

in(ter)dependence

Achieving Localised Self-Sufficiency in Future Urban Environments while
Enhancing Biodiversity and Interspecies Co-Existence

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in(ter)dependence: Achieving localised self-sufficiency in future urban environments while enhancing biodiversity and interspecies co-existence

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Abstract

in(ter)dependence is a design-based research project that explores how architecture and architectural systems can support urban agricultural self-sufficiency in urban fabrics. The project aims to develop an agroecological architecture that is sensitive to Indigenous knowledge and practices, that builds local food systems, economies and more-than-human communities. This project seeks to pivot from dependence on the current harmful industrial food system, instead empowering a distributed, context-responsive and ecological approach. This project also acknowledges that a shift in societal ontology is required to achieve this vision, and therefore addresses this shift through an architectural intervention.

Situated in a future beyond our present day, this project intervenes in a world suffering from the impacts of anthropogenic climate change, extensive biodiversity loss and widespread social inequities. Intervening at the precipice of societal change, in(ter)dependence catalyses the shift from the Anthropocene to the Ecocene, through shifting the socio-political ontology from capital-centric to agroecological kinship. This project intervenes within the urban fabric and ultimately seeks to disestablish dependence on our broken commercialised food system. Instead, empowering a distributed, context-responsive approach through the establishment of interventions – architectural and otherwise – that support flaxroots agroecological initiatives and later the establishment of a central node in this web, the Memorial to the Sixth Mass Extinction. This will be achieved by implementing tactful and strategic modes of engaging with vacancy, food production, and generalised public ontology. This distributed approach not only increases accessibility but also empowers human communities to connect with food production and value the intrinsic interdependencies shared with more-than-humans. Located within Tāmaki Makaurau the project focuses its intervention on the suburb of Māngere. Interrogation of the wider site vernacular distilled two core typologies: the mound, or maunga, and the glasshouse. These typologies are investigated to reveal their distinct and definitive characteristics, resulting in the programmes of their architecturalisation. For the mound aspect, these programme(s) stem from the notions of the underground, germination, solemnness, and latent potential. For the glasshouse, the programme embodies notions of efficient productivity and a lively, lightweight structure full of light.

The programmes contained within the mound are concerned with seeding change. The mound houses a literal seed bank for the surrounding communities and region alongside the facilities to extract and cure these seeds. At a relational transformational level, the mound embraces the Memorial to the Sixth Mass Extinction – a memorial to the significant losses incurred throughout the Anthropocene. The memorial aims to spatialise generalised grief and mourning surrounding the current ecocide, and acknowledge the harm inflicted by industrialised civilisation, before pivoting toward an eco-relational sensibility. This is delivered through the arrival at the ‘glasshouse’, an architecture that rises from the earth, simultaneously piercing and disappearing within in the skyline. The architecture resembles that of the hakari, a performative skeletal structure that hosted celebratory feasts (Treadwell, 1999; A. Yates, 2010), and in this instance celebrates, supports, and enables the surrounding agroecological food system.

Approach

To approach these issues, the Agroecological Care Theory is synthesised from the interpretation of many existing theories. The significance of this project lies in its translation of this theory into a collection of principles and processes against which case studies and design decisions are evaluated. These principles and processes are networked, layered, transformational, resilient, local, and productive.

- Networking is an ecological principle concerned with creating functional, linked systems stemming from the notion that ecological systems are intrinsic meshes of connection. This principle is pivotal in linking the aspects of food, the architectural urban, people, and more-than-human communities as a homogenised arrangement of being.
- Layering is concerned with acknowledging histories that span deep time – and also the physical processes of rebuilding soil vitality and biodiversity, referencing the process of layering organic matter in the act of composting or mulching, both of which return vitality to the earth and increase biodiversity. In another sense, layering invokes thoughts regarding knowledges and narratives, specifically those of Indigenous origin, that lie within the strata of the earth.
- Transformation enacts the purpose of the research to shift from an anthropocentric to an ecocentric model of being, resolved to the detail of food systems, urban systems, and architectural tectonic systems. Transformation is the realised potential of a shifted socio-political ontology where an ecocentric paradigm has influence over the practices of humanity.
- Resilience is concerned with the protection of food systems and the corresponding health of communities. Specifically, in the face of climatic crises such as increasing temperature, sea level rise, and intensifying weather events, having enduring systems that can withstand these pressures (and contribute toward mitigation) is a critical necessity for feeding the population.
- Localising, when actualised, achieves the purpose of the research in transitioning to modes of living that no longer rely on globalised industrial systems of production and distribution; instead, amenity is produced and available within a person's locale. Furthermore, localising reduces accessibility inequity.
- Productivity as a principle of agroecology not only manifests through the growing systems implemented to produce food within the scheme, such as organic bio-intensive polycropping, but also as an influence on the architectural outcomes of this research. This is observed through moves such as small building footprints, vertical density, and the preservation of fertile land for the production of food.

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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 used artificial intelligence tools or generative artificial intelligence tools (unless it is clearly stated, and referenced along with the purpose of use), 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:

Date: 19/11/2025

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Introduction

in(ter)dependence is a one-year design-led research project grounded in a deep enquiry into how architecture might serve as an eco-agricultural, localised, food-producing infrastructure that facilitates cohabitation with the more-than-humans. This research results from the cumulation of various fields of interest across my personal practice and academic studies. In 2022, while I was in the second year of my Bachelor of Architecture and Future Environments, my work began to engage architecture with more-than-human ecologies. The aims of this work sought to develop architectures that would gracefully coexist with the vibrant earthscape beneath them and programmatically activate food sovereignty in an urban environment. Underpinning this work was critical thinking around agroecological and kinship-centred theories that exhibited the potential to activate and shift architecture itself. These projects established the trajectory for this research project, which is also informed by the work of many theorists such as Donna Haraway, who applies feminist theory to critiquing and understanding the relationships between humans, nonhumans, and technology; these ideas are critical in the positioning of this work within a world of more-than-human kin.

I am a compost-ist, not a posthuman-ist: we are all compost, not posthuman.
(Haraway, 2015)

The instinctive connection to our natural environments and growing food can be traced to some of the earliest photographs from my childhood, which comprise of a very young me 'helping' my mother in the garden. My grandfather and his father were both keen attendants of their vegetable plots. This results in an intrinsic intergenerational connection to growing food. The desire to pursue this field of research within my architectural studies comes as a pragmatic response to the current ecological crises (Brondízio et al., 2019; Masson-Delmotte et al., 2022) and severe food accessibility inequity (Brondízio et al., 2019; Pannekoek & Ree, 2019) but also is driven by an existential desire to re-connect and live-with our living planet. My ongoing interest is in how architecture might create habitats for both people and nonhumans, intertwined with the challenge of affording high-quality local food, and it stems from roots deep in the earth.

This question has a poignant relevance at this time and requires innovative strategies for contemporary conditions as increasing urban density denies this possibility of self-sufficiency to the individual or community. Hence my interest in the question of how architecture might intervene and enable food production in urban fabrics. However, the project is also guided by the ancient agroecological practices of Māori in Tāmaki Makaurau. Generations before my great-grandparents, and grandparents gardened here, Māori were forming highly productive agroecological landscapes across the isthmus of Tāmaki, incorporating the cultivation of crops alongside earth-shaping techniques, foraging, hunting, and fishing to establish seasonally resilient and balanced diets.

Following this ancient urban land practice of Māori, and the contemporary need for ecological connection and regeneration, this project develops an Agroecological Care Methodology in an architectural context. Agroecological Care is fundamentally intertwined with the notion of network – relationships that connect to the numerous entities of ecosystems both micro and macro. Within these ecosystems, various beings interact and depend on each other for sustenance, shelter, or support for survival. Kinship is the expression of the interdependence of beings in ecosystems, in contrast to the independence sought by humans. Humans have detached themselves from the role of functioning participants in wider systems, instead acting in isolation unfazed by the implications of their actions for all beings in the sense of both contemporary and deep-time temporalities. The reconnection of humans with their nonhuman counterparts is intrinsic to kinship with a living world where an ethic of care is expressed toward more-than-human entities. The inherent value given to the other in reciprocal exchange shifts human ontological positioning away from anthropogenic capital-centric thought.

Aims

This research project aims to explore the architecture of agroecological kinship in response to the urgent need to make our communities resilient, decarbonised, and locally productive. The outcome of agroecological kinship is regenerative, rhizomatic and networked, it is relational and interconnected, and it avoids 'monoculture' in favour of rich diversity and radical fecundity. In asking how architecture may become agroecological, I have sought to explore how these conditions can spatialise, become tectonic, programmatic, experiential and materialised. The resulting eco-ethical kinship architecture expresses an ethic of care to both human and nonhuman beings.

Chapter One explores the literature, theoretical landscape, and current practices of Agroecological Care. This exploration creates the context from within which this design research evolves. Despite these fields all sharing adjacencies, the chapter is divided into two sections, the Ontological and the Precedent, to better delineate, not bifurcate, the outcomes of scholarly and academic research from those of physically embodied processes. The Ontological section is itself separated into Parts 1 and 2 to discuss various schools of thought that offer different philosophical lenses that can be used to approach the field of eco-ethical human existence and symbiosis with a living world. This provides an ontological grounding for the research project and emphasises the necessity of supporting design work with ontological positioning. The Precedent section in Parts 3 and 4 consists of exemplar projects and design interventions that constitute the current field of practice across both local and global geographical contexts of eco-ethical design and agricultural production. These precedents inform a guiding framework of principles that ultimately shape the design outcomes of this research project.

Chapter Two addresses agroecology as a methodology that can afford care to more-than-human and human entities. The definition and use of the agroecological as a methodology allows for the integration of the 'natural' and 'cultural' in contrast to the bifurcation that is typically observed

in current practice. Chapter Two also explores methods associated with drawing connections across varied ‘-scapes’: land, sea, air, time, socio-political, and socio-cultural. Within this chapter the methodology is abstracted to produce a set of principles to which the design process adheres, ultimately guiding the implementation of the eco-ethical architectural intervention. These principles are further described as a set of methods allowing for the implementation of Agroecological Care as a physical output.

Chapter Three presents design compositions created from speculations of positional adjacencies, programmatic function, and tectonic form. The varying design compositions are presented and critiqued throughout the development process before the finalised outcome is presented. Among other critique, the compositions are assessed against the guiding principles derived from the agroecological kinship methodology to deduce the validity of the design decisions. This process resulted in the production of a final design that maximises the possibility of the site, responding to deep-time, ecological regeneration, and human recovery.

This project uses agroecological qualities or conditions as architectural processes and design drivers. It tests out radical ecological thinking through architectural infrastructures of ethical care. The value of this research lies within the vision it manifests of a decentralised urban food system housed within architectural hubs that coexist in reciprocal dialogue with nonhumans, highlighting the intrinsic interdependencies of life on planet Earth. The project draws attention to the intrinsic and essential value of productive soils and biodiverse ecologies. Beyond this project, the future potential for this methodology lies in fields of urban design and in construction policy-making and legislation. As with the project itself, the desire to shift the ontological consensus toward one of agroecological kinship is at the core of this research. The implementation of this methodology will result in urban fabrics that are sensitive toward and foster coexistence with more-than-humans. This work critiques contemporary building practices that allow class one highly productive soils to be developed and built on. The critique of urban sprawl onto productive land operates in parallel with critique of the concentrated national ‘food bowls’ that have shown their vulnerability and insecurity in various natural disasters, which will only worsen with the deteriorating stability of our climate. The development of urban planning or design policy that applies agroecological kinship ontologies would be the consequential next step that follows from this research.

Research Questions

Main Question: How can vacancies in urban fabrics provide space for self-sufficient urban agriculture to be achieved while forming connections between human and nonhuman entities?

Sub-question One: How can eco-ethical architectural interventions support self-sufficient urban agriculture while significantly enabling more-than-human communities?

Sub-question Two: How can vacancies in urban fabrics act as banks of Indigenous , regenerative, circular resources that enhance biodiversity and local ecology while performing reciprocal ecological exchanges?

Design Tactics

The project proposes interventions at two different points in time: one in the near future, now or no later than 5-10 years from the present day, the other between 2100 to 2200 A.D. The first proposal would consist of architectures that support the soil microbiome and return to the earth at their end of life, while facilitating regenerative agroecological practice. The second proposal speculates on how the architecture itself becomes a functioning part of ecosystems while shifting socio-political ontologies and facilitating the production of food in a new age. The future ontology-shifting intervention manifests as a memorial in honour of the sixth mass extinction. This memorial is nested within a constructed earthen mound on the site. This mound is constructed of the fill typically excavated and discarded in construction projects. Given the fecundity of South Auckland's soil, the project repurposes this earth, which would normally be wasted, into a terraced farm. This earth is seen as gifted from the varying places across the whenua to the project burying the memorial and seedbank within whenua that is intrinsically connected to the region. The memorial's positioning underground protects the land above from future development and contributes to the narrative journey. This experience moves through the phases of creation in a Māori worldview, Te Kore, Te Pō, and a return to Te Ao Mārama , taking the visitor through a process of grieving and mourning the lost, reflection, and then rebirth into the ecocentric structure of the glasshouse.

This future proposal also provides crucial infrastructures to support the urban food network such as a 'farm', seed bank, compost hub, preservation and canning facilities, rongoā and herbal medicine production, and a wānanga where goods are produced from naturally regenerating resources. These programmes are housed within the 'glasshouse', a mass timber 'hakari' cloaked in bio-acrylic shingles that can be user-actuated to dissolve the boundary between interior and exterior.

Chapter One: Theoretical and Design Contexts

in(ter)dependence is grounded in contexts of care toward nonhumans, humans, ecologies, and the urban. The urban is the physical site of the research, where architecture is implemented as the infrastructure supporting care. Urban ecosystems are both a further key ground – physical, ethical, existential, relational – and a community to whom care must be afforded. This chapter grounds the research in specific contexts. Firstly, in Part 1, concepts of kinship with the more-than-human are explored as a foundational condition for the agroecological. Subsequently, Part 2 addresses ecological temporalities and eco-relational systems as a critical living attribute that architecture must attend to. Part 3 engages Tāmaki as a food system within the context of the urban condition. Finally, Part 4, aims to prepare the conceptual and creative grounds for this critical design research in the form of design precedent.

Part 1. Agroecological Ontologies/Kinship with a Living World

The advancement and development of industrial processes have led humanity to drastically alter the earth's surface at an unprecedented rate and scale (Haraway, 2015). Thus dawned the unofficial epoch of the Anthropocene. The Anthropocene is an epoch created by human culture, specifically – as many Indigenous scholars note – a Western, Cartesian, industrial culture that has not attended to the interconnected systems of this living world (A. M. Yates, 2021). As Haraway notes, it is important to consider that this is simultaneously a “multispecies phenomenon – and a multispecies crisis – through and through” (Haraway et al., 2016, as cited in Andersen et al., 2023, p.3.). To attend to matters of the Anthropocene with sensitivity toward the more-than-human, care must be expressed.

Human expansion across the vast reaches of our planet throughout the Anthropocene has caused monumental multispecies loss. Those lost are pivotal members of and participants in local and global ecological networks, in both life and death (Rose et al., 2017). The resulting trauma of these horrific deaths spans deep-time, generations, kin, and knowledge; however, there is no generic experience of extinction, with each specific event situated within complex entanglements, relationships, and multi-contextual histories (Rose et al., 2017). Through measuring loss, the shift in epoch from the Holocene to the Anthropocene is evidenced by the monumental reduction of refuge (Haraway, 2015). To limit the extent of the Anthropocene, we must imagine the next epochs as ones that replenish refuge, reconnect humans with nonhumans, and permit the flourishing of generous, reciprocal lives (Haraway, 2015).

The rekindling of human–nonhuman connection is at the heart of this eco-agricultural architectural project. This research argues that the transition to regenerative urban systems must involve an ontological shift in both the public and legislative sectors. This ontological change would see a shift to a post-industrial, post-Cartesian, or post-colonial system of living, where kinship with the living world is inherent.

The move toward these systems would oppose the linear immediacy of 21st century Western norms, instead introducing slow, cyclical timespans of more-than-human and living systems, such as that of soil (Puig de la Bellacasa, 2017). This is crucial, even as the current ecological crisis forces us to make a rapid response, to halt and adapt to the implications of climate change, because we must find ways to align human temporalities with periodicity of ecologies to cultivate long-term prosperity (Puig de la Bellacasa, 2017). This attention to more-than-human temporality is a mode of expressing care while enacting “nonexploitative forms of togetherness” (Puig de la Bellacasa, 2017, p.24.). This notion of togetherness can extend from the concept of the naturecultural world, where what is of natural origin and what is of cultural origin are entangled inseparably, rejecting humanist ontological bifurcation (Haraway & Wolfe, 2016; Puig de la Bellacasa, 2017). This idea is a speculation that the expression of care toward other-than-humans is an instinctive characteristic of people living in naturecultures. The ethical engagement of care in more-than-human worlds is often depicted as the acts of everyday maintenance, as ecofeminist literature denotes, typically done by women in both contemporary and pre-European Indigenous societies

(Heuer, 1969; Hochschild, 2012). These practices of maintaining relationships through care can be manifested through acts such as the return of surplus to the earth through composting and acknowledging cyclical reciprocal coexistence, rather than the perpetual extractive nature of current relationships.

Compost itself extends beyond an expression of care for the nonhuman other and into a perception of oneself as an equal component of the Chthulucene. As each of us is no more than an organism consuming others that will, in turn, be consumed by them, the thought of living-with and dying-with others is no longer escapable (Haraway, 2016). This positioning is parallel to the making of kin with our other-than-human beings and, in fact, composting can be seen as the instance where the unexpected collaborations and combinations of kin come together, “in hot compost piles. We become-with each other or not at all” (Haraway, 2016, p.4.). Crucially, with composting, it matters what it’s made of, therefore we shall strive to make good compost (Hamilton & Neimanis, 2018; Puig de la Bellacasa, 2010).

For Māori, the expression of kinship toward the more-than-human is inherent in worldview, Te Ao Māori, cultural practice, tikanga and mātauranga Māori, and traditional narratives and myths, pūrākau. In these pūrākau, humanity can trace its origins back through whakapapa to the Earth Mother herself, Papatūānuku (Royal, 2012). The consequent ontological positioning crafted by this creation story situates humans within an entanglement of multispecies kin sharing ancestry and mauri, thus further informing the ethic of care expressed in practices that engage with these other-than-human beings (Higgins, 2012; Mikaere, 2011; Reilly, 2004). This symbiotic approach to the co-occupancy of our world resulted in interwoven interdependencies on both macro and micro scales. Some research suggests that this eco-relational ontology was exemplified in architectural notions such as the monumental and intricate pā, or massive timber hakari feasting structures (Rolleston & Awatere, 2009; A. Yates, 2010). These architectures celebrated eco-relational ties with the surrounding landscape and provide important place-based approaches for the systemic change that is necessary now.

Part 2: Agroecological Systems/Eco-Relational Food Systems

Urban agricultural transitions: From capitalist industrial to ecocal models

Implementing kinship-centred urban agroecology at scale requires tactful navigation of the politics surrounding existing planning and regulatory frameworks while theorising entirely alternative methods of planning the urban landscape. Aside from the physical activation of spaces to produce food within the urban (environment), this tactful intervention tends toward the decommodification of food, supporting architectures or infrastructures that enable these food networks, resisting the capital-centric land agenda, and providing sustainable livelihoods.

The dawn of the Plantationocene established the practices of extensive extraction alongside the abstraction of human and other-than-human life for profit. Capitalism is capable of converting inherently noncapitalist goods or services into capital through ‘salvage accumulation’ (Tsing, 2015). The sites of salvage exist both within and beyond the bounds of capitalist control, making them ‘pericapitalist’. An example is the timber of a forest: once the trees are felled, they enter capitalist supply chains where the value imbedded by the tree’s growth is ‘salvaged’ for capital accumulation (Tsing, 2015). Capitalists exploit the capacity of natural systems; however, they remain dependent on the processes of natural systems which they cannot control, such as photosynthesis and animal digestion (Tsing, 2015). The commodification of such goods represents imbalances of power not only between humans and nature but also between humans in the wake of colonial histories and the resulting “postcolonial political economy” (Barua, 2023). The commodification of natural goods, such as fruit and vegetables, within capitalist frameworks incentivises the cheapening of their production and favours monetary value over the fundamental value of nutrient density or thriving soil biology (Barua, 2023; Patel & Moore, 2018).

The impact of capitalism on agriculture extends beyond the salvage of natural processes for profit through to the erasure of productive agrarian landscapes through urbanisation. As the global population has grown, the percentage of the populus living in urban areas has simultaneously increased (Masson-Delmotte et al., 2022). As a result, urban areas have spilled over their borders and sprawled onto surrounding farmland (Tornaghi & Dehaene, 2021). Urban planning has traditionally ignored the multispecies histories and diversities that inhabit the peri-urban landscape, instead visualising this space of rural complexities as a blank canvas ‘awaiting development’ (Tornaghi & Dehaene, 2021). Perceiving rural land in this light enables capital accumulation and, ultimately, the conversion of this land to urban development (Borras & Franco, 2024; Tornaghi & Dehaene, 2021). This capitally incentivised urbanisation fuels the bifurcation between the rural and urban, creating spatial divides that compromise rich entanglements between humans and other-than-humans, simultaneously enforcing the separation of what is cultural and what is natural (Puig de la Bellacasa, 2017; Tornaghi & Dehaene, 2020).

Interweaving agricultural production within urban fabrics is crucial to providing resilience in times of climatic and ecological uncertainty, specifically enabling sovereignty over what crops are grown and how, in the context of agroindustrial seed and fertiliser corporations and changing

genetic modification laws (Tornaghi & Dehaene, 2020).

Human and microbiome interconnection: Interconnected biomes

Living with living systems is inherent to humans as, throughout millions of years of evolution, people became intrinsically intertwined with their environments and the organisms that cohabit these spaces. As a result of the Great Acceleration, the population of humans rapidly grew and, over time, urbanised. Natural evolution and labour-intensive farming practices could not maintain pace with population growth and were shortly superseded by technological advancement that empowered industrial-scale farming that enabled the 'manufacture' of processed foods for these people (Gibney & Forde, 2022).

The process of urbanisation often ignored the importance of 'green spaces' and neglected the value of productive land and ecologies (Tornaghi & Dehaene, 2021), while the urbanised population experienced a shift in socio-cultural norms that saw a reduction in outdoor exposure (Graham & White, 2016). The current narrative of urbanisation enforces the bifurcated rhetoric of the cultural and natural, otherwise referred to as the "urban-rural divide" (Puig de la Bellacasa, 2017; Tornaghi & Dehaene, 2021). This bifurcation has resulted in the 'sterilisation' of our cities where more-than-human life is scarce (Robinson et al., 2024). Alongside modern medicine, this sterility has contributed to the reduction in the prevalence of communicable diseases since the Great Acceleration commenced; however, the presence of non-communicable diseases has rapidly increased in this same period (Bruno et al., 2022; Selway et al., 2020). The separation of humans from our more-than-human interdependencies is partially responsible for the detrimental health conditions experienced by urbanised populations. This separation took place in the anthropocentric belief that humans are beyond, or independent of, wider ecological systems. The distancing of humans from their evolutionary microbiomes prevents the inoculation of the human microbiome with beneficial microbes, resulting in an immune system that may lack adequate 'training' to cope with future exposure to irritants and pathogens. The consequent immune dysregulation increases susceptibility to diseases such as asthma, allergies, inflammation and autoimmune disease (Matthews et al., 2024; Sun et al., 2023).

Human ignorance toward nonhumans is reflected across many aspects of human life; one that is notable in relation to this thesis would be agricultural practice. Current industrialised agrarian methods sideline the complexity of ecological and biological systems and timespans, instead favouring a monolithic and controlled approach to food production where the focus is solely on the product rather than holistic systems (Norgaard & Sikor, 2019). The use of synthetic pesticides and fertilisers to achieve industrialisation has caused significant harm to biodiversity, waterways, soil fertility, and wider more-than-human networks (Norgaard & Sikor, 2019).

The distributed nodes of eco-regenerative agriculture across urban landscapes will produce nutrient dense food that will positively contribute to human health while establishing thriving communities of microbiota. Eco-regenerative agricultural methodologies express care to the

more-than-human and aim to enhance the symbiotic relationships and circular systems of the ecological world (Altieri & Nicholls, 2018). The reactivation of more-than-human mauri within these farms not only supports agroecological kaupapa, but it also re-establishes a diverse urban aerobiome. Flourishing urban soil biodiversity is critical in the provision of diverse aerobiomes (Matthews et al., 2024). The aerobiome is significantly important in urban environments for supplementing the reduced microbial contact that urbanised communities experience. Doing so through passive exposure requires no behavioural change from inhabitants and is equitable in the sense that it has the potential to reach majority of the population, even those who suffer from 'nature deprivation' (Matthews et al., 2024; Sun et al., 2023).

