Whakapaparanga

The Architecture of Whakapapa an iterative layering

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The Architecture of Whakapapa an iterative layering

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ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed

_____

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To my cherished whānau and aiga, I take this moment to reflect on the journey we have shared, a clink to us all, ka tau te aroha, faafetai ma ou te alofa ia te oe.

Ki tōku makimaki whakatoi,
my Alexander, I write this for you.

PEPEHA

Ka tīmata i te pō urirui
Te pō tangotango
Whakarīri, whakarīri, whakarīri tēnei taonga ohoho
Tēnei taonga puipuiaki
Tēnei taonga tuku iho
Nā Ranginui e tū ana
Nā Papatuanuku e takoto ana
Ka tū ko Tānemāhuta
Ka puawai ko te ao marama

He uri ahau nō ngā tōpitopito o te Hokianga-whakapau-karakia. Ko Ngāpuhi te iwi, Whirinaki te rohe. Kauhoe i ngā ngaru o te wai-tai ko Hokianga, ko Opononi ko Hokianga te moana, heke noa ki te waka o Ngātokimatawhaorua, te waka ā Kupe. E tū te whare o Mātai Aranui, te whare o Pā te Aroha, ko Te Hikutu te hapū, ko Te Ramaroa te maunga. Ko Patricia Te Whatu e tū mai nei. Tihei Mauri ora

ABSTRACT

This research, part of the He Puna ORA's MĀTOU: Regenerative Co-Housing Lab, explores how the concept of whakapapa can inform culturally specific regenerative housing solutions. Whakapaparanga – The architecture of whakapapa as iterative layering, expands on whakapapa as a framework for relational interconnectedness, examining how socio-ecological relationships and iterative processes in architecture can contribute to socio-ecological regeneration and long-term sustainability. The research aims to investigate how socio-ecological systems-thinking, design approaches, and material selection can support circular processes in our buildings. A combination of methods, including mapping, model-making, and engagement with traditional Māori practices, are employed. A key component of Māori practice within this research involves connecting with Ngāpuhi heritage in the Hokianga region, focusing on Whirinaki and Opononi. The revitalisation of traditional mōteatea (Māori songs) is explored as a means of strengthening the connection of this research to the people, culture, and the land of Whirinaki and Opononi. In the context of practical application this thesis explores timber as a building material, specifically investigating how timber might be responsibly sourced within the Opononi region. It emphasises whakapapa, the connection of ecological systems and how this is reflected in 'whakapapa circularity' a focus on community (both human and non-human). Architectural elements such as solar power and water collection systems prioritise regenerative and sustainable material sourcing for the papakāinga development. The study concludes with a focus on designing for adaptation to future environmental changes within a coastal setting, specifically analysing sea-level rise and contributes to iterative design over-time.

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INTRODUCTION

Whakapaparanga – The Architecture of Whakapapa as Iterative Layering

This Master of Architecture thesis explores the concept of whakapapa (genealogy or more-than-human ancestry) as a framework for regenerative architectural design. Focusing on the Opononi site in the Hokianga region of Aotearoa New Zealand, the research investigates how architecture can integrate ecological regeneration, particularly in terms of design approaches and material selection, for housing and papakāinga. The thesis proposes ways in which architectural design can harmonise with both restored and evolving ecologies, ensuring the well-being of the environment and future generations, both human and our more-than-human whanaunga or kin.

In this research, whakapapa is more than just a genealogical record—it represents the interconnectedness of people, places, and the environment. This conceptual layering reflects how elements of the land, such as soil, vegetation, native species, aquatic systems, and human activity, interact over time, creating a dynamic and relational landscape. By applying this concept to architecture, Applying this concept to architecture, this study develops designs for built environments that acknowledge and respond to these relationships, fostering sustainability and cultural continuity.

This introduction outlines the theoretical and practical framework for the research. The following delineates the thesis' trajectory, starting with an initial exploration of the key groundings of the research in Chapter One, followed by an exposition of whakapapa as methodology in Chapter Two and an exploration of design method in Chapter Three. Chapter Four features the discussion of the resolved design.

Chapter One: Whenua (Land)

- **Part One: Design Locale & Regenerative Design Context** explores Opononi's geography, social history, and ecology, laying the groundwork for applying regenerative design principles. It examines how these principles can address ecological challenges, promote sustainability, and align with the cultural context of Opononi.

- **Part Two: Whakapapa as Ontology** explores the philosophical significance of whakapapa, extending beyond genealogy to inform the research methodology.

- **Part Three: Design Precedents** reviews architectural projects that incorporate circular design principles, Mātauranga Māori, and papakāinga development, offering precedents for integrating regenerative design into architecture.

Chapter Two: Whakapaparanga – Methodology

- **Part One: What is a Methodology of Whakapapa?** introduces the methodology of whakapapa as a guiding framework for design.
- **Part Two: Mapping Method** explores the use of mapping to understand the socio-ecological dynamics of the site and how this process informs design.
- **Part Three: Iterative Making** discusses the iterative design process, aligning with both whakapapa and regenerative design principles.
- **Part Four: Casting as Iterative Process** examines how casting contributes to the development of sustainable architectural forms.
- **Part Five: Importance of Mōteatea** explores how traditional Māori chants (mōteatea) connect people to the land and inform the design process.

Chapter Three: Design Methods in Practice

- **Part One: Mapping – Socio/Ecological** delves into the practical application of mapping to understand the socio-ecological dynamics of Opononi and how it influences design.
- **Part Two: Concept Design & Iterative Making** explores concept designs, emphasising the iterative process of refinement and adaptation to site conditions.
- **Part Three: Mōteatea-Ō-Ngāpuhi** focuses on how Ngāpuhi cultural practices, particularly mōteatea, influence the design process and its connection to the land.

Chapter Four: Whakataunga Hoahoa (Design Resolution)

- **Part One: Whakapapa-o-te-Whenua Framework** presents a framework for integrating whakapapa with the whenua (land), guiding the design process through ecological and cultural lenses.

- **Part Two: Whakapapa Tectonics and Materials** addresses how whakapapa influences tectonics and material choices in architecture, focusing on sustainability and cultural values.

- **Part Three: Community integration Papakāinga Settlements and Programmes** explores the design and development of papakāinga settlements, integrating cultural traditions and ecological regeneration principles.

- **Part Four: Whakapapa Iterations Over Time** –discusses the iterative design process in relation to the evolving concept of whakapapa. The final designs present the culmination of the research, highlighting the design proposal and key visual representations— drawings, models, and other media— that reflect the architectural concepts developed throughout the thesis.

This research is rooted in my ancestral connection to Opononi, within Ngāpuhi's traditional lands. By exploring the relationship between people, place, and environment through whakapapa, this thesis develops a design methodology that prioritises sustainability, cultural stewardship, and socio-ecological regeneration. Using regenerative design principles and whakapapa, the project aims to enhance Opononi's ecological health, increase biodiversity, regenerate native vegetation, and integrate architectural solutions that foster cultural and environmental resilience for future generations.

CHAPTER 1:

This chapter further introduces the site of Opononi in the Hokianga region of New Zealand. Part one of this chapter discusses the literal ground on which this research project is sited. Part two explores the philosophical grounds for the study that focuses on ‘whakapapa’. Part three explores key design precedents that set a direction for the later design work.

PART ONE - DESIGN LOCALE & REGENERATIVE CONTEXT

Understanding and respecting a place's identity is essential to creating designs that are both meaningful and environmentally responsible.
Part one, design locale and regenerative context focuses on the unique qualities of Opononi, guided by the exploration of geographic, historical, social and environmental considerations.

The Site: Opononi + Whirinaki, Northland, New Zealand

The site for this design project is located at 99 Waione road, Opononi. This place has personal significance as I spent several years of my childhood here. I vividly remember the landscape where my siblings and I grew up. Its stunning coastal sunrises and sunsets visible from our home by the sea. I remember falling asleep to the sound of waves crashing against the bank, breathtaking and simultaneously unsettling. My connection to the Hokianga region and the ocean forms the foundation of my design inspiration. The nostalgia it holds drives my desire to preserve the natural habitats and the life they sustain. The mountains surrounding the area are rich with stories my mother shared about her childhood in the small town of Whirinaki, a life shaped by hunting, fishing, and living in harmony with nature in its entirety. She taught my siblings and I about Rongoa (Māori traditional medicine) and often spoke about the ngāhere (the forest) and how the environment will take care of us as we nurture it. This was the beginning of truly understanding kaitiakitanga (kinship with the environment) and its importance, with its deep understanding of the environment. This is something I recognise as a true treasure, valuable knowledge, and something I am committed to passing down to my children.

My grandmother, Mary Wikaira, or informally known as (Nana Moko) is deeply tied to our whenua (land) in Whirinaki neighbouring the site of Opononi. This site lies within Ngāpuhi's ancestral land and within proximity to the local marae (traditional meeting house) Pā te Aroha and Mātai Aranui. A multitude of Hapū (sub-tribe) that surround and protect this area consist of Te Hikutu hapū, Ngāti Kairewa, Te Whānau-ā-Pango, and Ngāti Tuapango, all historically significant in association with chief Kupe, a legendary Māori explorer who is said to have arrived in Aotearoa (New Zealand) from Polynesia. Kupe's journey and legacy are deeply embedded in the land of Hokianga, with stories passed down through generations. In Opononi, the interconnection of land, sea, and mountains forms a living landscape rich in purakau (stories), one of which explains the origin of the name Hokianga (King, 2003). A gathering of people along the Hokianga

Harbour would perform prayers and rituals aimed at ensuring the well-being of the community and seeking blessings from the gods. This act of returning to a sacred site is said to have led to the name Hokianga, which means the place of return (Barnes, 2010).

Figure 1 - Map of Whirinaki

Figure 2 - Wikaira Road, Whirinaki

Figure 3 - Whirinaki awa (river)

Figure 4 - St. Pauls Anglican Church

Figure 5 - Whirinaki Urupa (cemetery)

Figure 6 - Arai-te-uru, scenic reserve

Regenerative Design Context

This thesis explores regenerative architecture as a design approach that combines traditional Māori values with ecologically sensitive design with building practices. Regenerative design, as described by McDonough and Braungart focuses on designing systems that restore and enhance ecosystems, including improving soil health and biodiversity.

Ecologically, Hokianga, which is the region surrounding Opononi is characterised by coastal and rural landscapes, in the more developed areas of Opononi there is limited tree coverage - small patches of native bush. In contrast, neighboring town Whirinaki, is known for its significant tracts of indigenous forest, which support a wide variety of native species include kauri, and nikau tree. The forest within Whirinaki offers habitat for numerous species including manu (birds) which is further researched in this thesis. Overall, this thesis project seeks to ecologically regenerate the Opononi site over time, increasing its tree coverage and biodiversity. Opononi offers a unique opportunity to develop strategies to support regenerative design principles and address how affordable housing will align with the lifestyle and aspirations of the local people and provides an opportunity to design housing options that support the practices of hunting and fishing.

Kainga Tahi, Kainga Rua an edited volume by Māori professionals, develops principles for sustainable and culturally sensitive housing solutions. The report examines the intersection of Māori housing realities and regenerative design, highlighting systemic challenges such as discrimination in the housing market. The text discusses developments of various papakāinga and the benefits of having a lens of cultural value, including how whakapapa is vital, noting that "living in the papakāinga on the whānau farm supports the wellbeing of the whānau in a multiplicity of ways. Significantly, it provides them with a deep sense of home and belonging, of interconnectedness to the whenua, to the taiao, and to each other, by knowing and valuing the whakapapa that ties them all together" (Griffiths et al., 2003, p. 151).

The insights from *Kainga Tahi, Kainga Rua* are particularly relevant to the Opononi papakāinga development as they highlight how regenerative design, informed by Māori cultural values, can contribute to addressing housing challenges Cram (2013). By integrating ecologically sensitive practices, this approach supports Māori aspirations for self-determination and enhances the wellbeing of the community. In this context, the principles of whakapapa—interconnectedness—are essential, reflecting the ongoing responsibility to protect the land while developing culturally meaningful and sustainable housing solutions. Building on these principles, the Opononi papakāinga development explores regenerative design strategies aligned with Māori values, fostering a community-driven approach to housing. As discussed in Chapter Four's section on design resolution, these concepts inform an architectural framework that balances cultural and environmental factors, contributing to long-term resilience for both the community and the environment.

Academic Fleur Palmer explores the development of sustainable papakāinga to support Māori communities in the Far North of Aotearoa New Zealand. In her doctoral dissertation, she examines the historical, social, and cultural contexts of housing challenges faced by Māori communities, particularly land loss, the Māori land courts, and its impact on self-determination. The research highlights the gap between Māori and Western worldviews, especially around

land and housing. Palmer discusses the urgent need for adequate, warm, and dry housing in the Far North, citing examples of substandard living conditions “access to housing for Māori is associated with a complex history” she emphasises the potential of papakāinga as a culturally grounded, ecologically regenerative solution that supports Māori aspirations for self-determination. This research connects Māori cultural values with sustainable architecture, demonstrating how housing designs can reflect Māori identity while addressing environmental and social needs. It aligns with the concept of whakapapa, which links people to the land, their heritage, and the environment (Palmer, 2016).

Palmer’s insights are particularly relevant to the papakāinga development in Opononi, as they highlight strategies for community engagement and for identifying the needs of the people. The Opononi design aims to honour the community’s cultural and ecological connection to the land through regenerative architectural practices, as discussed in Chapter Four's design resolution.

The “Whakapapa o te whenua,” a visual framework developed in Chapter Four, explores the interconnectedness of architecture, the environment, and local resources. It deepens our understanding of how these elements relate to Atua (spiritual guardians) and how they can inform regenerative architectural design. The framework structures the design development of the Opononi papakāinga within this research.

Figure 7 - Soil types map of Opononi, Northland

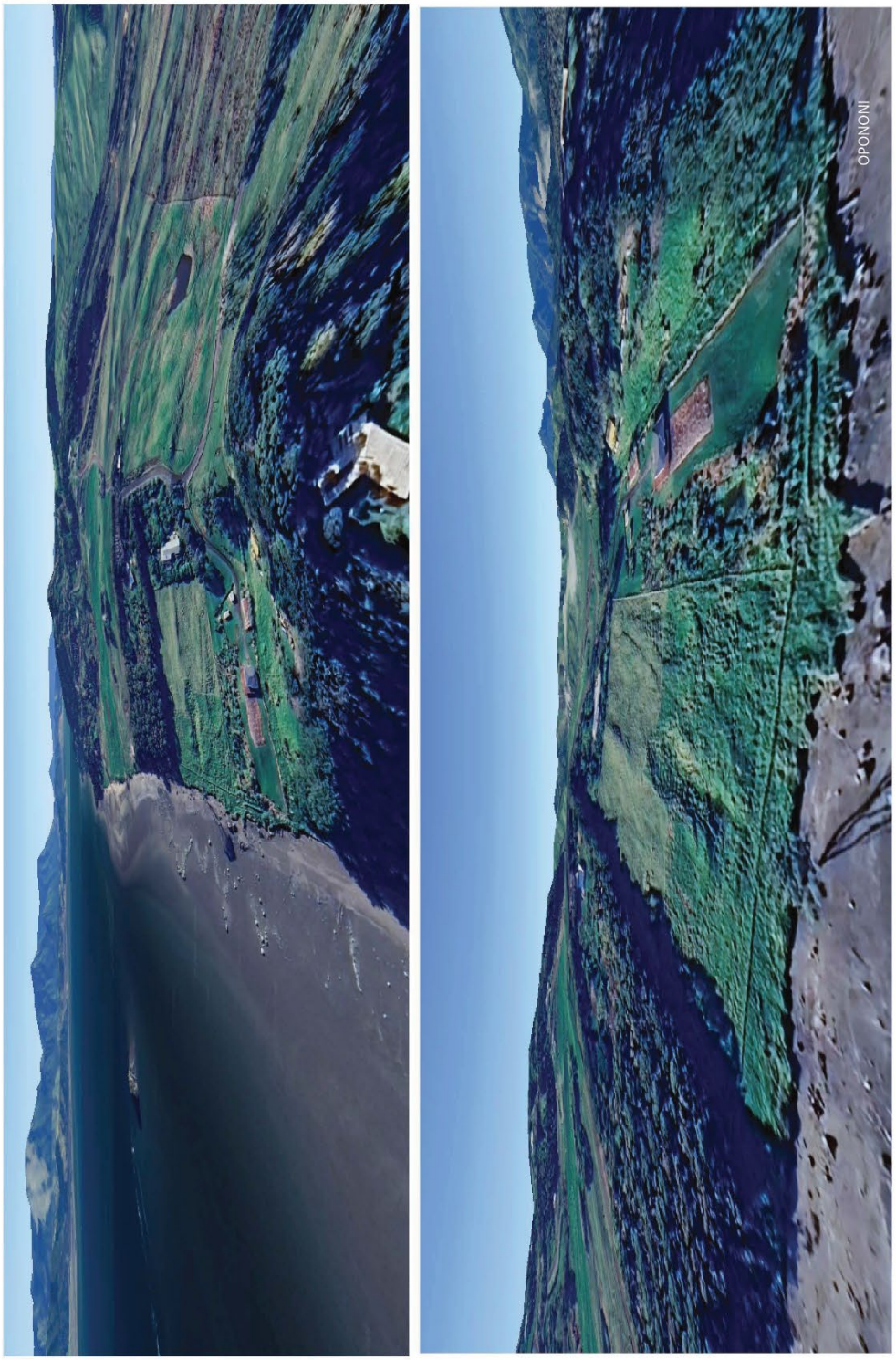


Figure 8 - Opononi, Waione Road

Figure 9 - Opononi, 99 Waione road

PART TWO – WHAKAPAPA AS ONTOLOGY

This section examines whakapapa as both a way of thinking and a lens through which we understand the world. It shows how everything—humans, nature, and the universe—is interconnected. In this research, whakapapa extends beyond family history to also connect cultural identity, environmental stewardship, and ethical considerations in architecture.

In what follows, I discuss the work of three creative practitioners who each explore whakapapa in various ways, and across a range of creative practices. Academic Carl Mika examines whakapapa through the lens of Māori philosophy and its implications for contemporary education and thought, Rachel Shearer explores whakapapa with an emphasis on cultural and ecological connectivity; Amanda Yates investigates how whakapapa informs the relationship between architecture, sustainability, and identity. By exploring the thinking of these diverse practitioners, I aim to identify my own ways of expressing whakapapa in practice.

Whakapapa in Philosophy

Philosopher Carl Mika, of Tuhourangi iwi, discusses whakapapa as a framework for understanding the deep connections between all things, including the land and the universe. He explains it as a way of seeing, a way of thinking, a way of understanding our place within the world (Mika, 2014).

Mika shares how whakapapa can mean both "genealogy" and "layer" (in a physical sense). Further, it can also mean "to become ("whaka") earth ("papa") be embraced towards Papa (mother earth) to cause to become ("whaka") earth ("papa")" (Mika, 2014, p. 53). He discusses how both the ranges of meanings here are all useful in helping one to get to the complex cultural specificity of the term. Mika describes the iterative continuity and transformative capacity of the concept when he states that "whakapapa, read in light of its layering nuance, enables us to think of things in the world as constantly moving" (Mika, 2014, p. 54) his understanding of whakapapa, positioned in an architectural locale, encourages an interconnected and ethical perspective on architecture and the environment.

Whakapapa in the Creative Arts

Racheal Shearer, a musician and academic, has whakapapa ties to Te Aitanga a Mahaki and Rongowhakaata. She describes whakapapa as a framework for understanding relationships with the land, the cosmos, and ourselves. Shearer uses whakapapa in her sound installations to illustrate the interconnectedness of all things, emphasising its importance for both cultural preservation and environmental care. As she says, "whakapapa is a holistic genealogical network within which everything that exists is connected" (Shearer, 2018, p. 13).

In her work, *Te Oro o te Ao*, whakapapa presents as a cyclical acoustic mapping of relationality. A sound cycle reiterates through the soundtrack, presenting the volcanic agency of the Waitemata through repeating a low cycling sound. This continuous layering of sound creates a space where the listener is drawn into an ongoing dialogue between land, sound, and memory.

Whakapapa in Architecture

Architect and academic Amanda Yates – Te Arawa, Rongowhakaata, Te Aitanga a Mahaki - views whakapapa as an ontological condition that presences our kinship relationship to the living world from which we whakapapa or originate. She believes that whakapapa's focus on interconnectedness offers a transformative relational model that can help with addressing global challenges, such as climate chaos and biodiversity collapse, that are caused by industrial modernism's extractive ontologies and processes. "All of our more-than-human whanaunga (kin, including humans) originate from the earth and its atmosphere. In Māori ontologies, the fundamental condition of living is that of whakapapa (multi-species lineage) and whanaungatanga more-than-human kinship" (Yates, 2021, p. 108).

Yates works with whakapapa-led design practices that are both regenerative and culturally respectful and are inherently concerned with the ongoing vitality or wellbeing of people and place. She makes architectural landscapes that engage the papa, the earth, to create architectural space held within the body of Papatuanuku. Spatially, she aims to create space that is radically interconnected with the environment, either via large scale sliding wall panels, or glass louvre walls that create highly permeable architectural boundaries, or outdoor rooms that mediate between interior and exterior. With regenerative intent, she aims to incorporate green infrastructure, collect resources (solar energy, water), and develop edible landscapes in addition to making architectural space that is radically connected to the environment. "Somehow 'we' — our design cultures, our manufacturing systems, our materials' labs, our governmental standards, our social norms — appear unaware that the earth, as magic matrix, can only make-disappear bio-degradable matter. All non-bio-degradable material placed into the earth, or rivers and oceans, further degrades at varying rates, losing material integrity – form and ethics – delivering pollutants right down to the cellular level by way of nano-toxins that migrate and mix with emergent or unpredictable effects" (Yates, 2018, p. 34). Yates' concern with the impact of non-biodegradable materials on the planet, particularly the degradation of ecosystems at a cellular level, positions her work within broader conversations about environmental ethics and the need for sustainable material choices in design, this reiteration environment responsibility.

The research of Mika, Shearer, and Yates demonstrates that whakapapa is not just about family ties but a profound understanding of our connections to culture, the environment, and each other. It highlights how cultural values, sustainability, and ethics align with regenerative design. Their work has deepened my understanding of how whakapapa might shape architectural design through the principle of interconnectedness. Mika's emphasis on deep ecological time has influenced my approach in that I now aim to design and regenerate over time, slowly becoming part of the earth. Shearer's emphasis on cultural-ecological connection through sound installation has influenced my understanding of the symbiotic relationship between people and the environment, guiding me to design with a respect for both cultural and environmental sustainability. Yates' whakapapa ontology within a built environment provides examples that have influenced my approach to integrating Māori relational ontologies into the architectural process, particularly with regard to creating spaces that respect the interconnectedness of all life forms. By applying whakapapa as a framework, I aim to create architectural designs that

preserve cultural identity while promoting environmental stewardship for future generations. A key aspect of understanding the whakapapa methodology was drawing from the work of these researchers to explore how it translates into an architectural context. This process involved shifting from ontological perspectives and paradigms to architectural features and material choices. For the Opononi site, this means selecting materials that are ecologically respectful and incorporating architectural elements that are sustainable and regenerative, in harmony with the surrounding environment.

PART THREE - DESIGN PRECEDENTS

This section examines three key buildings - the Tuhoe Living Building Challenge, the Auckland University Science Building, and the Waikiwi Papakāinga Development - as case studies that provide insights into design principles relevant to the whakapapa focus of this research. These projects demonstrate how circular design and regenerative strategies address challenges faced by Māori communities and how the findings are relevant to the papakāinga development in Opononi.

Tūhoe Living Building Challenge – Te Kura Whare

The building Te Kura Whare, located in Tūhoe, Tāneatua, New Zealand, was completed in 2020. Designed in collaboration with Ivan Mercep of Jasmax, the building integrates Māori values like whakapapa and kaitiakitanga (Tūhoe, 2020). Reflecting Tūhoe iwi, while Ralph Simpson of RTA Studio contributed to its sustainable design, ensuring it met the Living Building Challenge (LBC) standards - a certification program for sustainable buildings. It promotes a regenerative design framework that goes beyond sustainability to create buildings that are socially just, culturally rich, and ecologically restorative. The LBC encourages buildings to be self-sufficient, using resources in a way that mimics natural ecosystems, and advocates for the health and well-being of the people who interact with the built environment (Living Future Institute, n.d.). By combining traditional Māori knowledge with modern sustainability practices, Te Kura Whare creates spaces that nurture both people and the environment. As a model of self-sufficiency and environmental stewardship, Te Kura Whare aligns with Tūhoe's ancestral responsibility to their whenua (land), demonstrating how architecture can foster community interaction, cultural expression, and ecological balance.

Site and Community: Tūhoe prioritises local materials and resources, ensuring that the built environment harmonises with the landscape, while actively involving the community to reflect their needs and aspirations.

Water and Energy: Systems for rainwater harvesting and renewable energy generation align with the LBC's goals of water neutrality and energy self-sufficiency.

Materials: Tūhoe uses non-toxic, sustainable materials and locally sourced timber to minimise environmental impact.

Equity and Wellbeing: The LBC encourages designs that promote social equity and wellbeing, with communal spaces that foster interaction and reinforce collective values.

Biophilic Design: Te Kura Whare incorporates natural elements to support mental and physical wellbeing, aligning with Māori beliefs about the importance of the natural environment. The relevance of these principles is particularly clear when considering the proposed papakāinga development in Opononi. As Te Kura Whare honours whakapapa and kaitiakitanga, a papakāinga in Opononi could integrate these same values, creating a regenerative space that supports both cultural and environmental aspirations. The sustainable practices seen in Te Kura Whare, such as the use of locally sourced materials and renewable energy, could guide the development of a papakāinga that thrives in harmony with its landscape, while honouring ancestral ties and ensuring long-term sustainability Partington and Zari (2020).

In this way, Te Kura Whare not only exemplifies a successful model of regenerative architecture but also provides a path forward for future papakāinga developments. It demonstrates how whakapapa connects architectural practice with the land, people, and culture, and how indigenous knowledge can complement contemporary sustainability frameworks to create thriving, resilient communities. These principles, grounded in regenerative strategies, are essential to the success of this thesis project.

