Nomadic Norwegian Architecture

An historical and contemporary study of prefabricated Norwegian Whaling settlements in the Southern Hemisphere

By Hannah France

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Cover Image: Nowegian Flag draped over a Norwegian Whalers' grave at the Stewart Island Cemetery, Photo by author, 11 July 2010.

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Abstract

The early 1900's saw a Norwegian Whaler's base formed on Stewart Island where they shipped prefabricated buildings from Norway to create a settlement. The majority of these kitset buildings are still standing and apparently have had little modification from their original form. These buildings have no documentation of their materials, suitability of site or analysis of their current condition in this foreign environment. Initial research found one book by J.P.C Watt from the 1980's which researches the Ross Sea whalers with little focus on the architecture or design. The book documents the movements of the buildings from their original service as a whaling station in the early 1900's. This is an interesting ensemble of nomadic buildings, foreign to New Zealand, being moved around consistently and yet still remaining in the country today. Through the investigation of materiality, tectonics and individual building elements the research demonstrates how the buildings reacted to their nomadic inhabitants and also how the materials allowed for a sense of personal belonging to occur.

This research aims to explore the materiality of Norwegian portable architecture and the material's present conditions. It establishes that the nomadic/temporal nature of the Norwegian kitset buildings were not adapted to fit the New Zealand context and documents these buildings for future reference. The first step is literature research and design exploration of Norwegian kitset materials, tectonics and components. In the second step, analysis of case studies is conducted. Findings have been judged upon functionality, and therefore the design is a result of the site context and research.

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Final thanks must be made to my family and friends. My parents, Patricia and Evan France, for providing personal and financial support. They have helped to keep life in perspective during this year and offered valuable feedback. Also to my boyfriend David for understanding the late nights and providing design perspective. To my friends and flatmates for their encouraging support, ideas and guidance.

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Chapter 1 *Introduction*

Prefabricated buildings have been utilised for more than a century. Mostly these have been made and transported within a country, but sometimes transported between countries. There are some exquisite examples of overseas buildings influencing communities they have been brought to. An example is the Norwegian Whaling Company, Rosshavet, who brought kitset buildings to places like South Georgia, Antarctica and Stewart Island. Despite whaling being a topical subject at the moment due to sustainable hunting issues, very little has been documented in terms of the buildings the early whalers utilised and their origins.

In South Georgia the original prefabricated buildings, although starting to decay, are still erect and some are in use. However, on Stewart Island the buildings are no longer in their original positions – they are now situated in the main township. The prefabricated buildings have been removed from their original site and context therefore raising questions how these transient spaces have influenced their inhabitants. Thus the aim of this research is to find out if a transient space can be materialised and personalised for use.

The research has been divided into seven chapters to achieve this aim. The research approach will be a combination of literature reviews, studies of personal accounts and onsite analysis. Chapter 2 and Chapter 3 are historical and create a solid grounding for the rest of the research. Chapter 2 focuses its research on Norwegian Wood. It will look into the history of the building material Norway is globally known for. This chapter will also start to explore kitset materials, tectonics and components

Figure 1.0 Nowegian Flag draped over Norwegian Whalers' graves on Stewart Is, Photo by author, 11 July 2010.

of Norwegian buildings, establishing possible historical references towards the current buildings. The final section defines and forms an understanding of the term 'Norwegian detail'. All three sections include literature reviews from authors within this field and prominent Norwegian theorists. Chapter 3 seeks to achieve the aim of personalising a nomadic space by investigating the theories and ideas surrounding portability. The need for transportable environments and the types that are available will then be discussed to form an understanding of the placement of such structures.

Chapter 4 discusses the two case studies. The case studies are comprised of two whalers' bases; Kaipipi Shipyard, Stewart Island and Grytviken, South Georgia. To understand the links between these situations a brief introduction to Captain Carl Anton Larsen will be offered as well as a summary of the history of whaling. The case studies are laid out similarly, starting with an historical overview of the Whalers' Base followed by the portable nature of the buildings and finally an analysis of their respective site response.

Chapter 5 is about the design and seeks to achieve the aim, personalising a nomadic space, through design. This chapter evolves through the design and research processes. Chapter 5 will introduce the Marquette process that was utilised to derive potential spatial and design strategies. There are several stages in this process; each stage introduces either a new material or process. The second part of this chapter introduces the programme of the design and the scope with the intention of responding to the aim. The third part of Chapter 5 will analyse the response to the aim and the strengths and weaknesses proposed by the design.

Chapter 2 *Norwegian Wood*

> "Architecture is the result of many forces: materials, climate, labor [*sic*], and economics are pragmatic factors, but cultural traditions, social patterns, and political values are what ultimately give any art its local expression. Not surprisingly, the latter were more important for shaping the character of Norway's buildings. The unique expression of Norway's architecture leads one to believe that building methods were treated differently in this part of the world. Norway's history reveals cultural and natural forces that led to the development of its woodworking techniques, and it also reveals the prototypes that led to its traditional buildings." (Holan & Norberg-Schulz, 1990, p. 19)

2.1 History of Norwegian Wooden Building

Reima Pietila, a Finish architect, states that a Nordic man dreams of a "cave of wood". (Holan & Norberg-Schulz, 1990, p. 7) He goes on to state that caves are necessary for "protection against a harsh climate, and these must be of the warm material wood in order to offer comfort during the long winters, and even colorful [*sic*] to make us remember the green trees and the flowers of summer." (Holan & Norberg-Schulz, 1990, p. 7) It is this way of thinking towards materials and their properties that makes

Figure 2.0 Urnes Stave Church in Western Norway dating back to 1130 is the oldest in Norway. *Sacred Destinations*, http://www.sacred-destinations.com/norway/urnes-stave-church, November 12, 2010.

Figure 2.1 Close up of the Urnes Stave Church in Western Norway dating back to 1130 is the oldest in Norway. *Sacred Destinations*, http://www.sacred-destinations.com/norway/urnes-stave-church, November 12, 2010.

building Norwegian wooden buildings a tradition. Holan's book titled *Norwegian Wood – a Tradition of Building*, endeavours to explore the historical references of Norwegain building. The Norse people tend to see wood as a stable and primary material that satisfies practical and functional needs.

The reason Norwegians have a strong connection with wood is due to the abundance of Baltic Pine that grows along the northern boundary. Holan describes the term "wood culture" as more than just the existence of wooden building and objects. He believes it gives the Norwegians an identity; a sense of belonging and security. The poetic nature that Holan uses to describe the characteristics embodies the Norwegian idea of "home". (Holan & Norberg-Schulz, 1990, p. 7) It is perhaps the difference between the traditional stone buildings associated with many other parts of Europe that makes Norwegian wood so unique. Holan describes the different tree types associated with the countries as the determining factor in their structure and complexion. He describes the skeletal post and beam structures as being associated with deciduous forests, (like those found in France, Germany, England and Switzerland). (Holan & Norberg-Schulz, 1990, p. 16) Although, the more traditional building technique of log building is associated with coniferous forests, (like those of Russia and Finland), building in Norway tends to be a combination of both – utilizing the structural aspects whilst associating it's techniques with the delicate wooden details.

Christian Norberg-Schulz claims that Norwegian architecture is embodied by it's rich history of 'ancient wooden architecture'. In terms of it's relationship back to the 'stave' churches of the Middle Ages, Norway's modern wooden architecture relates through the level of craftsmanship. (Norberg-Schulz, 1986, pp. 8-9) Holan also supplements this statement by saying Norway's vernacular surpasses other similar cultures due to the craftsmanship. (Holan & Norberg-Schulz, 1990, p. 16) The year 1914 was significant for Norway for many reasons. First, it was the centennial celebration of Norway's constitution and the second was the aim to "Norwegianize the 'Swiss style'". (Norberg-Schulz, 1986, p. 23) In doing this Norwegian designers set about creating a point of difference – this being the 'Dragon Style'. The motif of a dragon was placed on the gables of many of the wooden houses to signify this style. Norberg-Schulz describes this period as "national-romantic" and points out that although many architects travelled this area on study they were too self-absorbed to regard the decorative wooden architecture.

Norwegian's associate vernacular architecture with the wooden 'cabin'. There are many elements that create this association and they appear to be common between the inland and coastal cabins. Holan's describes Norway as reflecting a:

> "certain order precisely, because such craftsmanship dominated the building culture. Consequently, its buildings illustrate the act of "making" in its deepest sense-that is, the revealing and enhancing of structure or reality. As opposed to mere building, "making" is an act of emphasizing the given structure in any situation, whether a site, a building, or a detail. (Holan & Norberg-Schulz, 1990, p. 20)

Norwegians see the saddle roof as the major aspect of design and it is often turfed. It wasn't until recently that bitumen was permitted as a building material to create flat roofs. (Tostrup, 2002, pp. 17-22) The vernacular is also inspired by the weather and extreme conditions in Norway which, are similar to that of New Zealand's as the case studies reveal further on.

Figure 2.2 An example of a turfed roof in Stordal, Norway. Image taken September 23, 2007, Image retrieved November 12, 2010, http://www.lostateminor.com/2010/11/12/norways-turf-roofs/

Figure 2.3 A modern example of a grass/turf roof in Norway. Image retrieved November 12, 2010, http://www.lostateminor.com/2010/11/12/norways-turf-roofs/

2.3 Norwegian Detail

For over 800 years the Norwegians have been creating well crafted and significantly detailed wooden buildings. Therefore, it is of great importance to summarise their techniques and look into the "Norwegian detail". (Holan & Norberg-Schulz, 1990, p. 22) This 'detail' is partially a response to the wood itself and also to the strong history associated with boat building techniques.

The principles associated with wood give it the potential to be utilized for carving or molding. It also holds structural principles which make it versatile and it is these characteristics that other materials like concrete, stone or glass are lacking. Baltic pine is grown in abundance on the Northern border again highlighting Norway's self-sufficient nature and it's potential to showcase skills associated with this material and its properties. Given timbers load bearing capacity and elasticity it became of upmost importance to deliver these principles and exhibit them through the detailing. The properties of timber have been reflected upon in many cultures but the Norwegians tend to have taken these and refined

them to suit their lifestyle and also their work with nature. It was this refining of techniques associated with timber that allowed the Norwegian craftsmen to create their vernacular. This patience of working with timber in such a repetitive manner was also passed on through the generations allowing the builders to satisfy their own creative aspects through the details. (Holan & Norberg-Schulz, 1990, p. 19) It is this way of working that lends itself to the details and structure being realized before the envelope itself. It was perhaps Louis Kahn who summaries the Norwegian's way of designing their buildings the best. He describes it as "making". He goes on to say that "aesthetics are realized out of the singularity of a making in which someone, sensitive to how rules derived from the laws of nature might be employed, makes an aesthetic principle. Aesthetics come after one makes something, not before." (Holan & Norberg-Schulz, 1990, p. 23)

The scale of Norwegian detailing is significant. It lies prominently in the joining of materials and intersecting of planes or in the expression of the structural principles. The details seen in Norwegian buildings give the buildings their distinguishing attributes. Norwegian craftsmen were able to enlighten a structure by "emphasizing certain details" and also considering their "place within a building." (Holan & Norberg-Schulz, 1990, p. 22) It is this aspect of detailing that will initiate a design strategy within the project and analysis of the case studies.

Figure 2.4 Norwegian Cottage - example of Wenche Selmers work. *Norwegian Wood - The Thoughtful Architecture of Wenche Selmer*, Elisabeth Tostrup, p. 81, 2006, Princeton Architectural Press, New York.

Although the traditional detailing approach was employed by many Norwegian architects, Wenche Selmer detailed her wooden architecture so that her buildings explore the details of colour. The treatment of the wood inherently became the detail for Selmer, with many techniques uncovered. Primarily she utilized ferrosulphate mixed with black soot powder and resin. These were then dissolved with water and rye flour to gain a grey-black tinge to the wood. This technique was derived from Magnus Poulsson and Knut Knutsen's treatment of timber. (Tostrup, 2002, p. 37) From here she started to expand and explore the potential of these techniques progressing onto tar products that left a translucent finish given the timbers properties.

Another significant aspect of the detailing lies within the historical approach that can be linked to the "stave" churches. These were highly sacred places and the use of wooden carvings can be directly linked to these forms. Most other countries were utilizing stone and brick for large construction however

the Norwegians were experimenting through their carver's potential in detailing. Holan describes the medieval period in Norway as being quite similar to other cultures with the builders specializing in both churches and farm work. It is interesting to note that the construction methods derived for church structures were then implemented into the building of farm buildings particularly the carvings seen in 'stave' churches, and therefore, filtered into mainstream architecture. (Holan & Norberg-Schulz, 1990, p. 18) Norberg-Schulz calls this stage of Norwegian wooden building the "give-and-take of sacred and profane, the blending of both mundane and specialized skills" while also stating that the "finest woodworking skills" were seen during this period. (Holan & Norberg-Schulz, 1990, pp. 17-18)

Another significant aspect of the "Norwegian detail" is the strong relationship between the ship/boat and the building. Ships had long been used in Norway for economic purposes and also allowed connections between other countries. The level of craft and detail in these vessels had therefore started to influence the connections at a different scale. It is this level of craft in the detail that is intuitive of the builder. It becomes the physical object that is practical at a stage that is aesthetically resolved.

2.4 Conclusion

Norwegian Wood is starting to revitalize and be understood within the contemporary scene. Not only does the wood hold strong historical links it also is utilised in a different way to other countries. These historical carving links are starting to be revisited and a resurgence of Norwegian architecture is visible. Norwegian architects like Wenche Selmer are utilizing new techniques in their handling of wood and referencing back to historical uses. The Norwegian detail that forms many unique aspects of their architecture through the joining or craftsman ship is now strived for globally. It is this Norwegian detail that will be crucial in the execution of the design phase as it has the potential to enhance the level of design and create narratives through its placement.

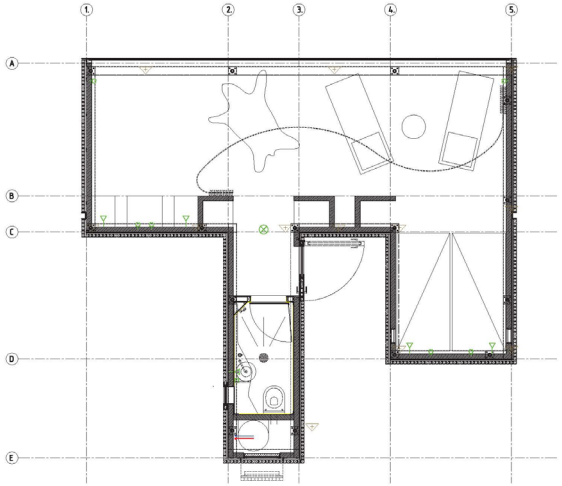


Figure 2.5 Example of a floor plan from Juvet Landscape Hotel - Jensen& Skodvin Architects, Image retrieved November 12, 2010, http://www.jsa.no/download/Landscapehotel/LandscapehotelPackage.pdf

Figure 2.6 Exterior view of the Juvet Landscape Hotel by Jensen & Skodvin Architects. The Hotel formed one of the precedents for the design component, Image retrieved November 12, 2010, http://www.jsa.no/photos/Juvet/largePhotos/JuvetLandskapshotel_9787.jpg

Figure 2.7 Juvet Landscape Hotel, Norway, showing the reflection of the landscape into the building, Image retrieved November 12, 2010, http://www.jsa.no/photos/Juvet/largePhotos/JuvetLandskapshotel_9764.jpg

Figure 2.8 An elevated view of the Juvet Landscape Hotelshowing the lightweight structure that appears to float, Image retrieved November 12, 2010, http://www.jsa.no/photos/Juvet/largePhotos/JuvetLandskapshotel_9774.jpg

Chapter 3 *Transportability Theory*

Chapter three investigates the theories and ideas surrounding portability. Although the topic of portability is complex, this chapter seeks to explore and clarify the topic while also exploring its theoretical nature. The need for transportable environments and the typologies that are available will then be discussed to establish an understanding of the placements of such structures.

3.1 Transportable Buildings – The types & requirements.

The notion of portable architecture came to the forefront in natural disasters, showcasing its need in the global market as well as its versatility. Disasters such as Hurricane Katrina and the series of tsunamis in Asia demonstrated the lack of infrastructure that is left after such occurrences and the immediate response that is desired. The Architectural Associations Design Research Laboratory implemented research into "strategic design systems" that had the potential to perform in extreme conditions. The Co-Director of AA Design Research Lab, Theodore Spyropoulos, says that the group's proposal was to engage a system that was "flexible and adaptable" while also being able to "negotiate the uncertainty of disaster relief". (Caste, Bermejo, & Li, 2008, p. 9) This research was created in accordance with the parameters suggested in a brief that the National Health Service and World Health Organisation

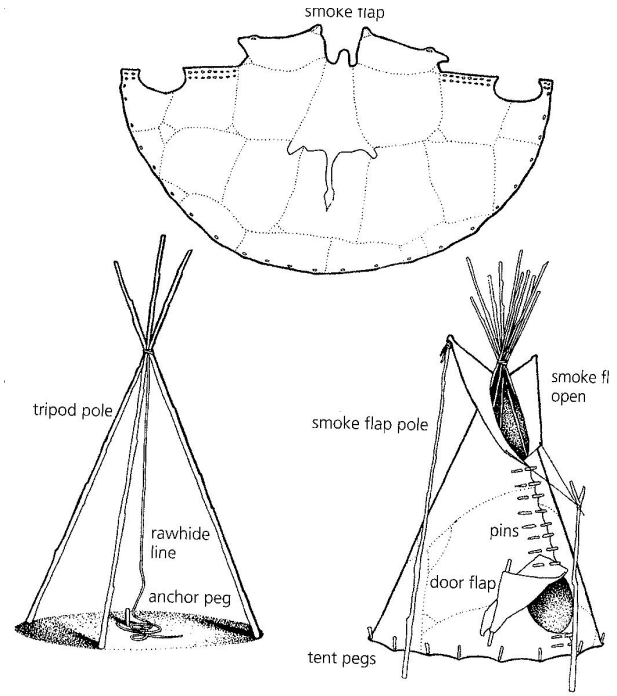


Figure 3.0 Diagram of a 'tipi' showing the ease at which it can be made portable. "The Native People of Canada - The Peoples of the Plains", Image retrieved November 12, 2010, http://nativesofcanada.tripod.com/id6.html

designed. Their final system utilized patterns defined by them and a clip together system for panels to create a three dimensional space.

Portable and transportable architectures are developing and changing rapidly as the built environment seeks to change. Robert Kronenburg is a prolific writer on transportable environments. Kronenburg suggests that portable buildings and environments have been around since man first started building however it is only now that it is considered to be architecture. (Kronenburg, 2008, p. 8) In his book *Portable Architecture: Design and Technology*, Kronenburg discusses the ideas of tent structure and the North American "tipi" saying that they utilized construction techniques that are still applied today.

Given the discussion regarding transportable environments, a definition must firstly be given as to the nature of these structures. Robert Kronenburg defines three differing types of moveable building. First is the "Portable Building" – these are complete structures that are moved as a whole. They have the potential to be installed directly on the site or with the mode of transport incorporated therefore providing the potential for instant use. The second type is the "Relocatable Building" – a physical structure moved in different parts but then reconstructed on the desired site. This is usually quick to assemble but lacks the possibility of instant use. The final type Kronenberg defines is the "Demountable Building" – this is a building broken down into components and then built on site. This is the slowest process but it provides the potential to fit the parts into a compact space allowing for efficient transportation. (Kronenburg, 1995, pp. 7-8)

Transportable environments, like portable buildings, have principles that make them successful and create a need for their ideas. They have become popular given the highlighting of natural disasters and the need for these environments and buildings to become emphasized. The ideas surrounding portable structures in the simplest form is the movement of a premade structure from one site to another for immediate use. Kronenburg discusses how some of these environments integrate the mode of transport into their design while others have simple erection methods once on site. (Kronenburg, 2008, p. 8) These basic built forms and environments vary in scale from the physical house to the personal "transportable environment".

Figure 3.1 Destruction caused by Hurricane Katrina in United States of America. Image retrieved November 12, 2010, http://www.katrinadestruction.com/images/v/hurricane/

Figure 3.2 Houses damaged by Hurricane Katrina showing the devastation and displaced people. Image retrieved November 12, 2010, http://www.katrinadestruction.com/images/v/hurricane/

3.2 Scales of Transportable Environments

With portable and ephemeral buildings, like the "tipi", being the first form of building after the cave, it is inevitable that they have developed and constantly evolved. The scale of transportable buildings and their location tends to describe their use and type. Although most transportable environments are not permanently fixed they do however, have a permanent use. It is this quality that makes them reusable and renewable – once they have completed their use they can be resituated at their new placement. (Kronenburg, 1995, p. 9)

Small scale portable housing has been created by SKOR, the Foundation for Art and Public Space, who wanted to cover a range of smaller scale installations in art, architecture and urbanism. PARASITES – Prototypes for Amphibious Readymade Advances Smallscale Individual Temporary Ecological Houses – the name of the installation, explains that the exhibition is looking at an assortment of building types and techniques. (Melis, 2003, pp. 7-8) Many of the PARASITE installations are futuristic, however, they deal with the interaction between the human body and architecture. This interaction is important as it understands the relationship between the body, scale and materiality.