Eco-regenerative agriculture

The worsening climate crisis and critical biodiversity loss not only impact sea level rise and the 'wild' places of our planet, but they also directly influence the outcomes of farming. This leads to one of the most pressing questions of the 21st century: how will we feed our growing population? Our current modes of agricultural production are vulnerable and have terraformed the earth's surface to provide unsustainable levels of production. This degradation of planetary systems is driven by a capital-centric crusade for profit (Gordon et al., 2024). The vulnerability of this food system has been proven by extreme weather events, for example, in the case of Cyclone Gabrielle and its impact in Hawkes Bay. Industrial scale agri-business has thrived in the wake of systemic colonial logics, the underpinnings of which are the plantation. The emergence of the plantation signified an epochal shift from the Anthropocene, which broadly covers the implications of human beings on the planet, to an era focused on the direct effects of extractive and enclosed monoculture plantations, birthing the Plantationocene (Barua, 2023; Haraway, 2015). The plantation sanctioned the pursuit and production of profit from other humans and the other-than-human, integral principles that remain within modern practice. Predominant contemporary, postcolonial systems of living and producing on our planet are categorised as linear take-make-waste economies that are responsible for the unsustainable extraction, exploitation, and degradation of our planet (Patel & Moore, 2018; Tornaghi & Dehaene, 2021). In these systems, waste that could remain within circular systems is discarded and lost to landfills, as seen in the significant amount of organic material sent to landfills in Aotearoa each year (Ministry for the Environment, 2022).

Current food systems, designed to thrive in capitalist conditions, struggle to provide accessible and nutrient dense foods to the socio-economically deprived (Tonumaipé'a et al., 2021). The food environments of our cities and urban landscapes have promoted unhealthy diets though the availability of highly processed, nutritionally sparse, energy-dense foods that are persistently broadcast to the population (Gibney & Forde, 2022; Tonumaipé'a et al., 2021). These diets are afforded through the savage exploitation of cheap nature and marginalised communities for labour (Barua, 2023). The resulting food environments are categorised metaphorically as food deserts, food swamps, food oases, and food mirages (McClintock, 2011; Tonumaipé'a et al., 2021)

and exist across our urban fabrics. These ‘environments’ are simultaneously the result and the cause of the severe food insecurity faced by New Zealanders despite our country producing enough food to feed 40 million people (Curran-Cournane & Rush, 2021; Mcilraith, 2022). With a rapidly increasing population both on global and local scales, this problem can only be expected to worsen as an anticipated 56% more food will be required by 2050 (Ministry for Primary Industries, 2023).

Urban agriculture seeks to contrast the aforementioned metaphors, instead offering the food haven as metaphorical rebuttal. Individual self-sufficiency through urban agriculture has been proven spatially viable, using suburban Adelaide as a case study. Only the lawn space of a standalone dwelling was required to achieve self-sufficiency, and under high- and medium-yield scenarios only 23% and 72% respectively was required (Hume et al., 2021). This measure of self-sufficiency accounts for the production of fresh, nutrient-dense crops such as vegetables over calorie-dense foods such as cereals and grains, as this is deemed a more efficient use of space in the urban setting (Hume et al., 2021; Martellozzo et al., 2014; Weidner et al., 2019). The research of Hume et al. (2021) proves the viability of urban individuals or households achieving nutrient self-sufficiency; however, the present research project is founded on an interest in achieving nutrient self-sufficiency at a neighbourhood scale, given the forward projection of this work into a time where the urban has experienced a level of densification that would see fewer standalone dwellings and a greater sense of interdependent modes of living.

To achieve maximal output on restrictive sites across urban fabrics, growing methods that are spatially efficient, offer high yields, and are founded in eco-regenerative principles must be employed. Implementing agroecological growing methods has been proven to increase yield significantly compared to conventional growing, in one case by 61% (D’Annolfo et al., 2017). Agroecology, despite covering a vast array of practices, can broadly be considered as either conforming, where the principles are applied to current industrial-technical farming, or as transformative, where agroecology is implemented as a tool that can reshape “food systems and territories based on a balanced human-nature perspective” (Andrade et al., 2020, p. 21). This project is concerned with agroecology as a transformational tool and therefore the consequent benefits of such a transformation. Examples of such tools would be applying ecologically intensive growing practices like polycropping (Altieri & Nicholls, 2018; Liebman, 2018) and syntropic agroforestry (Andrade et al., 2020; Lincoln et al., 2023). These radically productive systems are capable of producing considerable yields over conventional monoculture farming with polycropping producing 5-20kg/m² per year and outperforming some conventional methods by 15 times (Altieri, 1999; Altieri & Nicholls, 2018; D’Annolfo et al., 2017). Additionally, syntropic agroforestry produces between >1.5mt/ha and >11mt/ha of food, excluding biomass from other medicinal and resource plants (Andrade et al., 2020; Lincoln et al., 2023).

Despite the radical productivity of agroecological growing methods, it is also necessary to evaluate whether these yields can sustain nutritional self-sufficiency. To calculate expected fruit and

vegetable consumption, I have used a male, 19-50 years old, as their recommended serving sizes are the largest (McIntyre et al., 2020), despite only 9.1% of adults in New Zealand consuming the recommended daily intake of fruit and vegetables combined (Ministry of Health, 2024). Based on an approximate serving size of 75g for vegetables and an expected intake of six servings per day, this subject should consume 164.25kg of vegetables per year (McIntyre et al., 2020). For the same subject, the recommended daily intake of fruit is approximately a 150g serving, and at least two servings daily, which would total 109.5kg of fruit per year (McIntyre et al., 2020).

Using achievable yield values of 8mt/ha for syntropic agroforestry and 10kg/m² for vegetable production, one adult would require 137.5m² for fruit production and 16.4m² for vegetable production.

Part 3: Ngā Māra o Tāmaki – Tāmaki Food Systems

Looking to Aotearoa for precedent, we must look no further than Tāmaki Makaurau to see localised, radically productive urban agriculture. Kelmarna Community Farm located in Ponsonby, Tāmaki, is an example of this movement. Neighbouring the CBD, Kelmarna has 1,040m² of market gardens in production yielding “4,700kg of nutrient dense, organic produce” (McFadden & Morrison, 2025, p.9). This equates to approximately 4.7kg of edible biomass per square metre, which is a good level of productivity compared to the yields outlined in Part 2 (Altieri, 1999; Altieri & Nicholls, 2018; D’Annolfo et al., 2017). However, Kelmarna’s outputs go beyond fruit and vegetable production with their farm outputting 10,200 eggs, \$11,070 worth of seedlings, processing 40,160 litres of food scraps into compost, a 130m² plot dedicated to flowers and other ecologically enhancing species, native enrichment, and massive public outreach through on-farm volunteering, workshops, and community events (McFadden & Morrison, 2025). This shows the radical transformational potential of agroecological principles beyond the farm gate (Altieri & Nicholls, 2018; Huambachano, 2018).

Despite being spatially plausible, using land efficiently, and creating a variety of eco-social benefits, critics argue that small-scale regenerative agriculture is unviable because “economic and energy (embodied energy) analyses showed they were relatively inefficient in their use of material and labor resources” (McDougall et al., 2019, p. 129) However, this is contested among researchers, with some citing an increase in labour productivity by 100% in agroecological growing systems (D’Annolfo et al., 2017), some saying the cost of labour increases during formational years (Andrade et al., 2020), and some stating agroecology is not labour intensive (Altieri & Nicholls, 2018). Andrade et al. (2020) believes scalability issues reflected in labour costs will be rectified through advancements in low-impact technologies that will assist the management of these complex ecologies. However, the necessity of scalability is questioned as, instead, the implementation of small-scale distributed farms makes for desired yields and achievable management. As monetary concerns around agroecological labour appear the largest concern regarding the implementation of this system, we must ask whether capital-centric policies and ideals prevent the existence of urban agricultural futures or whether we are capable of imagining a possible shared future beyond capitalism (Osborne, 2019).

The activation of small-scale agriculture in urban settings should be considered a space to rethink the methods of food production and implement broad spectrum socio-cultural and socio-political change toward regenerative growing methodologies (Hanna & Wallace, 2022; Tornaghi & Dehaene, 2021). The decommodification of food, specifically fresh produce, would not only improve consumer accessibility, but also disincentivise unsustainable farming practices favoured for their low monetary cost, albeit high environmental cost (Borras & Franco, 2024; Patel & Moore, 2018). The activation of contemporary urban agrarian practices foster food producing systems that express care toward more-than-humans through respect of soil ecology, promotion of biodiversity, and the appreciation of horizontal knowledge-sharing and the intrinsic value it contributes to place-based or culturally grounded practices (de Molina, 2013; Tornaghi & Dehaene, 2021; Van Dyck et al., 2018). The physical manifestation of ethical care in

everyday maintenance can be expressed through the act of composting. Returning excess to the other-than-human is the basis of this reciprocal mode of engagement. The notion of nourishing and tending to nonhuman others grounds this practice in eco-ethical care (Puig de la Bellacasa, 2017).

Urban agriculture should provide the opportunity to decolonise food systems and offer an opportunity for Māori to reconnect with mātauranga and tikanga practices and use these as foundational pou in the establishment of new agricultural and food systems (Smith & Hutchings, 2025). Practitioners within the field are currently engaging with this space, forming frameworks such as Hua Parakore (Smith & Hutchings, 2025), an Indigenous food sovereignty initiative that attends to the wicked problems of climate change, peak oil and food insecurity through a kaupapa Māori lens. This allows the assertion of rangatiratanga in the food production world (Hutchings, 2015; Hutchings et al., 2012). The activation of urban agroecology, especially when grounded in Indigenous knowledge, establishes a platform for decolonising the agricultural landscape. The implementation of farming as distributed plots that are grounded in Indigenous knowledge contrasts the colonial agricultural legacy of the monolithic plantation (Bezner Kerr, 2024).

Māngere as an agroecological site

This research project is centred on Tāmaki Makaurau, specifically focusing on Māngere in Auckland’s south. Tāmaki, as consequence of being a volcanic isthmus, has an extremely fertile and highly productive soil composition (Landcare Research, 2024). These fecund lands have a long history of food generation spanning from early Māori settlement, through early colonial times, to the present day (Mackintosh, 2021) while Māngere as a site is of significant importance to iwi who have ancestral ties with this land. In pre-colonial times Ihumātao, neighbouring Māngere, was a critical site of food production for Māori and then later Europeans who recounted that if it was not for this great agroecological productivity and generosity of Māori in sharing their harvests, they would have starved (Mackintosh, 2021). The Māori gardeners of this era displayed a deep understanding of soil, having over 60 different names for various types often describing texture, moisture, colour, and stone content (Best, 1925/2005; Harmsworth & Roskrug, 2014a, 2014b).

These gardeners also displayed a deep agroecological sensibility through their practice of using natural soil amendments of stone and shell to improve friability and drainage (Best, 1925/2005; Furey, 2006), excavation and stone structures to improve growing conditions (Furey, 2006; Mackintosh, 2021; Roskrug, 2011), a system of crop rotation that ensured repeated cropping ensued for no longer than three years at most sites (Harmsworth & Roskrug, 2014b; Roskrug, 2011), alongside considered management of crucial wild plant populations for food, rongoā, and utility (Harmsworth & Roskrug, 2014b).

Part 4: Design Case Studies

Oral retelling is reinforced by archaeological evidence of these agrarian practices at Ihumātao and across the isthmus of Tāmaki. These practices were crucial in supporting the intensive proto-urban inhabitation of the area surrounding the Manukau and neighbouring papakāinga such as Maungakiekie, the most extensively developed pā in Tāmaki (Best, 1927/1975; Stone, 2001).

Māngere today is a sprawling suburb of Tāmaki where urban form abruptly meets the edges of volcanic cones, if not devouring them completely – the same maunga who mana whenua regard as kin. Many of the volcanic cones that once dotted the whenua have been quarried away (Burns et al., 2013) and the landscape that was once rich with biodiversity and distributed māra kai and mahinga kai has been divided into gridded suburbs. Agriculture still takes place in Māngere with 6.53% of the land zoned for rural production and another 6.43% zoned as countryside living. However, a significant portion of the highest-class soils are lost to industrial developments (heavy and light industry covers 10.23% of land) including the airport that covers 30% of the terrestrial area of Māngere.

There is now a range of ecologically sensitive architectural projects that offer valuable strategies for care-based architecture. The following precedent studies engage a variety of approaches across a diverse scope of interventions across the globe. These different tactful modes of interacting with the more-than-human respond to the specific contextures of their projects. The Hakari and Pā offer insights into Indigenous eco-relational architectures and practices regarding inhabiting the whenua through built form. *Of Soil and Water* suggests a sensibility of ecological temporalities and flows to the urban user while improving biodiversity within the city. *O.M.G.* provides a useful precedent of the latent potential that lies in vacancy in urban fabrics and the radical transformational possibility of agroecology in practice. The Jewish Museum poses techniques of affective architecture that are capable of invoking an emotional response in the user in the context of memorial. Bruder Klaus Field Chapel provides a similar precedent of affective architecture, although at different scale, and is more interested in evoking feelings regarding a spiritual, reflective experience rather than mourning. The Future Library engages more-than-human temporality in the process of design, ultimately leaving the outcome of the project in the hands of nature. Each of these case studies has informed my design practice and consequently this thesis project. It is somewhat poignant that these works encompass life, death, and time through the lens of ethical care as we live on this damaged planet.



Figure 1. *Māngere Maunga* from *Papatūānuku Kōkiri Marae* (Webster, 2025).



01 Maunga



02 Maunga



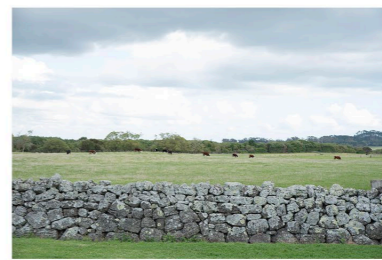
03 Maunga



04 Vendor



05 Moana



06 Vacancy



07 Vacancy



08 Vacancy



09 Vacancy



10 Vacancy



11 Vacancy



12 Vacancy



13 Mound



14 Mound



15 Mound



16 Greenhouse



17 Greenhouse



18 Greenhouse



19 Greenhouse



20 Greenhouse



21 Greenhouse



22 Greenhouse



23 Greenhouse



24 Greenhouse



25 Greenhouse



26 Greenhouse



27 Shed



28 Agriculture



29 Agriculture



30 Agriculture



31 Agriculture



32 Agriculture



33 Agriculture + Maunga



34 Food Forest + Agriculture



35 Food Forest + Agriculture

Figure 2. Site Documentation 'Contact Sheet' (Webster, 2025).

Māori

Hakari and Pā

Long before European arrival in Aotearoa, Māori inhabited the whenua with their own vernacular construction that responded to available materiality and climatic conditions while embodying the specific principles and beliefs largely surrounding atua (deities) and kinship with their environment. Two remarkable structures of this era were the hakari and the pā. The hakari, a layered, open, performative timber-framed structure, was erected for celebratory feasts, displaying the bountiful harvests of the land and sea (Treadwell, 1999; A. Yates, 2006). The porous boundaries of the skeletal structure blended with the surrounding landscape until the feast had passed; thereafter, the structure was redundant (A. Yates, 2006). The pā, however, was a significantly more permanent feature of the landscape. Adorning maunga, the pā was a complex settlement differentiated from others, such as kāinga, due to the scope of earthworks and constructed ditches and terraces (Best, 1927/1975; A. Yates, 2006, 2010). This project seeks to draw from these intricate Māori architectures, incorporating their principal features, such as the complex earthen mound and large timber constructions, that shall represent a productive and successful harmony with nonhuman kin.

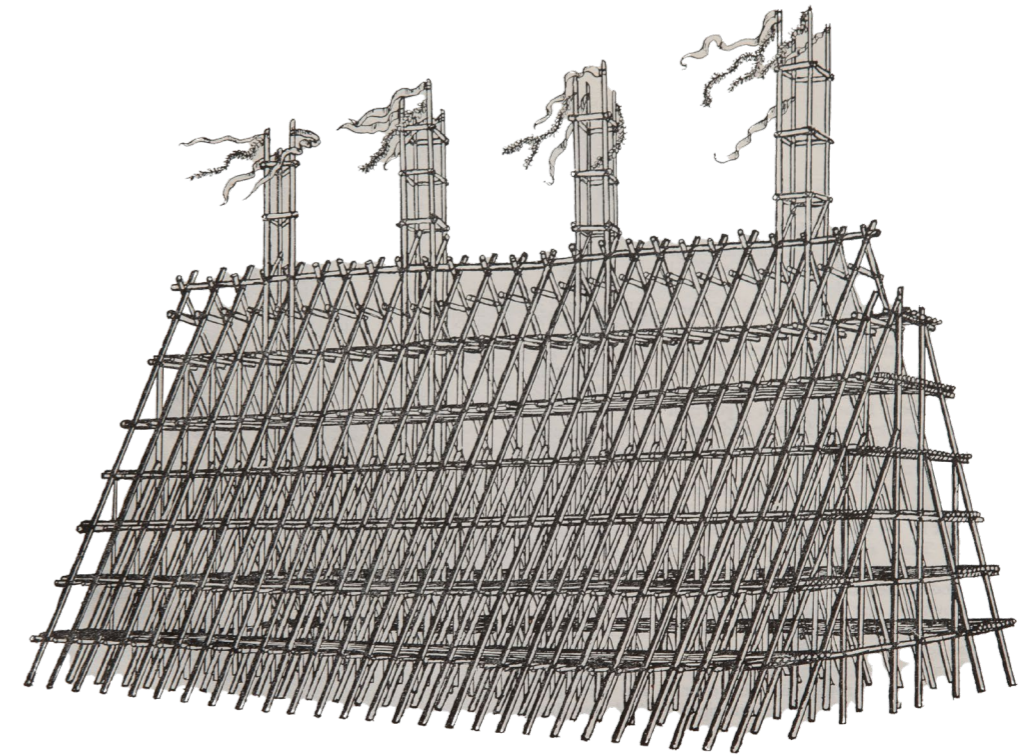


Figure 3. Ink drawing of hakari structure (Taylor, 1966).



Figure 4. Entrance to Motu-o-Puhi Pa at Rotoaira (McDonald, 1927).

Ecological

Of Soil and Water: The King's Cross Pond Club, U.K. – OOZE

This case study was a public art project, commissioned by King's Cross Central Partnership as part of the Relay Art Programme as a temporal activation of a portion of the King's Cross construction site in London. The installation heightened the awareness of human users regarding their duty of care toward the environment. "The elevated pond becomes a stage where the swimmers perform the balancing act of coexisting with nature" (OOZE, n.d., para. 3). The pond itself is free of chemicals, instead using ecological systems and processes, supported by a set of filters, to cleanse the water. This means that the number of total daily bathers is restricted by the pond's natural filtration cycles, thereby engaging human participants in the act of care for their environment as they must coexist with nature. Human participants in the project must engage with more-than-human temporality and bathe on a schedule beyond their control. This contrasts the typical rhythm of city living where services are available constantly around the clock. The agency held by nonhuman beings in this project is key to theories such as kinship. Empowering natural systems to determine human engagement is important when seen through a lens of kinship; this sets the stage for ethical, reciprocal engagement between worlds.

From the stage that is *Of Soil and Water*, participants can observe the evolution of the "surrounding neighbourhood and the ever-changing city, where new possibilities and new futures are being born" (OOZE, n.d., para. 3). The project's positioning on high-value urban land is crucially important when seen through the lens of decommodifying urbanisation. The provision of space for a micro-ecological intervention on some of London's highest-value property opposes traditional capital-incentivised development, instead placing value on social wellbeing and environmental health. Using an already existing urban redevelopment project as the catalyst, *Of Soil and Water* demonstrates the inherent benefit of incorporating ecological projects within urban fabrics. Intervening within vacancy in urban fabrics through 'guerrilla gardening' or landscape initiatives to provide public benefit is a tactic that will be important in catalysing the systemic socio-political ontological shift within this thesis project. The act of coexisting with our other-than-human kin is crucial in achieving an Agroecological Care architecture.



Figure 5. Photograph of the pond in use with surrounding vegetation (Sturrock, n.d.).



Figure 6. Swimmer in pond in front of excavated earth (Sturrock, n.d.).

O.M.G., Auckland, New Zealand – For the Love of Bees

O.M.G., Organic Market Garden, is a crucial precedent for urban agriculture’s viability and regenerative potential. Situated in Uptown Tāmaki, O.M.G. inhabits a 500m² site loaned to the farm by KiwiRail (McNamara, n.d.) with 310m² of the site in vegetable production (Hansen, 2021). This land area is capable of yielding 35 vegetable boxes of nutrient-dense food weekly for the farm’s community-supported agriculture customers, boxes that contain species that may never be found in supermarkets (Hansen, 2021). O.M.G. is a prime example of urban agriculture’s ability to exist within current vacancies in urban fabrics, and demonstrate the movement’s transformative potential, as a disused construction site is converted into a fecund haven of biodiversity and productivity (Hansen, 2021; McNamara, n.d.). O.M.G. is also able to intervene in waste streams, converting organic waste into compost and reducing the climatic cost of producing and distributing food through localisation (Hansen, 2021).



Figure 7. OMG farm with head farmer Levi Brinsdon-Hall (Hockley, 2021).



Figure 8. OMG farm development over time (for the love of bees, n.d.).

Memorial

Jewish Museum, Berlin, Germany - Daniel Libeskind

The Jewish Museum, Berlin, is more than a museum and more than a memorial, it is an experience. The angular unapologetic form itself rests starkly in its surrounds. The raw zinc façade scarred with slashes contributes to its heaviness while the building's form itself is a jagged scar across the site. The museum is culturally important for the remembrance of past Jewish contributions to Berlin, the experience of Jews during World War II, and ultimately as a symbol of Jewish continuity in modern Germany (Young, 2000).

The museum leads the audience on a journey and evokes emotions of absence, emptiness, helplessness. The use of architectural design techniques to deliver the most confronting of truths through a sense of choreographed theatrical experience (Hannah, 2006) is a key architectural aspect that will be useful to draw on for this thesis project. Libeskind uses void to shrink the audience and leave them feeling insignificant. These extensive voids interplay beautifully with the slivers of natural light that pierce their caverns (Hannah, 2006). The entrance sequence squeezes the occupants as they move downward through darkness stripping them of their safety. Using the threshold to create a specific tone is desired within this thesis project to create a sense of humility within the subject as their egotism is shed as they re-enter the Earth Mother.

The architecture's ability to be affective in inducing an emotional response from an inhabitant is an expression of care, in the sense that to feel-with another who may be inextricably beyond one's own comprehension is to care.

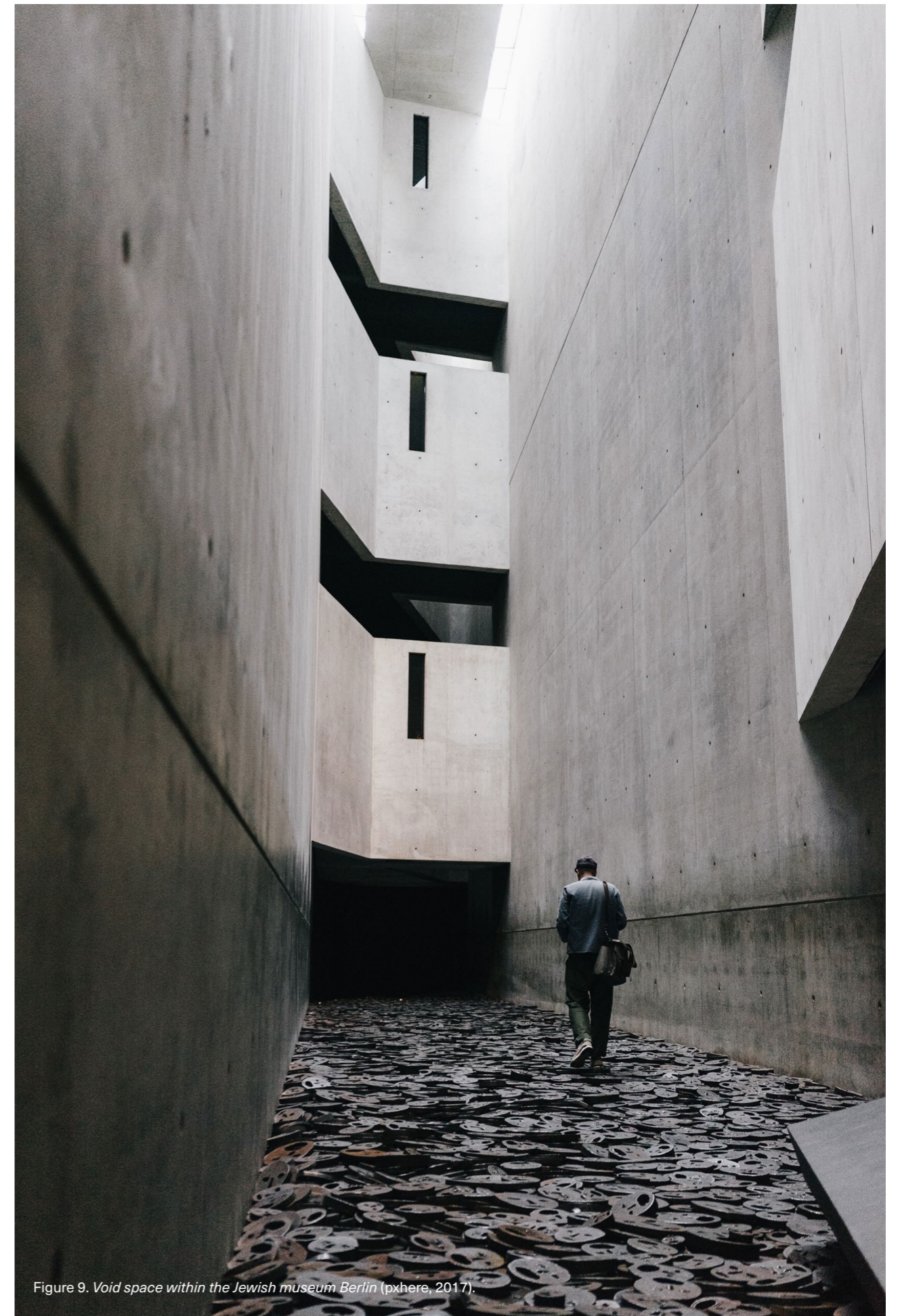


Figure 9. Void space within the Jewish museum Berlin (pxhere, 2017).



