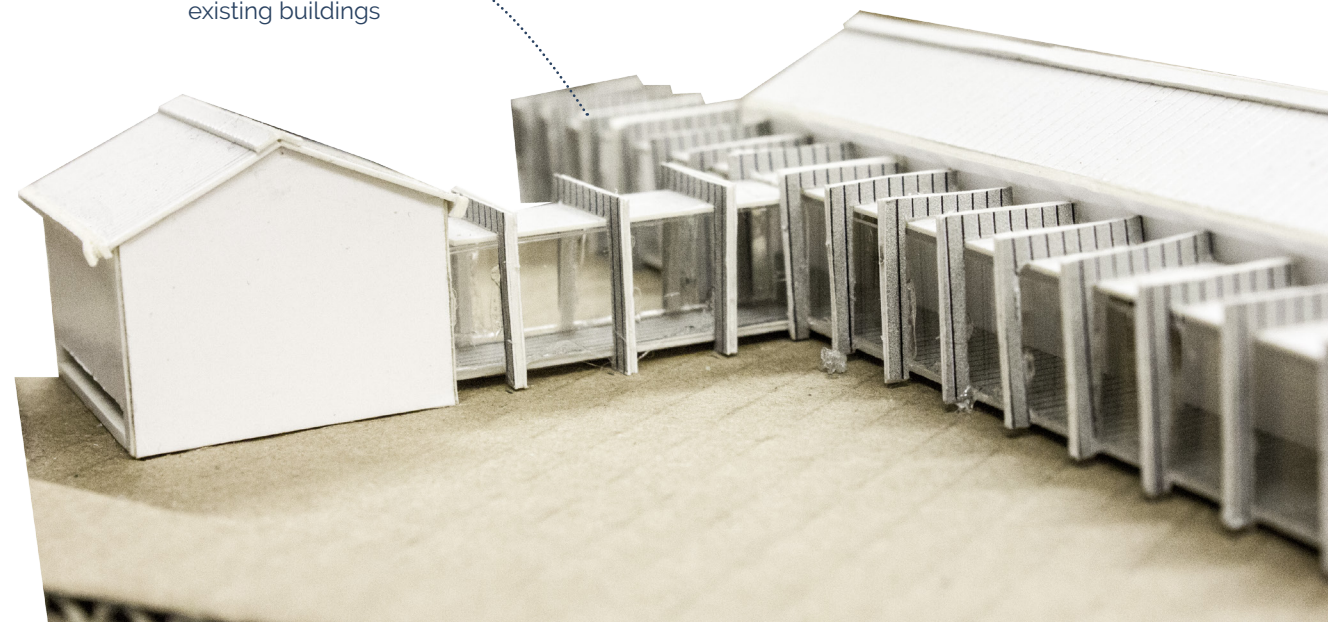
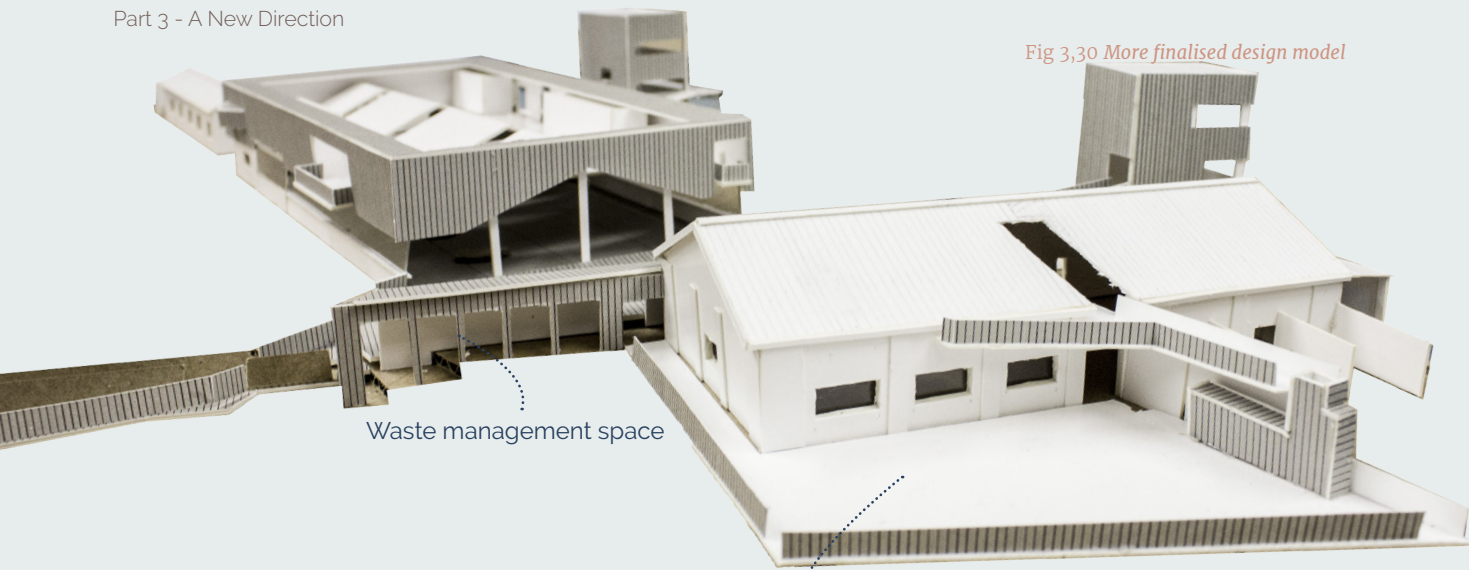


Fig 3,29 View of the passage towards existing structures

Fig 3,30 More finalised design model



Type of cladding approach differs to allow for optimum viewing

Student camping area

Services are hidden within 'roof' cladding

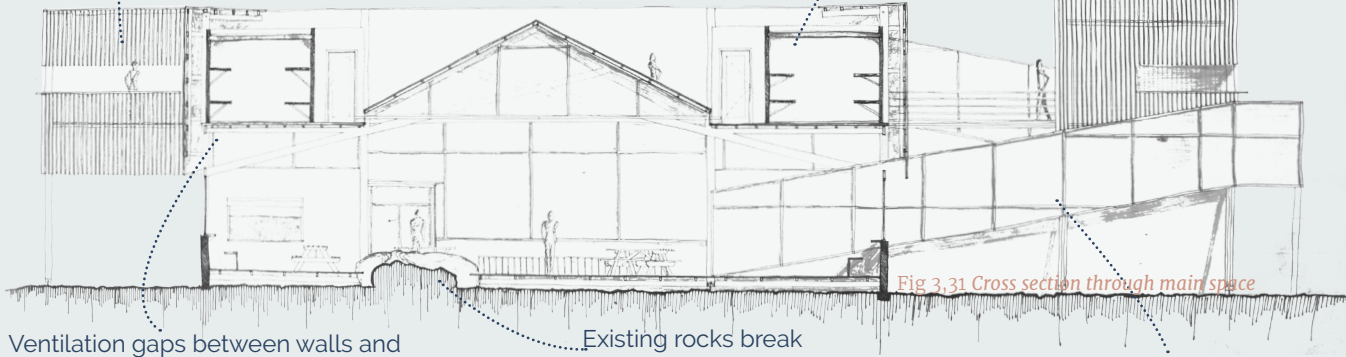


Fig 3,31 Cross section through main space

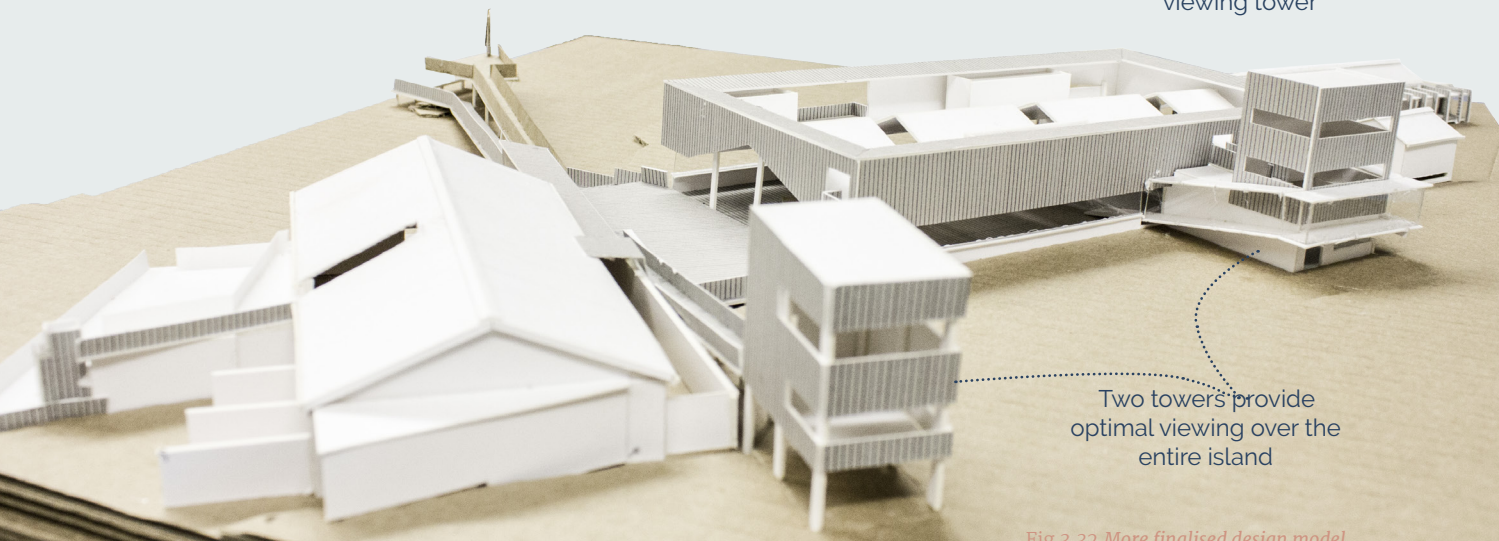


Fig 3,32 More finalised design model

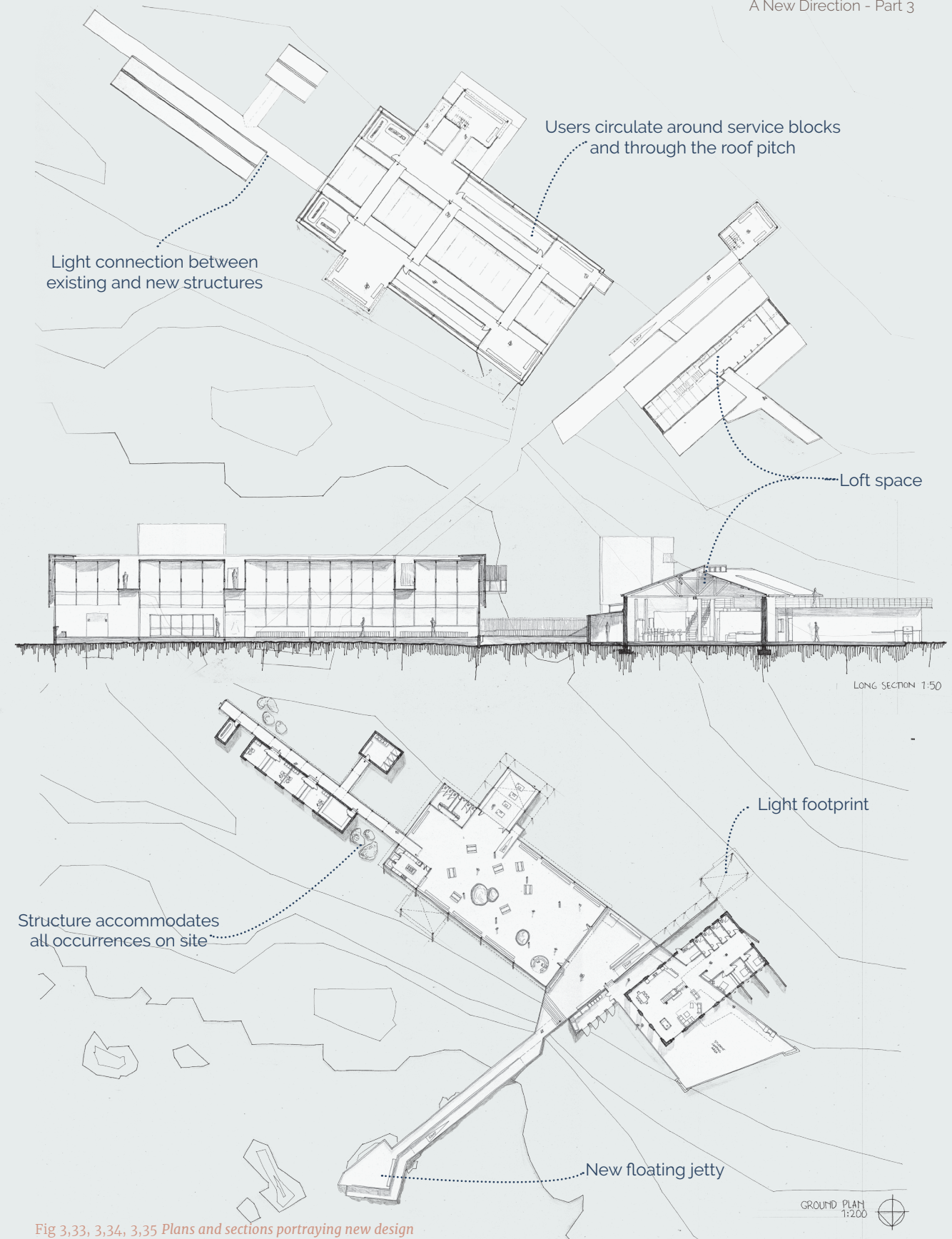


Fig 3,33, 3,34, 3,35 Plans and sections portraying new design

Fig 3,39 Design model



The model more accurately represents the relationship with solid walled spaces and transparent cladded facades



Fig 3,36 Camping area



Fig 3,37 Main elevation

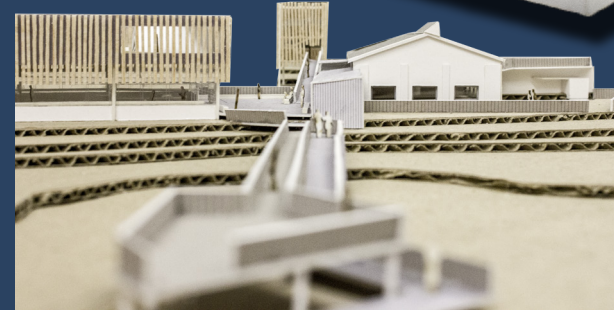


Fig 3,40 Approach onto the island

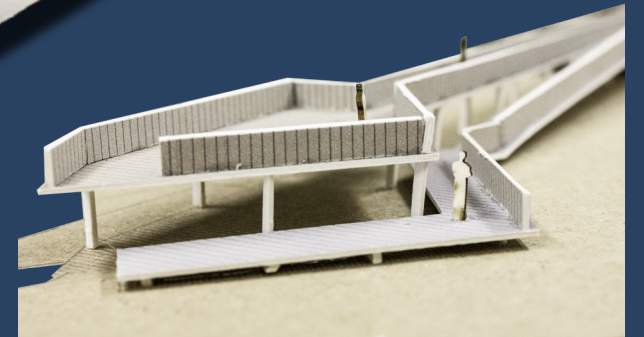


Fig 3,41 Existing and new jetty

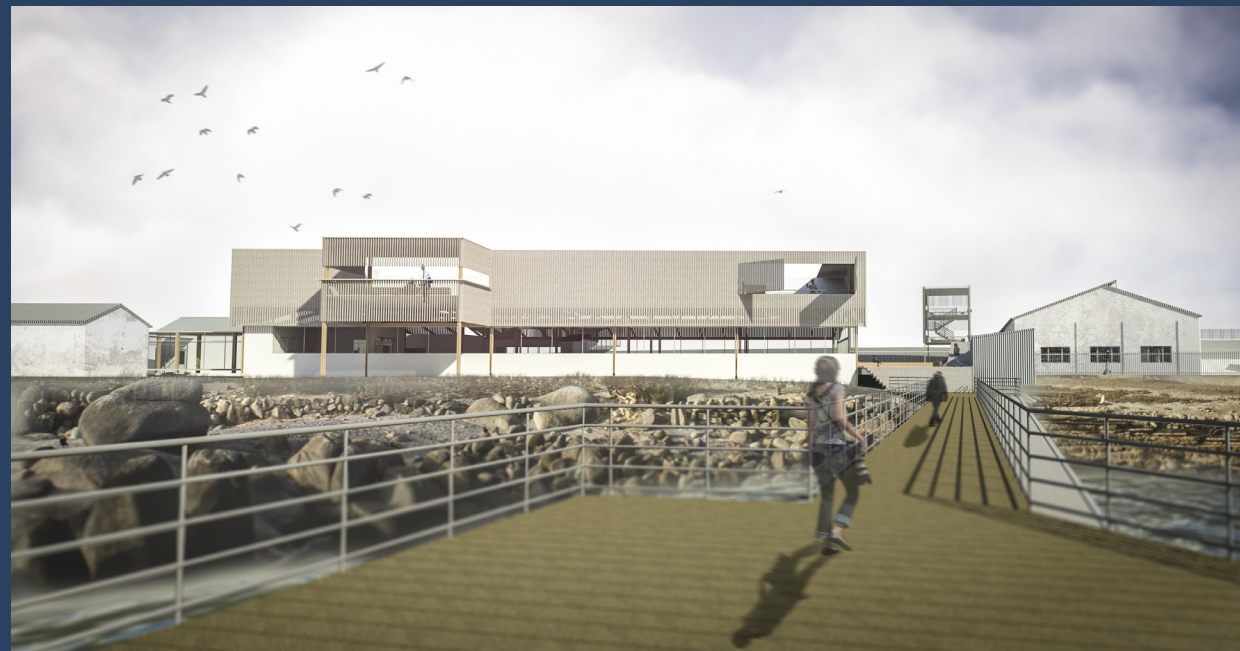


Fig 3,38 View from the jetty



Fig 3,42 Aerial view of the design

Improving and Modifying

With the basic design morphology becoming finalised, the more intricate details such as structural solutions, sculptural elements, furniture and light-shafts need to be designed. Sculptural elements are introduced that become an integral part of the design's structural resolution, not only decorative elements. The sustainability aspects of the design such as mist harvesting and solar energy storage also become more fully manifested ideas. The various furniture throughout the building such as viewing benches, eating tables and internal staircases will be individually and custom designed in order to maintain the integrity of the overall architectural approach.