The example above is a solid example of personal scale portable architecture that still embodies a physical material and structure. Prasad Boradkar discusses an alternative scale of transportable environment with the phenomena being an iPod or portable music player as the source in Transportable Environments 3. Boradkar discusses the interaction between the physical environment and the mental. He states that physical structures are easily maneuvered and built while also catering for short term inhabitation in comparison to that of a mental environment. (Boradkar, 2006, p. 21) Broadkar states that environments can be seen in three differing ways; "imaged rather than built, ethereal rather than corporeal, and perceived rather than prototyped." (Boradkar, 2006, p. 21) The ease at which these environments can be transported with the user allow for links to other environments by triggering memories.

So far the small scale, (both physical and mental), has been discussed but the more common scale is the prefabricated home or house. This is probably the most practical. A moveable house or house

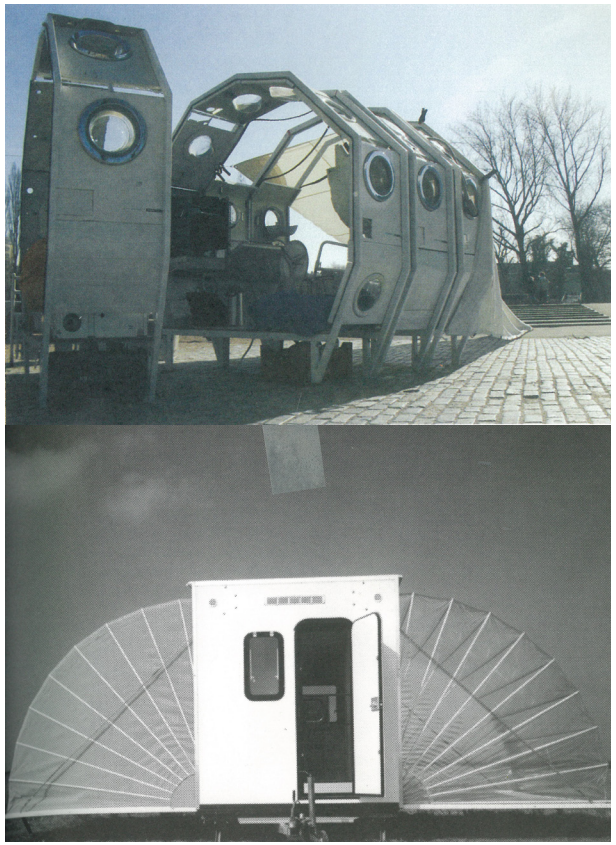


Figure 3.3 An example of temporary accomodation. *Parasite Paradise - a Manifesto for Temporary Architecture & Flexible Urbanism*, Liesbeth Melis, 2003, p.117. NAi Publishers/SKOR, Belgium.

Figure 3.4 Another example of an easily transportable environment with collapsable walls. *Parasite Paradise - a Manifesto for Temporary Architecture & Flexible Urbanism*, Liesbeth Melis, 2003, p.59. NAi Publishers/SKOR, Belgium.

attached to wheels has been around since the 19th Century dating back to the Gypsy caravans of Europe. (Davies, 2005, p. 73) Through the ease of movement that these structures have provided over the years they are still thought to be temporary, much like those utilized at times of disaster relief work. The practical scale of these structures means, however, that they have the potential to be incorporated into everyday homes and living. Kronenburg argues that with greater appreciation and understanding of the nature of 'transient' architecture there is the potential to create a new category of design. (Kronenburg, 1995, p. 11) Kronenburg also discusses principles of design that Glenn Murcutt also adheres to. Murcutt states "tread lightly on the earth" as a form of creating a responsible society. (Kronenburg, 1995, p. 11) Murcutt's design strategy is "Touch the Earth lightly" which is a principle similar to the portable building strategy Kronenburg implores that has the potential to influence the design phase. (Drew, 2001, p. 167)

Although the smaller scales are favoured in design, it is vital that the large scale be explored as well. Buckminster Fuller proposed to cover whole cities in geodesic domes. Globally he is known as the designer of futuristic structures with some calling him "alternately frightening and incomprehensible" and most saying he's "puzzling". (Fuller & Marks, 1973, p. 2) The Secretary General of the United Nations, U Thant, commented that Buckminster Fuller was "one of those rare thinkers who can analyze the trends of human history and who is preoccupied with fashioning the future". (Dil, 1983, p. 12) Fuller designed Military pods from his Geodesic domes and also proposed to cover the whole of New York in the giant dome therefore creating a microclimate. This idea of portability was in stark contrast to any others explored. It started a new line of thinking.

3.3 Portable Theory – the types, significant authors and history.

Transportable environments have been utilized in differing forms to create architecture and it is important that aspects of their theory be discussed. Many noted architects and theorists have summarized this movement and commented on points they see changing or developing. When discussing portable architecture the ideas associated with Buckminster Fuller must be overviewed and discussed as he is at the forefront of portable and ephemeral architecture. In addition the architectural theorists who have shaped this subject and contemporary writer's ideas need to be discussed.

The transition from static to fluid transportable environments first signified motion. Wassily Kandinsky at the Bauhaus was an early and noted artist who investigated movement and the connotations of motion in painting. Although many other painters were starting to exhibit similar notions and ideas, Kandinsky was the first to take the static painting and shift it into the dynamic. (Jormakka, 2002, p. 7) In his work "Point and Line to Plane" Kandinsky started to explore the shift by tracking a singular moving point. (Jormakka, 2002, p. 7)

Like Fuller, Erich Mendelsohn was also at the forefront of movement in architectural theories. The ideas surrounding integrated and dynamic forms are best understood in Mendelssohn's Einstein Tower that was constructed in Potsdam 1920-1924. (Jormakka, 2002, p. 9) It was constructed to exhibit Einstein's relative theory and to challenge Newton's space and time concept through the use of materiality. Reinforced concrete was a state of the art technology for it's time and therefore it was a revolution for architecture. Although Mendelsohn was privileging Einstein's theories through the design, he also wanted to show his personal views on materiality by classing steel as too irrelevant and sterile and by encasing it within the concrete the form began to take precedence. (Jormakka, 2002, pp. 9-10) The techniques that were utilized by Mendelsohn are still explored and developed this century to show motion. Techniques such as "inclined planes, horizontal emphases, acceleration of facade rhythm, aerodynamic curves" are still seen in movement influenced design today. (Jormakka, 2002, p. 10) These techniques are derived from industrial design principles.

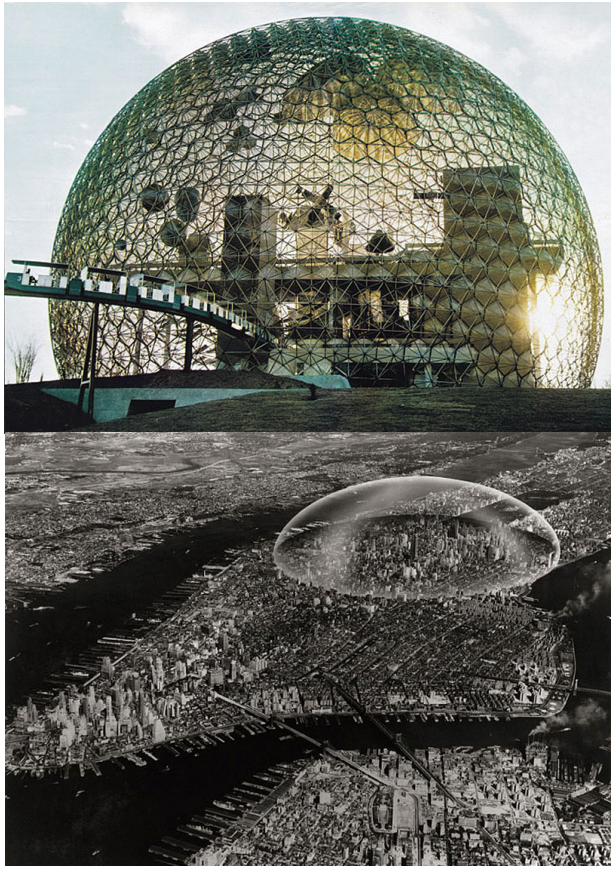


Figure 3.5 Buckminster Fuller's US Pavilion for the 1967 International and Universal Exposition in Montrea. Image retrieved November 12, 2010, http://arttattler.com/Images/NorthAmerica/NewYork/Whitney/Buckminster%20Fuller/fuller_pavilion.jpg

Figure 3.6 Buckminster Fuller and Shoji Sadao, Dome Over Manhattan, 1960. *The Dymaxion World of Buckminster Fuller*, Robert Marks & Buckminster Fuller, 1973, p.234, Anchor Books, Illinois.

Although these design directions have been tried and tested there is still work to be analysed. Materials have the potential to influence design while also the ability to showcase a theory, (like motion). Kari Jormakka the author of *The Flying Dutchmen* argues that although a building like a train station may be designed to accommodate movement and motion and must understand the principles of these notions it is a misconception that the structure itself must be designed more aerodynamically than the trains. Jormakka also says that the "metaphorical representation of movement through aerodynamic form is a matter of conventional symbolism, comparable to the symbolic devices of 19th Century historicist styles." (Jormakka, 2002, p. 13) Like the train station example, Jormakka believes that literal representation in relationship to motion needs to also be avoided. If a building is designed for cars, or situated amongst cars, it is not necessary to design a building that literary mimicks the shape of a vehicle. This starts to question the architectural technique and representation. Jormakka suggests that the way to move away from this situation is to understand design principles and allow for the "architecture and other parts of the built environment really move." (Jormakka, 2002, p. 17)

As well as Mendelsohn and Fuller, other ideas and theorists in motion architecture relate to Le Corbusier and Deleuze. Deleuze sees the diagram as the mediator between "concept" and "realisation" and defines movement through these mediums. (Jormakka, 2002, p. 44) Le Corbusier's manifesto included principles in relation to the automobile and future design. His Villa Savoye showcases these principles which included the turning circle of a car forming the parameters of the ground floor and utilised ramps therefore avoiding stairs to allow for a smooth circulation up through the building. The roof presents ideas of movement comparable to the automobile. An opening in the wall symbolises the view through a windscreen. (Jormakka, 2002, p. 34)

In terms of contemporary theory surrounding motion and movement architecture, Robert Kronenburg is the most notable writer; editing all three of the *Transportable Environments* series and also writing numerous other motion orientated books and articles. He summarises many of the original theorists while also creating a contemporary view. Contemporary authors and architects involved in the portable architecture topic and who create portable environments themselves include, but are not limited, to Rem Koolhaas and OMA and Archigram. Structures are usually connected with solidity however

designs like Ron Herrons "Walking City" start to show the way of the future and the direction portable systems are heading towards. (Jormakka, 2002, p. 17)

3.4 Conclusion

Transportable environments have been utilised for centuries so it is of no surprise that they are still designed and refined to suit the 21st Century. Robert Kronenberg is a prolific writer about this subject given the ever evolving nature of portable buildings. No longer do environments need to be stationary they have the opportunity to be small and personal. The variation of scale means that headphones can create this state of mind and well as the traditional approach to larger portable houses. Fuller also created these temporary structures and altered the way we now approach portable architecture.

The topic of Portability is endless and aspects of it could form a whole document, however, certain elements from this research will be investigated and utilised within the final design. With the potential possibilities portable structures offer it is vital that it forms an aspect of the design to enhance the character.

Chapter 4 *Case Studies – Kaipipi Shipyard, Stewart Island & Grytviken Whaling Station, South Georgia*

Chapter 4 is the first of two whaling settlement case studies built using Norwegian prefabricated buildings. Case study one is situated on Kaipipi Shipyard, Stewart Island. Case study two is the whaling station Grytviken which is situated at South Georgia. Chapter 4 starts by giving a brief history of New Zealand whaling. It then goes on to introduce Captain Carl Anton Larsen the Norwegian whaler who formed both villages discussed in the case studies. The chapter will discuss the history of Kaipipi Shipyard and then the current location and condition of the prefabricated buildings with the aim of informing potential design aesthetics and site choice. Formed by Carl Anton Larsen, Kaipipi never saw the brutal culling of whales rather the repair of whaling equipment and vessels. Chapter four discusses the buildings site context and their Norwegian origin. Grytviken is also discussed in a similar structure to the first case study with the intention of discovering successes and downfalls of the Norwegian prefabricated buildings that can be adapted to the design.

Figure 4.0 Thomas,Ryan. 1864-1927, "Fast; 16 miles an hour", July 8, 1895. Pencil drawing on sheet. Description: A spouting hump-backed whale pursued by men in a rowboat. Image courtesy of the National Library of NZ.

4.1 Captain Carl Anton Larsen

Carl Anton Larsen founder of the Norwegian Rosshavet Whaling Company was born on the 7th of August at Østre Halsen, Norway. Growing up in a strong seafaring minded family he ventured onto

the sea at the age of twenty-one and became captain of his own boat, a trading schooner. (Barr & Watt, 2005, pp. 281-282) Larsen first ventured to the Antarctic in 1892 to whale the Weddell Sea as Captain of the vessel 'Jason'. He returned to Sandefjord with no whale oil but an insight into the vast ice continent.

Larsen did, however, eventually make the sub-Antarctic region his home. In 1904 he set up home at Grytviken Whaling Station in South Georgia with his family. He was an astute business man as well as having a sound understanding of the whaling industry. It was around a decade later that the whale stocks and production started to deplete paralleling the increasing need for the unsaturated liquid.

In 1914 Larsen and his family returned to Norway with the intention of buying a farm and enjoying a quieter and slower paced life. Larsen, however, was obviously still lusting after the benefits associated with whaling and set about initiating a voyage to the opposite side of the Antarctic – the Ross Sea. The 1920s were an exciting time for Larsen, he sought unsaturated liquid that would be solidified into neutral fat through hydrogenation. The solid fat had potential to be exported as the raw ingredient for soap. For Captain Larsen this meant that whaling would be, once again, prosperous and it was worth exploring the Southern Ocean. (Gavalas, 2007, p. 110)

Figure 4.1 Captain Carl Anton Larsen. Image courtesy of the South Georgia Historical Turst, Image retrieved November 22, 2010, http://www.sght.org/images/articles/CALarsen.jpg

This voyage was the birth of the Kaipipi Shipyard and the creation of the strong Norwegian influence on Stewart Island. It was this exploration and killing of the whales in the Ross Sea that was also Larsen's final voyage. On the 8th December 1924, Larsen passed away in Antarctic waters after leaving Kaipipi. The crew decided to persevere minus their captain and his embalmed body was returned to family in Sandefjord once whaling had finished.

4.2 History of Whaling in New Zealand

New Zealand's whaling history is vast due to its proximity to whale populated waters. The history of whaling within New Zealand started on 15 December, 1804. (Grady, 1986, p. 58) Whaling was of high importance worldwide at this period with the bi products highly profitable and sought after. The sperm

whale was highly regarded as the oil created was odourless, a quality lubricant and had the potential to be used inside. (Heritage, 17 April 2008) By 1810, there were twelve whaling vessels located in the waters of New Zealand. Many vessels were of British descent but they were joined by American and French whalers towards the 1830s. During this period shore whaling was prolific allowing the whalers to base themselves on land. Akaroa and Otago harbours had prominent bay whaling stations. (Heritage, 17 April 2008)

Stewart Island was also home to a whaling base. A Norwegian whaling company utilized the sheltered bays and their proximity to the Ross Ice Shelf. This base was different to the others further north, as the Norwegians were hunting the whales in the Antarctic and using the site for repairs and stopovers. (Grady, 1986, p. 217) New Zealand's abundance of sperm whales was not to last and the early 1900s saw a decline in whaling due to a decrease in the numbers of whales and because whaling was no longer economically viable.

4.3 History of Kaipipi Shipyard, Stewart Island

New Zealand's "third island", Stewart Island or Rakiura – Land of Glowing Skies, is situated to the south of the South Island; a mere twenty minute flight or one hour boat ride away. (Hopkins, 2009, p. 39) Drawing its name from a Maori myth it means "The Anchor Stone of Maui's Canoe" referring to the legend of 'Maui' who caught and raised the North Island, the "great fish", from his canoe the South Island. ("History and naming of Stewart Island," 2010) Not only does Stewart Island have strong cultural links with Maori who settled there from the 13th Century, it was also the home of the Norwegian Rosshavet Whaling Company from the 1920's.

Known for its pristine scenery and wildlife it is slightly hard to imagine such a brutal function occurring on these shores. Tourism and fishing industries make up the main occupations on the island, and both have historic ties to the whaling industry. Kaipipi Shipyard was home to the Rosshavet Whaling Company. Situated in Paterson Inlet, it has superb natural qualities including shelter from wind and

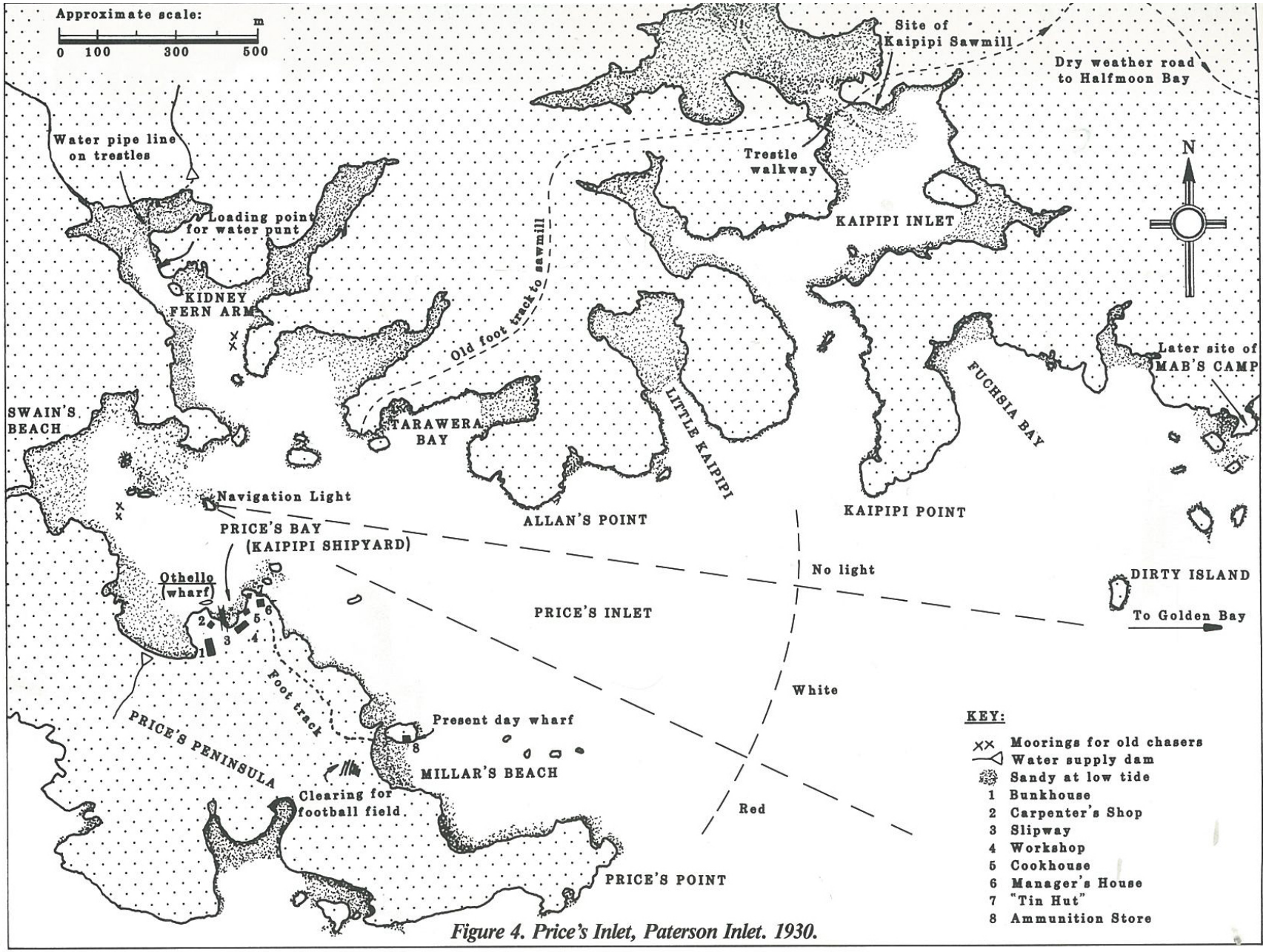


Figure 4. Price's Inlet, Paterson Inlet. 1930.

a ‘shelving’ beach that allows deep water access. (J. P. C. Watt, 1989, p. 17) Kaipipi Shipyard is also known as ‘the Base’ or ‘Prices’ is more commonly referred to as ‘The Whaling Base’.

