



An Intervening Opportunity

An architecture in solidarity with non-human others

A thesis to Auckland University of Technology in (partial) fulfilment of the requirements for the degree of Master of Architecture (Professional).

[Fig 2] Standing on the edge of Te Whau Awa at Kanae.



[Fig 3] Birds eye view of Kanae (Queen Mary Reserve)

Abstract

An Intervening Opportunity: An architecture in solidarity with non-human others.

As part of the **Muddy Urbanism Lab**, this thesis explores the potential of an architecture oriented to the more-than-human. **It asks, “Is it possible through a hybrid architectural-landscape intervention to introduce a relationship where more-than-humans thrive alongside human activity”?**

Straddling the intertidal zone between whenua (land) and awa (river) at Wai ō te Whau (Waters of the Whau), this speculative design project develops a space for seedling production and re-planting the **Whau tree**, which once forested the river’s banks.

It provides an **architectural apparatus** that collects data for agencies working on river health restoration and a place for learning and sharing kai (food). Crucially, in making the design, habitats are generated for endemic life forms, including oysters and migratory birds, providing a space for more-than-human to thrive alongside human activities.

This design research follows the principles of **regenerative architecture** to develop a structure that slowly integrates into its estuarine and riverside environment while also referencing the history of **Te Whau Awa** as an essential space of mahinga kai (traditional food gathering).

Keywords:

More than human

Regenerative architecture

Architectural Apparatus

Whau Tree

Muddy Urbanism Lab



I dedicate this thesis to Te Whau Awa



Acknowledgements

There is a trendy little coffee hole-in-the-wall place a five minute walk from my studio at AUT, I want to thank K, for his everyday happy aura and great coffee.

I had a great support group of family and friends encouraging me throughout this year, also the awesome group of students and AUT staff during my degree, thank you for the interesting and intriguing conversations.

I had some fun late nights writing reports with amazing night time city views from the 10th floor.

To the wonderful Kathy Waghorn, I just want to say you have been a passionate and patient supervisor.

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Attestation of Authorship

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

Ilycia Lavery

1

PART ONE

[Fig 7] Te Whau Awa bank at Kanae



Context



Part 1 Context

1.1 Pepeha

I am a fusion, made up of many that come before me. I stand here in New Zealand, and with my ancestors that go before me, I introduce myself. Of the people and places that are important to me. The mountain that has challenged me and helped me rise above, to the waters that call my name, a life source where I will always return.

I tipu ake ahau ki Tāmaki Makaurau

I grew up in Auckland

Ka haere au ki Maungawhau ki te rongo kaha

I go to Mt Eden/mountain of the Whau tree, to feel the strength

rongo = to hear, feel, taste

perceive

Ka haere au ki te moana o Piha kia kaha taku mauri

I go to Piha to strengthen my soul

Ka = past present future and is still existing

No Tonga me Kōtirana me Airana me Nōwei oku tupuna

My ancestors come from Tonga, Scotland, Ireland and Norway

I te taha o toku mama no Tonga, no Airana ahau

On my mother's side, I come from tonga and Ireland

Tatakamotonga ko toku kainga

Tatakamotonga is my village

I te taha o toku papa no Kōtirana ahau

On my dad's side, I am from Scotland

Ko McKenzie raua ko McDonald oku clans

McKenzie and McDonald are my clans

Ko Tupou raua ko Laverty oku whanau

My family lines are Tupou and Laverty

Ko Ilycia toku ingoa

Tēnei te mihi ki Ngāti Whātua ki Ōrākei rūa ko Te Kawerau ā Maki ngā tāngata
whenua o te rohe nei

Sending acknowledgements to the Tangata Whenua of this area

Tēnā koutou, tēnā koutou, tēnā koutou katoa

I am tauwi (non-Māori). The mana whenua, the people who have historical and territorial rights over the land and waters explored in this design research, are Te Kawerau ā Maki and Ngāti Whātua Ōrākie. They are recognised as the principal iwi. As this is a speculative design research, I develop this relationship through published materials.



1.2 Point of View

I want to feel, hear, see, touch and smell Mother Earth's perspective.

I live in Auckland city. I have always admired and enjoyed Auckland's many green spaces. Right up until the point that I started to understand that a manicured green space full of introduced flora and fauna is not mother Earth's perspective.

That which has mauri (aliveness) is everything around us. Therefore, I seek to accentuate the mauri of what is endemic, creating this Whenua to be or move into a state of ora (well-being).

Creating manicured green spaces like sports fields, playgrounds, and public parks, cuts out the mauri ora (aliveness) that was a part of these places.

These manicured spaces give us a sense of enjoyment and beauty; however, they make us forget about the wildness and the life that lived there before. We save the reality of the natural world for YouTube and documentaries to admire the vastness of the wilderness on our screens. However, we cannot feel or experience empathy or gratitude for mother Earth this way, not really.

The glowing box state creates an invalid sense of feeling of belonging. This state remains until you have felt it with your own senses and feel gratitude and empathy.

We need to understand that everything has mauri ora outside the anthropic view. It is more than talking about sustainability, recycling, or listening to what is educated into us; you can easily fall into 'doing your best within your safe place, your community.

It is not enough anymore.

Maybe, you can only feel gratitude if you don't box yourself into a particular role, like an architect or a philanthropist and ecologist; you need to step aside from that and feel with your heart, let your heart and brain tango.

I want to feel, hear, see, touch and smell.

Is it possible
through a hybrid
architectural-landscape
intervention to introduce
a relationship where
more-than-human
thrives alongside
human activity?

1.3 Thesis Introduction

An Intervening Opportunity: An architecture in solidarity with non-human others.

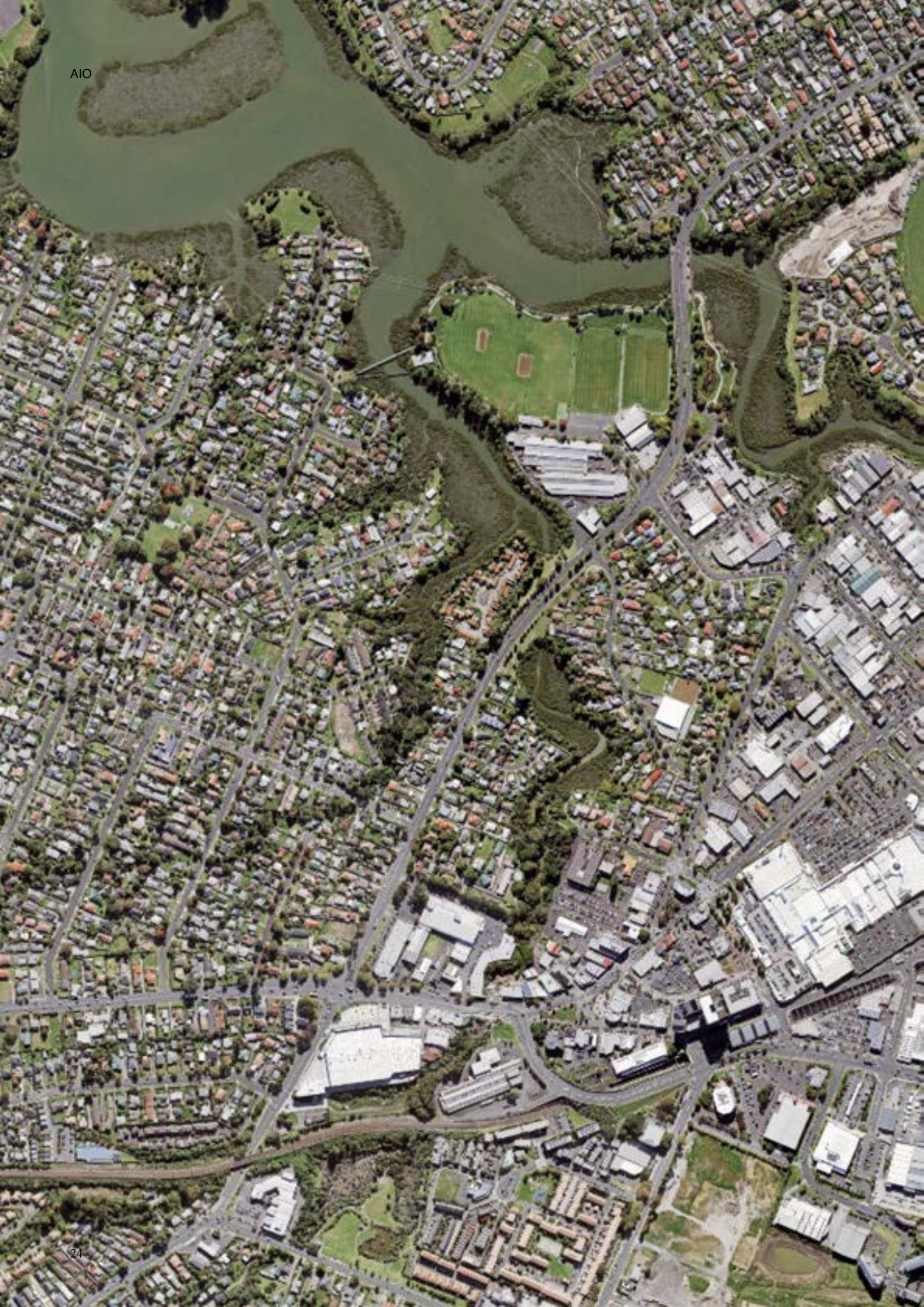
Architecture is an interpretation of how we see ourselves and view the world. It is more than a built environment; it is a part of who we are, our culture, our world and it can have an adverse or positive impact on our community. This research aims to create a dialogue around the connections to whenua and awa through mauri ora and regenerative design approaches. Within a location of modernist planning, this research asks, **Is it possible through a hybrid architectural-landscape intervention to introduce a relationship where more-than-human thrives alongside human activity?**

On-site, I sit on the ground adjacent to Te Whau Awa (The Whau River), to which this thesis speaks. It is made up of reclaimed land that sits at the end of a cul-de-sac in the West Auckland suburb of New Lynn. Here, I read Awa Stories¹ and listen to the residents of this area. I imagine a once-thriving landscape full of a rich and thriving ecology. In Mackay's interview, 'Our Streams Our River Our Backyard' Bert and Joy Oliver of Te Whau Awa explain how they have seen the river change over time.

"Joy moved to the area in the 1940s with her family, at a time when only three houses neighboured hers. They were surrounded by dairy farms, market gardens, orchards and vineyards. Bert and Joy married in the 1960's and created a family home of their own on the banks of this river. Over decades they watched houses built up around them and the industry's growth along Rosebank Road popping up like the trees it replaced. Bert and Joy recall the nightmare of the chemical spill in the 1980's. That killed the river completely for a couple of years. It killed all the crabs, everything. Then there were no fish, and the birds didn't come"².