Figure 10. Angular facade detail of the Jewish museum Berlin (Schlemmer, 2012).

Bruder Klaus Field Chapel, Mechernich, Germany – Peter Zumthor

The small chapel rests in a farmer's field; its stacked layers of hand-poured concrete exhibit a raw textural nature while concurrently adhering to the orthogonal form (Schwartz, 2025). It appears to have innately grown from the earth as the surrounding mountains once did. Internally, the chapel is stripped of modern conveniences, relying solely on natural light to fill the void encased by charred, ribbed walls. Zumthor's use of light interplaying with texture allows materials to be the forefront of his architecture, a theme commonly expressed throughout his work. The angular interior walls that extend upward to the orifice above induce a sense of ethereal spirituality, a sense of a greater life force or the faith that once sustained the hermit the chapel honours (Wang & Dai, 2022). Despite the palette consisting of materials that all hold such weight, Zumthor's implementation of them is able to offer solace to the visitor. Implementing materials considerately in architecture is crucial in delivering the dynamic journey of mourning and grief to an ethereal sensibility of ecocentric life, as it cannot be done by form alone. This will be taken forward into the design of the memorial within this research project.

Zumthor's material practice, in the case of Bruder Klaus, extends beyond aesthetic and affective selection and into a consideration of craft. Zumthor's dedication to material and the consequent craft of assembling those materials is well renowned throughout his portfolio of work; Zumthor trained as a cabinet maker, and the assemblage of material is crucial to his practice (Schwartz, 2025). To create Bruder Klaus, a 'wigwam'-esque structure is erected from locally harvested logs before being cast in layers of concrete imparting striations in the form reminiscent of the strata of the Earth (Schwartz, 2025). This formwork was later burnt out from within, leaving only the embossed print of the logs on the charred walls, a memory of the chapel's construction. This combination of material and craft as a practice has been a strong driver in my previous work and will be incorporated in this project too. The concept of layering aligns with the principles of agroecology, alongside the notion that a material itself holds memories, and these aspects will be brought forth in this design project.



Figure 11. Exterior and entrance to Bruder Klaus Field Chapel (Fischer, 2016).



Figure 12. *Interior textural walls looking back toward the entrance of the chapel* (Fischer, 2016).



Figure 13. *Interior of Bruder Klaus Field Chapel* (Fischer, 2016).

Speculative & propositional

Future Library, Norway – Katie Paterson

Speculative drawings that test near-future possibilities include examples such as the precedent of the Future Library by artist Katie Paterson. Future Library is a 100-year artwork comprised of the planting of 1,000 trees, which will become the paper for an anthology of books to be printed once the 100-year period has passed (Future Library, n.d.). During this time one author will contribute one text per year. These texts will remain unseen and unpublished, held within a trust, until the publishing date in 100 years. This artwork is an organic, more-than-human installation that is activated through a living systems temporality. Perhaps the project best suggests that, in eco-ethical architectural processes, creation is a shared process between humans and nonhumans, and that some elements should remain beyond the control of the human counterparts.



Figure 14. *Event on the site which the trees are growing* (Katie Paterson, n.d.).



Figure 15. *Poster for the Future Library Project* (Katie Paterson, n.d.).

Chapter Two: Methodologies

Chapter One has investigated an extensive collection of literary and design contexts within which this research project is situated. These contexts have not only located the design project on a site and highlighted the adjacencies present they have also introduced key theories and design precedents that shape the project's development. The literary contexts and theories of scholars such as Haraway and Puig de la Bellacasa are critical for approaching an architecture of kinship, alongside the thinking of Tornaghi and Dehaene which is pivotal to incorporating eco-regenerative agriculture within urban fabrics.

Chapter Two unpacks the agroecological as the core research methodology of this research project and distils what it means to implement agroecological care thinking in design practice. To develop this methodology, it is necessary to further engage with the work of Haraway and Rose and their notions of kinship whilst further extracting the principles of agroecology, decolonial ecologies, and feminist theory. In this chapter, these theories are engaged to form an appropriate architectural methodological approach. Furthermore, how an Agroecological Care Methodology is applied to architecture, more specially the architectural outcome of this design project, is outlined and discussed.

Part 1: To be Kin (Network of Relations)

Agroecology's inception came as a form of resistance to the changes imposed on agricultural practice by the green revolution, and sought to oppose the monocultural plantation and the consequent industrialisation across all aspects of the food system (Gliessman, 2018). During the formative years, agroecology was primarily concentrated at the farm level and encouraged farmers to replace synthetic fossil fuel-based chemicals with certifiable organic inputs while encouraging biodiverse multispecies life (Gliessman, 2018). By the 1990s, agroecology had evolved to encompass "the ecology of the entire food system" (Francis et al., 2003). This holistic approach to the production of food considers the relationships between soil, plants, animals, humans, and the broader environment (Francis et al., 2003; Gliessman, 2018). Numerous practices fall under the umbrella of agroecology, such as organics, permaculture, low- or no-till cultivation, polycropping, and biodynamics (Tornaghi & Dehaene, 2021). These practices all use whole-systems approaches that consider the intrinsic networks and connections that exist between the human and more-than-human entities in entangled ecologies (Puig de la Bellacasa, 2017).

Kinship theory engages with the ontological positioning of deep ecology, viewing kin as no longer defined by or limited to entities with shared ancestry or genealogy; instead, all earthlings are viewed as existing within an entanglement of multispecies relationships (Desai & Smith, 2018; Haraway, 2015, 2016). Kinship theory builds upon the ecosophy of deep ecology to incorporate the provision of ethical care to our other-than-human kin.

These two approaches sit side-by-side in the contextual field of theory of this research. Kinship is a sensibility toward other-than-human worlds and an ethical mode of engaging with nonhuman entities, and agroecology is a mode of unearthing vast networks of interdependencies that exists across human and nonhuman ecologies. Both theories foreground the significance of the relationships shared between the beings of planet Earth, viewing these as illimitable webs of intrinsic connection (Naess, 1995). In these theories, relationships are reciprocal and prolifically productive, resulting in flourishing multispecies life. The interdependency of these complex relations is akin to the complexity of the urban, which itself is a condition of interdependency (Bender, 2012). Perhaps the ethical engagement with the more-than-human presents an opportunity to restructure the socio-political landscape of Aotearoa at a governmental level while influencing construction practices at an architectural level. To answer the research questions of this thesis, a further question must be asked: how can these methodologies be distilled to architectural methods for implementation within the built environment?

Part 2: To Express Care

Although these two theories, agroecology and kinship, stem from a similar ontological positioning and imply comparable modes of engaging with issues, these methods are not inherently architectural. To better respond to the requirements of this design thesis, a new methodology was derived from a combination of these theories to create a methodology of agroecological care that is better suited to the contextual requirements of this project.

The Agroecological Care methodology approaches facets of our world that are typically unaddressed by architecture and the other practices within the built environment. This theory aims to express sensitivity toward Indigenous peoples, more-than-humans, and their respective knowledges while engaging with the interdependencies of the complex transversal landscape. This kinship-centred transversal approach would see that all beings from the micro to the macro, the soil microbiome to the food network, are attended to. To respond to the research questions of this thesis the Agroecological Care theory is distilled to a set of core guiding design principles that also translate to research methods. These are: network/relationships, growth/layering, resilience, local/productive, reciprocal/care.

Network as a design principle is concerned with the relationships between nodes across the urban fabric, the interrelations of varying aspects that form the urban are a network of interdependency. This calls upon the intervention of interacting with others across the urban landscape to enable participation in reciprocal exchange.

The principle of growth is crucial for agroecological care, not only in reference to architectures that support the production of food or environmental regeneration but to architecture's ability to grow (or de-grow) with time in accordance with its user's requirements, enabling programme to evolve over time. This principle is also referred to as layering as a core agroecological principle and practice. The act of building radically diverse and productive biological communities is achieved through layering, whether this be the layering of soil amendments such as compost and mulch or the strata of plant canopies. Layering also actualises within the forming of built elements within this project such as the puke/mound, that is accreted over time until the final mass is reached.

These design decisions must also be physically resilient, able to withstand degrading climatic conditions over time and foster community resilience through programme.

Local, as a principle, ensures that design decisions not only arise from local materiality and labour but also attend to the conditions of the site's locale, prioritising a response to the needs of the community first.

Finally, the design principle of reciprocal care influences the architecture's affective potential and capacity to participate in reciprocal exchange with more-than-human communities. To ultimately deliver an answer to the research questions of this design thesis, the architecture must express care while enabling the human to express care too.

Part 3: Methods

Mapping – Network as a method

This project implemented mapping as a tool for the synthesis and display of network and system information critical to the project. Mapping was also used to explore relationships that are typically intangible to or disregarded by traditional Western, Cartesian cartography. Here the Agroecological Care methodology was applied through the mapping of distributed influences and nodes of significance across a cosmological, Pacific (Te Moana Nui a Kiwa), Aotearoa, Tāmaki, Māngere, and site scale.

The Agroecological Care lens works not only across relational networks but also through the layered sediment of place, unearthing unseen relationships. The implementation of the Agroecological Care Theory was imperative to revealing and documenting the layered and networked histories and relationships that transcend place through time. The presentation of these visually in map form allowed the observer to understand the contextual positioning of the project. This series of maps exist within the transverse landscape of Tāmaki Makaurau and Māngere specifically.

These maps provide a plane of reference for the latent potential of site to be actualised through rigorously designed concepts and programmatic function.

Photography – Local as a method

Candid photography as a means of investigating and documenting the vernacular condition of wider Māngere revealed lives between and beneath the prior mapping. In the pictorial series of site documentation, photography offers a static glimpse of an animated life. As a living species on a living planet, we are well adjusted to the rhythmic temporality of moving time. The ability of a photograph to selectively capture not only within the confines of frame but within a still moment in the continuum of time can be seen as falsifying in staged imagery, yet equally raw and revealing in candid/ guerilla photography.

The photos intentionally capture spaces within Māngere with humans predominantly absent from the frame. Instead capturing human imposition on the landscape or, in some instances the remnants of said activity alongside spaces where the other-than-human has reclaimed agency.

This series of images captures the specific elements of Māngere that combine to form the vernacular. It is from the analysis of these images that reoccurring patterns or notions become evident.

Pamphlet/Postcard – Growth as a method

The postcard or pamphlet as an architectural method represents the principle of growth. The pamphlet unpacks key programmatic moves within the project; these actions result in transformative growth across both the early and later interventions. This method documents the key systems of food production and the supporting architectures of Phase 1 through instructional,

diagrammatic pamphlets. The pamphlet as a drawing is a condenser in the sense that it must distil complex systems and theory to a digestible and compact format. The pamphlet also manifests transformative potential as perhaps a manual for change, empowering interested parties, at the flaxroots level, with methods for and information on being changemakers. This accessible format of architecture is not only digestible but open source, containing parts lists, plans, and instructions to create these agroecological structures.

In Phase 2 the pamphlet remains a method of communication, the pamphlets of the prior phase are still relevant, however, during this phase the pamphlet also communicates the program of the memorial, guiding the inhabitants journey.

Speculative Drawing – Care as a method

Speculative drawing is implemented throughout the design process as a means of capturing the affective abilities of architectural intervention. Speculative drawing engages a broad array of media to deliver a sense of care, from atmospheric graphite sketches to intricate detailing of connections. This method is crucially a developmental tool as much as it is a documentation tool, with the ability to evolve responses to the notion of care in architecture in a tangible visual form. Visualising the essence of care is at the core of this eco-ethical scheme. Graphite sketches (see Figure 16) were beneficial in capturing formative notions surrounding form and spatialising emotion. Speculative drawings, such as Figure 42, allowed for care to be understood as a practice of living-with others alongside an actualisation in the practice of construction of this agroecological architecture. Capturing the somewhat visually intangible sensation of care is a challenge faced by these speculative drawings, therefore the series of visuals depicting spaces within the memorial and glasshouse (see Figures 45-53) capture the ethereal, cathartic, and solacing sensibilities of the design intervention.

Conclusion: Agroecological Care Architecture

This Agroecological Care methodology and corresponding methods are a critical component of this design-led research project. Agroecological Care defines key parameters for design precedents and directs the architectural principles of network/relationships, growth/layering, resilience, local/productive, reciprocal/care. The methodology is used to self-evaluate design decisions made within the development of this project. This involves addressing iterations and the final scheme by outlining and reflecting upon the design process undertaken throughout the development of this project. The intention with this chapter is to reveal the composition of Agroecological Care methods and display how this approach creates relationships between programme, tectonic arrangement, and material sensation.

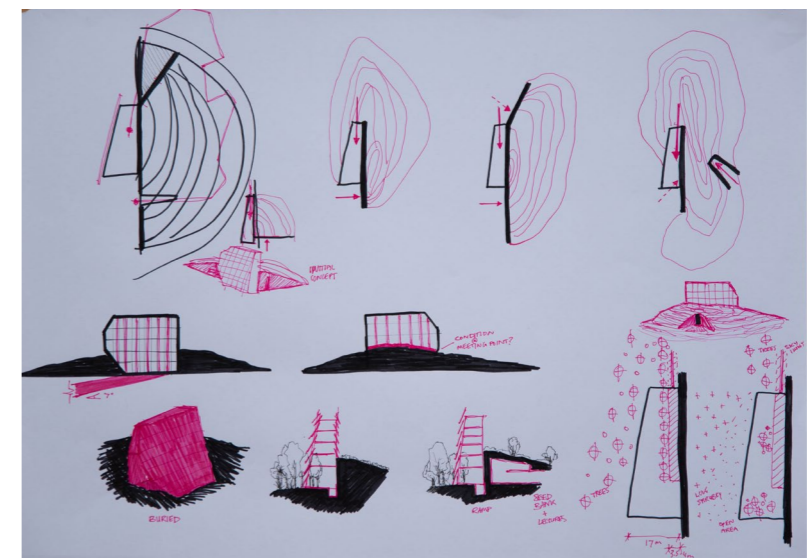
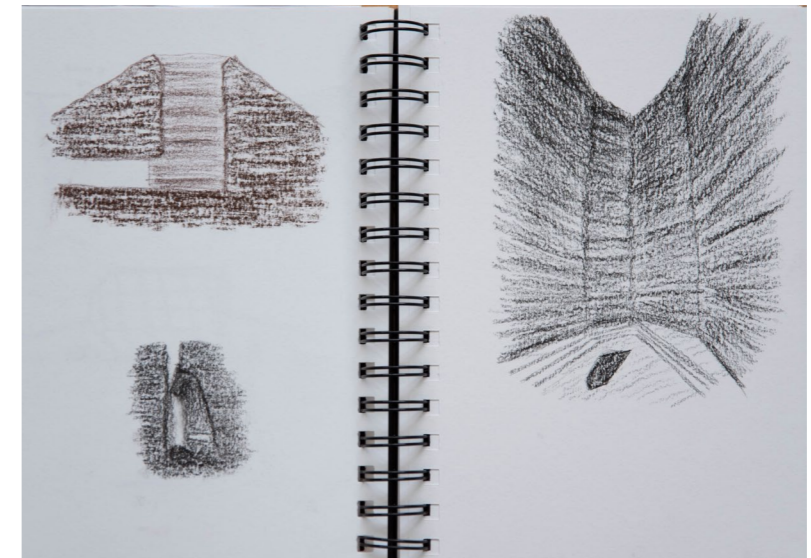
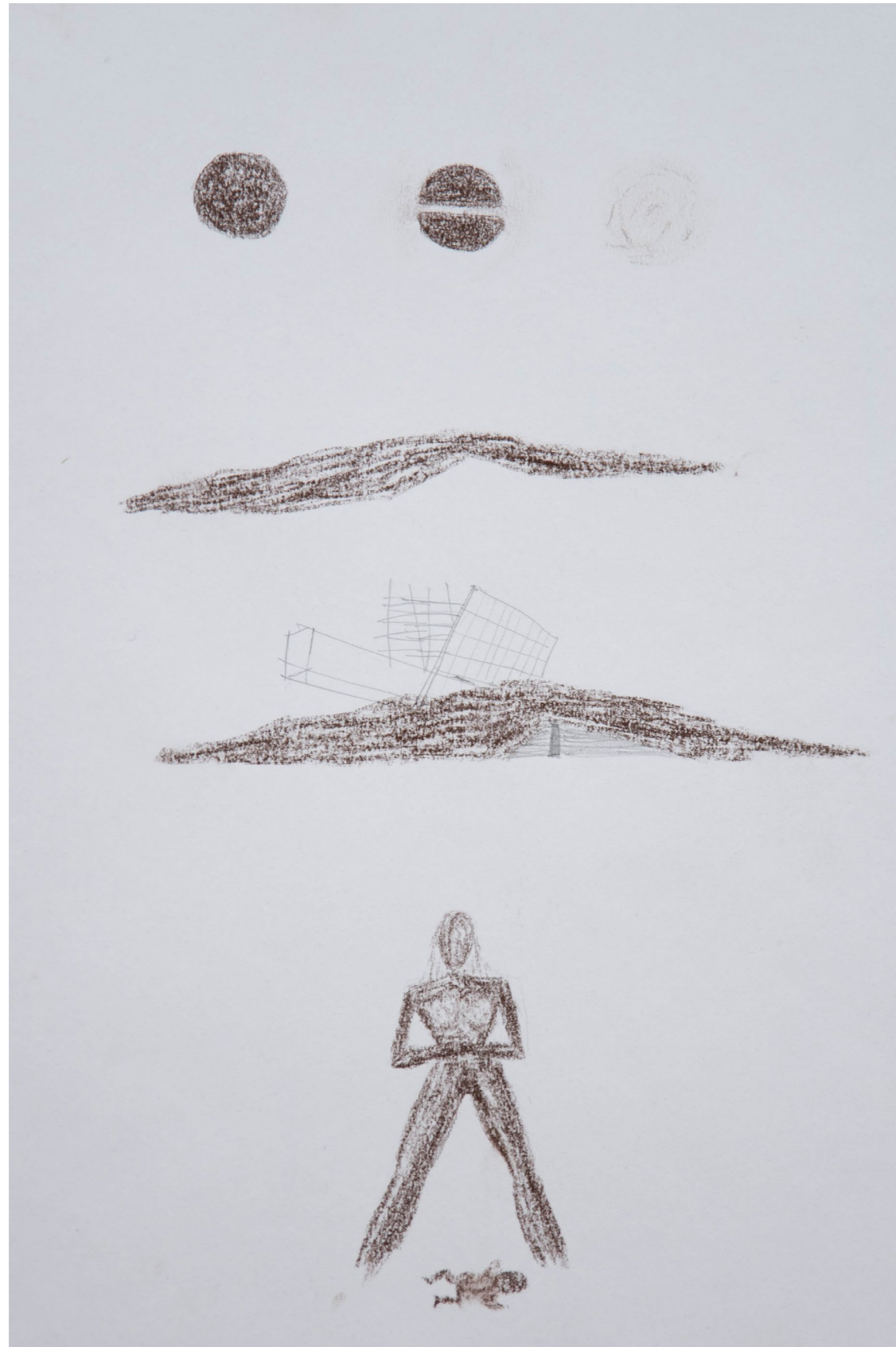


Figure 16. (this page and adjacent) Assorted sketched of graphite and ink. (Webster, 2025).

Chapter Three: Design Outputs

This chapter concerns itself with describing the iterative design process of this research. It addresses initial site exploration work and then unpacks conceptual design process.

Mapping and Site Analysis

The historical contexts of Māngere as discussed in Chapter 1, reveal key conditions of the wider site in the period of Māori inhabitation pre-Colonial arrival. In this design focused section the contemporary condition of Māngere as the site of this project is examined.

To best visualise the complexity of multilayered entanglements of place the information is distributed across a series of maps, of varying scales, to best capture the network of relationships within the site, Māngere, Tāmaki Makaurau, Aotearoa, and Te Moana-nui-a-kiwa. This series of maps can be considered as a crucial component in the practice of Agroecological Care, representing the core principles and uncovering potentiality in a spatial sense. This practice of mapping is able to render and understand interrelationships between sometimes disparate conditions and simultaneously define the condition of the actual.

Tāmaki as a site provides great opportunity for this intervention as Aotearoa's largest city by area and population. The primary site of Phase 2 is located on the southern shoreline of the Māngere Inlet and the corner of Mahunga Drive and Walmsley Road. This site is approximately 15.5ha, and a greenfield site, which of this size is uncommon in urban fabrics. Currently zoned for industrial use, this site is undeveloped and an opportunity to preserve this amount of space for a kaupapa such as food production in the city without the need to rehome or relocate people of this community. Māngere is an opportune site for the activation of Agroecological Care in Tāmaki Makaurau, a key supporting aspect of this is not only the rich historical context of food production in this area, but the contemporary context of food production such as Papatūānuku Kōkiri Marae who already incorporate agroecological practices in their production of food for the community. This project can be viewed as supporting of this kaupapa, shifting the model from a singular point of intervention in the urban landscape to a distributed, nodal system. Members of this community are already socialised within a broader system of regenerative urban agriculture and are likely to be supportive of such development.

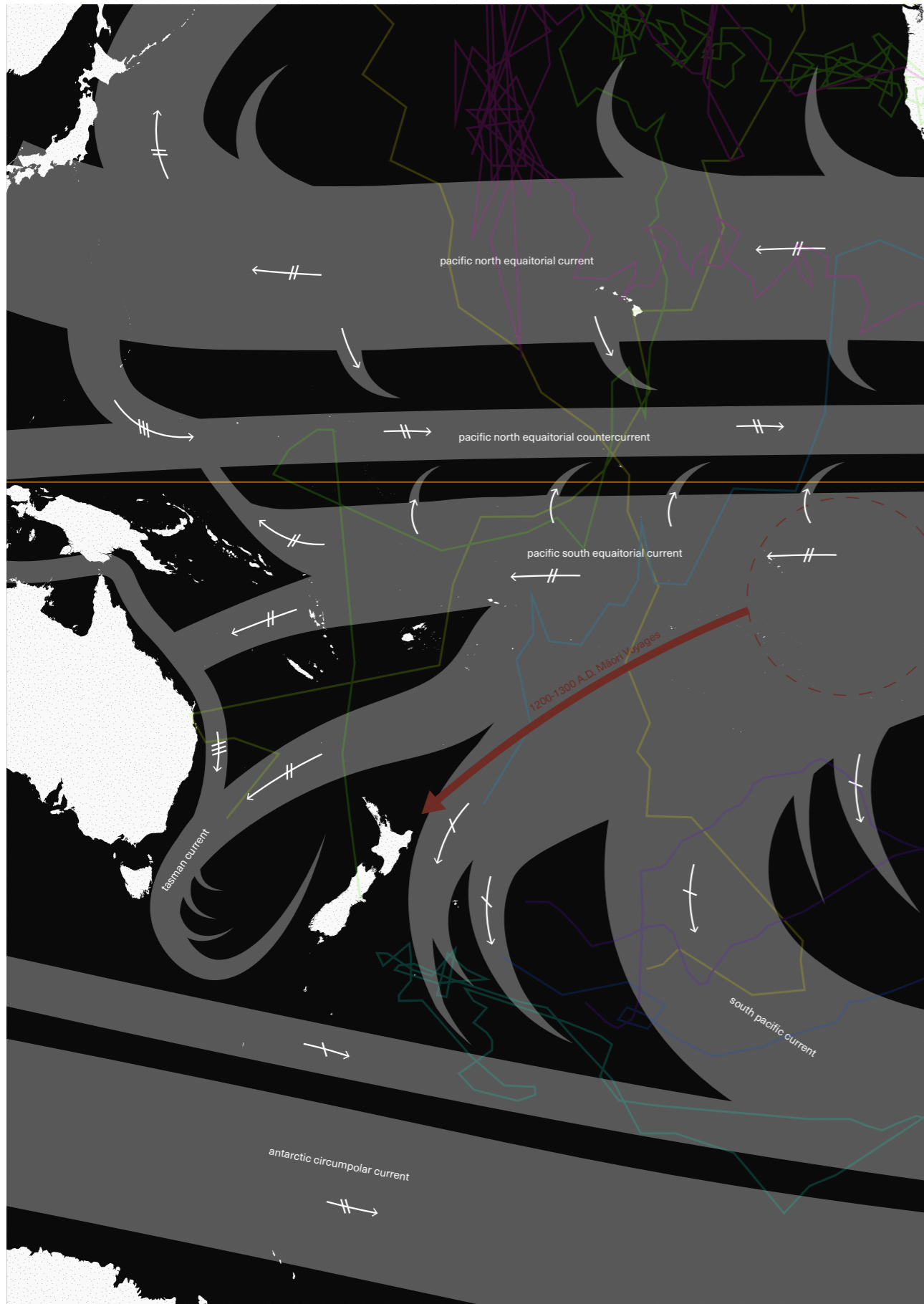


Figure 17. Te Moana-nui-a-kiwa movements (Webster, 2025).