Figure 10 - Te Kura Whare

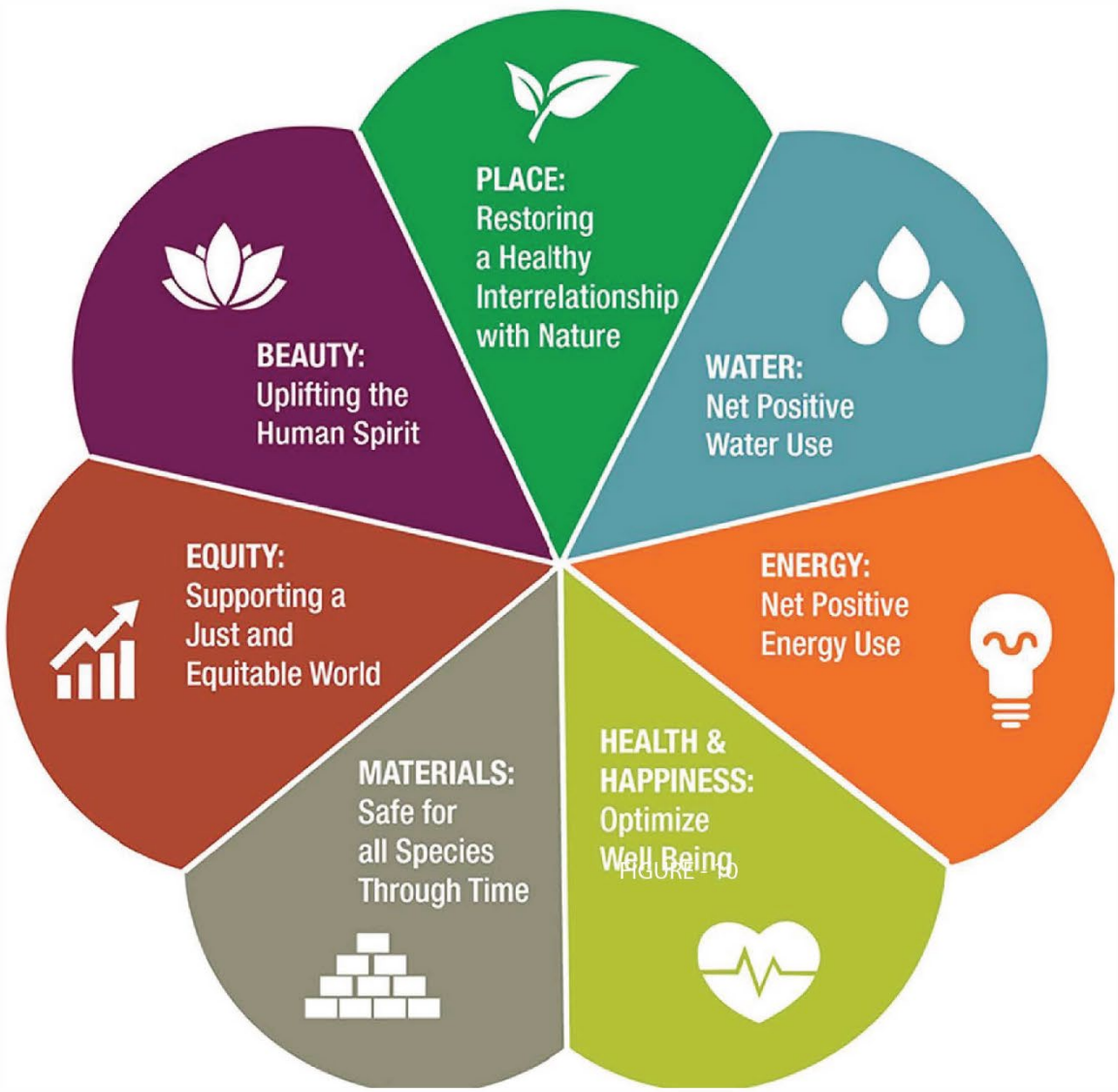


Figure 11 - Living Building Challenge diagram

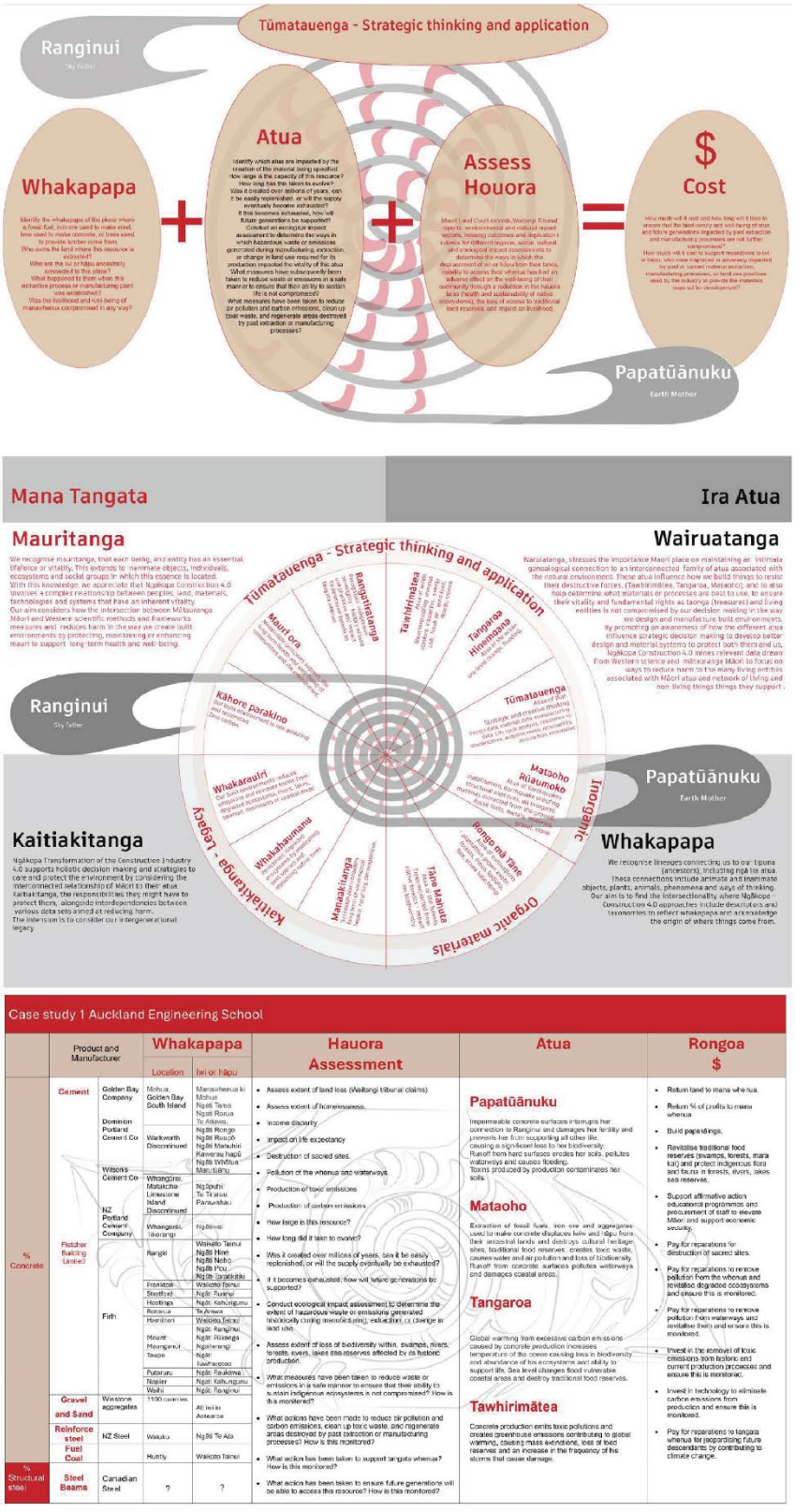
University of Auckland Engineering Building (Waipārūrū Hall) - Material whakapapa

The University of Auckland engineering building - Waipārūrū Hall, built in 2020 is a modern facility designed for the use of the engineering sectors of UoA by Architectus in collaboration with Beca. Located within the university's engineering precinct, the building includes lecture theatres, laboratories, and collaborative spaces to support various engineering disciplines.

A key element of the design was to reflect Aotearoa New Zealand's cultural heritage through the integration of Māori cultural references – the interior incorporating toi Māori (Māori art works) tukutuku on the glass paneling. While this aimed to acknowledge Aotearoa's cultural context, these references were ornamental only as the design concept did not reflect, or incorporate Māori values, particularly the concept of whakapapa in the context of material extraction — in this instance, the whakapapa of materials, which ties together the interconnectedness of people, land, and environment.

The construction of the University of Auckland's engineering building involved the extraction of materials such as steel sourced from Canada and Waiuku. The steel sourced from Waiuku directly affects the iwi Ngāti Te Ata, raising concerns about a range of Māori values. For example, what was the impact on biodiversity loss? What measures were taken to reduce waste? How is this monitored, and what actions have been implemented to ensure future generations can access this resource? A diagram supporting this information can be found in figure 12 (Case study 1: Auckland Engineering School) a visual developed by Fleur Plamer, which examines the 'whakapapa' of all materials used in the construction process. It also explores the hauora (health and well-being) of both the environment and the iwi impacted, as well as the Atua in the context of environmental and financial attributes that could benefit the iwi involved in future builds from the material extraction for this project Palmer (n.d.)

In other words, while some Māori cultural references appear in the design itself, the principle of whakapapa was not employed as a guiding framework for material selection or sourcing. This absence highlights a gap in the current design approaches to integrate deeper Māori values into the building's construction process, specifically those related to ecological stewardship and ancestral connections to the land. By embracing Māori cultural and ecological principles, future projects could better align with sustainable practices and Māori community values.



Case study 1 Auckland Engineering School

	Product and Manufacturer		Whakapapa Location	Whakapapa Iwi or Hapu	Hauora Assessment	Atua	Rongoa $
% Concrete	Cement	Golden Bay Company	Mahua, Golden Bay South Island	Manaaiheenua ki Mohua Ngāti Tama Ngāti Rarua Te Atiawa,	• Assess extent of land loss (Waitangi tribunal claims) • Assess extent of homelessness. • Income disparity • Impact on life expectancy • Destruction of sacred sites. • Pollution of the whenua and waterways • Production of toxic emissions • Production of carbon emissions • How large is this resource? • How long did it take to evolve? • Was it created over millions of years, can it be easily replenished, or will the supply eventually be exhausted? • If it becomes exhausted, how will future generations be supported? • Conduct ecological impact assessment to determine the extent of hazardous waste or emissions generated (environmentally during manufacturing, extraction, or change in land use • Assess extent of loss of biodiversity within, swamps, rivers, forests, rivers, lakes sea reserves affected by its historic production. • What measures have been taken to reduce waste or emissions in a safe manner to ensure that their ability to sustain indigenous ecosystems is not compromised? How is this monitored? • What actions have been made to reduce air pollution and carbon emissions, clean up toxic waste, and regenerate areas destroyed by past extraction or manufacturing processes? How is this monitored? • What actions has been taken to support tangata whenua? How is this monitored? • What actions has been taken to ensure future generations will be able to access this resource? How is this monitored?	**Papatūānuku** Impermeable concrete surfaces interrupts her connection to Ranginui and damages her fertility and prevents her from supporting all other life, causing a significant loss to her biodiversity. Runoff from hard surfaces erodes her soils, pollutes waterways and causes flooding. Toxins produced by production contaminates her soils. **Mataoho** Extraction of fossil fuels, iron ore and aggregates used to make concrete displaces kiwi and hāpu from their ancestral lands and destroys cultural heritage sites, traditional food reserves, creates toxic waste, causes water and air pollution and loss of biodiversity. Runoff from concrete surfaces pollutes waterways and damages coastal areas. **Tangaroa** Global warming from excessive carbon emissions caused by concrete production increases temperature of the ocean causing loss in biodiversity and alteration of the ecosystems and ability to support life. Sea level changes flood vulnerable coastal areas and destroy traditional food reserves. **Tawhirimātea** Concrete production emits toxic pollutions and creates greenhouse emissions contributing to global warming, causing mass extinctions, loss of food reserves and an increase in the frequency of the storms that cause damage.	• Return land to mana whenua. • Return ¼ of profits to mana whenua • Build papakāinga. • Revitalise traditional food reserves (pāuaroa, forests, mara kai) and protect indigenous flora and fauna in forests, rivers, lakes sea reserves. • Support affirmative action educational programmes and procurement of staff to elevate Māori and support economic security. • Pay for reparations for destruction of sacred sites. • Pay for reparations to remove pollution from the whenua and revitalise degraded ecosystems and ensure this is monitored. • Pay for reparations to remove pollution from waterways and revitalise their, and ensure this is monitored. • Invest in the removal of toxic emissions from historic and current production processes and ensure this is monitored. • Invest in technology to eliminate carbon emissions from production and ensure this is monitored. • Pay for reparations to tangata whenua for jeopardising future descendants by contributing to climate change.
	Gravel and Sand	Firth	Location	Iwi or Hapu			
		Golden Bay Cement Co	Whangarei, Matukicha-Limestone Island Discontinued	Ngāpuhi Te Tiriwai Parawhau			
		NZ Portland Cement Company	Whangarei, Tikorangi	Ngātiwai			
	Fletcher Building Limited		Rangiri	Waikato Tainui Ngāti Hine Ngāti Naho Ngāti Pou Ngāti Tarakiteke			
			Frankton	Waikato Tainui			
			Stratford	Ngāti Ruanui			
			Hastings	Ngāti Kahungunu			
			Rotorua	Te Arawa			
			Hamilton	Waikato Tainui			
			Mount Maunganui Taupo	Ngāti Ranginui Ngāti Awanga Ngāti Ngaiterangi Ngāti Tuwharetoa			
			Putaruru	Ngāti Raukawa			
			Napier	Ngāti Kahungunu			
			Waihi	Ngāti Rangiwi			
		Winstone aggregates	1100 quarries	All Iwi in Aotearoa			
	Reinforce steel	NZ Steel	Waiuku	Ngāti Te Ata			
	Fuel Coal		Huntly	Waikato Tainui			
% Structural steel	Steel Beams	Canadian Steel	?	?			

Figure 12 - Auckland University Engineering Building diagram by Fleur Palmer

Waikiwi Papakāinga – A hapū initiative papakainga development

The Waikiwi papakāinga development is an initiative by Ngāi Tūpoto to accommodate whānau returning from urban areas to their ancestral land. Funded by Te Puni Kōkiri (TPK), the project reflects the iwi's commitment to creating self-sufficient, sustainable communities that prioritise both environmental integrity and the wellbeing of their residents (WHAOUT Builders, n.d.). At the heart of this development is whakapapa, a key driver to the framework being developed within this thesis research. Whakapapa deeply influenced both the design and the cultural significance of the Waikiwi Papakāinga project. The development includes a variety of housing options: three two-bedroom homes, five three-bedroom homes, and three single bed-sit units with shared facilities.

These options were designed to foster a sense of community while catering to the varying needs of whānau at the same time. More than just providing shelter, the design honours the iwi's history and spiritual ties to the whenua, embedding the concept of whakapapa into the physical and cultural fabric of the space. Whakapapa is a fundamental concept that extends beyond genealogy to encompass interconnectedness. This understanding has shaped the architectural approach as reflected in the alignment with Ngāi Tūpoto's cultural and ecological values. The homes envisioned as spaces that reflect and honour ancestral connections to the land, providing a lasting link between past, present, and future generations. Sustainability plays a significant role in the project, with features such as solar energy systems, rainwater harvesting, self-watering plantations, and septic tank systems incorporated to promote environmental self-sufficiency (Ngāi Tūpoto Ki Motukaraka, 2023). These sustainable practices resonate with Māori principles of kaitiakitanga (guardianship), reinforcing the connection between the community and the land. By regenerating the land and ensuring its long-term health, the development becomes a way to protect and nurture the whenua for future whānau. The project also addresses the unique challenges of rural development, such as limited resources and infrastructure, by using locally sourced materials and engaging local labour. This approach not only reduces costs and environmental impact but also supports the local community, fostering economic opportunities and reinforcing the cultural identity of Ngai Tupoto. The emphasis on self-sufficiency through local resources is a practical application of the principles of whakapapa, ensuring that the development remains connected to the land and its people. The Waikiwi Papakāinga is an example of how architecture can integrate sustainability, cultural identity, and ecological stewardship. By placing whakapapa at the centre of the design, the development transcends basic housing needs. This case study demonstrates the power of architecture to create spaces that honour the past while providing for the future.

To summarise, these case studies demonstrate how the concept of whakapapa can shape regenerative design practices in varied contexts. In both the Waikiwi Papakāinga and Tūhoe projects, whakapapa serves as a framework that deepens the connection between people, land, and culture. While each project approaches this connection differently, they all use whakapapa to guide sustainable, self-sufficient communities and environmental regeneration. For the Waikiwi Papakāinga, whakapapa is directly embedded into the architectural design,

prioritising ancestral ties and ecological practices. In comparison, the Auckland University's Engineering Building addresses sustainability and ecological regeneration but does not integrate the cultural significance of whakapapa to the same extent.

In the examples of the Waikiwi Papakāinga and Tūhoe projects one can see how whakapapa enriches regenerative design by adding a cultural layer that not only focuses on environmental health but also supports the continuity of cultural practices and identity across generations, further incorporating the idea of whakapapa as an iteration over time.

waikiki papakainga

TAPUWAE INCORPORATION STRATEGIC PLAN 2022-25				
Tirohanga whanui: vision	A diverse and prosperous enterprise that enhances our people and environment.			
Kaupapa: purpose	To protect, manage, develop and grow the Tapuwae asset base balancing economic factors with social, cultural and environmental outcomes.			
He rarangi tohutohu: principles & values of tika, pono, aroha	• Mana whenua: customary authority over our rohe • Wairuatanga: spiritual dimension of the whenua and the people • Tino Rangatiratanga: effective, innovative and visionary leadership • Whanaungatanga: whakapapa connections • Kotahitanga: working together, unity of purpose		• Manaakitanga: whanau supporting whanau • Kaitiakitanga: taking responsibility for our environment so it can sustain us • Ahika: recognition of those that keep the home fires burning • Miitauranga: value of knowledge and expertise • Whakatau tika: accountability and transparency	
Four pou approach	Decisions are underpinned, influenced and impacted by four interconnected wellbeing pou; economic, social, environmental and cultural.			
Key relationships	• Tapuwae Shareholders • Te Runanga o Te Rarawa • Te Rarawa Te Waka Pupuri Putea • Te Tai Tokerau Pamu collective • Forestry sector		• Ngai Tupoto Marae Trustees • Ngai Tupoto ki Motukaraka Trust • He Whenua Topu o Hokianga ki Te Raki collective • Northland Regional Council (NRC) • Department of Conservation (DOC)	
Long term outcomes	*Whai Rawa-Economic*	*Ngai Tupatotanga-Cultural*	*Oranga-Social*	*Te Taiao-Enviranmental*
	• Sustainable return on assets • Contributing to local economy growth • Growth of assets	• Retention & acquisition of whenua • Shareholders connect and know the whenua	• Opportunities for shareholder whanau o Wellbeing projects o Training & employment o Housing	• Whenua rejuvenated & protected • Sustainable business practices

STRATEGIC PRIORITIES 2022-2025					
Priority	*Key Actions*	***Expected Outcomes***			
		Economic	*Cultural*	*Social*	***Environmental***
Forestry					
Priority One Planting and harvesting plan.	1. Document planting and harvesting plan. 2. Maintain partnerships with: o Crown forestry JV o PF Olsen Joint Management Committee 3. Keep up with Carbon developments.	• Forestry right secures long-term annual rental • Carbon revenue	• Tinorangatiratanga, mana motuhake • Use of native species where suitable	• Local employment o Nursery o Planting o Harvesting • Ability to manage our resource • Mutually beneficial relationships in forestry sector	• Ensure best enviro practice • Best use of steep land • Planting manuka riparian buffers and skid sites to protect waterways from sediment run-off & to support honey production
Shareholder benefits					
Priority Two Waikiwi Papakainga development.	4. Develop site and infrastructure plan for papakainga homes, renovation of old homestead, nohoanga facility and utility. 5. Apply for Resource and Building Consent. 6. Identify infrastructure and	• New and ongoing revenue stream • Return on investment	• Manaakitanga • Connection to tupuna whenua	• Shareholder access to the whenua • Housing for shareholders providing whanau security	• Enhancement of Waikiwi whenua • Eco-friendly design • Consideration of enviro footprint - septic and waste water systems • Policies re recycling, composting

Figure 13 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Strategic plan

	vertical build budget, funding opportunities and make application. 7. Secure bank finance for Incorporation contribution. 8. Establish Eal and tender processes for construction phases. 9. Let infrastructure and vertical build contracts. 10. Work with shareholders and whanau to identify suitable tenants. 11. Scope out nohoanga policy.				
Priority Three Putea Tohatoha	12. Maintain and budget for annual contestable shareholder fund for tertiary scholarships, hapu events, small research projects. 13. Update shareholders of application **process, criteria,** eligibility, priority details.	• Opportunities for local enterprise and Io increase skills and knowledge • Qualifications assist h our business	• Events and initiatives that support and bring Ngai Tupoto together • Support for Ngai Tupoto marae	• Opportunities for information and knowledge sharing and learning • Scholarships support whanau development	• Environmentally sound projects
	14. Annual koha to Ngai Tupoto Marae.				
Priority Four Mince for shareholders	15. Trial beef mince for shareholders (at processing cost price).	• Contribution from Tapuwae Farms Ltd	• Manaakitanga from whenua	• Quality kai at reduced price	• Local produce, smaller footprint
Priority Five Access to land on Te Pua block	16. Develop plans to subdivide and on-sell sections to shareholders. 17. Develop policy and eligibility criteria.	• Return on investment • Shareholders support local economy	• Shareholders return to hapu whenua	• Whanau security of home ownership	• Shareholders tautoko kaitiaki of Te Pua
Whenua					
Priority Six Identify whenua h the rohe for acquisition.	18. Document/map key land blocks h the rohe. 19. Bring to our attention and investigate any properties for sale.	• Opportunities to grow Incorp asset base • Local economy supported • Possible opportunities for shareholders	• Return ofwhenua lost over time	• Employment opportunities	• Kaitiakitanga practices
Priority Seven Support Tapuwae Farms Ltd to realise potential and achieve plans.	20. Maintain close relationship. 21. Plans to ensure the Incorp is not reliant on the farm for income.	• Development plans Io realise best return on investment. • Support for collagen market	• History ofTapuwae farm development documented	• Opportunities for shareholder 'hikoi le whenua' to know le taiao and resources	• Kaitiakitanga policies and practices • Land retired for conservation purposes where appropriate • Pest control

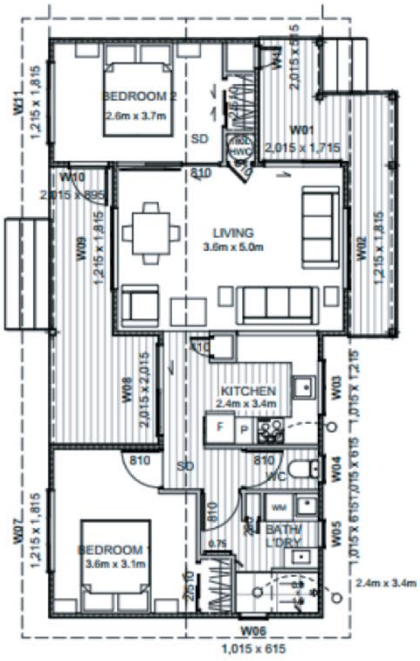
Figure 14 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Strategic plan

					• Understanding climate change impacts mitigation/ preparation
Diversification					
Priority Eight Diversification and added value.	Investigate opportunities for: 22. Possum meat and fur. 23. Establishment of a pet food abattoir. 24. Honey value added. 25. Beach Rd property o Long tenm plan o Installing EV charger 26. Community labour hire mahi/project. 27. Tourism. 28. Septage disposal site.	• Increased revenue	• Opportunities for whanau to reconnect through various projects	• Working collaboratively with Ngai Tupoto ki Motukaraka Trust, Ngai Tupoto Marae and others	• Projects align with Tapuwae taiao plan
Governance/ Structure					
Priority Nine Develop a governance process and improvement plan.	29. Identify structural issues and gaps h current governance processes. 30. Draft governa nee improvement plan. 31. Complete revised lncorp profile document.	• Well prepared and aware of risks • Clarity of roles and responsibilities • Knowledge and understanding of all aspects of	• CoM culture and knowledge of tikanga embedded h practices • Clear understanding of kaupapa and principles • Working together and strengthening haputanga	• CoM learning needs are met • Transparent systems • Succession planning	• Environmental impacts considered h decisions • Environmental expectations are made clear
	32. Maintain strong relationships and collaborations.	Tapuwae operations			

Figure 15 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Strategic plan

Figure 16 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Arcline Site Plan

PROPOSED NEW 2 BED DWELLING FOR



PROPOSED NEW 3 BED DWELLING

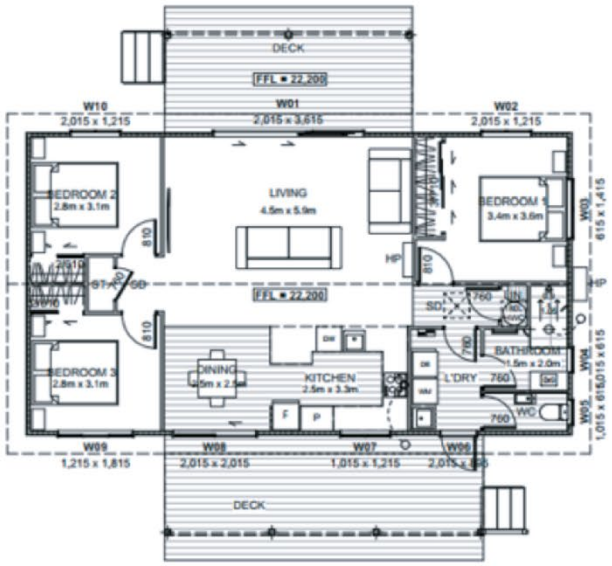


Figure 17- Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Floor plans

Figure 18 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Water Collectioon Systems

Figure 19 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Water Collectioon Systems

Figure 20 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Regenerative Planting

Figure 21 - Ngāi Tūpōtoki Motukaraka - Waikiwi Papakāinga - Construction Process

CHAPTER 2:

WHAKAPAPA AS A METHODOLOGICAL FRAMEWORK

This chapter explores the role of whakapapa as a methodological framework in this research, highlighting its importance in understanding the environments of Hokianga and Opononi. By centering whakapapa in the study, it integrates traditional Māori knowledge with contemporary architectural practices, revealing the deep connections between culture, identity, and landscape.

Part One outlines the principles of whakapapa, showing how it provides a comprehensive framework influenced by the theoretical foundations discussed earlier.

Part Two examines mapping as a whakapapa method, focusing on its ability to analyse social, cultural, and ecological aspects of a site, particularly through James Corner's influence on hydrological and ecological mapping.

Part Three explores iterative making as a whakapapa method, drawing on Bob Sheils' work.

Part Four reviews Rachel Whiteread's casting technique, illustrating how she transformed everyday objects and used iterative sequencing and memory in her practice.

Part Five ties the research to mōteatea (songs), sharing the knowledge of Hokianga's elders and deepening the understanding of the region's history. This sacred section incorporates Māori language and storytelling, reinforcing the concept of interconnectedness within whakapapa—people, place, and environment across time.

CHAPTER 2 - PART ONE

WHAT IS METHODOLOGY OF WHAKAPAPA?

The term “methodology” refers to the system of methods and principles that guide the process of gathering, analysing, and interpreting data in research (Creswell & Poth, 2016). In this context, the cultural concept of whakapapa was applied as the guiding methodological framework. Whakapapa refers to the interconnectedness of people, land, and the environment—as a guiding framework. As a research framework, whakapapa emphasises the importance of relationships, cycles, and layers of knowledge, which were crucial for designing solutions that respected and regenerated cultural and ecological systems.

The methodology highlights both spiritual and metaphysical aspects that are deeply embedded in Māori worldviews. These perspectives place the physical environment within a broader spiritual context, recognising the intrinsic relationship between people and nature.

The work of Yates and Mika had been influential in shaping the theoretical understanding of how whakapapa could be applied in architecture and community development. Their research provided a framework for the regenerative principles used in papakāinga design, particularly in Opononi. These principles focused on sustainability, cultural stewardship, and ecological health, with the aim of creating spaces that strengthened cultural ties and promoted the well-being of the community.

A key feature of this methodology is the shift from a human-centred approach to an eco-centred one. As there are several iwi and hāpu who are under the umbrella of a Māori in New Zealand this context will pertain directly to customs of Ngāpuhi iwi. So, within the Ngāpuhi iwi the environment is as a living, interconnected system. Instead of prioritising human needs, an eco-centred approach places the environment at its core, recognising that human well-being is tied to the health of the land, sea, and sky. This wider connection to whakapapa is central to the methodology.

While Atua (Māori gods) were not the primary focus of this research, they play an important symbolic role in Māori culture. The Atua represents the spiritual and ecological relationships that connected humans to the natural world, reinforcing the values of respect, care, and reciprocity in our interactions with the environment.

Grounded in whakapapa, the methodology of this thesis offers a culturally informed approach to architectural design—one that prioritises sustainability, ecological health, and cultural stewardship. When applied to designing a papakāinga for communities in Opononi, the goal was to integrate the principles of whakapapa and regenerative design. By incorporating these insights, the project aimed to create spaces that promoted strong cultural connections, environmental sustainability, and community well-being, while also respecting the traditional knowledge and values at the heart of Māori culture.

CHAPTER 2 - PART TWO

METHOD: MAPPING

This section explores mapping as a critical tool for understanding the social, cultural, and ecological complexities of a site and its wider environment. In the following I examine the mapping work of landscape academic James Corner, specifically his approach to Operative Mapping, and then discuss how this method informed my own work.

In this research, mapping served to document and analyse the interconnected systems of Opononi and Whirinaki, blending cultural knowledge with ecological and hydrological processes. The approach to mapping thus shifted from a human-centric to an eco-centric perspective, which reflects Te Ao Māori and its application to regenerative design in Hokianga.

James Corner's work in The Agency of Mapping introduced operative mapping as a method that captures dynamic ecological processes and human-nature interactions. Corner stated that "If maps are essentially subjective, interpretative and fictional constructs of facts, constructs that influence decisions, actions and cultural values generally, then why not embrace shaping new realities?" (Corner, 1999, p. 99). His mapping methodology was not merely about creating static representations of the landscape but about engaging with the dynamic processes that shaped a place. operative mapping involves documenting not only the visible elements of the landscape but also uncovering the hidden

forces—social, cultural, ecological, and historical—that influence the environment. This approach allows for a deeper understanding of how places evolved over time, integrating past narratives with future possibilities. By considering these multi-layered aspects, Operative Mapping has become a tool for reimagining spaces, enabling designers to create interventions sensitive to both the physical and socio-cultural contexts of a site. Operative Mapping is particularly useful for visualising complex phenomena, such as water flow and climate impacts, which aligns with the regenerative goals of this research. Corner's emphasis on mapping as a generative tool, rather than a fixed representation, was especially relevant for the current study as this conceptualisation of mapping supports adaptive design strategies that resonated with Māori worldviews and environmental rhythms.