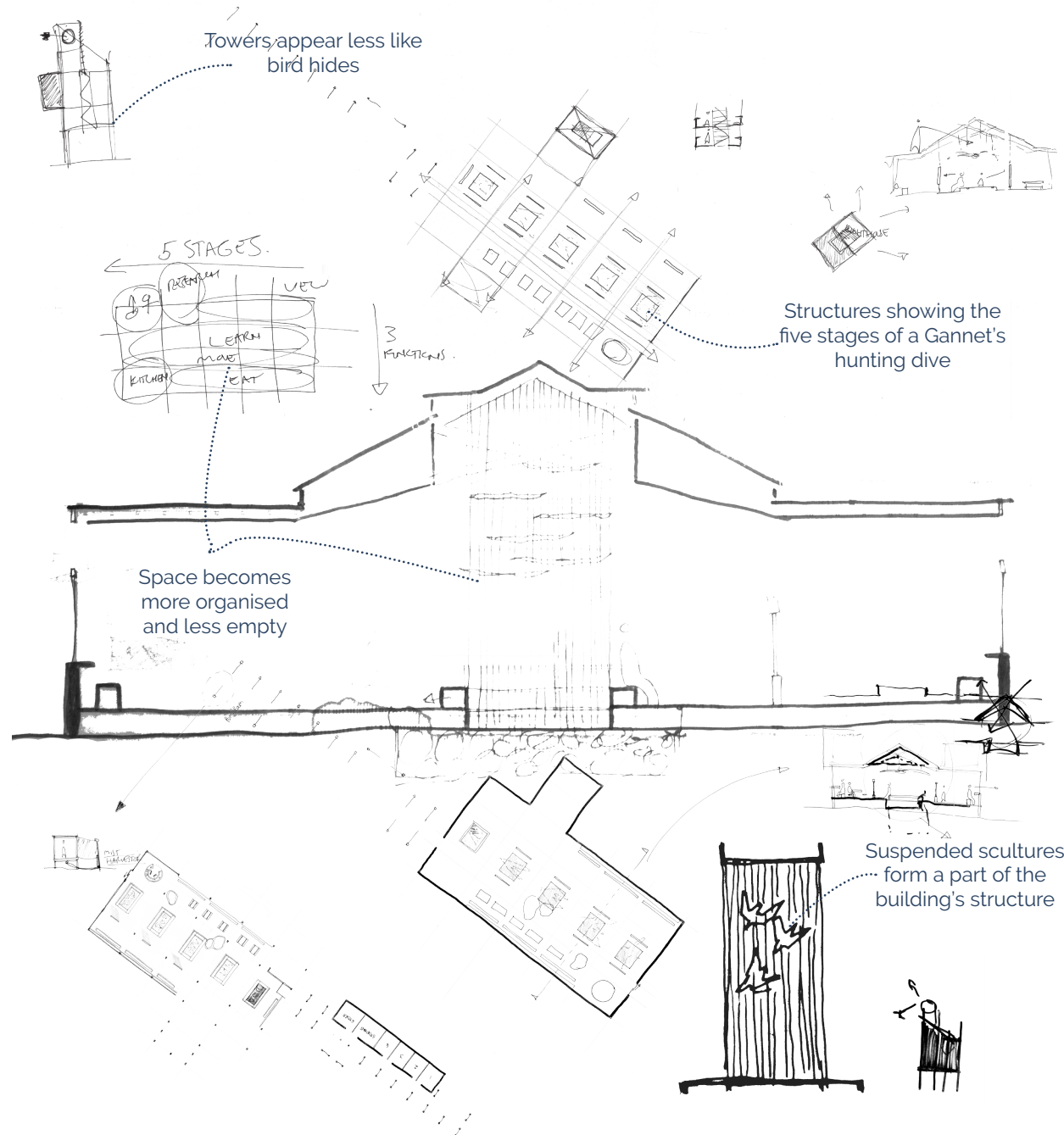
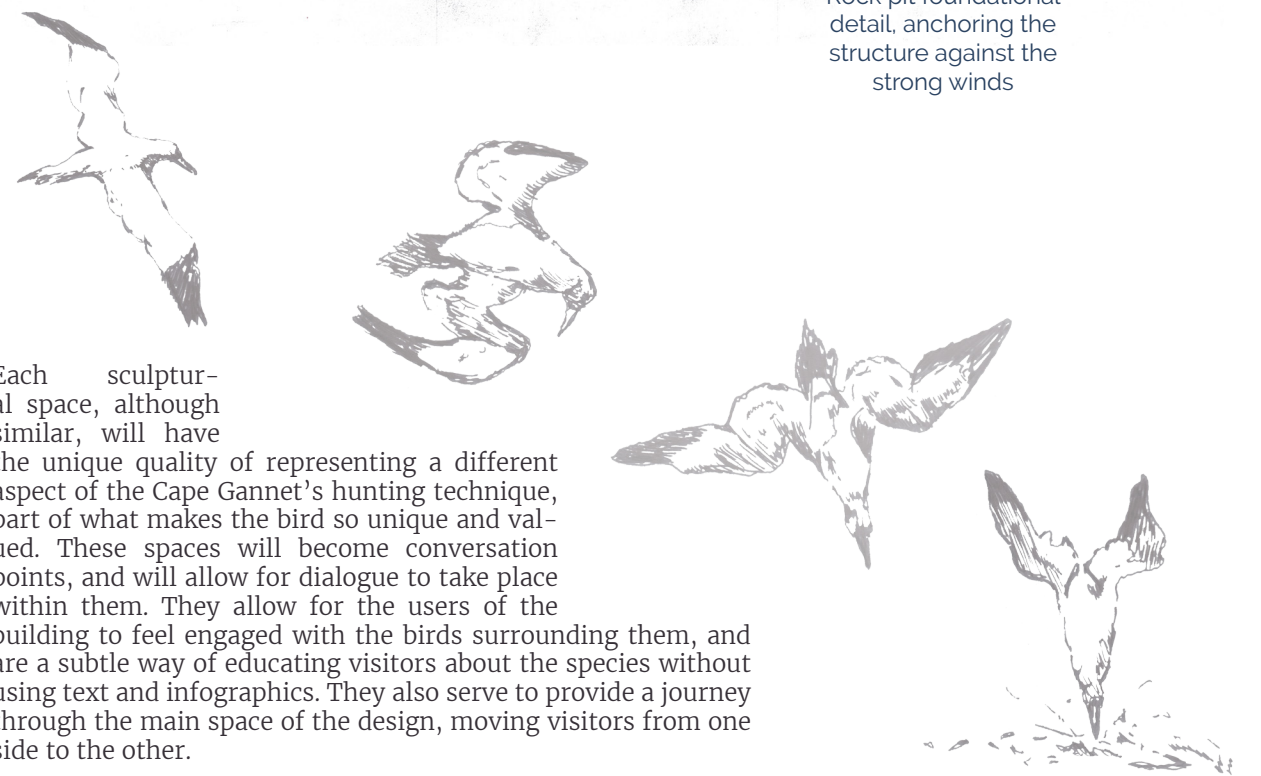
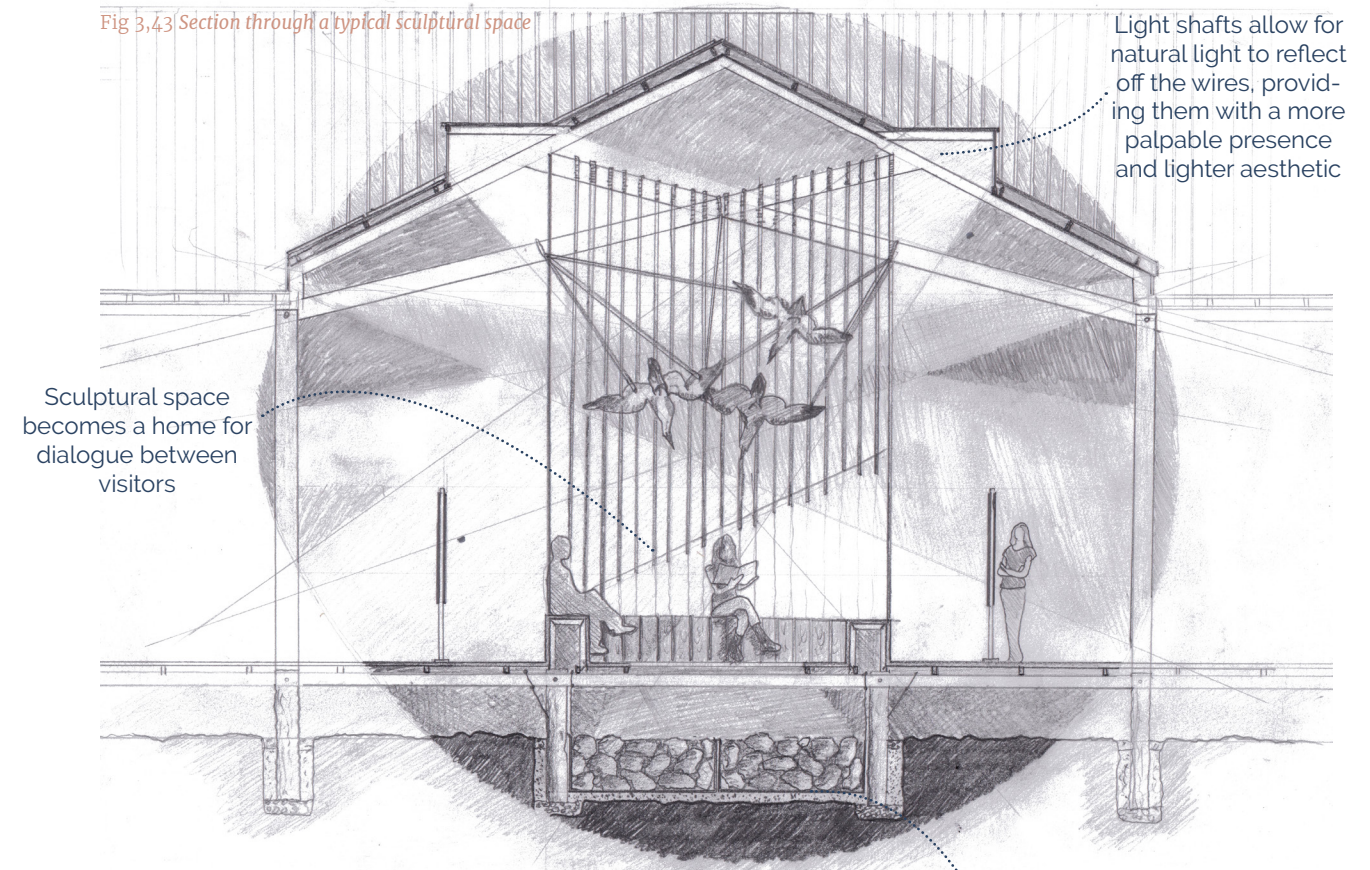


Fig 3,43 Section through a typical sculptural space



Each sculptural space, although similar, will have the unique quality of representing a different aspect of the Cape Gannet's hunting technique, part of what makes the bird so unique and valued. These spaces will become conversation points, and will allow for dialogue to take place within them. They allow for the users of the building to feel engaged with the birds surrounding them, and are a subtle way of educating visitors about the species without using text and infographics. They also serve to provide a journey through the main space of the design, moving visitors from one side to the other.

Rock pit foundational detail, anchoring the structure against the strong winds

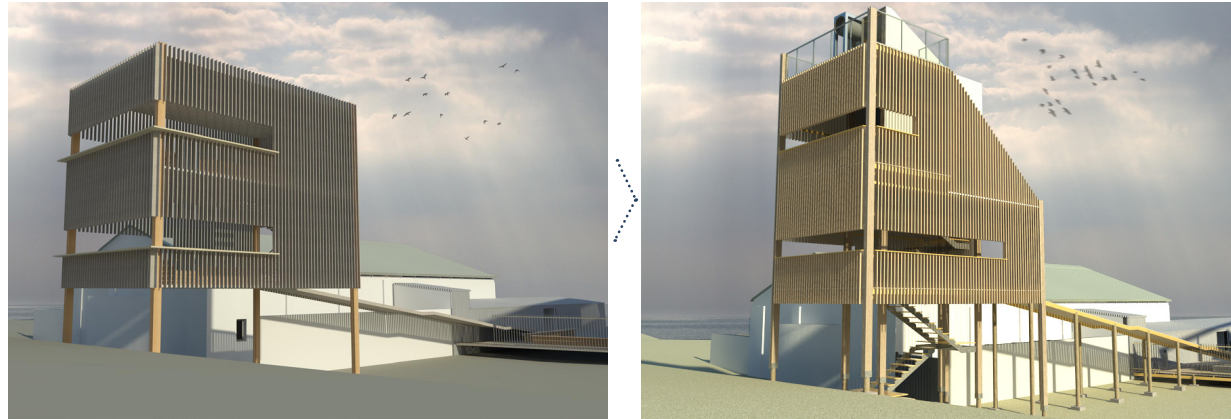


Fig 3,44 & 3,45 Improvements were made to the observation tower's aesthetic, by cutting forms out of the rigid box. This allowed the towers to lose their bird-hide aesthetic and become truly integrated with the rest of the design.

Towards a Final Design Solution

The following series of models is a brief overview of the design process undertaken until the final design was realised. Hereafter, all final artistic renders, sketch plans and models will be catalogued.