1 Nina Patel "Te Hau o Te Whau," EcoMatters (blog), accessed March 21, 2021, <https://www.ecomatters.org.nz/in-nature/te-hau-o-te-whau/>. (<https://www.youtube.com/watch?v=-JxjvXYDs-E&list=PLRDLgq8kLNFwX3o6oiCzyEmgORo-3q9k24&t=2s>)

2 Jo Mackay, "The Whau our streams, our river, our backyards" accessed August 2021, <http://projecttwinstreams.com/wp-content/uploads/2012/10/thewhau.pdf>:33



Through time, the actions of modernist planning have created the current complexity of this estuarine environment. The combination of the partitioning of land into discrete private sections, the layout of roads, stormwater and electricity infrastructure has negatively impacted the river's natural systems and ecologies. Moreover, these impacts will only grow as the suburbs become more densely occupied through infill and medium-density housing.³ In other words, the nature that disappears as the Anthropocene grows over has left us with an ecosystem that is working hard to sustain itself to remain amongst the monocultural and mechanistic behaviour of the contemporary suburban environment.

To address this, architecture can be approached as relational and regenerative. This requires a change in world views, as will be discussed more fully in Part 2 of this thesis. Furthermore, Part 3 will explore the places that will have communities involved in regenerative practices, for example, Te Wānanga – A Public Space Design,⁴ The Living Building Certified, Tūhoe-Te Uru Taumatua,⁵ and the Camp Glenorchy – Eco Retreat,⁶ which is Petal Certified. By engaging the relationships of More-Than-Human, Regenerative Architecture and Mauri Ora, it is clear we can use architecture to support natural and ecological systems.

Process and duration are just as vital as form because good architecture evolves with time. An Intervening Opportunity (AIO) evolves to meet the needs of its immediate surroundings by designing a learning and reforestation apparatus on the interface between wai (water) and Whenua at Te Whau Awa. This speculative design provides and tests an architecture that creates a regenerative relationship. In addition, this apparatus collects data for agencies working on river health restoration and documenting the endemic life forms. Bringing these programs together in a speculative design provides experiences that engage users and visitors with a healthy future for the awa environment.

This thesis begins with my Pepeha, situating myself as tauiwi and acknowledging that my relationship with this place is unique to my whakapapa and different to that of Mana Whenua.

3 "Plan, Strategy, and Research Department," Auckland Plan 2050, accessed March 3, 2021, <https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-by-laws/our-plans-strategies/auckland-plan/about-the-auckland-plan/docs/sprintdocuments/auckland-plan-2050-print-document.pdf>

4 Isthmus Group "Te Wānanga Case Study.Pdf," accessed April 2021, <https://www.aucklanddesignmanual.co.nz/streets-and-parks/park-design/civic-space/case-studies/te-w%C4%81nanga>

5 "Tūhoe-Te Uru Taumatua", Ever The Land, accessed March, 2021 https://evertheland.com/uploads/web-sites/1071/wysiwyg/Tuhoe_Article_Singapore_Architecture_Journal.pdf

6 "Camp Glenorchy, Eco Lodge.", Mason & Wales Architects, accessed, April 2021, <https://www.masonand-wales.com/work/camp-glenorchy>

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The following section introduces the Muddy Urbanism Lab, Wai Ō Te Whau and Te Whau Pathway (TWP) and then focuses on the site chosen for this speculative design. Next, to support an understanding of an ecosystem and regenerative thinking, I explore the entire catchment of Te Whau Ward. Finally, I place you, the reader, at Kanae (Queen Mary Reserve), the site for the project, helping situate you in relation to more-than-human.

Part 2 of this thesis explores what underpins my project, the mechanisms by which nature influences our well-being and the essential aspects of regenerative architecture. First, under the heading More Than Human, I look to Ghosthorse's ethos, where he takes a stance on understanding site not as a reductive bounded parcel of land (as often the way in architectural projects) but as a place and an ecosystem. The exploration of Ghosthorse's work acknowledges the use of language and how we treat the land. More recent attention has focused on indigenous intelligence as a trend, however, Ghosthorse's literature defines how indigenous intelligence has been present but suppressed.

In addition to Ghosthorse's ethos, in the section titled Regenerative Architecture, I introduce the work of Meyer in relation to 'systems thinking', and I define and explore this idea through the specific ecology of Wai Ō Te Whau. I analyse systems thinking as it could apply to Kanae, the site for this speculative design project. I approach regeneration as part of AIO. It is a big topic in the world covered by many disciplines, and it is necessary to clarify what is meant by regeneration. It is good to point out here that you cannot have regeneration without resiliency. I explore ideas of nature being relational, not just spatial, and that we are not inseparable from nature. Meyer adheres to these methods in his resilient thinking as he tries to build as much as he can within the resiliency space.

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Thirdly, under the heading Mauri Ora, I look into the theories of Yates, who brings a holistic approach to regenerative practices. A relatively small body of literature is concerned with mauri ora (aliveness), also defined as indigenous intelligence in Aotearoa (New Zealand) as it applies to architecture. In recent years the National Science Challenge Project 'Building better homes, towns and cities'⁷, has presented a deep exploration of principles of the work Yates has carried out around mauri ora.⁸

In Part 3, I continue this journey through the exploration of a series of precedent projects, again clustered under the headings More-Than-Human, Regenerative Architecture and Mauri Ora. Exploring these projects from the lens of these three chosen topics shifts to a design-led approach drawing together ecology and cultural values helpful to this research.

Following this, in Part 4, the design research project **An Intervening Opportunity: An architecture in solidarity with non-human others at Te Whau Awa** unfolds through a series of drawings, diagrams and explanations. Finally, in Part 5, I outline my findings and what I have discovered through the design research. Leading you through to re-addressing the research question, then flowing lastly to my Conclusion.

⁷ Amanda Yates, "Urban Wellbeing - Nga Kainga Ora," accessed May 2021, https://www.buildingbetter.nz/research/urban_wellbeing

⁸ Amanda Yates, "Transforming geographies: Performing Indigenous-Māori ontologies and ethics of more-than-human care in an era of ecological emergency", New Zealand Geographer 77 issue 2, accessed 2021, <https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1111/nzg.12302>, 101-113



1.4 The Muddy Urbanism Lab

The Muddy Urbanism Lab⁹ is an ongoing urban research project focused on the future of Te Whau Awa in Tāmaki Makaurau (Auckland), Te Whau bisects the inner west of Tāmaki Makaurau. Used as a portage connecting two harbours, for iwi, it has provided a natural infrastructure of kai, connection and economic production. In the colonial economy, the river played a crucial role in the urbanisation of Auckland, as both a transport route and as a source of clay. Bounded by the Rosebank Peninsula and the suburbs of Avondale, New Lynn and Kelston, the river continues to drain away by-product materials from factories and other businesses located on the riverbanks. In latter decades Te Whau, like many other waterways, has lost this ‘mobilising’ significance and infrastructural importance and has become ecologically degraded. However, with municipal boundary changes in 2010, the river now sits at the geographical centre of the Whau Local Board area. This local authority and others have started to embrace the opportunities a re-connection with the waterway might offer.

Led by HOOPLA,¹⁰ since 2013, the Muddy Urbanism Lab has worked with students, independent researchers and community groups to collaboratively re-imagine the regenerative future of Te Whau Awa. The Lab has produced an archive and a series of speculative urban proposals, leveraging the powerful nature of utopian thought in imagining possible futures for this river and its neighbourhoods. The Muddy Urbanism research has been widely exhibited and published, circulating these speculative proposals with the anticipation that these might enter the public imagination. This has been a fruitful strategy with the proposal for a linear riverside park taking hold and now a project in the first stages of construction as TWP.

In 2021 at Hoahoanga mo huri re ao (School of Future Environments and Architecture), five Lab members, Dylan Cawte, Nikitha Kolar Nagabhushan, Rebecca Burgess, Quanyin Zhang and Ilycia Laverty, through each design-research thesis project, have asked how we can extend the impact of TWP as a new opportunity for re-connection to the awa.

9 "Muddy Urbanism lab," Advanced Design 1 Studio for the 5th Auckland Triennial, accessed March 2021, <https://muddyurbanismlab.wordpress.com/>.

10 "Muddy Urbanism," Hoopla, accessed March 2021, <https://www.hoopla.nz/muddy-urbanism>



Each speculative project takes one site along TWP and imagines its specific potential as a strategic urban node on the linear path. We have each developed a specific programme for our locations through the research and tested this through design-making. Each project re-imagines new neighbourhood and river connections to restore the awa's mauri ora.

1.5 Wai Ō Te Whau + Te Whau Pathway

This section is a brief introduction to the Mana Whenua of this area. It is vital to begin to understand the history of this site first before understanding the Whau Ward catchment as a whole. Reading on from here, I situate you at Kanae, thus introducing my chosen location along Te Whau awa.

Mana Whenua

Mana Whenua are the indigenous people (Māori) who have historical and territorial rights over the land. Te Whau is part of the wider area known by Mana Whenua as Te Wao Nui Ō Tiriwa (The great forest of Tiriwa), the ancient Māori name for West Auckland and its surrounding districts.¹¹ Te Whau Awa connects the Waitemata and Manukau harbours through a portage route. Meaning that, in the past, you could carry a waka and its cargo a short distance overland between navigable waters.

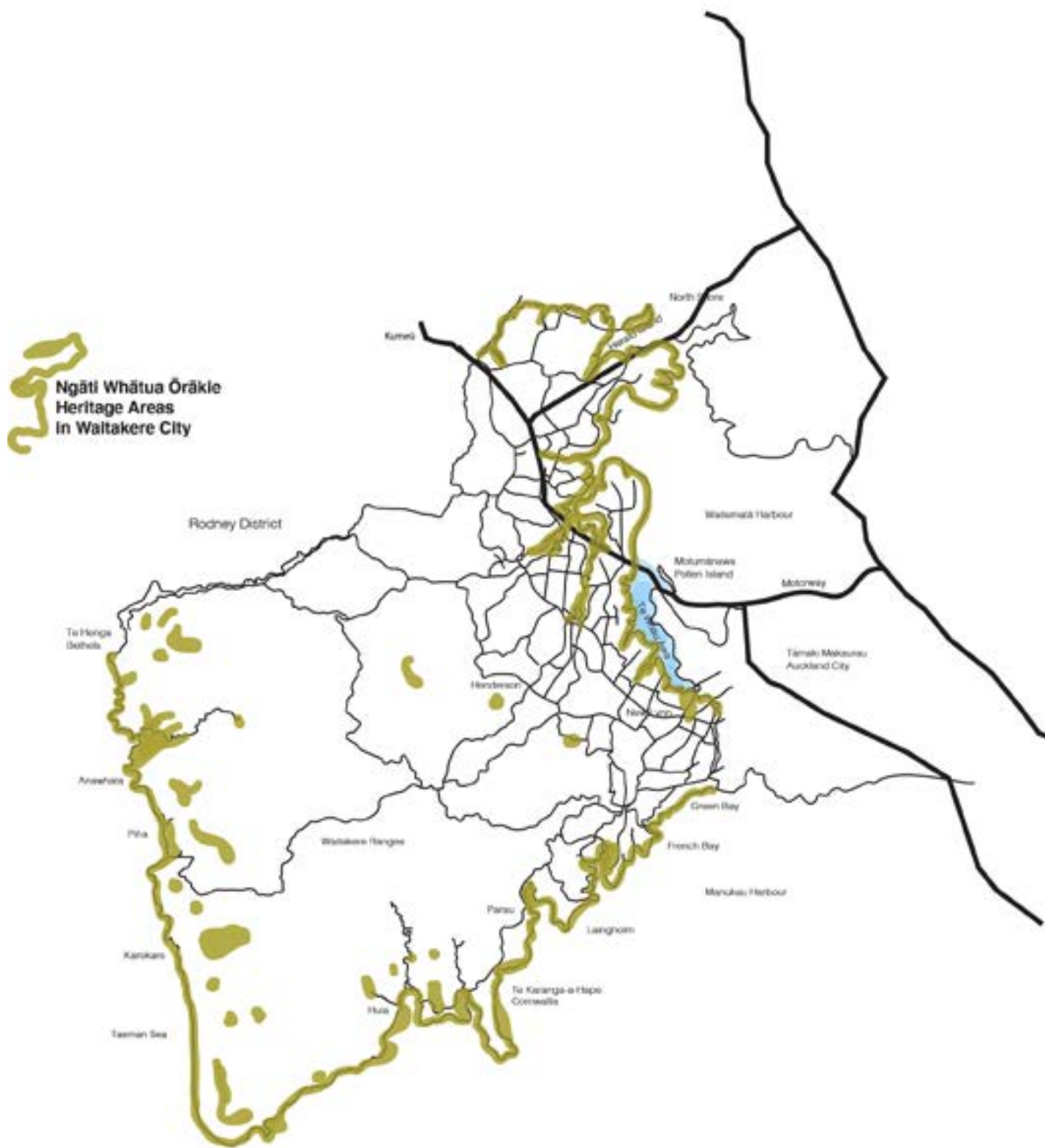
In the culture of the Māori people of New Zealand, humans are deeply connected with nature; the two are equal and interdependent, even kin. The idea is reflected in the māori word kaitiakitanga, which means guarding and protecting the environment to respect the ancestors and secure the future.¹²