Founded in 1923, the Kaipipi shipyard was a repair base for the Rosshavet Whaling Company while also forming a base for the whalers that operated in the Antarctic waters. Larsen had approached the British government on behalf of the Norwegian Rosshavet Company also known as “Hvalfangeraktienselskapet Rosshavet”, to obtain a license to fish the Ross Sea. The New Zealand government was also significantly involved as they along with the British saw the economic gains whaling attracted and the pride it evoked, so set about creating controls. The ‘Ross Dependency’ was created and governance over the area was established. The Rosshavet Company, headed by Larsen, was granted permission to whale under conditions that they be given a five year right to solely fish the area while surveying the numbers of whales. (Barr & Watt, 2005, p. 281)

The vessel that first graced these waters was the Sir James Clark Ross. It was a large whaling factory ship and was accompanied by five smaller chasers – (boats that aided in the capture of whales). Larsen was the Captain of the Sir James Clark Ross as well as the pioneer of the Kaipipi Shipyard. He recognized the need for a base to repair damaged vessels, a frequent occurrence given the size and strength of the mammals that were brutally culled. Paterson Inlet was chosen for its location and the base was set up. In its first voyage the large factory ship transported significant amounts of building material needed for setting up base. These included kitset/prefabricated buildings that would serve to house the men and establish a community. As well as carrying significant building supplies the Sir James Clark Ross also brought any necessary spare parts and materials needed should a breakage occur. Given the remoteness of Stewart Island and their trips further south to the Ross Sea, Larsen needed to be prepared for all eventualities. This migration of technology and materiality to such a remote area gives Kaipipi’s buildings a certain richness. As well as being equipped onboard with a blacksmith’s shop and a turning and fitting shop her crew also comprised specialist carpenters, mechanics, electricians and two divers who eventually built the concrete slipway at Kaipipi. Although the crew of 130 people were mainly Norwegians, there were also several other Eastern European men on board that added to the community at Price’s Inlet. Their interaction with the local Stewart Islanders was also reflected through

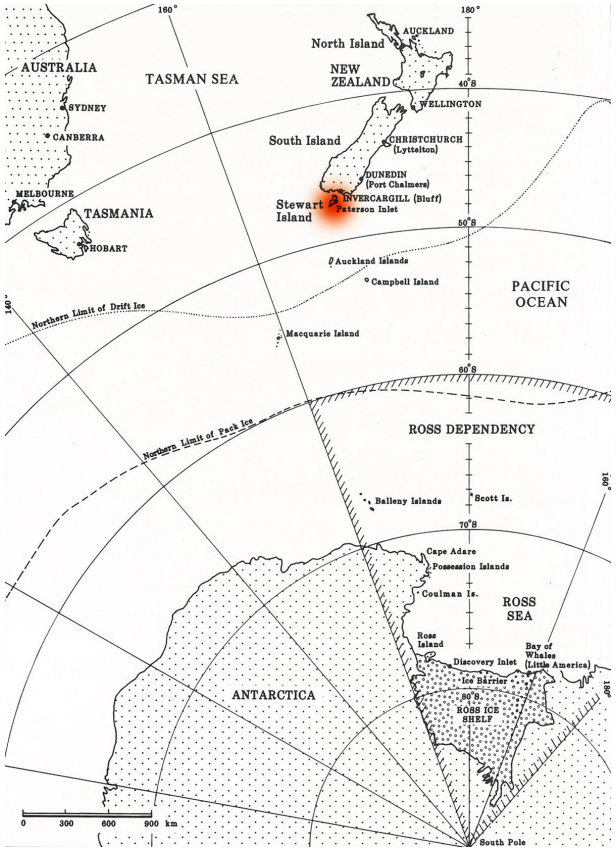


Figure 4.2 Pattersons Inlet Map, *Stewart Island’s Kaipipi Shipyard and the Ross Sea Whalers*, p.13, J.P.C Watt, 2000, Hawkes Bay

Figure 4.3 Map of Stewart Island & the proximity to the Ross Sea. Adapted from: *Stewart Island’s Kaipipi Shipyard and the Ross Sea Whalers*, J.P.C Watt, 2000, Hawkes Bay

the use of their skills in erecting the buildings and employing them on several trips to the Ross Sea as coal handlers. (Barr & Watt, 2005, p. 283)

Kaipipi was home to about 12 Norwegian men during the 'off' season – winter. Here they performed maintenance on the chasers and other equipment. They brought highly qualified craftsmen with them that not only demonstrated their skills on the buildings at base but also translated them to the Stewart Island locals. In 1924 one of the chasers, a designated 'store ship' arrived. It contained the materials of the prefabricated buildings as well as cables, wires, rope, steel etc. and an assortment of tools to create the Kaipipi community. Sunday was family day at Halfmoon Bay, Stewart Island and the Norwegians along with their families would travel there to join in. They formed friendships and bonds that are still remembered today.

Whaling was booming in the late 1920s and early 1930s and it was greed that lead to the demise of the Kaipipi shipyard. 1931 saw a worldwide glut in whale oil with the Norwegian Whaling companies including the Rosshavet Company agreeing to pass over the next season whilst also setting stricter guidelines and quotas for the following seasons.

Today, however, there are still visual clues showing activities as well as concrete pads that served as foundations for the prefabricated buildings. Although not at first illustrating the mentality of the inhabitants, the sites history and the deteriorating relics offer many clues as to the life that occurred. Not only did the Norwegians leave behind remnants of chasers, propellers, prefabricated buildings and their foundations they also married local Stewart Island girls leaving a lasting legacy on the small community. (Barr & Watt, 2005, p. 296)

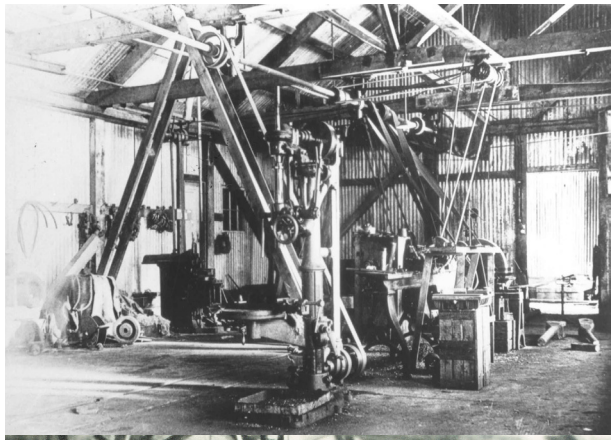
4.4 Portability of buildings – origin and location now.

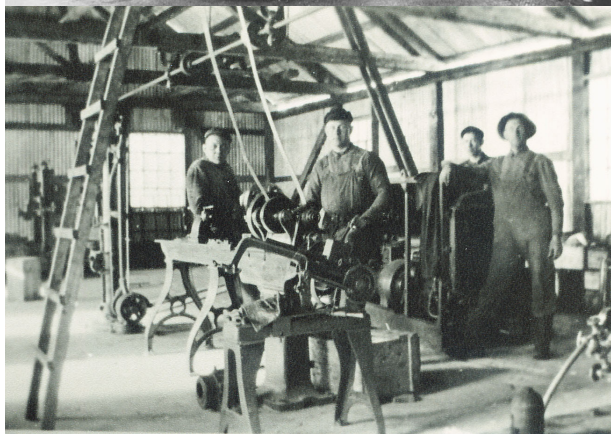
By 1925 there were significant numbers of buildings standing at Kaipipi Shipyard. They were brought over from Norway aboard the Rosshavet Whaling Companie's boats, the Ross and the Larsen. Prefabricated in Norway at Larsen's request the Baltic timber structures were ready to assemble and upon landing on site.

It took all 75 men that were available to help clear and ready the site for the buildings that would be arriving onsite. They had minimal tools and set to work clearing bush and scrub and levelling the dirt site. In November 1926 the boats arrived carrying the materials along with a prefabricated house that would soon become the manager's house. (J. P. C. Watt, 1989, p. 56) The site work and building can be accredited to Sigvil Johannesen, the site manager, and to Odvar Anderson the chief carpenter at Kaipipi. They erected the premade frames they received and a year later in November 1927 when the Ross returned significant improvement had taken place.

The prefabricated buildings that completed Kaipipi were the Workshop (including a machine shop, blacksmiths shop and a boiler house), the Managers House, the Bunkhouse and the Cookhouse. There was also the Askerud House which was erected at a later date and brought out to entice the Manager Askerud, to stay. Although none of these prefabricated structures still exist on their current location at Kaipipi they are all still standing and being utilised or inhabited. The only documentation that discusses their condition is from J.P.C Watt who in 1989 wrote a book about the Kaipipi Shipyard and detailed the buildings. *Stewart Island's Kaipipi Shipyard and the Ross Sea Whalers* names the buildings and discusses their use; however, there is no documentation of their current condition.

In 1924 the Cookhouse was situated on Bravo Island, as Larsen experimented with potential sites around Stewart Island to set up the Whalers Base. (Barr & Watt, 2005, pp. 302-303) However, it was soon discovered that the beach at Bravo was too shallow and that the large whaling boats would not fit. The Cookhouse was the oldest building at Kaipipi, though all that is left on the original site is the concrete foundations and old cogs and wheels. (J. P. C. Watt, 1989, p. 20) The foundations between Bravo and Kaipipi match perfectly with the old building now being utilised as a bach.





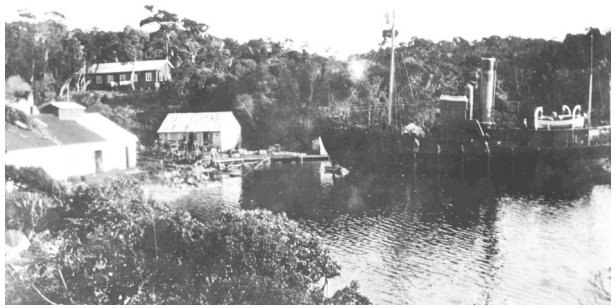


Figure 4.4 Flensers awaiting repair at Kaipipi Shipyard. Image courtesy of the Southland Museum and Art Gallery.

Figure 4.5 Boat sitting on the slipway by the workshop awaiting repair. Image courtesy of the Southland Museum and Art Gallery.

Figure 4.6 Steam belches from the workshop while a boat sits on the slipway. Image courtesy of the Rakiura Museum, Stewart Island.

Figure 4.7 Photograph showing machinery and tools inside the workshop Image courtesy of the Southland Museum and Art Gallery.

Figure 4.8 Workers pose for a photo inside the workshop. Image courtesy of the Southland Museum and Art Gallery.

Figure 4.9 Shipyard with the bunkhouse pictured in the background. Image courtesy of the Southland Museum and Art Gallery.

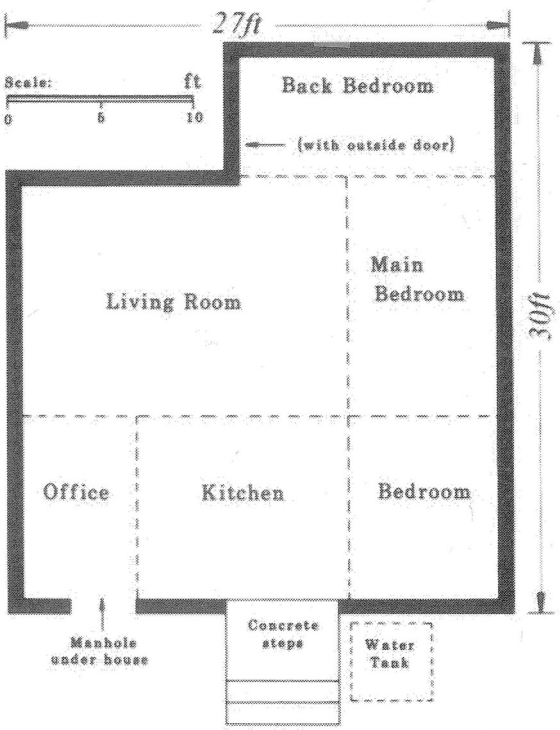


Figure 4.10 Floor Plan of the Managers House, Kaipipi Shipyard. *Stewart Island's Kaipipi Shipyard and the Ross Sea Whalers*, p.64, J.P.C Watt, 2000, Hawkes Bay

Figure 4.11 Entry into Kaipipi Shipyard Managers house. Now positioned in Oban Stewart Island. Image: Authors own.

Figure 4.12 Side view of the prefabricated Managers house showing the window details of the slot together nature of the structure. Image: Authors own.

Figure 4.13 Corner detail showing the new foundations the building sits on. Image: Authors own.

Figure 4.14 (Main Image) Front view of the Managers house. Although small alterations have taken place it is largely in tact. Image: Authors own.

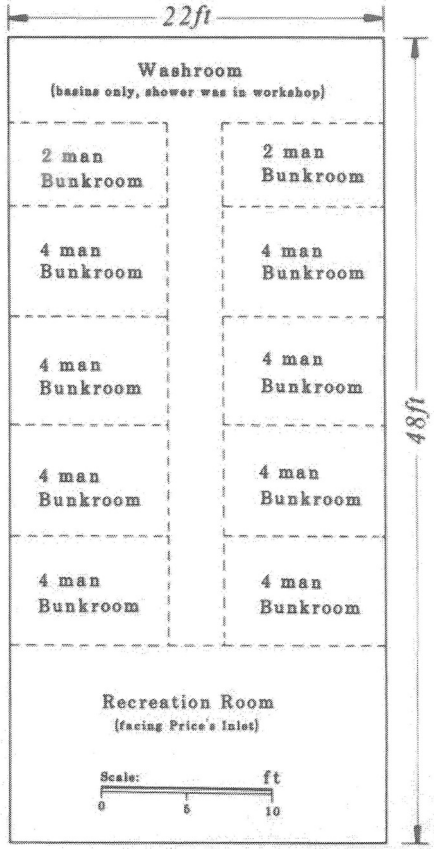


Figure 4.15 Floor Plan of the Bunkhouse, Kaipipi Shipyard. *Stewart Island's Kaipipi Shipyard and the Ross Sea Whalers*, p.70, J.P.C Watt, 2000, Hawkes Bay

Figure 4.16 (Main Image) Front view of the Bunkhouse, it is now the Sunday School. Image: Authors own.

Figure 4.17 Interior view of the workers bunkhouse at Kaipipi Shipyard. Now positioned on Oban, Stewart Island. Image: Authors own.

Figure 4.18 Rear view of the prefabricated bunkhouse. Similarities between the Managers house and the bunkhouse are visible. Image: Authors own.

Figure 4.19 Side view of the bunkhouse that shows the buildings sitting on its new foundations. Image: Authors own.

Figure 4.20 Workers building the managers house at Kaipipi Shipyard. Photo courtesy of: Rakiura Museum, Stewart Island.

A concrete slipway is the first relic that is seen when arriving at Kaipipi. Its sleepers protrude from the land down into the water and on a clear day it is possible to see well under the tide. This penetrating structure pierces through the site and is still relatively intact however the potential to haul boats up is now lost. The slipway was constructed over the summer of 1925-26 allowing Kaipipi shipyard to begin. (Barr & Watt, 2005, pp. 302-303) The slipway leads up to a winch house which is dug into the cliff. All that is left is a slab of concrete. Although it is no longer in use this structure, which still creates a memory on the site, is a hint of the industrial activity that once occurred.

The slipway also leads up to the ridgeline where the bunkhouse (men's quarters) were located. The foundations and piles of this building are also visible and although overgrown allow for an idea of how the building sat. (J. P. C. Watt, 1989, p. 17) The bunkhouse, now the Stewart Island Presbyterian Church's Sunday school, is currently for sale (2010). Walking around the exterior it is possible to see how the building would have connected to the foundations. Inside the building the structure is separated into two sections – the living quarters and the sleeping quarters. The sleeping area originally partitioned into smaller bunk rooms and the original framing and divides are still visible.

The main workshop is located on the prime position on the site roughly measuring 33x9 metres. During operation it contained "a machine shop, blacksmith's shop, plate room, engine room, and boiler room". (Barr & Watt, 2005, pp. 302-303) The remnants of the concrete foundations and floor pad are still visible. They remain mainly intact towards the rear with the front situated closer to the tidal effects of the beach. As well as the foundations, the remnants of the concrete supports for the boiler and other equipment are also seen to protrude from the slab. The cradle is said to have supported the boiler that is evident in the bay, partially submerged. (J. P. C. Watt, 1989, p. 18) Although the remnants merely hint at the nature of the site it allows for a good understanding of it's the original scale.

4.5 Site response

Larsen scoured Patterson Inlet for the most appropriate site for the whaling base and eventually decided upon Kaipipi. The original buildings were not designed for a site specific context, as their portable nature was quite responsive to their function and location. The prefabricated factory is from the similar if not more extreme and harsh climate of Norway. The buildings have caused no negative effects on their surroundings and have withstood the test of time in a coastal environment. The prefabricated buildings at Kaipipi are a testament to their designers and manufacturers.

Like Grytviken, Kaipipi's buildings also originated from Strømmen Travarefabrik Stream Travarefabrik the prefabrication factory in Norway. (Ervland, 2008) They all still stand and have had the ability to adapt and change into different uses without too much alteration. An interesting aspect to note is that some owners of the buildings have understood the origins of buildings and are trying to refurbish the structures to their original glory. The idea that these historical buildings have a story to tell even though they no longer stand on the same site starts to be reflected through their rejuvenation.

Figure 4.21 The concrete foundations of the workshop, the pad for the boiler is still visible in the centre. Image: Authors own.

Figure 4.22 Foundations left behind from the workshop are still mainly in-tact. Image: Authors own.

Figure 4.23 Workshop Floor Plan, *Stewart Island's Kaipipi Shipyard and the Ross Sea Whalers*, p.59, J.P.C Watt, 2000, Hawkes Bay.

Case Study Two – South Georgia, 'Grytviken' Whaling Station

4.6 History of South Georgia

A forgotten and often brutal historical story can be associated with South Georgia Island in the South Atlantic Ocean. The snow capped peaks and glaciers plunge into the sea. South Georgia is described as an "alpine mountain range rising straight out of the ocean." (Wheeler, 2004, p. 144) Although it is known for its vast and abundant collection of birds and wildlife it is the whaling that occurred on it for so many years that still haunts its nature. Captain Cook made the first landing on South Georgia Island in 1775 and claimed the Island for King George III. However, it was not until 1904 that Norwegian Captain Carl Anton Larsen established the first whaling station on South Georgia. This was the beginning of modern Antarctic whaling and the industrial whaling station 'Grytviken'. It also signaled the permanent inhabitation of South Georgia. (Davidson, 2009)

Grytviken, meaning 'Pot Cove', was named for the sealers' 'trypots' that are found there. (Wheeler, 2004, p. 149) The whalers' base is in a sheltered spot, the best on the Island. It is a bay formed within another bay. Larsen chose it for its flat land, fresh water and shelter, qualities that are often rare in such an isolated location. Larsen arrived in 1904, a poignant year for South Georgia's history, and after five weeks of construction a whaling base emerged. Whaling was successful during this time and the station was solely owned by the Norwegians. However, in 1961 Grytviken was leased to the Japanese for their

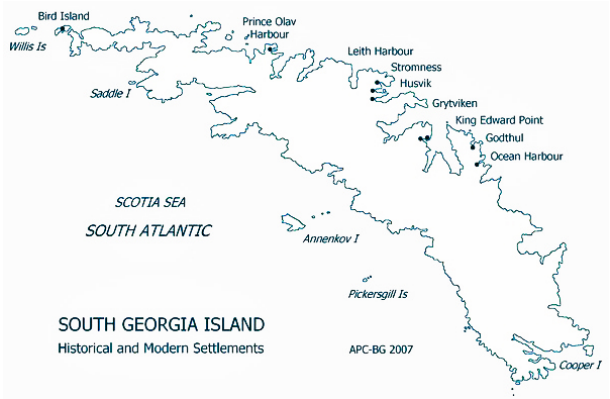


Figure 4.24 Map of South Georgia Island showing historical and modern settlements. Image created 2007, Image retrieved: May 13, 2010, http://mappery.com/South-Georgia-Island-Settlement-Map

whaling activity as the Norwegians admitted it was not reaping the economic benefits it had previously offered. Still the brutal and industrial nature of the Island lived on. On the 4th of December, 1964 the Japanese finally declared that the South Atlantic was over fished. (Wheeler, 2004, p. 149) Grytviken was victim of its own success. It was the first whaling station to operate in 1904 and was also one of the last to close in 1965 when the whales were fished out. (Carr, 1998, p. 40)

Whaling is more often than not associated with negative connotations, many of which are deserved given the brutal nature associated with the industry. The stigma and notion behind whaling has significantly changed in the last century as 'Whaling' as a career has been respected amongst Norwegians. In the early years at South Georgia the Norwegians cared only for the blubber of the whales and only kept this part. Several years later, however, experiments were conducted and the value of the remaining parts of the carcass was discovered. By extracting the oil produced through cooking the meat, bones and viscera it created by-products that could also be utilised. (Wheeler, 2004, p. 149)

Given the isolated nature of Grytviken and the nature of jobs the workers did, they lived a gruelling life. The 'official' whaling season was during the Southern Hemispheres warmer spring/summer months. The ice of the Antarctic was not as thick during this time and the workers undertook many jobs, often working strenuous twelve hour days. During peak whaling times at Grytviken up to 300 workers were at the base but only several stayed over the winter months to maintain the buildings and vessels. (Wheeler, 2004, p. 149) The large numbers of workers meant that many services were required on the isolated base during the height of the season.

4.7 Portability of Buildings – Origin, location, condition

Carl Anton Larsen brought the base and industrial buildings from Norway. These buildings were all prefabricated and erected in 1904. Some years later Larsen brought a second shipment of prefabricated buildings over including a church. Over 40 years ago Grytviken was at its peak industrial life. There were large chimneys "belching steam" and on the "plan" – wooden flensing platforms – lay giant whale

carcasses awaiting dissection. The whalers utilized "chains, steam winches, and blocks and tackles" on the platform to dissect the mammals before processing. After this process they moved onto the butchery which housed the "saws, cookers and centrifuges" (Carr, 1998, p. 40) There are a lot more whaling artifacts still left at the site than at Kaipipi.