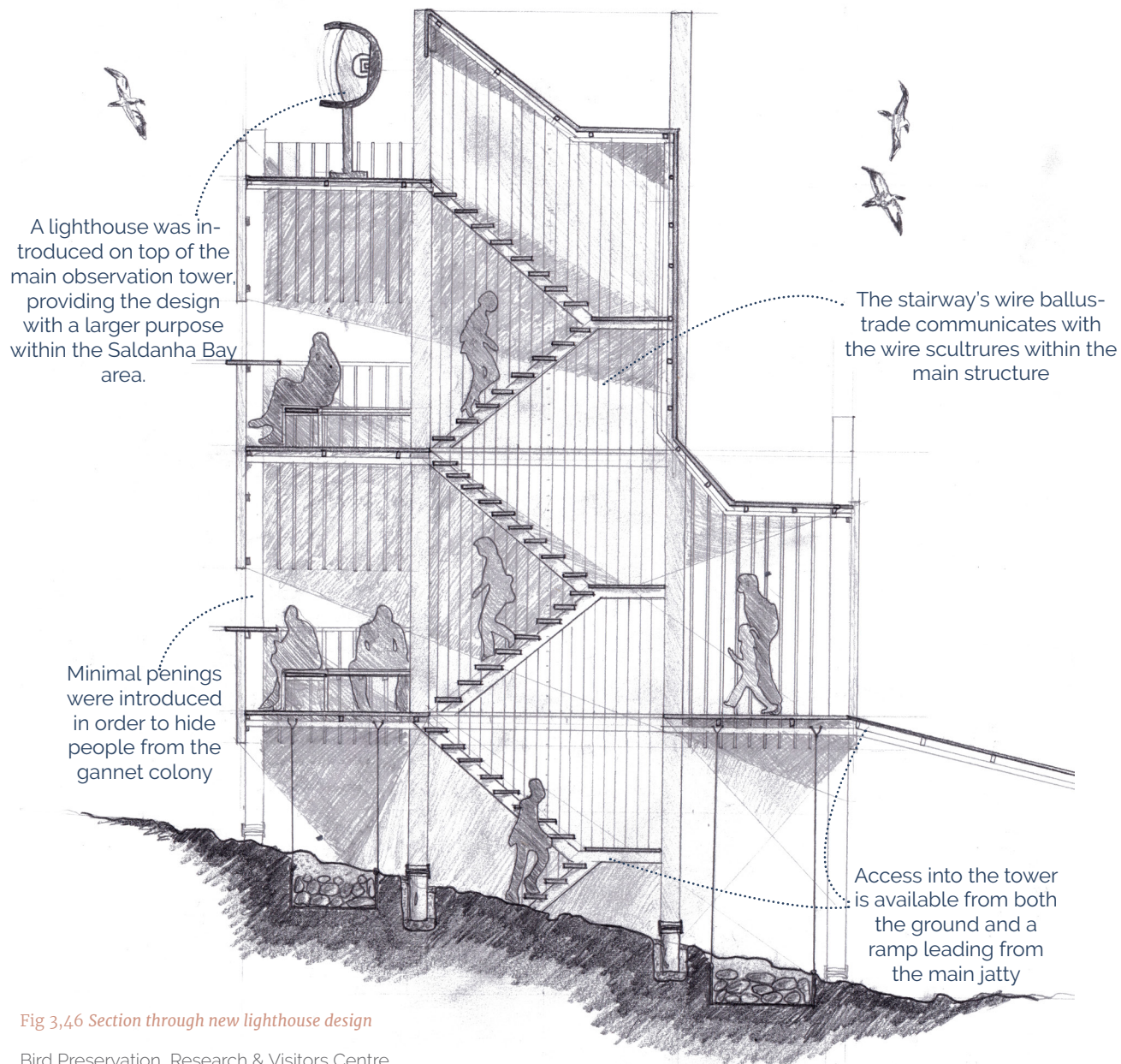


Fig 3,46 Section through new lighthouse design

Fig 3,47 Series of models



Fig 3,48 Observing the design from the main tower



Fig 3,49 Approaching the site from the new jetty



Fig 3,51 The spatial experience



Fig 3,50 Moving toward the main entrance



Fig 3,52 Looking out over the sea from the first floor

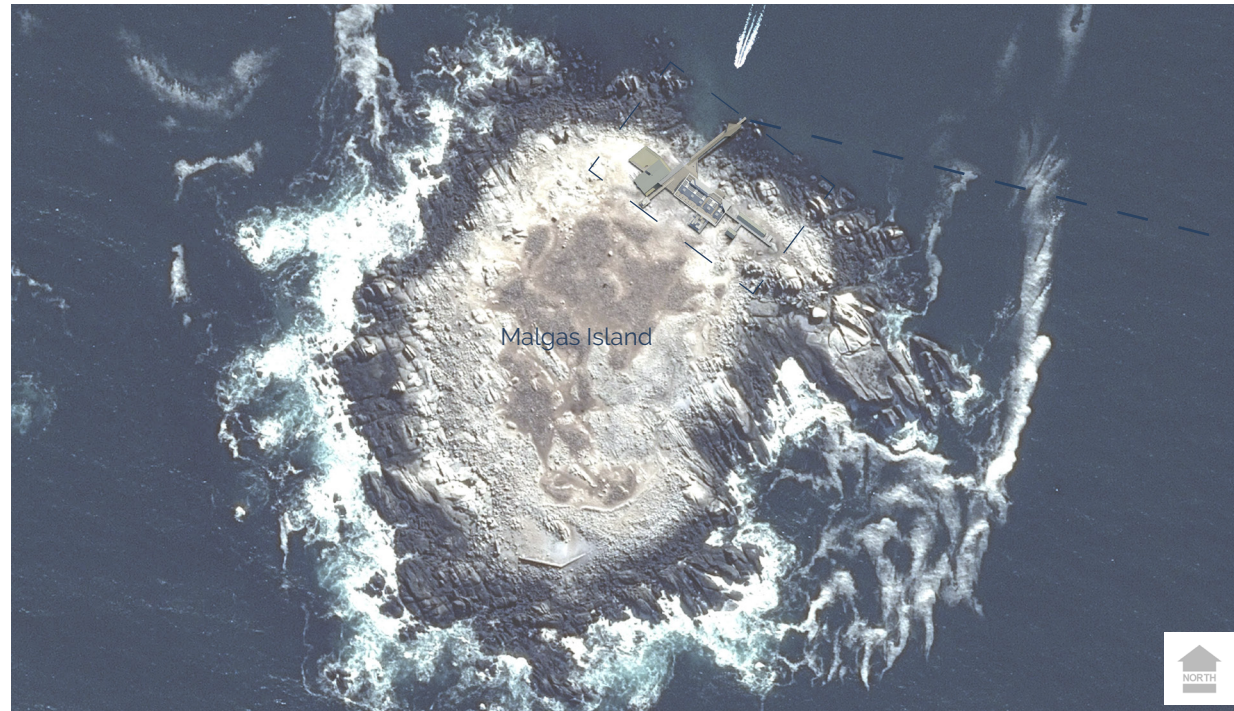


Fig 3,53 Malgas Island with the proposed design

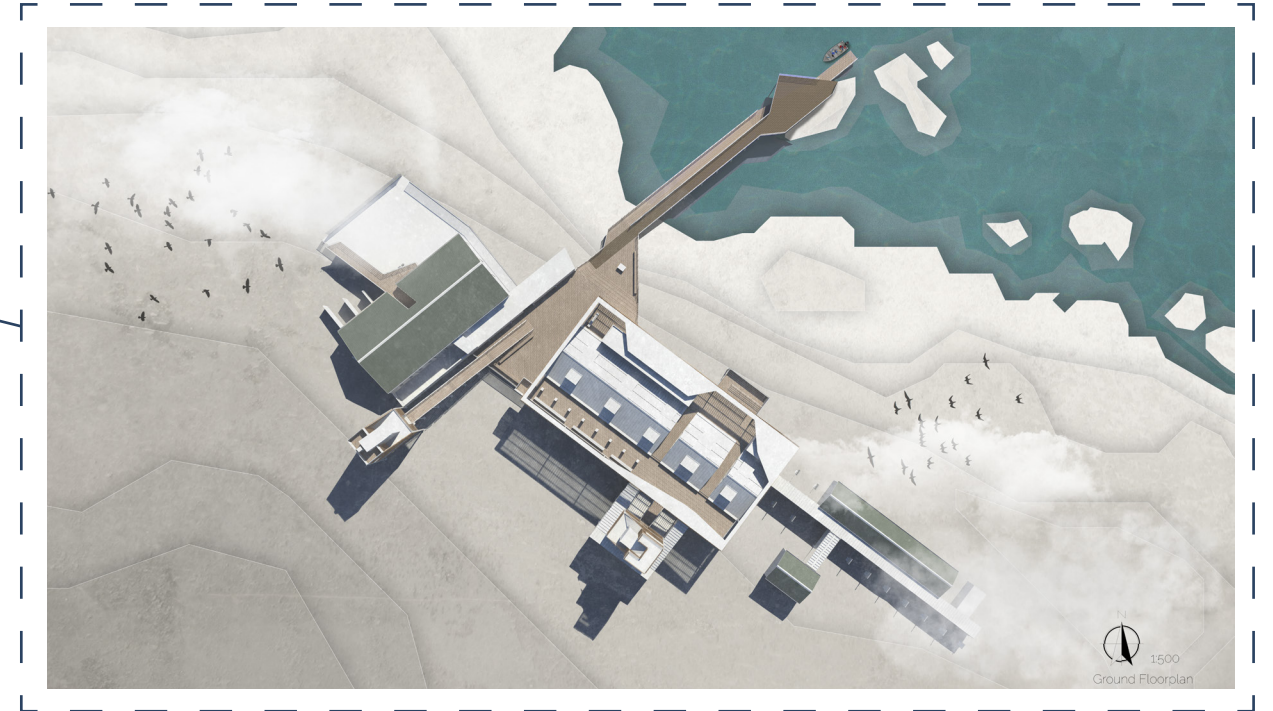


Fig 3,54 Site plan

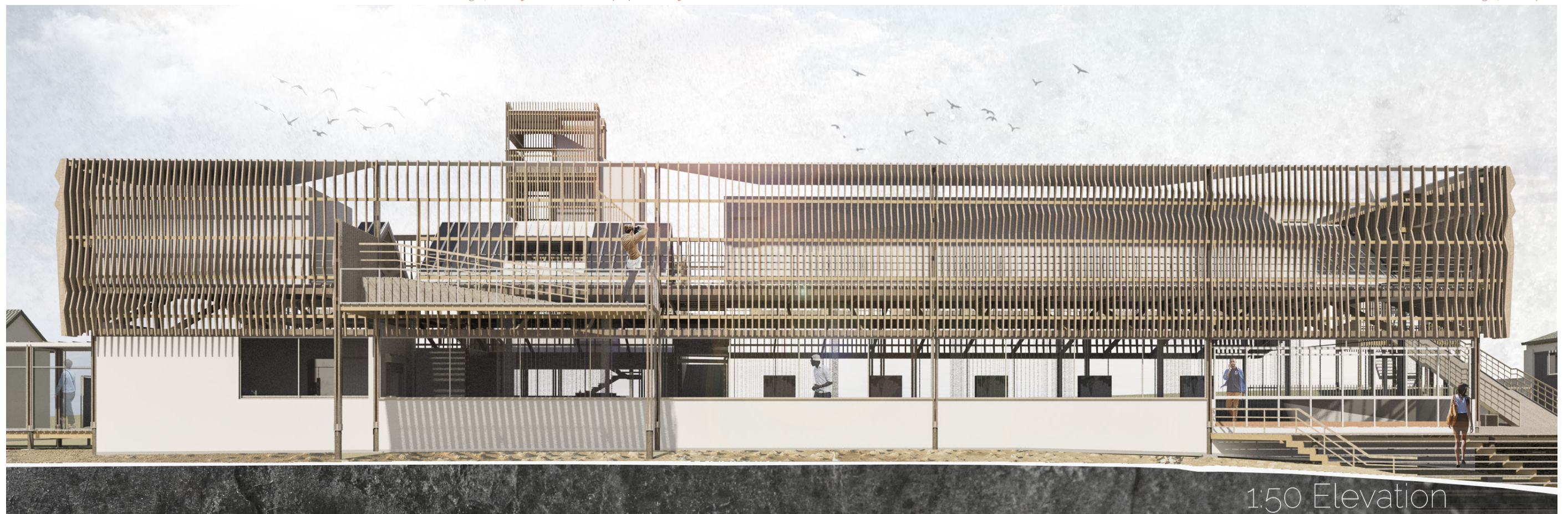


Fig 3,55 Main Elevation



Fig 3,56 Ground floorplan

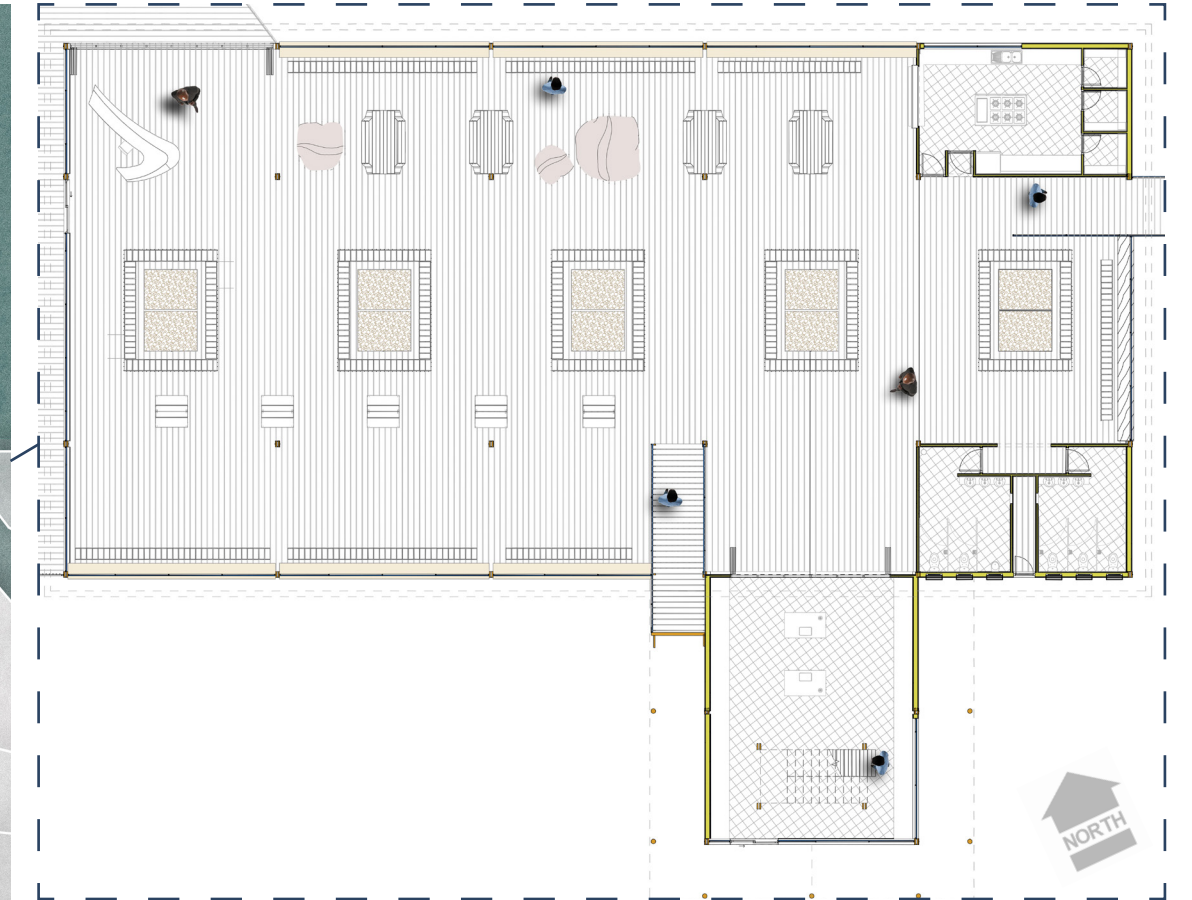


Fig 3,57 Main space floorplan

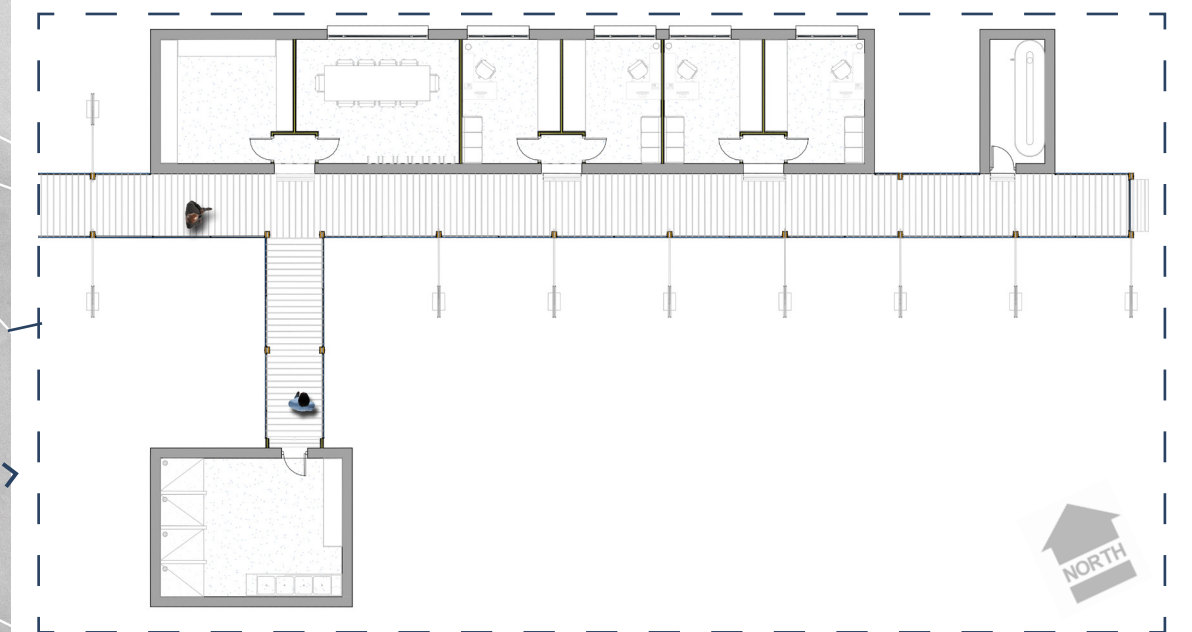


Fig 3,58 Passage to existing floorplan



Fig 3,59 Longitudinal section through design

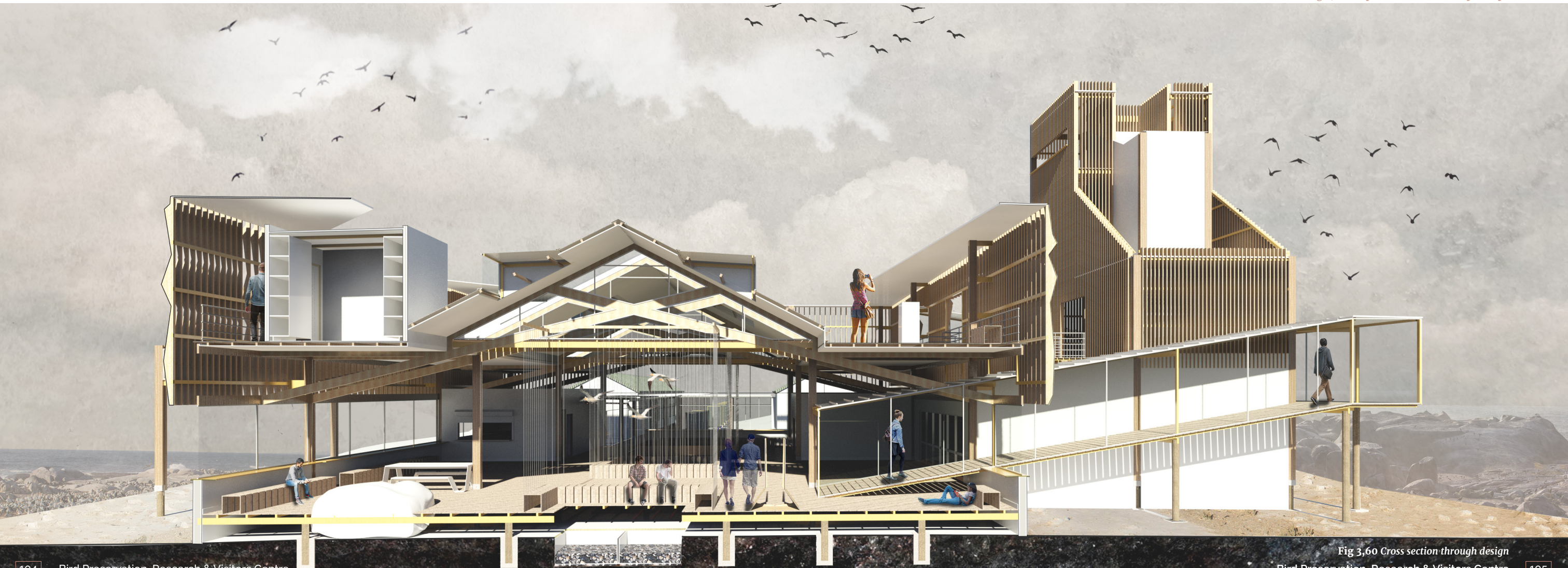


Fig 3,60 Cross section through design
Bird Preservation, Research & Visitors Centre