In Aotearoa, Tangata Whenua (people of the land) understood ancestral waterways of tribal boundaries. A tribal catchment area was defined by geographic features such as a Maunga (mountain) and an Awa, which formed the basis of identity.¹³

11 "about us" Community Projects | The Whau River Catchment Trust | Auckland, accessed May 2021, <https://www.whauriver.org.nz>

12 "Indigenous People and Nature: a tradition of conservation", UNEP, accessed May 2021, <http://www.unep.org/news-and-stories/story/indigenous-people-and-nature-tradition-conservation>

13 "Community Law" Legal Personality for Maunga, Awa and Other Natural Features of the Land, accessed August 2021, <https://communitylaw.org.nz/community-law-manual/chapter-2-maori-land/legal-personality-for-maunga-awa-and-other-natural-features-of-the-land/>



Today, identities are given back to natural phenomena like the Whanganui River¹⁴ located in Te-Ika-a-Māui (North Island). This has had a profound influence around the world and is helpful to navigate the reader to real-time, real-world action.

There are two iwi (tribes) that act as Mana Whenua for Te Whau Awa, namely Te Kawerau a Maki and Ngāti Whātua Ōrākei. Te Kawerau a Maki are the Tangata Whenua of Waitakere City.

They migrated from Taranaki and have been the area's inhabitants since the 1600s when Maki and his people conquered the Auckland Isthmus, in the 1790's, to Leigh.¹⁵

In the 1790's Ngāti Whātua o Ōrākei left their villages that grew around the great Maungakiekie (One Tree Hill) and became a coastal people with base settlements at Onehunga and Ihumātao. They spread out from Ōrākei, Onewa and both ends of the Whau portage, the portage between New Lynn and Karaka (Green Bay)¹⁶. These coastal areas like the Manukau harbour and Te Whau Awa were renowned for being lush with ika (fish) and notably Kanae (Mullet), tuna and shark from ancestral times.

Te Whau Awa: a catchment approach

Te Whau Awa is located in Hikurangi (West Auckland).

Te Whau (taken from the Whau plant) is the Māori name for the tidal river flowing into the Waitemata Harbour. A catchment is an area of land where precipitation drains to a common area like a river. At differing scales, a catchment works on the landscape as part of a vast ecosystem, an ecosystem that is this living world; this includes the whenua, wai, soil, flora, and fauna. This living-world that each ecosystem is a part of functions together, and if one does not thrive, it will impact the others (Appendix: pg139). As Yates describes in her article, *Transforming Geographies*, the living world is

14 "Innovative Bill Protects Whanganui River with Legal Personhood - New Zealand Parliament." Parliament, accessed March 2021, <https://www.parliament.nz/en/get-involved/features/innovative-bill-protects-whanganui-river-with-legal-personhood/>

15 "A Brief History | Te Kawerau a Maki." Te Kawerau Iwi accessed March 2021, <https://www.tekawerau.iwi.nz/history>

16 "Our Story – Ngāti Whātua Ōrākei." NGĀTI WHĀTUA ŌRĀKEI, accessed April 2021, <https://ngatiwhatuaorakei.com/ngati-whatua-orakei/our-story/>

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"Mauritanga as the immanent vitality, well-being and enmeshing of life as a field or more-than-human collective".¹⁷

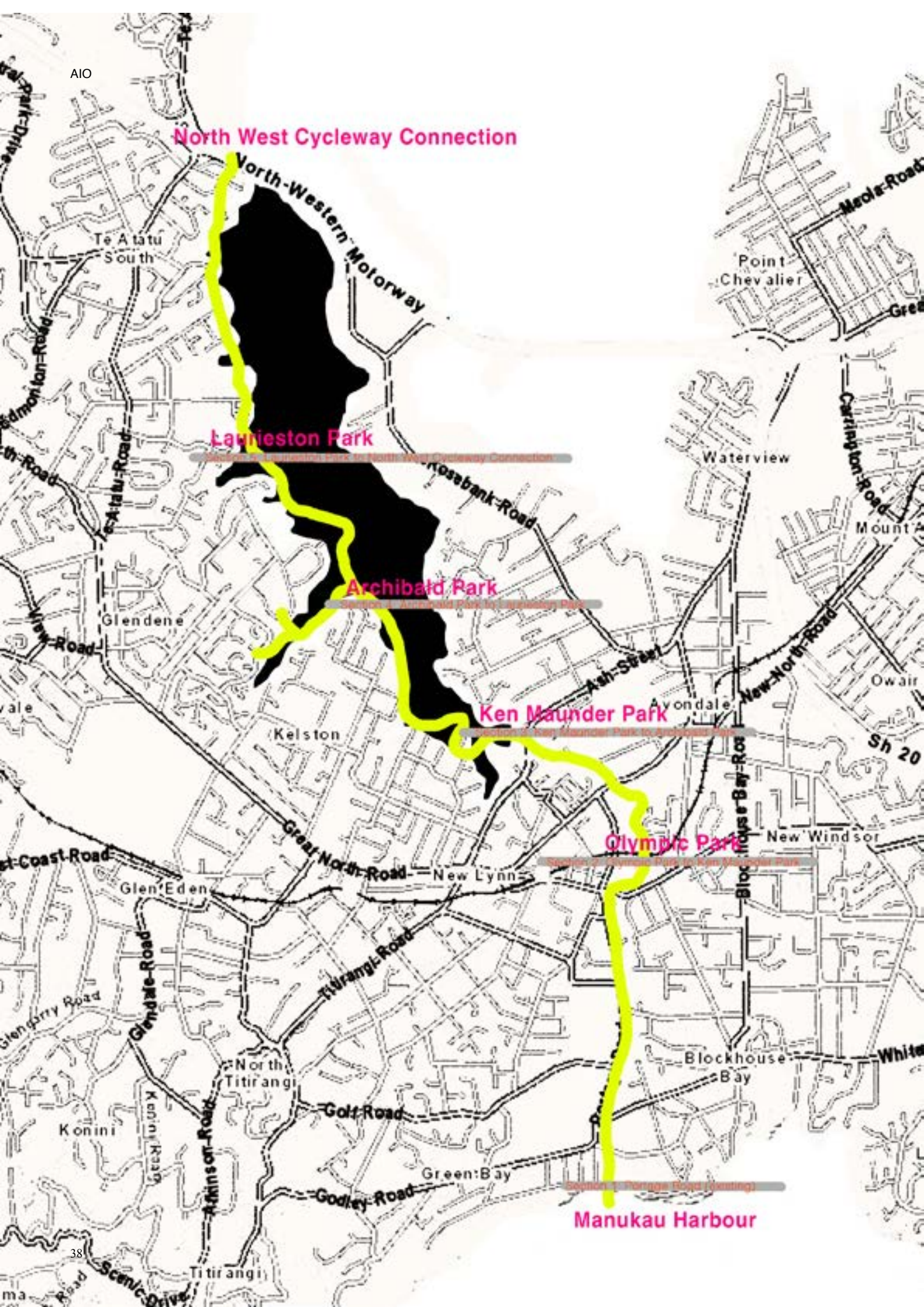
For this thesis, the area of land I refer to is the catchment where all water flows to Te Whau Awa. These vast ecosystems and this water running through the urban landscapes on its way to Te Whau Awa are comprised of many sub-catchments which form the area of undulated neighbourhoods where the water enters through precipitation that flows to the nearest drain or stream.

The Whau catchment is comprised of 11 suburbs covering a land area of 29.4 square kilometres. This awa running through the centre of the Whau Ward spans 800 meters at its widest point and 400 meters at its mouth. Higher up the catchment, the river is fed by a network of narrow streams and creeks.

Te Whau Awa is commonly referred to as a river, but it is an estuarine environment. Estuarine ecosystems are environments where both ocean and land contribute to a unique ecosystem. Tides, waves, catchment discharge, and land reclamation profoundly influence estuarine morphology. Tāmaki Makaurau lies on and around an isthmus, a narrow strip of land connecting two larger land areas, this means the city has many estuarine environments. Te Whau Awa is a shallow estuary, it is a well-mixed duo of salt and fresh water from top to bottom. Most of this estuarine water drains out during the outgoing tide (as opposed to a deep estuary where the freshwater lies at the surface and the salty water at the bottom). The mouth of this estuary is legally protected as the Motu Mānawa (Pollen Island) marine reserve. Providing calm refuge for millions of plants and animals from the open sea and migrating non-humans¹⁸ (See fig 16), such as the Kuaka (Godwits), that inhabit the Whau as a refuge. It provides nurseries for the young and a rich feeding ground, especially around the mangroves. Mangroves are essential productive vegetation that improves coastal protection and stabilises the mudflats.

17 Amanda Yates, "Transforming geographies: Performing Indigenous-Māori ontologies and ethics of more-than-human care in an era of ecological emergency", *New Zealand Geographer* 77 issue 2, accessed August 2021, <https://onlinelibrary-wiley-com.ezproxy.aut.ac.nz/doi/full/10.1111/nzg.12302>, 101-113,

18 "Wilderlab EDNA Sample Report." WilderLab, accessed July 2021, <https://s3.ap-southeast-2.amazonaws.com/wilderlab.openwaters/reports/ff230b785fe1fc0e.html>



North West Cycleway Connection

Lamieston Park

Archibald Park

Ken Maunder Park

Olympic Park

Manukau Harbour

Te Whau pathway

Te Whau pathway (TWP) Project is a collaborative partnership project between Te Kawerau a Maki, Ngāti Whātua Ōrākei, the Whau Coastal Walkway Environmental Trust, Auckland Council, Auckland Transport, the Whau and Henderson - Massey Local Boards.¹⁹

It starts in Te Atatū near SH16 and finishes in Karaka, and on completion will be about 15km in length. TWP runs along the western banks of Te Whau Awa, following the historic portage route. The pathway creates a walking and cycling route connecting reserves, parks and neighbourhoods along the awa.