In the current study, Corner's layered mapping methodology formed the foundation for a mapping practice that allowed me to trace the complex web of social, cultural, and ecological, environmental relationships underpinning the papakāinga development framework in Opononi. In this context, mapping served as a connective tool, ensuring that design decisions were deeply aligned with the whenua. By combining Indigenous, ecological, and hydrological mapping techniques, the framework fostered a regenerative, self-sustaining community model where the papakāinga became an interconnected system that supports both people and the environment. This research demonstrates that mapping is not just a tool for spatial analysis; instead, it is a way of seeing, understanding, and designing in relationship with the land. Moreover, regarding the current study, mapping ensured that the concept for a future development in Opononi was rooted in whakapapa, environmental resilience, and intergenerational well-being.

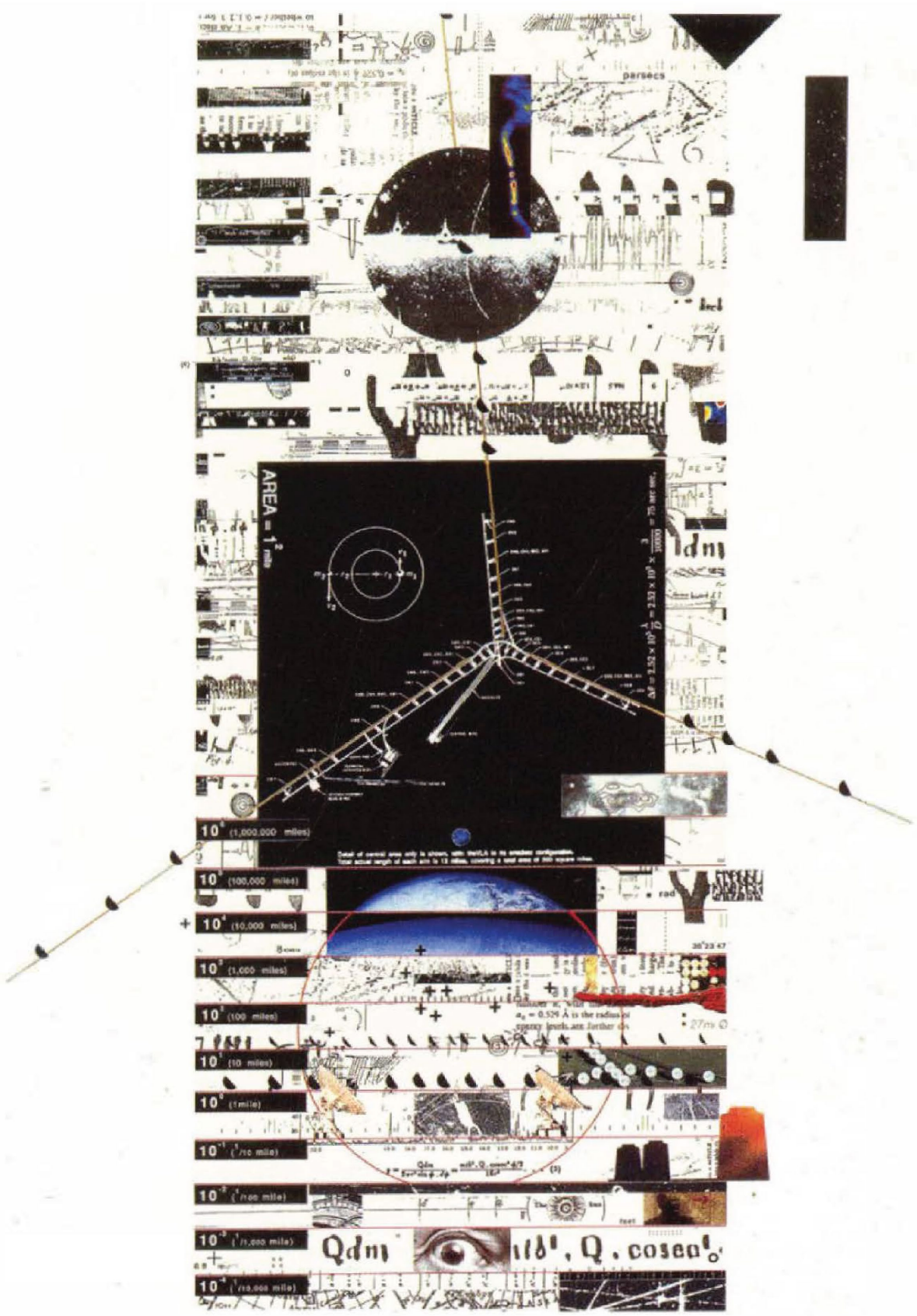


Figure 22 - Corner, J. (1995). Taking measure across the American landscape

CHAPTER 2 - PART THREE

METHOD: ITERATIVE MAKING

Part Three of this chapter explores iterative making, a core method in this research that prioritises continuous refinement and exploration. It encourages flexibility in design through feedback, experimentation, and adaptation, enabling ideas to evolve progressively (Sheil, 2020). This approach is particularly effective when engaging with cultural and ecological systems, balancing tradition, and innovation (Sheil, B. (Ed.).2008).

Iterative making, inspired by Bob Sheil's approach, views architecture as a continuous exploration, where models and prototypes evolve through ongoing refinement. This process emphasises dynamic learning, where design is a cyclical, adaptive response to materials, ideas, and the environment. In this research, iterative making enabled a dialogue between theory, cultural knowledge, and design. Ideas were revisited, tested, and reworked to align with whakapapa values and meet community needs. Prototyping and feedback ensured the design remained adaptable to both environmental and cultural contexts. A key aspect of this method is iteration over time, which extends the research into future thinking. By considering how the design might adapt to changing conditions, the architecture was made flexible for future generations. This approach ensured that the design remains responsive to evolving environmental and cultural contexts, fostering long-term sustainability.

In the book *Design Transactions: Rethinking Information Modelling for a New Material Age*, Sheil exemplified this iterative process through continuous model-making and real-time adjustments (Sheil, 2020). Each iteration of his model-making process, both physical and BIM (Building Information Modelling), involved specific adjustments to his project, incorporating feedback loops in a collaborative idea-producing setting. This approach provided valuable insights into spatial relationships and material properties, highlighting the role of hands-on experimentation in fostering deeper understanding and innovation. This method was especially relevant to the design process in Hokianga and Opononi, where sensitivity to the unique cultural and ecological factors was essential.

In summary, Sheil's iterative approach highlights that design was an ongoing dialogue among ideas, materials, and environments. It fosters architectural innovation while ensuring the design is responsive, sustainable, and attuned to the cultural and ecological narratives of its landscape. In this research, I applied this method to the model-making process for the Opononi papakāinga, using physical models to test and refine design concepts. Like Sheil, I learned from my models—refining ideas, exploring materials, and adapting to feedback—so that the design could evolve over time and remain relevant to the community's long-term well-being.

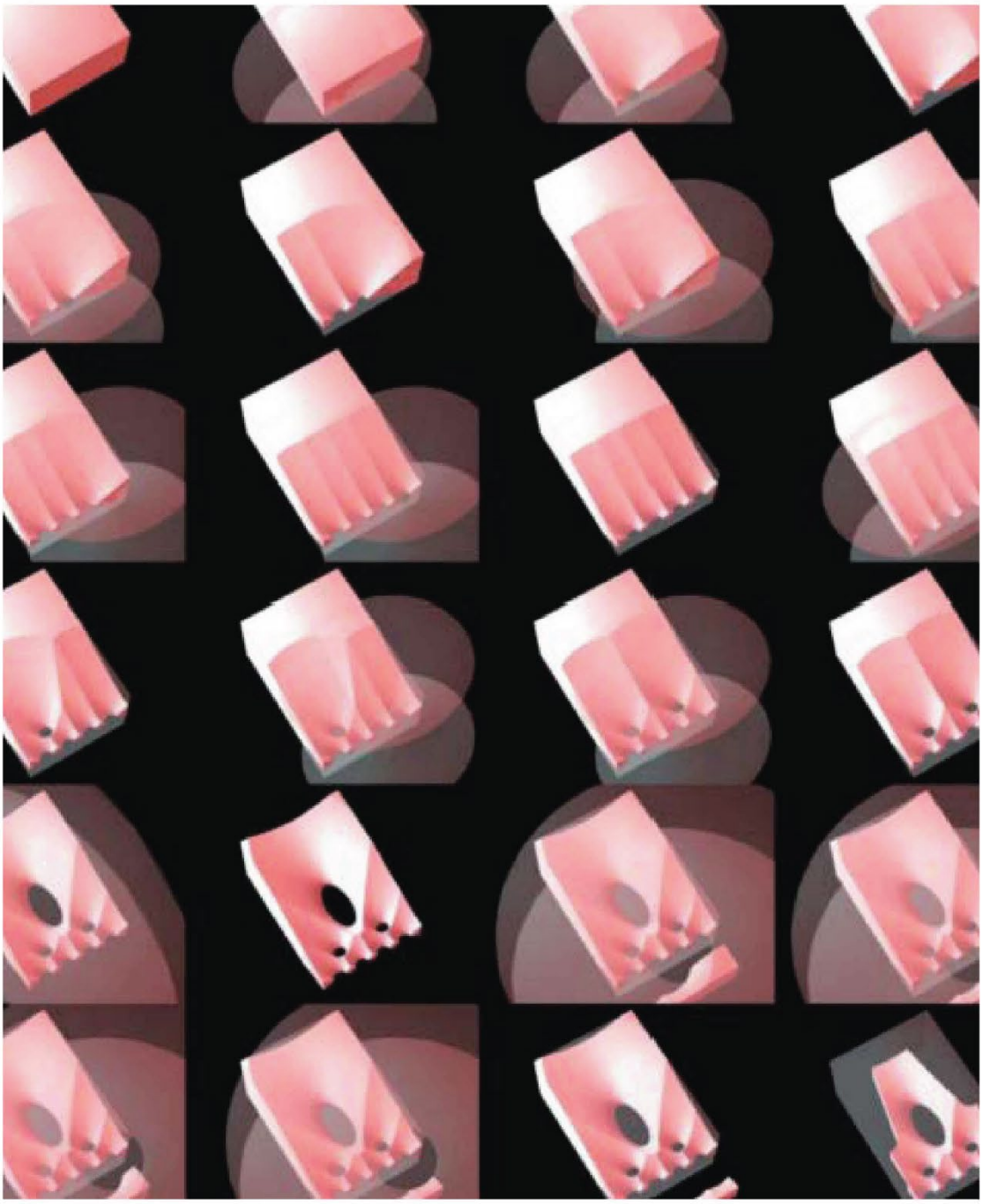


Figure 23 - Sheil, B. (2005). Design through making

CHAPTER 2 - PART FOUR

METHOD: CASTING AS AN ITERATIVE PROCESS

Rachael Whiteread's work illustrates casting as an iterative process that captures the essence of negative space, memory, and absence. Through her meticulous methodology of layering and refining casts, she reveals spatial and material qualities while inviting critical reflection on the relationship between individuals and the built environment. Her art demonstrates the power of iterative making, where each layer adds depth, meaning, and insight into the physical and emotional qualities of space (Whiteread & Kellein, 2001). Whiteread's installation *House* is a prime example of how casting as an iterative process can transform our understanding of space (Artsy Editorial, 2017). By creating negative moulds of a Victorian house's interior, she captured the intimate details of the walls, fixtures, and contours using plaster and concrete.

The iterative nature of Whiteread's work is evident in her approach to refining each cast. As she dealt with material shrinkage, imperfections, and other challenges, each layer of casting offered insights that helped her refine the final installation. This process was not only about the technicality of materials but also about deepening the conceptual and emotional resonance of the piece. Whiteread's work transformed absence into presence, with each successive iteration enhancing the viewers' understanding of space's historical and emotional significance. The iterative process of casting allowed Whiteread to capture the nuances of both physical materials and intangible concepts such as memory and identity. By continuously refining her cast, she explored the interplay between presence and absence, which invites contemplation of what is lost and what remains (Archive of Destruction, n.d.). In doing so, she challenges traditional views of architecture by focusing on the voids and memories that shape our experience of space Pollack (2013).

In the context of this research, Whiteread's iterative process of casting offers valuable insights for designing papakāinga in Opononi. The method of working with layers and sequences in her casting process aligns with the idea of capturing cultural, ecological, and material traces within architectural design. By applying a similar approach to the creation of models or physical forms, this research could explore how iteration and the act of casting captured both the essence of whenua (land) and the cultural narratives associated with it. Just as Whiteread's work reveals the deeper meanings embedded in physical spaces, this methodology served to uncover and preserve the cultural and ecological memory of the land in Hokianga.

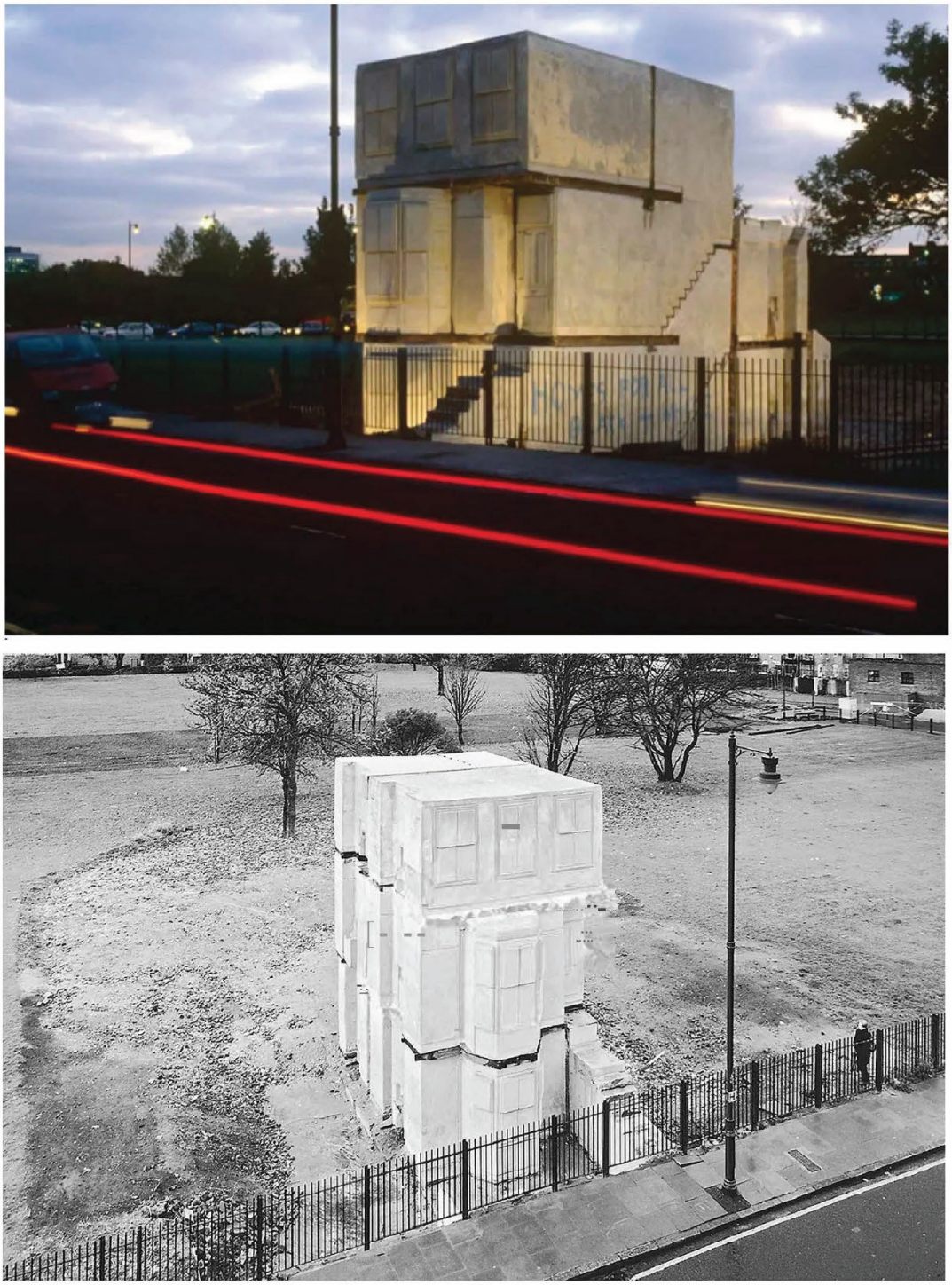


Figure 24 - Whiteread, R. (1993). House

CHAPTER 2 - PART FIVE

METHOD: IMPORTANCE OF MŌTEATEA-O-NGĀPUHI

This section explores the significance of mōteatea – chants - as a method for understanding historical events and cultural narratives, particularly in relation to the deep connection Ngāpuhi and broader northern region. Māori oral traditions have long served as a means of passing down knowledge, ensuring that cultural identity remains strong across generations. Several scholars have explored the significance of waiata and mōteatea as vehicles for transmitting knowledge.

The role of waiata in transmitting cultural knowledge has been extensively researched. In the text *Ka whawhai tonu mātou: Struggle without end,* the importance of waiata, pūrākau (stories), and whakataukī (proverbs) maintain cultural identity and ensuring the intergenerational transmission of knowledge (Walker, 1990).

Māori language and cultural practices are fundamental to the preservation of Māori identity and heritage, maintaining their significance despite the pervasive influence of Western society. While colonialism and Western ideologies have historically challenged these practices, they have also underscored the resilience of Māori traditions, which continue to reconnect and nurture cultural identity in the face of external pressures.

Historically, attending Kura Kaupapa Māori was a privilege not afforded to all generations, particularly when Māori language and cultural practices were suppressed by Western institutions. This research acknowledges this historical context and highlights the ongoing role of Māori cultural practices, such as mōteatea, in preserving the narratives, histories, and genealogies of Māori communities.

Focusing on mōteatea-ō-Ngāpuhi, this study examines its content as a cultural and historical artifact that connects Māori experiences—particularly regarding land—with broader principles of Te Ao Māori. Mōteatea not only reflects historical events but also fosters spiritual connections that deepen the understanding of culture, identity, land, and whānau (family). Despite the influence of Western society, Māori language and practices remain central to Māori identity. This research reaffirms and reclaims Māori traditions as essential expressions of this identity.

The role of whakapapa within mōteatea is a central focus, encapsulating cultural and historical ties in both theoretical and practical terms. Whakapapa is an iterative process that ensures the retention and honouring of teachings embedded in these compositions, integrating mātauranga Māori and recognising the interconnectedness of social, cultural, and ecological knowledge. Through the analysis of mōteatea-ō-Ngāpuhi, this research sheds light on the history of Northern New Zealand, particularly during the early settler period, and explores how this knowledge can inform the development of papakāinga. By engaging with the emotions, stories, and ancestral connections within mōteatea, the research ensures cultural sensitivity and historical awareness, grounding design decisions in whakapapa and local narratives.

The mōteatea examined for the purposes of of this study was “I te tekau ma wha”. composed by Tarau Titore and passed down to the iwi of Te Uri Roroi, Te Parawhau, Te Mahurehure ki te Kokoru o Mangakahia, Ngāti Wai, Ngāti Taka, Ngāti Korora, and Te Waiakiri, is rich in historical and cultural

significance. It references key events and places such as Ōihi strengthening the iwi's ties to the land of Ōihi which is the Bay of Islands, Northland, New Zealand (NZHistory, n.d.).

Kaitito (composer): Tarau Titore
Kaiwaiata (singer): Hone Wharemate, Taipari Munroe

Kaikorero ((orator): Taipari Munroe

Ngā kupu (words):

I te tekau mā wha

In the year of (1400)

Ka ū te whakapono e i

Faith will settle in

Ki runga i Ōihi

Upon Ōihi (a historical location)

Ka tū te matenga e i

Death will stand

Ko te kupu tēnei kei te rangi te atua

This is the word of the heavens, the divine

Me huri koutou me titiro ki reira e i

Turn and look there

Ka huri te Māori ka titiro whakarunga e

The Māori will turn and look upwards

Ka huri te matenga ka titiro whakararo e i

Death will turn and look downwards

Ki te papa oneone ki Aotearoa e

To the land, to Aotearoa (New Zealand)

Taiapa rawa mai ki te pāraharaha e i

The fence comes up to the barriers

I te pātītī, i te rōriarino e

In the fighting, in the peace

I te paraikete whero nāu e te kawana e i

The red flag is yours, O governor

Kua riro te whenua e tere rā i te moana e i

The land has been taken, swiftly to the sea

The study and translation of mōteatea has been both enriching and personal, connecting my research to Opononi. While not directly referencing Opononi, the mōteatea preserves shared historical timelines from Ōihi, making it highly relevant to Ngāpuhi iwi and Opononi.

Architecture is not just about buildings; it's about creating environments that honour cultural narratives and are adaptable to the future (Pallasmaa, 2012). Following Ngāpuhi research practices, learning the mōteatea was vital. This knowledge, now carried in memory, strengthens cultural identity and deepens understanding of place. It also underscores the significance of oral traditions in preserving Māori heritage. In the Opononi papakāinga design, this knowledge will weave into both the spiritual and auditory experience, embedding cultural histories within the space.

Figure 25 - Nga Moteatea o Ngāpuhi, I Te Tekau Mā Wha by Ngā Moteatea o Ngāpuhi (2020)

CHAPTER 3:

DESIGN METHODS IN DEVELOPMENT

Chapter Three examines the diverse design methods developed throughout this research The chapter is structured into four interconnected parts as outlined below. The methods build on strategies from previous chapters, applying them as active tools in architectural processes, making, and design outcomes as part of an architectural process.

Part One: Mapping Opononi
This section explores the cultural, ecological, and hydrological aspects of the Opononi site, extending the study to the Hokianga region through cultural, manu (bird), tree, and soil mapping. The mapping informed the design by ensuring accurate architectural placement while simultaneously considering environmental, social, and cultural factors, as well as the future of the site's ecologies. The section also addresses material selection, extraction processes, and native tree planting, factoring in growth timelines and knowledge generation.

Part Two: Concept Design + Models
This part focuses on iterative making, highlighting how initial ideas evolved through cycles of experimentation and refinement. It emphasises the importance of hands-on processes in shaping architectural outcomes, forming the foundation for the final design.

Part Three: Mōteatea-ō-Ngāpuhi
This section brings a cultural perspective to the design by incorporating indigenous knowledge and narratives. It examines how integrating mōteatea enriches contemporary architecture, deepening the understanding of place and identity. The insights gained in this section were incorporated into the final design as a sound element, reinforcing the cultural connection to the land.

Together, these parts provide a comprehensive overview of the design methods, by integrating socio-ecological considerations, iterative processes, innovative construction techniques, and cultural narratives, this chapter highlights the multifaceted nature of architectural practice and the potential for creating meaningful, sustainable spaces.

CHAPTER 3 - PART ONE

MAPPING OPONONI AND WHENUA CONNECTION

In this whakapapa-grounded study and building from Corner's complex socio-ecological maps, multiple mapping techniques were integrated to develop a holistic understanding of Opononi. This section explores the cultural, ecological, and hydrological aspects of the Opononi site through manu mapping, rākau (tree) mapping, wai (water) mapping, papa (soil) mapping, and cultural mapping. The insights gained in this section informed the final design by ensuring the accurate placement of buildings within the site, considering how their positioning might adapt to potential environmental changes such as flooding, coastal erosion, and shifts in the surrounding ecology, while also factoring in environmental, social, and cultural considerations, as well as the sustainability of local materials.

Cultural mapping documented Māori relationships with land, including place names, oral histories, and customary land use, ensuring the proposed papakāinga development aligned with Māori values.

Ecological mapping tracked native bird populations and tree ecologies, highlighting their interactions within the landscape.

Hydrological mapping, informed by Corner's methodologies, traced water movement, retention areas, and irrigation systems, addressing flooding risks and water-sensitive design opportunities. These mapping layers together provided a multi-dimensional analysis of the visible and invisible systems shaping the landscape.

Map One: Cultural Mapping

Cultural mapping held particular significance in this research as it acknowledged the primordial beings Ranginui (Sky Father) and Papatuanuku (Earth Mother). To support the cultural depth of this research, I developed a cultural map that incorporated eight key cultural factors: moana (ocean), puna or awa (river or stream), marae (traditional meeting house), iwi (tribe), hapū (sub-tribe), ngahere (forest), kura kaupapa (Māori-immersion schooling), and mahi toi o naianei (contemporary Māori art), with a focus on the region of Hokianga, Northland, New Zealand, this data collected through a series of geological research through LINZ, and personal knowledge of the area.

Moana: This highlighted the significance of Atua Tangaroa, the deity of the sea, particularly within the Hokianga region, where the sea is an integral part of the local environment and culture. The cultural and spiritual connection to Tangaroa reflected the importance of the ocean in sustaining the community, providing resources such as food and shaping the identity of the people. The proximity of the sea to the site reinforced the need to consider the role of water and coastal ecosystems in the design, fostering a deeper understanding of the relationship between the land and the sea in the Hokianga region.

Puna or Awa (River or Stream): These waterways provide wai Māori (drinking water), essential for iwi and hapū, which emphasises the interdependence between human communities and natural systems.

Marae (Traditional Meeting House): The marae actes as a turangawaewae (ancestral homeland) for each iwi, embodying cultural identity and its connection to the surrounding environment.

Maunga (Mountain): The mountain represented the deep connection Māori have to whenua (land). The mountains, parted by the awa (river), told a story of their own. The Maunga shaping and supporting the surrounding environment.

Iwi (Tribe) and Hapū (Sub-tribe): The cultural map highlighted the demographic distribution of iwi. There are a multitude of iwi across Aotearoa (New Zealand), but this map focused on Ngāpuhi in the Hokianga region.

Ngahere (Forest): Is associated with Atua Tānemāhuta, the acknowledge of Atua such as Tāne exemplifying the ecological balance and spiritual significance of forests in the context of cultural mapping.

Kura Kaupapa (Māori-immersion Schooling): While not related to ecological environments, kura played a crucial role in preserving mātauranga Māori (Māori knowledge) and cultural practices, particularly in fostering safe environments to learn Te Reo Māori (Māori language).

Mahi Toi o Naianei (Contemporary Māori Art): This section is less about ecologies and more about how art influences cultural expression in alot in and on architecture today through visual representations of pūrakau (stories) and whakapapa (genealogy), blending traditional knowledge with contemporary design to deepen the connection between culture and place.

Figure 26-27 informed by whakapapa, highlights the interconnectedness of the cultural icons within the cultural map, and offered a deeper understanding of the site. The cultural mapping process enhanced Valuable visual accounts of the area that enabled the development of a whakapapa framework work within this research. By identifying the essential elements of Te Ao Māori (Māori world), the mapping grounded the research in a culturally rich context.

Throughout the process of designing the papakāinga, I regularly returned to this map to ensure that my design philosophy, methodology, and approaches are appropriately grounded in Māori culture specific to the site.

Reflecting on the cultural map deepened the understanding of the geological context and the potential role of infrastructure in supporting Māori development. The proximity of kura (Māori schools) and kōhanga (childcare centres) to the site became increasingly evident, offering insights into how these established institutions could enhance the Opononi Papakāinga. The location of iwi and hapū in relation to the site was also a good finding, with particular attention given to how the design of the Opononi papakāinga could align more closely with iwi and hapū needs and aspirations. This process of cultural mapping prompted a critical examination of the broader community, highlighting the importance of addressing the needs of the extended iwi, hapū. It facilitated a deeper understanding of how to design spaces that not only serve the immediate community but also respect the wider cultural and social landscape. This approach ensures that the papakāinga development can support long-term Māori development and well-being of the extended community.