Fig 3,61 Eastern view of the design



Fig 3,63 Approaching the first floor from the ramp



Fig 3,62 Moving through the passage



Fig 3,64 Moving through the first floor spaces



Fig 3,65 View from the sea

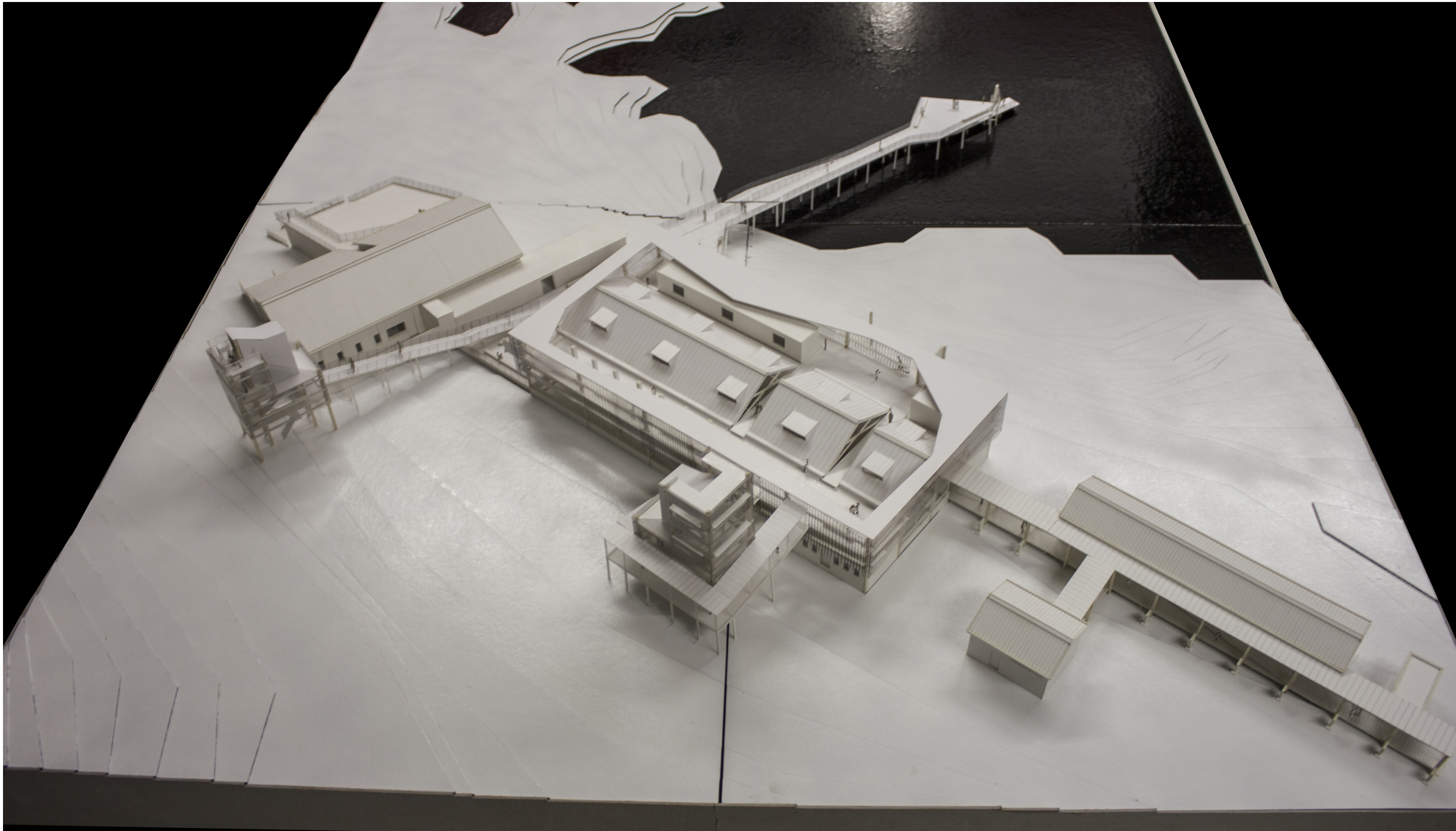


Fig 3,66 Final model

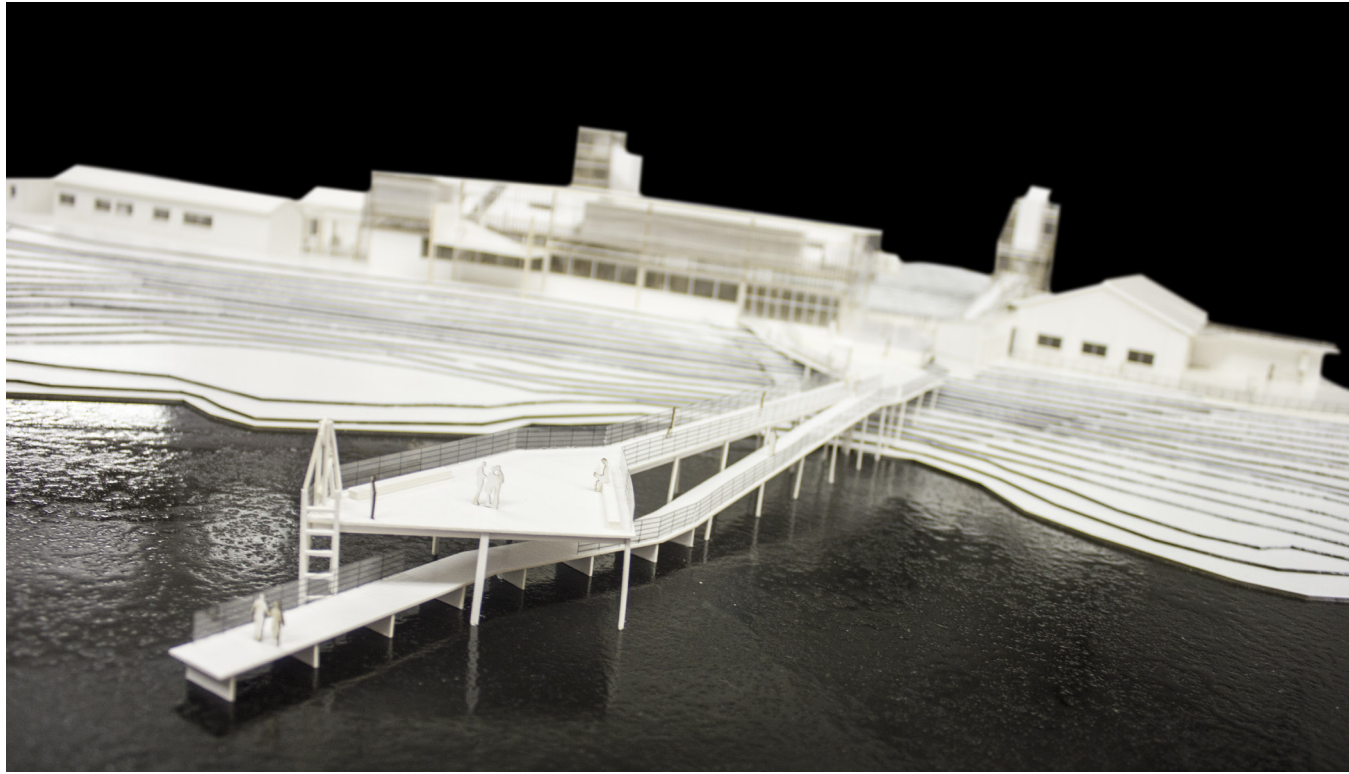


Fig 3,67 Final model

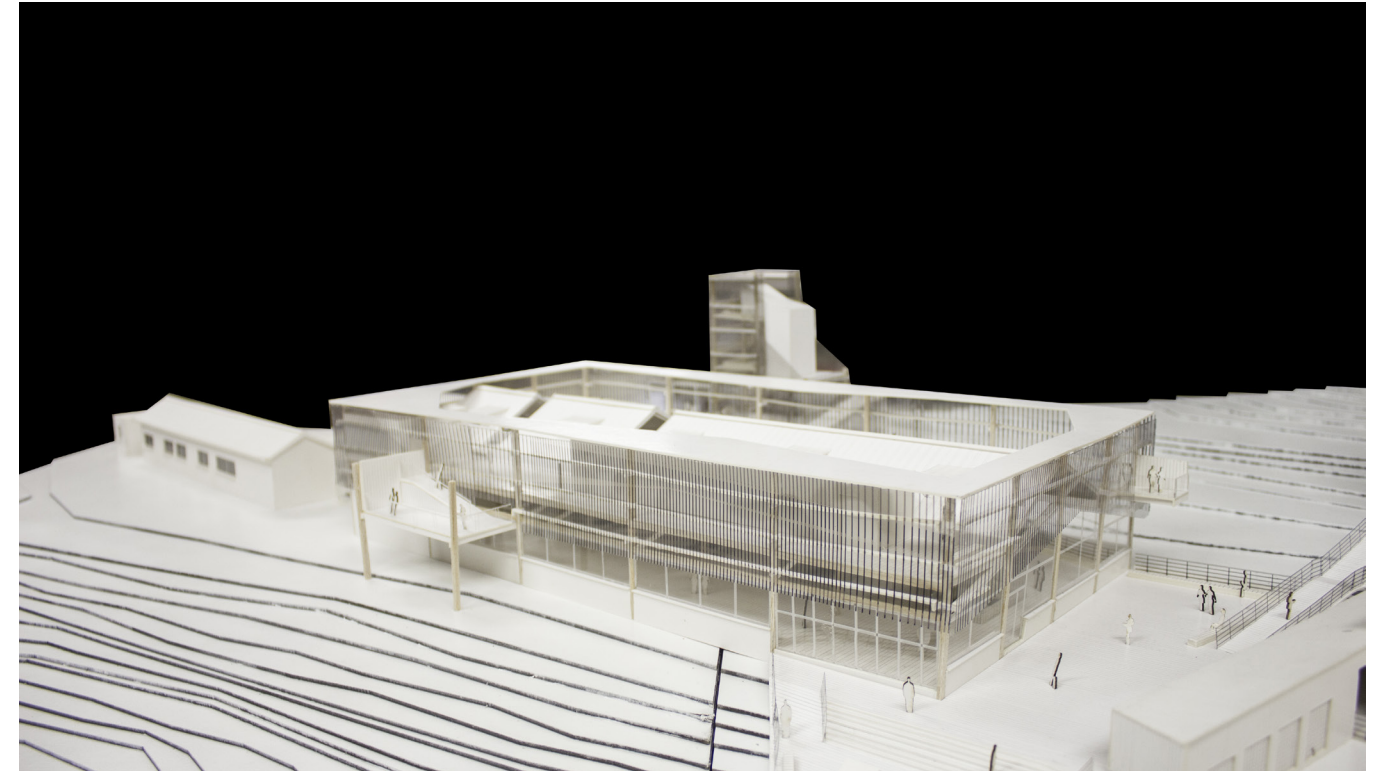


Fig 3,69 Final model

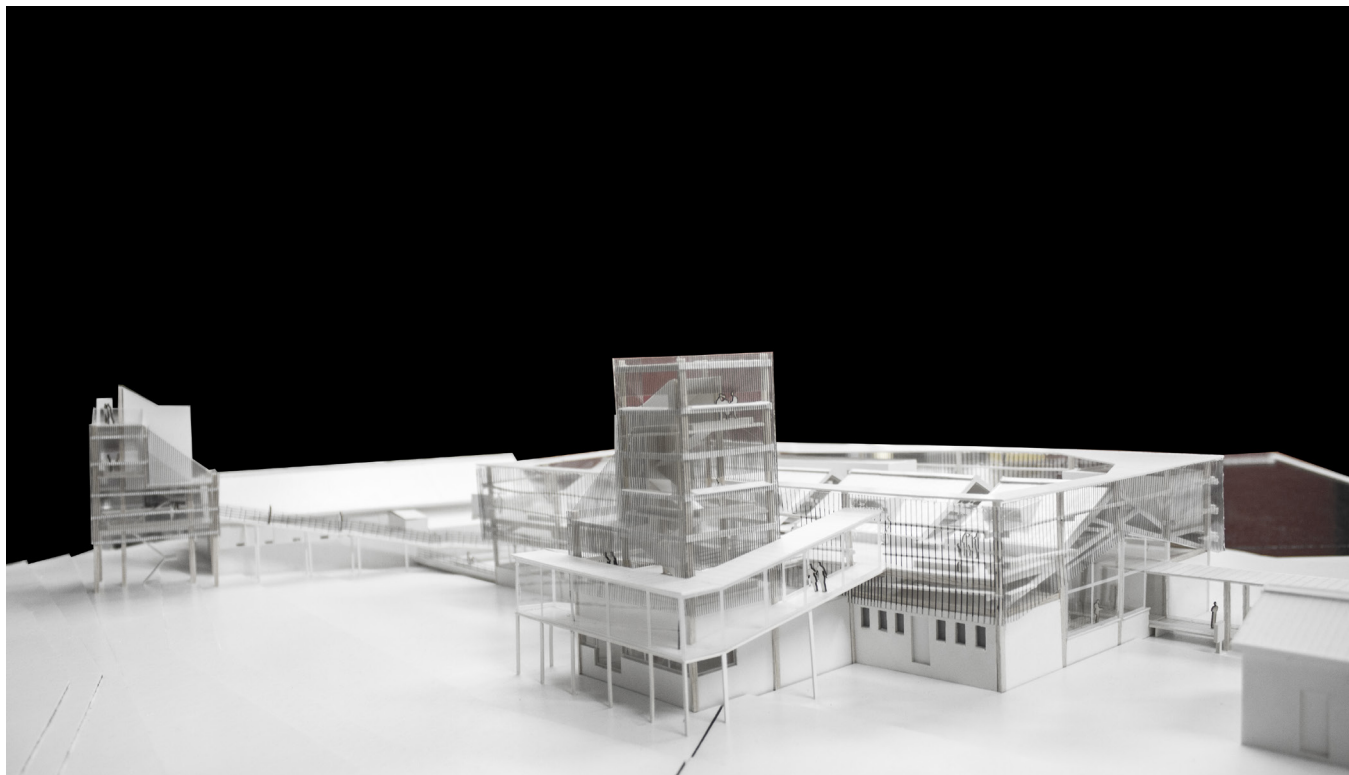


Fig 3,68 Final model

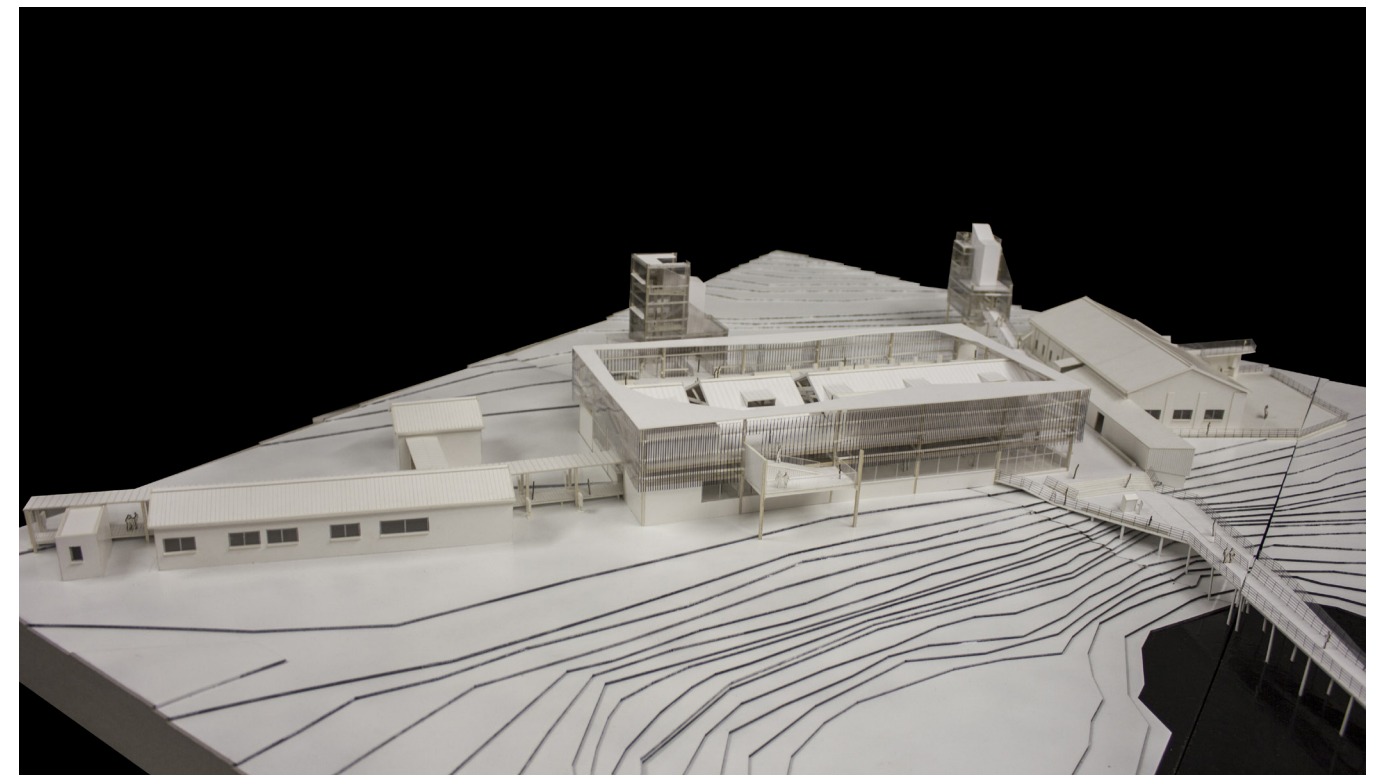
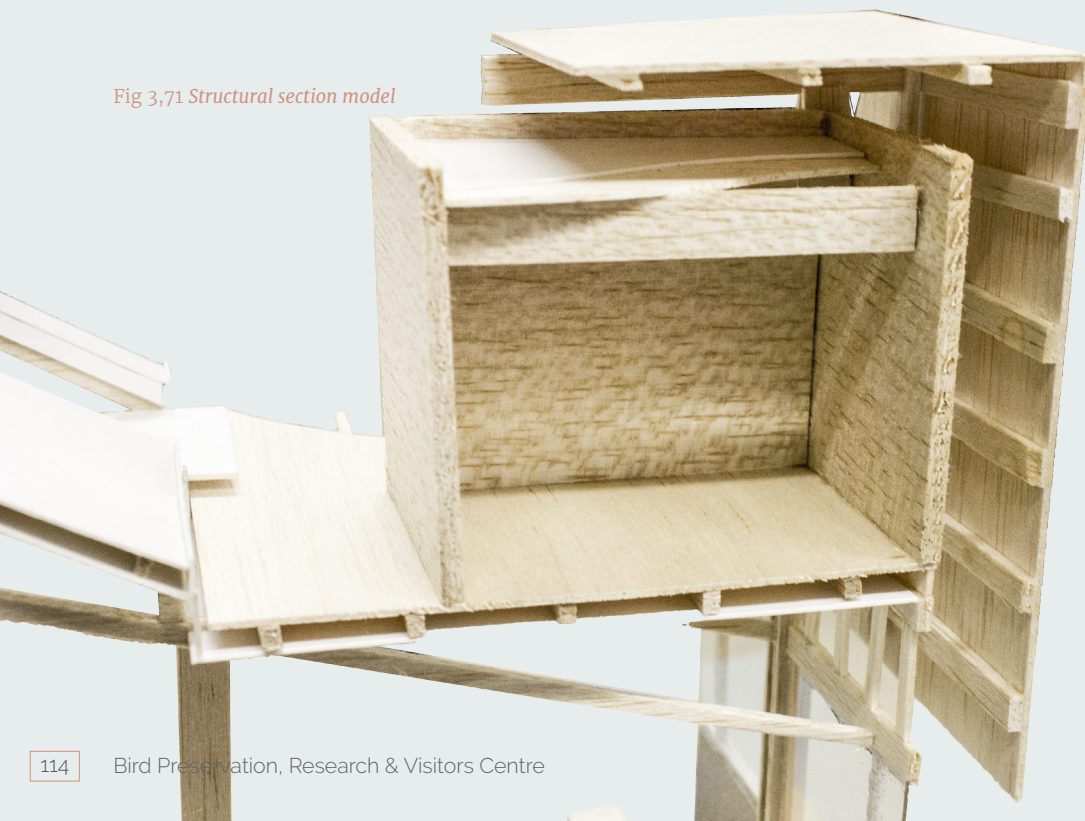


Fig 3,70 Final model

Tectonic Investigation



Fig 3,71 Structural section model



A structural model was built in order to properly resolve the timber construction system that up until this point, was largely conceptual. It was also used to realise the amount of space needed for the structural elements to inhabit the design. This model explored the balance between spatial dimensioning as well as the difference between cladding and floor decking.

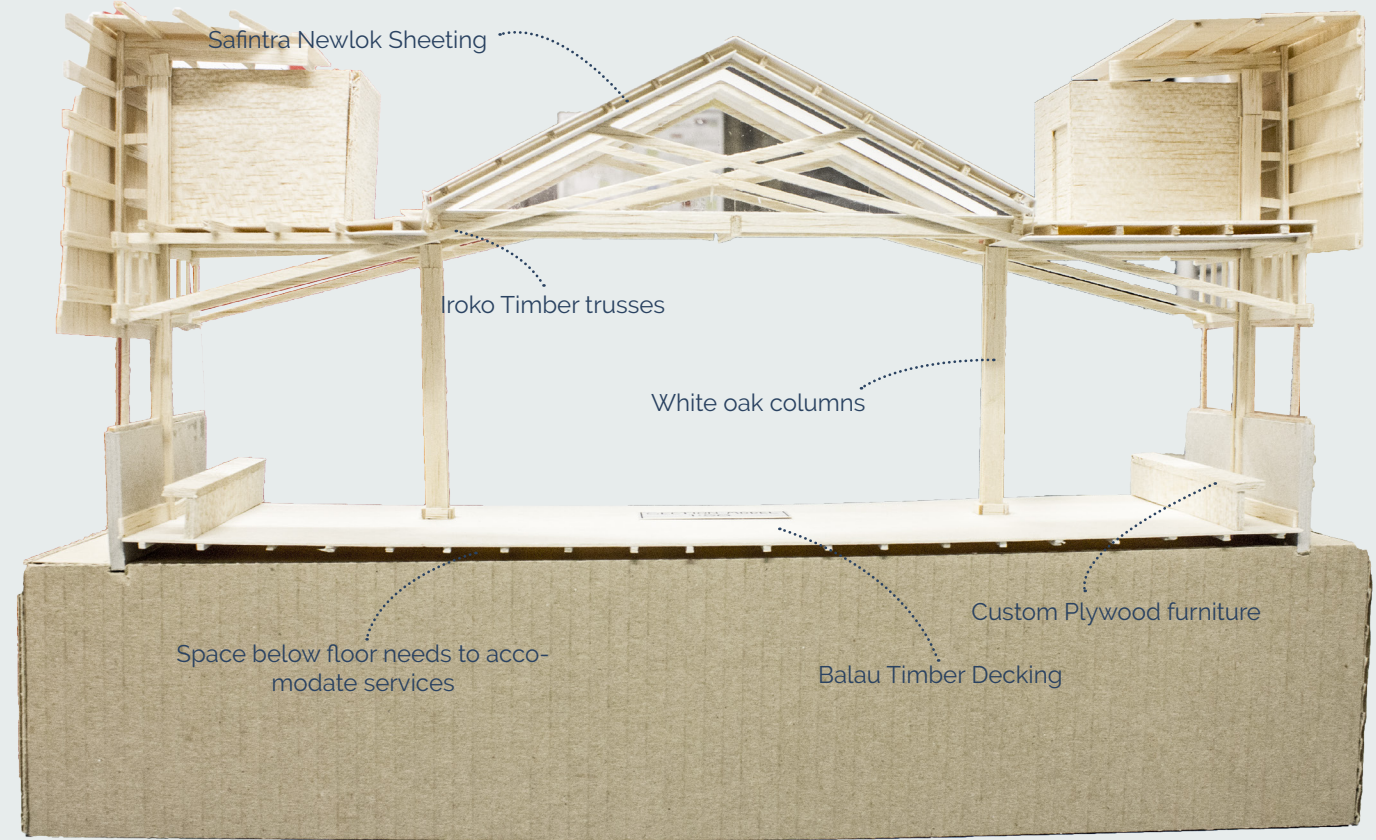


Fig 3,72 Structural section model

It became clear that the amount of structural elements needed to support the proposed structure will become an interesting issue as they will all have to be transported onto site via boat. Whereas it is desired that all elements should be pre-cut and pre-fabricated off-site, with timber it is possible to make adjustments fairly easily whilst on site, where necessary.



Fig 3,73 Structural section model

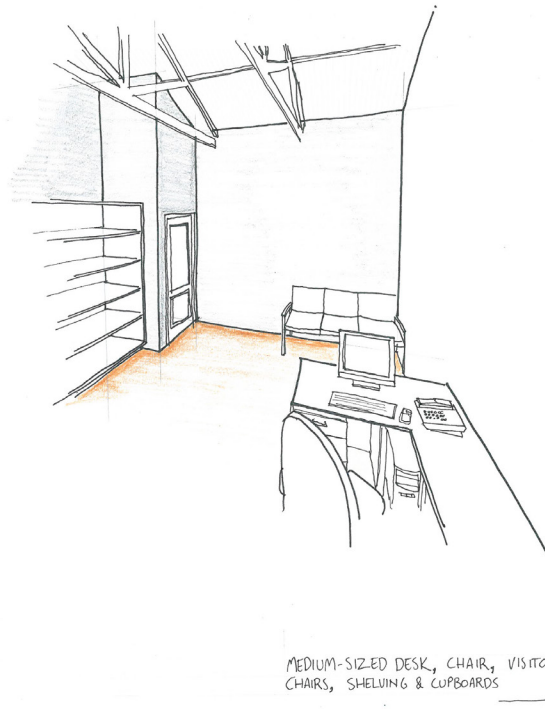
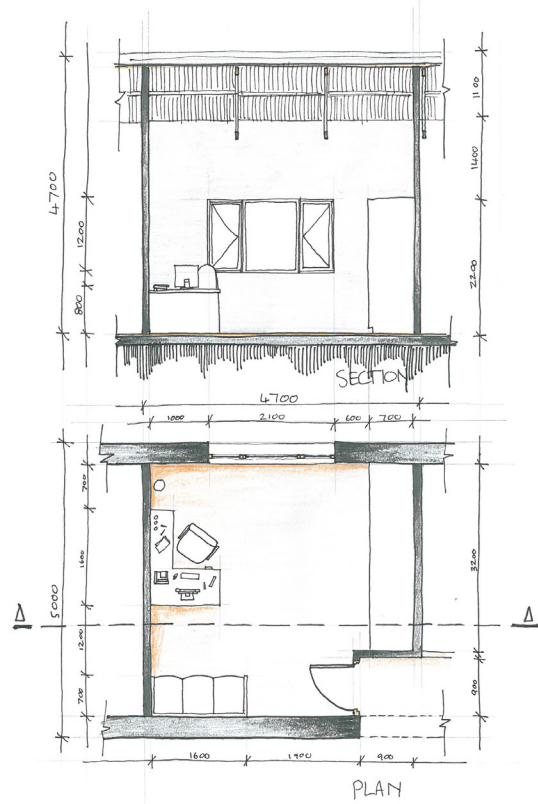


Fig 3,74 Office space requirements sketches

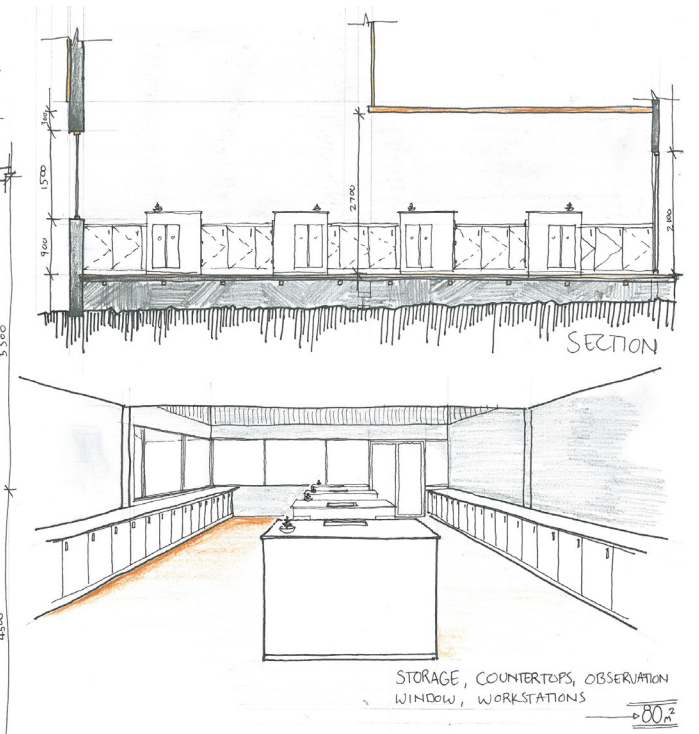
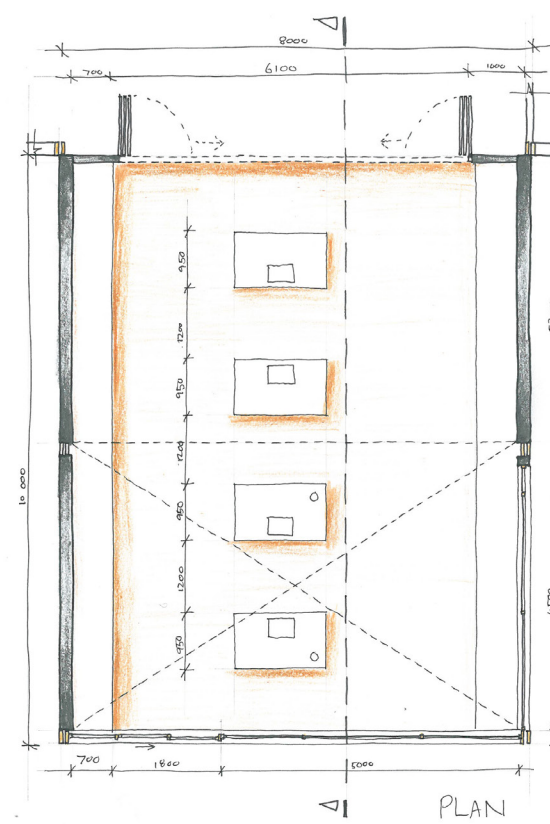


Fig 3,76 Laboratory space requirements sketches

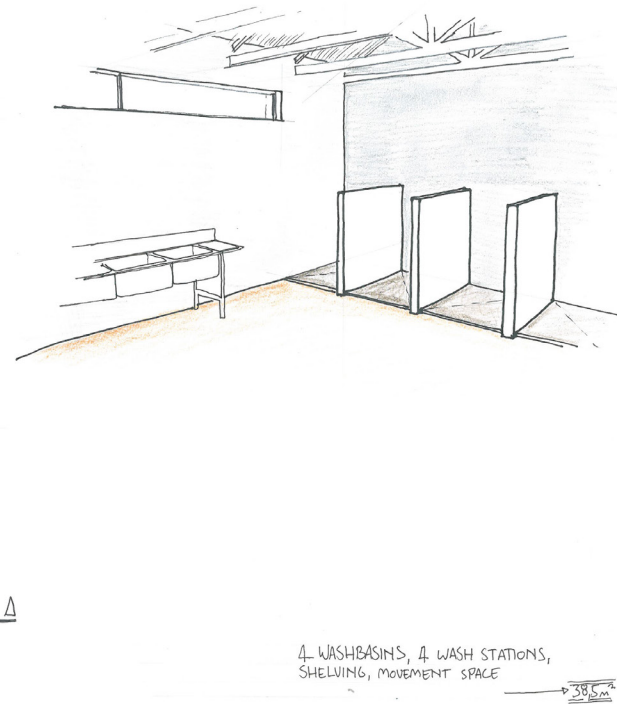
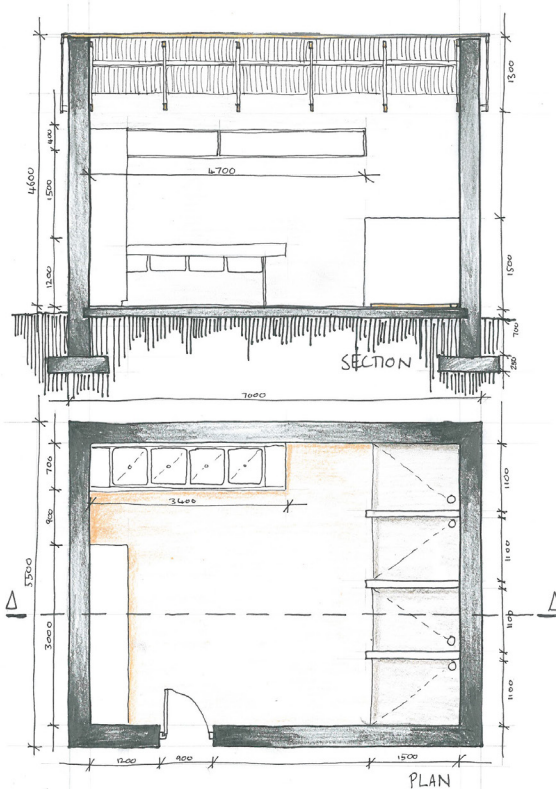