TWP project is currently under staged construction. The first stages opened in 2016, and the following two stages are set to be completed over the next five to eight years as funding allows. The path, with some parts over land and others over the awa, has different width spans for busy or less busy segments.

In an organic fashion, TWP is designed in a curvilinear alignment with the awa. Legacy planting is used to emphasise identity and to enhance ecological habitats and values. Ethnobotanical principles are used at Archibald Park for the forest and coastal waters edge, from Te Atatū to Olympic Park and Karaka.²⁰ The pathway crosses the eastern edge of Kanae.

Kanae

Queen Mary Avenue was named in 1925 after its namesake, Queen Mary, the wife of George V. In 1937, this avenue was described as 12 chains long with six residences.²¹ The term chain is referred to here as a measurement established in the 16th century, a linear measurement; one chain equals 100 links, and one mile equals 80 chains.²² Before western expansion, this area was historically a food bowl and a favoured destination for migratory birds—an area alive with ika and manu due to the rich habitat.

19 "02BUN60337530AssessmentofEnvironmentalEffectsAEE.Pdf."Beca, AEE Report:Te Whau Pathway (Green Bay to Te Atatū) - Assessment of Environmental Effects, accessed March 2021, <https://www.aucklandcouncil.govt.nz/ResourceConsentDocuments/02BUN60337530AssessmentofEnvironmentalEffectsAEE.pdf:2>

20 "Vegetation - Existing,"Te-Whau-Pathway-Uldf-Volume-1.Pdf, accessed March 2021, <https://at.govt.nz/media/1973046/te-whau-pathway-uldf-volume-1.pdf:17>

21 Auckland street names guide,"Queen Mary Avenue", Auckland Library, accessed August 2021,<https://www.aucklandlibraries.govt.nz/Pages/waitakere-street-names.aspx>

22 "Chain (length)," WikiGIS,accessed May 2021,[http://wiki.gis.com/wiki/index.php/Chain_\(length\)](http://wiki.gis.com/wiki/index.php/Chain_(length))



Archibald
Park

Waimarumaru

Kanae

Ken
Maunder
Park

In 2022, Queen Mary Avenue is a mixed housing suburban zone²³ with predominantly single-storey housing growing to around 53 residences after merging with Morrison Avenue in 1969.²⁴

This specific area of Te Whau Awa is intertidal, the mudflats form the entire area around Kanae, making it a favoured location as a space to create and design AIO. Favoured also for its large quantities of mangrove forests, passive green space and being an intertidal area with a thriving diverse range of habitats.

At Kanae, this design research project titled An Intervening Opportunity plants itself immediately adjacent to TWP (on a section yet to be built). This architectural apparatus almost grows out of whenua in amongst a rejuvenated forest of Whau trees, the other continues jetting out over the awa in a long pier shape. As the Whau forest accompanies the whenua apparatus, a deck accompanies the awa Apparatus allowing you to navigate out onto the water and get close to the world of the muddy estuary. AIO creates a place along the pathway – generates identity in a sub-urban cul-de-sac, and has legibility. AIO is described and discussed in detail in Part 4.

23 "Auckland Council GeoMaps," Plans and places, Unitary Plan Zones, accessed July 2021, <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>.

24 Auckland street names "Queen Mary Avenue."

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Part 2 Philosophical Positioning

2.1 Introduction to Philosophical Positioning

AIO is a speculative design that attends to and supports human and non-human species; oysters and migratory birds, and that fosters the foresting of the Whau tree. It is about reconnecting ecology, culture and spirituality. I define spirituality here as a part of indigenous intelligence. Through research, I understand that the vast realm that is spiritual ecology is not limited to just indigenous intelligence but expands into learning about the familiarity between ecology and religion. This is the mauri ora that is all around us, in the Manu (bird), Rakau (trees), Whenua, and wai. The relationship between humans and other beings has been cited before,

"In Aotearoa, an orienting principle is mauri ora, which is an exclamation and an invocation to the environmental entities and other-beings of this living-kin-world to be-well and an ethical exhortation to us human-beings to practice well".²⁵

Under the three headings More-Than-Human, Regenerative Architecture and Mauri Ora, you will read what underpins AIO, and under each of these three headings, respectively, I introduce a series of writers, thinkers and practitioners to learn from their knowledge and wisdom.

I believe that these three topics, More-Than-Human, Regenerative Architecture and Mauri Ora, are an essential part of the design research for this thesis. An understanding of these approaches is key to understanding the impetus of AIO.

²⁵ Yates, "Transforming Geographies," 7.

2.2 More-Than-Human

To understand the phrase 'more-than-human', I introduce David Abram. He is a cultural ecologist and philosopher interested in language and the sense of nature and was the one to coin this phrase, more-than-human.²⁶ In his book *The Spell of the Sensuous*, Abram explains a divide in western thought between humans and all other things, a category which he terms the more-than-human. This split contradicts our ancestors, who lived with an understanding of the rivers, mountains, and weather patterns; they understood that they were a part of this larger population, including the animals, plants, and atmosphere²⁷. Only with western expansion did we humans start to generate this divide from the more-than-human. Yates describes more-than-human as everything found within the realm of the atmosphere, geosphere and the hydrological and biological realms that hold the entities that form the livingness of this world, where animate and inanimate binaries do not hold.²⁸

This concept is the driver for AIO, it realises nuances in the concept of *matangaro* (the unseen). The unseen mentioned in this thesis needs to be unveiled to properly understand the relationships required to carry on living. The relationships between Wai, Whenua and Tangata and more-than-human.

Finding a lens in Tiokasin Ghosthorse

Ghosthorse is an International speaker on Indigenous, Peace and Mother Earth perspectives and guest faculty member at Yale University's School of Divinity, Ecology and Forestry. Ghosthorse frequently speaks on the cosmology, diversity, and perspectives on Western society's relational/egalitarian vs rational/hierarchal thinking processes.²⁹

Ghosthorse's lens on current and future living is peace with mother Earth rather than peace on mother Earth, the first being a relational approach while the other means dominating.³⁰

26 David Abram, "Centre for Humns and Nature," accessed July 2021, <https://humansandnature.org/david-abram/>

27 David Abram, *The spell of the sensuous: perception and language in a more-than-human world* (New York: Vintage Books, 2017), 15

28 Yates, "Transforming Geographies," 2

29 Tiokasin Ghosthorse, panelist, filmed March 31 2021, Harvard GSD, Design Impact Vol. 4, 2021. accessed March 2021, <https://www.gsd.harvard.edu/event/design-impact-vol-4-regeneration-design-strategies-for-a-resilient-future/> 30:00

30 Ghosthorse, "regeneration-design-strategies-for-a-resilient-future".35:37

In other words, it is about having the 'indigenous intelligence to make a more sustainable future whereby we start to feel, see and listen before we design. (Appendix: 142)

In this way, we are designing for this planet rather than taking a humanist view of designing on the planet. Dumont defines 'indigenous intelligence' as the

"Wise and conscientious embodiment of exemplary knowledge and the use of this knowledge in a good, beneficial and meaningful way. Within whatever world view one is operating, intelligence has to do with more than the acquisition of knowledge and the mental manipulation of thoughts and ideas; intelligence has to do with activating knowledge into something useable within a system that is charged with meaning." ³¹

Similar in approach, 'spiritual ecology' and 'religious environmentalism' are terms generated by Tucker and Grimm, who write about how all religions are influenced by the same moral forces.³² In the mainstream, spirituality is seen as a religious concept, and today whether spirituality is viewed as religious or not, religious environmentalism forms part of the Earth community, an unlikely pairing, yet the two have much in common. Through this new partnership, religious environmentalism recognises unity and interdependence with nature and ecological sciences. Tucker and Grimm affirm this profound connection with the natural world and the inter-religious dialogue on environmental issues in their work.³³

These concepts of indigenous intelligence, spiritual ecology and religious environmentalism speak to the urgent need for a paradigm shift toward a healed relationship with the Earth from extractive (Earth as a commodity and resource) to a recognition of natural systems (us included), as an interdependent, living and sacred whole.

31 Jim Dumont, "Indigenous Intelligence." First Nations Regional Longitudinal Health Survey, RHS Cultural Framework, accessed June 2021, https://fnigc.ca/wp-content/uploads/2020/09/rhs_cultural_framework.pdf:1

32 Mary Evelyn and John Grim Tucker, "Movement of religion and ecology." Introduction to the forthcoming Routledge Handbook on Religion and Ecology (October 2016) <https://www.routledge.com/Routledge-Handbook-of-Religion-and-Ecology/Jenkins-Tucker-Grim/p/book/9781138315938>

33 Passionist Earth & Spirit Center "Mary Evelyn and John Grim on Serendipitous Creativity, Religion, and Ecology." accessed May 2021, <https://www.earthandspiritcenter.org/mary-evelyn-tucker-and-john-grim-on-serendipitous-creativity-religion-and-ecology/>

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By intervening in the ecological regeneration, with opportunities through AIO, habitats are created for non-human others. The structure underneath the awa Apparatus enables oysters to spawn, supporting the water and encouraging growth. This also helps the wellness of the existing mangrove forests. Patches and habitats in the form of a sub-urban ngahere (forest) and living roofs in the middle sit within existing flora within this diverse green ecosystem attracting the fauna needed for this thriving ecology. Up high, the migratory birds play a critical role in the ecosystem by dispersing seeds, pollinating plants and eating bugs and small mammals.

These non-humans are affected through phenology,³⁴ whereby this apparatus becomes a safe place. It's not about marrying up architecture next to life but weaving design into the biodiversity.

While Ghosthorse, has no specific experience or training in architecture, it is essential to relate to this indigenous intelligence as a basis of regenerative architecture because of the lens he uses that closes the gap between humans and non-human others. For various reasons, we moved from indigenous intelligence in time with western expansion. We have our policies and sciences, laws, and economics, creating wicked problems.³⁵ To quote Abram,

"Transfixed by our technologies, we short-circuit the sensorial reciprocity between our breathing bodies and the bodily terrain..."³⁶

To clarify what I mean by the term wicked problems, I use it to explain that there are social, sustainable and cultural issues beyond what one person or one small group of people can resolve.³⁷

The thinking through an enriched and ecological awareness of place is how this section on Ghosthorse and indigenous intelligence fits in with AIO.