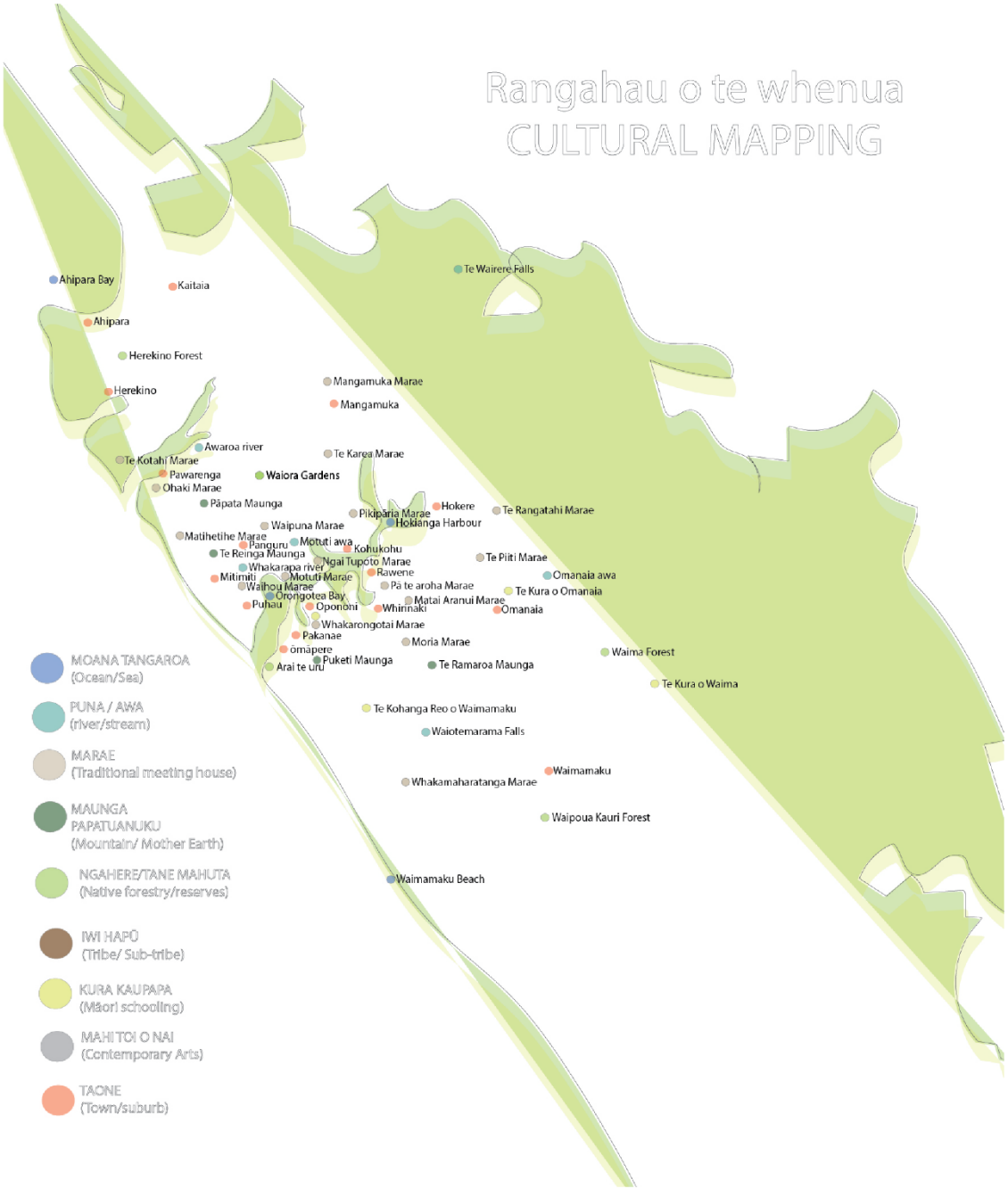


Figure 26 - Rangahau-o-te-whenua (Cultural Mapping)

Figure 27 - Cultural Mapping Hokianga

Map Two: Manu Mapping (Birds) & Native Rākau (Trees)

The manu mapping intergraded various sources including from the Department of Conservation. Manu mapping identified bird species and their ecological roles, while native rākau (trees) were mapped to understand their contribution to the local ecosystem and potential for material selection. The rakau research was gathered from research found withing Te Ara Encyclopedia of New Zealand (Dawson, 2007). This dual focus offered a comprehensive view of the site's biodiversity and ecological balance, ensuring native species were integrated into the design process to support long-term ecological health.

Insights from the manu and rākau mapping guided the selection of local material selection, particularly native trees, for sustainable construction. The map captures the growth rate over time and compares with other tree species to understand which is best for the current soil types in Opononi. By growing and harvesting these trees, the project adopted a regenerative model that strengthened the connection to the land, supported ecological restoration, and provided locally sourced building materials, aligning with the iwi's values and encouraging community engagement with the land.

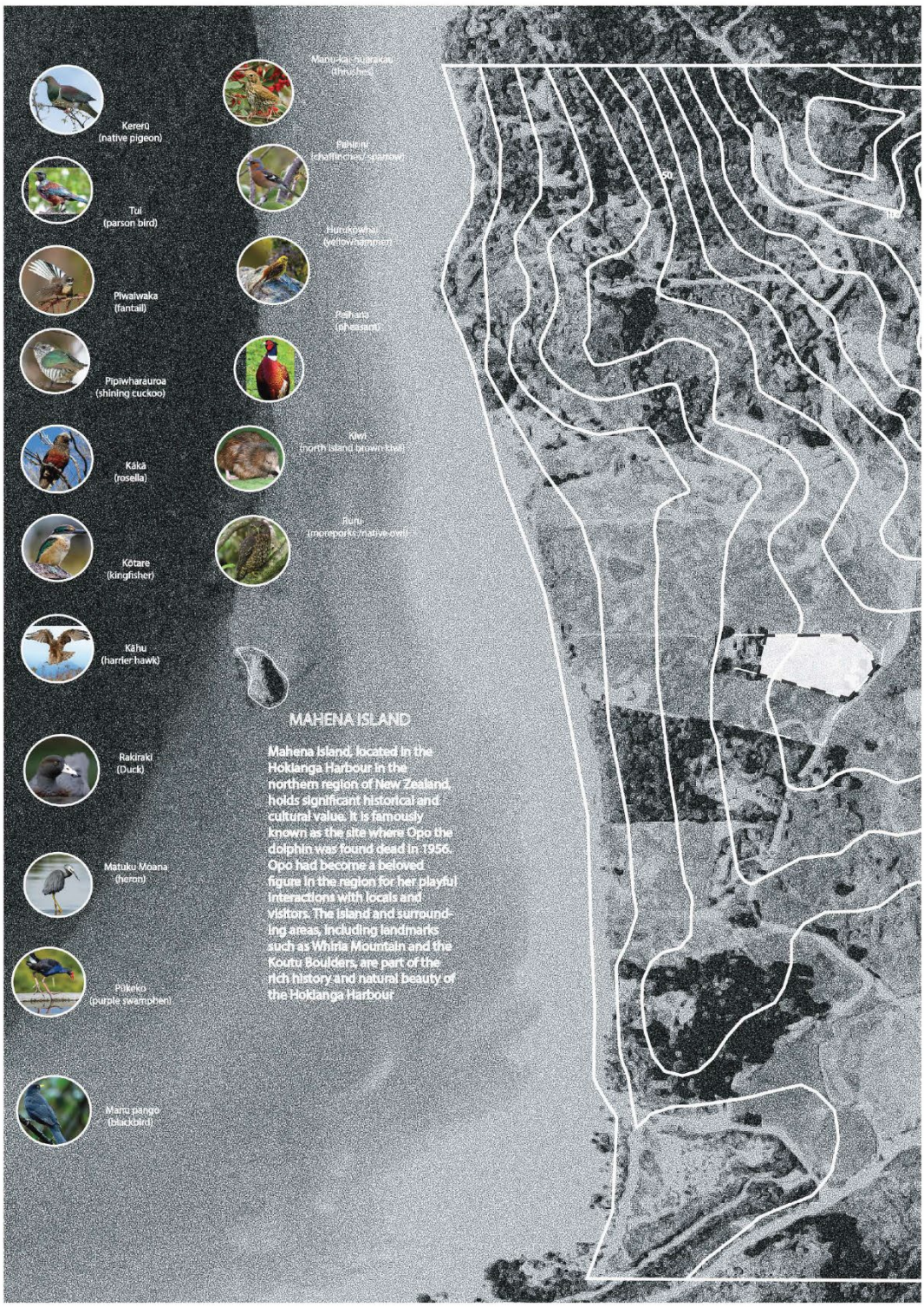


Figure 28 - Manu Mapping Hokianga (birds)

Figure 29 - Manu Mapping Hokianga (birds)

Map Three: Wai Mapping (Hydrological)

This wai (water) mapping figure 30, examined the water systems within and around the site, including rivers, streams, wetlands, and groundwater. This was essential for understanding water flow patterns, identifying potential flood risks, and managing water resources effectively. Given that Opononi is a coastal town, hydrological mapping also acknowledged the impacts of sea-level rise and coastal erosion, which were key considerations for the design. Based on this hydrological mapping, water management strategies could be developed and integrated into the sustainable design. The water management strategies developed aim to mitigate risks associated with flooding and coastal erosion, ensuring that the development remains resilient and adaptable to future environmental changes.

This offers a visual representation of the moana (ocean level), awa (rivers), contours, and buildings in relation to the surrounding water systems, the Opononi area is encircled by water, with sea-level rise projections as follows: approximately 0.1 to 0.2 metres (10–20 cm) by 2025, likely between 0.3 and 0.5 metres (30–50 cm) by 2050 as emissions continue to rise, and ranging from 0.6 to 1.0 metres (60–100 cm) by 2100, with more extreme scenarios suggesting even higher increases if emissions remain at the upper end (NZ SeaRise, n.d.). This map highlights the importance of incorporating sea-level rise mitigation strategies within the papakāinga development, such as elevated foundations, careful consideration of building placement in relation to rising sea levels, and effective water collection and storage from nearby streams and water systems.

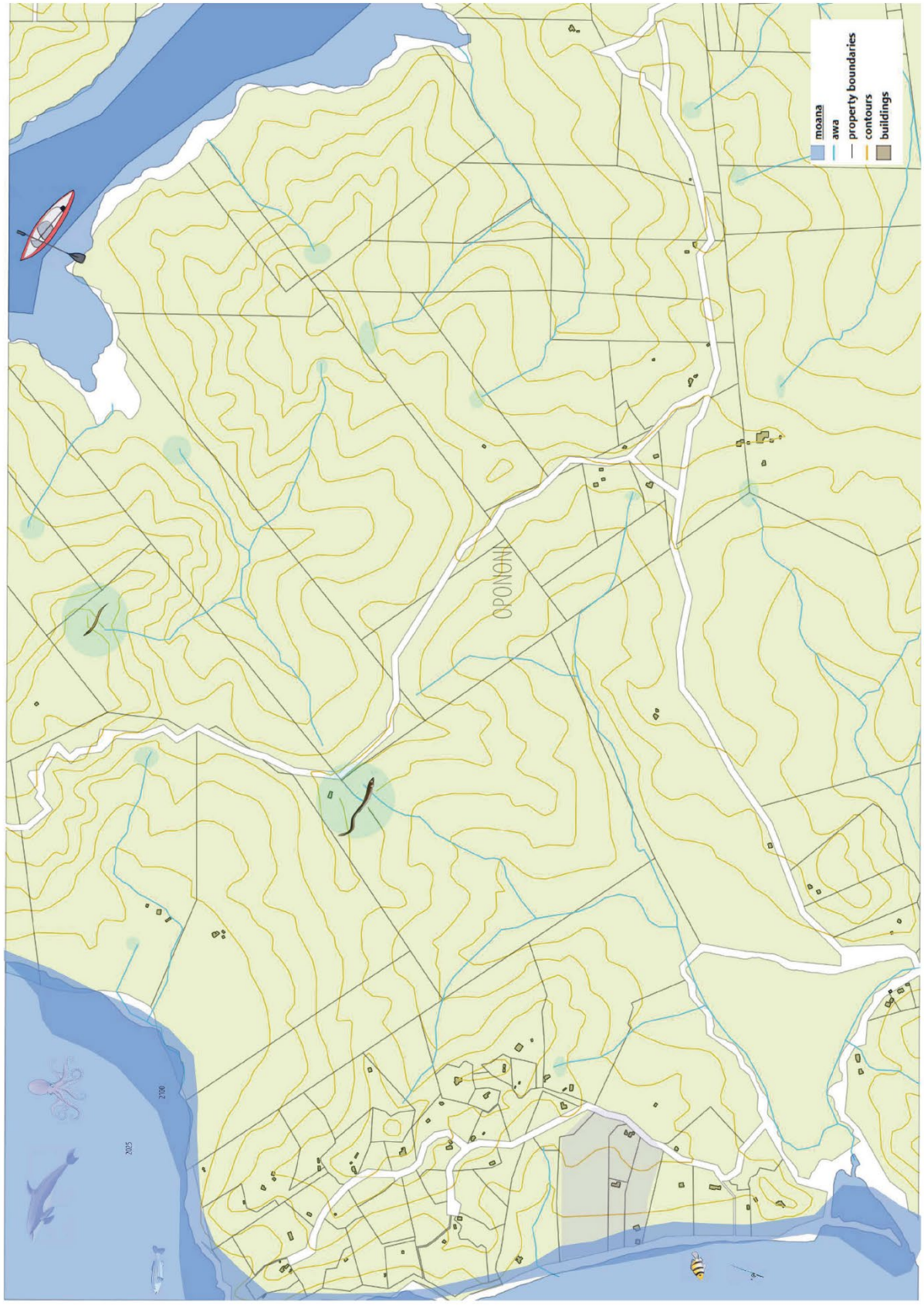


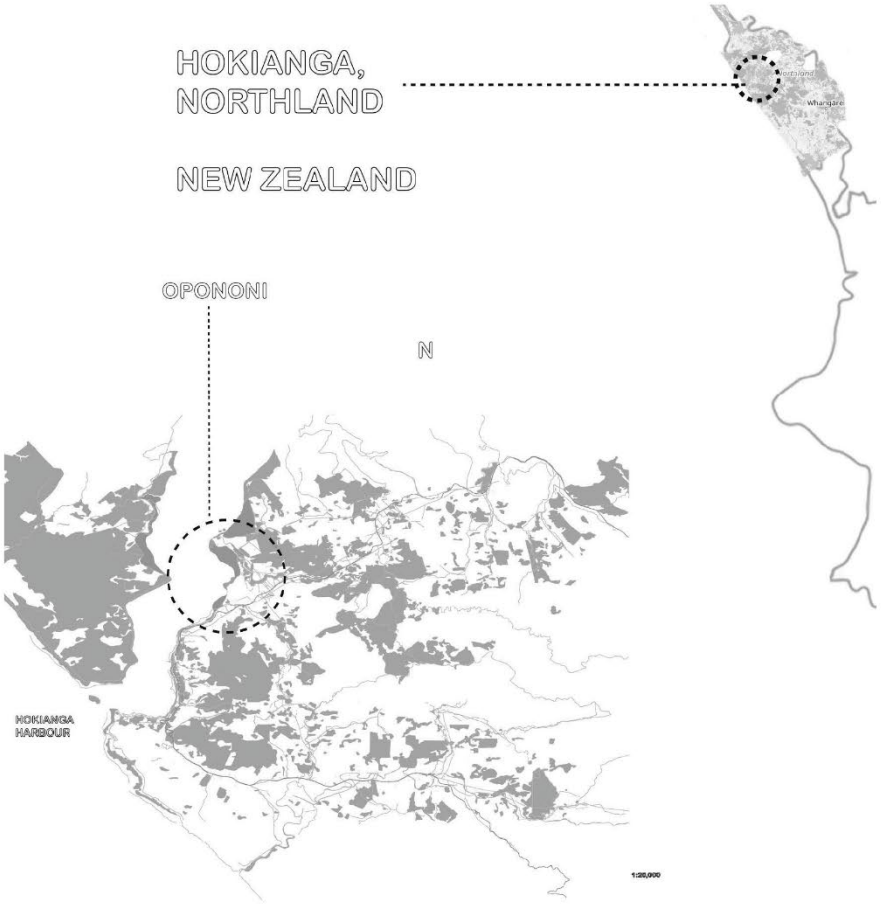
Figure 30 - Wai Mapping Opononi

Map Four: Soil Mapping

Soil mapping investigated the soil types of the site, providing insight into the land's ability to support several types of vegetation and development. Understanding the soil's composition was critical for determining appropriate land use, including tree plantation for construction materials, plant species, and agricultural practices. Figure 31 illustrates the diverse types of soil in Opononi and surrounding region. This map also shows the level of moisture held in the soil due to being in a coastal area, certain aspects like drainage are particularly important when considering plantation for regeneration of ecologies, specifically trees.

The mapping process not only highlighted the interconnectedness of the land, water, flora, fauna, and people but also ensured that these natural systems were respected and supported throughout the development. By understanding the local environment through the lens of these maps, the project could develop suitable sustainable practices, such as using native trees for construction, maintaining water systems, and preserving local ecosystems.

This knowledge guided the development of a sustainable and culturally rich community that aligns with the values of the iwi, reinforcing their connection to the land and fostering long-term ecological health. Moreover, by integrating these findings, the papakāinga development reduced construction costs, enhanced self-sufficiency, and provided economic opportunities while ensuring environmental and cultural sustainability. These insights are applied in the next chapter, which focuses on practical applications for Opononi’s community and their relationship to the land and resources.



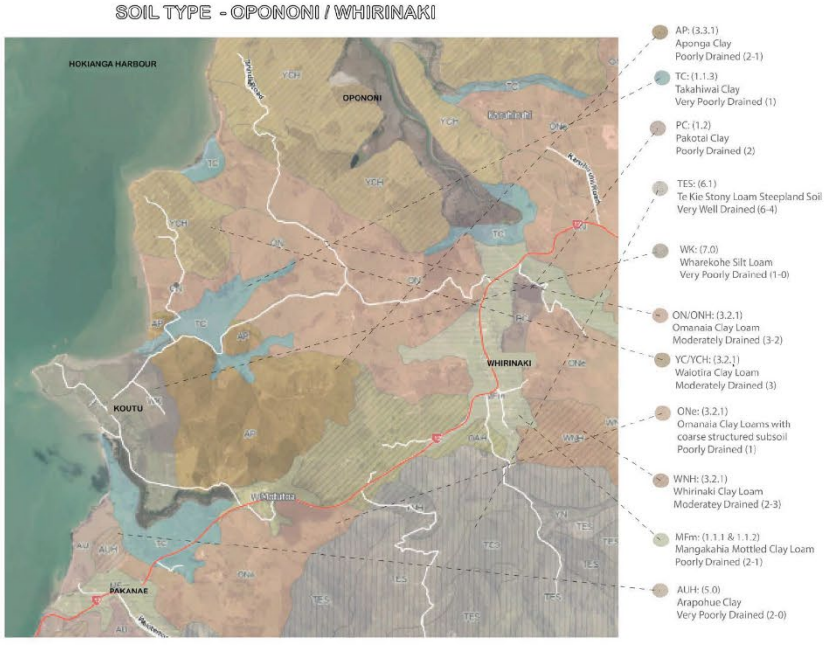


Figure 31 - Whenua Soil Mapping

CHAPTER 3 - PART TWO

CONCEPT DESIGN + ITERATIVE MAKINGS IN THE DESIGN

Part Two of this chapter focused on the concept design phase, where research and theoretical frameworks were transformed into tangible design outcomes. Emphasising the iterative nature of design, this section highlighted the importance of continuous refinement and adaptation in shaping meaningful results.

The models within this chapter explore materiality, craft, and hands-on making as integral components of an iterative process. This approach enabled continuous design evolution through experimentation and refinement. Various modelling materials and methods were employed, including 3D printing, which was used to create prototypes. The process began with an Ender-3 printer using PLA+ filament, a biodegradable thermoplastic derived from renewable resources.

This investigation into material sustainability also considered alternatives such as recycled filaments and plant-based options, contributing to a more sustainable design approach. The iterative nature of 3D printing facilitated the exploration of complex forms while minimising material waste— a key consideration in papakāinga development and its connection to whakapapa.

This section also addressed the challenges of creating non-standard shapes and forms, prioritising innovation, and material efficiency. By integrating these technologies, the design process fostered creativity while aligning with sustainable practices. The iterative modelling process was guided by whakapapa, reflecting a layered approach to development. Over multiple iterations, forms began incorporating circular openings, exploring how these elements could enhance indoor-outdoor connectivity within a building.

While not all iterations resulted in the final design, each stage provided valuable insights, allowing for learning from both successful and unsuccessful ideas. By embracing iterative design principles, this section established a foundation for adaptable, sustainable, and contextually relevant architectural solutions.

Whakapapa as a Driver of Design Development

The iterative nature of model-making was central to design development. Just as whakapapa speaks to cycles of creation and renewal, each model built upon the last, symbolising the generational transmission of knowledge and change. The organic, flowing forms sculpted from clay became integral to the design, fostering a porous, interconnected relationship between the built environment and the land. This permeability symbolised the balance between human habitation and nature, enabling indoor-outdoor connectivity and environmental responsiveness.