Fig 3,75 Stabilisation room space requirements sketches

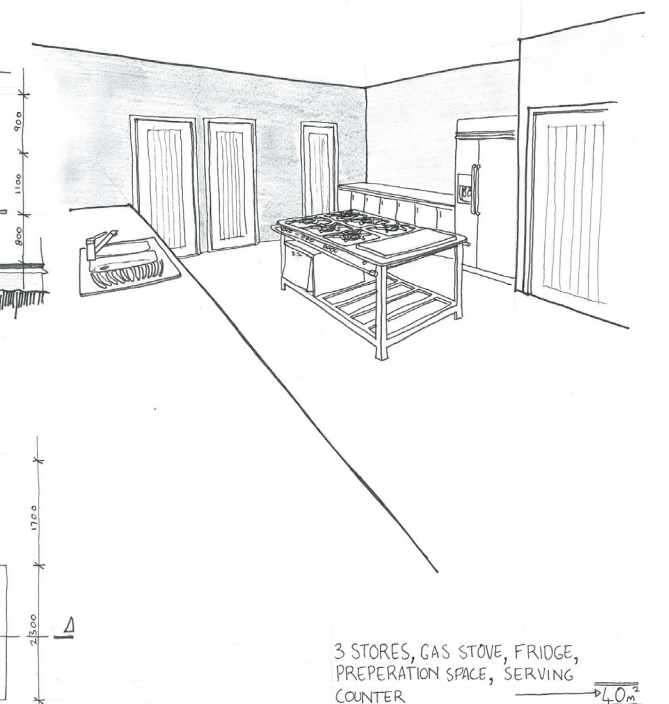
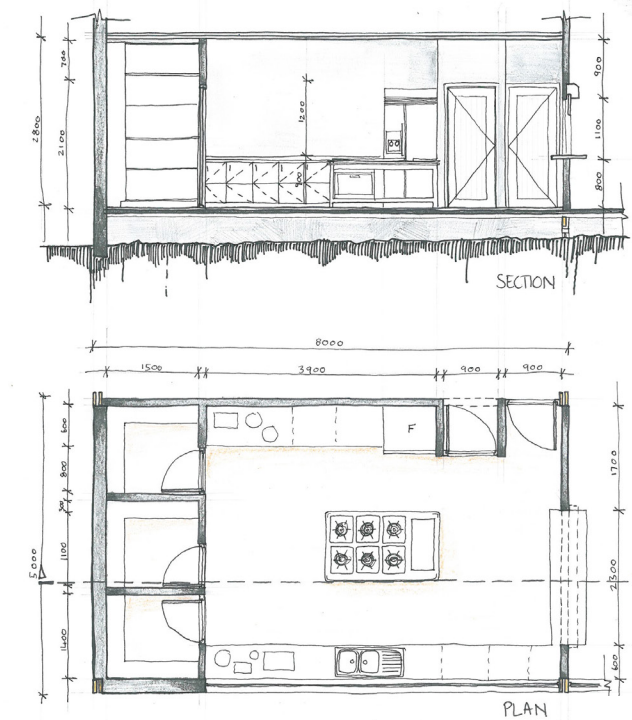


Fig 3,77 Kitchen space requirements sketches

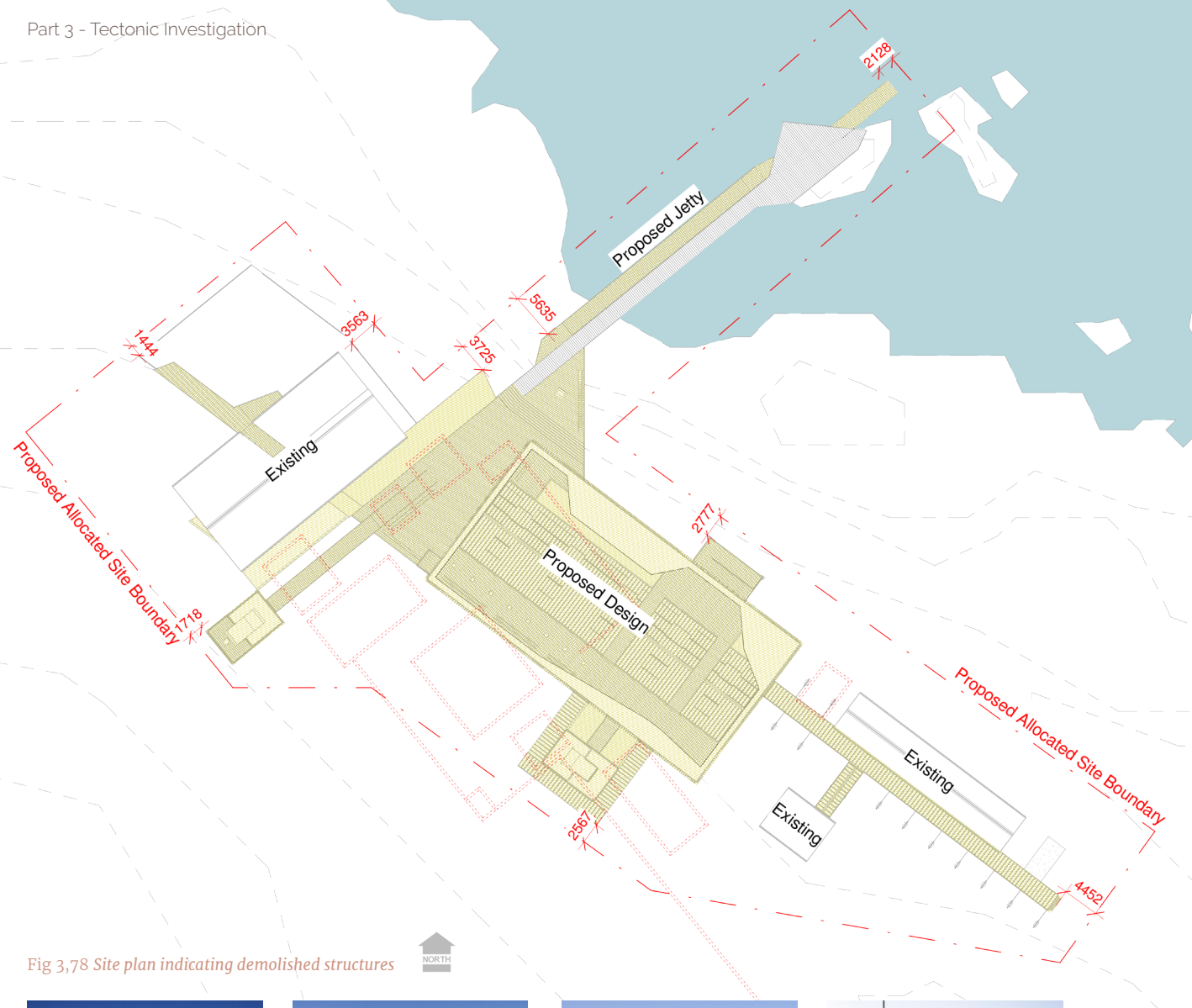


Fig 3,78 Site plan indicating demolished structures



Fig 3,79 Photographs of the proposed demolished structures

As seen on the site map above, a seemingly large amount of structures have been demolished. However, most demolished elements are thin, semi-broken walls and empty concrete shells. The four actual structures that are to be demolished are pictured above. As is clearly visible through simply observing the photographs, they are not constructed from the same thick concrete blocks as the structures that are to be conserved on the site. It should not be too large a task to demolish the buildings, with the largest challenge being transporting the waste off the island after the process is complete. Similarly, one of the largest construction challenges of the proposed structure is the transportation of materials onto site as well as the movement of these materials once on the site.

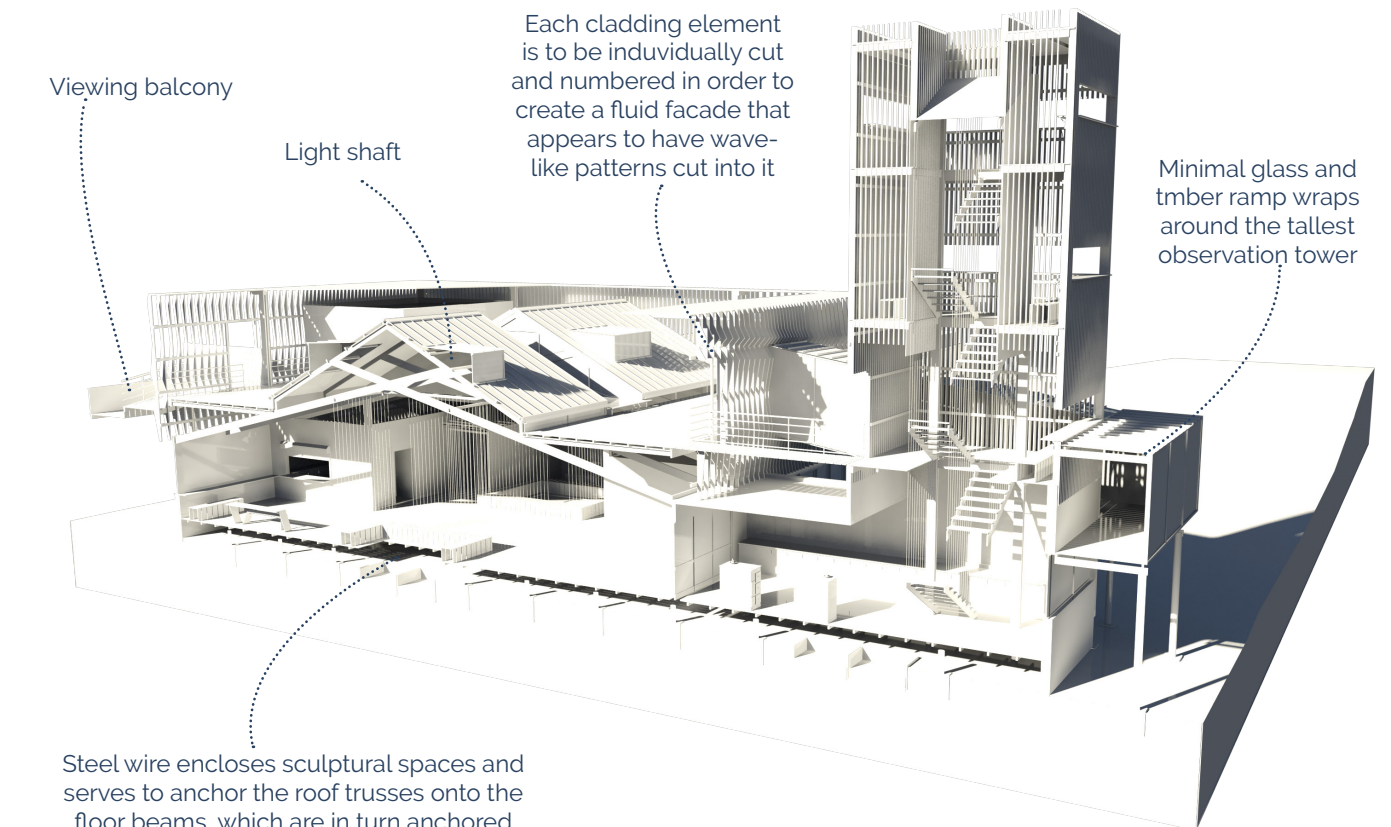


Fig 3,80 Cross section structural render

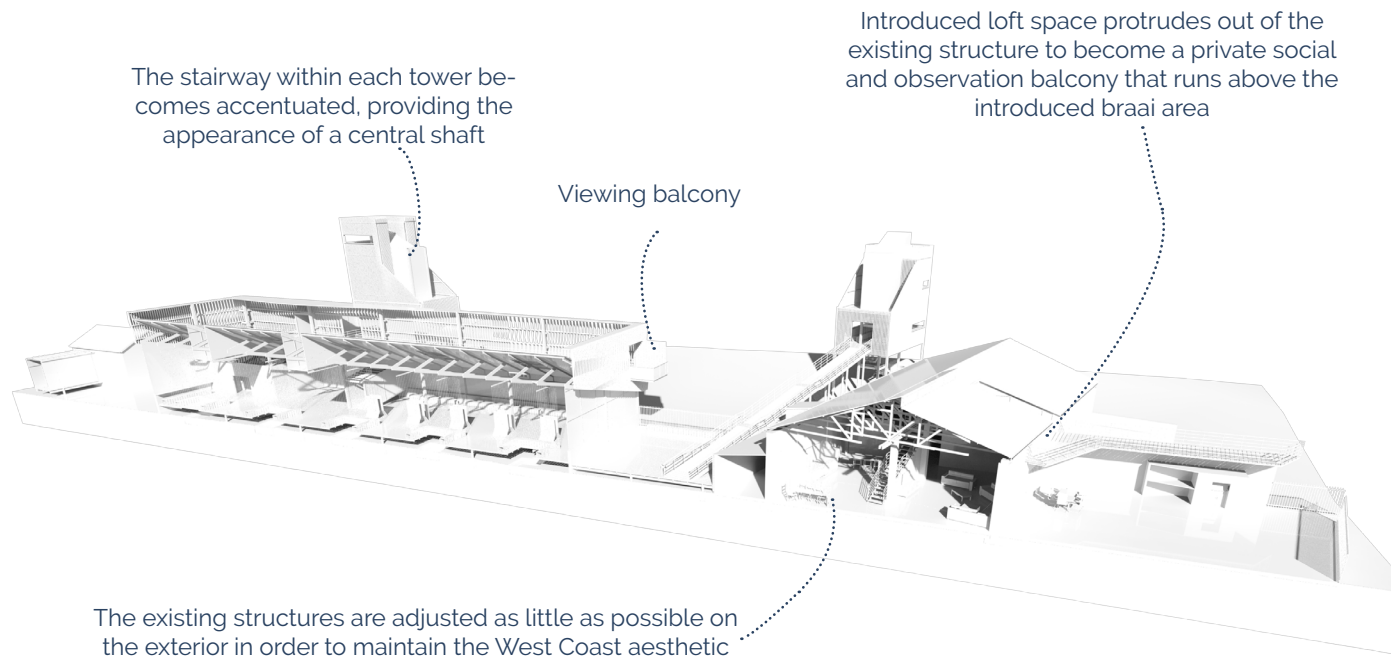


Fig 3,81 Longitudinal section structural render

The existing structures are adjusted as little as possible on the exterior in order to maintain the West Coast aesthetic they currently possess on site. On the interior, however, they have been both aesthetically and structurally altered in order to better accommodate their new functions

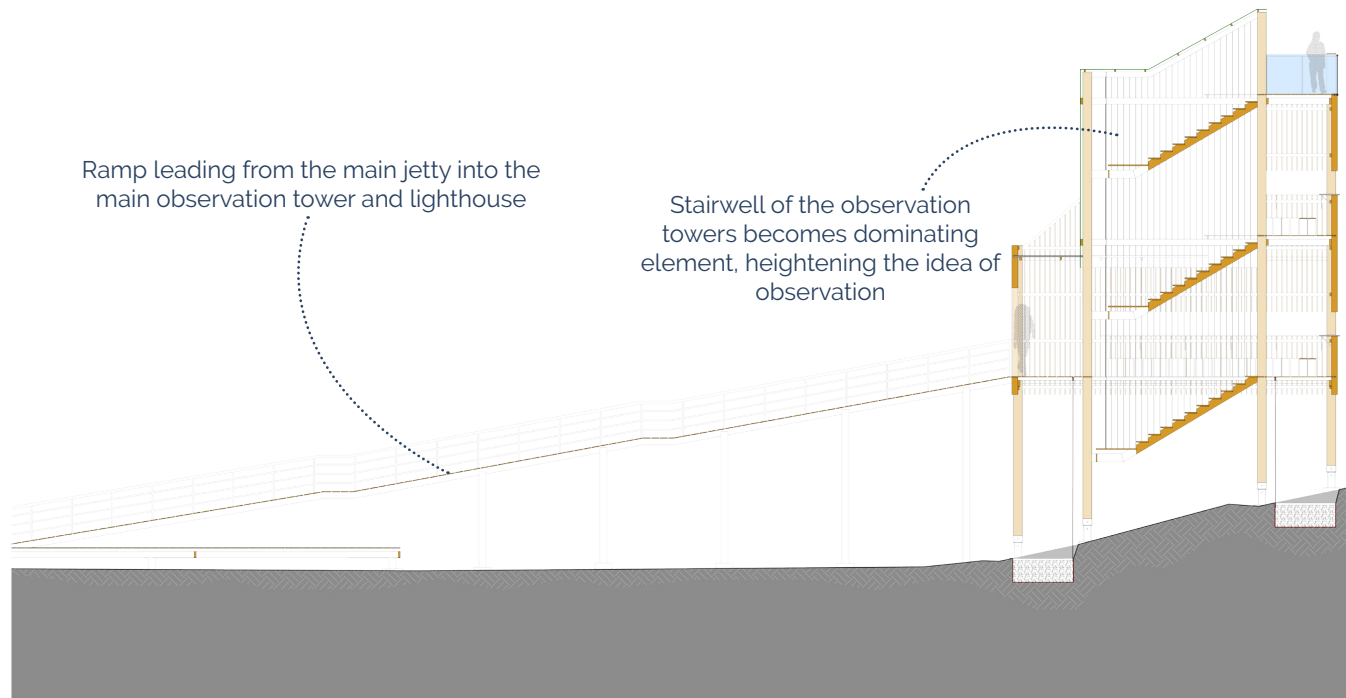


Fig 3,82 Section through observation tower

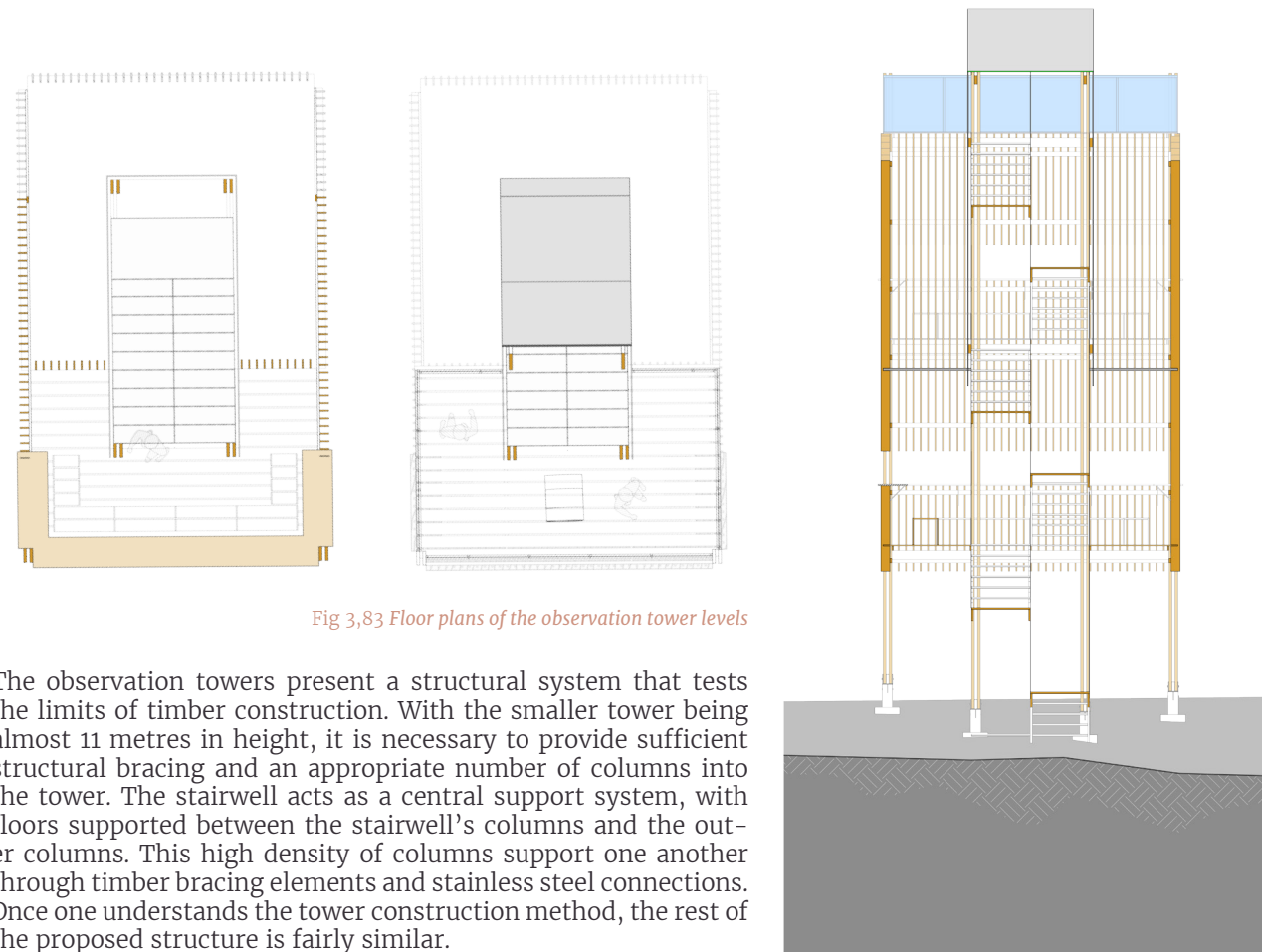


Fig 3,83 Floor plans of the observation tower levels

Fig 3,84 Section through observation tower

The observation towers present a structural system that tests the limits of timber construction. With the smaller tower being almost 11 metres in height, it is necessary to provide sufficient structural bracing and an appropriate number of columns into the tower. The stairwell acts as a central support system, with floors supported between the stairwell's columns and the outer columns. This high density of columns support one another through timber bracing elements and stainless steel connections. Once one understands the tower construction method, the rest of the proposed structure is fairly similar.