34 Rhys Green, Rhys E Green, James W Pearce-Higgins, *Birds and Climate Change: Impacts and Conservation Responses*. United Kingdom: (Cambridge University Press, 2014). 92

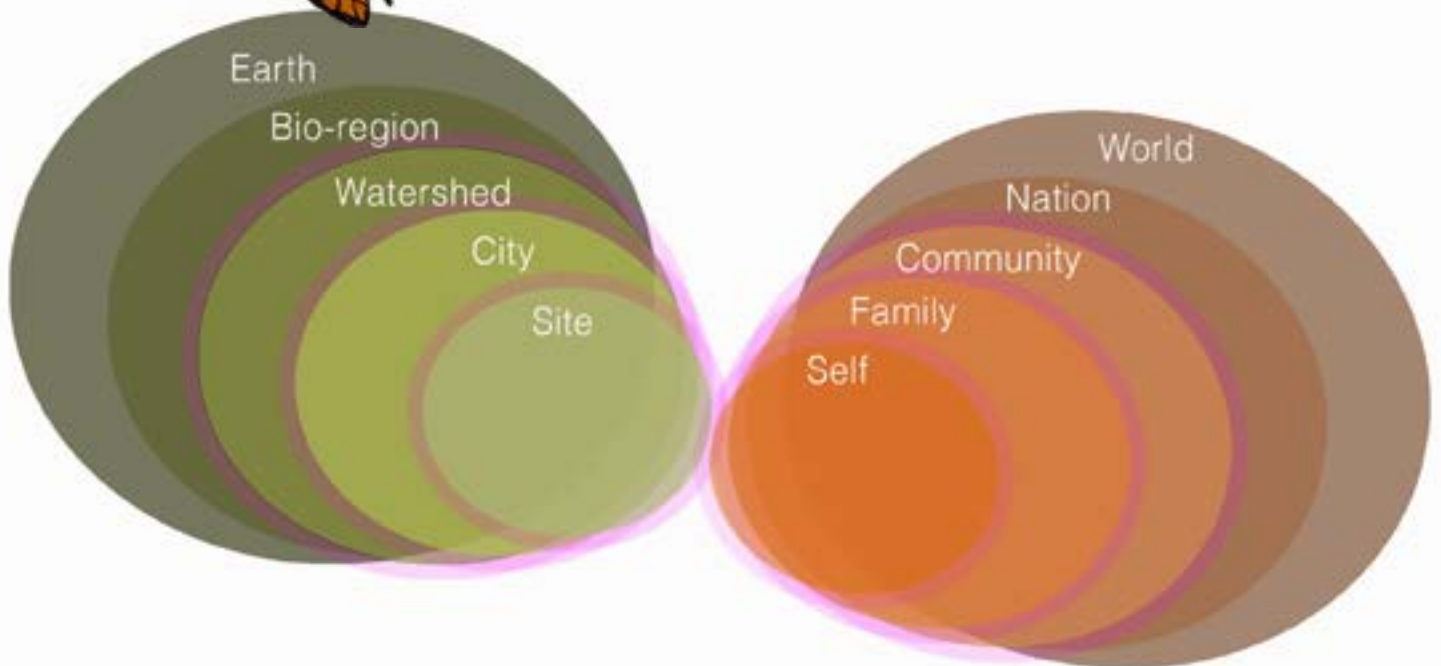
35 Michael Whelton, Glenn Ballard, "Project definition and wicked problems," 2002, accessed August 2021, https://www.researchgate.net/publication/228771126_Project_definition_and_wicked_problems, (August 2021):378, ResearchGate

36 Abram, *The Spell of the Sensuous*. 159

37 Viveka T. Hocking, Valerie A Brown, "Tackling wicked problems through collective design," 2015, accessed August 2021, https://www.researchgate.net/publication/282514260_Tackling_wicked_problems_through_collective_design, ResearchGate. 25

Whole system diagram

The over all living systems are made up of nested systems where every thing is connected, although living systems do not have barriers, for this project AIO's place is this big



Many indigenous peoples have an empathetic, reciprocal appreciation of what is needed to live with the Earth through knowledge of ancestral living experiences that have been closer to Earth. In many cases, indigenous peoples adjust themselves to the Earth as non-anthropocentric participants.³⁸

2.3 Regenerative Architecture

Systems thinking from Walter Meyer

Meyer, a Landscape and Urban Designer, a Community Organiser for Climate Justice and a Lecturer at the Parsons School of Design in New York, uses ecosystem services to create resilient hydrology and energy systems. Ecosystem services include the many and varied benefits to humans provided by our natural environment through healthy ecosystems.

An ecosystem service is when an entity like a wetland provides eco-services like water purification without human intervention. Through an indigenous lens, we could say this is what mother Earth provides through herself and nature; the production of oxygen, purification of water and air, maintenance of migratory and nursery habitats for wildlife, the decomposition of organic waste, solar energy etc. Critically, these highly complex phenomena are not easy to replicate through technology.

Understanding and working with these phenomena is critical to the practice of Regenerative Architecture. Regenerative architecture is to practice the engaging of the natural world as the medium and generator of architecture.³⁹ Similarly to this, resiliency in architecture is to prevent damage and recover from damage within a holistic approach,⁴⁰ while Regenerative Architecture requires consistently helping to improve the quality of the environment. According to Amanda Sturgeon, an architect in the regenerative design space defines regenerative design as people and nature being one natural system, based on the principles of whole systems thinking.⁴¹

38 Tiokasin Ghosthorse, "Tiokasin Ghosthorse on the Power of Humility /episode 237." interview by Ayana Young, *For the Wild*, December 2021, audio, 4:00, accessed December 2021, <https://forthewild.world/listen/tiokasin-ghosthorse-on-the-power-of-humility-237>

39 Jacob A. Littman, "Regenerative Architecture: A Pathway Beyond Sustainability." (*Masters Theses*, 2009), accessed August 2021, <https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1389&context=theses>. 1

40 Good Practices in Resilience-Based Architectural Designs, "WBDG, Whole Building Design Guide," Updated August 2018, accessed June 2021, <https://www.wbdg.org/resources/good-practices-resilience-based-arch-design>

41 Amanda Sturgeon "Using Biophilic Design to Heal Body, Mind, and Soul." Youtube, March 2021, 9:13:00/13:58:00

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Meyer's practice, Local Office and Landscape Design (LOLA) designs nature-based 'resilient' infrastructure that fosters ecosystem services to protect vulnerable communities from the impacts of man-made and natural disturbances. An example of a resilient project design by LOLA is Mayaguez Parque del Litoral located in Mayaguez Puerto Rico.

This new park produces fresh, brackish and saltwater ponds, forested coastal dunes and wet meadows that all function as 'treatment cells' for stormwater. Improved flood storage and resiliency was tested by a category four hurricane where this lineal coastal park performed as designed with only minor damage, where the park was up and running again in only a fortnight.⁴²

Meyer's perspective, while different to Ghosthorse's, also stems from an indigenous approach/ontology. The Muisca people, from the city of Chia in the Northern Andes, where Meyer's mother comes from, believe we are a cumulation of human experiences conveying knowledge and power collectively rather than concentrating it.⁴³ At a cellular level for Meyer, he talks about the decolonising of what is known today as Columbia with the knowledge from that epigenetic history of the Muisca people, his people, and their non-hierarchal beliefs, and this is also what he feels is a continuum of what he does today, as well as decolonising his own thinking.⁴⁴

I look at Meyer's examples of resilient nature-based infrastructure to understand prevention by damage and to recover from damage as part of the regenerative and resiliency processes used for AIO. Meyer describes the difference between sustainability and resiliency,

"The big difference is that resiliency is dynamic and changing, while sustainability is static. In terms of scale, sustainability is holistic and more big-picture, and resiliency is more local."⁴⁵

In this design research for Kanae, I have drawn on this rapidly expanding field of regenerative design/architecture. My project is not the building, it is the health of the living system. The design emerges from this understanding of the ecosystem and whenua.

42 Local Office and Urban Design, Projects,mayaguez,"Mayaguez Parque Del Litoral."accessed May 2021, <http://www.localofficelandscape.com/projects/mayaguez>

43 Walter Meyer, panelist, Harvard GSD, Design Impact Vol. 4, 2021. accessed 2021, <https://www.gsd.harvard.edu/event/design-impact-vol-4-regeneration-design-strategies-for-a-resilient-future/>. 2:17:06

44 Walter Meyer, panelist ,Harvard GSD, Design Impact Vol. 4, 2021. 2:17:11

45 Walter Meyer and Jennifer Bolstad, "Local Office Landscape and Urban Design,interview by Olivia Martin. The Architect's Newspaper, November 2016, accessed August 2021, "<https://www.archpaper.com/2016/11/local-office-landscape-and-urban-design-interview/>



Replenishing a coastal grove with Whau trees and mangroves encouraging the oyster reef on the piles of the Awa Apparatus are design moves to help with the regeneration and resiliency in this informal recreation space. They also perform specific functions that entail binding nutrients in the roots in the planting in the riparian zone and water filtration through stabilised soil filtering. Furthermore, the oysters filter the water to create improved water quality.

The mangrove forest naturally stabilises the coastline and reduces erosion from storm surges while also being attractive as food and shelter to the more-than-human living in the estuarine environments.

How does Ghosthorse's 'more-than-human' thinking relate to Meyer and other relational and regenerative practitioners? Regenerative Development and Design is the convergence and evolution of various disciplines and methodologies; architecture, urban planning, permaculture, living systems theory, and indigenous cultures. At the intersection of the worldviews lies the acknowledgement that for humanity to thrive, we must retake our place as part of nature.

Places are living systems, and regenerative projects seek to develop the inherent potential in everyone and every living system they touch; from this understanding comes the design. In Regenerative Design, 'inherent potential' is what the place or person or atmosphere can be. Until we understand the uniqueness of the place, we shouldn't build on it. Regenerative Design looks to the nature of the place, the reciprocity, the relationship is the potential for the more-than-human and the watershed.

The role of the regenerative architect is to engage in all these dimensions, then the design develops from this process. Where do we start? The land remembers, it is a living being. This relates to the indigenous intelligence ethos described by Ghosthorse, of listening to the Earth to provide an understanding of the complex ecology that we are a part of. If you do not see the bigger picture, how can you be a part of the regenerative development?!