Figure 32 - Iterative Casting Models

Figure 33 - Iterative Casting Models

Figure 34 - Iterative Casting Models

Figure 35 - Iterative Casting Models

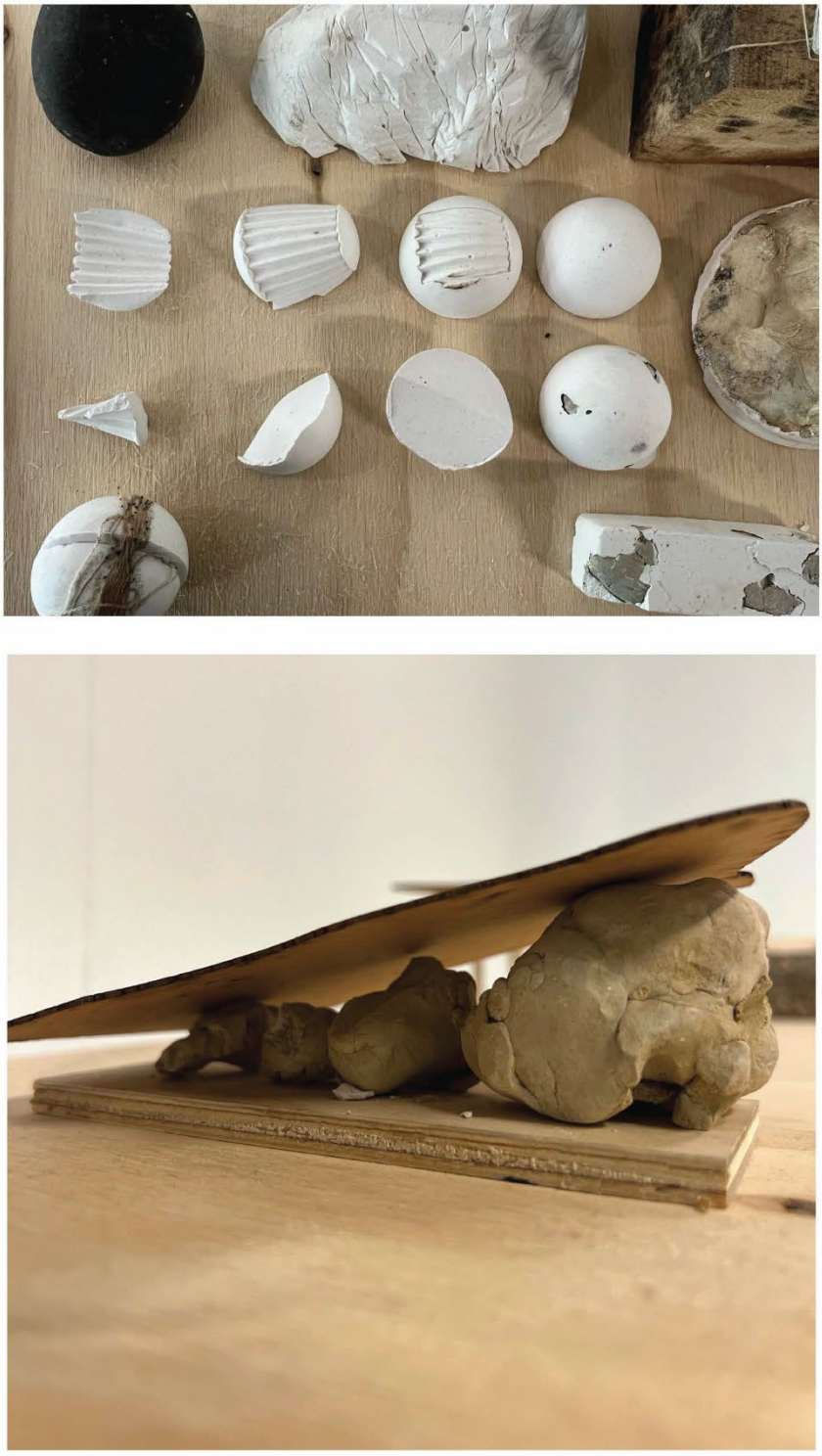


Figure 36 - Iterative Casting Models

Figure 37 - Iterative Casting Models

Figure 38 - Form Exploration

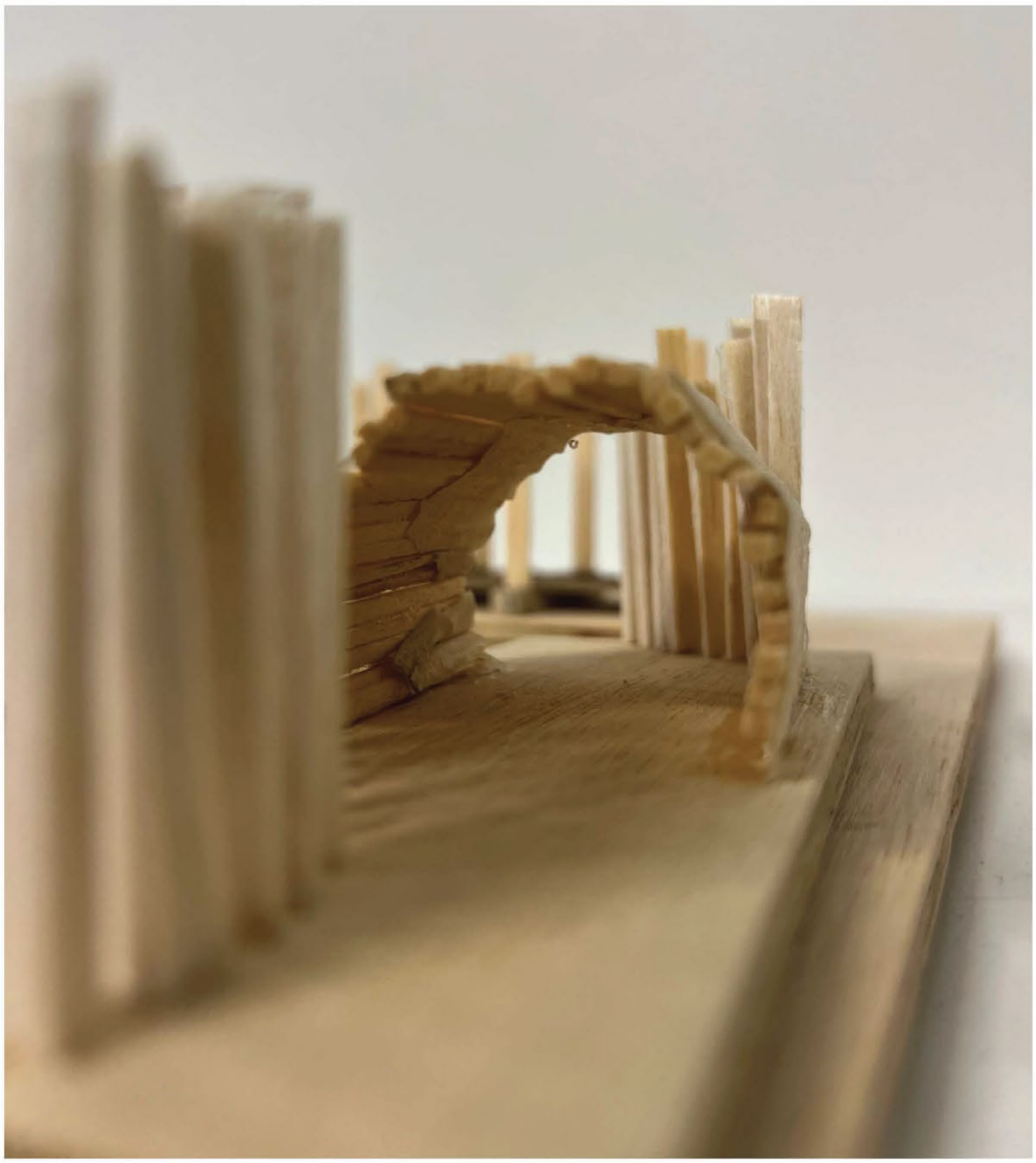


Figure 39 - Form Exploration

Figure 40 - Form Exploration

Figure 41 - Form Exploration

Figure 42 - Form Exploration

Figure 43 - Form Exploration

Figure 44 - Form Exploration

Figure 45 - Form Exploration

Figure 46 - Form Exploration

Figure 47 - Form Exploration

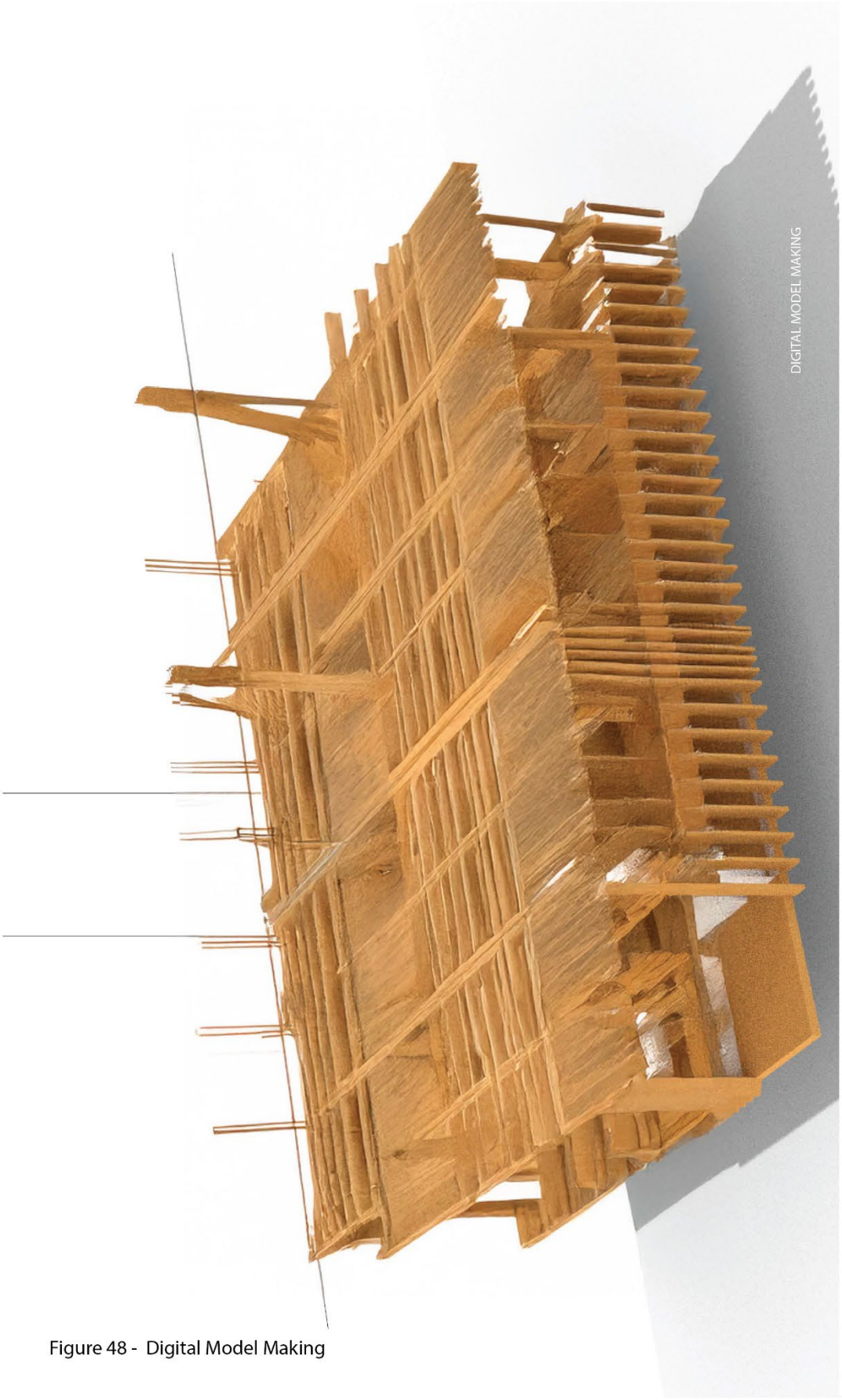


Figure 48 - Digital Model Making

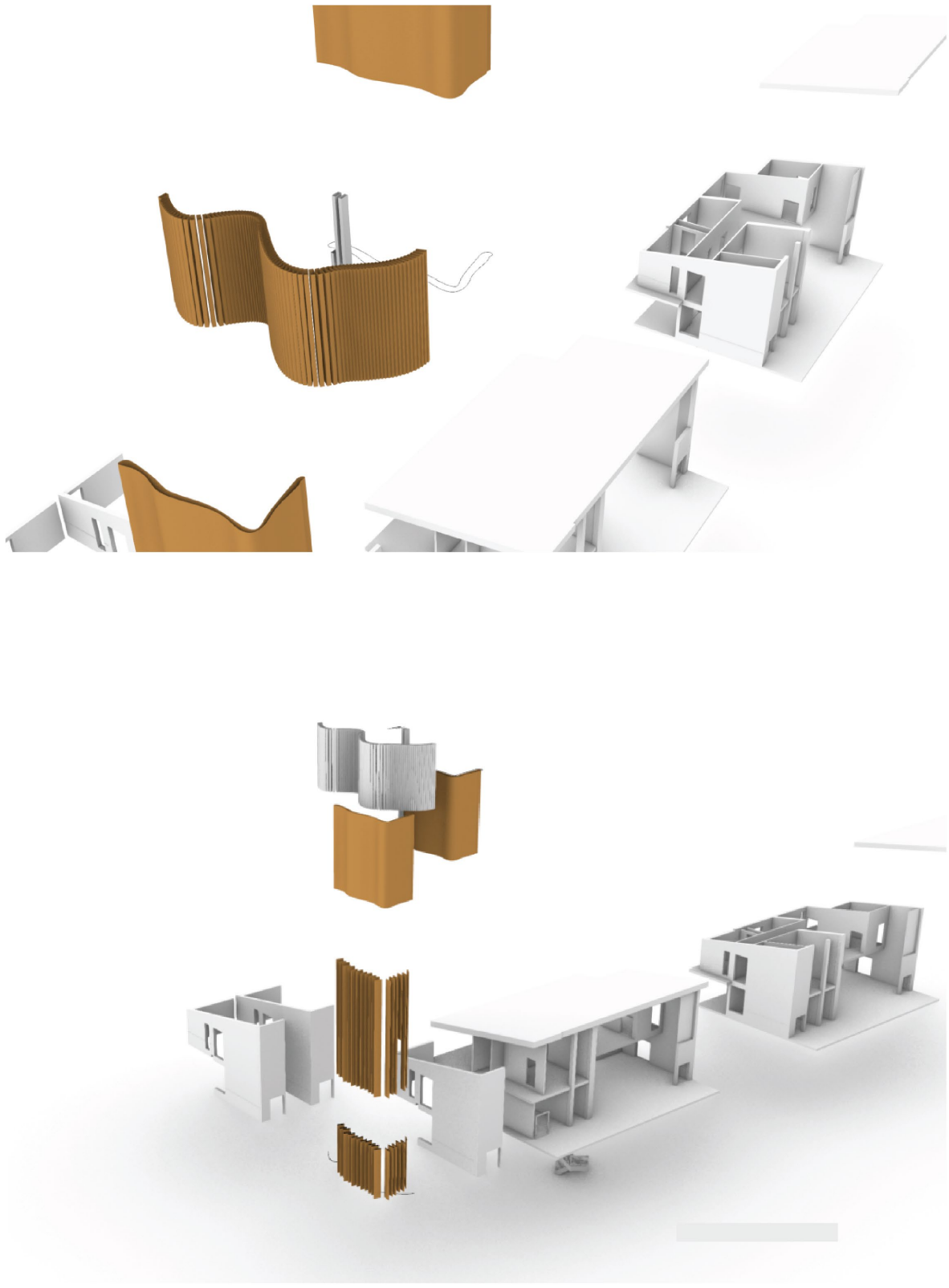


Figure 49 -Digital Model Making

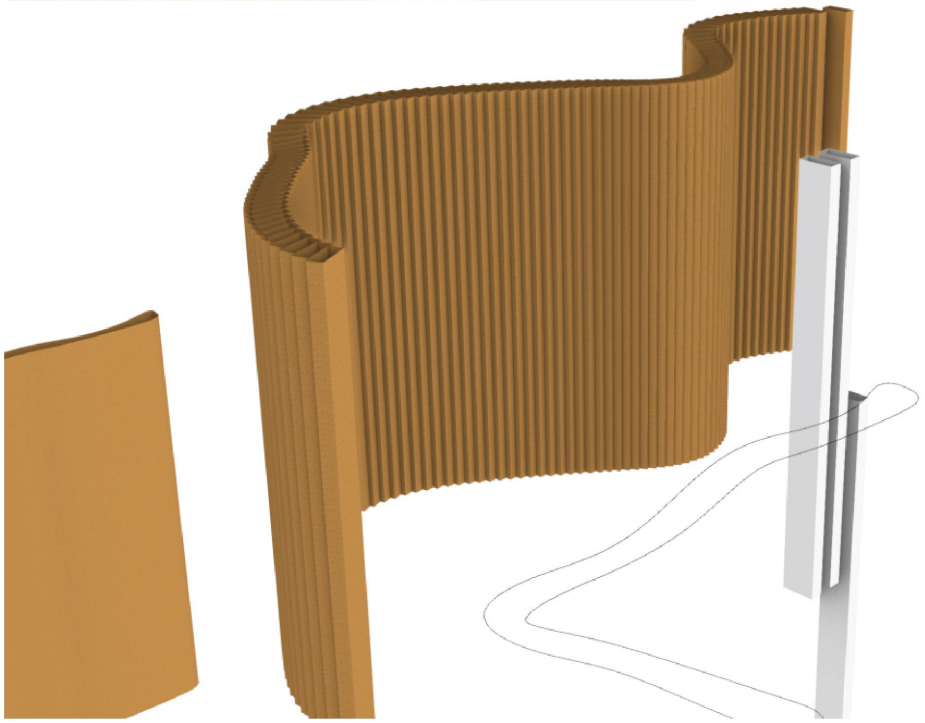


Figure 50 - Digital Model Making

CHAPTER 3 - PART THREE

MŌTEATEA-O-NGĀPUHI

This section explores the integration of the mōteatea "I Te Tekau Mā Wha" into the papakāinga development in Ōpononi. The mōteatea serves as a spiritual and auditory connection to the land, ancestors, and the cultural identity of the Ngāpuhi iwi. Through this traditional chant, the research highlights the importance of revitalising Māori knowledge and using it as a tool to deepen our existing understanding of the region's history and whakapapa. Rather than being a physical element, the mōteatea is a spiritual presence within the design of this thesis and an auditory element within the designed outcome. In the proposed design, audio recordings of the chant are strategically placed throughout the papakāinga, allowing residents and visitors to engage with the ancestral voices as they move through the space. This auditory presence reinforces the spiritual bond between the people and their land, offering a deeper understanding of the region's cultural significance while honouring ancestral teachings.

By embedding the mōteatea in the design as a voicing of cultural connection, the papakāinga transcends a purely physical space, becoming a place where the past and present merge through sound and architecture. This integration ensures that the development remains aligned with the Ngāpuhi iwi's whakapapa, creating a lasting connection to their heritage and reinforcing cultural identity for the people of Ōpononi and beyond. The learnings from the mōteatea have deepened my understanding of Ngāpuhi as a region and helped to shape understanding of historical events told by the composers. This knowledge will be taken into the final design of papakāinga development within Opononi.

CHAPTER FOUR:

WHAKATAUNGA HOAHOA (DESIGN RESOLUTION)

Chapter 4 explores whakapapa as a guiding principle in architectural resolution the key elements of this architectural resolution are derived from three key drivers, community integration, incorporating hunting and fishing. Two, circular material selection, and three, the concept of iteration. These three components form the core structure of the chapter, Whakapapa-o-te-Whenua Framework. This framework guided this study and is introduced in this chapter, divided into four parts, blending tradition and innovation.

Part One: Whakapapa Framework
This section presents the visual whakapapa developed for the Opononi papakāinga, laying the foundation for the design work.

Part Two: Community Integration in Design
This part examines the architecture of the papakāinga settlements, including the Hunting Shack, Whare Puna, and Whare Ua, which reflect the research's focus on whakapapa layering.

Part Three: Circularity of Materials – Whakapapa Tectonics
This section looks at material selection in model making and its practical application in the papakāinga development.

Part Four: Iterations Over Time
This section investigates how design iterations and environmental changes influence the papakāinga.

Together, these parts form a comprehensive framework for papakāinga development in the Hokianga region, considering environmental, social, and cultural contexts to create resilient, meaningful spaces. The framework embodies a layered, evolving approach that deepens the understanding of the design process.

CHAPTER 4 - PART ONE

WHAKAPAPA-O-TE-WHENUA FRAMEWORK:

The Whakapapa-o-te-Whenua framework (Figure 51-53) were developed to understand the needs of Opononi community and guide the papakāinga design. Emerging from prior research and discussions, this section outlines how the community informed the design, material circularity, and environmental adaptation over time.

Community Needs and Practices

The framework emphasised integrating community through traditional practices like hunting and fishing, central to Māori culture. The design incorporated spaces for food gathering, including hunting sheds, Whare Kai, and Mahinga Kai.

Communal spaces, such as Māra Kai and Haumietiketike gardens, reinforced social connections and shared responsibility. Natural play areas and outdoor learning spaces encouraged environmental awareness and community education. Wildlife corridors supported biodiversity by linking habitats.

Sustainable Housing Design

Using locally sourced natural materials minimised environmental impact and strengthened ties to the land. Passive heating, solar panels, and energy-efficient appliances reduced carbon footprints while ensuring long-term sustainability.

Green spaces and active transport options promoted well-being, while rainwater harvesting and wetlands enhanced water conservation and ecosystem resilience. Community gardens increased food security, biodiversity, and ecological education.

Cultural and Community Practices

Intergenerational learning strengthened cultural ties, with Kaumātua passing on traditional ecological knowledge. Collective decision-making ensured sustainability remained central to community development.

By integrating sustainable practices, the papakāinga design fostered resilience, cultural heritage, and ecological regeneration.

Circularity of Material Selection

The design prioritised local materials such as Kauri, Tōtara, and Rimu, honouring Tāne Māhuta. Earthworks acknowledged Papatūānuku, promoting land-based sustainability.

Solar panels, rainwater systems, and composting toilets reinforced circular resource use, ensuring self-sufficiency and minimal waste.

Iterative, Regenerative Design

Reflecting whakapapa, the framework supported continuity, adaptation, and long-term ecological balance. Renewable energy, water systems, and material reuse ensured ongoing sustainability. The design evolved to maintain harmony with the land, honouring cultural and environmental principles. The Whakapapa-o-te-Whenua framework informed architectural design through community integration, material circularity, and adaptation over time, ensuring culturally respectful and ecologically sustainable development.