Technical Report

“A great building must begin with the immeasurable, must go through measurable means when it is being designed, and in the end must be unmeasured.”
- Louis Kahn

In *The Idea of Building*, Steven Groak states that one of the prevailing attitudes of building is that “there exists a repertory of well-tried technical solutions, which provide reliable precedents for designers and craftsmen. It is the continuity by which most building proceeds, but also enables gradual innovation” (Groak, 1992). It is through researching and observing these ‘well-tried technical solutions’ that I will attempt to generate the correct material usage, construction methods and detailing.

As the project is situated on a secluded island with restricted access to materials, construction methods that are not only sensitive to the amount of space they require but also, where possible, do not have to be layered with various finishes, will be applied. A pure structure that is dominated by a singular structural system will be sought. The current state of a large proportion of the building industry is in ‘the thrall of “faked-up” materials: imitation timber veneers on flabby chip-boards, counterfeit “marble” surfaces complete with mica chips to add so-called sparkle, stock bricks that crumble to the touch, concrete mix in casually unchecked proportions – particularly vis-à-vis its cement content. Shuttering that swells and distorts; to be corrected, smothered by thickly ladled plaster’ (Lipman, 2003).

A sustainability-focused design requires a sophisticated, uncomplicated and honest approach in order to fulfil the goal of creating a substantial whole with as few parts as possible. At the same time, it requires carefully-planned ventilation systems in order to be as passive in climate control as possible, as spaces for unnecessary services are limited, as well as the number of available façades. Also to be taken into account is the fact that the interior finishing of the building is both handled in the same way and holds as much importance as the exterior finish.

The following technical report will comprise of an analysis of the proposed design, including the entire construction process, structural systems, and the detailing and specifying of each component. A touchstone (pictured below) was created to measure structural solutions in an effort to maintain conceptual integrity throughout the structural detailing process. The touchstone was an experiment in solidity, lightness, stereotomics and tectonics.

Fig 3,85 The initial concept behind the structural approach portrayed by the touchstone



Environment & Microclimate

Locality & Larger Context

The proposed design is situated among the existing buildings on Malgas Island, a small, uninhabited island found within Saldanha Bay along South Africa’s West Coast. The chosen site is located on the North-Eastern edge of the island, the only side that is easily accessible by a boat due to the existing jetty. The existing structures on the island were constructed from as early as 1835.

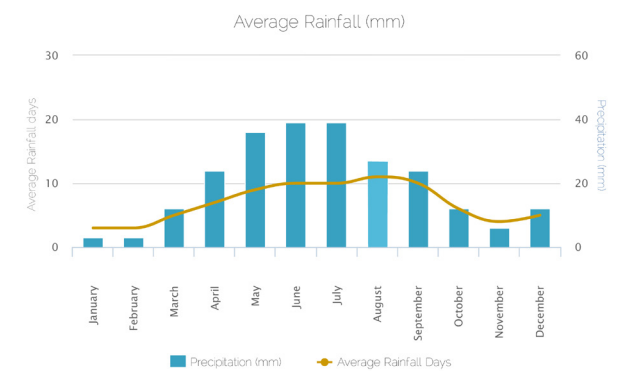


Fig 3,86 An average weather graph for the Saldanha Bay area (Adapted from: WorldWeather, 2016: online)

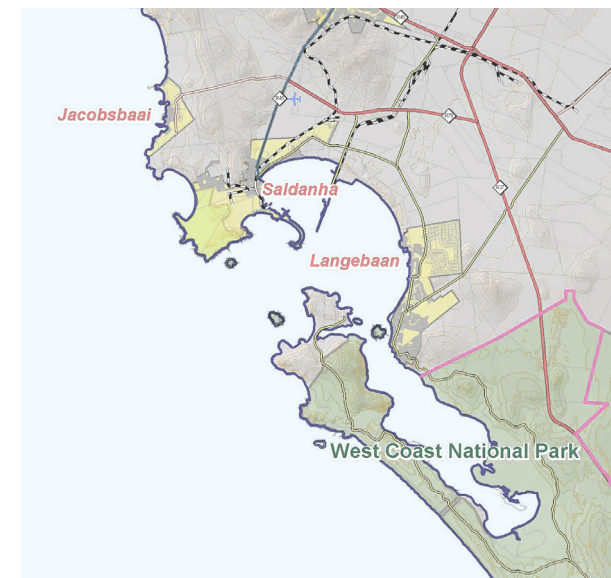


Fig 3,87 A map of Saldanha Bay and surrounds (Adapted from: WorldWeather, 2016: online)



Fig 3,88 The boat used to travel to Malgas Island

Climate

As with any location in the Southern Hemisphere, Malgas Island receives sunlight such that a northern orientation is ideal and sought after. Located off the western coast of South Africa, it has a mostly wet climate with moderate summers and cold winters. Rainfall is scarce during the summer and frequent during the autumn and winter months. This, combined with the extreme winds that frequent the area, results in a need for methods of waterproofing that can resist heavy and sudden rainfall. The regular and extremely powerful winds require extra attention to structural detailing where anchoring roof and cladding finishes are concerned. The combination of harsh elements on the island requires attention to ventilation systems and the building’s ability to seal itself off from the penetrating elements.

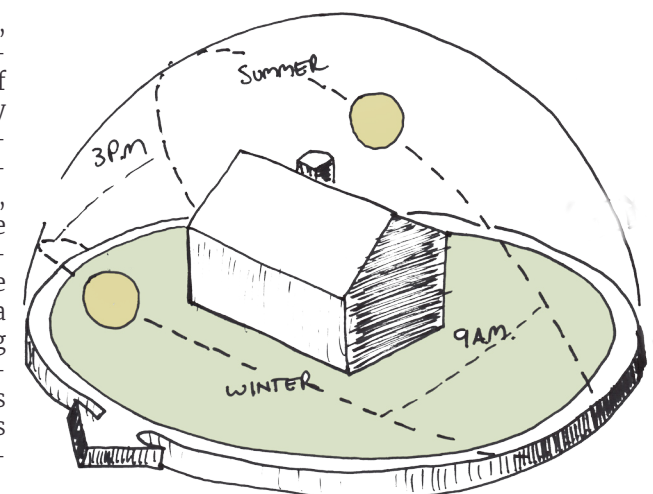


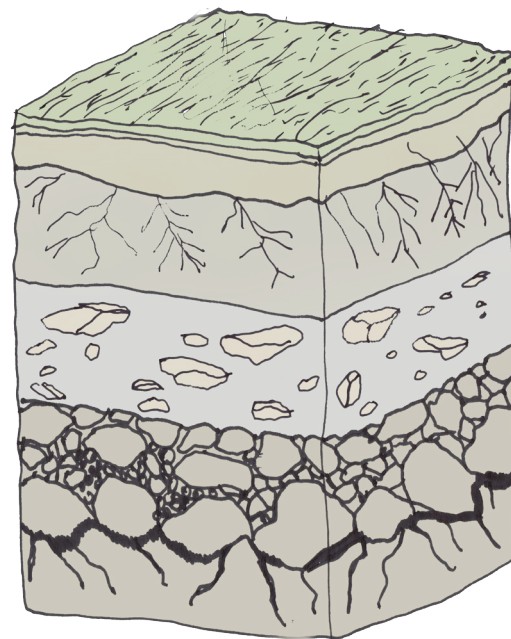
Fig 3,89 Sun patterns applicable to the area

Site

Topography

The chosen site provides an almost flat and level surface to be constructed upon. The limited availability of horizontal space will inevitably result in a need for certain vertically-developed elements within the design. The existing surface of the site mostly consists of impenetrable rock, as well as existing concrete slabs within the historical buildings. This hard surface is advantageous to an ecologically-ethical approach to foundation design, yet at the same time, it creates complications in terms of the structure not being able to properly anchor itself.

Fig 3,90 Sketch through toposurface on site



Existing Buildings

Of the six existing buildings on site, three will be demolished and three will be repurposed into the new design proposal. The three that are to be demolished are constructed from more modern, hollow concrete blocks, and should not be difficult to remove. The three structures that are to be maintained are constructed from more solid and stable concrete blocks, as well as what appears to be Oregon pine trusses and beams. Demolishing the selected structures without disturbing the Gannet colony on the island will be the biggest challenge for the first stage of the construction.

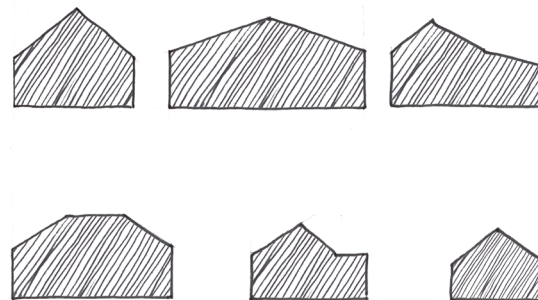


Fig 3,91 Various roof pitches of existing structures

User Behaviour and Requirements

Design Brief

The client, SANPARKS within the West Coast National Park, currently possesses Malgas Island and frequently visits it in order to gather data and intervene when issues arise. The buildings currently on the island do not sufficiently serve the needs of the client. It is clear that there is a very real need for more advanced research facilities, observation points, a new jetty, visitor facilities, office spaces, more humane space in which the people living on the island can stay, and refurbishment of some of the historically-relevant buildings. SANCCOB was introduced as an additional client as it inevitably rehabilitates any injured or sick birds, and stated

the need for a small stabilisation area on the island in which such birds can remain until retrieved by one of its boats and transported to its headquarters.

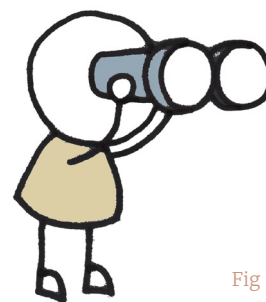


Fig 3,92 Observation

User Goals

It is important to realise that the proposed design aims, first and foremost, to serve the original animal inhabitants of the island. The users of the proposed building will be the park rangers and day visitors. Mainly due to the building's secluded loca-

tion, the goal of the users is to inhabit a fully-sustainable building that provides ideal viewing of the Cape Gannet colony, as well as protection from the site's harsh conditions.

Accommodation List

| | |
|----------------------------|--------------------|
| Preservation: | |
| Stabilisation Room | 30m ² |
| Observation Towers x2 | 80m ² |
| Storage | 24m ² |
| Research: | |
| Laboratory | 74m ² |
| Offices x4 | 72m ² |
| Storage | 28m ² |
| Visitor: | |
| Reception | 40m ² |
| Museum | 200m ² |
| Kitchen | 28m ² |
| Dining | 140m ² |
| Ablutions | 30m ² |
| Living: | |
| Bedrooms x3 | 36m ² |
| Living Room | 50m ² |
| Kitchen | 30m ² |
| Ablutions | 30m ² |
| Other: | |
| Water Collection | 30m ² |
| Waste Storage | 50m ² |
| Camping Area (60 Students) | 160m ² |
| New Jetty | 300m ² |
| Aprox. Total: | 1900m ² |

Utility and Space Enhancement

Ultimate Observation

Due to the fact that observation is the first and most important step in any nature preservation effort, the proposed design needs to provide multiple opportunities for ultimate observation. This will inevitably result in a large percentage of the building's envelope consisting of curtain walls, and

will require a subtle structural resolution so as to not interrupt what must be a speciously seamless view. This large amount of glazing will, inevitably, have to meet all incurred requirements according to the regulations in SANS10400 Part N and Part XA (2010).

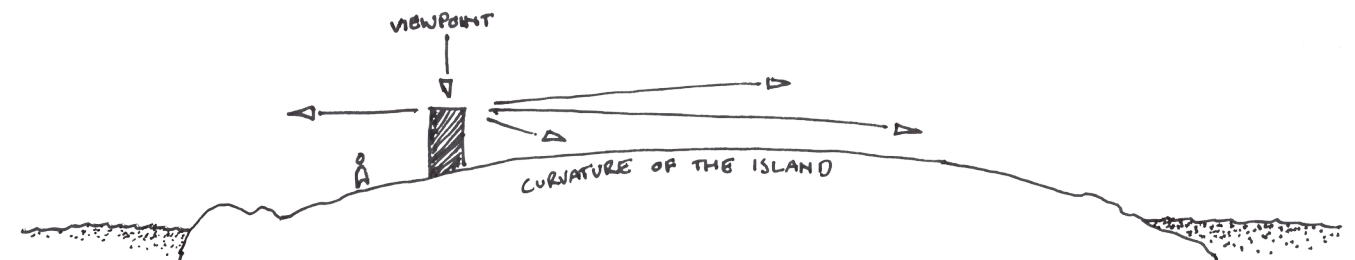


Fig 3,93 Sketch indicating the concept of ideal observation

Structural Sculptures

As a result of the attempt to achieve complete structural integrity throughout the building, as well as a dedication to a uniform structural system, even elements such as the hanging sculptures within the main space of the proposed design have to contribute fully to the structure. No item within the building will be entirely decorative, and the wires used to suspend the sculptures will assist in anchoring the roof trusses to the foundations of the structure, as discussed later.

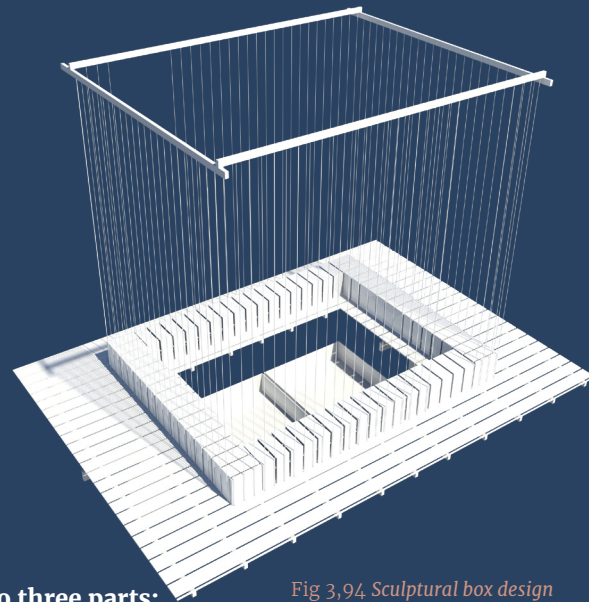


Fig 3,94. Sculptural box design

Form and Function

Overview of Functions

The building's functions can be categorised according to three parts:

Firstly, the private functions of the building include the living areas and bedrooms for both the Island's residential researchers and the annual group of environmental students visiting the island. These functions are situated within the northern-most existing warehouse, as well as the existing concrete slab beyond that.

Secondly, the semi-public functions of the building include the bird stabilisation room, the administration offices, the storage areas, and the research laboratory. These are situated within the other two existing buildings, as well as within the introduced structure.

Lastly, the public functions include the new jetty addition, both observation towers, the reception, dining area, and museum display area. These functions are mostly situated within a large space that offers users freedom of movement while subtly restricting them to a certain portion of the island so as not to disturb the Gannet colony.

Morphology and Metaphorical Imitation

'It is the Architect's task to express architecturally his or her era and simultaneously get involved in a dialogue with the context, in which he or she builds' (Demiri, 2013).

The manner in which the proposed design both acknowledged and metaphorically imitated the existing structures became an essential part of its presence on the island. The iconic roof pitches of the West Coast vernacular buildings, as well as the smooth, white walls of the structures were introduced into the project. The two roof pitches found on the existing site are that of 23° and 30° , which were incorporated into the proposed design as seen in the sketch below. The iconic white walls became an element which encompass and enclose the cavity beneath the timber decking of the main space within the design. The existing architecture will for this reason not be directly mimicked in style and proportion, but rather metaphorically imitated (Demiri, 2003).

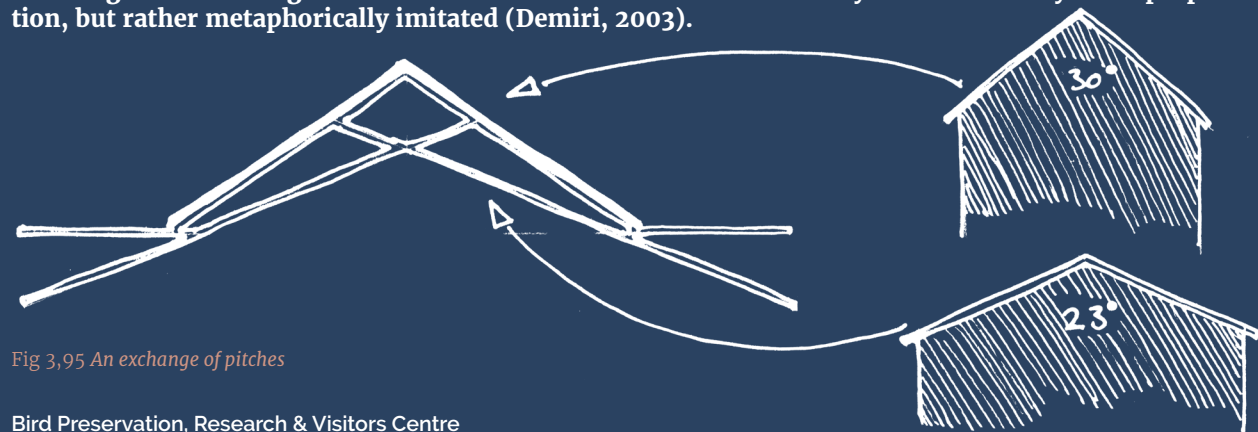


Fig 3,95 An exchange of pitches

Circulation Techniques

Vertical Circulation

Two methods of vertical circulation have been introduced into the design: ramps and multiple types of stairways. One ramp is situated directly off the main jetty, leading towards an observation tower, whereas the second ramp wraps itself around the second observation tower, also leading into the tower itself. Both towers contain central staircases leading to further levels that provide more advantageous viewing over the rest of the island. Another staircase will be introduced within one of the existing structures that leads into a proposed loft space and balcony. Due to each level's relatively small floor area, the stairs within the observation towers provide adequate fire-escape routes, in accordance with SANS10400 Part T (2010). As will be further discussed in the Structural Systems section, the proposed stairs are to be a mixture of stainless steel and timber construction. Furthermore, the stairs comply with the correct dimensioning of tread depth (270 mm), run height (190 mm), railing (900 mm) and head height (2 100 mm) as provided in SANS10400 Part C (SANS10400, 2010).

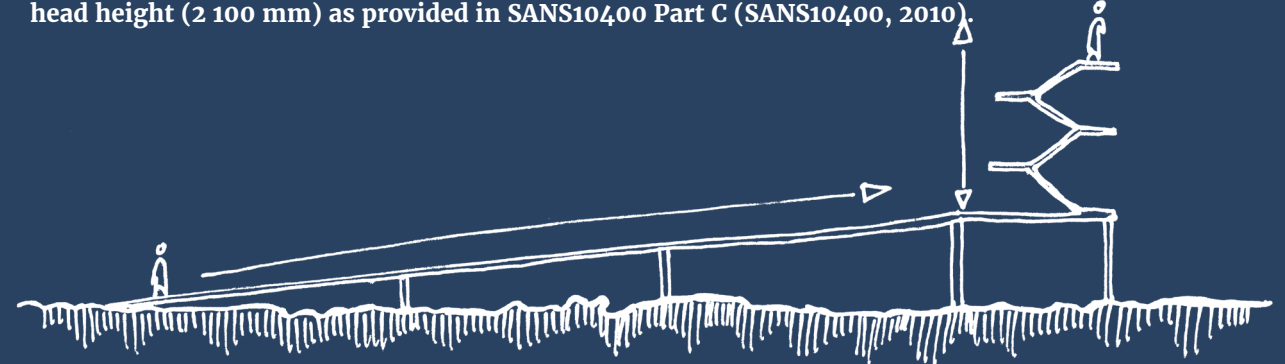


Fig 3,96 Circulation techniques

Horizontal Circulation

The fact that the design aims to be human in scale, combined with the impossibility of any vehicular activity within the site, results in circulation spaces that are entirely designed around pedestrian comfort. Whenever a circulation corridor is needed, a minimum width of two metres is proposed as this removes the risk of constricted circulation space. Within the main space of the structure, there are very few rigid circulation paths as users are encouraged to explore and experience the space in its entirety. The main horizontal circulation occurs as one approaches the island from the jetty, moving on a straight line that inevitably introduces users to the Gannet colony before the architectural intervention.