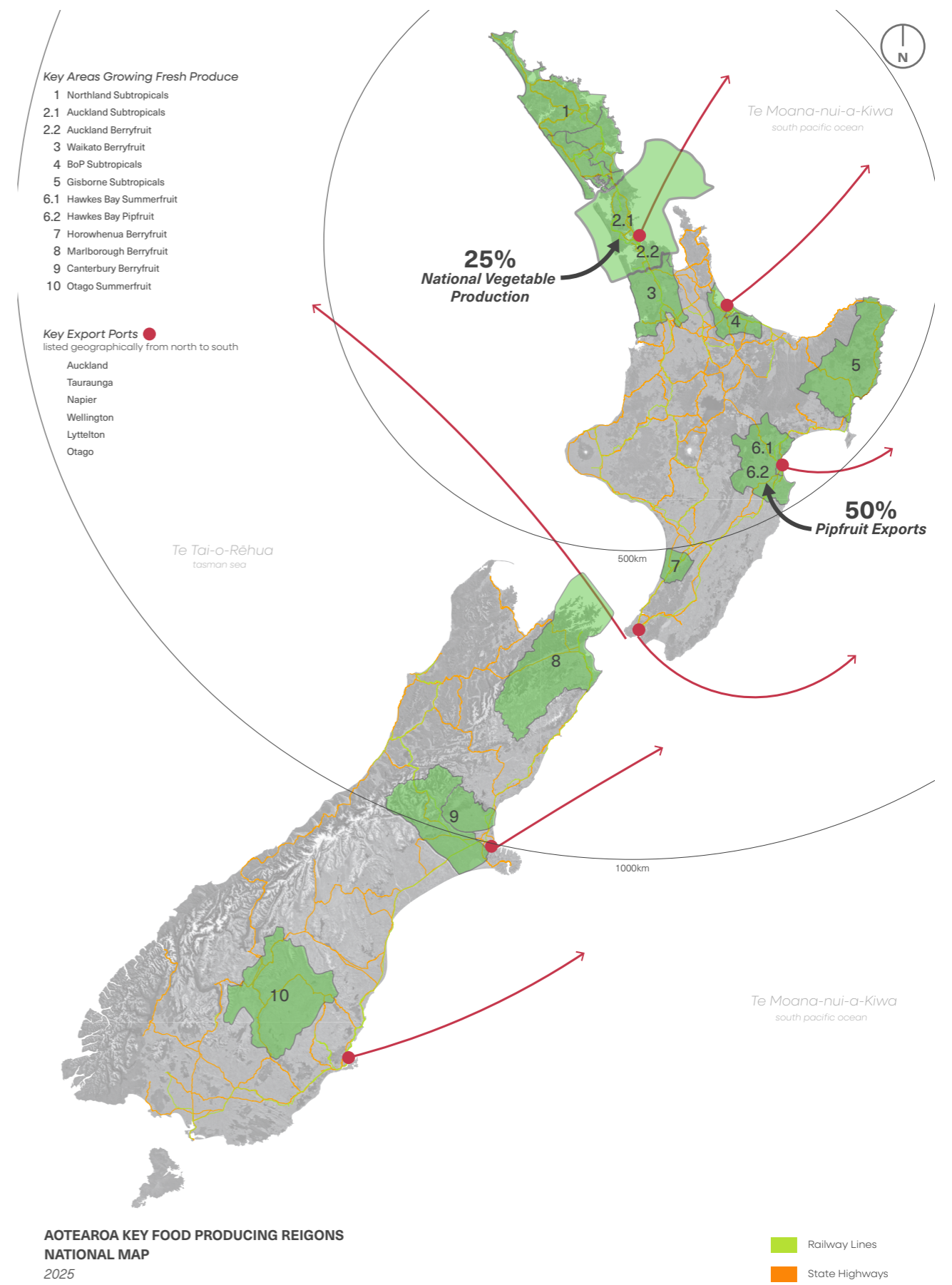


Figure 18. Key food producing reigons of Aotearoa (Webster, 2025).

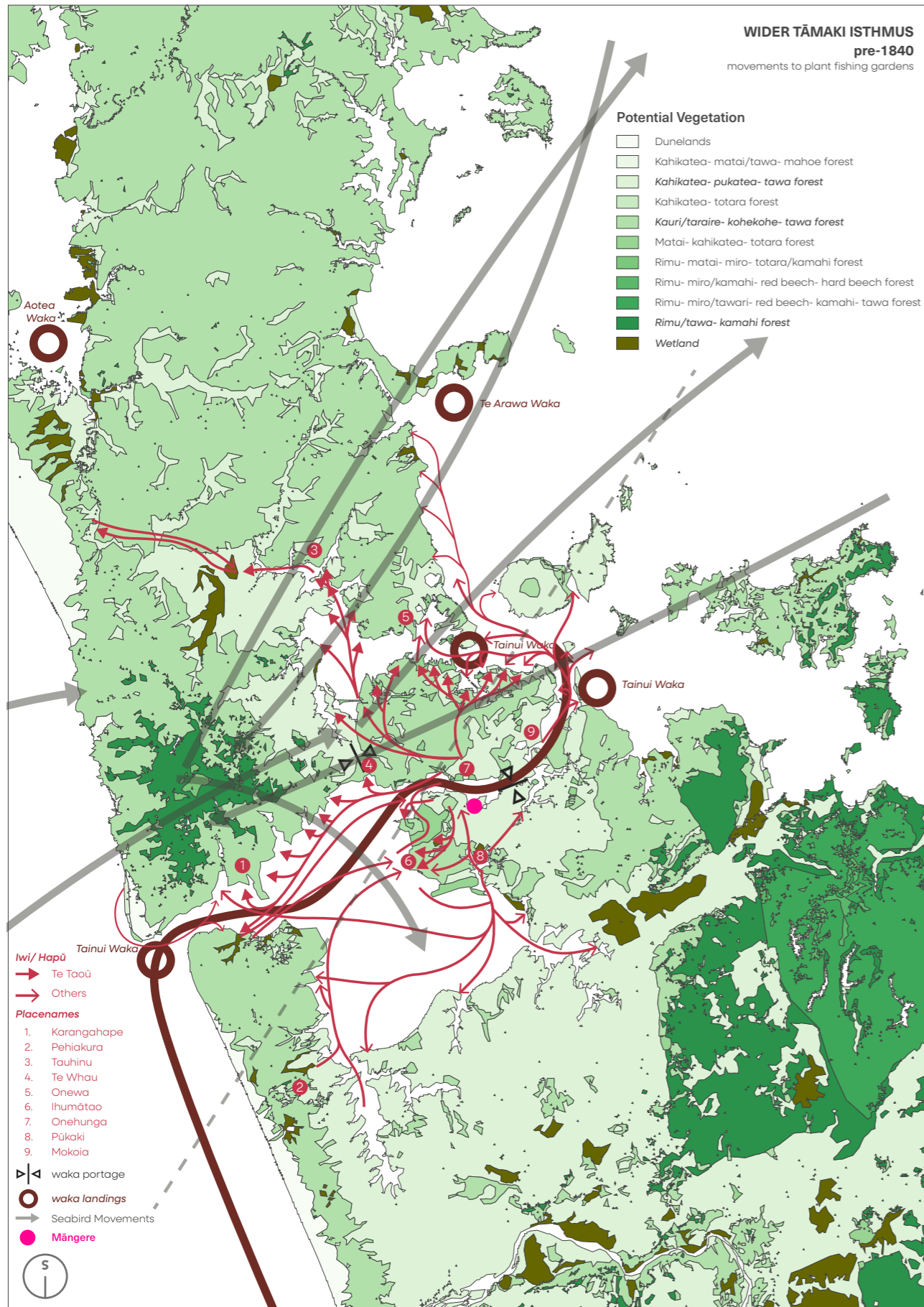


Figure 19. Pre-European food movements of Māori in Tāmaki (Webster, 2025).

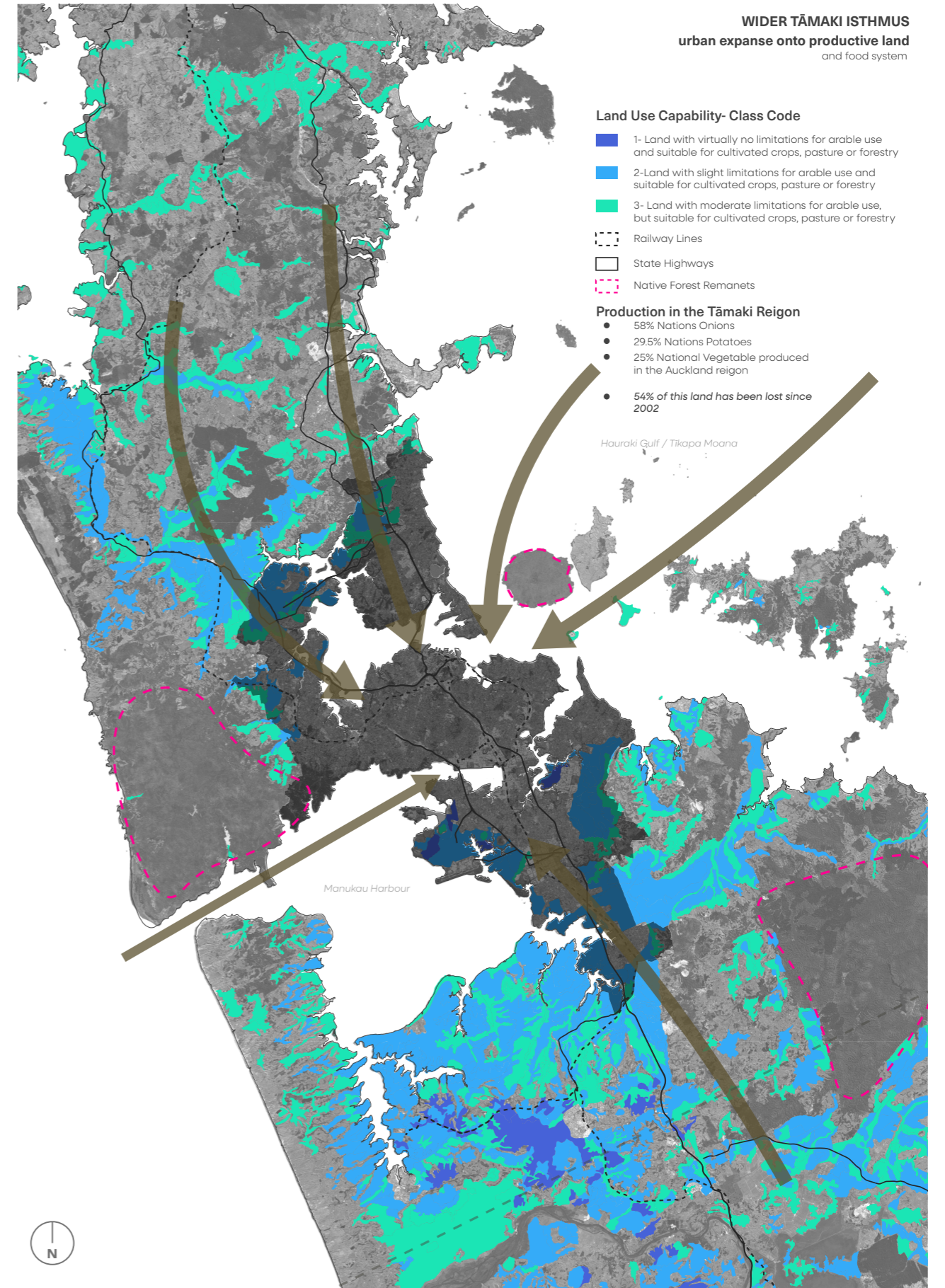


Figure 20. Contemporary food movements within Tāmaki (Webster, 2025).

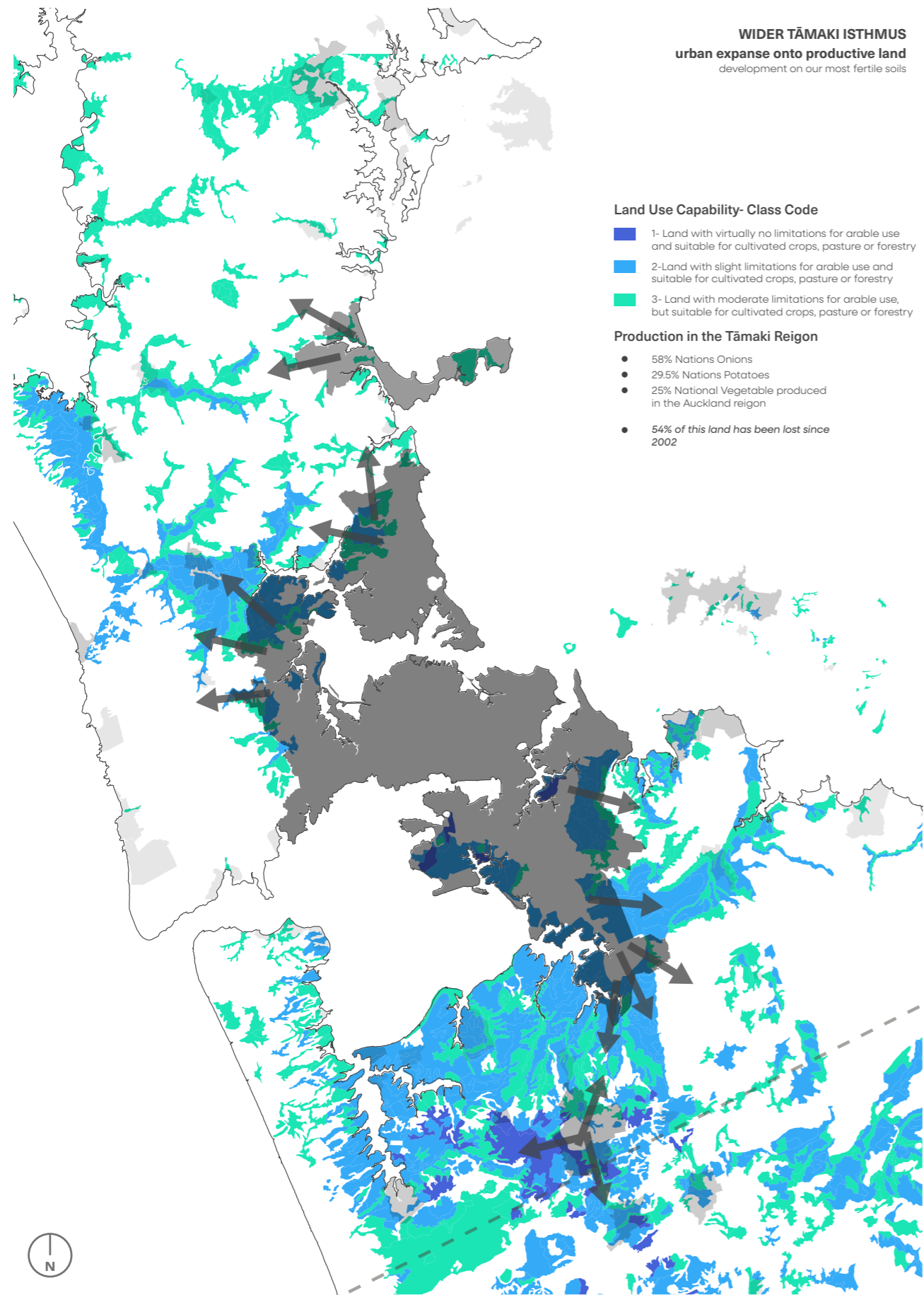


Figure 21. Land Use Capability (soil classes) of the Tāmaki isthmus (Webster, 2025).

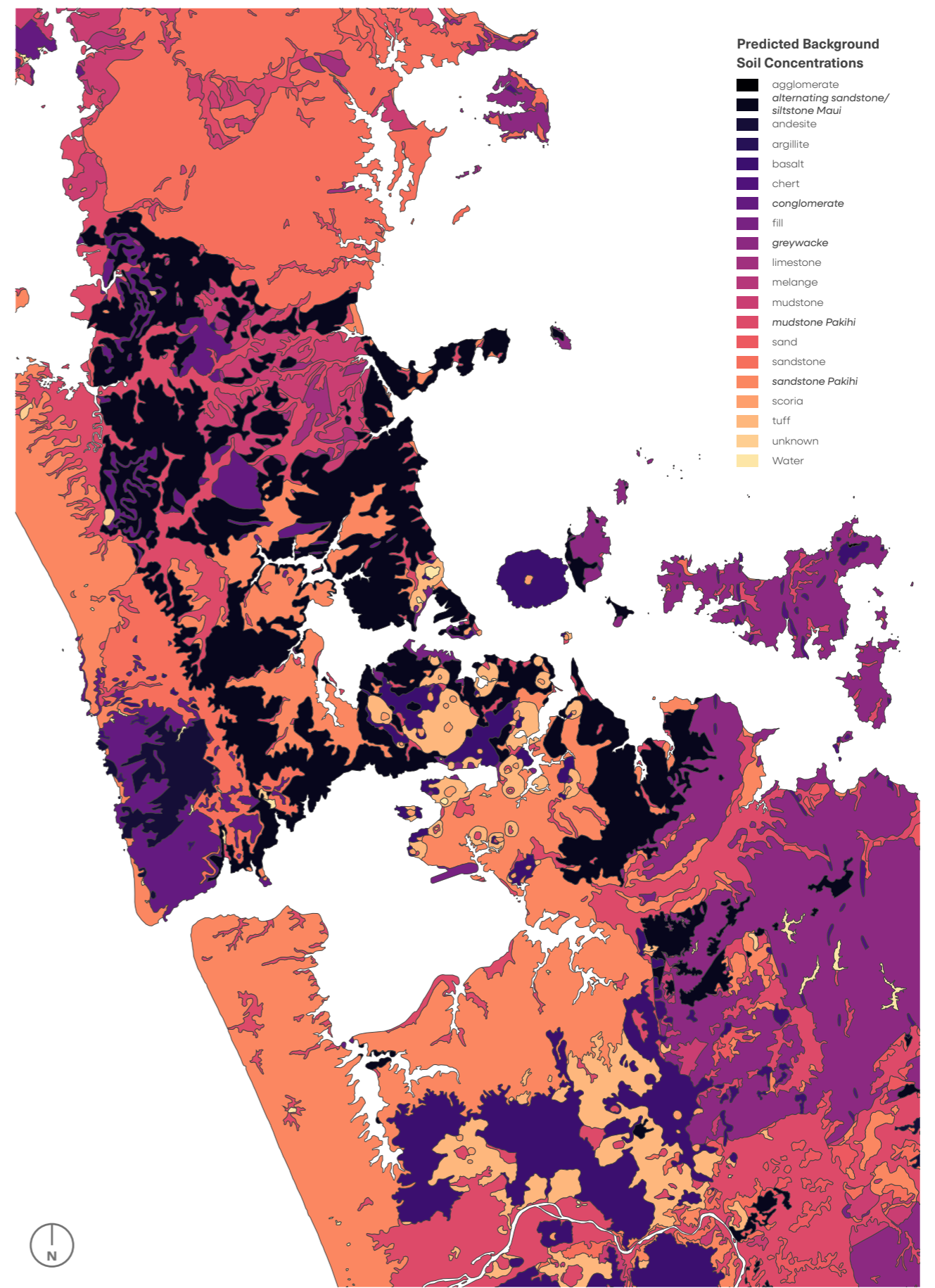


Figure 22. Background soil concentrations of the Tāmaki isthmus (Webster, 2025).

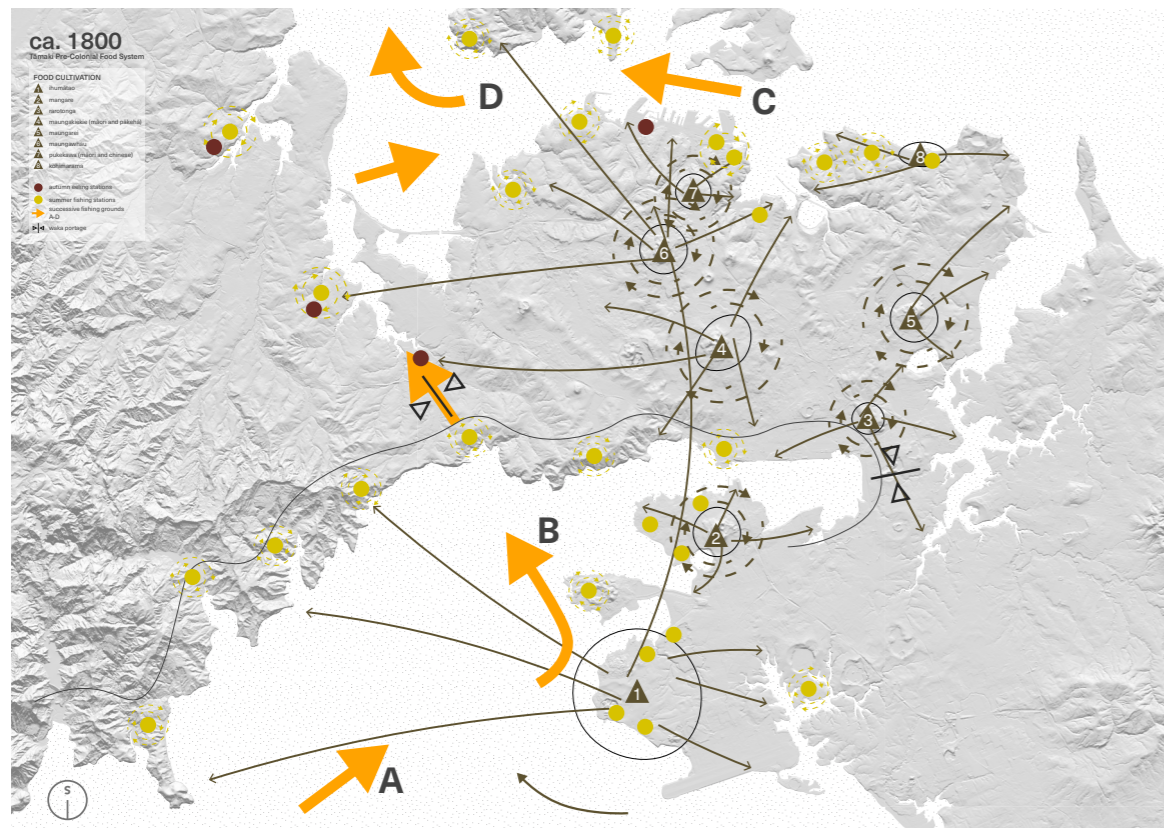


Figure 23. Key sites of māra and mahinga kai of the Tāmaki isthmus pre 1800 (Webster, 2025).