Resiliency

To support a larger, more prosperous population

To reduce the city's carbon emissions

To adapt the city to thrive in extreme weather

MAURI ORA HOUSING DEVELOPMENT WELLBEING COMPASS

TRANSITIONS TOWARDS:
RENEWABLE ZERO-CARBON ENERGY
REGENERATIVE ECOLOGICAL SYSTEMS
CIRCULAR ECO-ECONOMIES
COMMUNITY WELLBEING

WHAKA-ORA: HOLISTIC WELLBEING ACTIONS

KIANGA-ORA: REGENERATIVE LIVING BUILDINGS & NEIGHBOURHOODS

- Local zero carbon energy generation & storage, home &/or neighbourhood systems
- Living net zero or carbon storing buildings with low embodied carbon materials
- More whenua & wai local living green & blue building systems (they work, are resilient, healthy, safe, and water saving)
- Energy efficiency
- Quality building envelopes & indoor climate control
- Papakāinga multi-generational living & co-housing
- Compact development
- Biophilic design
- Māta kai & rangai, food commons, urban orchards
- Cultural landscape markers & signage
- Development protections (green wedges, etc.) that ensure a flow of 100% green space

WHENUA-ORA | WAI-ORA: GREEN & BLUE ECOSYSTEMS

- More whenua, māta kai - enhancing the agency of land and waters, cultural landscape restoration
- Ngahere, greens & community infrastructure (parks, etc., better)
- Ecological regeneration - whenua & wai (plants, microorganisms, insects, water, etc.)
- Carbon sink infrastructure (urban design & living systems, etc.)
- Māta kai & rangai, food commons (parks & orchards)
- Blue-green infrastructure (water management & blue-green water & wai, etc.)
- Regenerative agriculture

PANEKE-ORA: ACTIVE & ZERO-CARBON MOBILITY

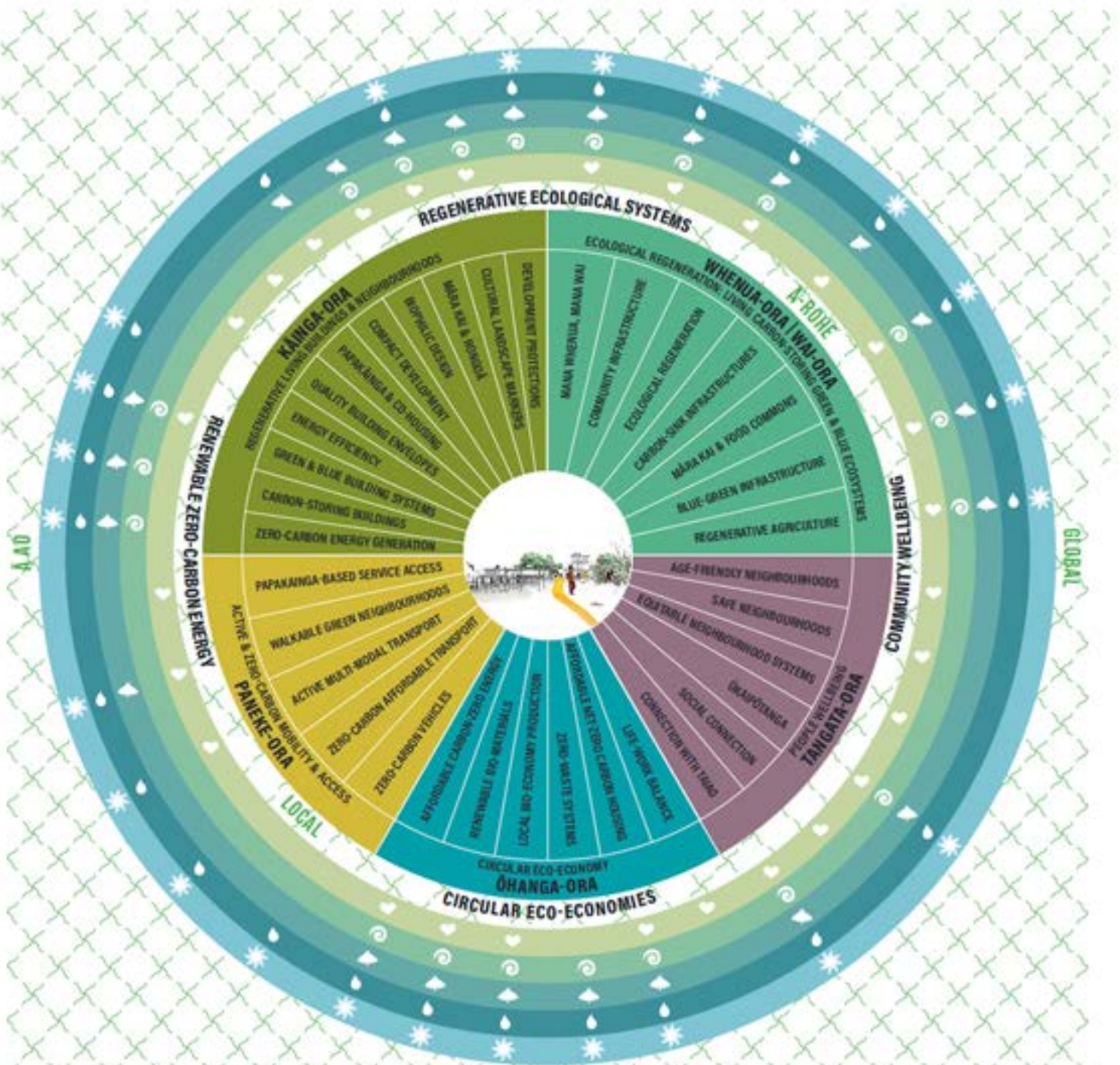
- Access to better papakāinga-based services
- Walkable, green neighbourhoods
- Active multi-modal transport
- Zero carbon affordable public transport
- Zero carbon vehicles

OHANGA-ORA: CIRCULAR BIO-ECONOMY

- Affordable zero carbon energy
- Renewable bio-materials, low toxin & low carbon materials
- Local bio-economy production
- Zero-waste systems (waste-to-energy, etc.)
- Affordable, net zero carbon regenerative housing, energy, water, food
- Living wages & life-work balance (better work conditions)

TANGATA-ORA: PEOPLE WELLBEING

- Whānau & connection with tūpuna
- Social connection (papakāinga, marae, libraries, community gardens)
- Okapūtanga - culture & cultural landscape connection
- Accessible, equitable neighbourhood systems (health, education, justice)
- Neighbourhoods designed for safety
- Child-centred & age-friendly neighbourhoods



MAURI, WHAKAPAPA, WHANAUNGATANGA, MANAAKITANGA

MAURI-ORA: PLANETARY WELLBEING

RAVANGA-ORA | BALANCED TEMPERATURE
For better, paper & ink can help to reduce carbon emissions by using less energy in our buildings. Using renewable energy, changing the way we move through our neighbourhoods, and increasing the amount of green carbon stored in our urban systems is the future where we live. Our living systems are key.

WAI-ORA | BALANCED WATER CYCLE
Designing to meet a 100% water use can help regenerate living systems. This can help to reduce the risk of water scarcity and ensure that our water systems are resilient to climate change. Our water systems are key.

PAPA-ORA | ECO-DIVERSITY
Ecological diversity is the life support system of the living world. Living systems have evolved over time to create a balanced ecosystem. Our living systems are key.

MATA-ORA | ECO-INTEGRITY
We can choose to design and use resources and systems that are truly regenerative and sustainable. Our living systems are key.

HAPORI-ORA | COMMUNITY WELLBEING
Designing our living systems and neighbourhoods for community well-being is the future. Our living systems are key.

2.4 Mauri Ora

Well-being through Amanda Yates

To understand the Te Ao Māori concept of mauri ora, I have drawn on the work of Yates, Associate Professor at Huri te Ao - School of Future Environments. Yates works with council, iwi and communities exploring place-based, indigenous-led strategies and actions for urban transformations.⁴⁶ In her work, she brings 'more-than-human' approaches alongside a Te Ao Māori view of mauri ora Yates describes this as "thinking that is feeling."⁴⁷ Respecting and restoring mauri ora requires our recalibration, in a non-binary (animate/inanimate) and non-hierarchical manner, with respect to ethical relationships, in the fielding of life forces within this genealogy.⁴⁸

Alongside the regenerative strategies discussed earlier, Yates also draws attention to practices such as reducing industrial scaled land conversion and transitioning to zero-carbon aspirations to create a carbon negative culture. However, and importantly, Yates also brings Mātauranga (knowledge) Māori to bear on regenerative thinking.⁴⁹ Yates created the Mauri Ora Wellbeing Compass (figure 24) as a tool to help navigate toward a healthy relationship with social ecology, cultural ecology, and urban ecological well-being, bringing regenerative thinking and Mātauranga Māori together. Simply put, the Mauri Ora Wellbeing Compass⁵⁰ is an indigenising tool.

Adding to the ecological life cycles that I mention above in the More-Than-Human section, Yates also elaborates on the well-being of the water and how the climate change boundary crosses into the atmosphere. Climate change is reframed as the atmospheric carbon-cycle integrity on the Mauri Ora Wellbeing compass. It is a widely held view that we need to take heed of climate change. Still, for the most part, the general population is not aware that climate change encompasses the matangaro (the absent), for example, the wind that you feel but not see, the temperature and the atmosphere.

46 Amanda Yates, Nga Aho, Kaitautoko "Nga Aho Members Search Amanda Yates." accessed May 2021, <https://ngaaho.maori.nz/memberProfile.php?mid=127>

47 Amanda Yates, "Whakaaro Papa: Anthropos Design and decolonising metaphysics," accessed June 2021, (PHD diss., Auckland University of Technology, 2018), 3

48 Yates, "Whakaaro Papa," 68

49 Yates, "Whakaaro Papa," 68

50 Building Better Homes, Towns & Cities, "Mauri Ora Wellbeing Compass - Te Tatau o Te Arawa," August 2022, <https://www.youtube.com/watch?v=LFXcKjTpGFs>

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Most people see the impact of devastating strong winds and flooding above ground. However, this also has an impact underground, whereby pollution overflows into seaward drains. Another example of the 'un-seen' is the humble mangrove that the layman is primarily unaware of as a carbon-capturing superhero. Mangroves happen to be one of the top three carbon-capturing ecosystems on Earth,⁵¹ capturing more carbon than any other ecosystem. These carbon-capturing mangrove forests are known in Yate's Mauri Ora Compass as blue carbon ecosystems. Along with the ability to store mass amounts of carbon for millennia, these forests protect the land from the wave impacts of storms.

Amid Kanae's sub-urban, car-centric, fossil fuel consuming context, AIO locates a strategy for producing a diverse green and blue ecosystem. Drawing on the Mauri Ora Wellbeing compass for this design research (fig 24), I can aim to achieve wai-ora (living blue ecosystems) by fostering diverse living systems through the mangrove forests located in this cultural landscape. The emphasis is on regenerating at a sub-meso level (at a suburban scale). With other terrestrial foresting such as the Whau tree, biodiverse and carbon sequestering environments can help bring food and shelter to the more-than-human and help create the resilient and regenerative hybrid-architectural landscape on Kanae.

51 NIWA, "Muddy Sinks," 2017, accessed June 2021, <https://niwa.co.nz/news/muddy-sinks>

2.5 Philosophical Positioning Reflection

Marrying the above approaches from Ghosthorse, Meyer and Yates helped me understand the importance of enhancing mauri locally and globally. There is no point to holistically help a small portion of Whenua when the unseen forces like the stormwaters, the winds and rains can undo small feats of sub-urban healing optimism.

Increasing urban forests, and urban ecosystems, can help to improve wider planetary ecosystem well-being.

In the following, Part 3, where I introduce and talk about my chosen precedent studies, I have chosen three built projects located in New Zealand; they span from Auckland City down to the bottom of the South Island.



3

P A R T T H R E E

Precedent Projects

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Part 3 Precedent Projects

3.1 Introduction to Precedent Projects

It is useful to this research to look at who in the world is successfully engaging with architecture related to More-Than-Human, Regenerative Design and Mauri Ora.