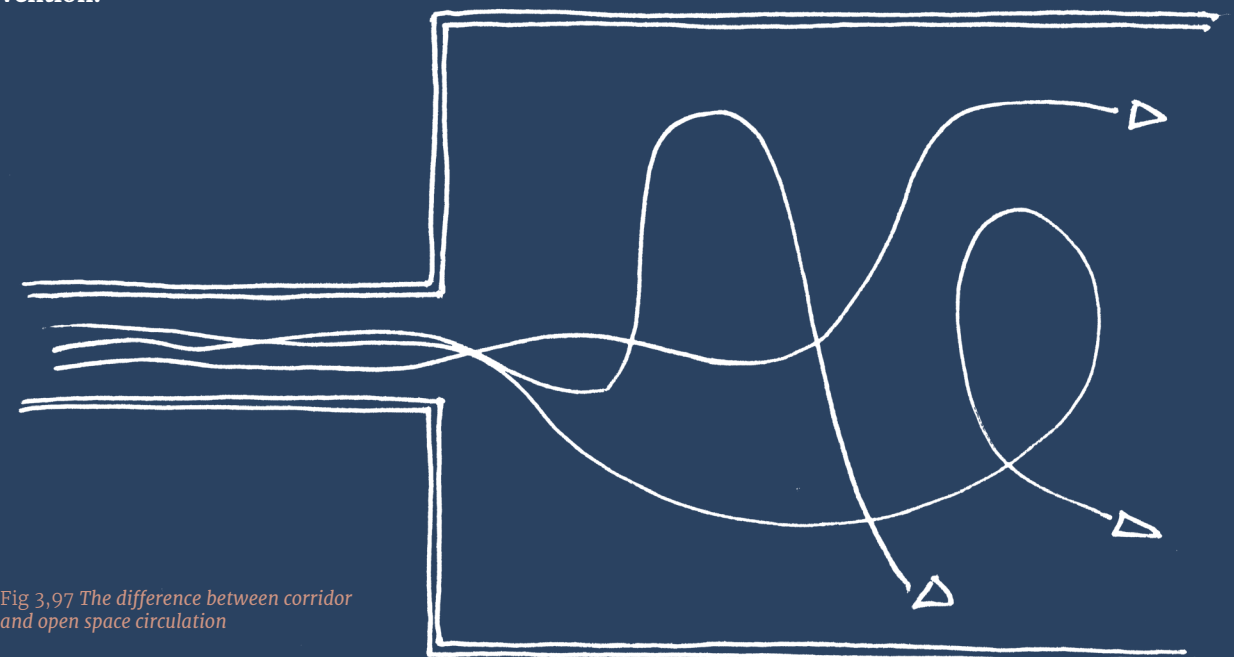


Fig 3,97 The difference between corridor and open space circulation

Site Planning and Landscape Detail

Site Development

Due to its extreme weather conditions and limited soil depth, Malgas Island is home to very little vegetation. For the sake of the ecology of the island, no vegetation will be introduced, nor will any landscaping efforts. Instead, the design will open up to the already existing beautiful surroundings such as the water's edge and large rock formations. Any landscaping would not only disturb the surface of the island but also invite unwanted bird and insect species onto the island that could have a detrimental effect on the population of other resident species.

Site Access

As previously discussed, the existing jetty provides the only means of access onto the heavily-restricted island. Once a boat is anchored at the jetty, the only access onto the island is on foot, eliminating the need for any form of wall, fence or gate anywhere along the boundaries of the site. It is, however, important to note that the island may only be accessed with special permission from the West Coast National Park.



Fig 3,98 View from the jetty

Water and Waste Management

Space within the proposed design has been allocated for waste management. Waste will have to be stored within an enclosed area of the site until it can be removed by boat and taken into Saldanha to be properly disposed of. As will be discussed later, rainwater and mist are to be harvested and filtered into the design's water system. Once the water, which is not sewage, has been used, it will be moved into the surrounding ocean, unless harmful chemicals have been introduced, in which case such water will be filtered before removal.

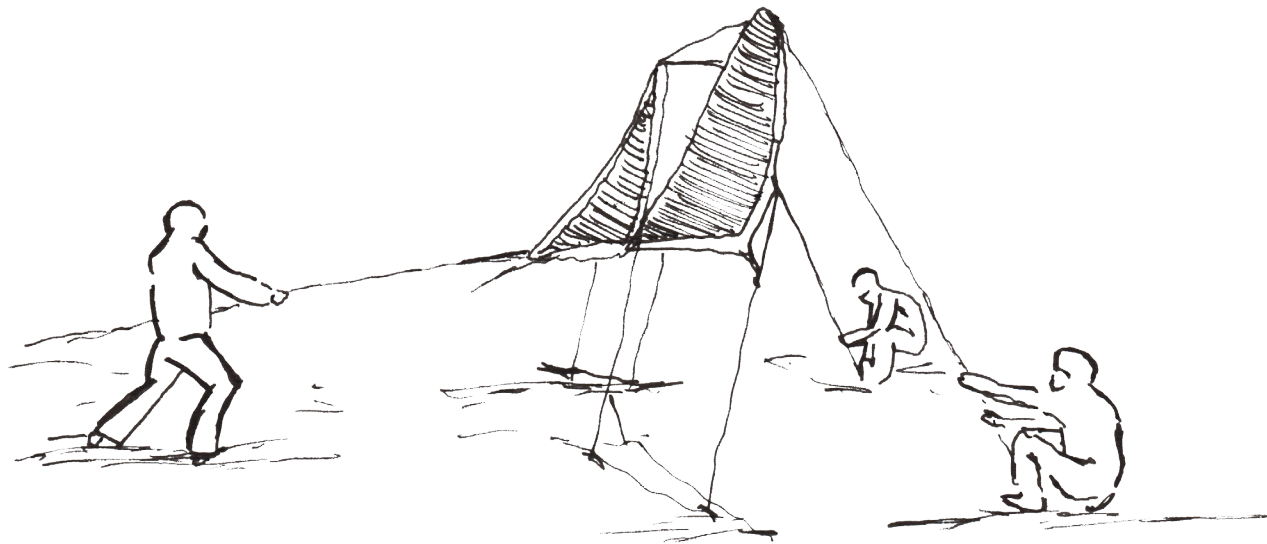


Fig 3,99 Typical mist-harvesting technology

Structural Overview

Solving the structure was a matter of finding products that are as small and durable as possible, as well as practical and inexpensive without being standard and uninteresting. Each component of the building has to accommodate the need for being prefabricated and transported by boat onto the island before being assembled. It was also important to introduce a structural system that is able to maintain complete integrity throughout the design. The structure of the existing buildings was also documented to the best of my ability, and simply reinforced where necessary.



Fig 3,100 Final construction complete

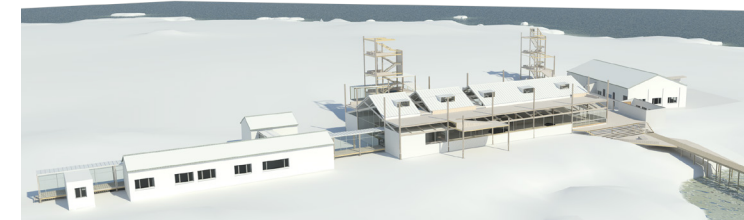


Fig 3,101 Before cladding systems

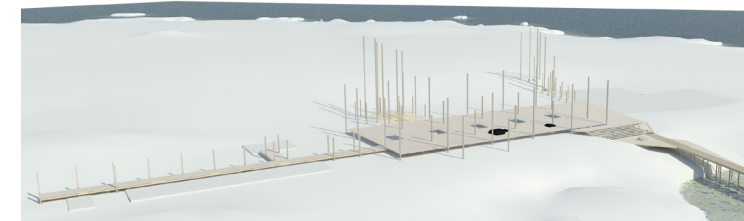


Fig 3,102 Floors and columns



Fig 3,103 Foundations

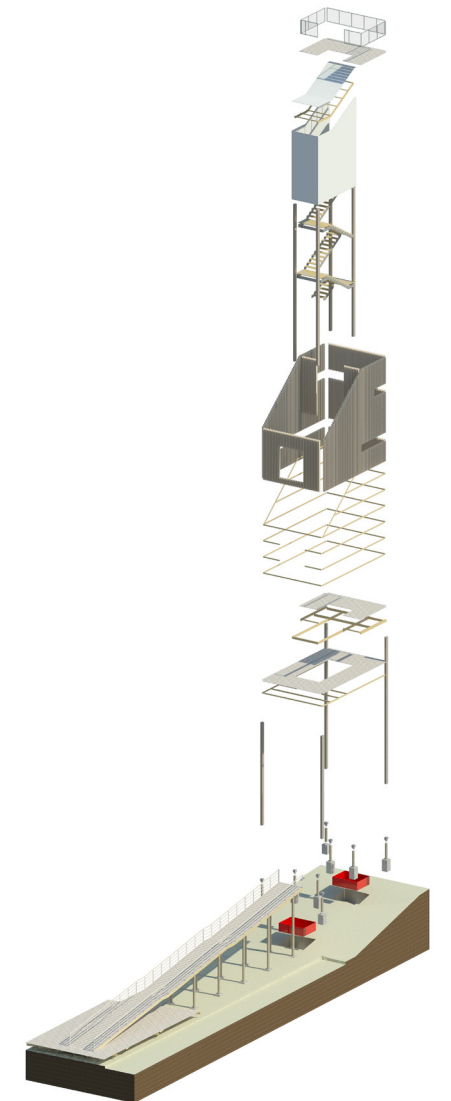


Fig 3,104 Exploded axonometric

Structural System

The structural system of the entire building is to be comprised of timber with stainless steel joints where necessary. It also makes use of some existing materials on site such as smaller rock formations. There is no wet construction throughout the structure, except for that of the existing buildings which do not constitute part of the main structure.

Below, each element of the building is individually analysed in terms of more specific structural systems used. It is important to note that the specification and detailing of each of these systems will fall under the 'Technical Application and Detailing' section of the report. In this section of the report, the basic principles and ideas behind each element's structural resolution will be discussed in terms of a more theoretical approach.

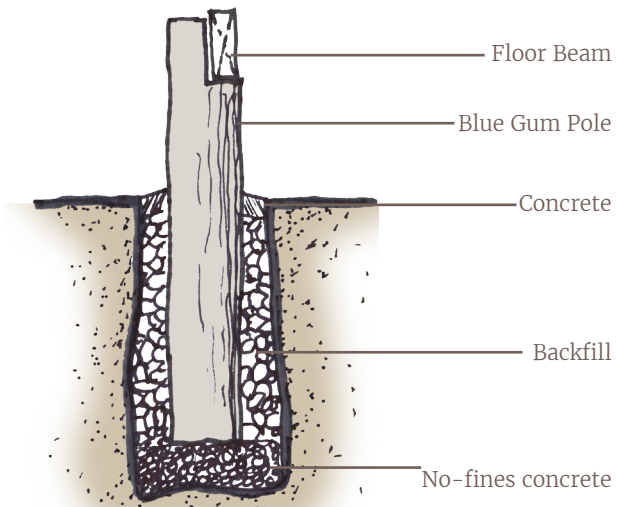
Technical Application and Structural Detailing

As many of the following structural components as possible were sourced from local companies. However, when it comes to large timber elements that can sufficiently survive the conditions found on Malgas Island, it is undeniable that the timber South Africa has to offer falls short. It is justifiable that many of the larger timber components are to be constructed from timber that will need to be imported, which also agrees with the fact that the design finds itself on a secluded island.

Foundations

The foundations of the existing buildings are relatively shallow concrete footings that have no need to be removed or improved upon, and shall be left as they are. The main structure will make use of Northern Poles H4 treated Blue Gum poles set in crushed gravel and no-fines concrete footings as the main foundation grid. The floor beams will then rest on the grid of poles. In order to ensure the structure's wind resistance, large plastic containers will be buried in the ground, filled with medium-sized rocks collected on site and fastened to the floor beams, using 6 mm nylon rope. The size and intervals of these plastic containers will be specified by the engineer.

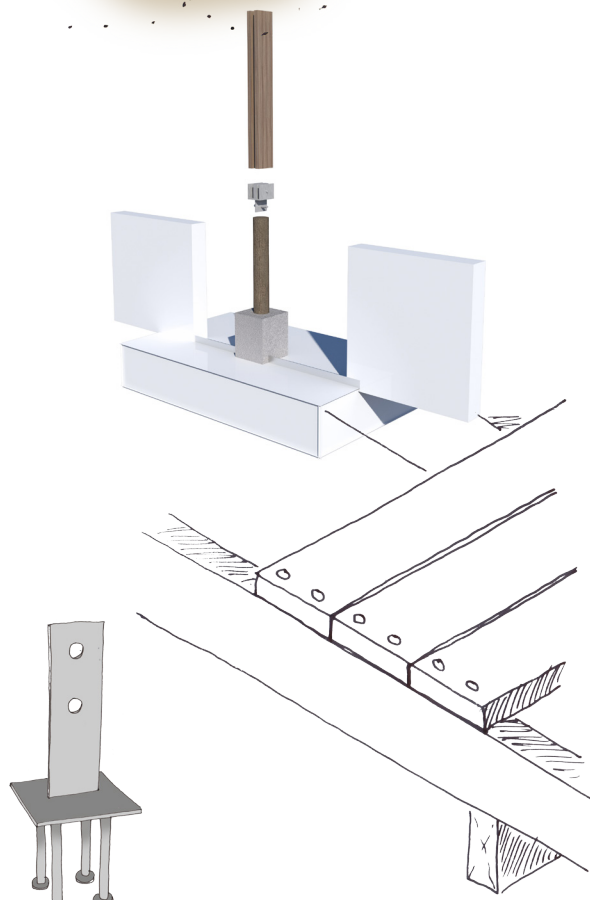
Fig 3,105 Gum pole foundation detail



Floors

All floors within existing buildings are to be finished with a 15 mm layer of machine-polished concrete that has a grey pigmented dye within the screed. As with all the circulation paths and any levels within the observation towers, the main floor will be an Iroko structural timber deck. This deck will be finished with imported Balau 19 x 90 mm decking planks, sourced from Numill in Cape Town. Kitchen and ablution facilities will be finished in Belgotex's 2 mm 1007 Breeze Astral Homogenous vinyl floor tiles. This composite floor system requires rational design as stated by SANS10400 Part J (SANS10400, 2010).

Fig 3,106 Foundation-to-column detail



Columns and Beams

All columns within the structure will be doubled-up 50 x 228 mm imported Numill White Oak timber columns. Galvanised steel connections will be used for any joints between these timber columns and beams. All floor and roof beams are specified as 24 x 228 mm imported Numill Iroko timber elements. The columns will be connected to the gum-pole foundations by means of a galvanised steel connection in order to prevent water penetration.

Fig 3,107 Example of galvanised steel column base

Fig 3,108 Balau timber decking detail

External Walls

All external walls of the existing structures will be upholstered with a new plaster and paint layer. The external walls of the main structure will consist of a lightweight Nutec Drywall steel frame cladded with plastered and painted Nutec Fibre-Cement Cladding externally and Nutec Tongue and Groove Cladding internally. This will provide a west-coast aesthetic in a manner that requires no wet construction and very shallow foundation work.

Internal Divisions

All internal divisions within the existing structures and the new, introduced structure will consist of a Nutec Drywall lightweight steel frame and Nutec Fibre-Cement Cladding that is then finished with plaster and paint. All internal edges of the walls within the project will then be sealed with fibre-cement skirting in order to ensure waterproofing. All external and internal walls comply with SANS10400 Part K (SANS10400, 2010).

Light

Any light shafts or ceiling elements throughout the entire structure consist of 18 mm Plaster Cement panels that are machine-screwed onto the main structural elements of the building. These panels will be finished with a primer, pigmented paint and, finally, layered with a clear gloss coating. This finish will enable the panels to reflect a large amount of light, providing a source of light during the day.

Roofs

Existing roof trusses will be left standing and simply touched up where necessary. In the case of the introduced loft within the larger existing building, a small number of the existing trusses will be modified to allow for enough head-space within the loft. All introduced trusses will be assembled on site and will be constructed from imported Numill Iroko timber elements that will be pre-cut off site, and assembled on site. The existing asbestos roof tiles will be stripped off and replaced with Everite Corrugated Fibre-Cement roof tiles that have an almost identical aesthetic but which contain no asbestos. The main new roof will be finished with Safintra's Newlook Steel roof system and painted with Plascon Cool White NuRoof paint. A large portion of the roof will be covered in solar panels that will be attached, using the Safintra's Steel S-5-H90 mini-clamp system. All roofs comply with the SANS10400 Part L requirement of being rationally designed (SANS10400, 2010).

Fig 3,109 Example of Nutec drywalling system with internal timber cladding and external plasterboard cladding

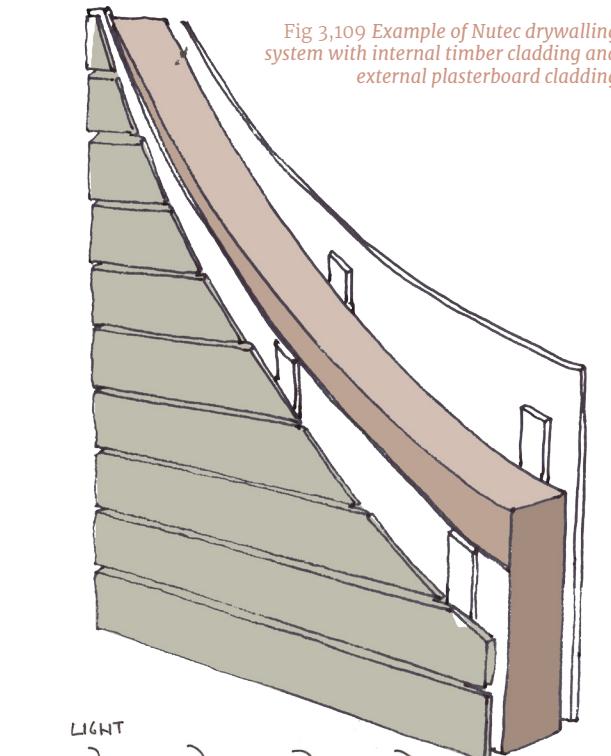


Fig 3,110 Light shaft paint detail

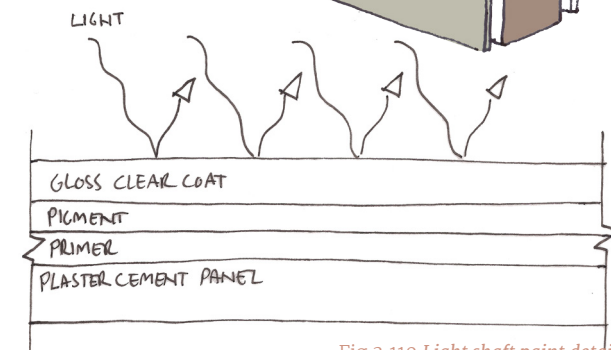


Fig 3,111 Safintra Newlok steel roof sheeting profile

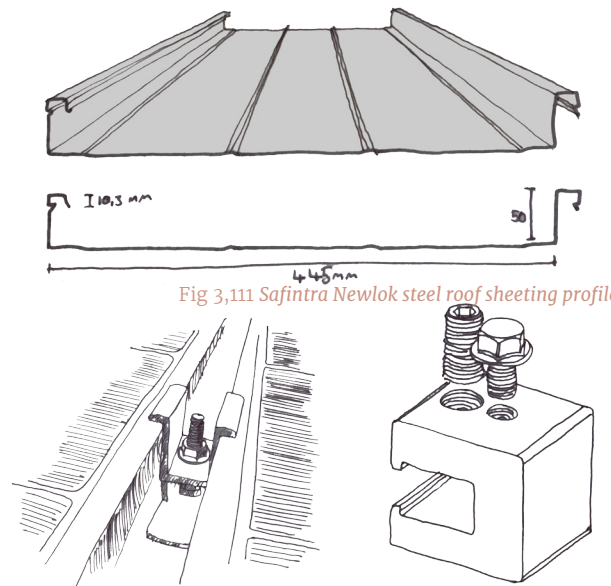


Fig 3,112 Safintra's Steel S-5-H90 mini-clamp system

Glazing

Geustyn and Horak curtain wall systems will be applied to the glazed façade. This system makes use of double glazing with 6 mm thick laminated glass panes, and aluminium window frames and mullions. The glazing system meets the requirements of SANS10400 Part N and Part XA (SANS10400, 2010).

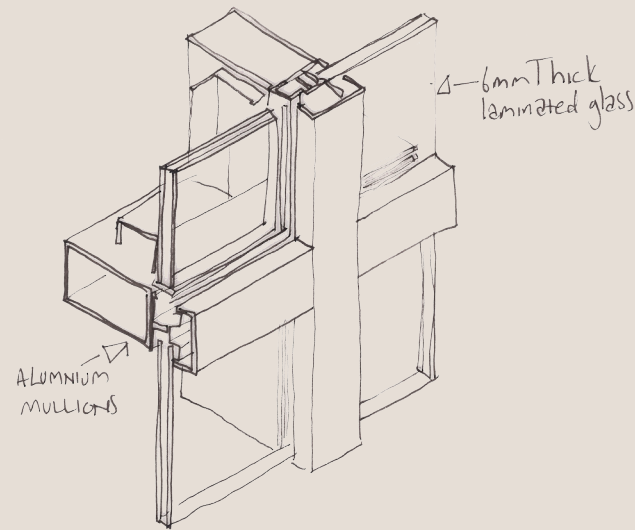


Fig 3,113 Aluminium window frame detail

Cladding Systems

All timber cladding will vary between 19 x 140 mm and 19 x 90 mm imported Numill Massaranduba decking planks. These will be machine-screwed onto the lightweight timber frame provided for the cladding.

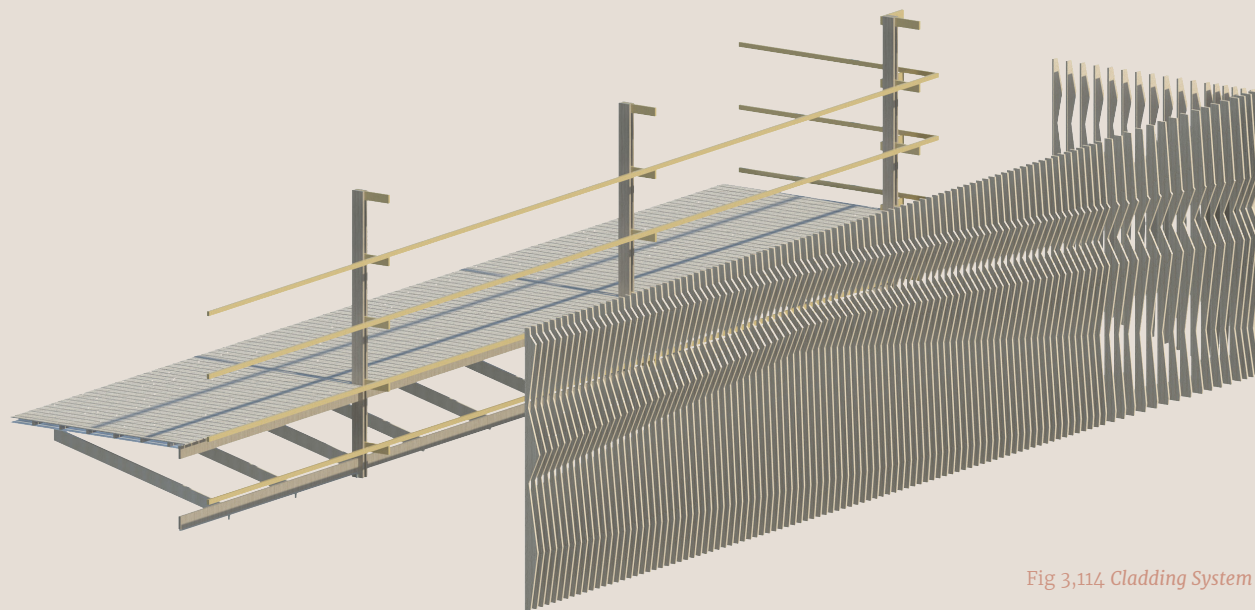


Fig 3,114 Cladding System

Finishes and Fittings

All light fittings are supplied by RegentLight's Industrial, Urban and Interior light departments. Furthermore, all ceiling panels are to be Nutec 16 mm Fibre-Cement ceiling boards that shall be cut to specification and assembled on site. All viewing benches and counters, as well as all dining tables and the reception desk, will be custom-designed timber furniture that will consist of laminated Saligna and SA Pine plywood elements.