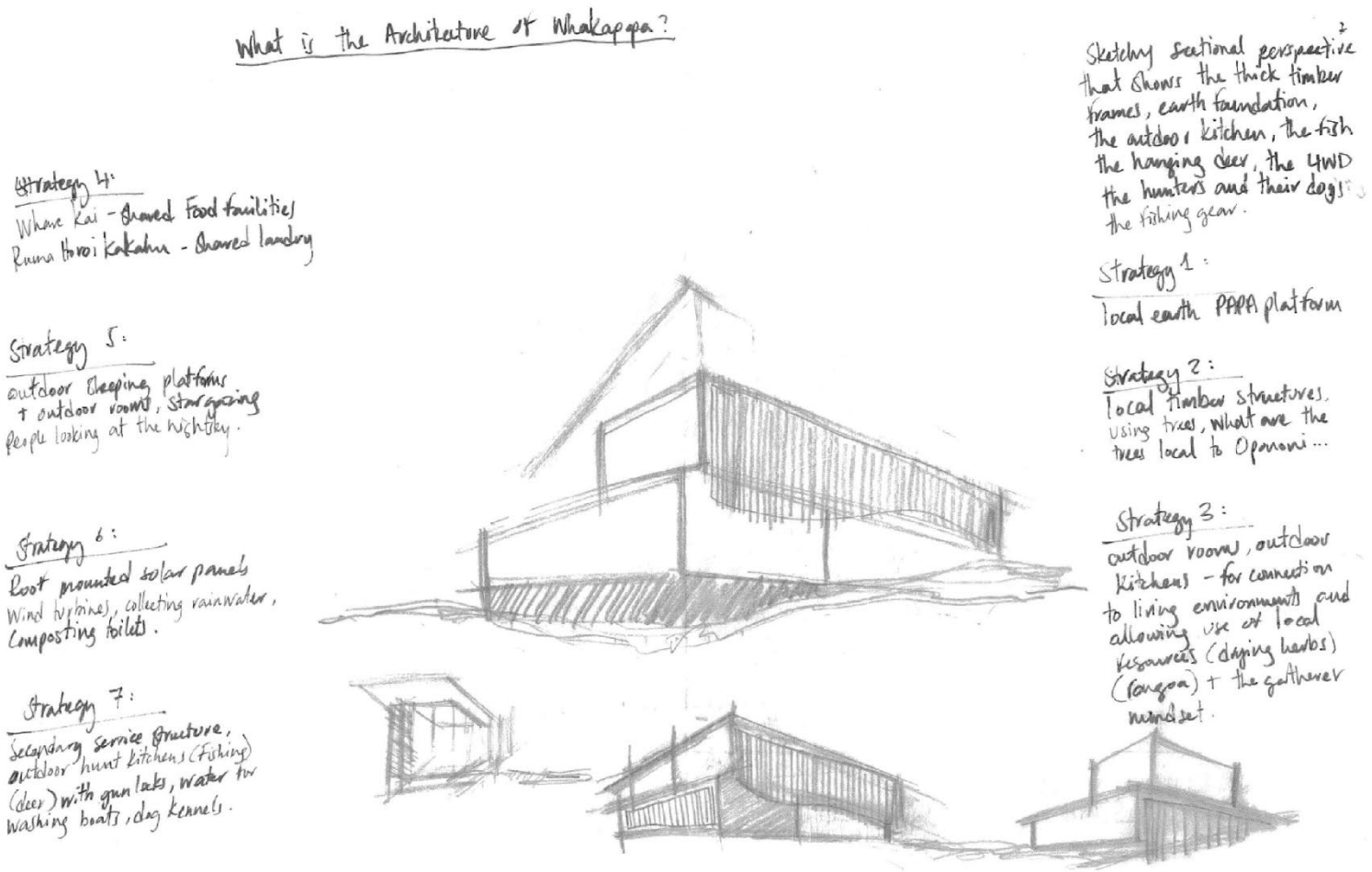


Figure 51 - WHAKAPAPA-O-TE-WHENUA FRAMEWORK

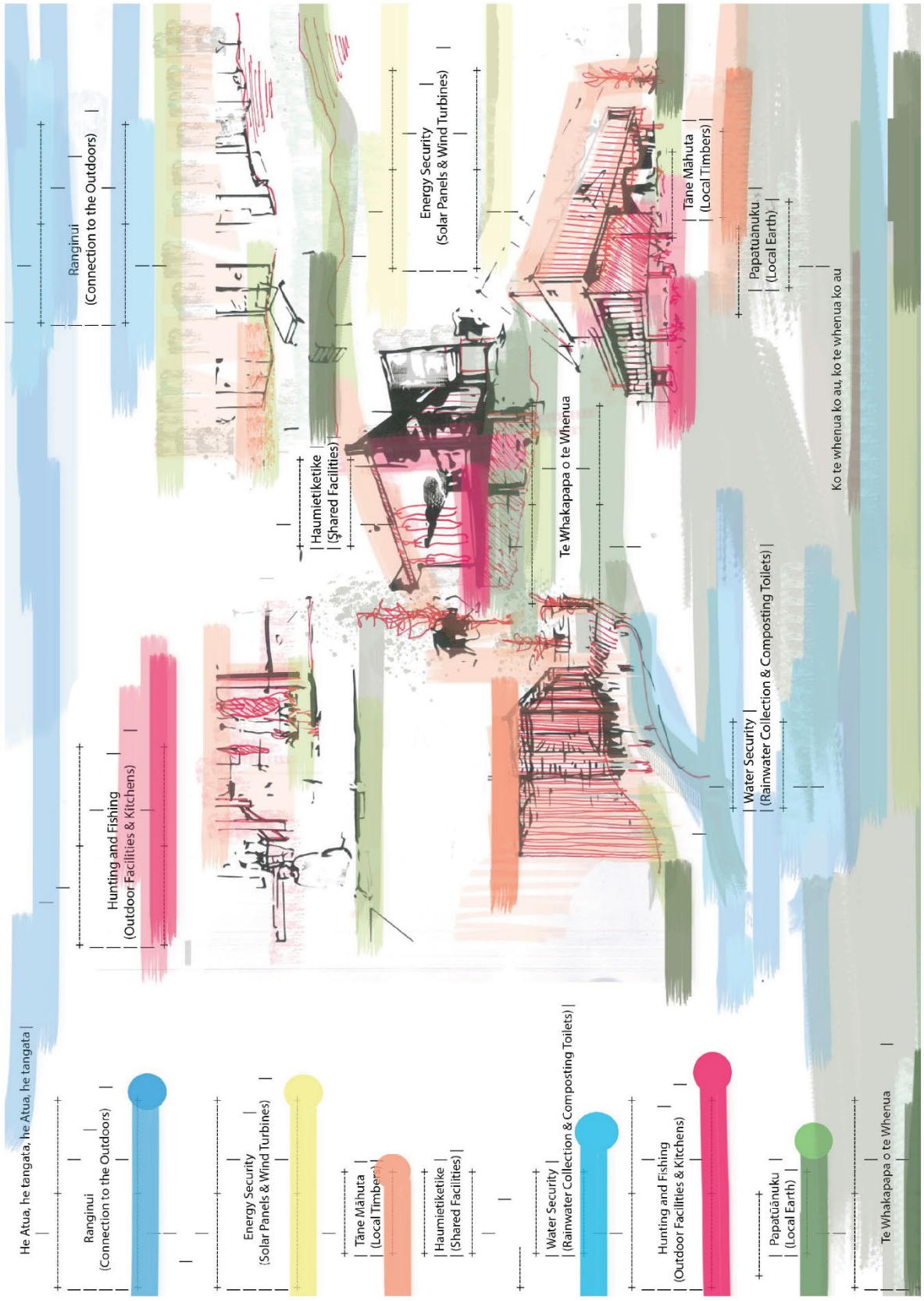


Figure 52 - WHAKAPAPA-O-TE-WHENUA FRAMEWORK

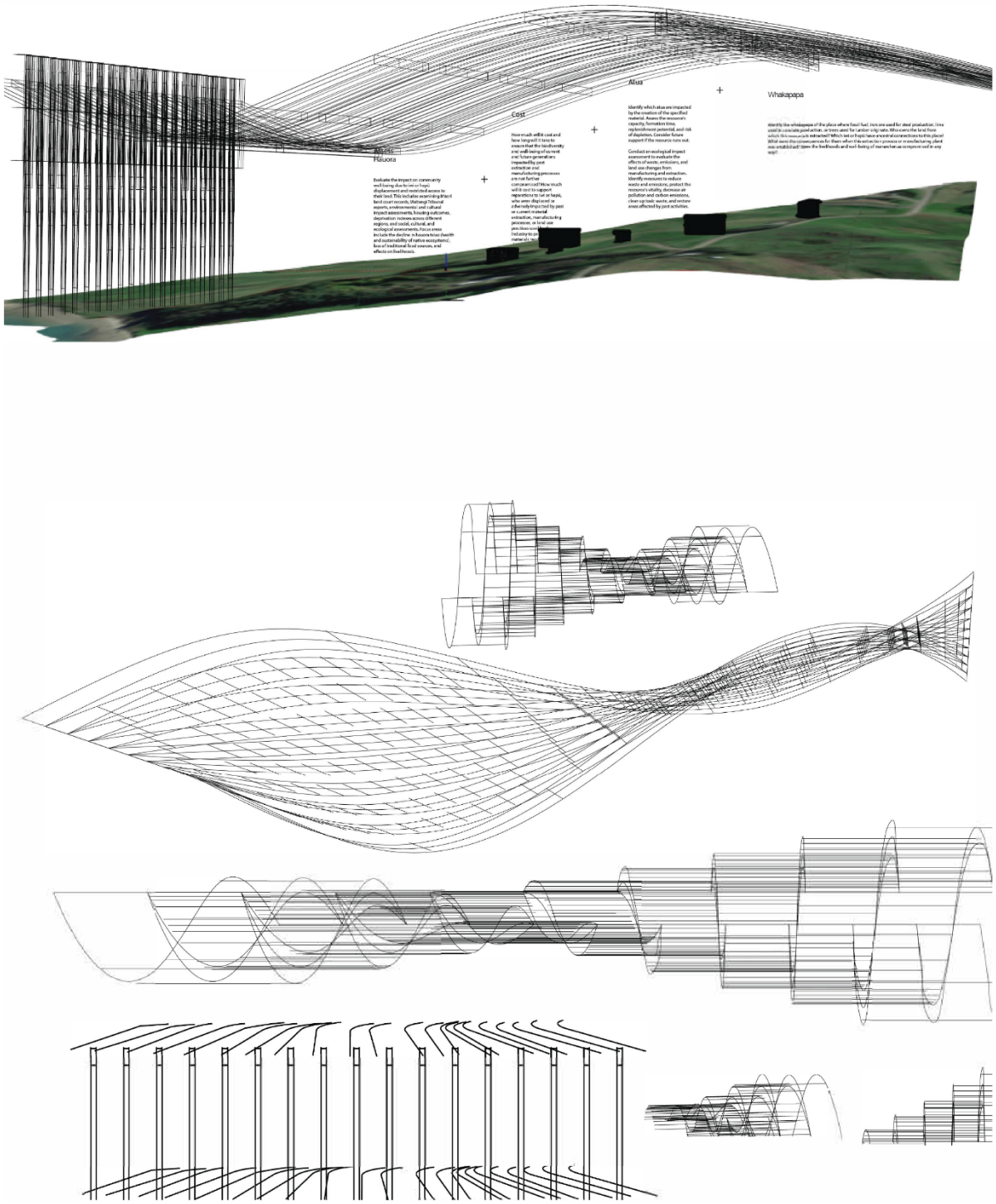


Figure 53 - WHAKAPAPA-O-TE-WHENUA FRAMEWORK

Figure 54 - Project Site Visuals

Figure 55 - Project Site Visuals

Figure 56 - Project Site Visuals

Figure 57 - Project Site Visuals

Figure 58 - Project Site Visuals

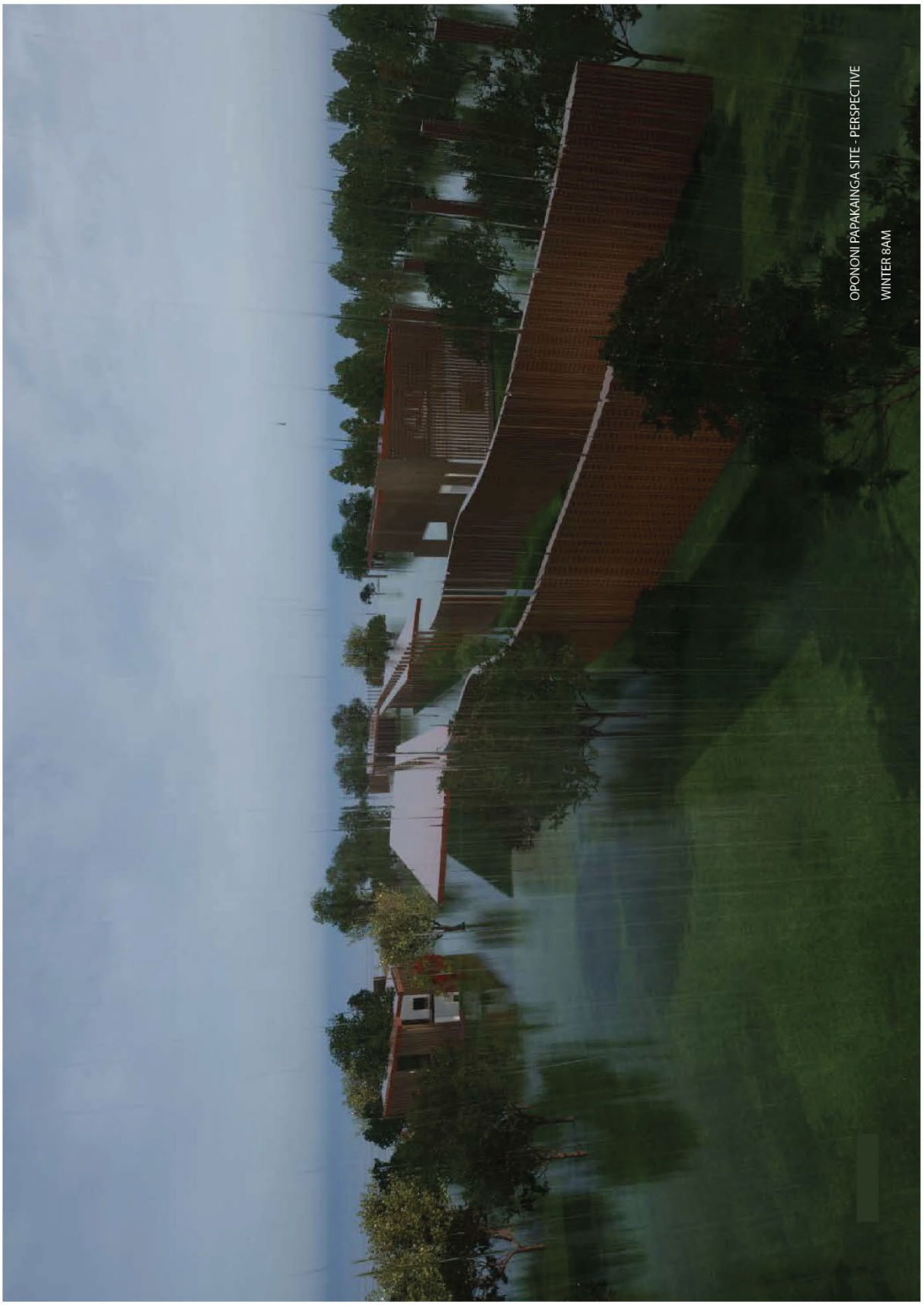


Figure 59 - Project Site Visuals

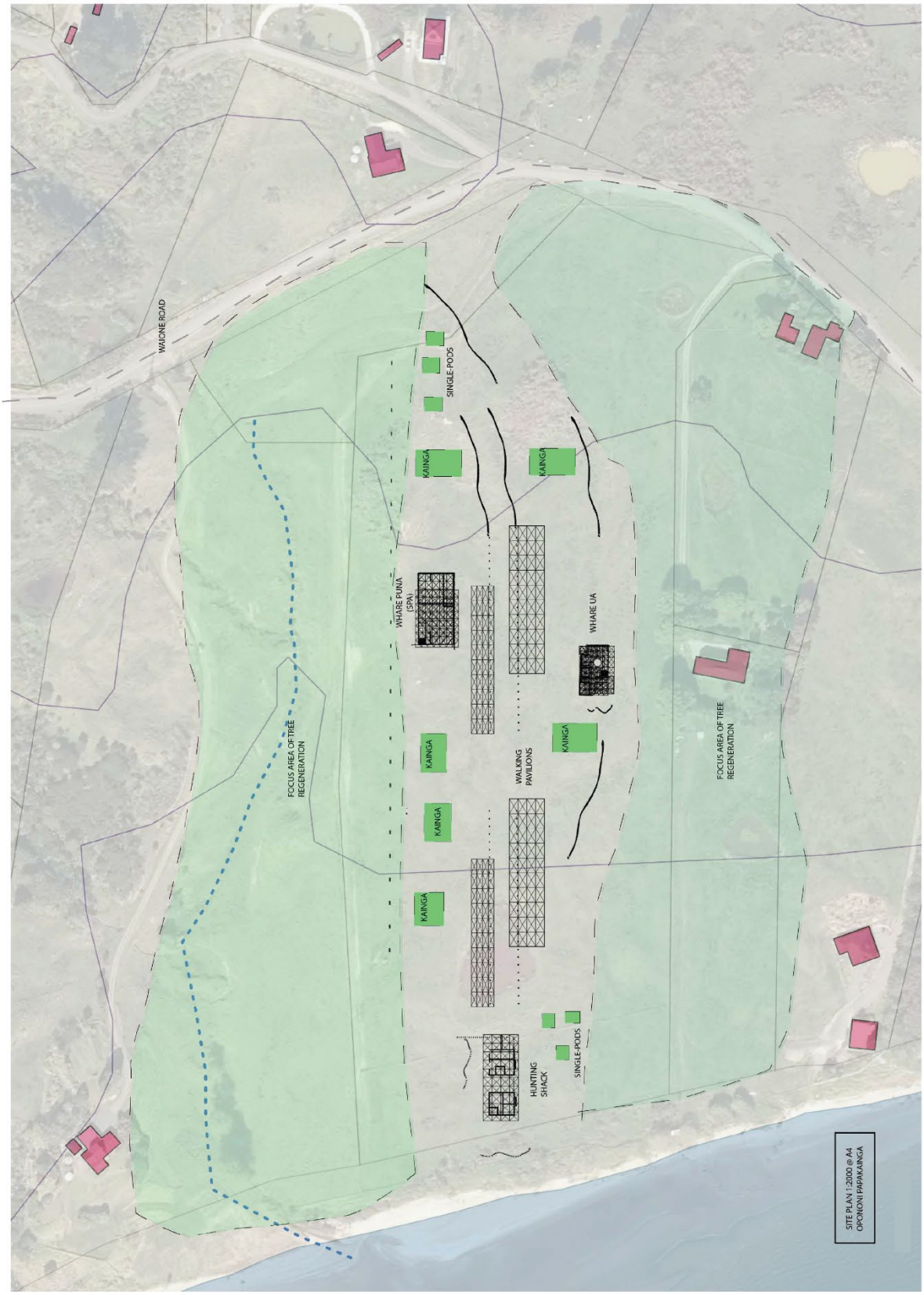


Figure 60 - Project Site plan - 1:1000 @ A4

CHAPTER 4 – PART TWO

CIRCULAR MATERIALS + WHAKAPAPA TECTONICS

Whakapapa Tectonics explores the relationship between materiality, form, and cultural narratives in design. Central to this is the issue of how tectonic expression and materiality reflect whakapapa—the interconnectedness of all things—and how this informs a design that is both culturally resonant and environmentally responsive. Using local, sustainable materials such as native timber, clay, and stone strengthens the connection between architecture and the land. Timber, as a lightweight material, sits atop a solid foundation, reinforcing environmental responsiveness while respecting cultural narratives around local ecological relationships and material processes. The iterative design process and materials used continue to inform the final resolution, creating a harmonious relationship between nature, culture, and built form.

Models Casting

Casting techniques connect the concepts of whakapapa and iterative circular design. Whakapapa acknowledges life's cyclical, interconnected nature, while circular

design focuses on sustainability, regeneration, and material reuse, reflecting Papatuanuku's cycles of creation and decay. Casting becomes a physical manifestation of these principles, where each cycle of moulding, casting, and refining contributes to the design's evolution. By reworking materials like clay and plaster, the process demonstrates regenerative aspects of circular design, reducing waste while deepening the understanding of material behaviours. This iterative process allowed for refinement of the papakāinga design concepts, with each casting informing the next.

The casting process highlighted the regenerative potential of materials, revealing the importance of material reuse in circular design. It demonstrated the possibility of recycling plaster, underscoring the need for resource renewal. The hands-on approach opened new possibilities for integrating earth-worked walls as key features, merging regenerative whakapapa principles with sustainable, earth-based architecture.

Material Exploration in Model Making

The choice of clay in the model-making process symbolises papa (Earth), reflecting its connection to Māori culture. Shaping, casting, and remoulding clay mirrors the cycles of creation, destruction, and renewal in nature, embodying whakapapa. The natural imperfections of the clay—bubbles, cracks, and indentations—have become part of the design, symbolising the natural forces that shape the land. Plaster contrasts with clay's malleability, offering permanence, while string symbolises the transient forces of energy and time. These studies set the direction for the earthen tectonics of the project.

Material Selection in the Papakāinga Development

The final design requires materials for the papakāinga development to be sourced locally, supporting the local economy, ecology, and culture. The use of native timber, such as Kauri, Totara, and Rimu, ensures the sustainable harvesting of resources which benefits the local timber industry and minimises the development's environmental impact. The timber also reflects the cultural significance of Tāne Māhuta, the Māori god of forests,

connecting the project to Māori traditions. Locally sourced clay also supports ecology, reduces transportation costs, and has a minimal carbon footprint, reinforcing environmental sustainability. The use of these materials strengthens cultural identity, honouring traditional Māori uses of the land.

By integrating these materials, the papakāinga development addresses both physical needs and cultural heritage, supporting a sustainable, self-sufficient future for the people of Opononi.

CHAPTER 4 - PART THREE

INTERGRATION OF COMMUNITY + PAPAKĀINGA PROGRAMMING

This section explores the design resolutions of the Hunting Shack, Whare Ua (Regenerative House), and Whare Puna (Spa House), three key structures that embodied the values of whakapapa—the intergenerational connection between people, their culture, and the land. The programming of these buildings integrated community practices such as hunting, fishing, and water collection, displaying aspects of design that connected indoor and outdoor living. These three buildings demonstrated how regenerative architecture could serve the practical needs of the community.

The last section of this chapter examines additional elements of the programme that were integrated over time, including kaumatua flats and studio flats. The intention was to use locally planted, harvested, and processed materials—primarily trees. This approach required time, and within this whakapapa framework, it became a sequential process. The Hunting Shack was established by 2025, followed by the addition of Whare Ua and Whare Puna, which functioned as community facilities supporting harvesting and self-sufficiency within Opononi. By 2055, kaumatua flats were under construction, along with studio flats for young people. Over this period, the architectural programme evolved iteratively, both over time and across space.

PART ONE - Hunting Shack:

Intro:

The Hunting Shack was the first building within the papakāinga settlement, reflecting the importance of hunting as a cultural and economic practice. It emphasised the need to create adequate living spaces that supported local needs. This space encapsulated local living situations and built on them as part of an iterative design strategy. The Hunting Shack enhanced self-sufficiency and deepened the connection to the land's resources while reinforcing traditional practices that provided nourishment, livelihood, and ecological balance – hunting and fishing.

PART TWO - Whare Ua

Intro:

The Whare Ua or regenerative house, the literal translation is (rain-house) and this is since it has purposeful holes within the design to intergrate connection to the outdoors, this design element. This Building was developed in the later time-frame post harvesting of circular materials. The design of this building is to support local vegetation and ecological systems with space to store crops, soil, harvesting tools, and further space to grow kai (food). This structure fosters a relationship with the land through porosity or open indoor and outdoor spaces, providing a space that promotes

the connection to te taiao (the environment) and further provides kai for the community.

PART THREE - Whare Puna

Intro:

The Whare Puna was designed to be an innovative space that embraces harvesting natural resources, specifically water. The structure collection and purifying water. It reflects Māori tradition of puna (natural water source) and bathing to reconnect with the environment, this is both spiritually and physically connecting (taha-wairua and taha-tinana). This structure provides resource stewardship and the ongoing relationship with Papatūānuku (earth) as the baths were designed using natural earthwork materials and timber.

These three buildings are not just shelters; they embody a holistic philosophy of whakapapa, where human activity and ecological systems are interwoven. The use of locally sourced, circular materials like Rimu, Kauri, and Tōtara as well as earthworks further aligns the design with the principles of sustainability and respect for the Papatuānuku.

Part one - Hunting Shack:

The hunting shack marks the humble beginnings of the papakainga development in Opononi. It symbolises the current situation for Māori families in this rural area, where hunting and fishing are the primary sources of livelihood, and locally sourced materials are often unaffordable. The hunting shack is initially situated close to the sea, as this location is ideal for fishing activities. It is here that the concept of regeneration begins, as there is a need to expand facilities to support the community in establishing the papakainga. This becomes a community- and iwi-led project.

The initial facilities of the hunting shack consist of a small, timber-built one-bedroom structure that accommodates two people and provides an outdoor cooking area. The hunting facilities include a makeshift hanging rack for deer and fish, serving as the foundation for the papakainga. The structure is basic, with minimal weatherproofing and insulation—hand-stuffed into the walls by the fishermen staying in the shack. The timber walls are sturdy enough to withstand the coastal inlet's weather, and the roof, while able to endure the elements, requires patching each season. There are chairs and benches for gathering and relaxing, though the space inside is limited; the outdoor area serves as a gathering space where whānau and the wider community can come together to plan the papakainga. The cooking facilities include a portable stove, grill, fire pit with utensils, pots, pans, knives, plates, and cutlery. To store the meat from hunts, there is a large freezer, a dry food storage container, and a small pantry. The exterior walls hold hunting equipment, racks for gear, cleaning tools, and a designated area for skinning game. At night, flashlights and lanterns are used to preserve power. The toilet facilities include an outhouse, and an internal toilet, but there is no flushing system for passing of the bowels. Water storage or filtration systems are in place for drinking water. The heating source is a wood stove, providing warmth. The northern life is simple, yet rich in outdoor experience, and the hunting shack symbolises the relaxed nature of this community. It demonstrates whakapapa through the iteration of circular design and its deep connection to Papatūānuku (Mother Earth). The shack and its development process embody whakapapa in several ways.

Generational Knowledge and Sustainability:

The shack is a product of practical knowledge passed down through generations—traditions of hunting, fishing, and resourcefulness that are integral to the community's way of life. The tools, techniques, and materials used in constructing and utilising the shack reflect a long-standing relationship with the land and sea. This aligns with the Māori concept of whakapapa, where every action and decision are influenced by the generations before, and their knowledge is passed down to ensure survival and resilience in the present.

Iterative Circular Design:

The shack represents a starting point, yet it is also a symbol of an evolving process. The structure is basic, designed to grow and adapt over time as the papakainga develops. This iterative approach, where each phase of development builds upon the last, mirrors the concept of circular design. The shack’s modest beginnings are not final; rather, they form the foundation for future growth, just as whakapapa connects the past to the future in an ongoing, evolving cycle. In this way, the shack is an expression of circularity: it supports ecological regeneration, as well as the

regeneration of cultural knowledge and practices that will continue to inform the future development of the community and land.

Connection to the Earth (Papatūānuku):

The materials and construction methods are closely tied to the natural environment, embodying Papatūānuku, the Earth. The timber walls, use of local materials, and the emphasis on sustainable practices—such as hunting, fishing, and growing food—reflect a deep respect for the land. The shack's location near the sea reinforces this connection, chosen to support traditional practices like fishing, which are intrinsically tied to the rhythms of the natural world. The structure also acknowledges the Earth's cycles: the need to repair and maintain the shack after each season mirrors the constant renewal and care required to maintain balance with the environment. This reflects the Māori worldview, where humans are part of a larger ecological system, and every action on the land impacts future generations.

Recycling and Regeneration:

The design and practices surrounding the shack emphasise regeneration—both ecological and cultural. The use of local, renewable materials in construction, along with the practice of hunting and fishing that sustains the community, embodies the Māori principle of kaitiakitanga (guardianship). The shack itself is a manifestation of the Earth's cycles of regeneration, with building materials sourced from nature, and its role in facilitating a sustainable, cyclical relationship between humans and the land. This reflects the idea that the shack is not just a physical structure, but part of a larger regenerative process that sustains both the community and the environment.

The hunting shack reflects whakapapa by being a product of ancestral knowledge and practices that are being passed down through generations, while also embracing circular design and a reciprocal relationship with Papatūānuku (the Earth). It is not just a physical space, but a living, evolving symbol of the continuity between past, present, and future.