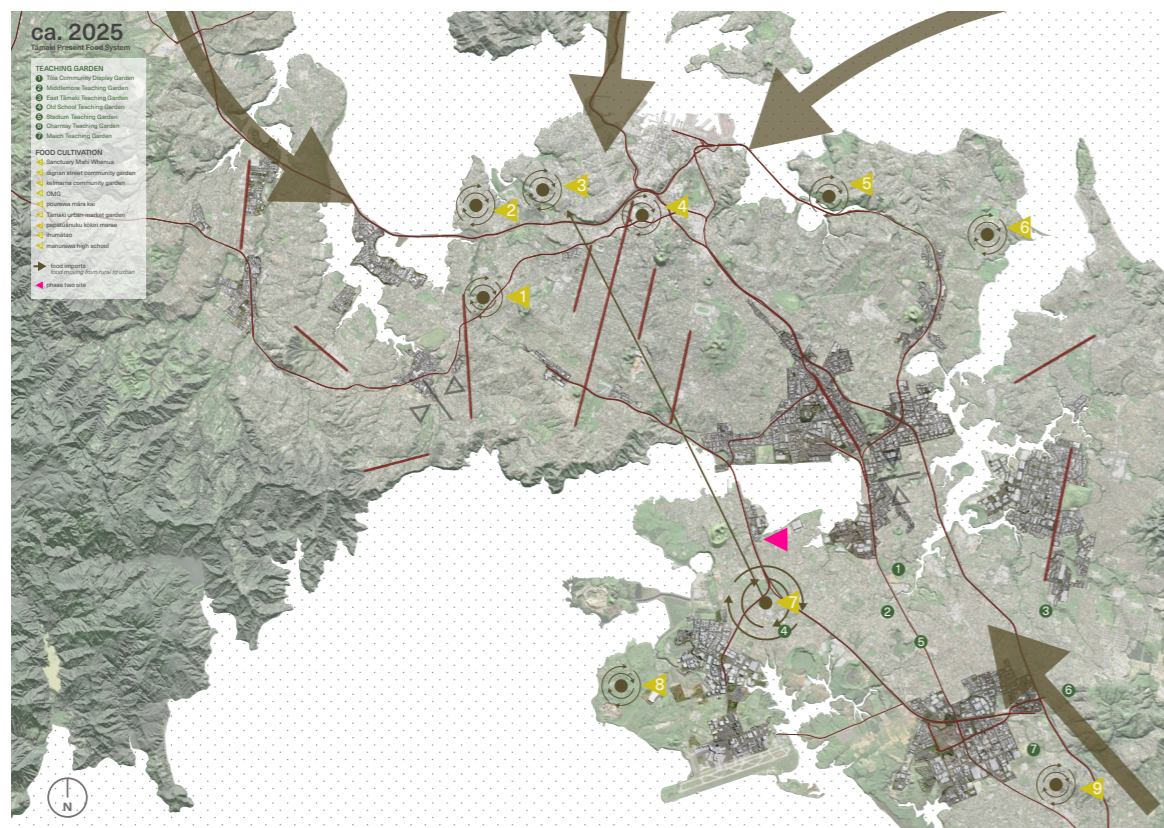


Figure 24. Industrialisation and 'Gridation' of the Tāmaki isthmus (Webster, 2025).

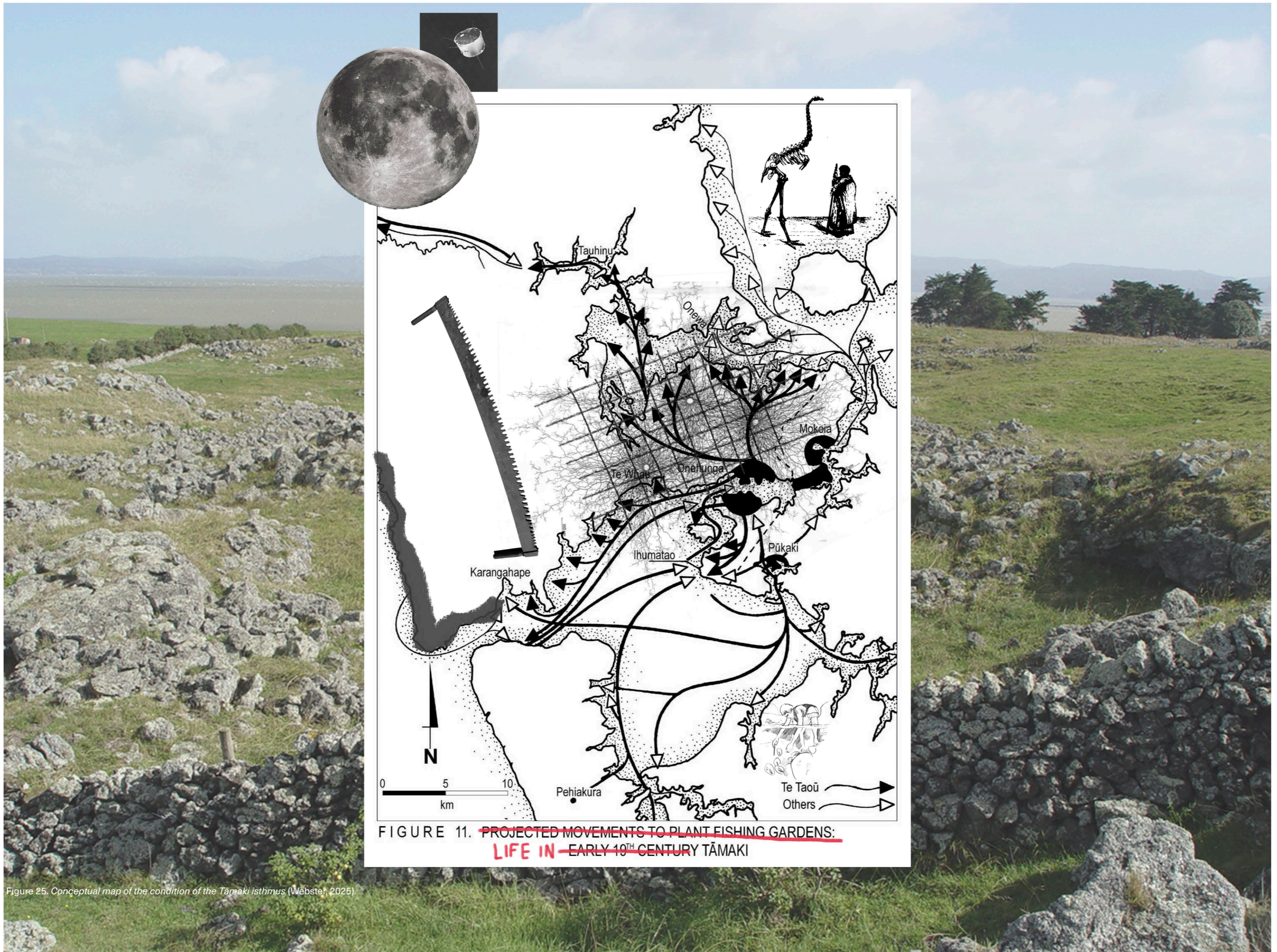


FIGURE 11. ~~PROJECTED MOVEMENTS TO PLANT FISHING GARDENS:~~
~~LIFE IN~~ EARLY 10TH CENTURY TĀMAKI

Figure 25. Conceptual map of the condition of the Tāmaki isthmus (Webster, 2025).

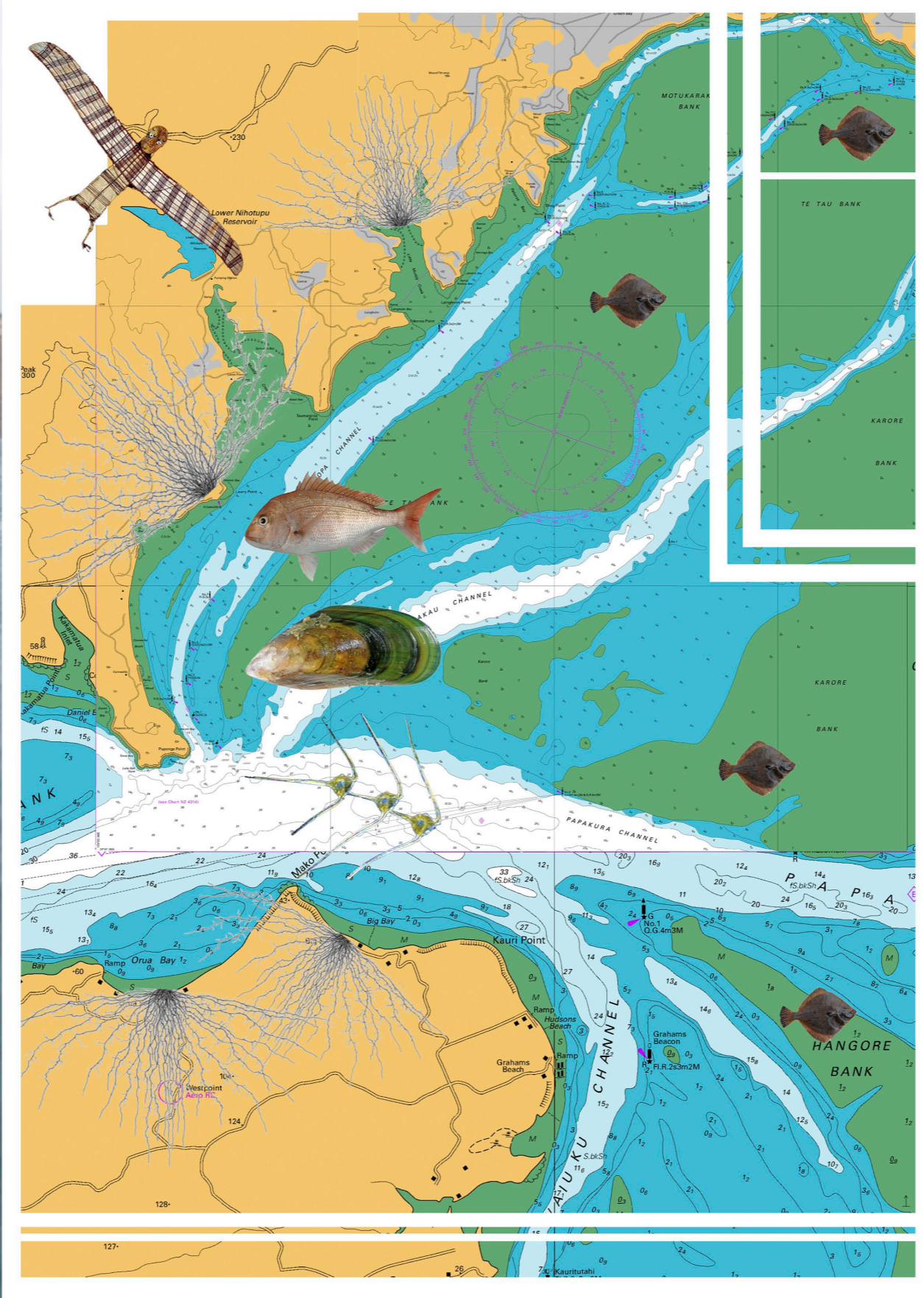
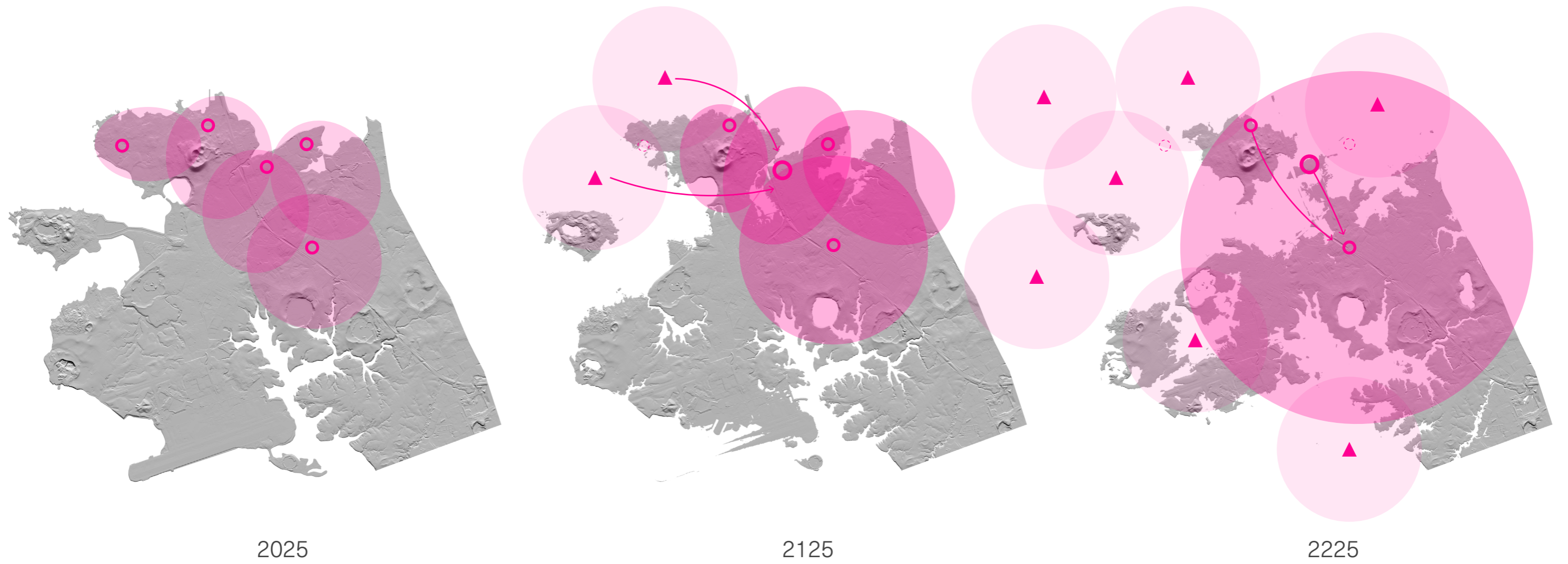


Figure 26. Conceptual map of the Manukau Harbour (Webster, 2025).



impacts of sea level rise on Māngere, terrestrial interventions that may become ocean based over time

Figure 27. Effect of sea level rise on Māngere coastline over 200 years (Webster, 2025).



Figure 28. Agricultural land and food vendors of Māngere (Webster, 2025).

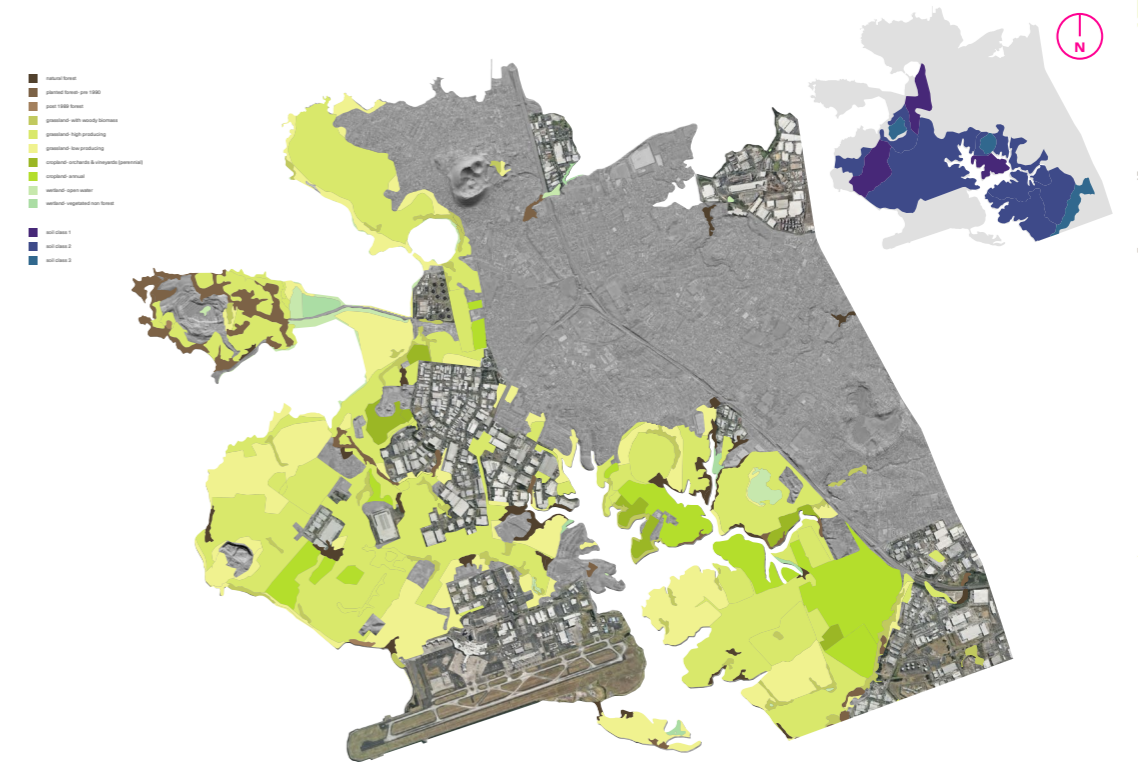


Figure 29. Land use and soil class of Māngere (Webster, 2025).

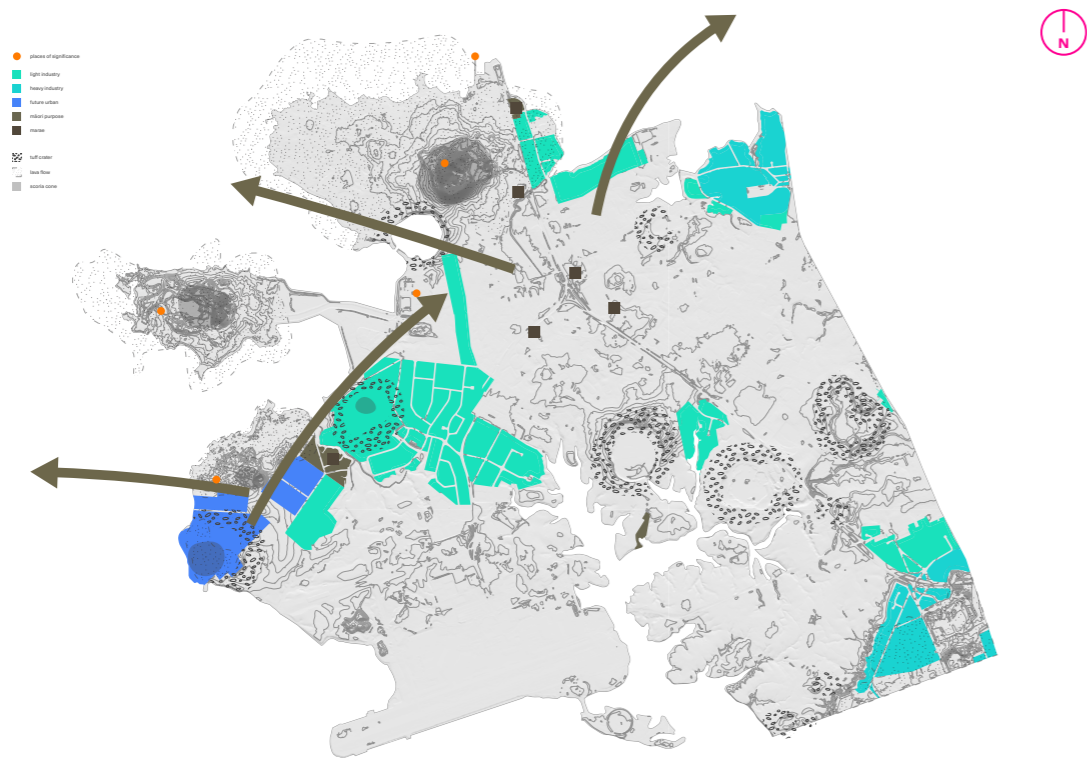


Figure 30. Industry, Volcanic remnants and Marae in Māngere (Webster, 2025).

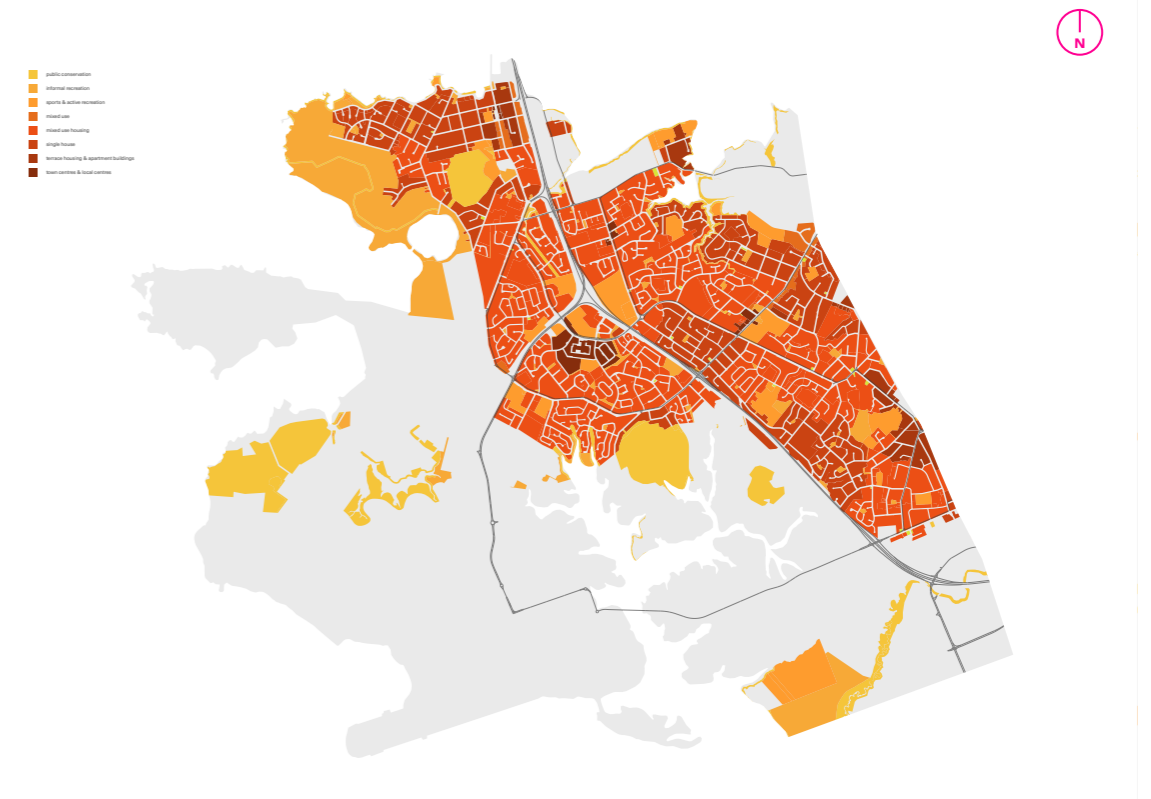


Figure 31. Housing zones of Māngere (Webster, 2025).



Figure 32. *Aerial view of Māngere* (Webster, 2025).

Concept Development

Through photographic documentation of the wider Māngere site key vernacular norms – the glasshouse and the mound/puke – were revealed alongside community activations within the urban fabric that lie undocumented by mapping such as the unitary plan. Projects such as Papatūānuku Kōkiri Marae play a pivotal role in urban nutrient cycling, waste diversion, and providing accessible food for the community, are invisible within the cartesian frameworks of documents such as the unitary plan and only discovered through immersion in the urban landscape. Two key vernacular tectonics, the mound/maunga and the glasshouse, became crucial to the development of this research project. The further distillation of the mound and glasshouse as conceptual notions revealed their foundational characteristics, allowing them to be understood not only as tectonic architectural drivers but as philosophical concepts. The mound can be understood as underground, as being about germination, darkness, solemnness, husbanding, safety, patience, latent potential, and consistency. The glasshouse is characterised as light weight, lively, light filled, productive, and efficient.

The mound/maunga and glasshouse are both inherently rooted in agrarian histories with the mound appearing in pre-colonial Māori growing practices, specifically within Ihumātao, where the earth was amended and shaped to provide better growing conditions for kai originating from warmer climates (Mackintosh, 2021) along with the complex urban pā systems incorporating living and growing on Tāmaki’s maunga. The glasshouse is a temporal, lightweight architecture that correlates with that other typology of the pā maunga, the lightweight ephemeral hakari. It projects the desire to grow cultivars from warmer climates in cooler climates in a western worldview, ultimately extending from this to synthetically prolonging growing periods or erasing the dependency on seasonality altogether (in hot houses).

At the concept stage these typologies were architecturalised as two connected structures, one inspired by the mound, buried beneath layers of accreted earth the spaces are nested within the mound, and the other by the glasshouse, reaching beyond the whenua as an angular shard blending into the sky above. The forms seek to extend from Papatūānuku, while simultaneously holding weight and appearing embedded in the earth, as the maunga is. The critique of the initial concept at Event 1: Concept Symposium (see Appendix A) suggested the mound appeared too artificial, only meeting the ground plane on one corner and being quite aggressively sloped. Although the design language of The Jewish Museum consists of harsh geometric angles this is demonstrated in the built form rather than the landscape. Therefore, the earthscape was altered to consist over softer curves and slopes, leading to the revision and development of the entry threshold through several iterations that tested various angles and number of vertical faces. The resulting mound swept around the glasshouse and had a small vertical face tucked behind the glasshouse allowing entry to the mound and memorial below. Original iterations of the glasshouse were denounced as ‘clunky’ and imposing, this was rectified by revisiting the form-finding process to produce a sleeker outcome through physical tectonic testing.

At first, the mound was entered from within the glasshouse; however, this common space juxtaposed programmatically. The intention of the glasshouse is to represent the potential of an agroecological architecture and provide the awe of the Ecocene, in contrast to the memorial which takes the user on a journey of mourning and solemnness for the massive loss of the Anthropocene. To achieve the best affect, it was decided it would be beneficial to physically separate these spaces, giving them room to best impact the user in their desired ways.