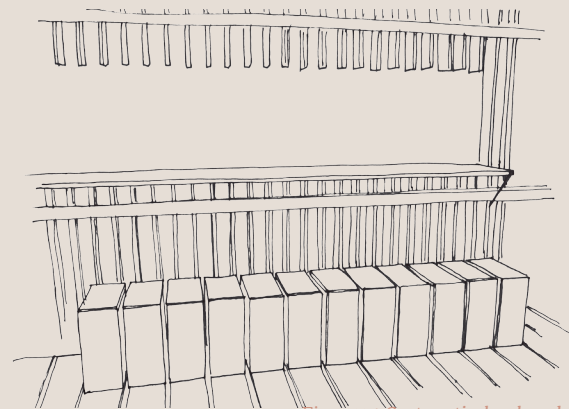


Fig 3,115 Custom timber bench detail

Building Services

Sewage Services

The proposed design incorporates a total of ten WCs, two kitchens, bird-cleaning bays and a laboratory washbasin. Due to the obvious lack of a municipal sewage connection, a septic tank system will be introduced onto the island, and will be the only design element that requires deeper foundations. All of the afore-mentioned services will link to a single sewage line that will transport any waste into this septic tank. This system will comply with the guidelines specified in SANS10400 Part C (2010).

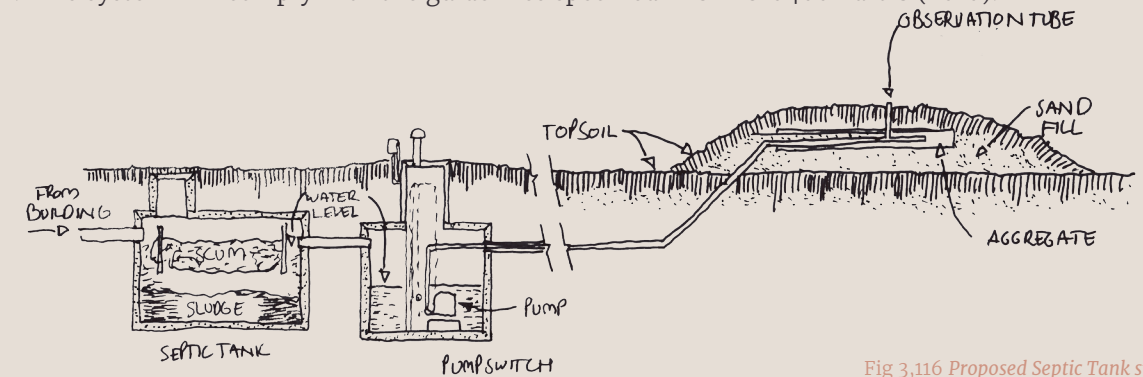


Fig 3,116 Proposed Septic Tank system

Fire Regulations

Due to the lack of surrounding architectural context, as well as flammable vegetation, the proposed design does not require much effort to comply with the regulations regarding fire escape and safety in SANS10400 Part T (2010). The risk of a fire occurring on the island is extremely low, yet in such a case, it will be very quick and easy to exit the proposed building and position oneself closer to a large body of water for protection.

HVAC

Due to the installation of ventilation and insulation systems, there is no need for HVAC systems in the design. The proposed design both protects the users from and utilises the harsh winds on the island for ventilation.

Design Detailing

Disabled Access

Access for the disabled is, unfortunately, limited within the design. This is mainly due to the site on which it is situated. However, with some minor assistance, any disabled users can experience most of the building in its fullness. The larger issue is how a disabled user would be transported safely onto the island.

Ventilation

The main large space within the proposed design requires a well-thought-out ventilation solution. Ventilation throughout the entire building is handled in a passive way by providing uninterrupted paths through which air can travel, creating a constantly-moving air current through the building. The intensity of this air current will be buffered due to the fact that the openings will be located between the façade's cladding, consequently allowing the unoccupied cavity to absorb any heavy winds, and filtering any possible dust or rain before the air enters the building.

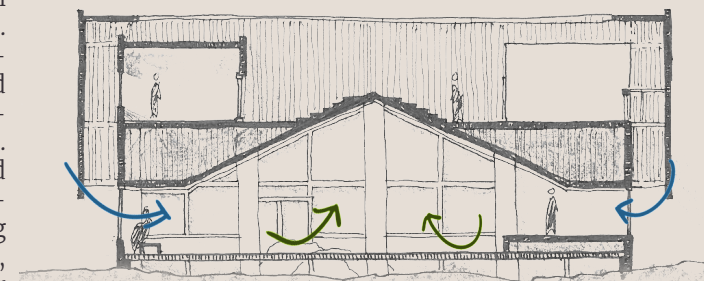


Fig 3,117 Ventilation sketch

Sustainability Goals

Once again due to the building's location, there are no connections available for municipal sewage and electricity lines. In addition, the client desires the building to be economical and easy to maintain, using as little electricity and water as possible. The design, with approximately 18% of the wall length consisting of glazing, conforms to the SANS10400 Part XA requirements of sustainability and glazing regulations (SANS10400, 2010).

Water Sustainability

Most of the water used on the island will consist of collected rainwater and water collected by means of mist harvesting technology. When necessary, a small desalination unit will be used to purify water extracted from the sea. All grey-water will be recycled for further use. Except in the case of emergency involving an oil spill resulting in the need for hundreds of birds to be washed, the proposed design allows for minimum water usage.

Energy and Climatic Sustainability

All electrical usage will rely completely on solar-generated electricity as is already the case on the island. Due to the large glazed and timber-clad façades around most of the design, the building will require little to no electrical lighting during the day. Solar panels will be positioned so as to service solar geysers and all electrical fittings throughout the building. These lighting and ventilation solutions are in compliance with SANS10400 Part O (SANS10400, 2010).

Material Sustainability

The decision to design a timber-framed building provides the advantage of using timber as an environmentally-sustainable material. Timber is sustainable due to the fact that it is durable, recyclable, has a low pollution output, carries no health hazards and, finally, is a constantly-advancing technology with improvements being made regularly (Grove, 2012). The dry walling systems used are manufactured in a manner that reduces emissions and produces a product that is durable and provides external envelope insulation.

Socio-Economic Profile of Users

Social Sustainability

Many, if not most, of the users of the building will be wealthy day-visitors who will, inevitably, bring financial stability to the running costs of the structure. Furthermore, the building integrates itself within the larger context of the West Coast tourism route.

Economic Feasibility

This project takes on the responsibility of providing an income that will be entirely focused on sustaining the preservation efforts of researchers and park rangers on Malgas Island. By turning the architecture of Malgas Island into something that is easily accessible and worth visiting, it is the hope that awareness will be raised with regard to the preservation and protection of the Cape Gannet colony.

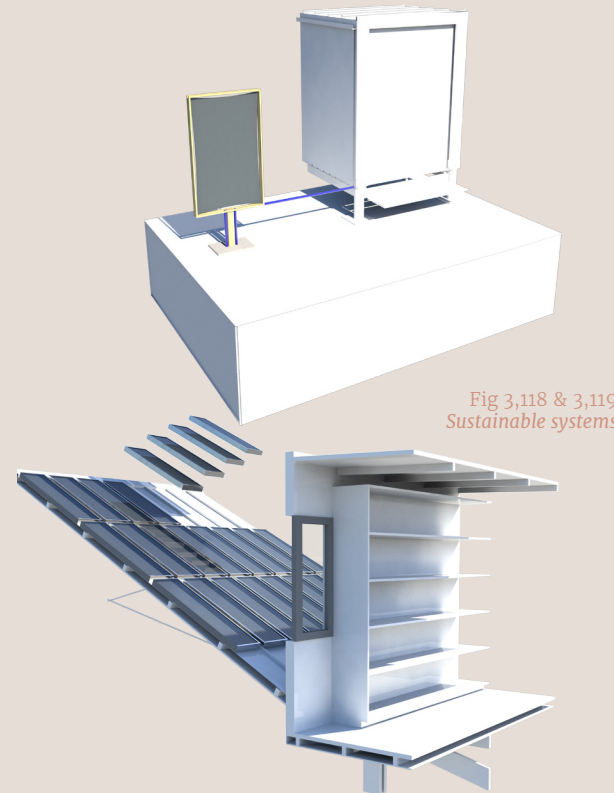


Fig 3,118 & 3,119
Sustainable systems

Conclusion

The Bird Preservation, Research and Visitors' Centre on Malgas Island provides a multitude of functions and structural complications within a small and secluded site, and is focused on presenting an honest timber structure with as little as possible 'make-up'. The structure is largely influenced by horizontal limits and, therefore, provides a number of more vertical elements. The apparent transparency of the façades emphasises the desire for an unassuming architectural aesthetic, as well as the need for focus to be placed on the site and its inhabitants rather than the architectural intervention. If the structure were actually to be built, it would be the survival of the Gannet colony that would become the measure of the architecture's success. What will inevitably be produced is a design that answers the call to an ecologically-ethical investigation, provides ultimate observation and research facilities to conservationists, and brings awareness to a mostly-unknown island with a precious yet endangered ecosystem.



Fig 3,120 The existing jetty



04

Reflection and Evaluation

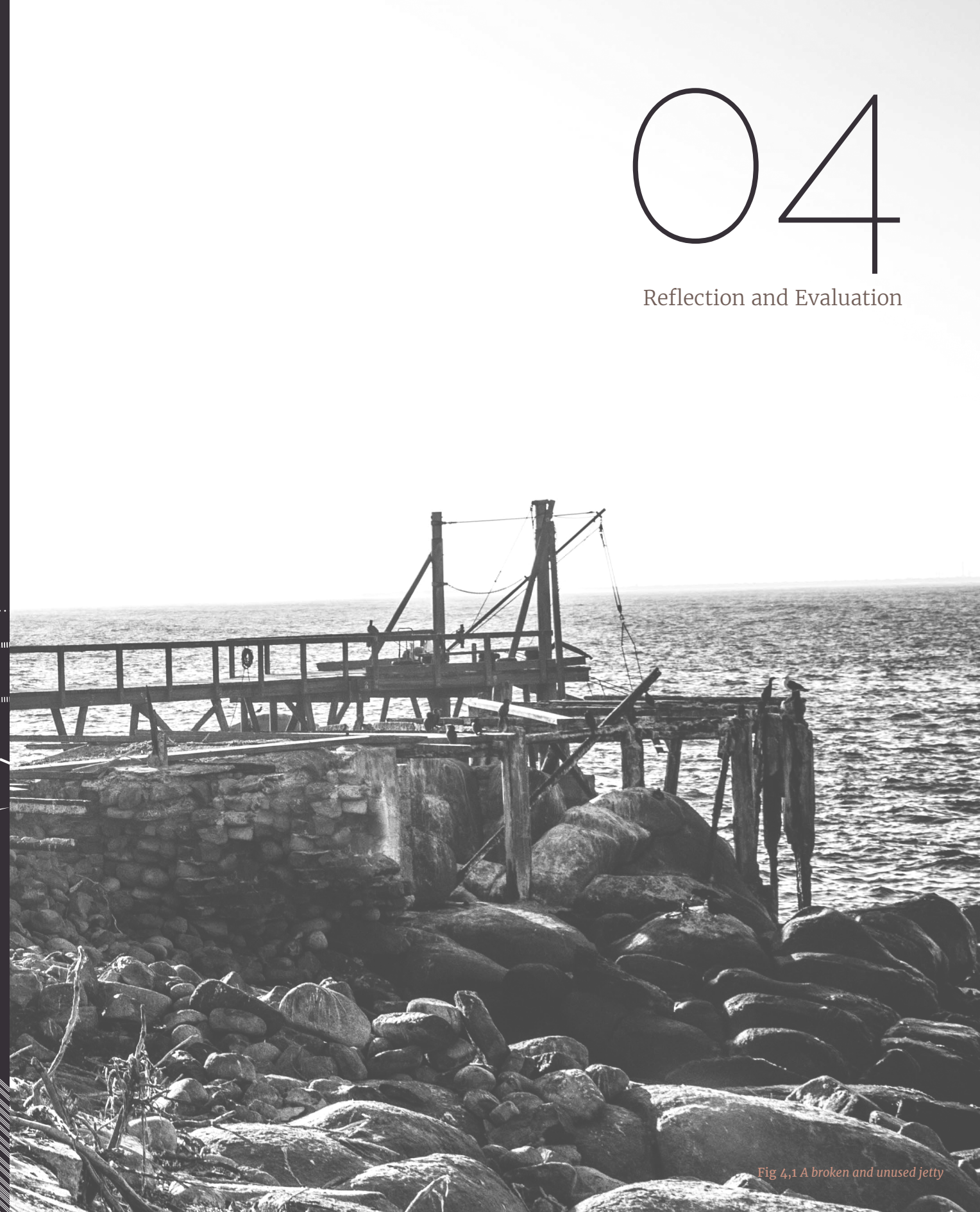


Fig 4,1 A broken and unused jetty

It is almost exclusively in the final year of an architect's studies that they are presented with the opportunity to assume the role of the client, user, architect, engineer and every form of sub-contractor. It is even more seldom that the site for such a project is situated on a completely uninhabited, secluded island. On one hand, this experience presented with me with an immense amount of freedom and opportunities. On the other hand, it overwhelmed me with the amount of decisions that had to be made by me alone, with the occasional guiding hand from various design mentors. It also struck me at an early stage in the year that every architect has an automatically generated image of what a building on a deserted island should look like, and will compare their image with mine when given an opportunity.

What seemed to be a project with endless possibilities inevitably became one with extreme limitations, as the practical aspects of a completely off-grid building somewhat overtook the theoretical possibilities of not having to work within an urban context. I firmly believe, however, that limitations encourage creativity. In the case of this design dissertation, these limitations forced me to engage at a closer, more detailed level with the design, on both an internal and external level. This resulted in a design that was structurally resolved to a larger extent than what I have experienced in my five years of studies.

Emotionally, working on the same design for the larger part of a year is a reasonably exhausting endeavour. I am, for the most part, a fast decision maker. Being advised to slow down and keep re-visiting past decisions was far and above the most frustrating aspect of this dissertation, yet it was, in hindsight, an extremely necessary learning curve. I have exited the year being more flexible, more thorough, and hopefully a better future architect. Physically, the dissertation has taken its toll more than it has emotionally. As I write this, however, I realise that the long nights and back-breaking model-building sessions are almost due to come to an end. At least, that is, until next year. 🐦

Fig 4,2 A Cape Gannet prepares to land
(Verma, 2012: online)

When looking back on the year, I remember it in four key stages: the first conceptual development, the initial design, the new design direction, and the design resolution. The first conceptual development was, in my opinion, a successful investigation into the essence of the project that not only served in justifying the validity of my project but also allowed me to order my thoughts and prepare myself for the challenge of putting plans on paper and starting the design. The initial design was filled with promise and potential, as I began to fall in love with the design solution I had begun exploring. It was in this stage that I became convinced I was going to be able to achieve success within the design. The new design direction, however, set me back a number of metaphorical paces. I realised that my initial idea was not the be-all and end-all of the possibilities that the dissertation presented. I began working in a new direction, and it took a while before I was comfortable and confident about my design. The design resolution was, in truth, a frustratingly slow process, as the design relied heavily on an extremely active engagement with the details of every finish and furniture piece within the design. This led, however, to a more full and mature accommodation list as well as a fully integrated design synthesis.


Reflecting on the research behind the project, I can only say that I have learnt an immense amount about the current state of the world as well as the new ecologically-driven ethical movements. As animal preservation is something that has interested me my entire life, this project has been the most engaging situation I have found myself with this subject. Learning about an ecologically ethical approach towards architectural interventions has left me with a sense of hope that a project like the proposed has a real chance of making a difference to an endangered species such as the Cape Gannet, if actually funded and built. The entire journey, from being introduced to Malgas Island to presenting the West Coast National Park with my design solution, has been one that I shall never be able to forget. It has, of course, been a labour of love, and I am unsure as to whether I would approach it with the same blissful hope as I did in the beginning of the year if I were to do it again.

I must admit that I do feel a certain sense of sadness as I realise that the project will forever remain within the bounds of a book, stored within an archive, perhaps to never be opened again. However, the amount of architectural knowledge gained throughout the process of the project will never be forgotten. I feel that it has become a base from which I can take the dive into my new career. 🐦



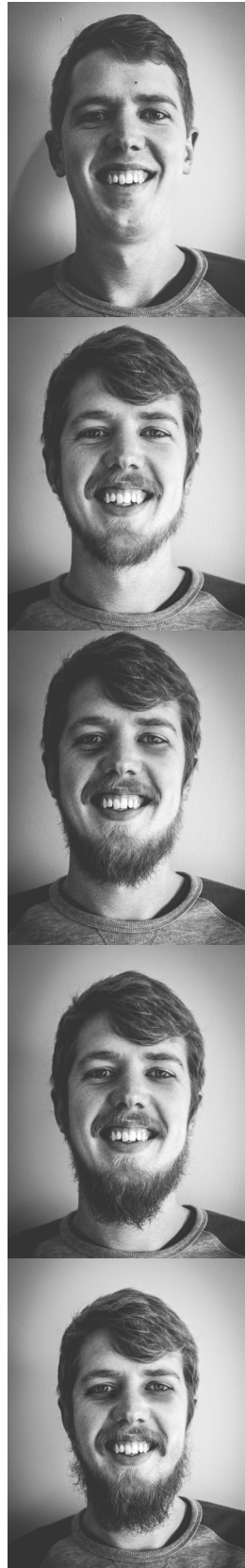
Evaluating the success of the design dissertation is a very subjective process. I would like to simply state that, in my biased opinion, the project was successful. Yet if I am honest and make an earnest attempt at a spot of objectivity, I quickly realise there are a number of areas in which the project is ineffective. I must also constantly prevent myself from travelling down the dark rabbit hole of deciding that my project was a total and utter failure (as I have felt at certain low-points throughout the year, although haven't we all?). I believe that a project is always more successful either on paper or in reality. With a design dissertation, however, paper is all there is. Within this paper-work, there is a theoretical aspect and a practical aspect. It is my conclusion that my project succeeded more in theory than it did in practicality.

In the discourse of the document, very new and exciting ethical questions were explored and expounded upon. The design methodology generated from this discourse promised an immensely exciting yet humble and unassuming architectural solution. Yet in reality, the architecture was more unassuming than it was exciting. The flat facades were inevitably an element that required 'make-up' in order to avoid monotony, which contradicted the desire for a fully integrated design and structural solution. In order to fill the large, void space within the design, sculptural elements were introduced that, in all reality, should perhaps not have been needed in the first place. The building, in an attempt to provide as many viewpoints over the island as possible, inevitably generated a large amount of empty, open-ended spaces that seem unnecessary at best.

With only the final model-building and presentation process as well as the final examination left lying before me, I would conclude that the year has been an overwhelmingly busy yet extremely interesting and successful exploration into an architectural design. It is my hope that the project can be enjoyed and be as intriguing for others viewing it as it has been for me. I leave the year with little regrets, more confident that I have ever been that I am embarking on the perfect choice of profession for someone as myself. 

S. Moffett

Fig 4.3 Self-portrait analysis taken from August to October 2016



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A comprehensive reference list for both the images and text of the design dissertation



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Tuesday, 12 January 2016

Early Morning

I climbed onto the boat at 06:00 this morning as we prepared to make the thirty minute passage across the open ocean. After a rough journey through large swells and the dense West Coast mist, the silhouette of Midge Island began to materialise. Before my eyes could make out the details of the island, it was my ears that were assaulted with the wailing of Cape Gannets screaming in unison, growing louder with each passing minute.

The boat approached the weathered timber jetty, standing a scanty three metres above the surface of the water, as Paul Rogers on the island unrolled a rusted steel ladder down until it touched the top of the larger waves. I was instructed to climb onto the nose of the boat and get ready to jump as the captain aligned it with the rungs of the ladder.

After a somewhat terrifying but successful leap across the gap between the boat's nose and the suspiciously rusty ladder, I ascended the rungs and stood up to take in Midge Island in all of its small and lovable glory. All trace of my nerves were wonderfully assuaged as I tried to identify what lay in front of me. Perpetual noise, rhythmic waves, the taste of seawater in my mouth, beautiful abandoned buildings from another era, and the constant pressure of heading west enveloping me from all sides. Feeling the a pressure on a foreign planet, I made my way towards the harsh, rocky surface of the island.



Bird Preservation, Research & Visitors Centre

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Fig 4,4 The plagiarism report



Fig 4,5 A final look