Grytviken is also significantly larger than Kaipipi as it houses a whale processing plant. The processing buildings are off limits to visitors due to asbestos problems. (Carr, 1998, p. 40) Tony Wheeler in his guide book discusses how the old station currently sits within the landscape. The main building at the site was the processing station and he discusses in depth the historical use of the slipway and processes involved. In addition he discusses how they brought the whales up onto the jetty or 'flensing plan'. The whales were winched up the slipway by a "40-ton [*sic*] electric winch" which has since been removed from the site. (Wheeler, 2004, p. 150) The use of an electric winch shows how advanced the whaler's technology was for its time.

The next stage in the process was the flensers who with knives shaped like sickles tore strips of blubber off the whales. Wheeler describes these strips being like "skin from a banana" that were then attached to steam winches that are still visible at Grytviken. The oil extraction process was described as follows:

> The blubber went to the blubber cookery, the large building on the right of the plan, where it was minced and fed into huge pressure cookers. Each cooker held about 24 tons of blubber, which was cooked for approximately five hours to drive out the oil. The oil was piped to the separator house for purification by centrifuging. The separator house, and the generator house behind it, have been destroyed by fire but you can still see the separators in the ruins. Finally, the oil was pumped into tanks behind the station. If there was a good supply of whales, about 25 fin whales, each 18m long, could be processed in 24 hours. They would yield 1000 barrels (160 tons [*sic*]) of oil. (Wheeler, 2004, p. 150)

As oil was the main component the whalers were looking for it was this process that required the majority of buildings. The bones of the whales were cooked in another part of the station which were then turned into animal feed or fertilizer. Towards the end of Grytviken's life the meat from the whale

Figure 4.25 - *Figure 4.30* (Pages 36-37) Images of Grytviken, South Georgia showing the state of decay of several of the processing buildings. Like Kaipipi the site lies unoccupied. *Figure 4.30* shows the managers house which was prefabricated in Norway and brought to the site. Images retrieved May 13, 2010, http://www.galenfrysinger.com/grytviken.htm

was also treated with sulphuric acid which could be used in dried foods and soups. (Wheeler, 2004, p. 150)

As well as the prefabricated buildings originally brought to Grytviken, Larsen also decided to supply the station with a Church. The Norwegian prefabricated Church was built in 1913 and stands to the rear of the station and is the only structure that to this day retains its original function. Currently it also houses memorials to both Larsen and Ernest Shackleton, the latter having his funeral and burial at the church. Although it is still the original structure, the church has undergone significant repairs due to storm damage. In 1994 major restoration was carried out. (Wheeler, 2004, p. 150) Tim and Pauline Carr, who lived on South Georgia as the museum curators, tended to the church during their stay, saying they occasionally rang the bronze bells in the steeple or played the organ to the empty pews. (Carr, 1998, p. 40) As well as the church, the cinema that Larsen had erected at a similar time, lies close but this has succumbed to the extreme weather. (Carr, 1998, p. 49)

Although these buildings all still stand at the original site their condition leaves a lot to be desired. They lack accessibility now due to their state of disrepair and also the extreme weather conditions they are situated in. A regular maintenance routine is apparently in place for the removal of asbestos from the whaling buildings. As the years have progressed the station has deteriorated and the hazards to visitors and wildlife increased. Grytviken itself is mainly fenced off with the museum and church the only accessible buildings. Leaving these to decay would be disappointing as they form a huge part of whaling history that may be lost forever. Reports state that the asbestos issue was to be fully resolved around 2004-2005 but there is currently no writing to support this. (Wheeler, 2004, p. 152)

Figure 4.31 Images of the church at Grytviken, South Georgia in the summer months. Image retrieved May 13, 2010, http://www.galenfrysinger.com/grytviken.htm

Figure 4.32 Image shows the church in the long winter months which like many of the buildings situated at Grytviken was prefabricated in Norway and asembled on site. *Antarctic Oasis Under the Spell of South Georgia*, p.49, Tim and Pauline Carr, 1998, Norton & Company, New York.

Figure 4.33 Interior photo of the church at Grytviken, South Georgia Image retrieved May 13, 2010, http://www.galenfrysinger.com/grytviken.htm

4.8 Site Context

Located in such a remote location it is not surprising that South Georgia is barely known of and not a regular tourist spot. Many parts of the island are completely inaccessible in the winter due to pack ice. Extreme weather conditions have caused significant damage to parts of the site and buildings. The prefabricated buildings still stand strong at the site and are a design feat given these conditions. Built from Baltic pine they exist in a region that is as cold, if not colder, than Norway. The Church is perhaps the most memorable of these as it is also the most similar in design to the buildings at Kaipipi shipyard.

Of the whaling stations on South Georgia Grytviken was the first to start operating in 1904 and also the last to shut down in 1965. They left everything intact and in working order so that when the whales returned they could restart the process immediately. (Carr, 1998, p. 40) Given its remoteness the buildings do extremely well to be still standing.

The prefabricated buildings were built in Strømmen Travarefabrik Stream Travarefabrik a prefabricated buildings firm in Norway (Ervland, 2008) Known as "Trevar'n" by the locals it was a large mill set up to produce prefabricated houses that would be exported around the world. The houses were constructed within the factory and then the components numbered before being dismantled and packed off to their destination. The factory was built in 1884 by Christehn A. Segelcke and Gabriel Kielland Hauge who saw a niche market in prefabricated buildings being sent offshore. As well as supplying prefabricated houses and structures to both Kaipipi, Stewart Island and to South Georgia they also supplied countries like Africa, South America and several other European countries. Their most famous building is the church at Grytviken. (Ervland, 2008)

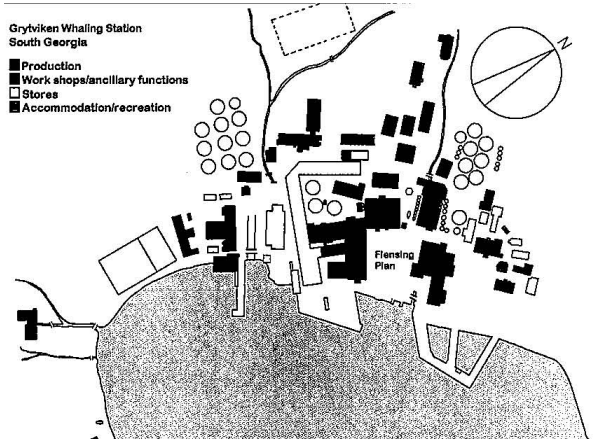


Figure 4.34 Site plan of Grytviken, South Georgia showing the 4 different types of uses - production, workshops, stores and acoomodation. Image retrieved May 13, 2010, http://www.galenfrysinger.com/grytviken.htm

4.9 Conclusion

The parallels between the case studies can be seen quite vividly. Not only were they both commissioned by Captain Larsen their positioning in the Southern Hemisphere is also similar. Both have withstood time and climatic conditions to still stand today. Given the buildings were built with the intention of portability and movement the Kaipipi buildings showcase this with the structures being moved since their placement by Larsen. The nature of their construction allows for easy assembly, therefore, the potential lies for them to be moved again if desired. Although the structures at South Georgia are starting to deteriorate it is testament to their creators and craftsmen that they have lasted more than a century.

The research into the case studies has provided options and potential ideas and building techniques that will lead into the design segment. The placement of the buildings at Kaipipi and Grytviken will allow for site context to be developed and also the nature of the architecture to be designed around these historical cues. The design stage has the potential to have a strong Norwegian influence given the success of the prefabricated case study settlements.

Chapter 5 *Design*

This chapter aims to define the design brief and explain the outcome of it while also exploring the processes involved in resolving the design. It starts with the process that was initially followed and then moves onto the design explorations – in relation to the site and theories of portability,movement and Norwegian design. This chapter aims to discuss the design in both a personal sense and reflect on the theories discussed. It then defines the design idea and discusses the nature of the form. The final summary discusses the relationship of the design to the research and thesis question. With the intention to see relationships and parallels formed between the research and the final design outcome.

5.1 Exploration of Design Functions

This stage of the design process is about exploring potential functions that could be situated on the Kaipipi Shipyard site. Elements were found during this stage that worked successfully and also started to understand how the site would respond to the proposed building. This process discusses and analyses numerous options.

Initially this exploration was approached by rationalizing the design as a transient space (buildings and environments that house transient people). The function needed to be brutal like the case studies and

ideas behind the writings researched. At an early stage the project leant itself to a correction facility, slaughter house, small scale prison or crematorium. These functions could either move to the points of need or house transient people. At this early stage the functions were not site-specific and this needed evolving. After analysing these potential ideas in the midyear review the programme became a crematorium situated on Stewart Island. At this stage the exact location of the crematorium was undetermined and questions started to arise specifically to how this function related to the site and to the research question.

The Crematorium was justified by identifying the brutal function as a parallel to the Case Studies. The Norwegian Whalers uprooted their lives and went on a voyage to the Antarctic in the search for whales. Their journey had a point of departure, a point of arrival and also a point of memory (which formed the starting point). Their departure from Sandefjord, Norway to South Georgia and Stewart Island had a point of departure and arrival and then memory in between. Although Crematoriums usually evoke religion and nature, the site offered a stronger relationship to memory and function than just spirituality.

This function also brought into the question of location. Why Stewart Island? Currently the Island lacks a space that caters for death. Any death that occurs involves moving the body to Invercargill for embalming or cremation. The problem was that the current population on Stewart Island (400 people) is very small and a building that caters for the deaths of such a small population is hard to justify. The site itself is tranquil and serene and offers possibilities for creating positive memories and rituals. It offers inhabitants a new sense of memory and a space that can start to draw links with departure. Although not for large numbers of visitors, the site becomes a final destination for some people like the fishermen lost at sea. The serene setting and history leads itself to creating new memories and creating new rituals.

It was this potential programme that started the line of thinking towards the site and prefabricated buildings. Together they had the potential to create a contemporary architectural approach to the site and to honour the past.

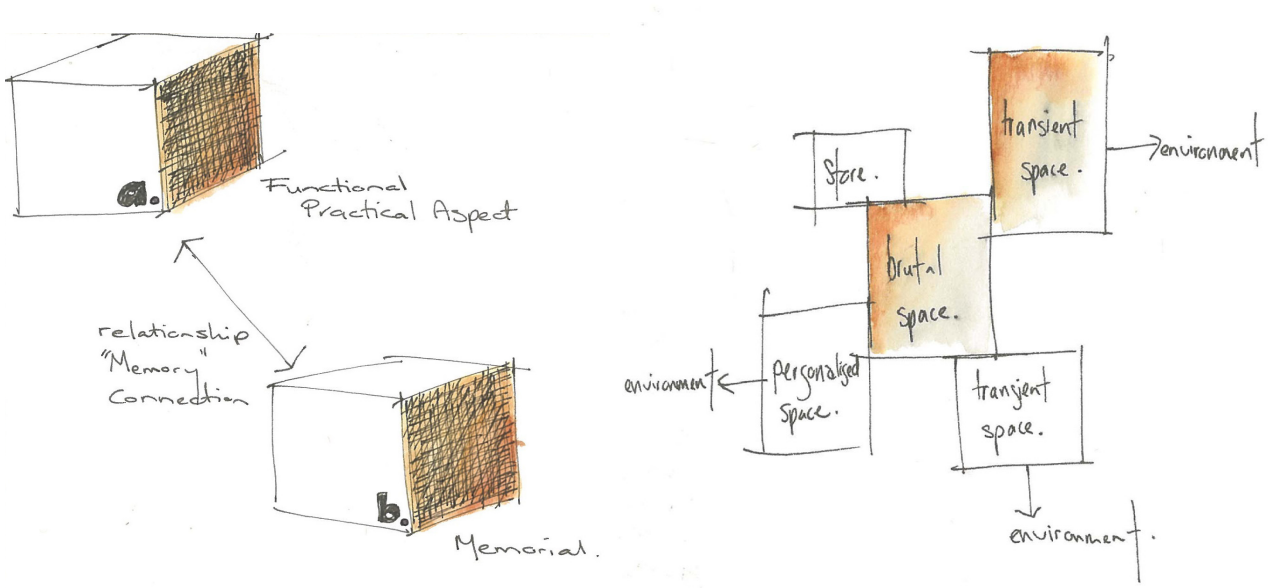


Figure 5.0 Sketches showing initial design exploration of the relationship between the building and the site and the spaces that are required. Sketches from authors sketch book.

5.2 Marquette's + Exploration

The following sections titled 'Memory Marquette's' are explorations into memory and possible design pathways. This study formed the initial understanding of the programme and allowed for potential directions to be explored. Each of the following series endeavors to explore either a new medium or a different process. The series have all been documented in the hope they will aide in defining specific spaces or aspects for the final design. Discussions about this series are below with a full detailed step by step analysis located in the appendix. Although not utilised as form drivers the Marquette's allowed exploration into the level of connection to the memory required.

Series 01 – Memory created through imprint.

Memory through imprint is the transfer from one physical form to another by analysing the imprint left behind. Therefore evoking memory and triggering haptic moments. The Marquette's produced for this series start to explore the idea of transfer of memory and indentation. This series deals with the physical transfer of memory onto a two dimensional flat surface; paper and cardboard. The way these surfaces translate the idea of memory from one to another will interpret 'memory' in a simple manner. Memory is defined as creating "a special relationship with space, holding on to the essence of it, the best and the worst, letting the rest of the details fade into gray." (Bastéa, 2004, p. 1) It is therefore this relationship that is privileged to the individual.

Memory through imprint focuses on the idea of wear and tear. It questions whether over time will a piece of paper to remember its original form, or is the memory destroyed. Therefore all that is left behind is the memory of its original structural composition. The question raised from this series therefore relates to individual perspective on memory, and the relationship that is visible between the original piece of paper and the new object.

Figure 5.1 Images of series 01. Layers of card peeled back to reveal the imprint. Simple transfer of memory through acetone. Crumpling of paper to understand its new form. Photo by author.

Series 02 – Memory created through process.

Memory through process endeavors to take series 01 and explore the three dimensional aspects. Through the process of change, series 02 takes the ideas associated with memory and develops them to form six definitive stages. Memory evolves and develops over time; consequently it will be informing an aspect or process of the design. It is this 'fading' moment that was analysed through this study. The translation process of memory is the distinctive node that could form a possible design or portion of design. Each stage should have its own connotations to memory and the distinctive change should be immediately visible. Memory through process endeavors to focus on theses stages and implementation. Series 02 works through a linear process utilising two mediums, image (photo) – a still photo that will be the starting point and test the preservation – and wax, exploring the fragmentation.

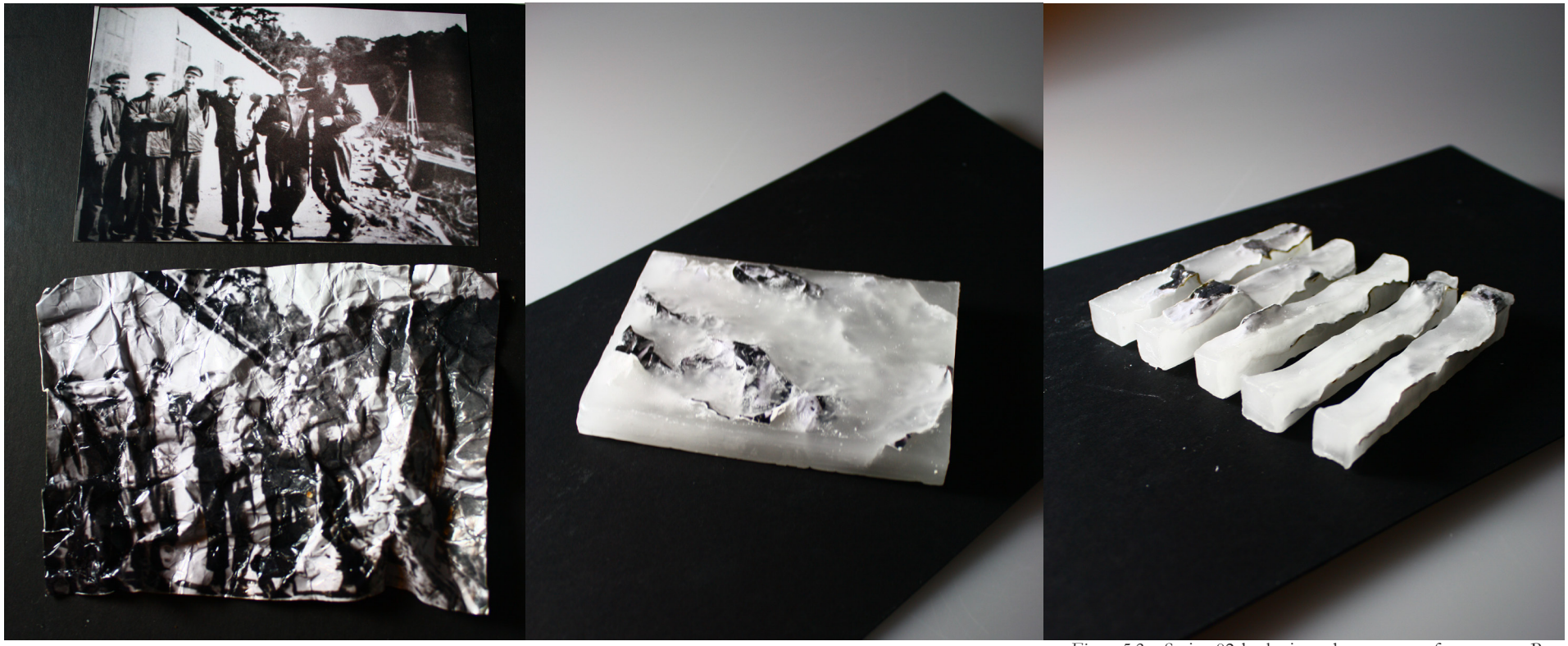


Figure 5.2 Series 02 looks into the process of memory. Base memory is the photograph. Setting the memory within wax explores the new form. Sectioning the new memory to create fragments of the original. Photo by author.

Series 03 – Memory created through attachment and removal.

Series 03 focuses on memory through the removal and attachment of elements. Through a process of casting plaster, memory can be shown to either be added or removed. This process shows that memories change and develop over time therefore allowing past memories to be privileged. Series 03 demonstrates that over time a preconception surrounding memory can be lost through removal of a part of the physical space or by added to the original. Series 03 explores a fundamental idea related to memory. Memories are created and stored, consisting from a past events or place visited but also from every day experiences. Returning to these places the original memory often changes therefore allowing adjusting the base memory. Through the process of removal and attachment series 03 focuses on the idea of time frames. There will be three simple Marquette's completing this series. The base Marquette forms the control. An attachment to the original forms the second Marquette with the final displaying the removal of a portion. Although this series is not form driving it sets a standard allowing for fundamental ideas to be explored.

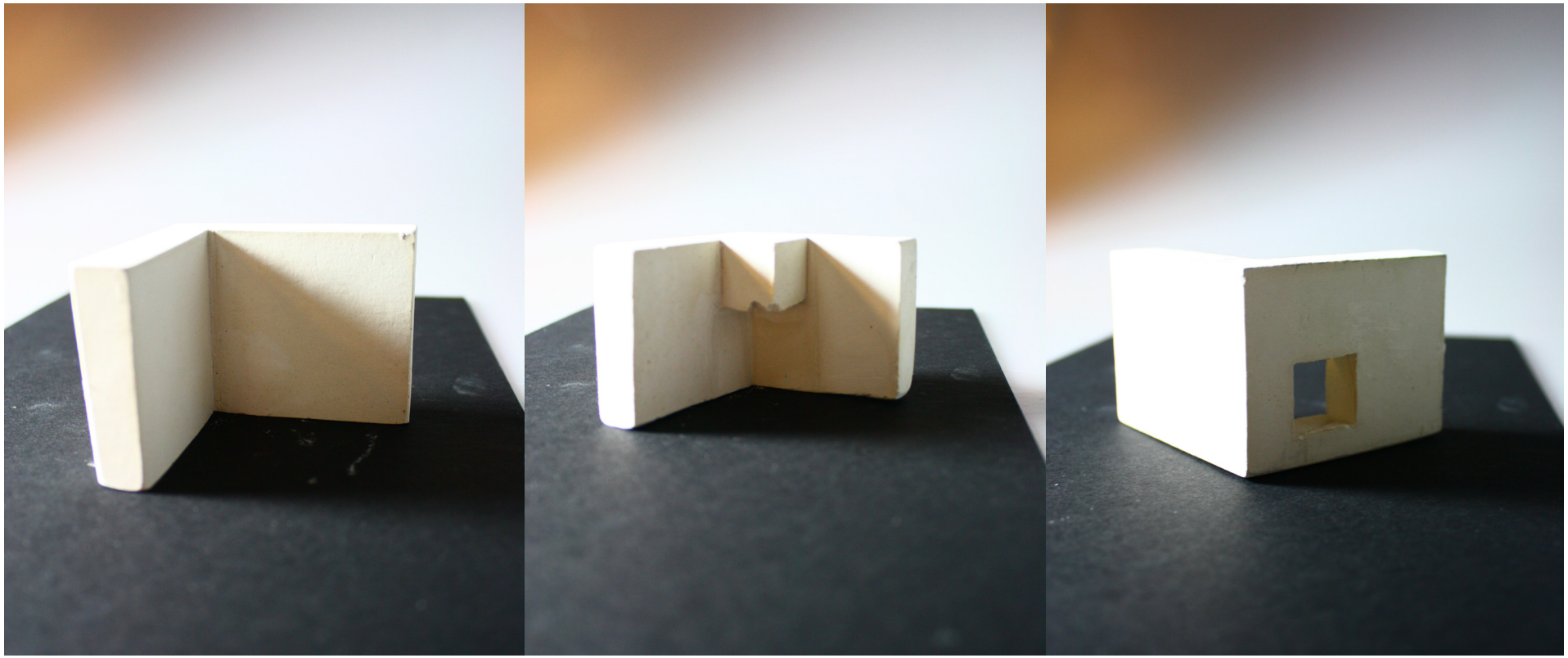


Figure 5.3 Series 03 is an exploration into basic adding and removing of memories. Photo by author.