I start with a built project located on the waterline of the downtown ferry basin, a new public space that connects moana (sea), whenua, and tāngata (people). Te Wānanga - A Public Space Design⁵² focuses on improving land-based and marine-based ecological health, such as marine ecology ropes for kūtai (mussels) that are an endemic species to Te Waitematā harbour. I am interested in Taiao Mauri Tū (Health and Wellbeing) and the more-than-human aspects that this design caters to.

Leading you through to the next focus toward Regenerative Design, the precedent study that influenced this research is Camp Glenorchy – Eco Retreat located in the plains of Glenorchy. This built design is petal certified through Living-futures.org New Zealand⁵³. Underpinning the conception of this project is the strong relationship to whenua that continues to this day.

As my last precedent project for this thesis, I look to Tūhoe – Te Uru Taumatua, under the heading Mauri Ora. It is a certified Living Building through the Living Building Challenge (LBC)⁵⁴ because it evokes a new spirit of place and is currently one of 15 in the world, and it is here in New Zealand.

As these projects will show, [in part 3] engaging the relationships of More-Than-Human, Regenerative Architecture and Mauri Ora, it is clear we can use architecture to support natural and ecological systems.

52 "Te Wānanga", Coast, Blending City and Harbour Te Wānanga, accessed May 2021, <https://isthmus.co.nz/project/te-wananga/>

53 "Our story," Sustainability, Camp Glenorchy - Eco Retreat, accessed August 2021, <https://www.theheadwaters.co.nz/sustainability/>

54 "Te Kura Whare," Case Studies, International Living Future Institute, accessed July 2021, <https://living-future.org/case-studies/te-kura-whare/>

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3.2 More-than-Human

Te Wānanga – A Public Space design

Tāmaki Makaurau Aotearoa 2021

Isthmus Architects

Designed by Isthmus, Te Wānanga is a public space design located at the bottom of Queen Street, Aotearoa. Blending the city and the harbour, creating a space that encourages co-habitation by human and more-than-human. The outcome for Te Wānanga is to protect and enhance the natural environment and help restore the space. Creating the marine and terrestrial habitats that support the mauri, the collaborating teams realise this through the overarching design principles developed with mana whenua. The protection and enhancement of place, authenticity, and histories and futures are key principles that relate to AIO and are part of the Te Aranga Principles used for this design.⁵⁵ Creating an atmosphere where reintroduced endemic more-than-human entities can thrive also addresses the missing link to the ferry basin. The natural features of this area have always been this way. However, western expansion has forced us to reimplement what was. This comes from indigenous intelligence.

This architecture is a good example of the use of kūtai ropes, whereby the mussels act as filter feeders and take in bacteria and phytoplankton as nourishment and other non-nutritive material such as silt from the seawater to help clean this part of the moana (sea). They are known as the Hoover of the sea.⁵⁶ The permeable edges between this public space and moana allow you to see the kūtai ropes anchored beneath the shared deck visually. Pohutakawa forests have been designed with mana whenua experts; the forest includes medicinal species and specific harakeke (flax). The planting encourages bees, birds, bugs and butterflies in helping to keep the ecological link. The unique plant palette recognises and regenerates original ecosystems of cultural significance.⁵⁷

55 "Te Aranga Principles," Design Subjects, Auckland Design Manual, accessed July 2021, https://www.aucklanddesignmanual.co.nz/design-subjects/maori-design/te_aranga_principles

56 Richard F. Dame, *Bivalve Filter Feeders: in Estuarine and Coastal Ecosystem Processes*, (Springer Berlin, Heidelberg), 57 - 84

57 Garth R Harmsworth, Shaun Awatere, "Indigenous Māori knowledge and perspectives of ecosystems," Landcare Research accessed July 2021: 276, https://www.landcareresearch.co.nz/assets/Discover-Our-Research/Environment/Sustainable-society-policy/VMO/Indigenous_Maori_knowledge_perspectives_ecosystems.pdf

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In the same way that Ghosthorse talks about mother earth remembering, and as a designer, to acknowledge this, Mana Whenua stipulate that the Pohutukawa forest is designed to allow users to experience and understand natural and environmental indicators, in line with the Maramataka (Māori traditional lunar calendar).

Furthermore, Tangaroa (deity of the sea) is the inspiration of the design and to echo the breath in-between low and high tides. This is to reacknowledge what the land was before the development of the Auckland waterfront, a traditional gathering site for kai moana.⁵⁸

There are a few critical differences between Te Wānanga – A Public Space Design and AIO. For example, AIO is located within a suburban waterfront, and the other is situated on the CBD waterfront. Another example is that each project's location offered a different use historically. For instance, Te Whau Awa was a portage,⁵⁹ and the design mentioned above sits on a harbour. However, both of these projects share similarities, exemplified in the forest and the mollusc habitats, and they happen to both engage with improving the waters surrounding the structures.



[Fig 30] Te Wananga - a public space design satellite map location.

58 Isthmus Group, "Te Wānanga Case Study.Pdf,"

59 Glen Farley, M A Hons, Sarah McCreedy, Jen Low, and Rod Clough, "Te Whau Pathway Main Route, West Auckland: Archaeological Assessment," (March 2019): 6

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3.3 Regenerative Architecture

Camp Glenorchy – Eco Retreat

Tahuna Aotearoa 2018

Mason and Wales Architects

A semi luxury Eco-Retreat located 40 minutes drive from Frankton in Tahuna (Queenstown). A nest of cabins sits on topographically flat terrain flanked by mountains and a river. Camp Glenorchy is committed to maintaining a healthy relationship with the natural environment. This design is petal Certified through the LBC, which means it adheres to the LBC challenges,⁶⁰ adapting to climate and site with low to no water bills and gas bills, and no external or internal toxic materials used. This retreat uses reclaimed wood, repurposed metal sidings and other materials recycled from Christchurch. 9 x 75 meter deep bores extract heat from the ground, which is transferred to the building using a heat pump. Moreover, it has been designed to achieve Net Zero as per the Net Zero Energy Building Requirements certification.⁶¹

Once construction finished, the regenerating of native planting was actioned.

The guiding theme was, if it is not native, it is edible. Native planting was restored, attracting native pollinators to keep the ecological link thriving. Designing for resiliency makes Camp Glenorchy autonomous.⁶²

One of their main objectives is to use 50% less water than similar facilities.

The primary source of drinking water is the rain, while the rain gardens, swales and soak-pits aid in stormwater runoff. The use of composting toilets aid to reduce the need for flushing, helping reduce the consumption of water dramatically. Furthermore, the stormwater is treated through permeable hard landscapes. The three designed wetlands will cater to the greywater from the bathrooms and the washing machines. At the same time, the camp kitchen, staff houses and excess leachate from the composting toilets are pre-treated via an activated waste system before being pumped to the wetlands.

60 Molly Freed and Kathleen Smith, Water Petal Permitting Guidebook, (International Living Future Institute, 2019), accessed May 2021, https://living-future.org/wp-content/uploads/2022/05/WaterPetal_PermittingGuidebook_FLINAL.pdf

61 Case Study, archive living future: Camp Glenorchy,lbc, 2019, accessed March 2021, <https://archive.living-future.org/lbc/case-studies/camp-glenorchy-eco-retreat/>

62 Landscaping, Place, The Headwaters, accessed Dec 2021, <https://www.theheadwaters.co.nz/sustainability/place/>

Blackwater is treated in tanks before filtering through these wetland gardens before being released into the natural water table.

It now is a source of education and research by providing a working example of how distributed microgrid technology can be applied at a commercial scale in New Zealand.

These benefits are community and business resilience, minimising interaction with the mains grid and showcasing the ability for renewable generation coupled with storage.⁶³

To top it off, the proprietors, philanthropists Debbi and Paul Brainerd, purchased the old campgrounds with the intention to return all of its profits into the community.

AIO relates to this project with its own small open-air wetland garden that filters greywater from the kitchen, grey and black water from the kaitiaki apartment and the toilet system. Rainwater is also harvested for use within the seedling house. As part of the regenerative process, the AIO nested systems incorporate photovoltaics, permeable ground cover, materials that are reused and upcycled, community involvement, storytelling, and is to be inclusive in the whole system as an overall living system.



[Fig 32] Te Uru Taumatua satellite map location.

"This content has been removed by the author due to copyright issues".



3.4 Mauri Ora

Tūhoe - Te Uru Taumatua

Te Urewera Aotearoa (New Zealand) 2014

Ngāi Tuhoe iwi and Jasmax Architects

Te Uru Taumatua sits at the entrance of the township of Taneatua. It is a cultural building bounded by three sides of farmland. Tūhoe – This precedent project is significant because it signifies the re-establishment of autonomy and self-determination after the Tūhoe Deed of Settlement was passed in September 1992.⁶⁴ The return of 500,000 acres of Tūhoe land creates connectedness for the Tūhoe people. The importance of enabling kaitiakitanga in place simultaneously enacts indigenous intelligence for this whenua. Furthermore, the indigenous values are included in the design process through the voice of whenua asserted by Mana whenua.⁶⁵

Te Uru Taumatua is a Certified Living Building, raising the bar beyond just being environmentally friendly. This unique design encaptures the past, present and future by belonging to the people of Tūhoe. As a state-of-the-art sustainable building, it also represents the responsibility to the environment and land-uses. The people of Tūhoe helped to construct this building alongside the Mana Whenua, architects, engineers and all the technical teams involved. Enabling a relationship with Tūhoe – Te Uru Taumatua beyond just visiting or acknowledging its presents. Thus, it has become a source of pride and a place to connect to and provides local employment. In the Transforming Geographies, Yates asks,

"How do we begin to transform these colonised geographies and improve the holistic well-being of our more-than-human whanaunga (kin)? What changes are required in spatial governance systems in an ontological frame, in land use legislation, in the planning process – to achieve this aim?"⁶⁶

Tūhoe – Te Uru Taumatua is an excellent example of what is being asked and the outcomes.

64 Ngāi Tūhoe Deed of Settlement Summary, Ngāi Tūhoe, New Zealand Government, last modified 2020, accessed March 2021, <https://www.govt.nz/browse/history-culture-and-heritage/treaty-settlements/find-a-treaty-settlement/ngai-tuhoe/ngai-tuhoe-deed-of-settlement-summary/>

65 "Constructing Te Uru Taumatua," accessed June 2021, Tuhoe, <https://www.ngaituhoe.iwi.nz/the-approach>.

66 Yates, "Transforming Geographies," August 2021.

Like Camp Glenorchy, Tūhoe – Te Uru Taumatua has complete independence from the main sewer facility. The blackwater treatment differs whereby this facility has no water reuse in place at Tūhoe – Te Uru Taumatua for cultural reasons. All the water used in the building is piped to a constructed wetland, where it is treated via layers of gravel and native plants before it is re-infiltrated into the Earth.⁶⁷

Within a shorter timeframe and a team of 1, I hope the outcome for AIO has similarities with this project, the Story, Place and Regenerative approaches are recognised and influence AIO's design. For example, composting toilets serve a great purpose, but my thought logic is the compost needs to end up somewhere. A material not treated on site. With only two restrooms, I utilise the wetland treatment system.