This form presented at *Event 1: Concept Symposium* was a singular large-scale intervention (see Appendix A). The panel felt that a series of supporting structures across small and medium scales would assist the articulation of the programmatic development and in turn justify a structure of such scale. This had been discussed previously in the design lab and it was agreed that this strategy would benefit from a trans-scalar approach. This would provide an opportunity to distribute the programmatic requirements across a series of structures rather than overcrowding a single space. This approach would also contribute toward the success of this strategy at an urban scale, giving the opportunity to decentralise the project which aligns with the Agroecological Care methodology that suggests a network of distributed interventions over the singular edifice.

The development that ensued following *Event 1: Concept Symposium* saw the production of the varying small-scale interventions that would catalyse urban agricultural production and a shift in socio-cultural ontology toward reciprocal care-based systems of urban living. These structures are constrained by the requirements to be low-cost, self-built, and programmatically enhancing.

By *Event 2: Developed Design Symposium* (see Appendix B) the memorial had transformed in from a helical journey downward, on a relatively small footprint compared to the developed idea, to a longitudinal journey below the ground. This change came forth in response to several factors. The previous concept employed the notion of taking up as smaller land area as possible to leave the site mostly undisturbed. However, to achieve the underground seedbank and memorial, the area was excavated, constructed within and then the earth was replaced on top to create the puke. This construction practice contrasts the Agroecological Care methodology especially the principle of layering, the perception of additive regeneration rather than extractive degradation. Through discussion it was also decided that the spiralling platforms downward, although a metaphorical jab at the direction of human existence on the planet, did not perform well with most of the floorplates spent ‘ramping’ between levels.

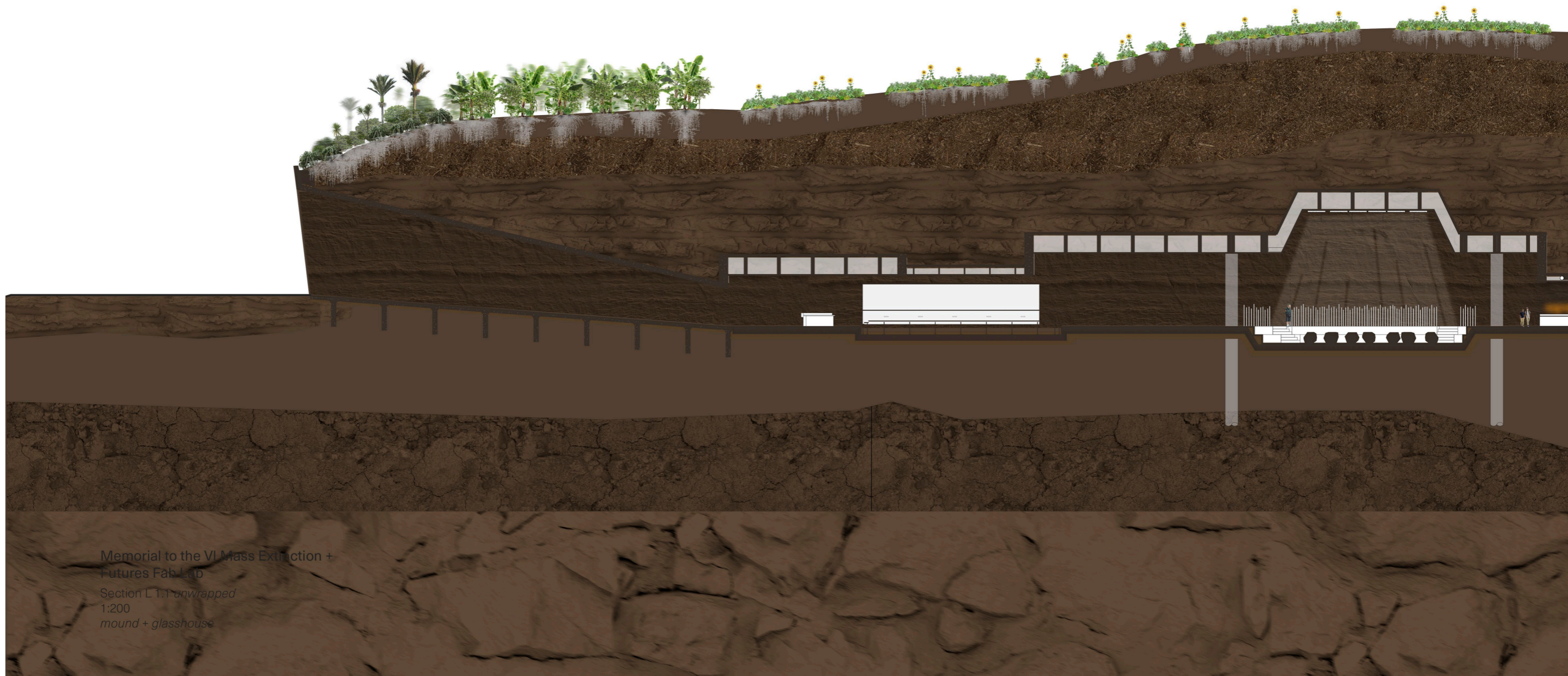
By *Event 3: Detailed Design Symposium* (see Appendix C) the memorial had evolved from the previous form to a scale that was considered more spatially appropriate. In the previous version the memorial had extended beyond the foot of the mound and across the site before returning to the glasshouse. To again reduce the need for excavation the decision was made bury the ‘underground’ aspects of the project within soil that is gifted from sites of development across Tāmaki. This metaphorical notion of burial and planting of the mound and seedbank respectively in soil contributed by iwi from across the isthmus represents the network of relationships joining

together in an act of agroecological care. Constructing this architecture through accretion rather than excavation gave the opportunity to increase the scale of the mound, as this would equal more soil-loss diversion and increase resilience against rising sea levels. This greater mass of earth was able to achieve notable height in the landscape while having enough volume to feather out into the remainder of the site.

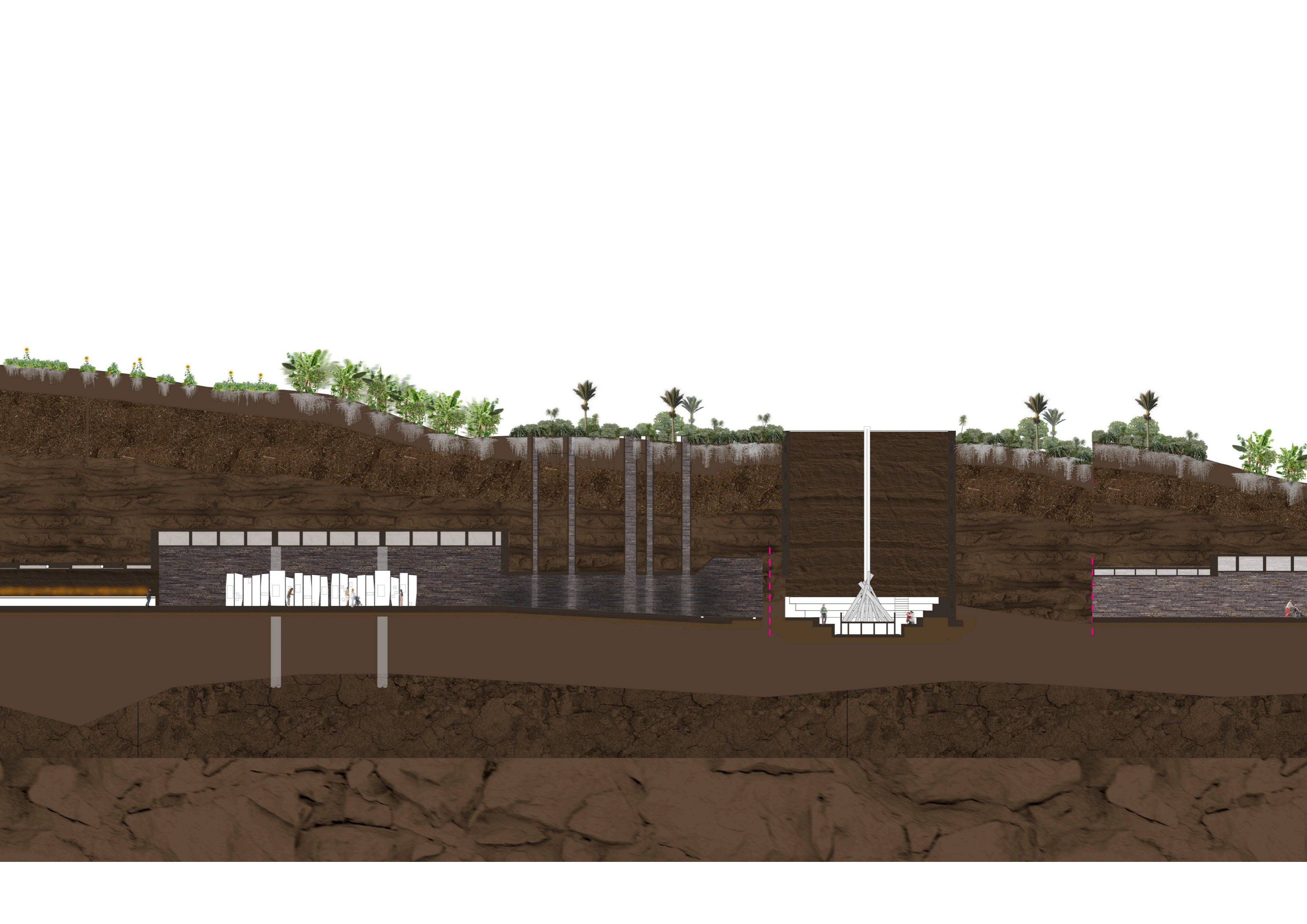
At *Event 3: Detailed Design Symposium* significant moments of the journey began to be tested spatially such as the turning point and memorial exit. The turning point was registered well with the audience capturing a moment to linger in the flow of the memorial. The textured earthen cast walls with vegetation encroaching the opening to the sky was deemed to capture a sense of return to the essential aspects of life on earth, however, it was felt this space would benefit if it was able to intensify the emotive response of the user, the same point was discussed regarding the other rooms within the memorial and posed the question of how to use space as a mode of evoking an emotional response rather than solely as a place to display artefacts. This is developed in the turning point by building the earth up higher simulating depth in the turning point. This gesture creates a sense of awe and ethereal spirituality reducing the scale of the human in this massive cathedral like void.

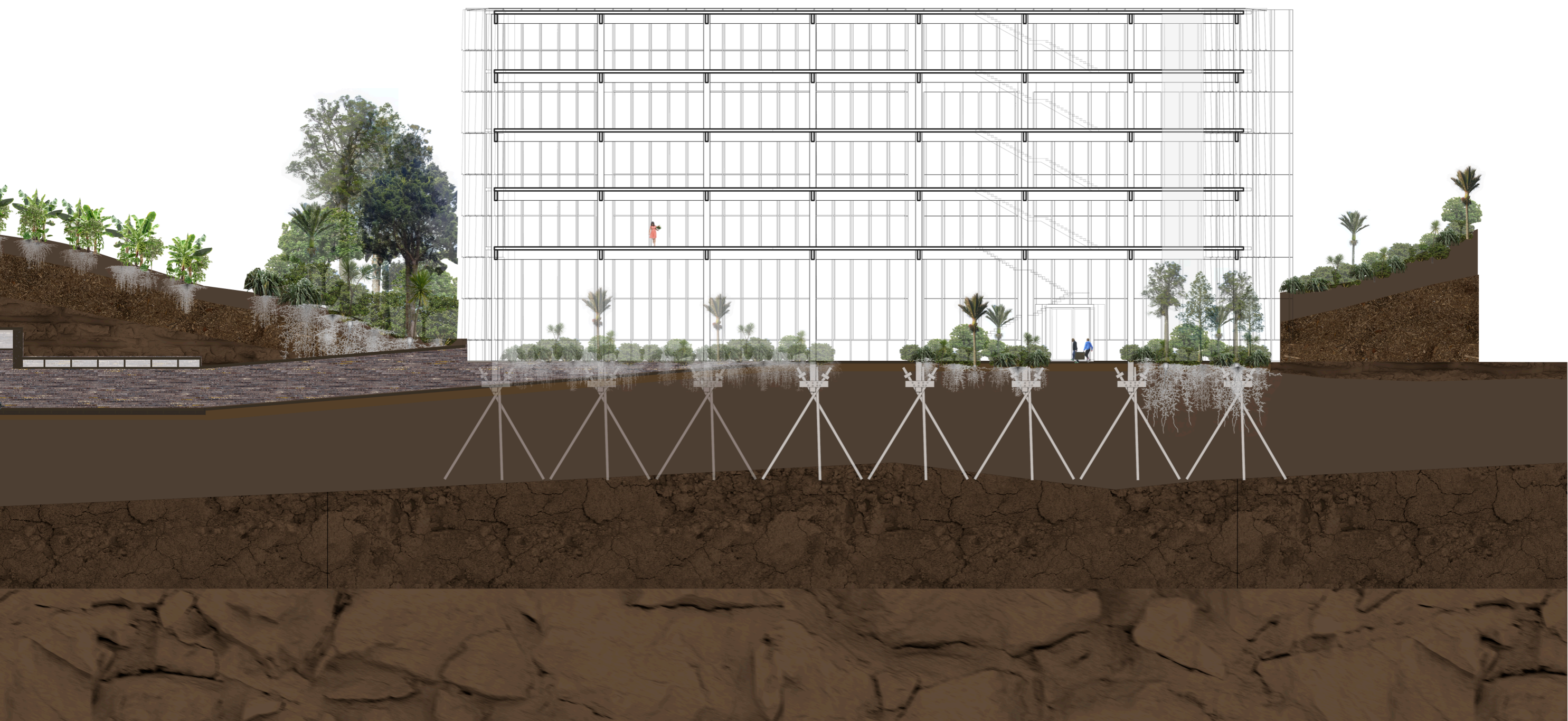
Between *Event 3: Detailed Design Symposium* and *Event 4: Final Design Symposium* the design went through a series of quick and 'hard-edits' in order to refine tectonic elements, programmatic performance, and user experience. This saw the refinement of the glasshouse tectonic from its previous sloped form, to be solely vertical. This attended to the principle of productivity as the building was able to retain greater floor plates across the upper levels as the sloped façade no longer encroached on them, therefore, increasing area for the workspaces within the glasshouse. The journey through the museum drew heavier on the precedents of Zumthor and Libeskind emulating their architectural techniques through a reduction in complexity in plan, removing unnecessary switchbacks and corridors, and emphasising the spatial experience through crafted revelatory thresholds and differing spatial volumes. This new iteration of the memorial's plan acknowledged the importance of the threshold for delivering a powerful affective response from a participant .

By *Event 4: Final Design Symposium* (see Appendix D) the glasshouse's position in relation to the mound had shifted. The previous concept had the mound cut to a significant vertical face of approximately 16m which the glasshouse sat against. This did not capture the essence of care desired in the experience of arriving to the 'new world' of the Ecocene, instead this significant earthen wall caused the space to feel enclosed as if the user was still in the memorial. To rectify this the mound was sculpted to meet the glasshouse in a more subtle manner at a lower elevation, now about 4m above the ground floor. This improved the atmosphere greatly, aiding in the delivery of the light- and life-filled eco-ethical architecture.



Memorial to the VI Mass Extinction +
Futures Fab Lab
Section L 1.1 *unwrapped*
1:200
mound + glasshouse





Construction Practice

The puke/mound works with the Agroecological Care method of layering. Earth is layered over the memorial architecture below (see Figure 35) and is a response to the earth-harming practices of contemporary building and development practices across Aotearoa. Specifically within Tāmaki, urban sprawl is devouring our most fecund soils (Landcare Research, 2024) and replacing these productive lands with low density housing schemes. These typical construction processes allow for the excavation and disposal of, what is deemed, ‘waste’ or ‘spoil’ to managed sites across the motu. Construction in Tāmaki sends an estimated two million tonnes of cleanfill to such disposal sites per annum (Beca Limited, 2025; Pattle Delamore Partners Limited, 2023; Tonkin & Taylor Limited, 2017). The translocation of the whenua is a subject of contention for some iwi (S. Bloomfield, personal communication, October 31, 2025).

This project, from its speculative positioning, intends to challenge the currently invisible waste streams of the construction industry in a fashion that is sensitive and responsive to a Te Ao Māori perspective on this issue. The mode for engaging with this reframes the earthen ‘spoil’ as no longer a waste product of capital incentivised development, instead, as a gift from iwi across the motu to the kaupapa of the agroecological care movement, where the whenua not only contributes to the burial of the memorial but to the protection of taonga seed species within the seedbank. The contribution of soil from across the motu that comes together to nurture the seedbank is an ethic of care, ultimately protecting the sovereignty of the contents within. The casting of the memorial within this mass of earth is a metaphorical gesture to the burial of Anthropocene as the epoch has come to an end, however, more poignantly an act of closure in the farewelling and remembrance of all that has been lost during the Anthropocene. Architecturally this creates an air of unease or tension, to create this building only to bury it never to be observed from the exterior, only to be experienced from within. The act of constructing the memorial from whenua also holds a deep relevance in the sense of memory. Whenua is more than soil, it is Papatuanuku, an ancestor of all life, including humans (Te Rito, 2007), who has herself endured the Anthropocene and holds those memories in her skin. The material act of casting reinforces this characteristic of soil as the memory of the form is held in place.

The use of mass timber within the Glasshouse is equally a practice of Agroecological Care as a carbon sequestering, regenerative, and compostable (in this speculative future) material. More importantly, the connection of these elements with the ground employs a propositional footing system that is concrete free and requires minimal compaction and earth disturbance (see Figure 33). This speculative mode of construction is the actualisation of Agroecological Care in construction practice.



Figure 34. *Layering as a practice within agroecological growing* (Webster, 2025).

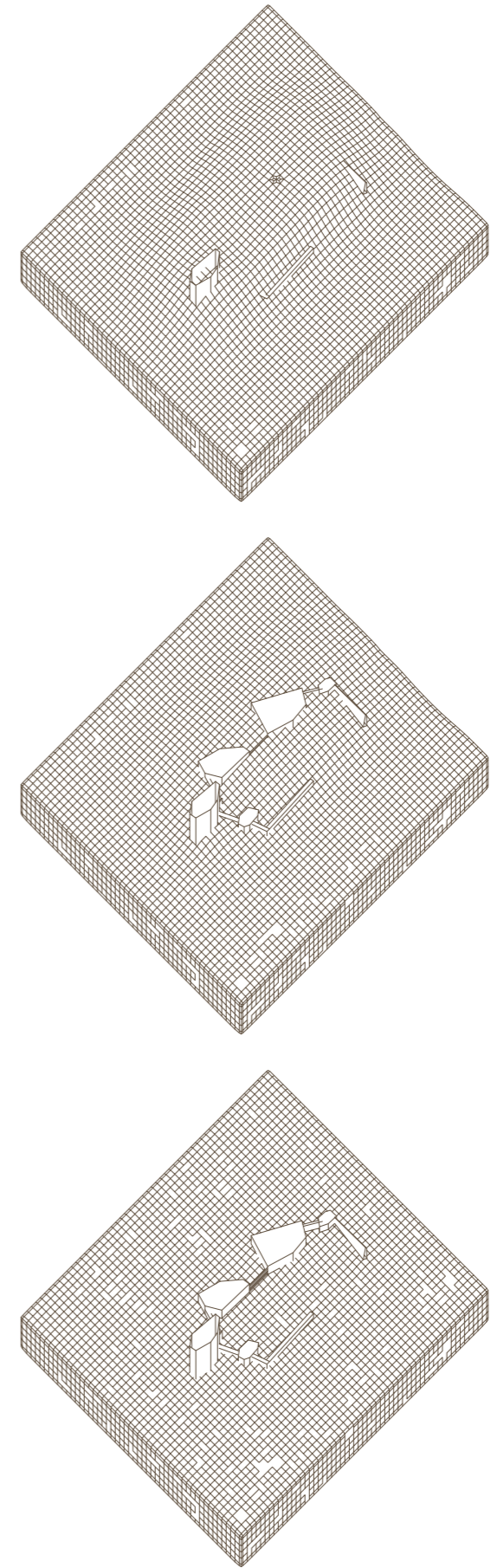


Figure 35. *Layering as a practice within Agroecological Care architecture* (Webster, 2025).

Positioning/Programme

As discussed in Chapter One, humanity has lost touch with the greater ecological systems that envelop the world around us. A minority of the population is already experiencing an ontological shift toward holistic ways of living, yet there is a need to reach the greater majority. This project occurs in two phases, an initial small-scale intervention in 2025 which begins to test agroecological methods and architectures; and a second larger scale architectural system planned between 2125 and 2225. Phase one implements a series of small, flaxroots interventions across wider Māngere to connect with and engage local communities in agroecological means of producing food and living reciprocally. These agroecological architectures and planting systems enable urban agricultural activation and are designed to express care toward the nonhuman. Soil becomes a key character and element to which the design attends. Phase two is designed as a memorial to those beings lost throughout the Anthropocene and an active architecture and infrastructure for local food production and ecological care.

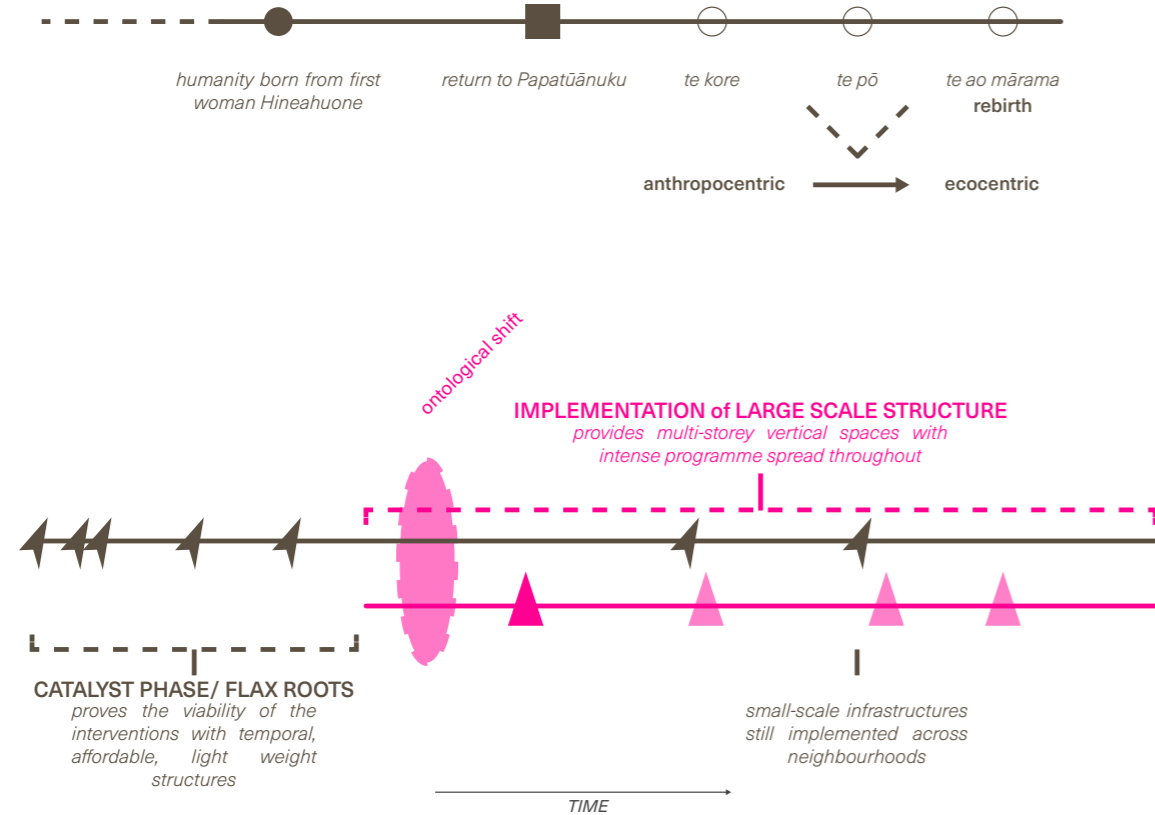


Figure 36. Project timeline (Webster, 2025).