Series 04 – Memory created through shadow.

Memory through shadow takes a form and through three different light intensities explores the notions and ideas behind shadow. A black cardboard form was derived to accommodate these shadows and start to explore memory. By utilising a simple form it does not detract from the shadows. Series 04 has the potential to form an aspect or a whole spatial experience. Like series 03, this series creates a base result and starts to discover the ideas surrounding memory and shadow. This series is created through a simple cardboard form. The first sequence deals with a single point of illumination. The second with two forms of lighting and the third looks into diffused lighting. All sequences are treated slightly different in technique, however, they utilise the same cardboard form to derive the shadows. Series 04 forms an aspect of design with the potential to be accommodated. They have the possibility to enhance a new memory within the space. Light as a principle has the potential to show spatial principles and evoke a new memory or trigger an old memory.

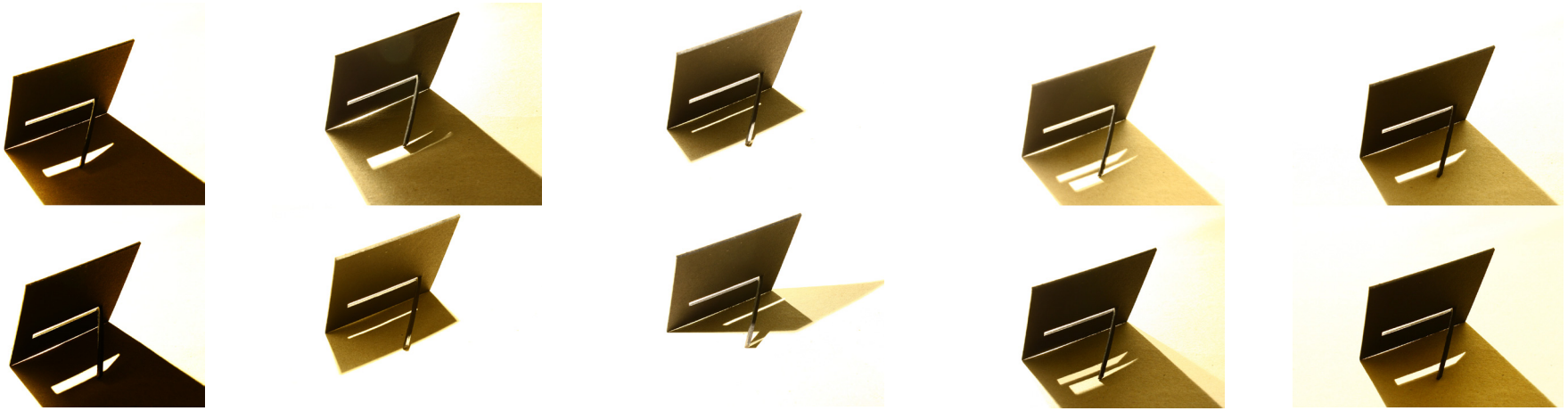


Figure 5.4 These images show Series 04. They show the exploration and development of memory through shadow. There are 3 types of shadow, from a single source, second source and also diffused lighting. Photo by author.

Figure 5.5 View along the beach at Kaipipi looking north showing the old slipway in the foreground. Photo by author.

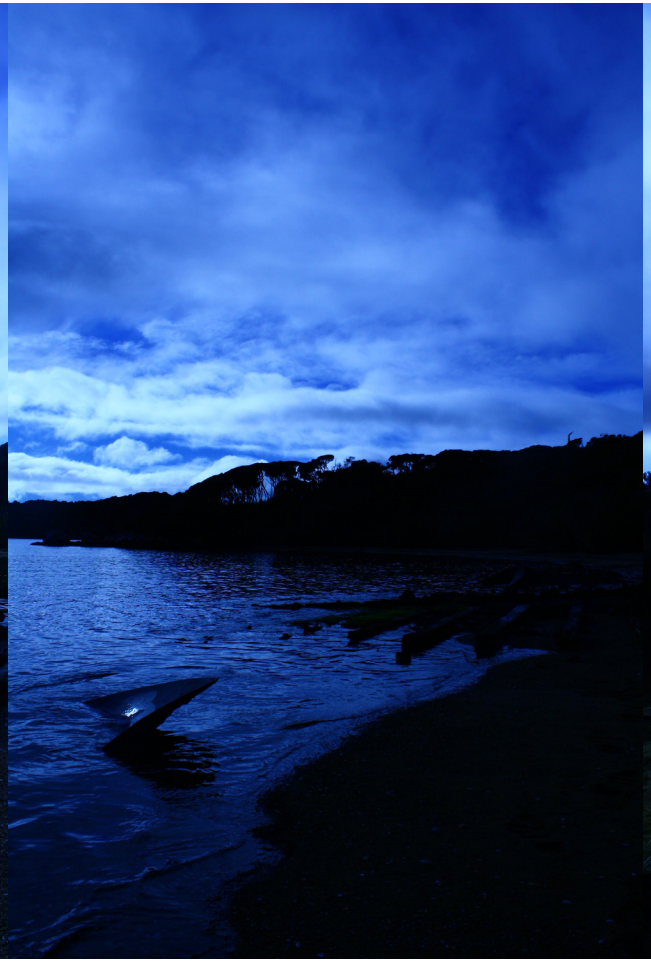


Figure 5.6 Looking north to the point where the managers house once sat. Photo by author.

Figure 5.7 View from the workshop foundations looking out to Prices bay. Photo by author.

5.3 Site Visit and Analysis

Initial studies into the location for the design and function suggested the site at Kaipipi shipyard, Stewart Island, offered a rich diversity and components that enhanced the feeling of memory that was trying to be portrayed. Its context in terms of the case studies was considered as well as the lack of physical interaction currently occurring with the site.

One reason for choosing to utilize Kaipipi to house the design programme was the contrast to the whaling station buildings at Grytviken, South Georgia. The buildings there remain in the same place they were erected with many remaining on their original footings. Grytviken boasts significantly more visitor numbers than Kaipipi Shipyard. Given the buildings at Kaipipi are not located on their original positions and the site is starting to deteriorate it is fitting that this site becomes the framework for the new design and a study point for memory.

Kaipipi Shipyard is a ten minute boat ride by water taxi from the main settlement of Oban. It was important to explore Kaipipi Shipyard where the old foundations and ruins stand and also to visit the prefabricated buildings that are scattered around the island. Arriving at the site it was vital to work through the maps that previous visitors had drawn of the layout to try gain a personal reading of the site. Being dropped off at the southern end of the beach allows the visitor to gain a panoramic view of the site and understand its scale. Halfway along the beach lies the slipway that appears to penetrate the site and divide it in half and extends down into the water.

This visit was about enhancing the knowledge of the site and about gaining a firsthand impression of how it looks not only now but also starting to understand the historical features. Upon arrival at the site and the initial discovery of artifacts the most striking aspect was the disregarded nature of the site and the overgrown bush. A small Department of Conservation plaque is situated at the site and gives a rough guide to the previous building's layout. It gives the visitor a starting point to stumble their way through the site if they wish to try and find the old foundations. It emphasizes the lack of attention paid to the site and the dwindling visitor numbers. A vague sign of human interaction was the freshly cut grass from within the foundations of the main workshop.

Figure 5.8 Foundations of the workshop at Kaipipi Shipyard. Showing some of the foundations starting to crumble. Photo by author.

Figure 5.9 Looking out from the workshop. Old fireplace structure is visible in this image. Photo by author.

Figure 5.10 Looking back into the site. On the left hand side is the conrete support for the boiler. Photo by author.

Figure 5.11 An old winch wheel that is still visible on the site. Photo by author.

Figure 5.12 Flencer propellers lie on the beach untouched since the whalers departed. Photo by author.

Figure 5.13 Throughout the site lay old machines and components from the whaling days. Photo by author.

Figure 5.14 Panorama looking north at Kaipipi Shipyard. Visible are the propellors as well as an old boiler pictured submerged in the water on the far left of the image. Photo by author.

5.4 Programme

Brief

This chapter introduces the aspects of the architectural programme that are a response to the previous chapters with the aim of answering the thesis question: Is it possible to personalise a nomadic space through materiality? Although the programme attempts to define certain aspects, it does not restrict the outcome, it only offers guidelines.

To achieve this, the programme and function is a Memorial to the Norwegian Whalers; providing a narrative between the past and present. The 1920s saw the arrival of the Norwegians to Kaipipi Shipyard, Stewart Island where they set up base for the whaling seasons. The programme acknowledges the need to respect the fact that they uprooted their lives, went on a journey to the Antarctic and arrived on Stewart Island with nothing except hopes and dreams to set up for a new life. Their journey had a point of departure, a point of arrival and a point of memory (starting point).

Given this information and the remnants that are still situated on the site, they form a point of memorial, an aspect of memory that I have chosen to explore through self-contained units. The connection detail to the ground is the main aspect. The memorial will be evident in the connection between the new building and the foundation remnants. This connection will, therefore, become the memorial in brief and the extent of the memorial will be evident in how the detail is privileged. The connection detail will reflect the Norwegian Detail research and the relationship between the old foundations and new architecture becomes the memorial.

Site Location

Unlike the whaling station buildings at Grytviken, South Georgia, the buildings at Kaipipi shipyard have been removed and relocated from their original footings. The remaining foundations on site do, however, show evidence of the once booming industry. Although the buildings are not located at their original positions they can still be seen in several different locations around Stewart Island.

The foundations and shipyard are well documented and remembered by the locals; they all know someone who worked there or are the descendants of the Norwegians whalers themselves. With the cemetery holding large numbers of the descendants and the Norwegian buildings spread amongst the township, it seems peculiar that there are no significant references made to the history. Stewart Island contains many hints about the nature of the site such as the buildings now located on its foreshore, to a propeller set into concrete in front of the museum and the graves of young Norwegian men drowned by their ambitions. The site itself is tranquil and serene and its location offers a perfect setting for the new function.

The main building at Kaipipi was the workshop. It takes the primary spot on the beachfront. To the left of it sits the carpenter's shop the 15x33m foundations are quite large allowing the design potential to use the whole space. Given its prime position on the site, this suits the primary function of reflection. The central nature of the old workshop foundations makes it an obvious site selection and the historical cues suggest it was also the busiest point within the site.

The carpenter's shop located on the right of the site is a place that has the potential to form the secondary memorial. Like the workshop it also boasts significant foundation remains however, the secondary site is not in direct connection with the waterfront; it is set back about thirty meters but does offer new points of view. Both building sites are separated by the central slipway. This offers the programme the possibility to explore this harsh dividing intersection and unique connections between sites.

Programme

Situating the memorial on one or both sites starts evoking the research question; can you personalise a transient space through materiality? The combination of the existing site and proposed architecture offer the inhabitants an experience, literally based on the past in which they can start to draw links with the departure process again. Although the site is large, the memorial will accommodate small numbers

of people allowing for a personal or intimate experience. The memorial inhabits the space with the aim of not disrupting the site significantly. The historical site allows for a subtle relationship to be shown between the two functions. The old foundations at Kaipipi shipyard will be retained to show the memorial and "memory" through the new attachment. The connection should be light but appear rigid in order to allow the memory to be conveyed, presenting a difference in materiality between the decaying old foundations and the new architecture.

The connection between the accommodation units and the Kaipipi shipyard is through the Norwegians. The Norwegians were trying to find a new place in life; looking for somewhere better to prosper. The Norwegians, like the visitors to the units, were taking a break and discovering their surrounds while also gaining a personal understanding. The location and layout all lend themselves towards a tranquil and personal setting.

It is obvious that a narrative between the Norwegian Whaler's past and the personal exploration of memorial - the self- contained units - needs to be established. The initial connection occurs at the arrival on site. The first time one sees the living quarters from offshore, it creates a narrative making the viewer pause and have a similar experience. This pause and moment of reflection allows one to ponder new life and to reflect upon the past. This can be achieved through the architecture. The pause that occurs as the boat moved into the bay – like the first time the Norwegians looked at their new home - can be reflected by forcing the trampers to stop and take in the building, site and detail. Another idea is to control the movement through the site with the intent of not being destructive to the bush and being more about fixing and repairing. The Norwegians were fixing their boats on the site so this could be explored through the rejuvenation of a building on the site. There is also the splitting of the site by the slipway that emerges from the water and divides the site in two. This can parallel the site's brutal and functional needs and has the potential to form a moment of pause. At this stage another key idea was to create an internal focus. Similar to a boat layout, the focus will be into the interior of the building allowing appreciation of the past. A further exploration of ideas occurs through the connection from the old to the new. Typically the detailed connection from the old foundations to the new building and the expression of this will be shown in the interior.

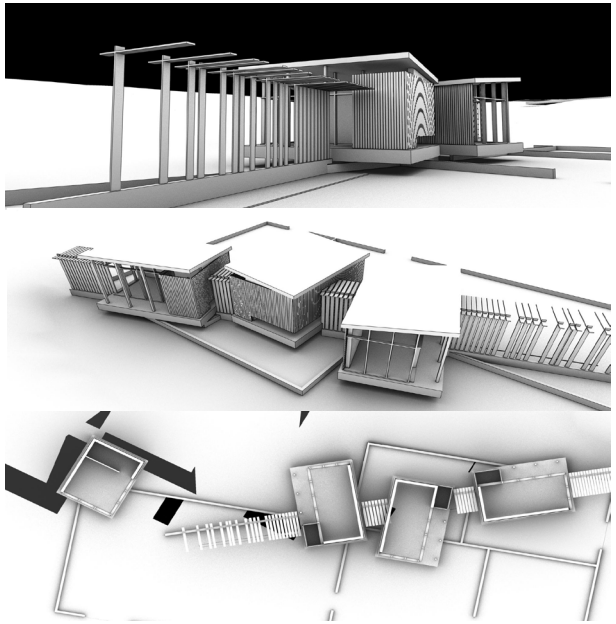


Figure 5.15 Concept designs of the self contained retreat. Working out massing and possible orientation on the site. Exploring the idea of the central core that penetrates through the middle. Image by author.

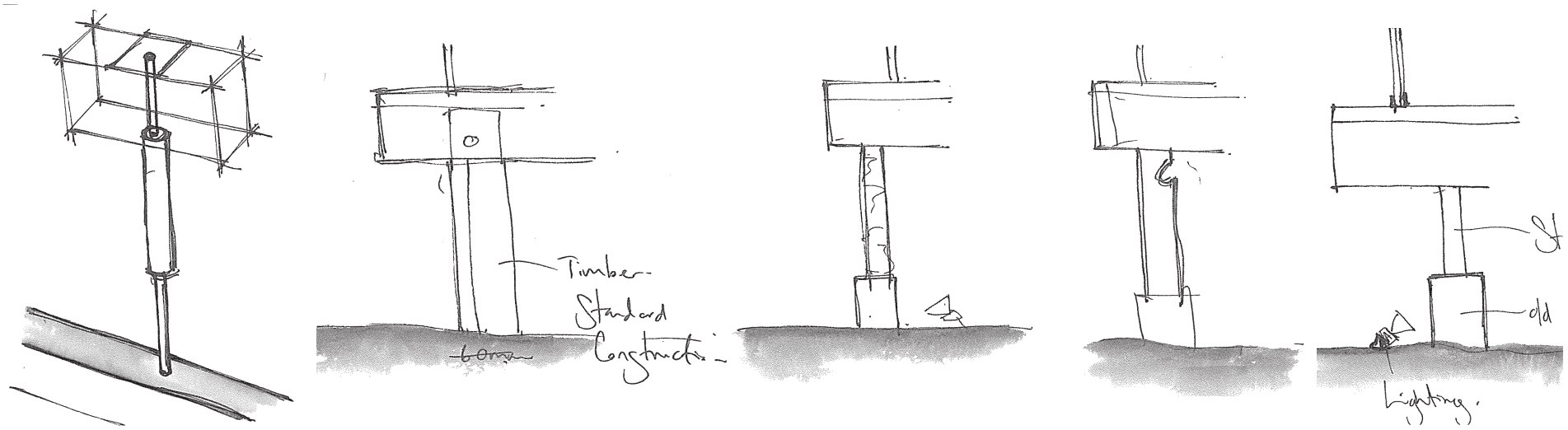
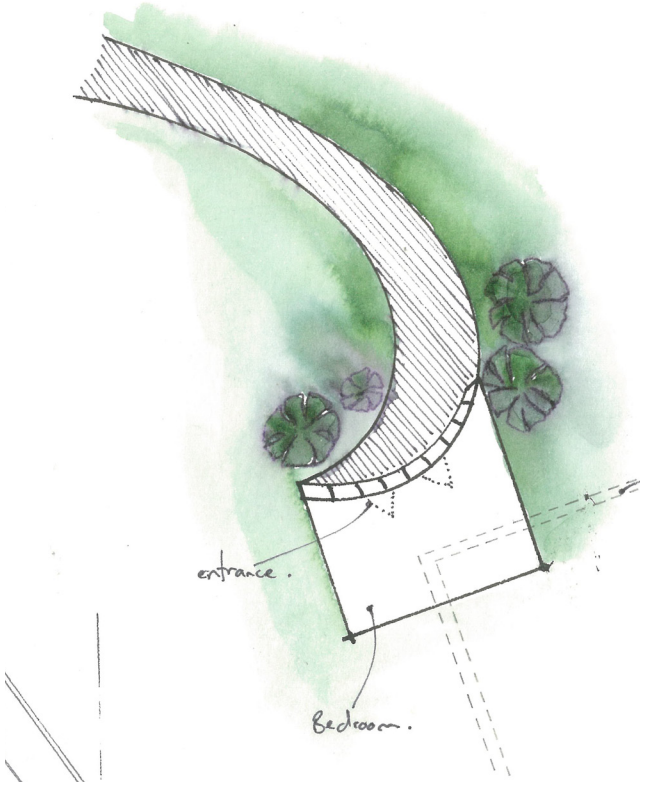
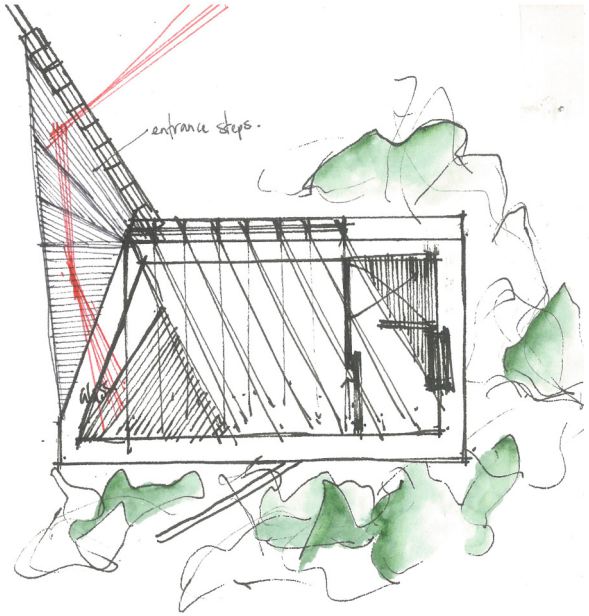


Figure 5.16 Sketches showing potential ideas for the connection detail. Slender structures were explored first but lacked structural integrity. The idea of standard timber construction for the connections to the ground was decided upon as well as thinking about ideas of imprinting maps on the steel.





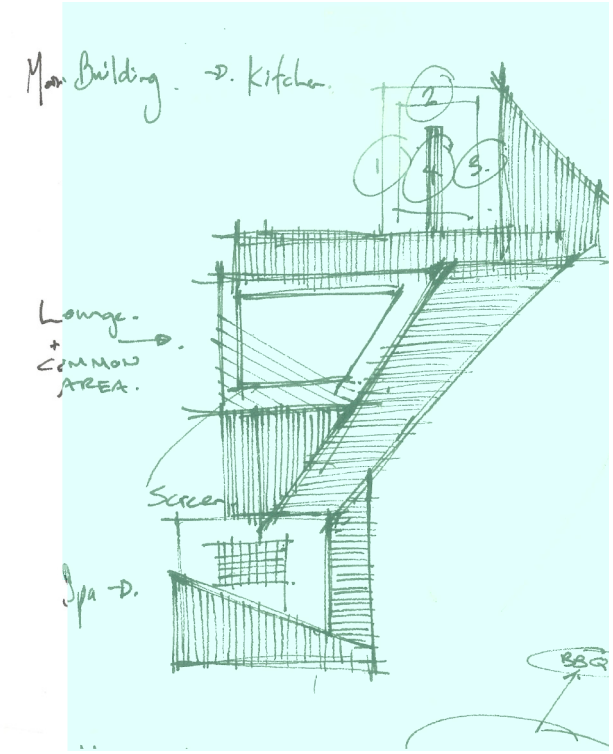


Figure 5.17 Sketch of potential walkways to the sleeping components. This idea was then refined as it apperared to be forcing an idea onto the site. Image by author.

Figure 5.18 Another sketch starting to understand the scale and floor plan of the building and the decking outside. Image by author.