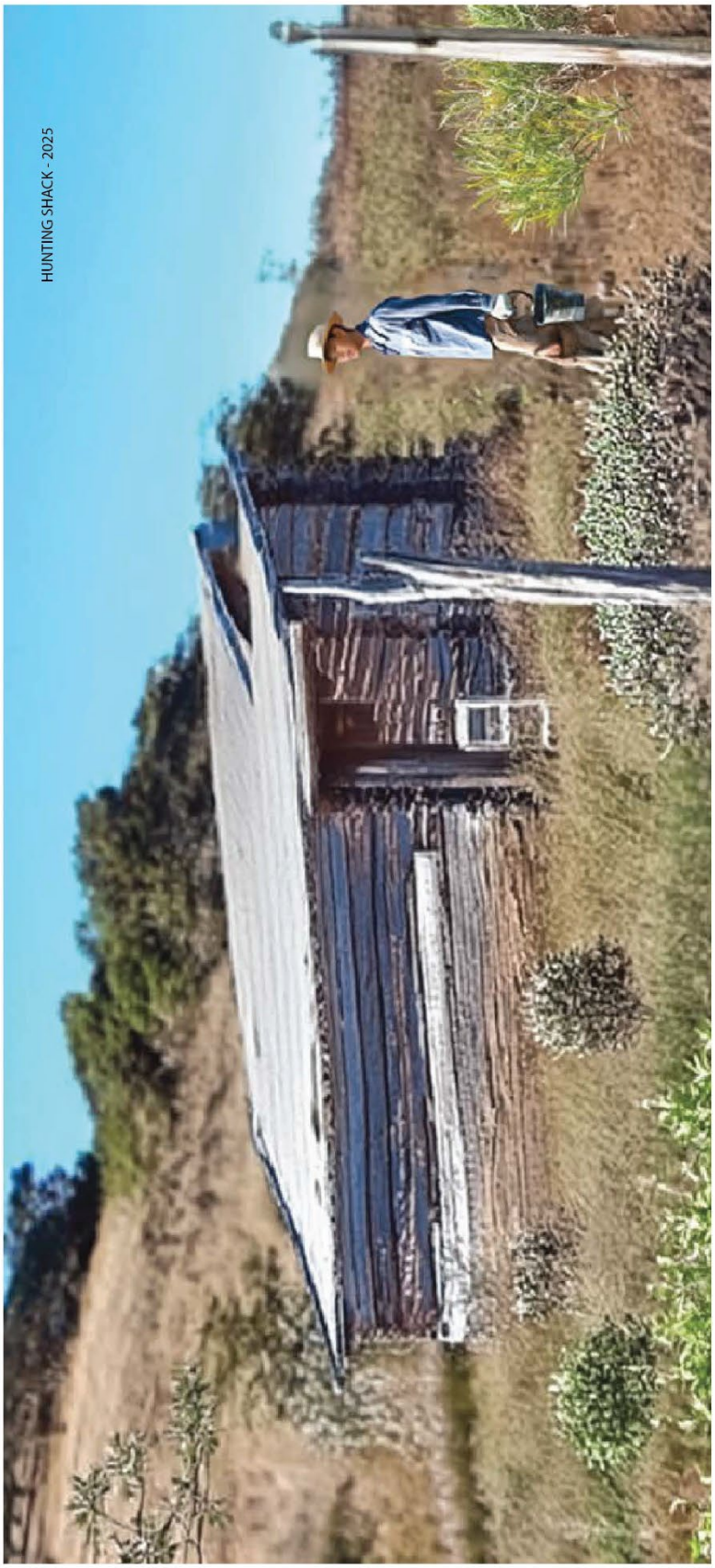


Figure 61 - Hunting Shack

Figure 62 - Hunting Shack

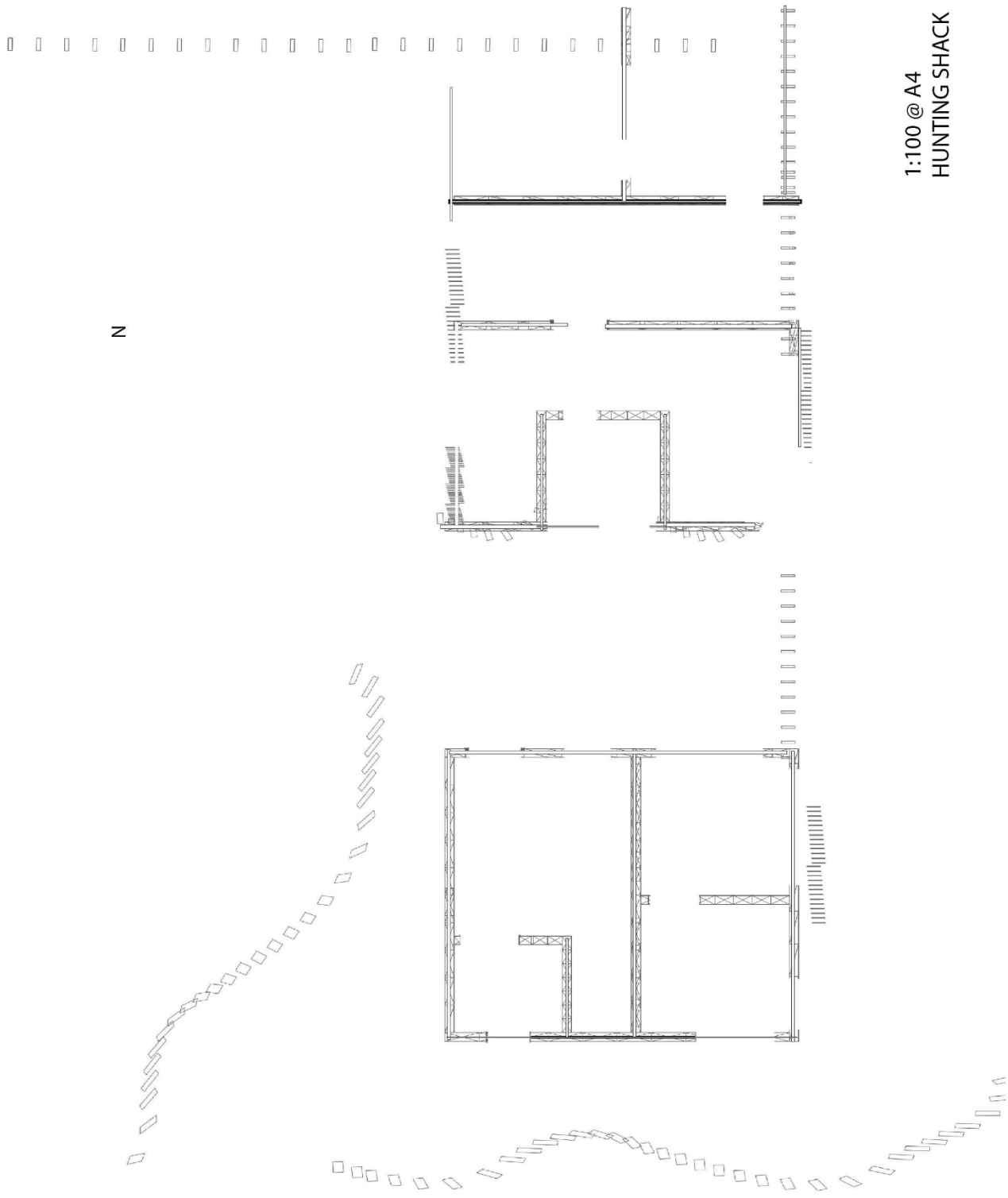


Figure 63 - Hunting Shack

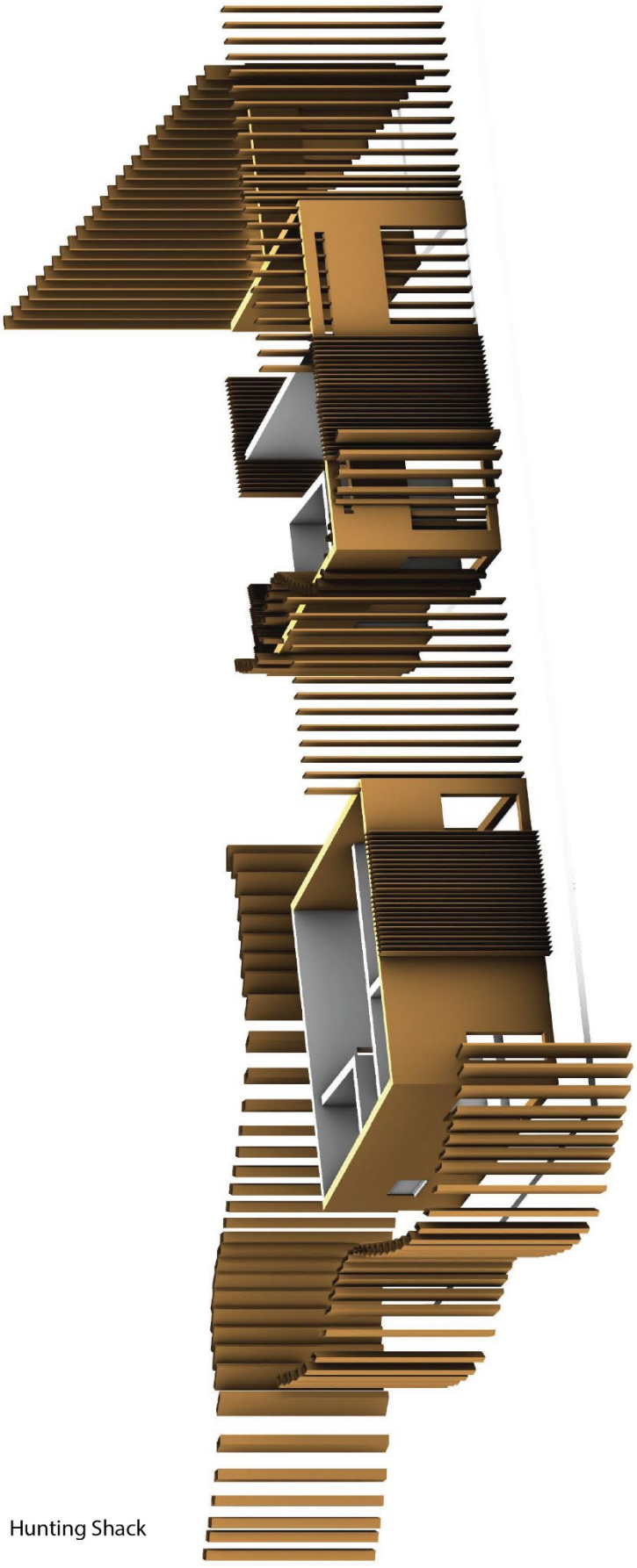


Figure 64 - Hunting Shack

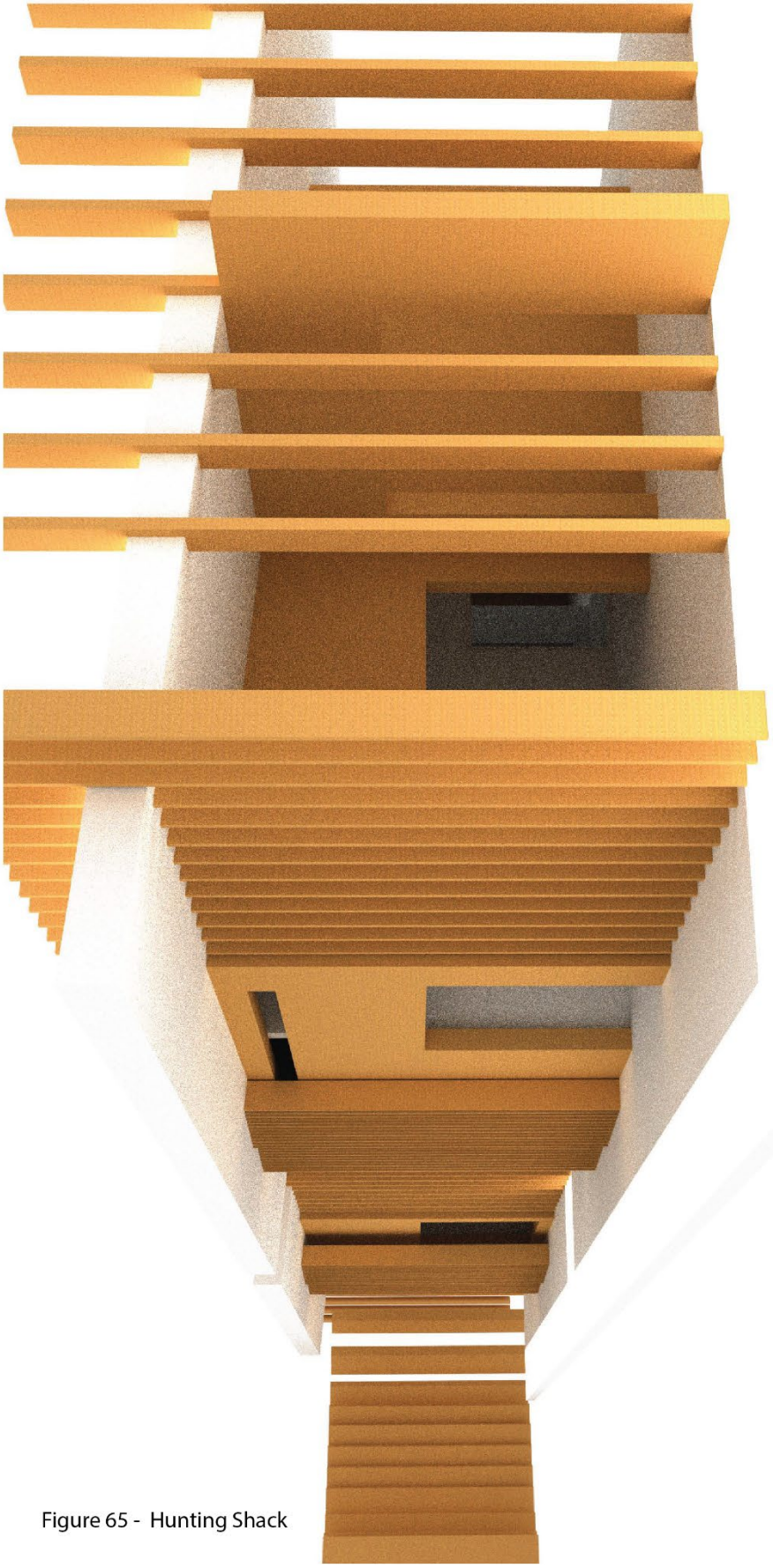


Figure 65 - Hunting Shack

Figure 66 - Hunting Shack

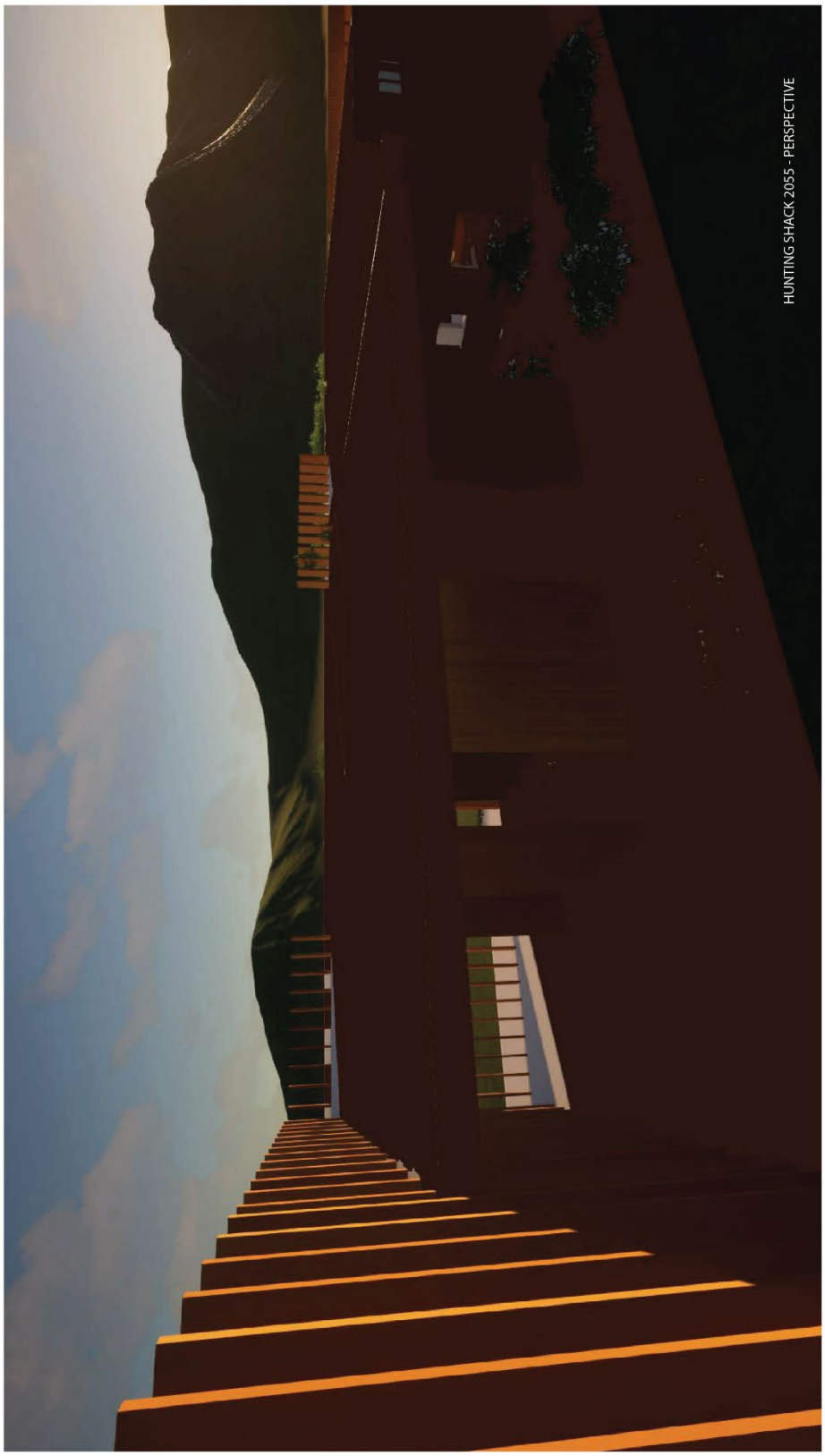


Figure 67 - Hunting Shack

Figure 68 - Hunting Shack

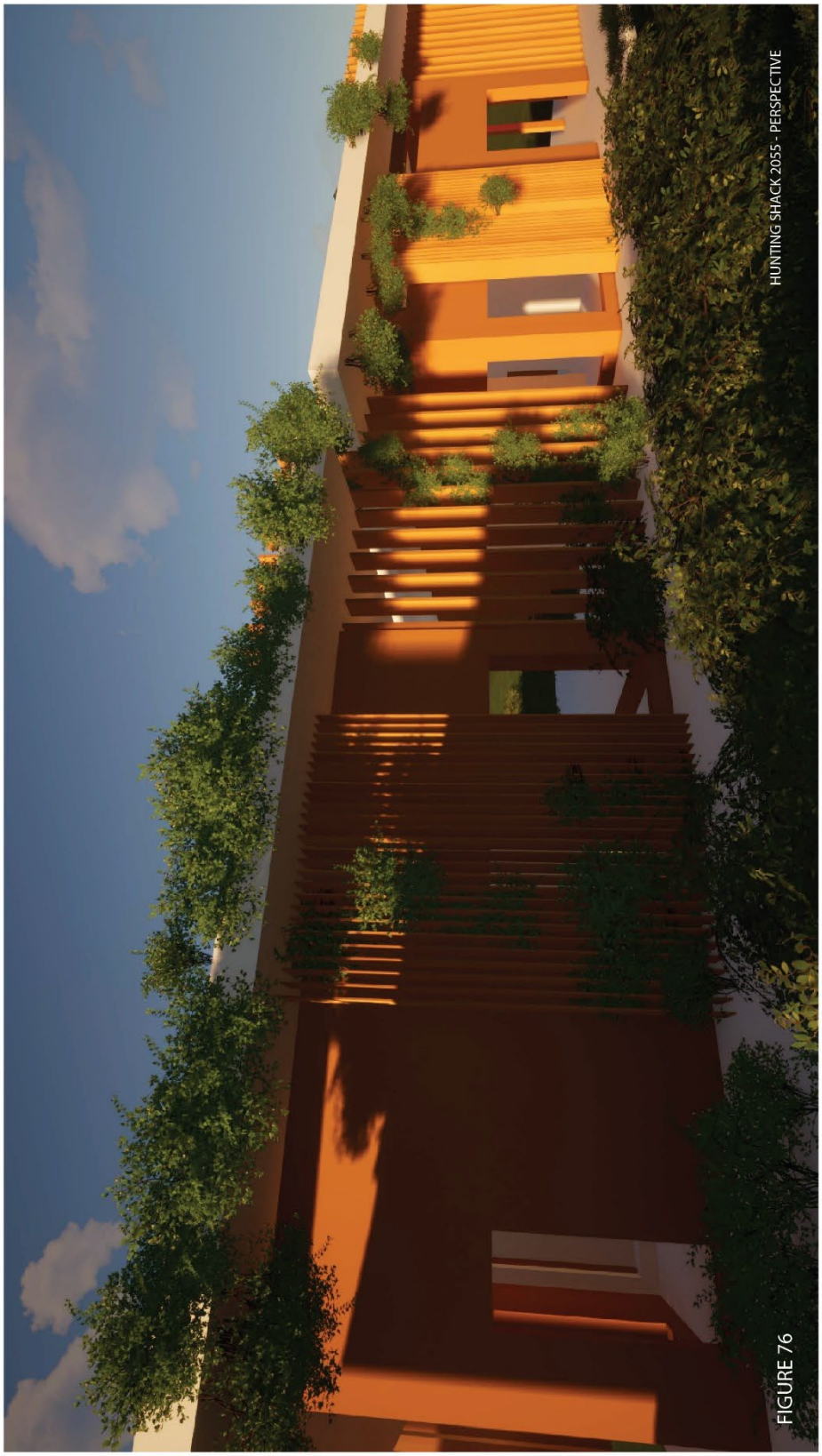


Figure 69 - Hunting Shack

Figure 70 - Hunting Shack

Part two - **Whare Ua – Regenerative house:**

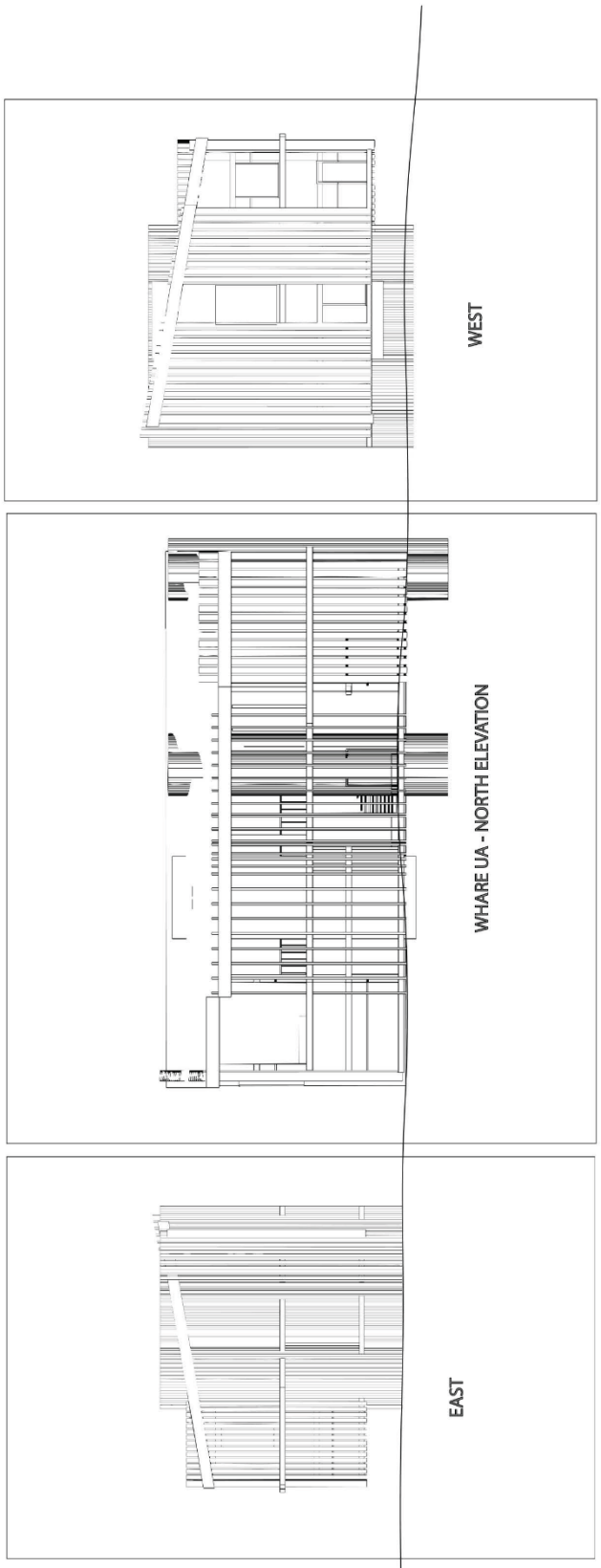
The Whare Ua is a two-storey ecological structure and community mara kai or community garden space designed to foster biodiversity and support regenerative ecology while prioritising sustainability and a deep connection to the natural world. It serves as a habitat for both plant and animal life, integrating flora and fauna into its design, and aligns with the community's values of environmental stewardship. Constructed from non-toxic, durable materials such as untreated wood and recycled elements, the Whare Ua ensures environmental responsibility. Proper drainage and ventilation are incorporated to maintain a healthy environment for its inhabitants.

The design creates a seamless flow between indoor and outdoor spaces. Timber verticals evoke a sense of porosity, allowing air and light to flow freely through the structure. These elements symbolise the connection to the surrounding environment, inviting nature inside and extending interior spaces into the landscape. This openness enhances the experience of living in harmony with nature, where the boundaries between the built environment and the natural world are fluid. At the heart of the Whare Ua is a circular opening, symbolising the connection between the sky (rangi) and the earth (papa). This feature reflects the cyclical relationship between the elements and life itself, inviting both human interaction and the natural world into the space. It also represents regeneration inherent in both ecological processes and cultural traditions. The surrounding landscape features native plants, which not only support the local ecosystem but also attract insects, providing essential food sources. Water features, such as ponds and birdbaths, offer drinking and bathing areas, while habitat layers—ground cover, shrubs, and trees—create diverse environments for wildlife. Certain areas of the site will remain undisturbed to allow for natural nesting and growth, promoting a holistic, self-sustaining ecosystem.

The Whare Ua will also serve as an indoor-outdoor mara kai, a shared community garden space. This space will facilitate community gatherings centred around growing, harvesting, and sharing food, fostering collective responsibility for the land. It offers an opportunity for intergenerational learning, where sustainable food production practices are passed down and integrated into daily life. The mara kai connects the community to the whenua (land), offering a space for cultural practices rooted in ecological regeneration.

The design of the Whare Ua embodies a commitment to ecological regeneration, community involvement, and sustainability, reflecting the principles of whakapapa. It honours the intergenerational relationship between people, land, and ecosystems, demonstrating how architecture can support both ecological systems and cultural traditions. The seamless flow between indoor and outdoor spaces, the porous timber elements, and the circular opening symbolising rangi and papa all highlight the dynamic connection between humanity and nature, inviting all living beings to thrive together in this shared space.

Figure 71 - Whare Ua (Regenerative House)



2055 - PERSPECTIVE

Figure 72 - Whare Ua (Regenerative House)

Figure 73 - Whare Ua (Regenerative House)

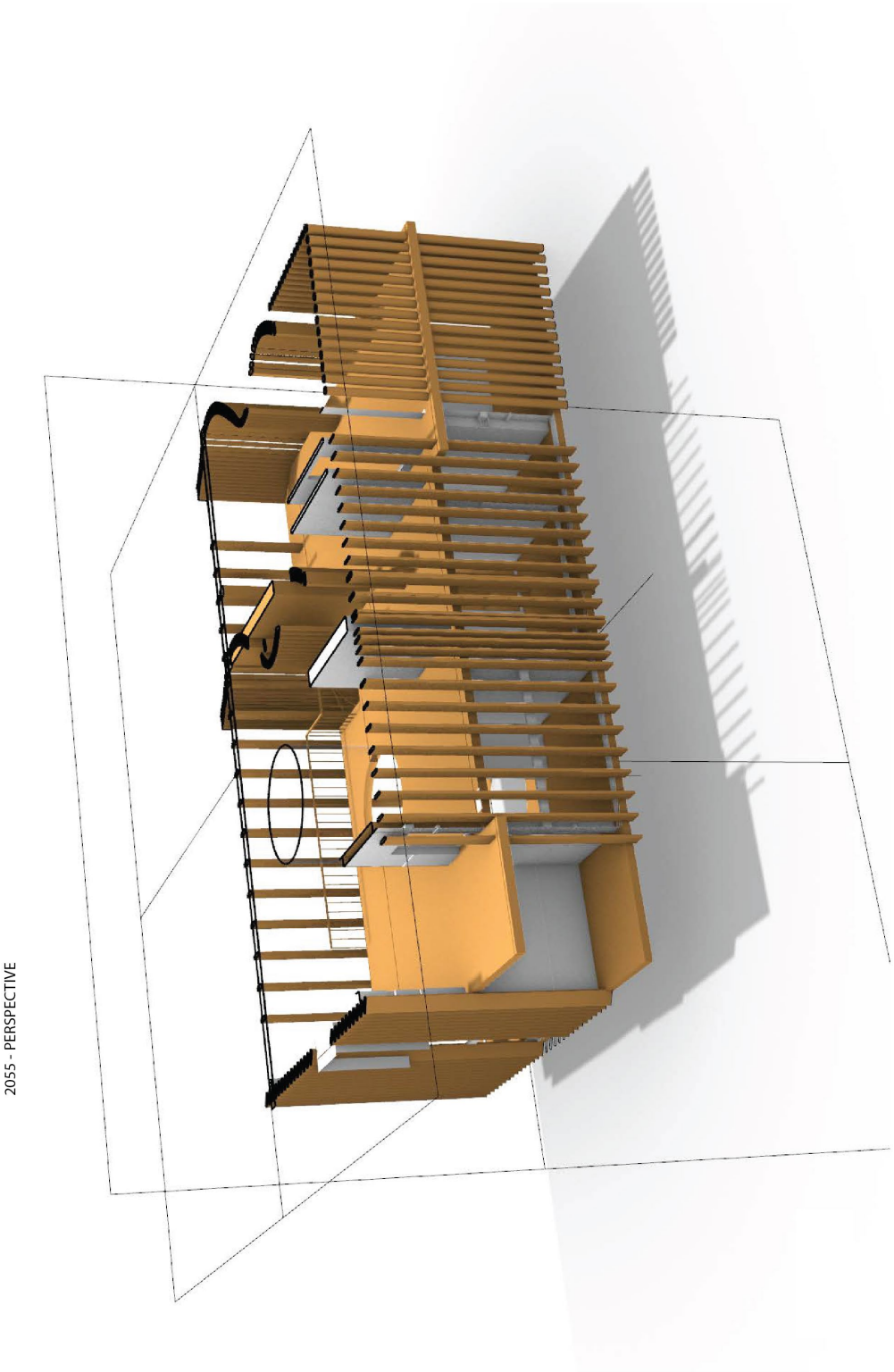
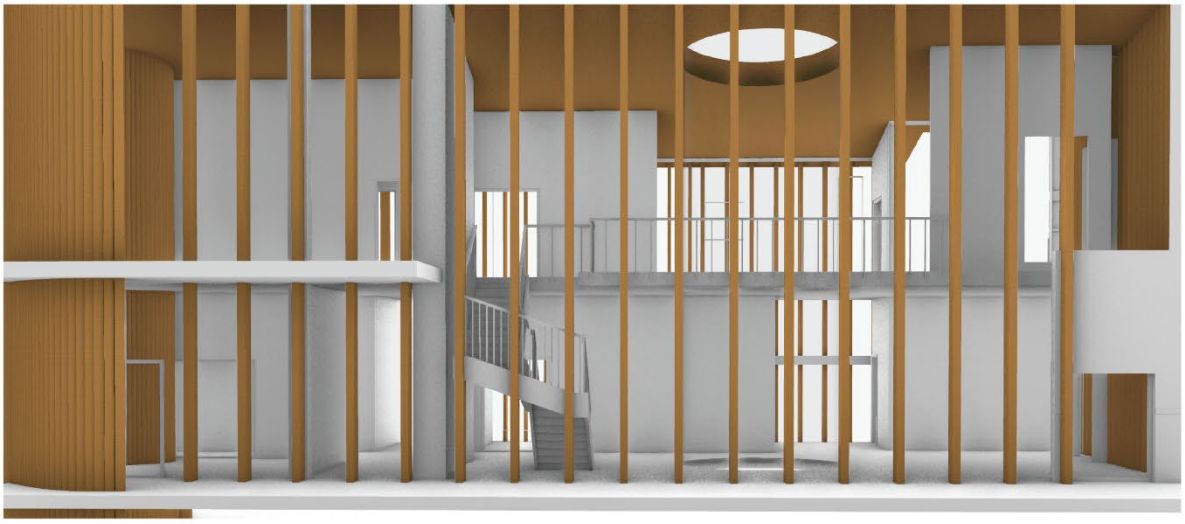


Figure 74 - Whare Ua (Regenerative House)



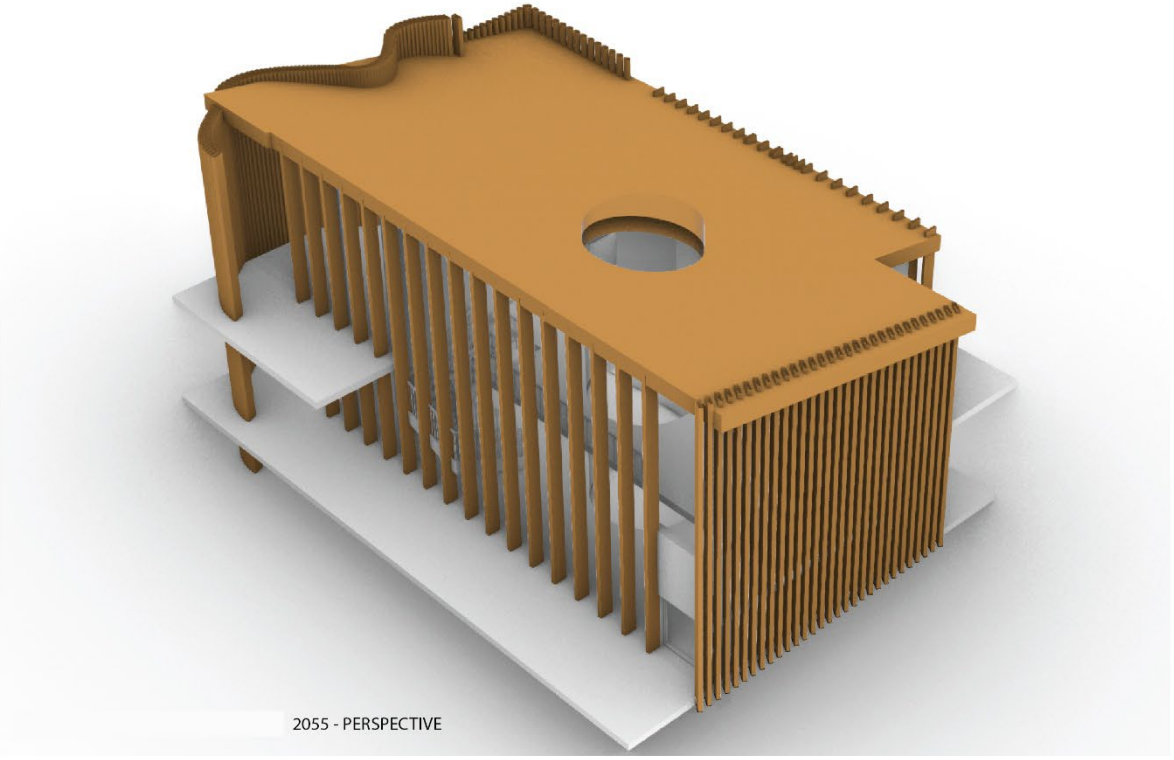


Figure 75 - Whare Ua (Regenerative House)

Figure 76 - Whare Ua (Regenerative House)

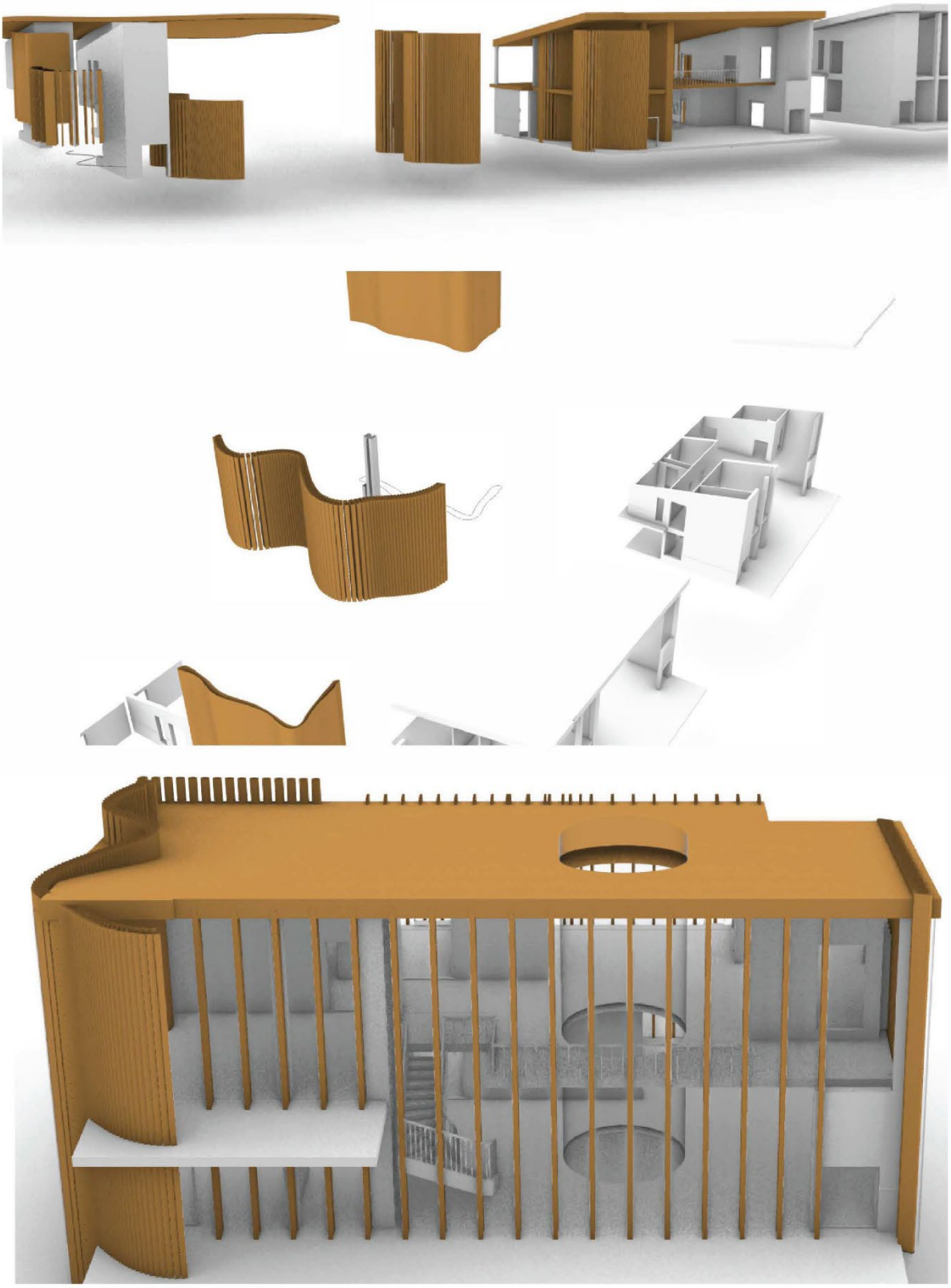


Figure 77 - Whare Ua (Regenerative House)

Figure 78 - Whare Ua (Regenerative House)

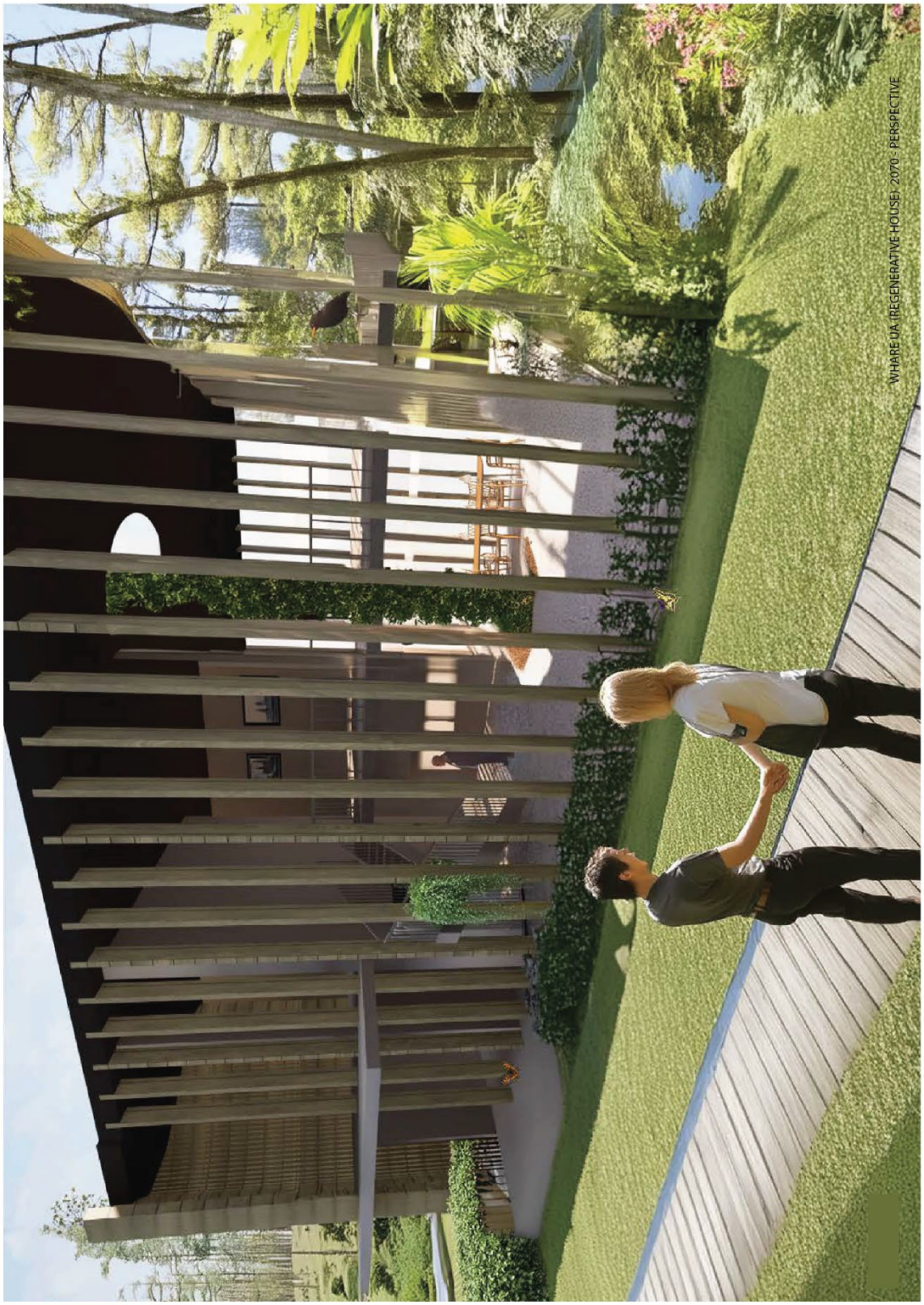


Figure 79 - Whare Ua (Regenerative House)

Part three - Whare Puna – Spa House:

The spa is a space designed to foster reconnection, drawing on the spiritual significance of Hokianga, known for its deep connection to spirituality connection to rangi, to sky, rain and water is culturally important and central to the programme here. The bathhouse serves as a place to reconnect the body and share ora (life) with others. This community-focused facility offers a space for healing and renewal, strengthening the bond between people and their environment. Therapies such as mirimiri (Māori spiritual and healing massage) are also enabled here. Outdoor sleeping pods further enhance this connection, providing opportunities to immerse oneself in nature, te wao, and deepen the experience of both spiritual and physical reconnection.