ECOCENE

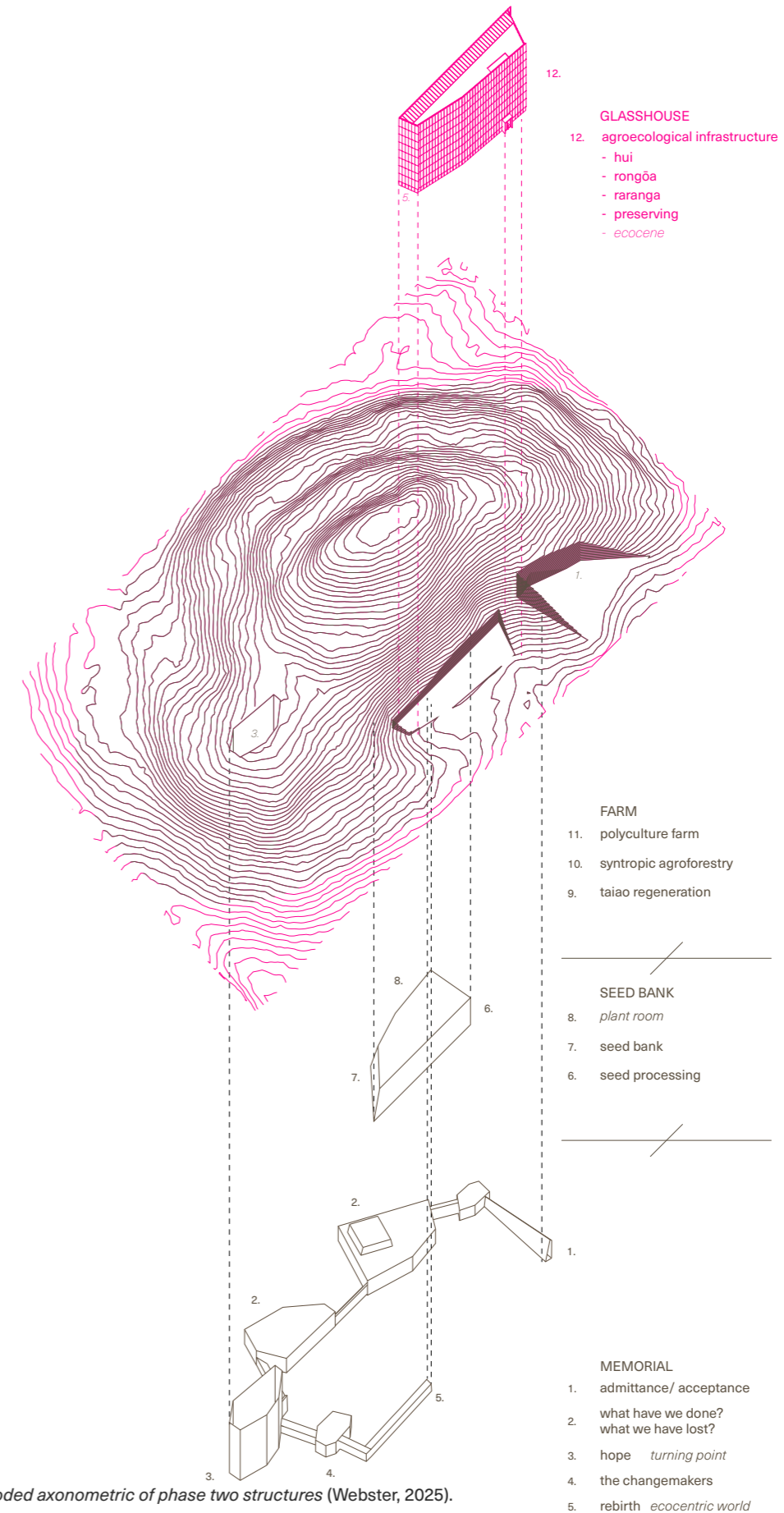


Figure 37. Exploded axonometric of phase two structures (Webster, 2025).

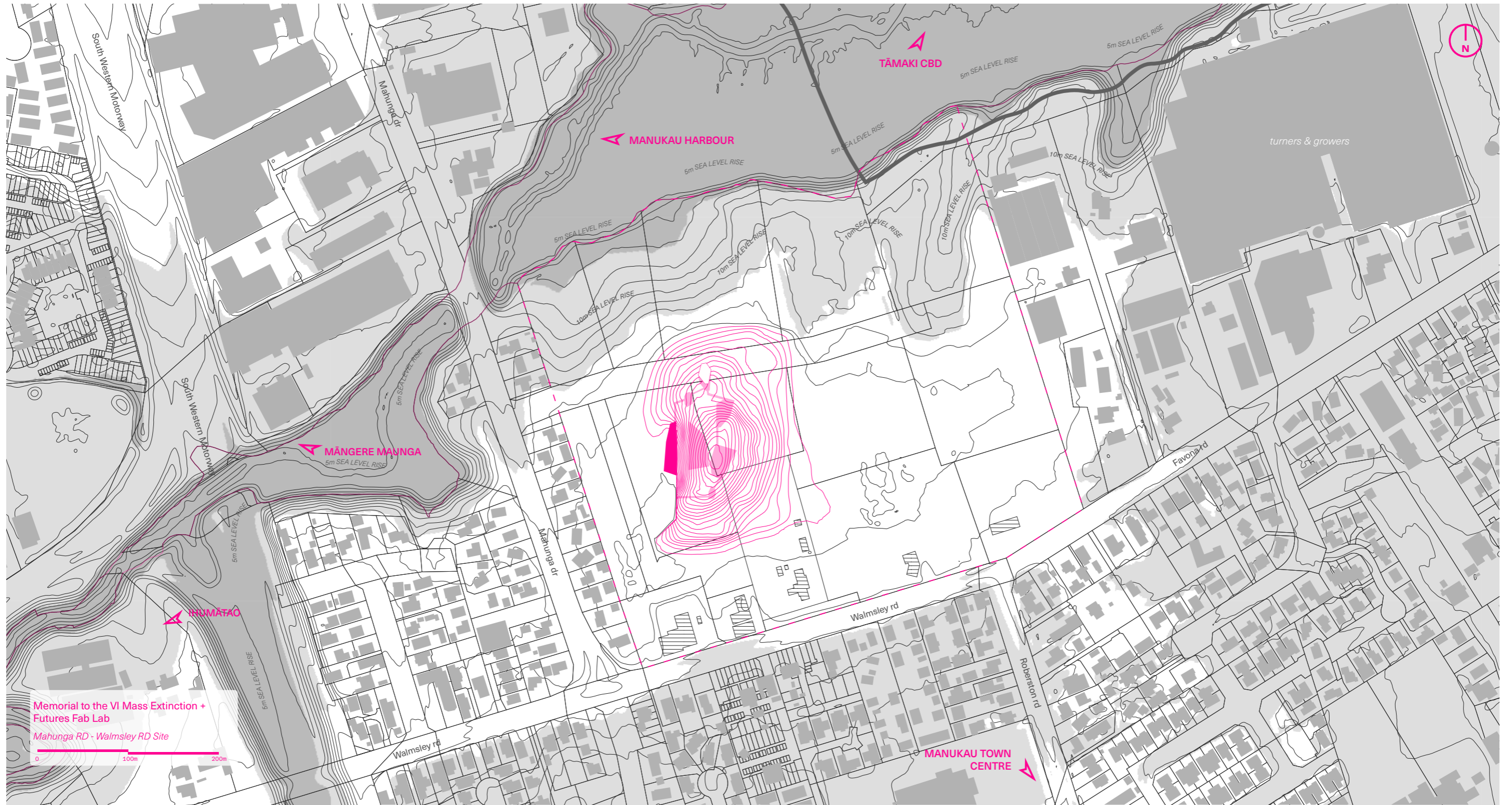


Figure 38. Phase two site plan (Webster, 2025).



Figure 39. Below ground plan view of memorial (Webster, 2025).



Figure 40. Above ground plan view of glasshouse (Webster, 2025).

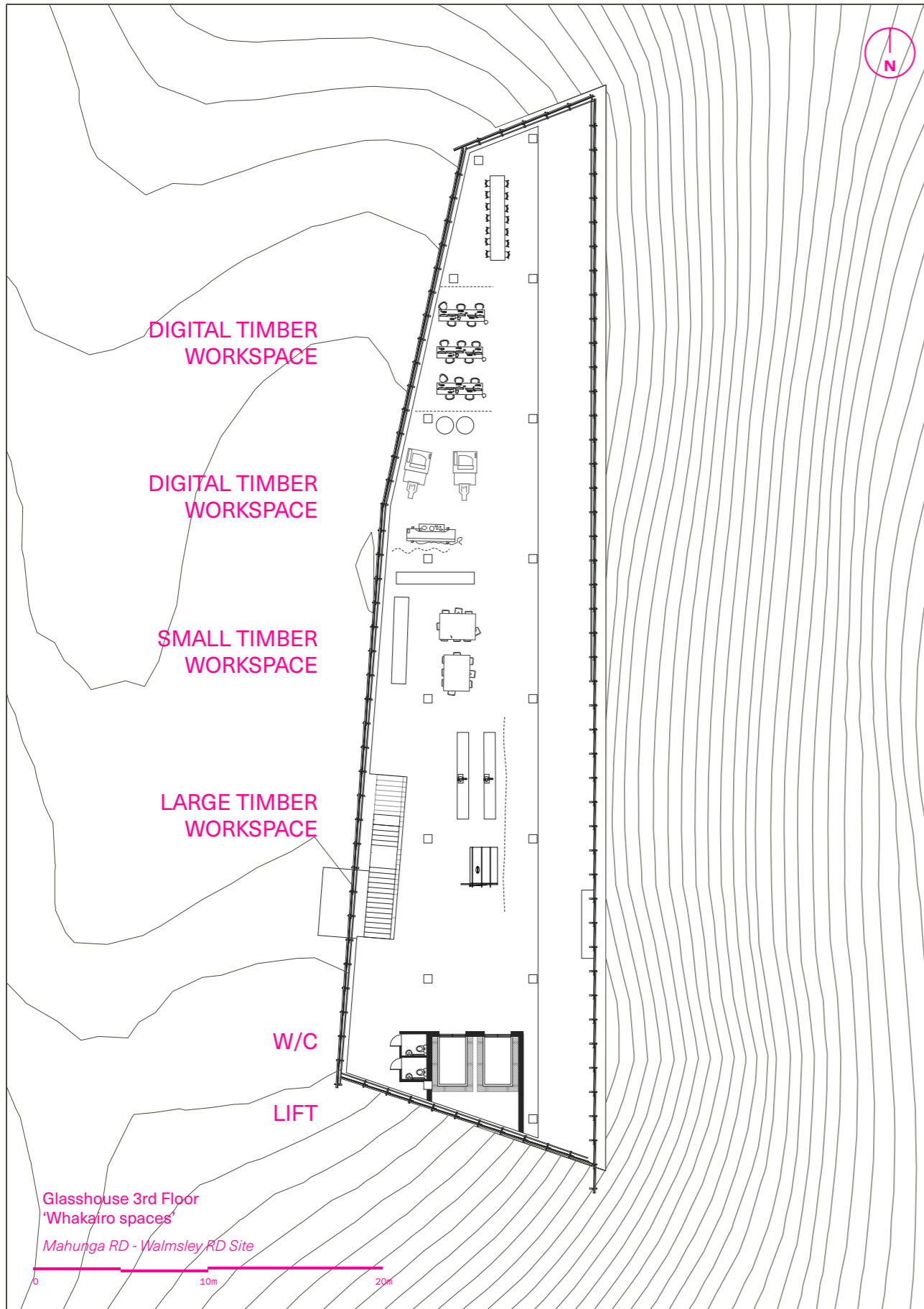


Figure 41. Glasshouse 3rd floor plan (Webster, 2025).

Phase One, 2025

Flaxroots Programme and Design

The present-day, or first phase of interventions, draw from the same tectonic and material language of the mound and glasshouse, however, implementing these through smaller scale, built form. The scale of which these interventions manifest is critical to the success of the agroecological care kaupapa, as at this flaxroots level financial support is scarce, therefore, keeping initiation costs low is crucial. The requirements of agroecological food production saw two key architectures arise in phase 1, the pātaka kai, food pantry, and the wharau, processing shelter and a third supporting architecture of the composting hub. Like the hakari and pā, the pātaka kai and wharau are eminent structures of pre-European Māori food architectures. The design of pātaka by Māori engaged with not only practical requirements such as moisture management, pest deterrence, and airflow but also the appeasement of the appropriate deities/atua such as those associated with cultivated and harvested foods (Best, 1974).

The Agroecological Care methodology is employed here to produce tactical architectural structures intended to incite interest and provoke community participation in urban agrarian activities. It is expected that these interventions will manifest in the sequence of wharau, pātaka, then composting hub, in order of necessity. Here, (see Figure 43), the architectural language of wharau is expressed as ephemeral and 'compostable' in nature. Derived of found materials this intervention offers interchangeable options to best suit the case of each activation prioritising affordability and ease of construction. The wharau is deemed the most crucial structure to implement because it is enabling of multiple farm programmes such as the preparation of harvests for sale (washing and sorting), seed saving, seed sowing, and protection from the elements for the farmers.

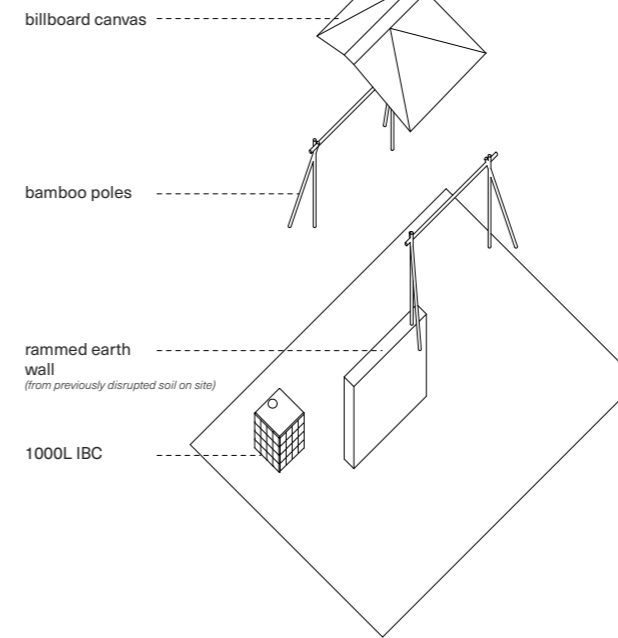
Next, (see Figure 43), the architectural form of the pātaka kai must be simultaneously welcoming and accessible, to encourage participation from the community, while protective of the harvested kai within from pests and inclement and torrid weather conditions. This intervention is derived of standardised building materials that are commercially available or locally source-able materials, keeping bespoke elements to a minimum. The design and corresponding instruction pamphlet enable farmers and their community to build this structure themselves. This is an activation of the agroecological care principle of network/relationships as the project is able to incorporate members of the neighbourhood to aid in the completion of large-scale tasks, who are later reciprocated through the array of benefits the project empowers, flourishing biodiversity, nutrient dense food, and a reduction in climatic impact to name a few. To enable self-built architecture the design must reflect the capacity of the users/builders to confidently erect the structure, this project approaches this through the mode of instruction pamphlets that outline and detail the necessary information for construction.

Finally, the composting hub (see Figure 43) is a semi-enclosed shelter to produce compost. Typically, the practice of composting is void of any structural requirements, however, this intervention seeks to highlight this act of composting through a celebratory structure, bringing attention to this critical practice of Agroecological Care. The structure still attends to the aforementioned conditions of phase 1 interventions, self-built and affordable, while extending function beyond solely that of necessity. The composting hub is able to host gatherings or art installations around the central living heart of compost. This allows the intervention to transcend the realm of purely agricultural function and offer alternate socio-cultural benefits to the community.

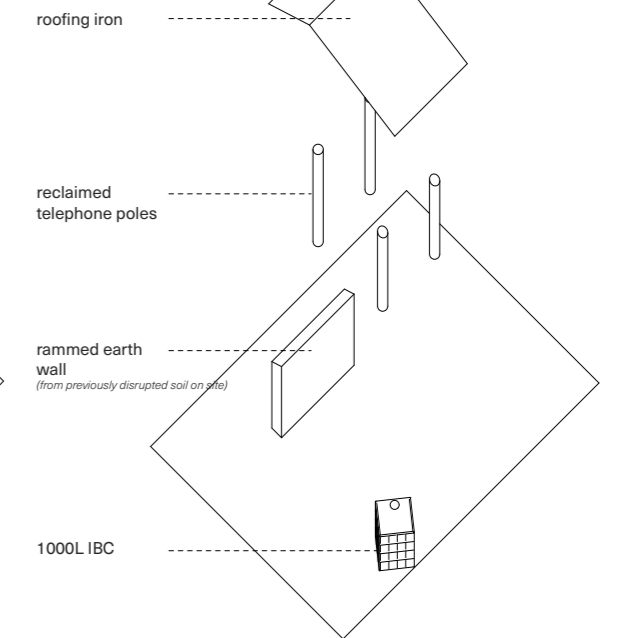


Figure 42. Sectional view of market garden rows with polyculture planting (Webster, 2025).

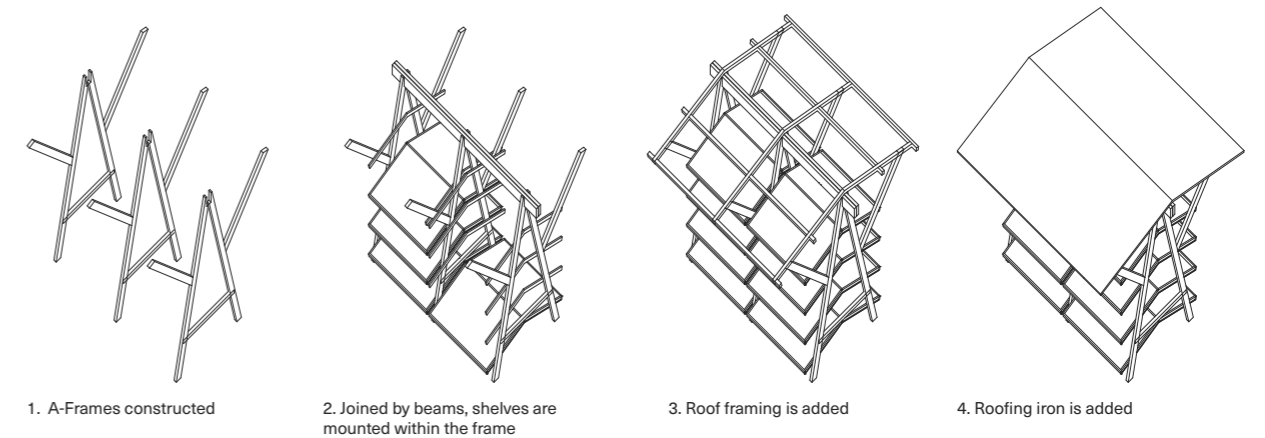
Wharau Option 1



Wharau Option 2



Pātaka Kai Option 1 general assembly stages



Compost Hub

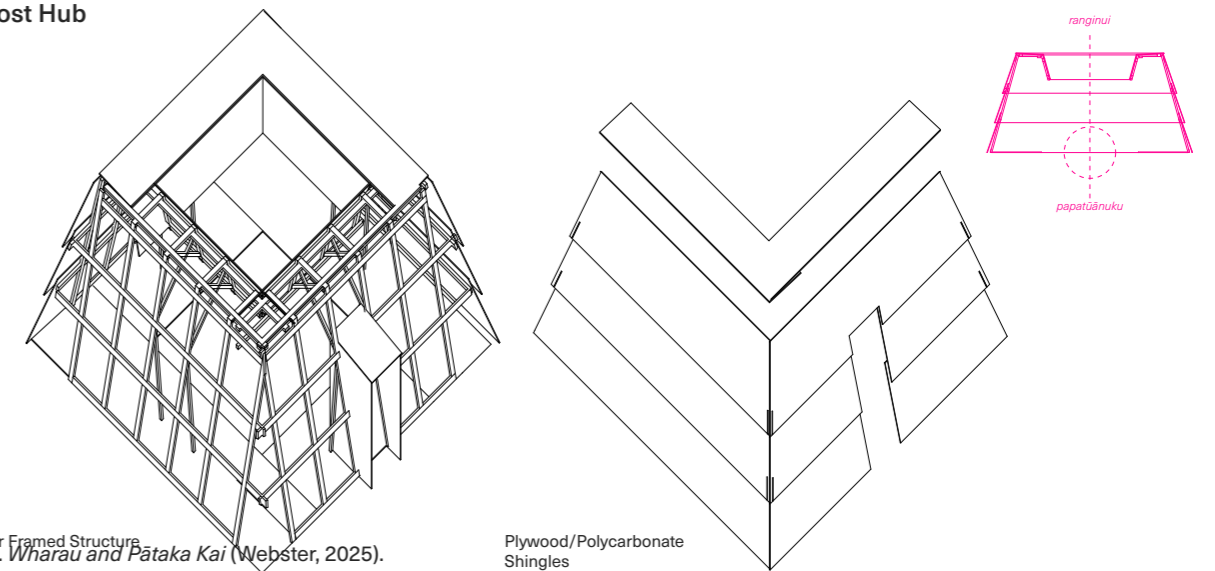


Figure 43. Wharau and Pātaka Kai (Webster, 2025).

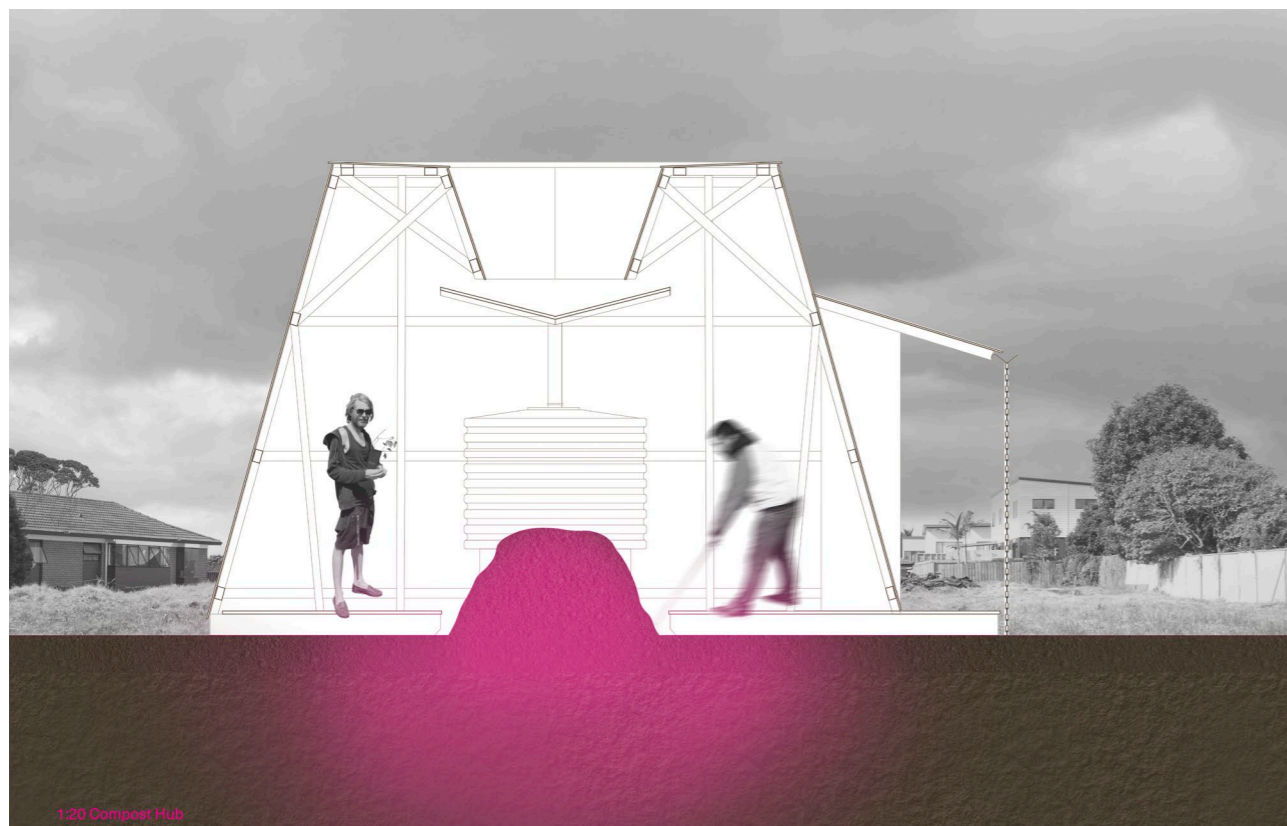


Figure 44. Sectional view of composting hub (Webster, 2025).

Phase Two, 2125-2225

Phase two of the project comprises of a memorial architecture, embedded in the earth, and an agrarian architecture, a glass house, that supports local agro-ecological generation, production and communities. The memorial acknowledges the Anthropocene, the glasshouse performatively signals an Ecocenic future.

The design can be experienced in different ways by different users. Farm workers may only engage with the Glass House and associated systems. Seed-bankers might only visit the subterranean Store House. Visitors, mourners, or festival goers may experience the full cycle of the design, beginning with the entry into the underground memorial, and ending with the return back into the world of light. This complete architectural sequence is understood conceptually and spiritually as a performative movement from Te Kore, the void, to Te Po, the darkness and the turning point, and then out into the vitality of Te Ao Marama, the world of light, to new life and generative potential.