Figure 5.19 Possible layout of the kitchen structures and their connection decks. Image by author.

5.5 Design Response

The design function is a series of accomodation units that also translate into a memorial. It will be a memorial to the remembrance of the Norwegian whalers. To keep it from becoming a "museum" the historic focus will be shifted to the detail of the connection of the old foundations and the new building. For the Stewart Island locals it would become not only a place to remember, but, also a place for the Norwegian relatives to come and feel close to loved ones.

Given its small scale the details and connections become important. They provide the link back to the thesis question: can a transient space be personalised through materiality? By having temporary accommodation units it creates a new type of memory and connection to the site. The memorial needs to be practical and functional, but, also delicate and portable. It does not need to be a religious memorial as this symbolism can be catered for through the memory. Religion would distract from the experience. The connection between the new installation and the original historical remains becomes the most privileged aspect of the design. This is achieved through the connection between the new building and the foundations. It is a small delicate connection dealing with memory.

There are five places on the old site where the original buildings stood and the foundations remain. The main structure, as mentioned earlier, is the workshop. The Carpenter's shop is next to this. Next is the remains of the cook shop up on the hill which is slightly more deteriorated than the others and then the old manager's house foundations. On the opposite hillside sit the old foundations of the bunkhouse which will form the base for several new accommodation units.

The new architecture will be situated in clusters around the site. The self-contained units are for short term stay and offer bedroom units, kitchen units and laundry units. The proposed retreat offers accommodation for small numbers thus keeping it a peaceful destination. Visitors have the option to occupy the space in a number of ways as the architectural response does not disrupt the site significantly. The units are positioned on top of the old foundation remains – those that are the most intact. As many of the foundations are crumbling it is vital that the new structures work in a way that enhances and protects them in their current form. There are nine bedroom units that cover the majority of the

foundations and these will help them stop deteriorating further beyond repair.

The new structures all face back into the site creating an internal reflection. During the day occupants will be out exploring the island. Memory reflection of this experience occurs inside the rooms. This internal reflection allows the visitor to relate back to the whalers and form their own understanding of the history that occurred at Kaipipi. The bedroom units are 6x4m allowing them to be easily maneuvered by helicopter onto the site further protecting the existing foundations. The base structure consists of modest sized glulam beams around the perimeter supporting an LVL flooring system. Insulation is placed underneath with a clean well detailed finish to conceal the synthetic finish. The upper components are easily fitted into this structure and, they too, are simple. The simple design of the buildings complements the site and allows for the option of future movement to other sites that use similar foundations.

The short stay unit's main materials are sourced from local suppliers and include imported cedar timber. Importing the cedar parallels the Norwegian case study research by bringing overseas materials onto the site which will weather into the surroundings. This timber works in with the landscape and also reflects on the 'Norwegian detail' that was achieved by the whaler's buildings as described earlier. The upper wall components are made from double glazed windows and doors that reflect back into the site. An upper clerestory around the top allows light and sunlight to be captured. Wrapped around this inner skin of glass and ply are vertical cedar strips that give the building a sense of belonging and reflection of the 'Norwegian detail'. This paneling allows light into the space while also allowing for the architecture to merge into the landscape in which it is nestled.

The connection detail from the new structure to the new footings is a standard timber connection associated with common building techniques but the connection from the new structure to the old foundations is through a slender stainless steel column. The slender nature of the column is different to normal construction and subtly allows the inquisitive visitor to engage with the site. Initially the column was a square connection; having inserts and old maps etched onto the steel allowing the visitor to see some of the history. However, this form was decided against as the site had the potential to turn into a museum or a DOC – Department of Conservation – documented site. By allowing this

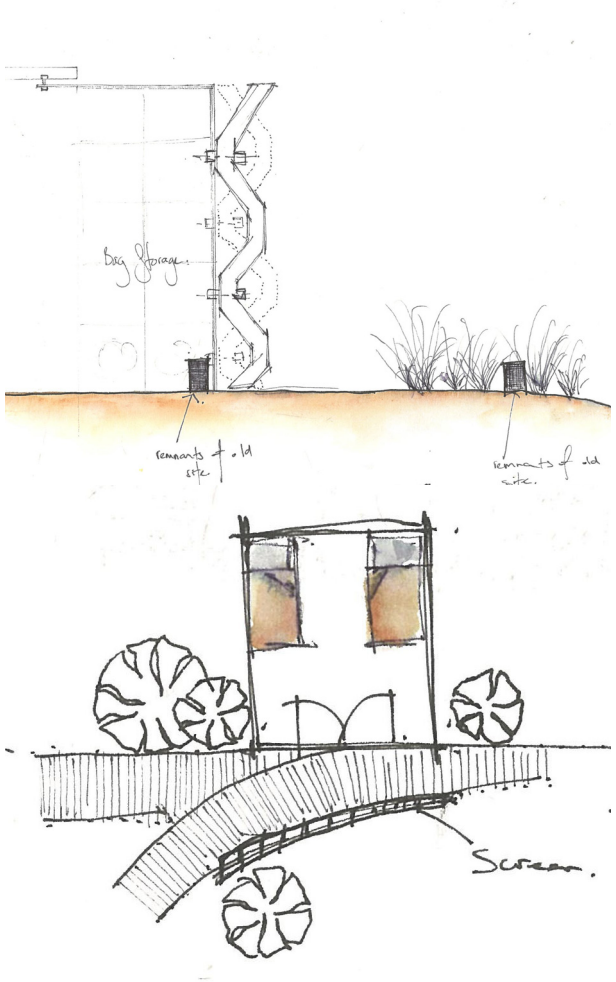


Figure 5.20 A sketch from the authors sketch book of potential screens that could be used to shelter the building. This option was decided against as it created a barrier between the architecture and the site. Image by author.

Figure 5.21 Another sketch shopwing potential spatial layout of a sleeping component. The decking that wrapped around the buildings was also not utilised as it directed the visitors into a set pathway. Image by author.

connection to be subtle, the visitor can identify themselves what aspects they see as crucial and to privilege.

There are no pathways designed around the site but instead it is left in its natural state. The building layout will enhance visual clues that link you to the other buildings. Given there are no pathways around the site currently; this should remain unchanged as it becomes an exploration around the site rather than a defined urban type form. Incorporated into the unit design are cedar timber screens that lead from the buildings into the landscape and also down into the water. These posts represent the positioning of the structures, piercing through the kitchens and cutting through the site. These posts evoke ideas of the brutal nature of the site and reflect the separation caused by the slipway.

Internally the accommodation units allow for a glimpse of the Norwegian detail. The bedroom component is small, but with floor to ceiling windows it allows the visitors to engage with the surrounding bush. The recessed detail, hiding the glass in the roof, makes the structure appear lighter and bigger than it is allowing the roof and floor planes to continue visually into the exterior spaces. The bathroom makes up the other half of the structure. It reflects what is happening externally on the building by wrapping the cladding system around the bathroom. The walls and floors are cedar slat, lined with two vertical windows allowing light to penetrate. The Norwegian detail forms a large part of this design and the shower tray attempts to showcase this. Recessed into the floor system there appears to be no shower tray, however it is situated underneath the cedar slats which have slight gaps in this area. The engraving on the tray along with old photos or maps on the splash back of the sink show examples of the Norwegian detail.

The three units that make up the kitchen aspect are also 6x4m and have the same structural system but their exterior has more glass that frames the balcony. These units are also raised well above the ground and appear to float. This emphasizes the difference between the old and new and references back into the site allowing the internal reflection. Inside, the kitchen layout is simple allowing for cooking and washing supplied by gas services. A small dining area storage for basic food items is offered but there will be an expectation of self-sufficiency. Externally these three buildings utilize the same cladding system as the bedroom units. Cedar wraps around the structure, but does not cover the clearstories or

the windows placed at floor level, allowing them to frame different perspectives for the occupants.

The kitchens, although not connected to one another, have the appearance of being connected through the middle by similar timber poles that are offered in the bedroom units. This central structure adds to the harsh and brutal nature of the new building. It reflects upon the nature of the old site while also adding a visual clue to the slipway penetrating through it. The kitchen units are situated in the center of the site in a prime position and would be the arrival point for most visitors. They are the most dominant and create the central hub to the site.

As well as the kitchens sitting over the old workshop foundations, there is also a small laundry and drying area. This will be needed to cater for the weather conditions found on Stewart Island. Built in a similar style to the other structures, it houses two washing machines and also drying racks and shoe racks. A central seat allows the visitor to sit and ponder while waiting and to reflect on the different areas of the site. A small service building to house garden equipment and generators is situated on the old winch house concrete pad up the slipway gully. This building has the same cladding as the others but has no windows.

The following images are the result of the design aspect. They show the self contained units and offer a variety of views. The watercolours help reflect the idea of serenity and evoke a sense of memory.

Note: Images that are obscured by the bind are situated in the appendix at a smaller scale.

Figure 5.22 Site plan of the new structures layout to be situated at Kaipipi Shipyard. The image shows the kitchens situated over the workshop foundations in the center. The central slipway divides the site in two with the self contained units situated above the other foundations. Image by author.

Figure 5.23 Perspective of the site looking towards the south. Visible are the kitchens in the foreground and the bedroom units situated within the bush. The site opens up into a sheltered bay. Image by author.

Figure 5.24 View looking north along Kaipipi Shipyard. The building in the foreground is the one of the 6x4m bedroom units with the decking down to the water. The three kitchen buildings are seen towards the rear of the image. Image by author.

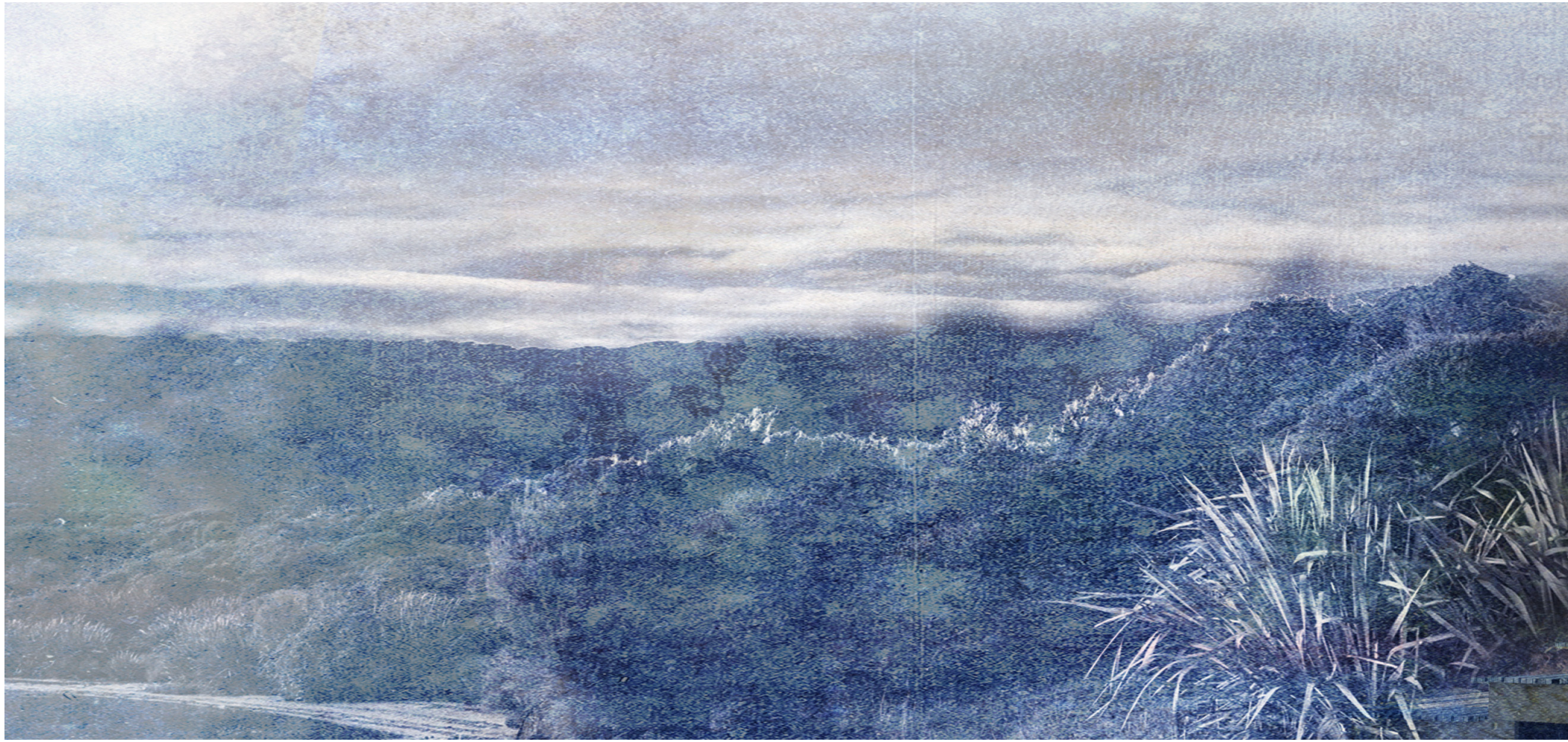
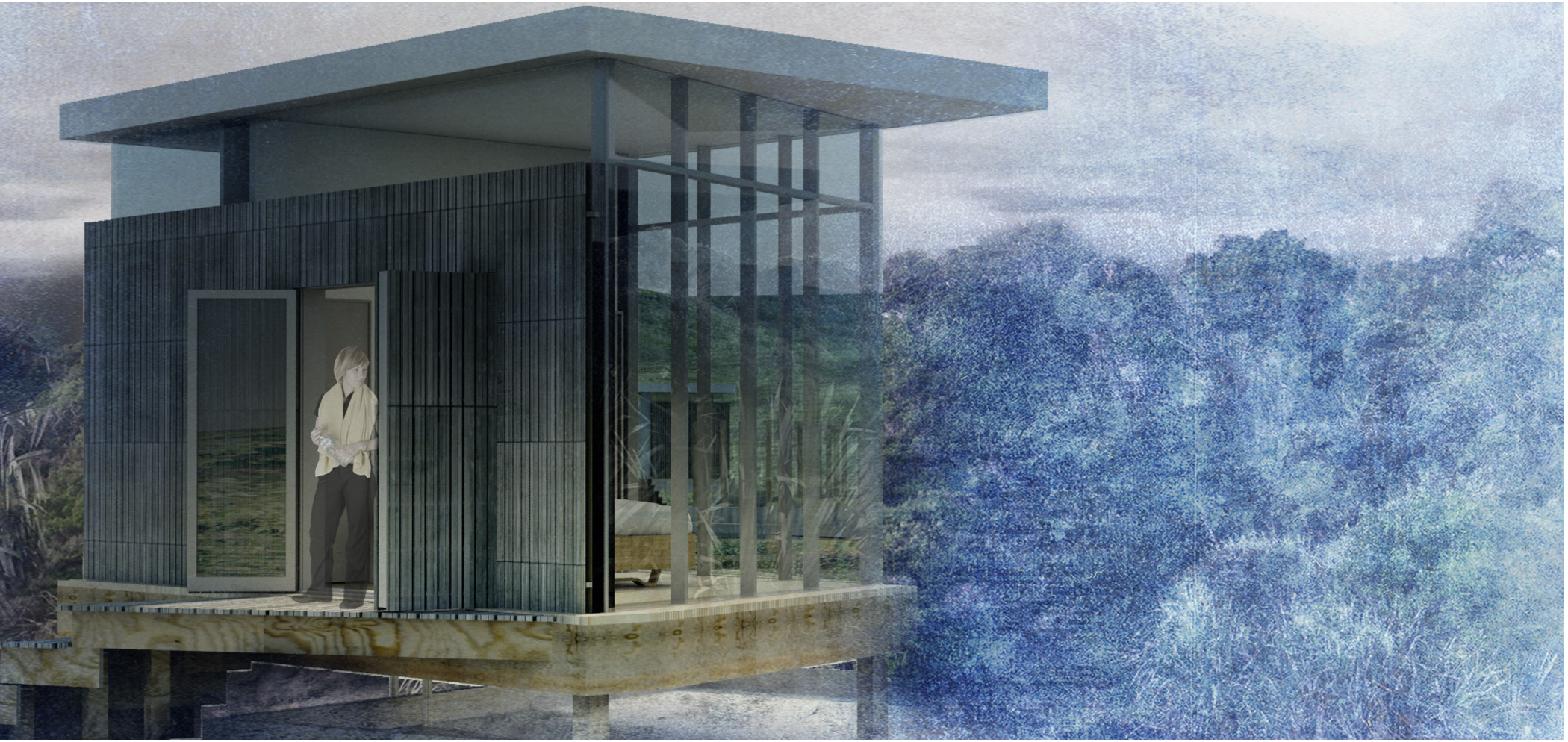


Figure 5.25 One of the self contained units that is situated over the carpenters workshop. The units are all similar with a 6x4m structural floor plate and prefabricated units that fit above it. All units contain a sleeping compartment and walk in shower. Image by author.



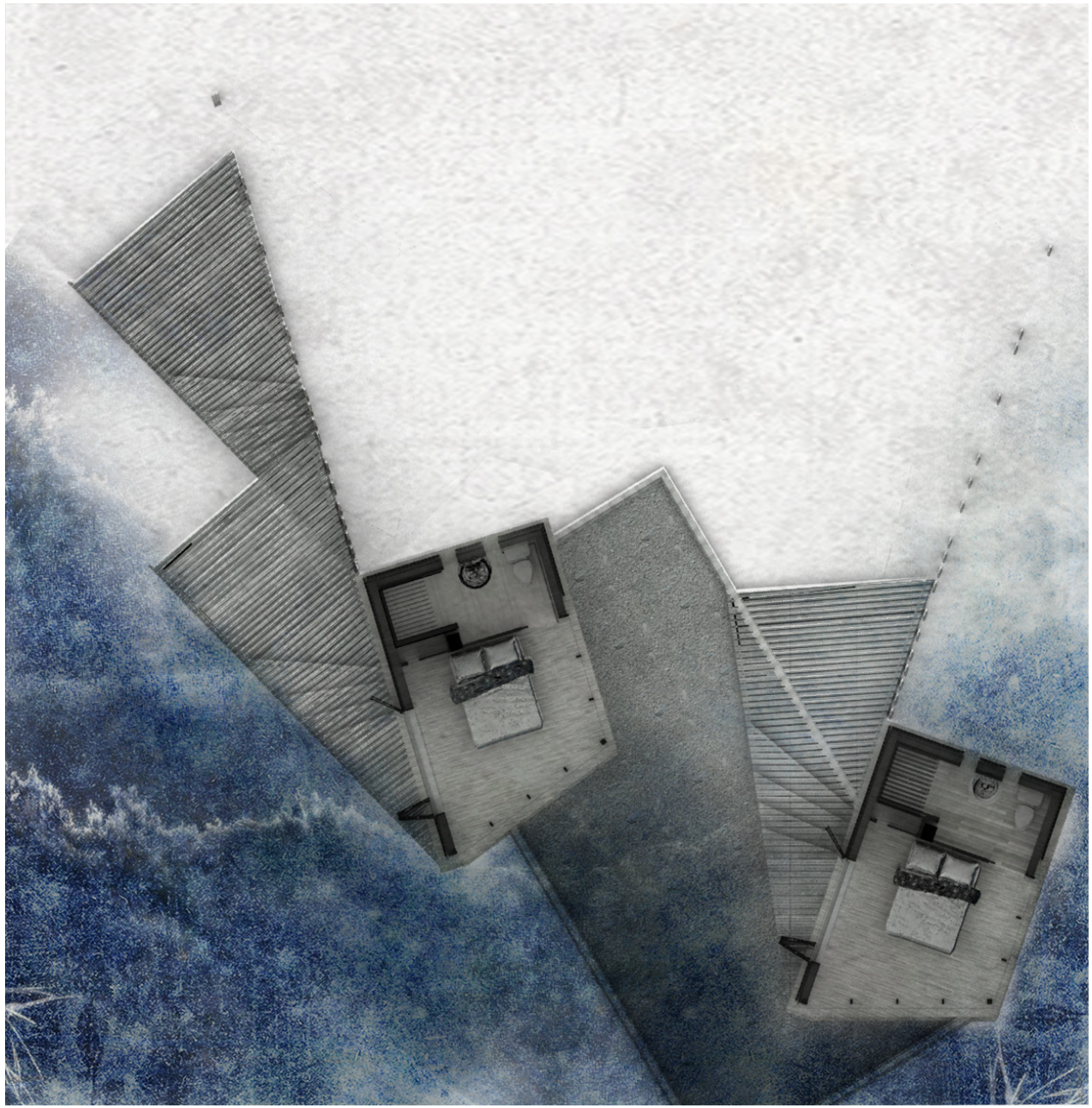


Figure 5.26 Floor plan of the bedroom units that sit over the carpenters workshop. They all have the same floor plan and slightly different decking options. The self contained units face back into the site to allow for internal reflection of the site. Image by author.