Whare Puna allows individuals to reconnect with their roots and honour the deep bond to Papatūānuku (Mother Earth). The rituals of bathing, mindfulness, and traditional healing practices promote physical, mental, and spiritual health. The inclusion of outdoor sleeping pods, quiet areas, and therapies such as mirimiri (Māori massage) helps nurture the soul, reaffirming the cultural significance of holistic healing.

A further function of the bathhouse is to meet the community's water needs for drinking and sanitation, alongside providing washing and laundry facilities for everyday living. The top floor is designed to strengthen the connection to nature through its outdoor sleeping pods, situated in the serene setting of Opononi, surrounded by forests, mountains, and water, which enhance the tranquil atmosphere.

The spa's design harmonises with the landscape, using natural materials like wood, stone, and water features. Timber verticals across the facade optimise natural light and balance privacy with public space. The sound within the space is curated for calm, incorporating waiata o Ngāpuhi and soft, natural music. Quiet spaces for meditation and mindfulness offer opportunities for reflection, while private areas for mirimiri, energy work, and body treatments support both physical and spiritual wellbeing. The spa's design also includes spaces for group sessions, workshops, or spiritual retreats, fostering collective growth and healing. Art, toi o naianei, and whakairo (Māori carvings and artwork) are integrated into the space, reinforcing cultural traditions and the broader community connection. The spa is also accessible to individuals with disabilities, ensuring inclusivity for all, with wheelchair access and additional features for comfort.

Through its focus on reflection, healing, and connection to the land, the spa supports the values of whakapapa (genealogy), kaitiakitanga (guardianship), and manaakitanga (hospitality). By integrating Māori beliefs and practices around spiritual ecological connection, bathing, massage and healing, the spa supports the spiritual and cultural wellbeing of the community. It is a place where people can nurture their physical being, reconnect with their ancestral roots, and heal their spirits, reinforcing the cyclical relationship between humanity and nature. In doing so, the spa becomes a vital part of the papakainga, promoting health, harmony, and balance for both individuals and the community.

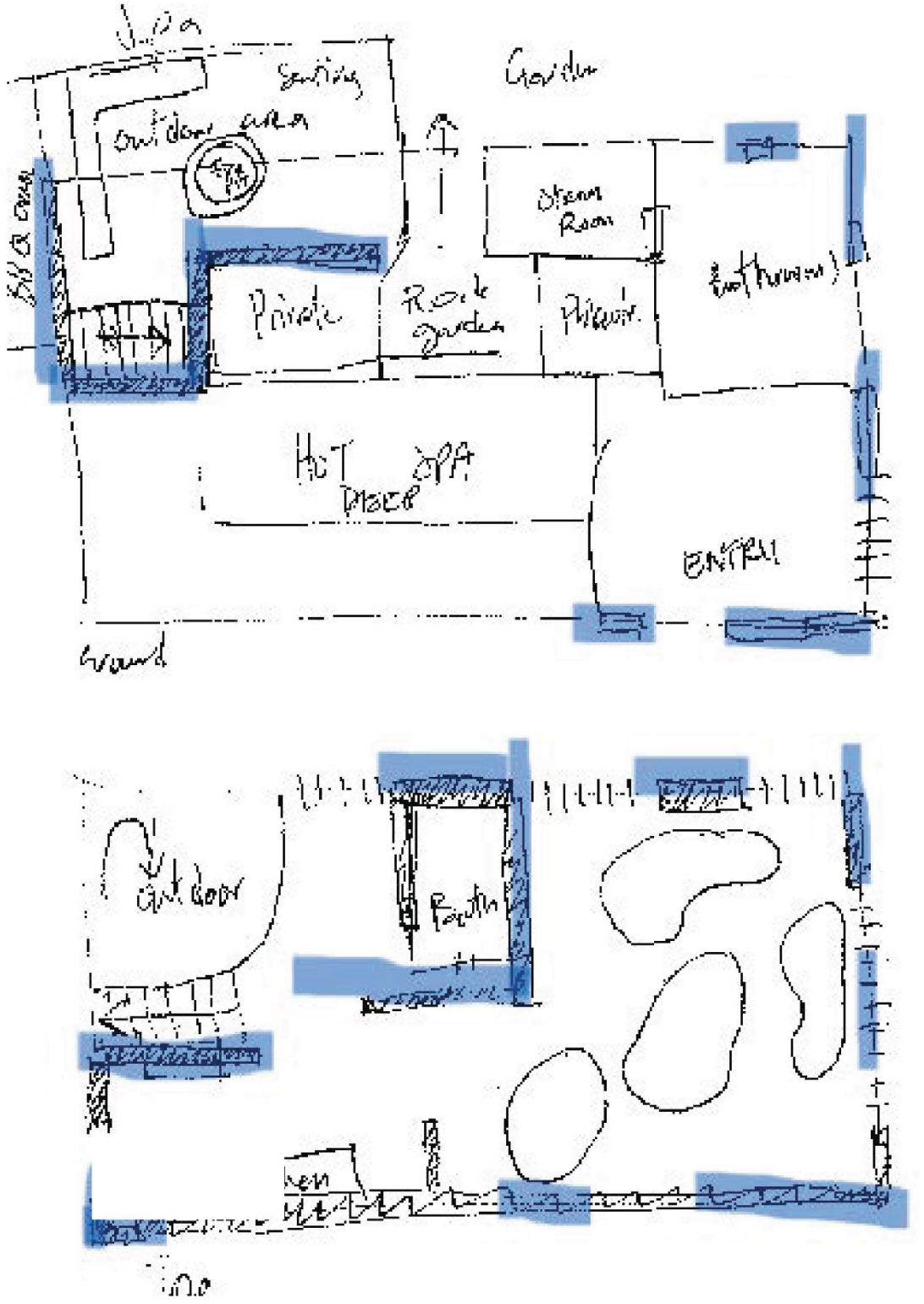


Figure 80 - Whare Ua (Regenerative House)

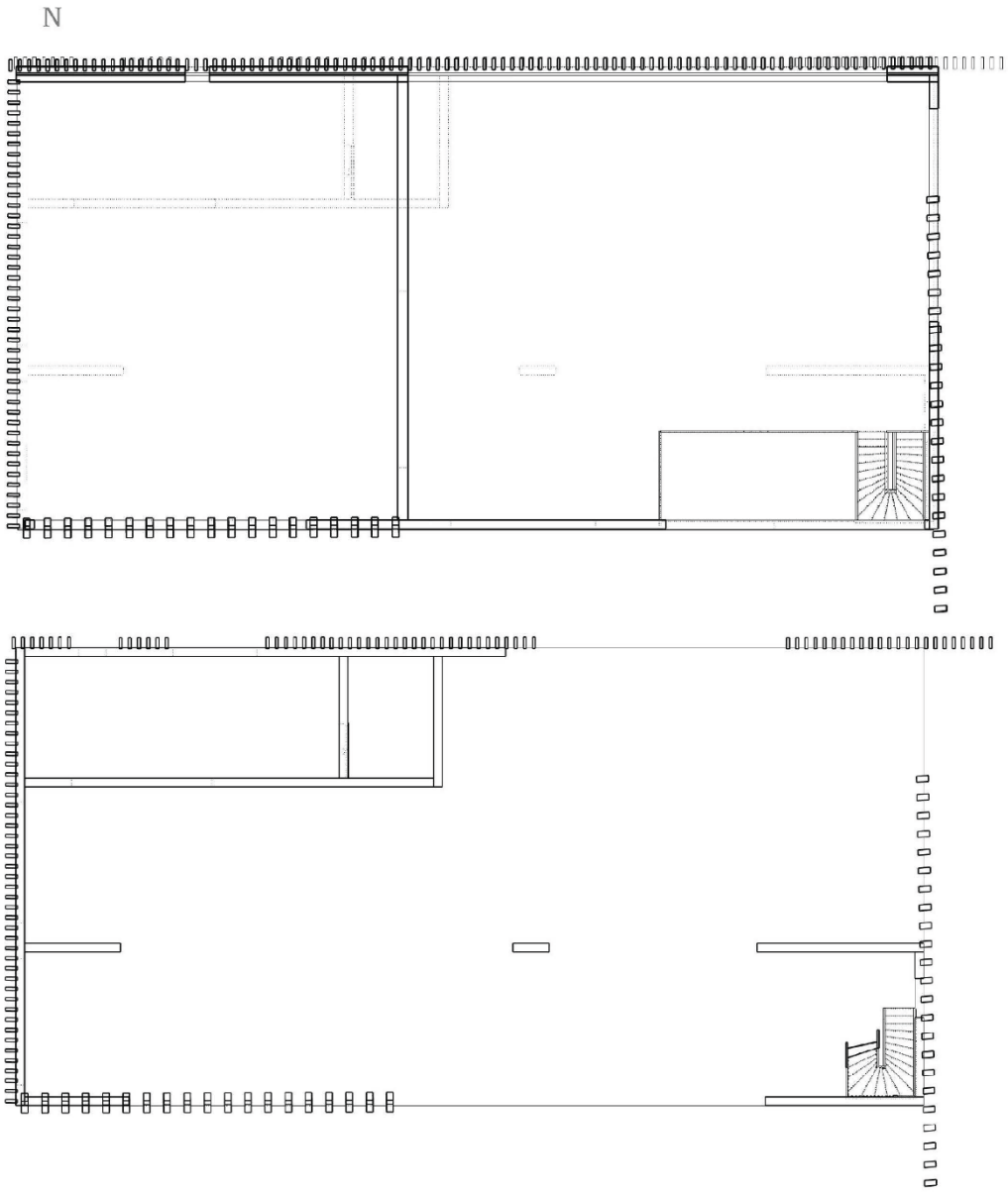


Figure 81 - Whare Ua (Regenerative House)

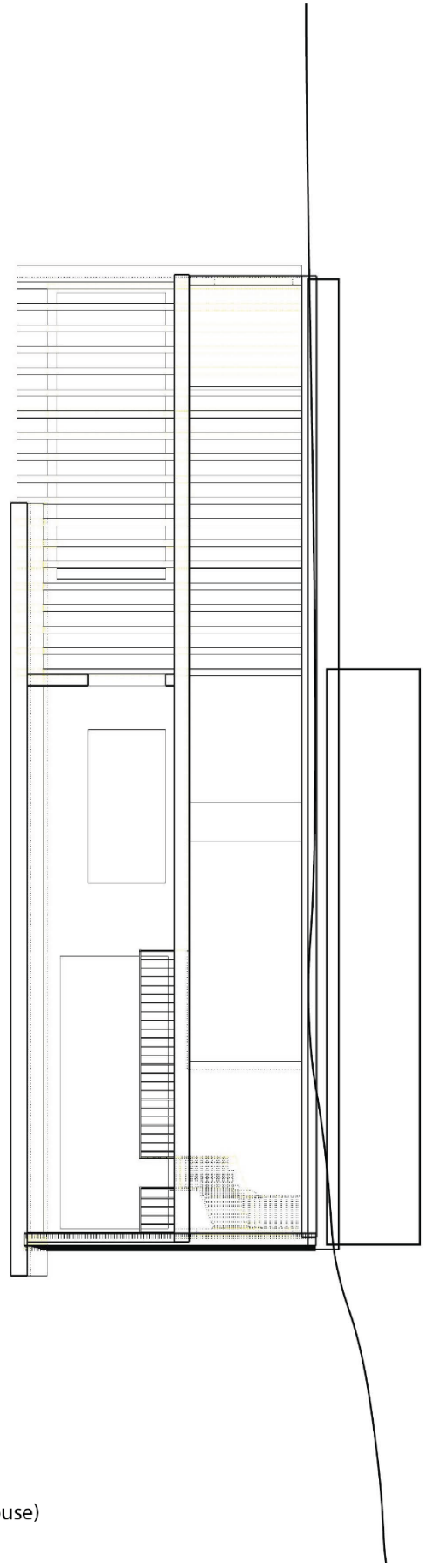


Figure 82 - Whare Ua (Regenerative House)

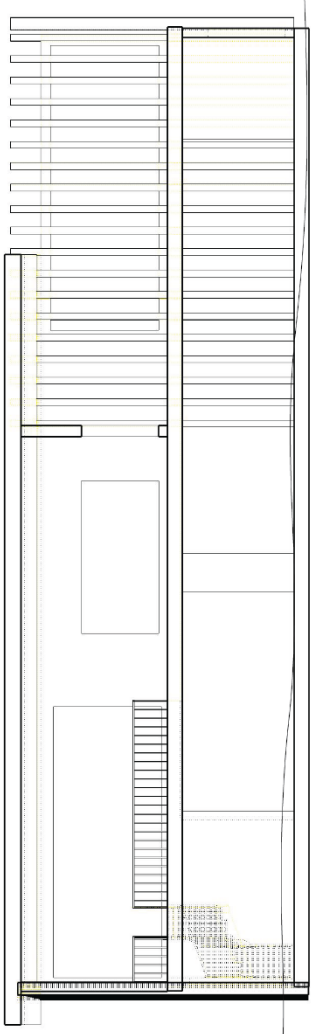


Figure 83 - Whare Puna (Bath House)

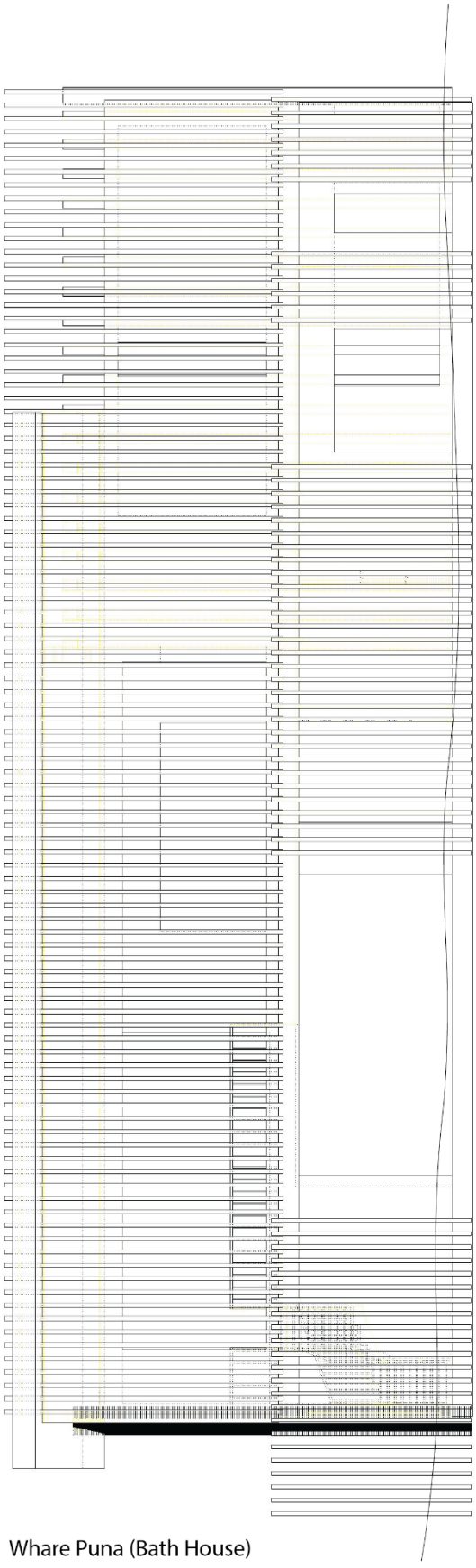


Figure 84 - Whare Puna (Bath House)

Figure 85 - Whare Puna (Bath House)

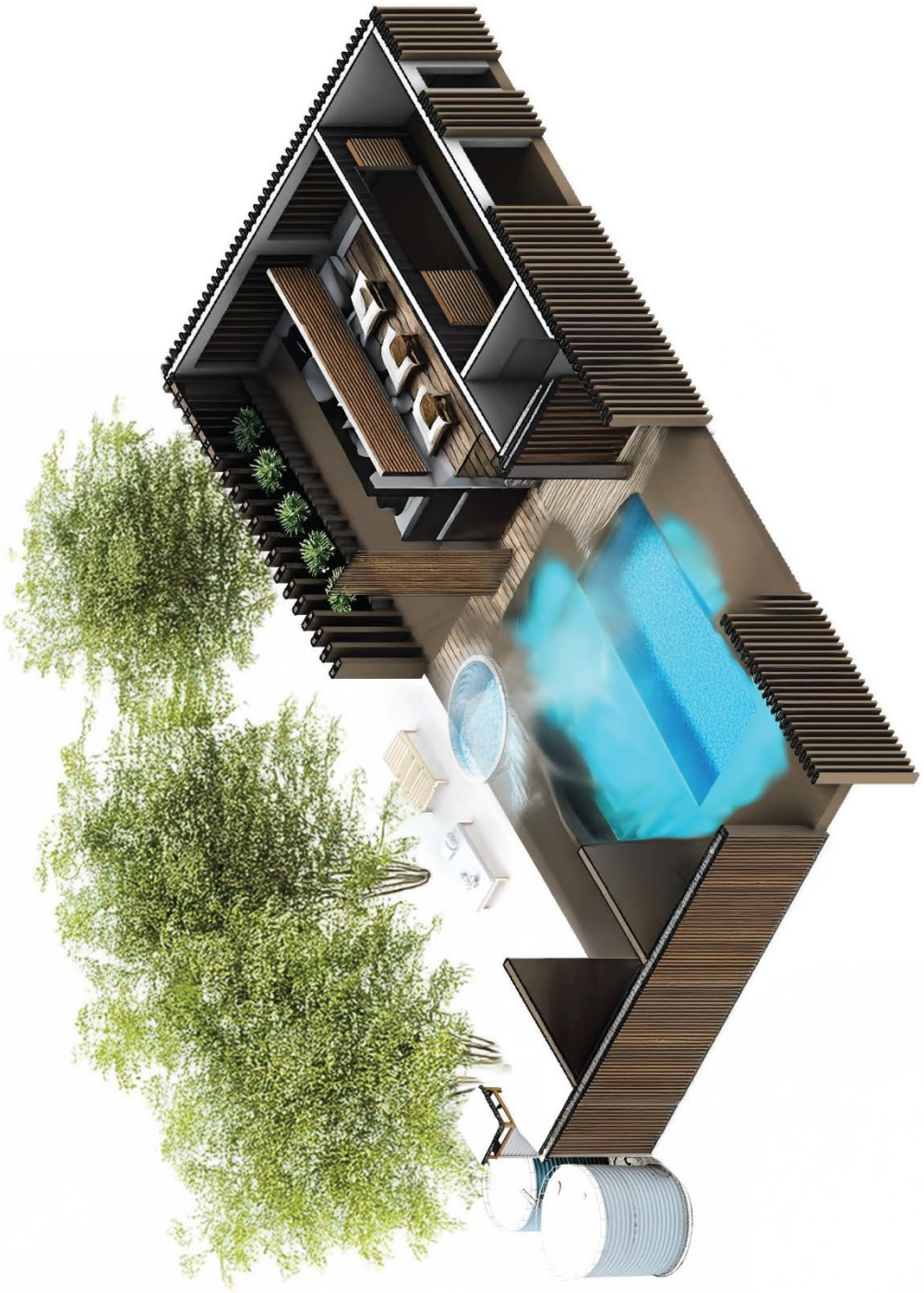


Figure 86 - Whare Puna (Bath House)

WHARE PUNA (SPA HOUSE) 2055 - PERSPECTIVE

Figure 87- Whare Puna (Bath House)

Figure 88 - Whare Puna (Bath House)

Figure 89 - Whare Puna (Bath House)

Figure 90 - Whare Puna (Bath House)

CHAPTER 4 - PART FOUR

WHAKAPAPA-ITERATIONS OVER TIME

This section presents a future-focused approach to architectural design, emphasising the necessity of adaptation in response to environmental and societal changes. Using the timeframes of 2025, 2055, and 2100, this research anticipates the ecological and climatic challenges that will shape the development of Opononi. These timeframes are visually represented in the accompanying drawings, illustrating how design evolves to address sustainability, resilience, and community needs.

The 2025 iteration prioritises the establishment of a foundational structure for the papakāinga, beginning with a hunting shack that provides an initial connection to the whenua. This small, practical structure represents the first step in a long-term vision for sustainable, intergenerational living.

By 2055, the papakāinga expands to include Whare Ua (Regenerative House) and Whare Puna (Spa House). This phase focuses on ecological regeneration, resource self-sufficiency, and community well-being, integrating renewable energy systems, sustainable building materials, and circular economies. Housing developments cater to all generations, with 3–4-bedroom whānau homes, kaumātua flats, and studio apartments for young people. Shared spaces—including community kitchens, gardens, and recreational areas—encourage interaction and uphold traditional Māori practices.

By 2100, the design responds to sea-level rise and climate change, with elevated structures, flood-resistant foundations, and a submerged boardwalk reflecting the transformation of the landscape. The Whare Puna (Spa House) incorporates water storage and filtration systems, while passive design strategies maximise solar energy capture and natural ventilation. Over generations, the community has flourished, its self-sustaining systems ensuring long-term environmental and social resilience. The hunting shack, once a small structure, has been relocated to higher ground and adapted to accommodate more whānau.

Throughout these stages, whakapapa remains central, grounding the designs in cultural heritage while ensuring adaptability to future challenges. Architectural responses are iterative, evolving alongside environmental and social shifts rather than remaining static. This whakapapa-based approach fosters not only sustainability but also a deep, enduring relationship between people and the land.

2025: Establishing a Foundation

The 2025 iteration begins with a hunting shack, a simple, functional structure that marks the first phase of the papakāinga's development. This small-scale dwelling provides a base for whānau engaging with the whenua while allowing time for forest regeneration and resource cultivation in preparation for future building projects. The design considers temporary adaptability, ensuring that as materials become available, structures can expand and evolve.

2055: Expansion and Sustainability

By 2055, the papakāinga develops into a more structured and sustainable settlement, with the construction of Whare Ua (Regenerative House) and Whare Puna

(Spa House). These additions reflect a shift towards self-sufficiency and ecological regeneration, ensuring the long-term well-being of both people and the environment.

Whare Ua (Regenerative House):

The Whare Ua is a community space for ecological restoration and self-sufficiency, supporting biodiversity, regenerative ecology, and food sovereignty. Constructed from non-toxic, durable materials, it integrates flora and fauna into its architecture, ensuring harmony with the natural environment.

A circular roof opening, symbolising the connection between rangi (sky) and papa (earth), enhances natural light while reinforcing Māori worldviews on ecological balance. The surrounding landscape features native plantings, water systems, and habitat layers, fostering biodiversity. This space serves not only as a functional area for food production and environmental restoration but also as a place for whānau to gather, learn, and share knowledge, strengthening intergenerational relationships.

Whare Puna (Spa House):

The Whare Puna is designed as a space for healing, reflection, and reconnection, drawing on the spiritual significance of Hokianga and its deep relationship with rangi (sky), ua (rain), and wai (water).

As a community spa house, it offers therapeutic spaces for mirimiri (massage therapy), meditation, and holistic Māori healing practices. Its design incorporates natural materials such as stone and untreated timber, reinforcing a connection to Papatūānuku (Mother Earth). Outdoor sleeping pods allow full immersion in the environment, fostering a sense of spiritual and physical renewal.

Beyond its role as a wellness centre, the Whare Puna also functions as an essential water infrastructure hub, incorporating rainwater filtration, sanitation facilities, and laundry services. Designed with open-air elements and panoramic views, the spa house reinforces the connection between the built and natural environments.

Papakāinga Housing: Whānau, Kaumātua, and Rangatahi

As the papakāinga expands, the housing development caters to diverse whānau structures while prioritising cultural continuity, sustainability, and well-being.

3–4-Bedroom Homes for Whānau:

These homes foster whānau connection through open-plan living, private bedrooms, and built-in storage. Outdoor gardens, play areas for tamariki, and shared kitchens and dining areas encourage intergenerational knowledge-sharing and sustainable living practices. Solar panels, rainwater collection, and passive heating and cooling ensure long-term energy efficiency.

Kaumātua Flats:

After Whare Ua and Whare Puna are established in 2055, kaumātua flats will be a priority, enabling accessibility and communal living. Single-storey layouts, minimal steps, and wider doorways ensure mobility support, while shared spaces for health activities, traditional crafts, and cultural ceremonies foster kaumātua engagement. Adjacent satellite housing for rangatahi reinforces intergenerational support.

Studio Flats for Young People:

Studio apartments provide privacy while maintaining social connection, incorporating compact, open-plan layouts with multifunctional furniture. Shared spaces—including a communal kitchen, lounge, and workshop areas—support social and cultural engagement, while mental health and life skills programmes empower rangatahi.

STUDIO 2070 - PERSPECTIVE

KAUMATUA FLATS 2070 - PERSPECTIVE

Figure 91 - ITERATIONS OVER TIME - Additional Housing Solutions

2100: Adapting to Climate Change

By 2100, (figures 92-95) the papakāinga has evolved in response to environmental shifts, particularly sea-level rise, and climate change. As the whenua transforms, architectural adaptations ensure the resilience and sustainability of the community, integrating structural and ecological solutions that prioritise both cultural and environmental integrity.
One of the most significant changes is the elevation of buildings to accommodate rising sea levels, preventing inundation while maintaining functional and accessible living spaces. In addition, a submerged boardwalk has been integrated into the evolving landscape, allowing for continued connection between spaces while adapting to the shifting coastal environment.

Passive design strategies play a crucial role in reducing reliance on external resources. Solar energy systems and natural ventilation techniques have been incorporated to enhance energy efficiency, ensuring the community remains self-sufficient. The Whare Puna (Spa House) now serves a dual function, not only as a space for well-being and healing but also as a water storage and filtration hub, reinforcing the importance of sustainable water management in the face of climate change. As the papakāinga has expanded, the hunting shack, once a small, temporary structure, has been relocated to higher ground and adapted to accommodate more whānau. This reflects the iterative nature of the settlement's development, where structures evolve over time in response to both environmental and communal needs.

Through this iterative design process, the community has successfully adapted to climate challenges while maintaining a strong connection to whakapapa and the whenua. This long-term vision ensures that future generations can thrive within a self-sustaining, resilient, and ecologically balanced environment, embodying the principles of kaitiakitanga and intergenerational responsibility.

Figure 92 - ITERATIONS OVER TIME - Walkable Roofs

Figure 93 - ITERATIONS OVER TIME - Walkable Roofs

Figure 94 - ITERATIONS OVER TIME - Generational Housing

SEA-LEVEL 2025

SEA-LEVEL 2100

Figure 95 - ITERATIONS OVER TIME - Sea level rise

CONCLUSION

This research underscores the centrality of whakapapa o te whenua—the genealogy of the land—in understanding the deep, interconnected relationship between people, the land, and the natural world. Whakapapa highlights the mutual responsibility humans share with both the land and all living beings, framing a comprehensive approach to community and ecological stewardship. This methodology has guided the design of papakāinga settlements, ensuring that each space reflects a balance of practical human needs and cultural ties to the environment.

One of the key findings of this research is the emphasis on material circularity as a principle rooted in whakapapa. The design prioritised the use of local, renewable materials, reflecting the cultural and ecological ties to the land. This approach not only respects traditional Māori values but also embraces contemporary sustainability practices, supporting long-term environmental resilience. By reusing and regenerating materials, the design reduces waste and encourages a sustainable relationship with resources, ensuring that the land is preserved for future generations.

The concept of community—both human and nonhuman—is fundamental to this thesis. The papakāinga design fosters shared spaces and practices that encourage communal responsibility and collaboration. Beyond just housing, these spaces include gardens, biodiversity corridors, and natural play areas, promoting intergenerational learning, environmental stewardship, and the wellbeing of all living beings. The design emphasises the interconnectedness of humans with the broader ecological community, supporting not only the physical needs of the people but also the health of the surrounding environment.

A critical element of the research is how whakapapa has shaped a design over time. The iterative approach ensures that papakāinga communities can adapt to environmental and cultural changes over time. This framework recognises that as climate change reshapes the landscape, the design must remain flexible and resilient. Systems such as rainwater harvesting, solar energy, and native planting not only promote self-sufficiency but also adapt to fluctuating environmental conditions. The design is built with an understanding of continuity and regeneration, ensuring that it evolves to meet future needs while maintaining respect for ancestral knowledge and ecological balance.

In conclusion, this research demonstrates how the whakapapa framework can guide architectural design that is both ecologically sustainable and culturally significant. By recognising the circularity of materials, the interdependence of human and nonhuman communities, and the adaptive nature of design over time, the research offers a model for creating environments that are resilient, sustainable, and deeply connected to the land. This approach ensures that communities can thrive today and, in the future, while preserving the balance between culture, ecology, and architecture.

Kia puawai te taiao mō ngā tamariki-mokopuna—May the environment flourish for our children and grandchildren.

Figure 96 - ITERATIONS OVER TIME - Site Regeneration

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