Te Kore / The Memorial

The memorial is entered through a thin slit in a vertical earthen wall that leads to an underground domain. The dark fracture in the wall is likened to re-entering the uterus of Papatūānuku, where the dark atmosphere is a reminiscent of a time before light and the birth of humanity. This cave-like entrance compresses the user, shrinking them from the vast world above to an intimate world below, bringing them closer to the earth. The intense feeling of weight is expressed through the earthen materiality of rough in-situ cast walls, the dark tones subduing the atmosphere. The use of these architectural techniques to evoke an emotive response is the essence of the principle of care, demonstrated here through materiality, the raw texture and earthen tones elicit a primordial sense in the user, freeing them of the commodity and ego of modern life.

The phase of Te Kore within the memorial evokes a sense of mourning within the user, depicting the vast scale of loss at the hand of the Anthropocene. Coming face to face with the loss, at scale, in a space focused only to this offers a chance to reflect, to experience, and potentially grieve and acknowledge the reality of what our industrial cultures have done to our living world. The mourning of these losses is crucial to recognising the value of relationships shared between oneself and others. The lofted ceilings and compressive corridors respond to the procession inducing a cathartic response in the user during their journey through this section of the memorial.



The absence of apertures to the overworld result in a space entirely lit with subtle artificial lighting, this detaches the user's perception of time from typical circadian rhythm; instead, time is suspended in the darkness and the user's duration in the space is determined by their engagement with the memorial, irrespective of external time pressure. Te Kore typically references a state of unrealised potential (Marsden, 2003), in this instance signifying the lost connections with kin that have passed in the sixth mass extinction while simultaneously revealing the dormant possibility of engaging with and expressing care toward the kin we have left. The architecture offers opportunities to pause, acknowledge, commune via votive platforms where remembrances candles can be lit. The architecture here seeks to support those journeying through spatial but also potentially a redemptive sequence of events.

Figure 45. Entrance to the memorial (Webster, 2025).



Figure 46. *Projection volume (Te Kore phase)* (Webster, 2025).

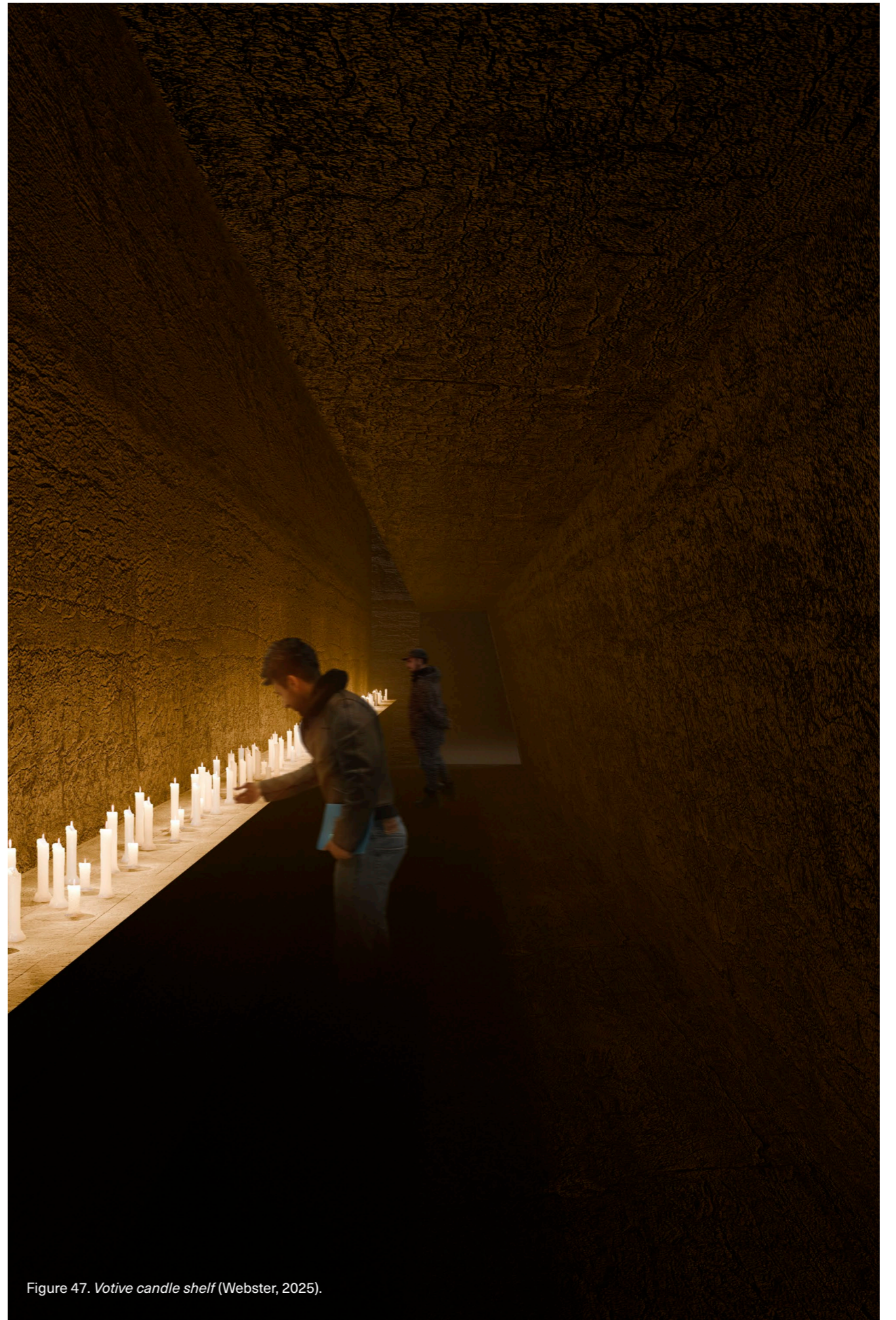


Figure 47. *Votive candle shelf* (Webster, 2025).

Te Pō / The Turning Point

Having experienced the intensity of the void, of loss, and of acknowledgement, the memorial experience then begins to transform. The zone of Te Pō is aligned to the later stages of the perpetual night, where transformation and movement are rife in the moments before the arrival of light (Marsden, 2003). Te Pō, the turning point alludes to the piercing arrival of light between Papatūānuku and Ranginui in the initial moments of Te Ao Mārama. The penetration of light into the depths of the memorial reflects a turning point in the user's journey.

Lozenge shaped voids in the ceiling link the passage with the sky above. They grow in size, dotting the length of hall that departs the final exhibition space. At the turning point of the memorial is a large amphitheatre like space for celebration, event, and environmental connection that is open to the sky some 20 metres above. Light shimmers in water flowing down the walls and floor of the corridor. Water glistens in channels cut into the walls of the amphitheatre and pools in a central moat that surrounds the great fire. In rain events, water rises to the level of the stepping stones which led to the next stage of the journey. The presence of water, the giver of life and the blood of Papatūānuku, represents the return of life.

The turning point void is a moment of tension between the earth and sky, Papa and Rangi, and space of relief for the user. The large void connects us with the world of light, offering solace, supporting ecological connection. This connection through the opening at the top of the stratified void leaves the user still contained, but exposed to the elements. It registers as a turning point, an initiatory moment in the return to the world of light. The void and material combination invoke a sense of an ethereal more-than-human presence. In addition to its role as part of the memorial sequence, the Te Pō void becomes a space of performance and celebration aligned with Matariki and the Maramataka (see Figure 49). The space becomes a vessel to connect to the mauri of these other forces and each other.

From the turning point, the memorial journey leads through a passage towards a terminus flooded with light.



Figure 48. Corridor to the turning point (Te Pō phase) (Webster, 2025).

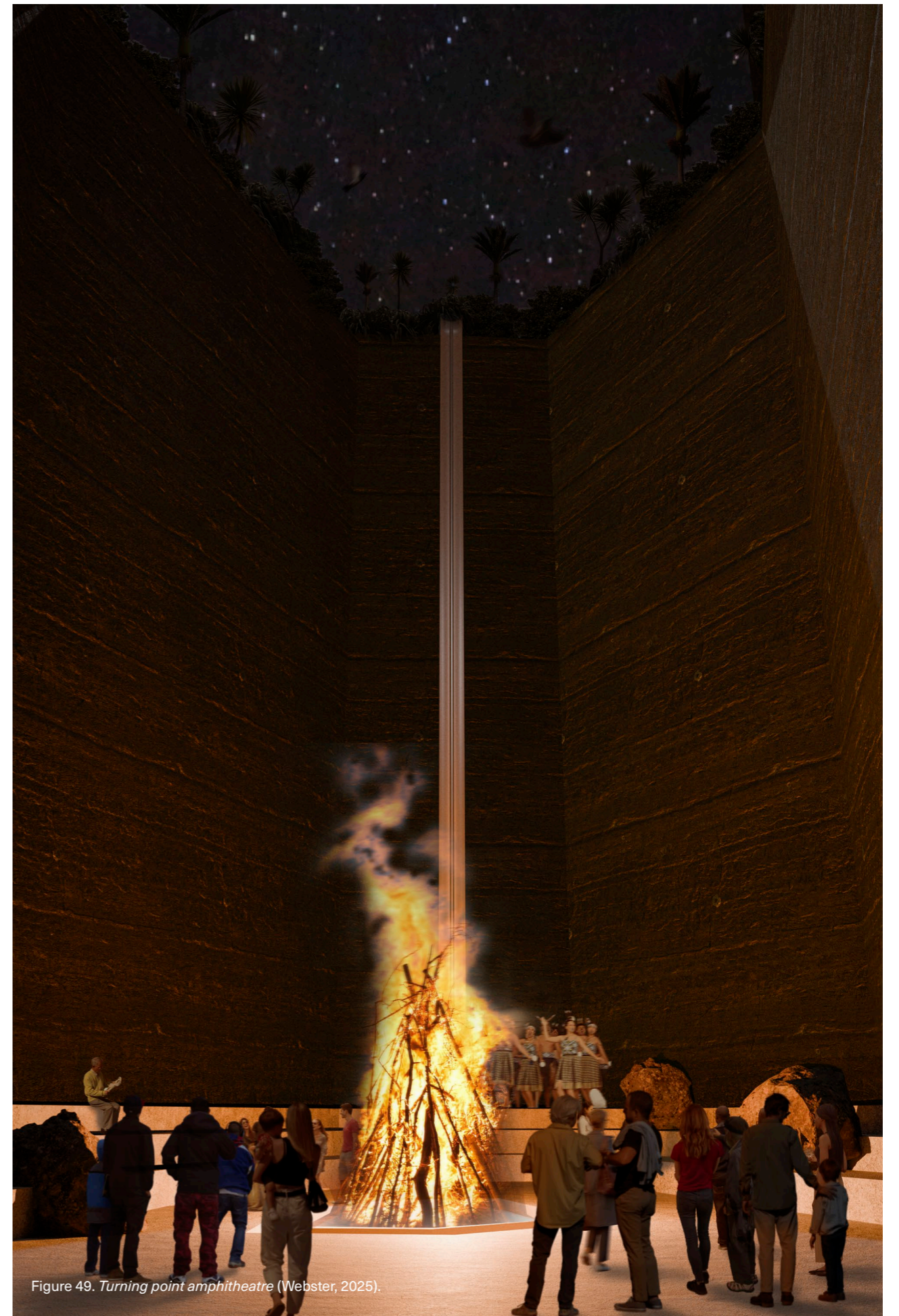


Figure 49. Turning point amphitheatre (Webster, 2025).

Te Ao Mārama / The Glasshouse

The ramping entry into the light filled glasshouse returns the visitor above ground. The building teems with life as users step out into an ecocentric world. Plantings of native species permeate the envelope of the structure, creating guided paths and clearings on the ground floor. The mass timber columns and beams are biophilic and sensorially rich. The buildings skin of translucent, frosted, and adjustable glazing is highly operable: large panels at floor level slide open to create an indoor-outdoor space for use during weekend markets, at higher levels panes slide and stack open. These operable panels, regulated by building users, dissolve the bifurcation between what has been thought of as natural and cultural. Actuating these panes to an open position forms a fluid or porous spatial condition as opposed to typically defined architectural container. This dissolution of confinement allows more-than-human species to traverse the landscape largely uninterrupted. This mode of architecture is reminiscent of performative Māori architectural structures observed in built forms such as the hakari which celebrated ecological abundance and scale (Treadwell, 1999).

The Glasshouse embodies agroecological care principles of transformation and care. It houses practices and programmes that enable agroecological success such as food preserving, rongoā (traditional medicine) practices, raranga and seed harvesting and storage (within the seedbank) that could be classed as 'green-collar' jobs. The ground floor supports the weekly farmers market and flow of inhabitants between the seedbank, upper floors and memorial exit. Adjacent to the glasshouse is the supporting farm infrastructure of a seedling nursery and potting shed for the raising of organic heirloom varieties of produce alongside native species for regenerative plantings. Nested parallel to the glasshouse within the mound is the seedbank which enables the saving of taonga and heritage seed species. There is benches, wash-stations, and drying racks for the processing of seed. Technicians are present to assist visitors in the collection of seeds alongside verifying the quality of seed arriving and ensuring seeds are properly prepared for storage. The storage takes place in multi-level racking which. Back within the glasshouse, the first floor contains preserving facilities, where fresh produce is canned/jarred for improved storage or sale. These preserving facilities are not exclusive to farmers or preservation technicians, instead function as a community kitchen in their downtime, where local food is produced and cooking classes are held. The second floor contains rongoā studios, where tinctures and herbal medicines can be prepared from locally harvested plants and applied to patients. The third floor is a raranga and whakairo workshop, where again, locally harvested plants can be transformed into woven or carved goods. This disrupts global economies with a hyper-local approach to production and consumption of good, especially given those goods are comprised of materiality that remains part of the ongoing circular vitality of the earth.



Figure 50. Exit from the memorial to the ecocentric ground floor (*Te Ao Mārama* phase) (Webster, 2025).



Figure 52. Rongoā remedy production (*Te Ao Mārama* phase) (Webster, 2025).



Figure 51. Ecocentric ground floor (Te Ao Mārama phase) (Webster, 2025).



Figure 53. Exterior view of glasshouse 'everyday' entry (Webster, 2025).

Te Puke / The “Mound”

The puke adjacent to the Glasshouse supports local food production through a syntropic food forest, polyculture market garden, and native tree groves. The farming landscape support entanglements of productive kin, regenerating the soil and atmosphere, communicating through rhizomatic microbial exchange. Here humans collaborate in reciprocal practices with the more-than-human to achieve nutrient-dense secure food systems for all. The agroecological farm provides an opportunity for the local community to activate their reciprocal kinship with more-than-humans on the site. The programme of urban agriculture on this site contributes to communal resilience to climatic and socio-cultural pressures such as global warming, food insecurity, and peak soil.



Figure 54. Exterior aerial view of glasshouse and adjacent mound (Webster, 2025).

Critical Reflection

in(ter)dependence, as a design project, intends to approach some of the most inherently wicked and complex issues surrounding human inhabitation of planet Earth. The design-led research responds to anthropogenic climate change, mass extinction and biodiversity loss, social inequality, food insecurity, and extractive consumptive practices through design, proposing instead alternative architectural systems that enact ecological care.

This project attends to these issues with methodical rigour as best it can within limits of scope and capacity. A potential weakness is the speculative nature of the project. At this time of ecological emergency that necessitates cultural systems change we must be engaged in future-focused enquiry - but such projects can lack in pragmatism or detail. The research aims to balance between the valuable long-term thinking enabled by the 200 year temporal window of the project while retaining a degree of specificity around architectural system, material, spatial experience, and programme. The first part of the project - encompassing small scale agro-architectures supporting composting and local produce growing - is projected as the initial phase of an agro-ecological project that then grows to the second phase in between 2125 and 2225. In this second phase the agro-ecological architecture has grown to encompass a space that ritualises ecological care through the Memorial to the Sixth Mass Extinction, the Glasshouse, and the surrounding agroecological food systems. The project presupposes that phase 1, 2025 seeding, does transition through to the larger phase 2, with both scales existing in parallel.

A further complexity associated with the 200-year future focused timeframe is the necessary speculation around what conditions - for the food system, in the climate, in the social structure - will be. In response, the project seeks data from current research to identify future conditions to design to including predicted sea-level rise, climate conditions, and the necessity of large-scale cultural change (Brondízio et al., 2019; Masson-Delmotte et al., 2022).

Conclusion: Becoming Kin

in(ter)dependence as a design-based research project explores how architecture and architectural systems can effect care. The project intervenes as an enquiry into socio-ontological repositioning, as it seeks to catalyse a shift from the Anthropocene to the Ecocene. The research approaches regenerative transition through an enquiry into urban agricultural self-sufficiency led by an Agroecological Care methodology. Positioned in a future not far from our current time, the project engages with the state of our current planet projected forth, where anthropogenic climate change, extensive biodiversity loss and widespread social inequities are rife and care is both an ethical and pragmatic imperative.

in(ter)dependence acknowledges the radical change that must occur across all spheres of human existence, behavioural, cultural, economic, and political - to shift from the current capital-centric, consumptive, and extractive existence, to a agroecological-care-centric, reciprocal, additive, and regenerative mode of co-habitation. The project strategically allies with the ecological care of Indigenous knowledge and practices. The Agroecological Care methodology allows the formulation of an architectural practice that is agroecological in nature, develops local food systems and economies that are grounded in a deep sense of ecological awareness, care and connectivity. The Memorial to the Sixth Mass Extinction acknowledges the harm done in the Anthropocene, and provides a safe space to collectively mourn and process. The transition back into the light-filled space of the "Glasshouse" performatively signals an ethical transition to cultural practices that are grounded in socio-ecological care and connection. The Glasshouse celebrates and markets local food production, collects seeds, acts as a community kitchen, supports indigenous craft and practices, while enabling wellbeing, and hyper local modes of living.

In celebrating local ecological care and connection through place-based architecture and food systems, the project aims to provide a seed for change that could scale at local, regional and national scales for wider global effect. in(ter)dependence proves that with considerate design decisions, the latent potential within vacancy across urban fabrics can be regenerated into sites of agrarian self-sufficiency that enable human connection with thriving more-than-human communities

This design project is speculative in its entirety, experimenting with answers to some of the most complex and wicked problems of our current age. The core principles of agroecological care and the vernacular of Māngere come together to form iterative, exploratory design-led research. This project calls on architects, and architecture to assimilate our position within the wider world of our nonhuman kin. If we can design so, we can develop architecture that lives and dies well with others, and is designed for the ongoing cyclical vitality of the earth.

On our journey to becoming compost.

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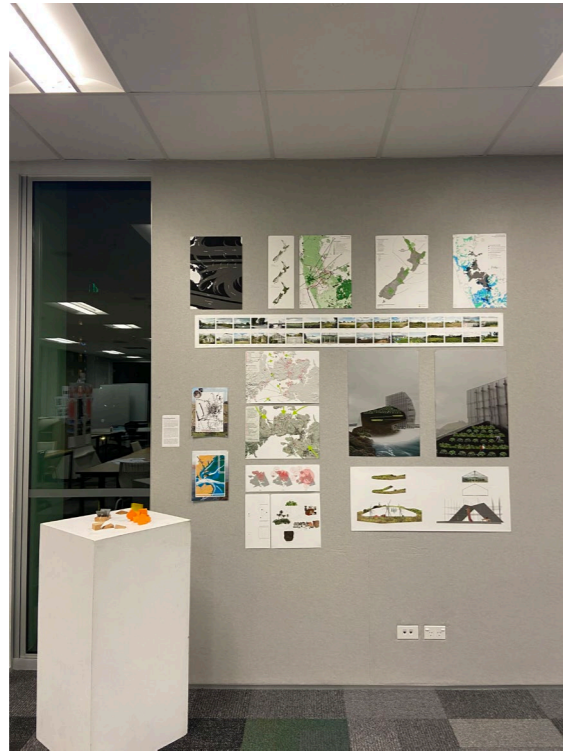
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Appendix



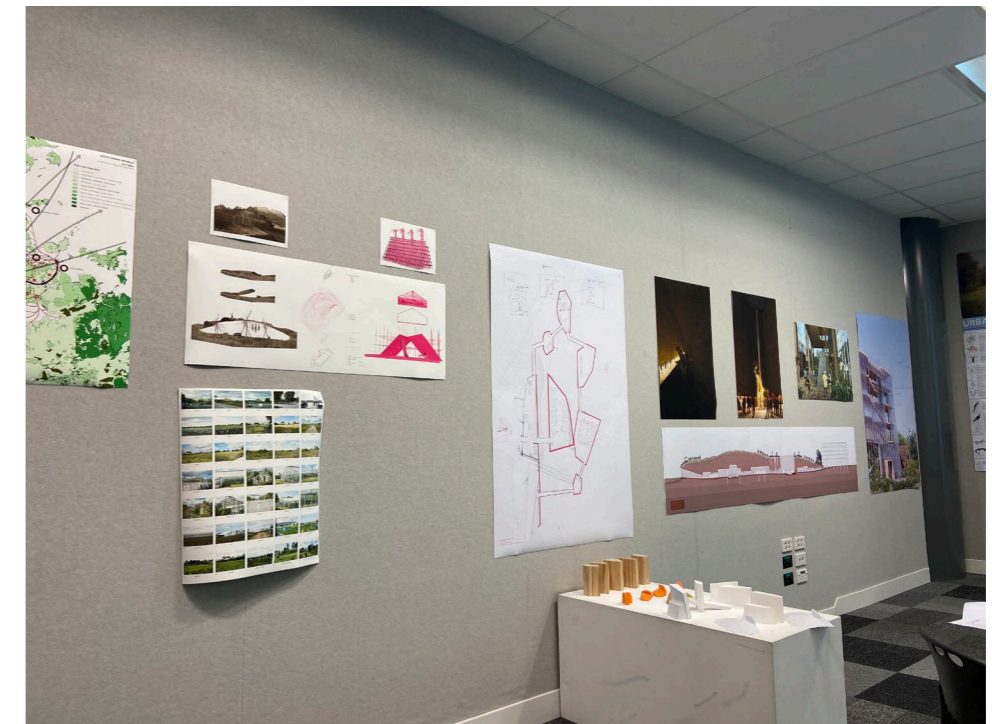
Appendix A. Event 1: Concept Symposium (Webster, 2025).



Appendix C. Event 3: Detailed Design Symposium (Webster, 2025).



Appendix B. Event 2: Developed Design Symposium (Webster, 2025).



Appendix D. Event 4: Final Design Symposium (Webster, 2025).



Appendix E. Stills from a model making performance of phase 2 (Webster, 2025).



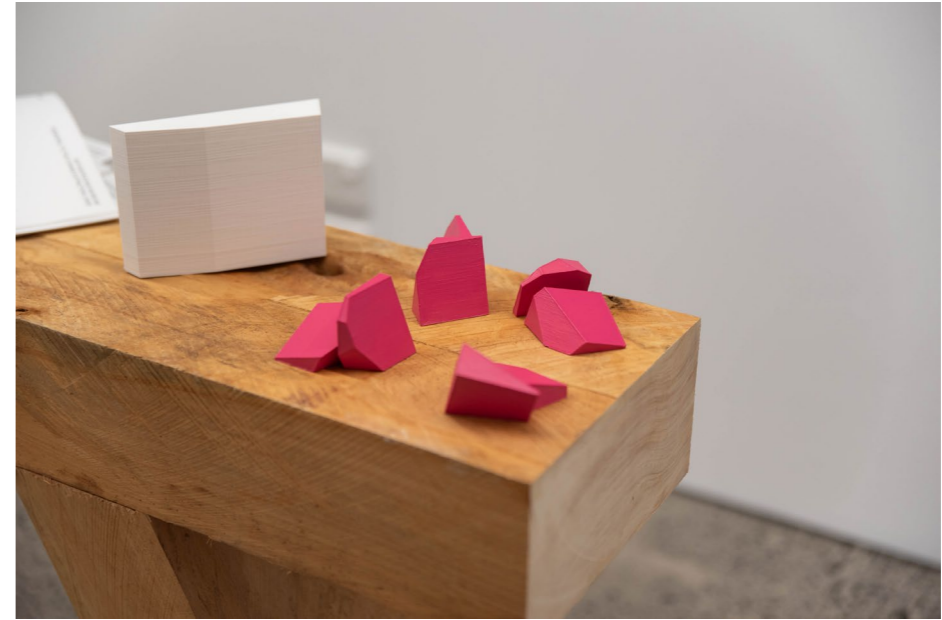
Appendix F. Thesis Examination (Webster, 2025).



Appendix G. Thesis Examination (Webster, 2025).



Appendix H. Thesis Examination model development forms (Webster, 2025).



Appendix J. Thesis Examination model development forms (Webster, 2025).



Appendix I. Thesis Examination pamphlet 'architectures' (Webster, 2025).



Appendix K. Thesis Examination Site (front) and Turning Point (rear) models (Webster, 2025).



Appendix L. *Thesis Examination Phase 2 site model* (Webster, 2025).



Appendix M. *Thesis Examination Turning Point closeup* (Webster, 2025).

ngā mihi nui

Steven Webster