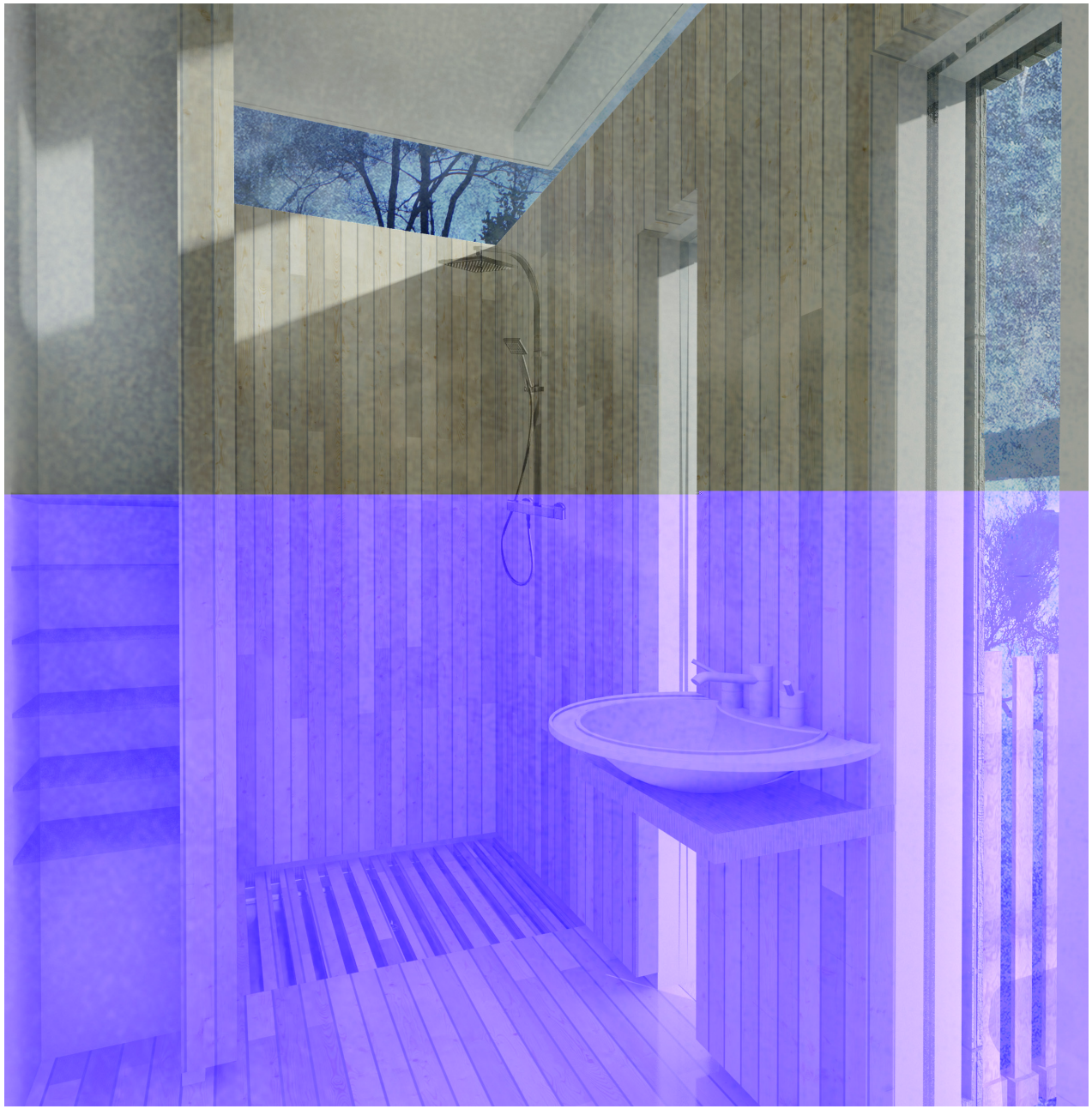
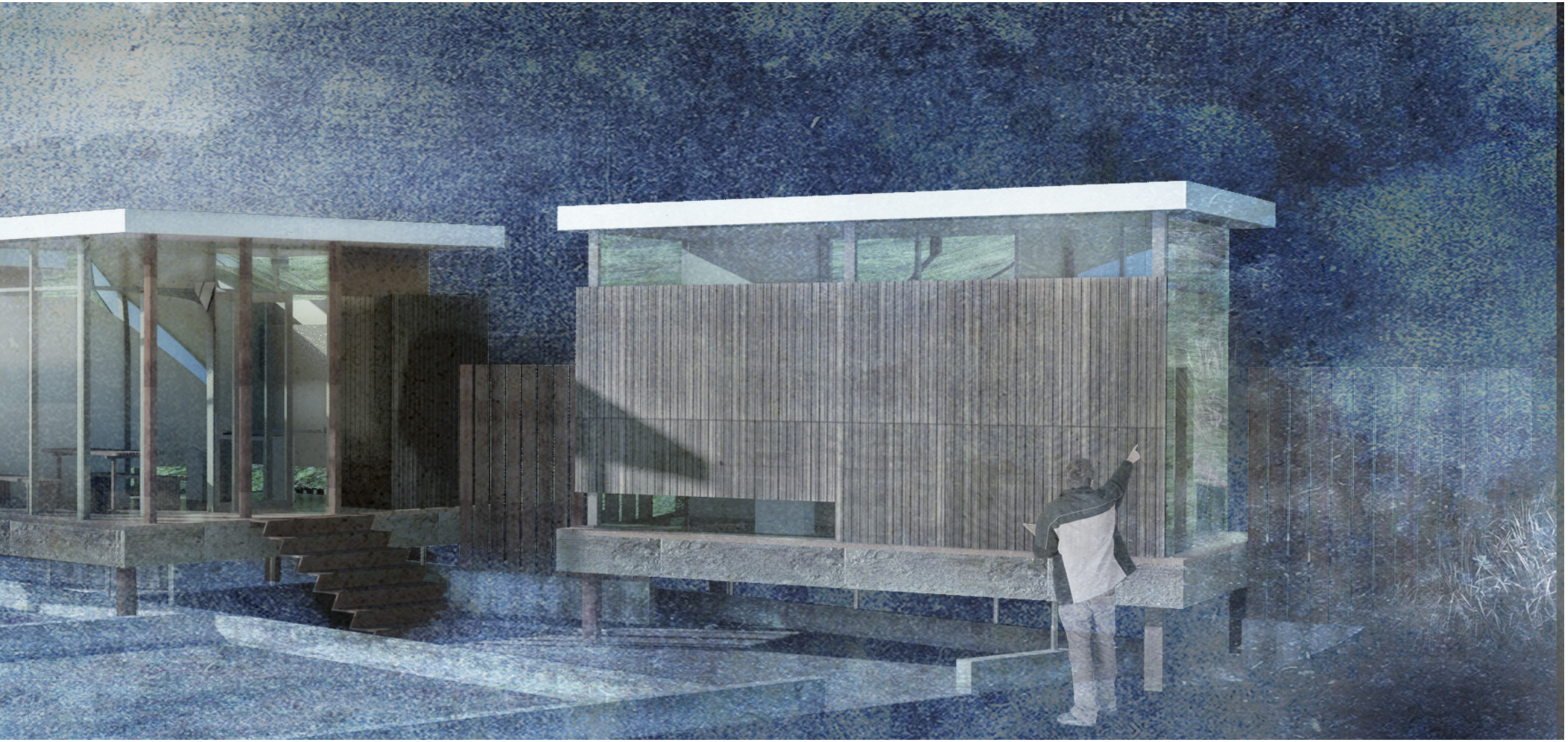


Figure 5.27 Interior view of the bathroom. The shower is sunk down into the floor giving the appearance of a flat surface. The interior reflects the external cladding and wraps in through the building. Upper clerestories allow for light into the bathroom while offering privacy. Image by author.

Figure 5.28 Perspective of the three Kitchen structures. Although not physically connected a central wooden structure pierces through the centre reflecting the brutal nature of the site as well as the slipway that penetrates through the site. Visible are the slender stainless steel columns connecting the new structure to the old foundations. Image by author.



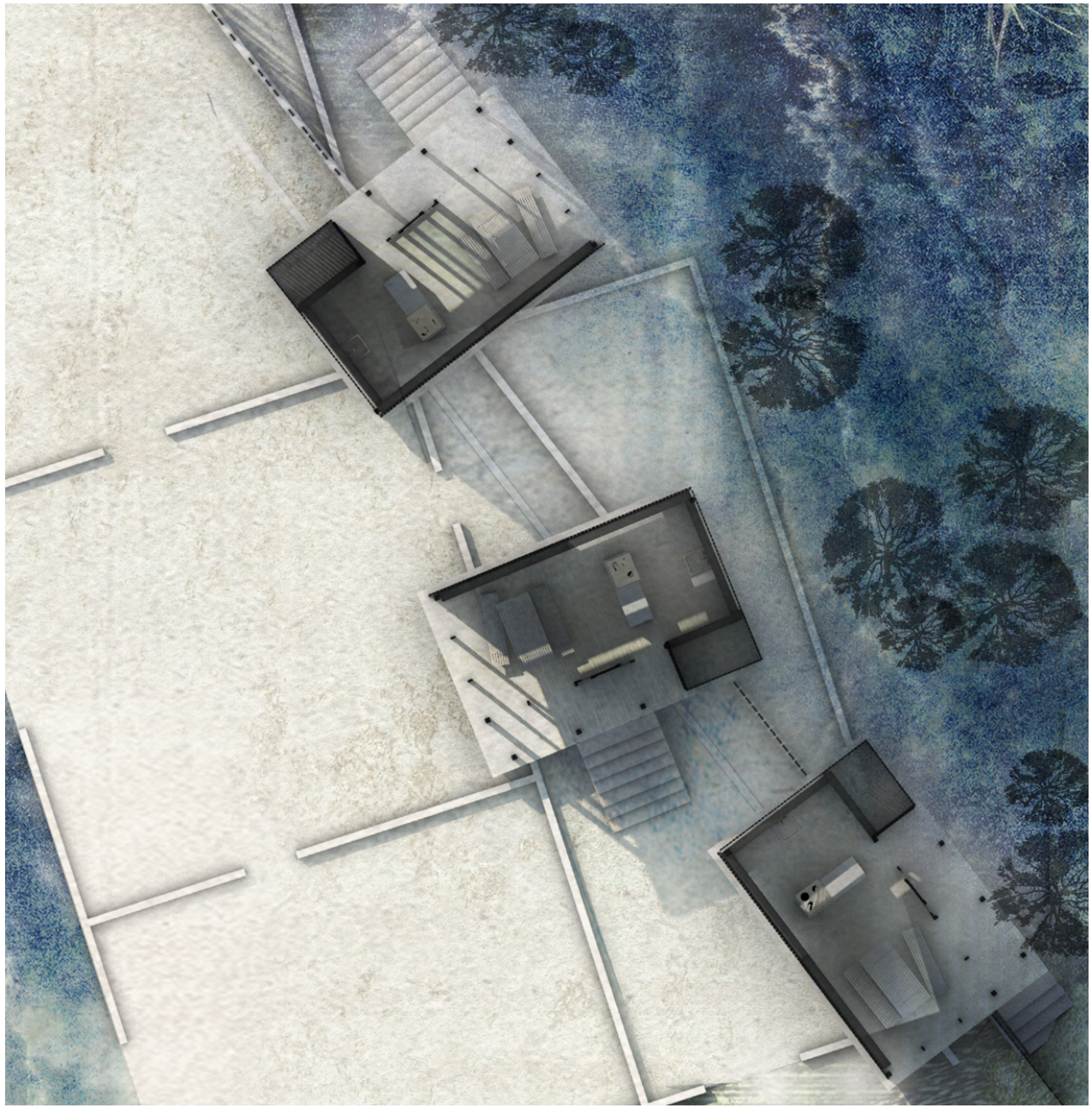


Figure 5.29 The floor plans of the kitchens showing their size and layout as well as their positioning over the main workshop. Each building has a deck that has the potential to become a bbq area Image by author.

Figure 5.30 Interior view of the kitchen. A simple design that is easily utilised by a couple staying at the self contained retreat. The kitchen offers cooking and washing up facilities and a dining area. The clerestories around the top allow light into the space as well as low windows that offer the occupants a private view to the old foundations. Image by author.

Figure 5.31 Section looking through the site showing the differing heights of the buildings situated in the bush as well as the posts that signify the buildings given there are no pathways throughout the site. The kitchen complex sits in the prime central site of Kaipipi Shipyard. Image by author.

Figure 5.32 This image shows the connection detail from new structure to the old foundations. A slender stainless steel column connects the two and is illuminated at night to enhance the visitors awareness. There are no imprints on these columns as they have the potential to influence the viewers understanding of the site. Therefore the subtle connection allows the viewer to create their own understanding of the historical nature of the site. Image by author.

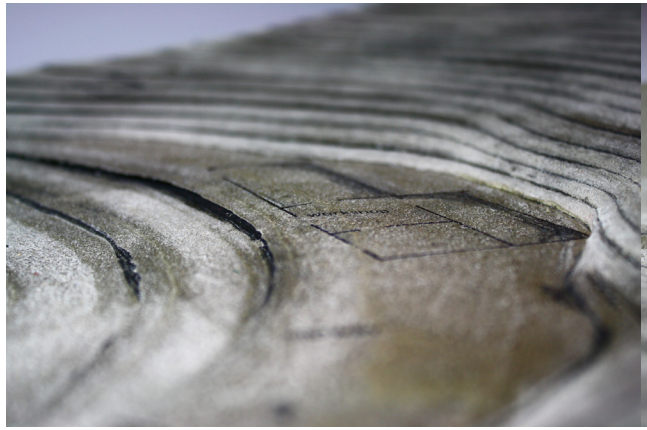


Figure 5.33 Photo of the sanded cardboard model showing the positioning of the old workshop. Photo by author.

Figure 5.34 The sanded cardboard model showing the contour lines and slope of the site. Photo by author.

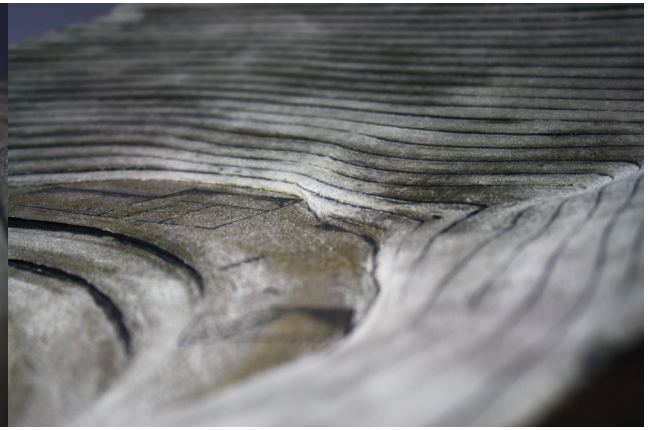


Figure 5.35 The steep terrain of the land as it slopes up behind the workshop. The gully is in line with the old slipway and winch house. Photo by author.

Figure 5.36 View showing existing Kaipipi Shipyard site model at 1:200. Photo by author.

Chapter 6 *Discussion and Conclusions*

6.0 Discussion and Conclusions

This text has discussed numerous ideas all in the aid of determining the aim; is it possible to personalize a nomadic space? The theoretical ideas were associated with Norwegian Wood and Architecture, followed by a chapter on transportable environments. The case studies from Kaipipi Shipyard and Grytviken allowed for historical links to be analysed in the design phase. The aim was established with preconceived ideas about the design outcome that evolved as the research was completed.

Discussion

The programme, a self contained retreat, became the driver for the design. Through the design process the notion of Norwegian wood and precedents allowed the buildings to gain a sense of direction. A modern aesthetic was chosen with aspects of Norway's architectural past influencing it. The "Norwegian Detail" was pivotal in the design process. Early on it was established that the connection between the old foundations and the new building was the focal point. The idea surrounding the "detail" is the subtle craft nature it beholds and this was translated into the mediation between the structures.

By establishing the case studies first it allowed for a programme to be developed and in-depth research into site, location, function and theory to commence. The building, therefore. has the potential to reflect principles surrounding portable environments. The idea that the movement varies in scale and that it can also be in the form of a mental environment. This reflection allows for the visitor to understand themselves within the environment as well as the building having the potential to be moved. Although the buildings are currently site specific they have the potential to be manipulated and positioned on similar historical sites. Therefore, relating back to Glen Murcutts idea of touching the earth lightly. The light ephemeral structures show the potential to alter and fit a different context.

The case studies provided a background into the conditions of whaling villages in the Southern oceans. Chosen due to their connection through Captain Carl Larsen their historical content formed a background base design ideas. These ideas were due to site location, structures still standing and comparison between the studies. Although either site had the potential to be developed Kaipipi held the richest design potential. The programme would have worked; however, the lack of regard to Kaipipi became evident and therefore was chosen. Although there are many approaches that could have been established between a memorial and the site, the notion of a self contained retreat fitted the context and the potential outcomes.

The remoteness of the site posed many questions, however, relating the intent back to the research of portability worked successfully. Small prefabricated units are easily maneuvered onto site, therefore, having the potential to be moved to future sites. The design consisted of clean detailing and subtle connections allowing the occupant to determine their own memorial. This connection works successfully as it does not predetermine the inhabitant's reflection on the space. The memories that the connection inspires are not predetermined and can vary from a personal reflection with the site or a reflection of whalers – for example the technology that was ahead of its time. It also successfully removes the plaques that most historical sites utilise. Minimum impact on the site was also established with the ephemeral structures connection through the old and also floating above the ground level again relating to Murcutts ideas. Pathways are not created to signify what currently exists on the site. The blue watercolour tone of the images helps to accentuate the presence of memory on the site.

Adding a serene view of the site and the misty look starts to hint at the historical ideas that once graced the site.

This project has many outcomes that were developed and explored. Each held its merits but the chosen path established a significant relationship between the historical foundations and new structure on an individual level. The self contained retreat reflects the research explored and successfully through the level of design stimulates historical memories for the visitor.

Conclusion

Throughout this text lie strong historical links to both Norway's building heritage and it's whalers through theoretical principles that have been researched. Norwegian timber construction can be seen to be well detailed and strong in character given the diversity of its building outcomes. Although lagging behind similar geographically placed countries in terms of architecture, Norway's modern structures are staring to be reassessed for their potential. This research explored the 'Norwegian detail', understanding the craftsmen's origins and their need for methodical detailing. It became the 'Norwegian detail' that was brought through to the design phase to establish a sense of belonging for the nomadic visitor. The ideas of texture, warmth and detailing associated with Norwegian wood refer back to the aim and allow for a sense of personalization to be established.

This text interprets and understands many of the ideas associated with portable architecture. Portable structures have a rich cultural history and with specific requirements for modern disaster relief new forms are being determined. These portable temporary structures have defined a new way of thinking towards belonging to a space. Transportable environments that emerge nowadays allow the inhabitants to personalize space or adapt to the specifics of a culture. This personalisation can be understood through differing scales from the intimate nature of sound to the typical accommodation structure. This research determined the principles associated with transportable structures and allowed for application of these principles during the design phase.

While this text dealt with the theory and principles around Norwegian design and also portable structures, it also analysed two case studies to determine the nature of the whaling settlements. Kaipipi shipyard on Stewart Island set the scene for Norwegian portable whaling villages within New Zealand. Grytviken, South Georgia formed the second case study. Analysing the types of structures transported and the placement of these buildings provided a solid background for the design studies. Through the research it became evident there was a lack of structure at the Kaipipi Shipyard and it was, therefore, a perfect location for the design solution. The research allowed the site at Kaipipi to respond to the aim; is it possible to personalise a nomadic space. With a rich nomadic history associated to the site it allowed for experiments to take place.

Overall the design reached the goals set and satisfies the research question; is it possible to personalise a nomadic space? The design shows the personalisation of the connection between the old building and the new. Initially personalising a space was through the interior and creating spaces that allow the occupant to create their own sense of place however, this changed given that the focus of memory shifted from the layout of the structure to the connection between the old and the new. Through the exploration the significant historical value the site held became obvious and it needed to be emphasized. By expressing the connection from the new building to the historical foundations subtly it allows for a personalized nomadic space to be achieved through the visitor determining their position to the past. This connection therefore paralleled the research in establishing a type of Norwegian detail.

7.0 *Bibliography*

Art Tatler International. Retrieved November 20, 2010, from http://arttattler.com/Images/NorthAmerica/NewYork/Whitney/Buckminster%20Fuller/fuller_pavilion.jpg

Barr, W., & Watt, J. P. C. (2005). Pioneer Whalers in the Ross Sea, 1923-33. *Polar Record, 41*(May).

Basberg, B. L. (2004). *The Shore Whaling Stations at South Georgia - A study in Antarctic Industrial Archaeology*. Oslo, Norway: Novus Forlag.

Basberg, B. L., & Burton, R. (2006). New evidence on the Manager's Villa in Stromness Harbour, South Georgia. *Polar Record, 42*(221), 147-151.

Bastéa, E. (2004). *Memory and Architecture*. New Mexico: University of New Mexico Press.

Boradkar, P. (2006). *Transportable Environments 3*. New York: Taylor and Francis.

Carr, T. a. P. (1998). *Antarctic Oasis Under the Spell of South Georgia*. New York: Norton & Company.

Caste, A. B., Bermejo, A. C., & Li, D. (2008). *Deployable Emergency System*. Spain: Netbiblo.

Davidson, E. (2009). Timeline - South Georgia Timeline. Retrieved April 23, 2010, from http://sgmuseum.gs/mediawiki/index.php/Timeline

Davies, C. (2005). *The Prefabricated Home*. London: Reaktion Books Ltd. .

Dil, A. (1983). *Buckminster Fuller*. U.S.A: First American Edition.

Drew, P. (2001). *Touch This Earth Lightly - Glenn Murcutt in his own words*. Australia: Duffy and Snellgrove.

Ervland, S. (2008). A Glimpse into History. Retrieved 23 April, 2010, from http://www.skedsmo.kommune.no/Om-kommunen/Glimt-inn-i-historien/

Frysinger, G. R. Grytviken and Stomness. Retrieved May 13, 2010, from http://www.galenfrysinger.com/grytviken.htm

Fuller, R. B., & Marks, R. (1973). *The Dymaxion World of Buckminster Fuller*. Illinois: Anchor Books.

Gavalas, M. (2007). *Landmarks of Fiordland, Southland and Stewart Island/Rakiura Past and Present*. Auckland: Reed Publishing NZ Ltd.

Grady, D. (1986). *Sealers and Whalers*. Auckland: Reed Methuen Publishers.

Hayes, H. (2010). Sacred Destinations. Retrieved November 12, 2010, from http://www.sacred-destinations.com/norway/urnes-stave-church

Heritage, M. f. C. a. (17 April 2008). 'Sealers and whalers - pre-1840 contact'. Retrieved April 19, 2010, from http://www.nzhistory.net.nz/culture/pre-1840-contact/sealers-and-whalers

Hillier, C. (2010). Norway's Turf Roofs. Retrieved November 12, 2010, from http://www.lostateminor.com/2010/11/12/norways-turf-roofs/

History and naming of Stewart Island. (2010). Retrieved 17 May, 2010, from http://www.stewartisland.co.nz

Holan, J., & Norberg-Schulz, C. (1990). *Norwegian Wood: a Tradition of Building*. United States of America: Rizzoli International Publications INC.

Hopkins, M. (2009). Scattered sites, Glowing skies. *Heritage New Zealand*(Autumn).

Jensen, & Skodvin. (2010). Juvet Landscape Hotel. Retrieved November 12, 2010, from http://www.jsa.no

Jormakka, K. (2002). *Flying Dutchmen*. Switzerland: Birkhäuser.

Kalynn, J. (2004). The Native People of Canada - The Peoples of the Plains. Retrieved November 12, 2010, from http://nativesofcanada.tripod.com/id6.html

Katrina Destruction. (2005). Retrieved November 12, 2010, from http://www.katrinadestruction.com/images/v/hurricane/

Kronenburg, R. (1995). *Houses in Motion*. London: Academy Editions.

Kronenburg, R. (1998). *Transportable Environments* (Vol. 1). New York: Routledge.

Kronenburg, R. (2008). *Portable Architecture* (4 ed.). Germany: Birkhauser.

Melis, L. (2003). *Parasite Paradise - A manifesto for temporary architecture and flexible urbanism*. Belgium: NAi Publishers / SKOR.

Norberg-Schulz, C. (1986). *Modern Norwegian Architecture*. Oslo: Norwegian University Press.

South Georgia Island Settlement Map. (2007). Retrieved May 13, 2010, from http://mappery.com/South-Georgia-Island-Settlement-Map

Tostrup, E. (2002). *Norwegian Wood - The thoughtful Architecture of Wenche Selmer*. China: Princeton Architectural Press.

Trust, S. G. H. (2009). South Georgia Heritage Trust. Retrieved November 22, 2010, from http://www.sght.org/images/articles/CALarsen.jpg

Watt, J. (2006a). An Explanation and Guide to the Whalers' Base Paterson Inlet, Stewart Island, NZ. Havelock North, New Zealand.

Watt, J. (2006b). *People of 'The Whalers' Base', Paterson Inlet, Stewart Island*. Paper presented at the New Zealand Society of Genealogists Inc.

Watt, J. P. C. (1989). *Stewart Island's Kaipipi Shipyard and the Ross Sea Whalers*. Hawke's Bay, NZ: Author - J.P.C. Watt.

Wheeler, T. (2004). *The Falklands & South Georgia Island*. China: Lonely Planet Publications.

8.0 *Appendix*

Memory Marquette's S01

Memory through imprint.

The idea transfer from one physical form to another and the imprint it leaves behind. This evokes the sense of memory and can trigger haptic moments or emotional strings. The Marquette's produced for this series will start to explore the idea of transfer of memory and indentation. This initial series will deal with the physical transfer of memory onto a two dimensional flat surface; paper and cardboard. The way these surfaces translate the idea of memory from one to another will interpret 'memory' in a simple manner.
Memory is defined as creating "a special relationship with space, holding on to the essence of it, the best and the worst, letting the rest of the details fade into gray."(Bastéa, 2004, p. 1) It is therefore this 'relationship' that is privileged to the individual.
The memory through imprint series will focus on the idea of wear and tear. Is it possible over time for a single piece of paper to remember its original form and structure? Or is the memory destroyed and all that lies before us is the 'memory' of its original structural composition. The question therefore relates to individual perspective on memory and the relationship that is visible between the original piece of paper and the new object.

S01.1 – Simple transfer of 'memory'
Series S01.1 deal with the transfer of memory from one object to another. The simple nature of taking one object (a drawing in this case) and using acetone to transfer the image to another piece of paper shows the journey of memory. This experiment in transfer of memory starts to look into the physical changes of that memory. The memory, although still evident and washed out, starts to evoke new memories while still relating to the original 'idea'.

S01.2 – 'Memory' state change
The second series starts to develop on the first through manipulation of the object. S01.2 explores the notion of state change and through this process asks if memory is altered. From the base sample the series looks at a piece of paper that is altered through crumpling and wear and tear. There becomes a point where there is no

linkage to the original idea and the state change allows the object to gain new memories. Although there is a relationship between the physical properties of the objects the emotional response is altered. This is specifically recognisable in the state change from fig 1.4 to the final memories procured in fig 1.6.

S01.3 – Layers in 'memory'

The final series questions the ideas of peeling back layers to evoke a sense of memory. The removal of sections of an object will stimulate memories as well all allowing for new memories to be created. This series is also an introduction into series two, which will explore three dimensional memories through imprint, as it starts to explore the sense of touch.

Images of series 01. Layers of card peeled back to reveal the imprint. Simple transfer of memory through acetone. Crumpling of paper to understand its new form. Photo by author.

Memory Marquette's S02

Memory through process.

Memory through process will endeavor to take series01 and push it further from the two dimensional plane towards the three dimensional. Through the process of change, series two will take the ideas associated with 'memory' and develop them to form six definitive stages. The idea that memory can evolve and develop over time will be explored through this series with the possibility of outcome informing an aspect or possible process of my design.
Again the quote from series02 surrounding memory is beneficial to these Marquette's "a special relationship with space, holding on to the essence of it, the best and the worst, letting the rest of the details fade into gray."(Bastéa, 2004, p. 1) It is this 'fading' moment that I will try to analyse through this study. The translation process of memory is the distinctive node that could form a possible design or portion of design.
This 'memory through process' series will focus on the idea of stages and the implementation of these. Each stage should have its own connotations to memory and the distinctive change should be immediately visible.

These Marquette's will work through a linear process through two mediums. Image (photo) – still 'memory' photo that will be the starting point and test the preservation – and fragmentation stages explored through wax. Memory is determined on many levels and a base level is through capturing this memory through photography. It allows a point in time (memory) to be captured then re-evaluated and recalled at a later date.

S02.1 – 'Memory' through image
Series S02.1 will form the base layer for this process. This stage will be the personal developing of a photographic image that encapsulates 'memory'. A photo that summarises what memory is and can be easily distinguished in the initial stages. For this I will take an image of a memory that has historical links to one of my sites and to me personally. On one level I am recalling the memory and on another the historical meaning will be relevant to families of the whalers.

S02.2 – Basic 'Memory' distortion
The second stage will involve a similar process to that found in S01.2. It will involve the manipulation of the

base layer to form a different perspective on 'memory'. Through crumpling of the image does the memory become altered or is it merely just neglected. This distortion may be on a more cosmetic level and although crumpled doesn't alter the idea of 'memory'.

S02.3 – 'Memory' state change/S02.4 – Partial loss of 'Memory'

This step in the process is the first significant change to the 'memory' state. S02.3 will see the 'memory' image immersed in a bed of wax in its crumpled form. Some parts may still be visible while others will be distorted through the translucent nature of the wax. It is therefore this step that we start to see the partial loss or disturbance of the original image. This step I feel has the potential to translate through to my design or start to conjure spatial relationships with memory within the design.

S02.4 – Fragmented 'Memory'

The fourth step in this process is the fragmentation of memory. To achieve this fragmentation the wax casting will be dissected into portions with each fragmented part having the potential to create new memories or privilege certain aspects of the original that are still visible. Series 2.4 has the potential to offer design forms through the sections that are cut. These forms that are derived from the original memory still have strong connections and allow a possible design movement. Whether they start to form the process through the building, the nodes of movement or even a detail they have a rich history and relationship to the original memory.

S02.5 – Resurrection and new 'Memory'

The resurrection of the new memory is created through the process and the final fragmented Marquette's having a significant relationship with original through the privileging of certain parts. As Bastéa stipulates memory is about retaining certain parts, the positive and negative, and letting the other aspects fade away. This final stage although not having a physical object defines the process and becomes the point of reflection. The new memory is possibly the interaction with the design process and how and what it influences.

Series 02 looks into the process of memory. Base memory is the photograph. Setting the memory within wax explores the new form. Sectioning the new memory to create fragments of the original. Photo by author.

Memory Marquette's S03

Memory through attachment and removal.

Memory through removal and attachment of elements take series01 and push it towards the three dimensional plane. Through a simple process of using plaster of paris memory can be shown to either be added or removed. This simple but obvious process shows that memory can change and develop over time and that people tend to privilege. Series03 is also demonstrating that over time a preconception or idea surrounding memory can be either lost through removal of a part of the physical space or by adding to the original.
Series03 is a simple idea but a fundamental idea in terms of memory. People create a memory and store it, either from a past event or site visited but also from every day experiences. If you return to these places and the original memory has been changed it therefore allows the base memory to change.
This 'memory through removal and attachment' series will focus on the idea of time frames and also further experiences adding to the original. There will be three simple Marquette's completing this series. The base Marquette is simple structure and forms the control. An attachment forms the second Marquette with the final in the series displaying the removal of a portion.

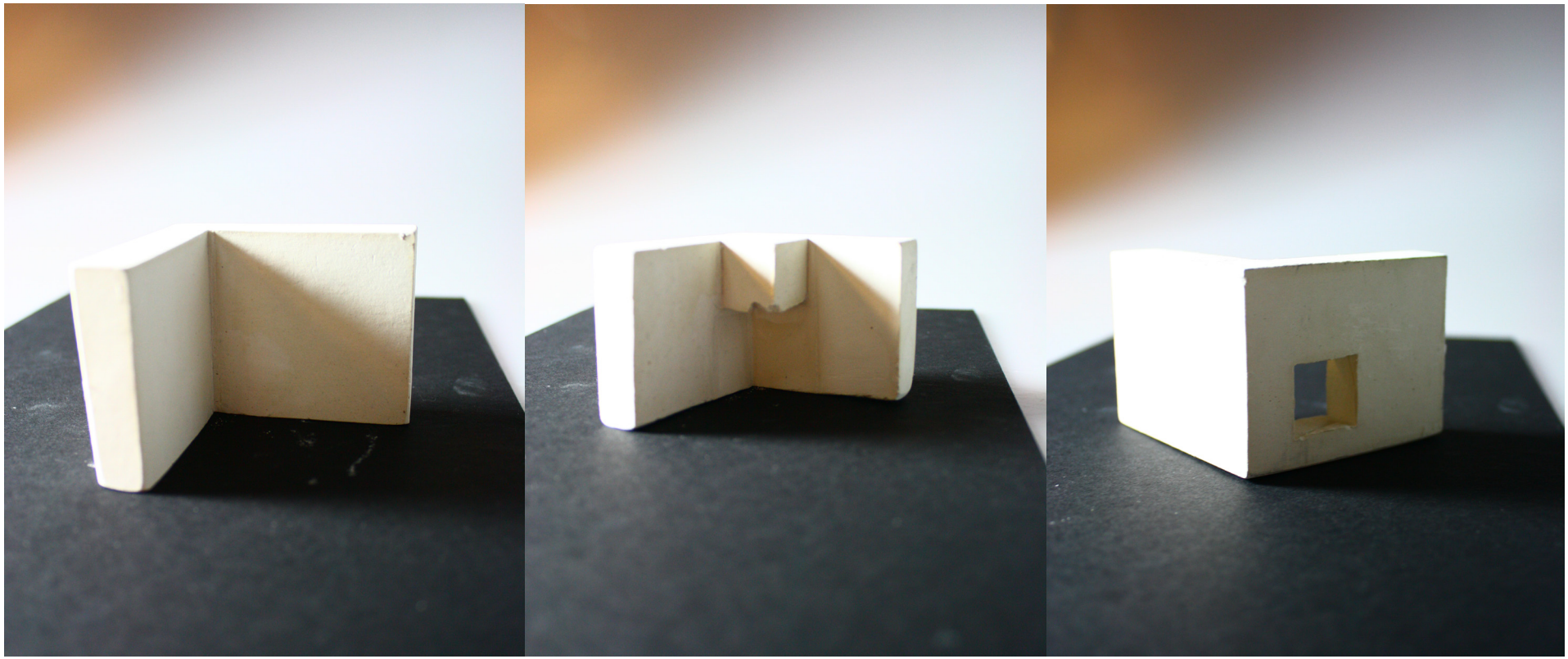
These Marquette's are meant to question one of the base levels of memory the ideas associated with memory and all in the hope of aiding a design and its principles. Although they aren't form driving they set a standard and allow for fundamental ideas to be based on them.

S03.1 – Basic 'Memory'
Series S03.1 will form the base layer for this process. It is a simple corner detail made from plaster of paris. Its simple lines and smooth surface represent the initial memory that is raw and unchanged. It will be easy to see the process through this Marquette staying the same.

S03.2 – 'Memory' through attachment
The second stage of this series will involve a similar process to that found in S03.1 although it will be see the attachment added to the original form. This Marquette is simply attached through casting however it would be interesting to explore the ideas of memory through differing forms of attachment.

S03.3 – ‘Memory’ through removal

Like S03.2 this Marquette is also made of plaster of paris and it is the final step in the process. The removal features a square missing in the detail shows that over time the original memory can have partial removal of some elements either by physical removal from the original or certain aspects not being privileged and therefore forgotten.



Series 03 is an exploration into basic adding and removing of memories. Photo by author.

Memory Marquette's S04

Memory through shadow.

Memory through shadow takes a simple form and through 3 differing light intensities explores the notions and ideas of shadow. A simple black cardboard form was derived to accommodate these shadows and start to explore memory. By utilising a simple form it is not detracting from the shadows. This exploration will be the first in a series of shadow experiments with the aim in informing a possible design.
Series4 is a simple idea but in terms of memory has the potential to form either an aspect or a whole spatial experience. Like series three this series endeavours to create a base result and merely start to uncover the ideas surrounding memory and shadow.
This series is created through a simple cardboard form. The first series deals with a single point of illumination. The second series deals with two forms of lighting and the third series with diffused lighting as well as the two forms off light. They all are slightly different in technique however they utilise the same original cardboard form to derive the shadows.

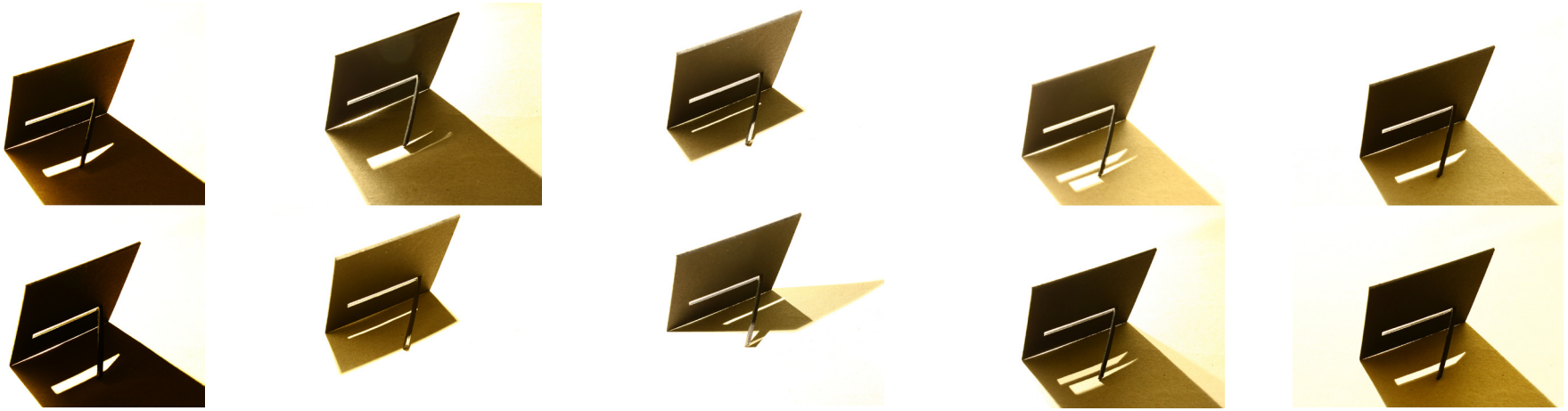
This series will hopefully form an aspect of design to be accommodated in one of the spaces. Although these images will not form a part of the final design they do however have the possibility to show memory and enhance a new memory within my space. Light is a principle that has the potential to be shown successfully through spatial principles and evoke a new memory or to trigger an old memory.

S04.1 – Single aspect 'Memory'
By utilising a single light to cast a shadow the image is a raw imprint of the original. Rather than blurring the lines and boundaries it is possible to see the vivid shadow that is cast. However this process leaves little to the imagination and creative side of design. It does however start to question the role of sensitivity through lighting to create certain aspects of memory and allows the possibility to privilege certain views.
S04.2 – 'Memory' through dual angles
This second stage in the process, S04.2, starts to blur the boundaries and offers up a more poetic image. By lighting the cardboard image from dual directions crisp lines are blurred and a personal view and interpretation of the shadow cast is allowed. It is interesting to note however that there are nodes created where the boundaries

overlap and these points have the potential to evolve into a design.

S04.3 – 'Memory' and shadow diffused

The third part in series four is the memory and shadow diffused. They are almost entwined as there starts to become no physical parameters or boundaries. The blurring of lines is the most successful as they start to evoke memory. Whether they relate directly to the original object or start to create their own objects and spaces. This may be the most evocative of the three experiments and allows for precise positioning in order to create the desired effect. S04.3 has the potential to inform the design of a space and therefore to evoke memory. This process will be utilised but also transformed and adapted to form the link between memory and site.

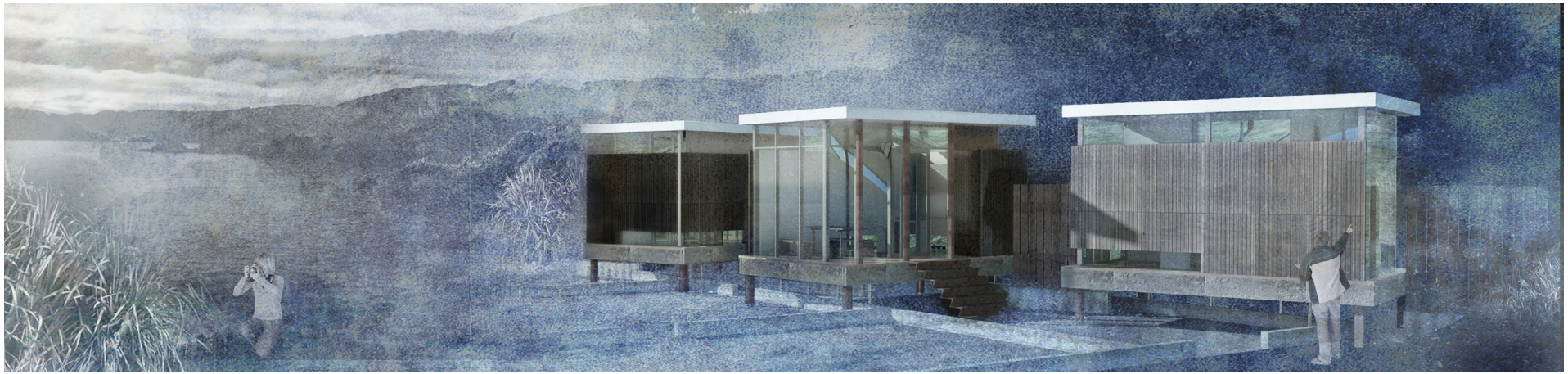


These images show Series 04. They show the exploration and development of memory through shadow. There are 3 types of shadow, from a single source, second source and also diffused lighting. Photo by author.

Perspective of the site looking towards the south. Visible are the kitchens in the foreground and the bedroom units situated within the bush. The site opens up into a sheltered bay. Image by author.

View looking north along Kaipipi Shipyard. The building in the foreground is the one of the 6x4m bedroom units with the decking down to the water. The three kitchen buildings are seen towards the rear of the image. Image by author.

One of the self contained units that is situated over the carpenters workshop. The units are all similar with a 6x4m structural floor plate and prefabricated units that fit above it. All units contain a sleeping compartment and walk in shower. Image by author.



Perspective of the three Kitchen structures. Although not physically connected a central wooden structure pierces through the centre reflecting the brutal nature of the site as well as the slipway that penetrates through the site. Visible are the slender stainless steel columns connecting the new structure to the old foundations. Image by author.

Section looking through the site showing the differing heights of the buildings situated in the bush as well as the posts that signify the buildings given there are no pathways throughout the site. The kitchen complex sits in the prime central site of Kaipipi Shipyard. Image by author.