67 "Water," Te Uru Taumatua, The Living Building Challenge, Tuhoe, accessed May 2021, <https://www.ngaituhoe.iwi.nz/water>

4

P A R T F O U R



Design Research Project



Part 4 Design - Research Project

"We now know about integrative design, about regenerative design – where you're not trying to do a green building but a building that heals the ecosystem and the social system that you're dropping it into. It turns it away from being the object [and] into the relationship."⁶⁸

- Jerome Partington

4.1 Introduction to An Intervening Opportunity

This part of the thesis explores AIO, the design produced and tested in this study, providing an overview of the design process and site analysis. This research is informed through the literature review (covered in the first part of this thesis) and through sketching and photographic images at the conceptual stage.

Flowing through to the proposed scheme, a learning and reforestation apparatus on the banks of Te Whau Awa started to emerge.

The story of place (the multi-layered network of living systems) helps us understand how resiliency works in this space and provides greater intelligence about how we can thrive alongside non-humans.

AIO tells a story of place, historically and currently. It responds to the research question, **"Is it possible through a hybrid architectural-landscape intervention to introduce a relationship where more than humans thrive alongside human activity"?**

68 Amanda Sturgeon, *Creating Biophilic Buildings* (Seattle: Ecotone Publishing, first edition, 2017), 137

4.2 Design Methodology

Alongside contextual and historical research, the investigation of the place of Kanae and of the proposed design began through drawing. Hand drawing closes the distance between the maker and the object. It puts the designer in a haptic contact with the object or space. For Kanae, drawing by hand allowed for a sensitivity to line weights and fuzzy edges where whenua and awa meet, so other life forms are included and thought about. It also allows you to be on site and sketch, observing closely and attentively, attaining a feeling for what could be right for this place and what Mother Earth needs.

A drawing and collaging methodology was used through this research, taking my thought space to the mauri ora of site and attempting to locate this in my design through illustration. This process allows me to understand what is happening in the spaces inhabited by AIO. For example, as I drew some Whau trees close to the Whenua Apparatus, I thought about what happens around this space, does the branch allow a shaded area to rest under or does the branch poke through an open threshold. The tree carries on below the horizon line, with its roots and life in the soil. The slower pace of drawing allowed for a haptic observation and attention to this in the design making. For example, what does the popping of the mud in the awa sound like? If I design porosity into the floor of the Awa Apparatus for this audio/visual connection with the mud, can I draw this haptic knowledge into this learning apparatus? These are a few imaginations that happen as I draw AIO and think of site.

4.3 Creative Design Process

The functions of digital modelling software/CAD can have replicative and non-bespoke creativity when using them. You can fall into a place of using the standardised items that the program provides and try and fit that into place. However, with a pencil in hand, you think about what is needed in this space to design for place and landscape. The typical architectural digital modelling process is ineffective in registering the whenua and awa interfaces and multi-species inhabitation. Digital modelling utilises inexpressive virtual spaces that have no gravity or weight. It becomes challenging to model natural land and water forms, losing the integrity of the connection to place integral in this design.

Hand drawing is not a lost skill (yet), with architects old and new still choosing this medium to practice authentically. An understanding still exists that this craft helps express the aura, and the drawn interpretation also offers the simultaneous action of having held in the hand and the head the imagined and projected physical image.^{69 70}

I have also used collage to imagine the Whenua and Awa Apparatus through Photoshop and Illustrator to support my final presentation drawings. It is duly noted that Photoshop and Illustrator fall under Computer Aided Design but have played a minimal role in this research.

Mexican architect Tatiana Bilbao supports the use of collage in her practice. Bilbao refuses to produce computer visualisations of designs still in progress, as she states in an interview in Dezeen. She mentions that computer renders of her design can become obstacles in the creative process. She believes collage also creates a more collaborative approach. Bilbao's idea to stimulate the creative flow through collages helps her develop more exciting buildings.⁷¹

69 Peter Zumthor, *Thinking Architecture*, (Germany: Lars Muller Publishers, 1998). 13

70 Juhani Pallasmaa, *Eyes of the Skin: Architecture and the Senses*, (John Wiley & Sons Ltd, 2012). 14

71 Tatiana Bilbao, "We banned renders" from the design process says Tatiana Bilbao," interview by Amy Frearson, *Dezeen*, December 2019, accessed July 2021, <https://www.dezeen.com/2019/12/04/tatiana-bilbao-banned-renders-architecture-interview/>



2017



2016



2008



2006



2000



1996



2011

[FIG 35] This area was approximately 1028.56 sqm² and after reclamation became approximately 7930 sqm²



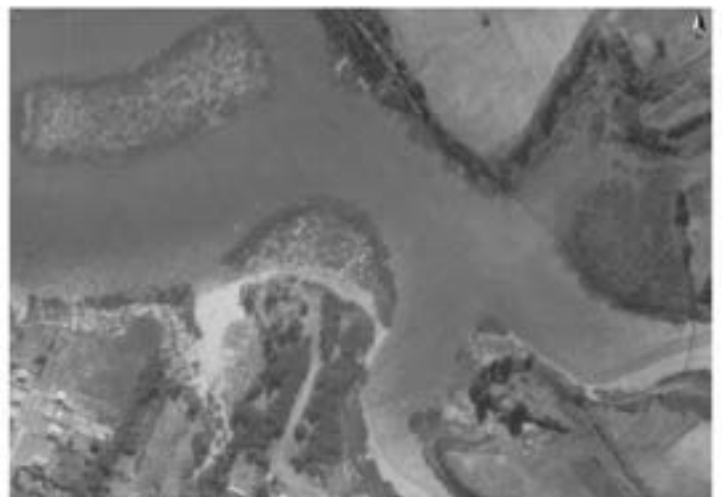
2004



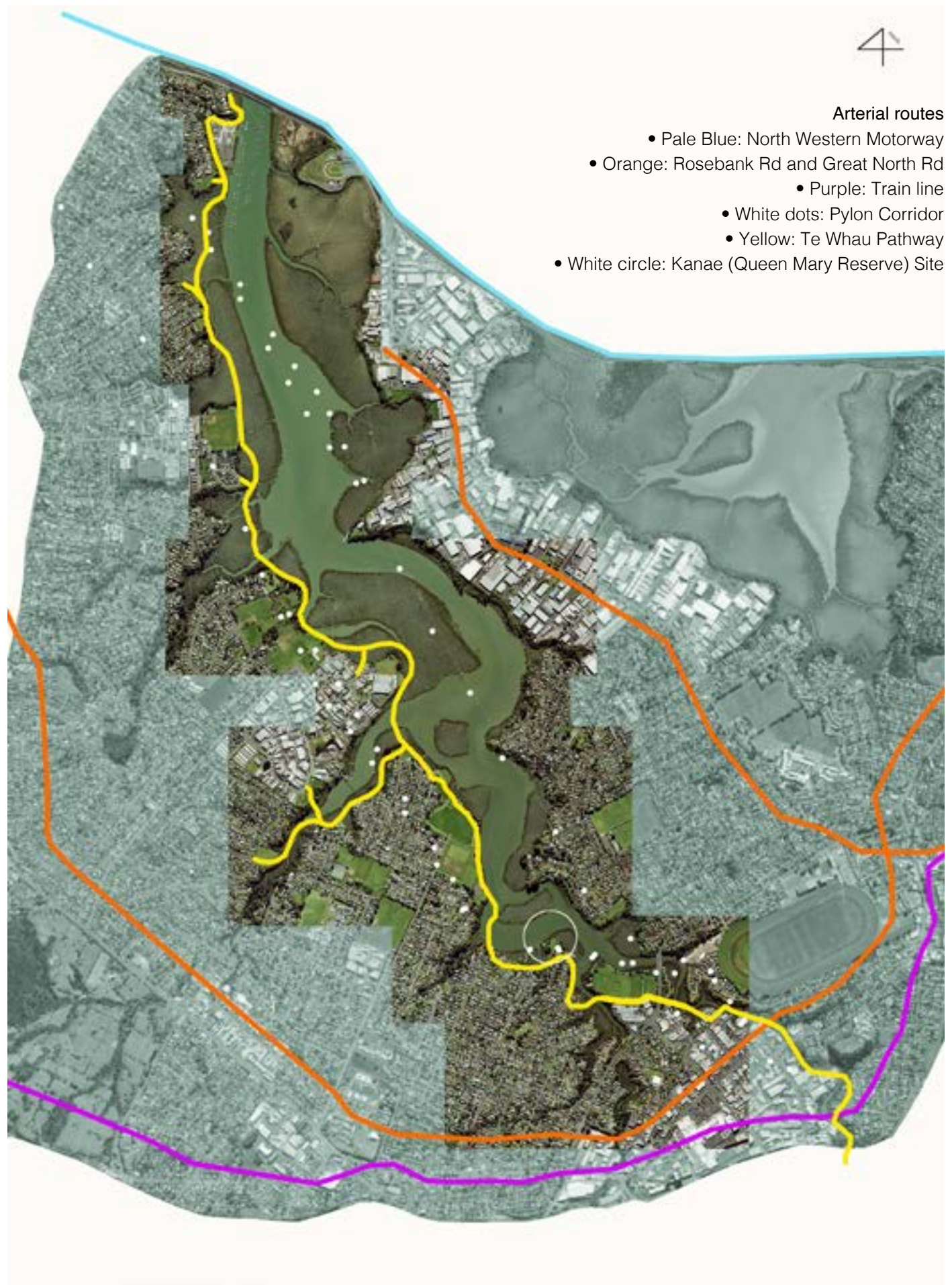
2001



1959



1940



4.4 Site Analysis

The land at Kanae slopes gently to the edge of the awa, where the coastal edges are populated with mangroves. Exotic trees are dotted around the edges of the green space. The enormous power pylon corridor narrowly misses this site, but these giants are visible through the NW views from AIO.

In the awa, currents are driven by tides more than the SSW winds, so waves do not pose a problem, and the mangrove forest helps to disperse the wave action. However, the 50-year sea-level rise will devour Kanae as per the Unitary Plan⁷².

Tidal waters come in contact with AIO for only 4 hours at each tidal change; it is mudflats for 16 hours per day. Archibald Park is within Kanae's view, where the Whau is permanently covered in water, allowing for continuous access with a waka ama or kayak. Time is of the essence in determining when to visit AIO at Kanae on a waka ama or kayak.

Kanae was a culturally rich landscape that has passed the time with not much intervention other than becoming the local landfill, ⁷³ pre-1959. The historic coastal edge has been moved with the reclamation of land that happened sometime after 1959,⁷⁴ (Appendix pg 144) through which any archaeological remains would have been buried or destroyed. This area was approximately 1028.56 sqm² and after reclamation became approximately 7930sqm².

72 "Climate Impact," Coastal Inundation, 5 year return and 50 year return 1m sea level rise, Auckland Council GeoMaps, accessed August 2021, <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>

73 "Queen Mary Reserve," AEE report, Te Whau Pathway (Green Bay to Te Atatu) Assessment of Environmental Effects, accessed June 2021, <https://www.aucklandcouncil.govt.nz/ResourceConsentDocuments/02BUN60337530AssessmentofEnvironmentalEffectsAEE.pdf>. 39

74 Farley, Hons, McCready, Low, and Clough, "Archaeological Assessment,"



The soils along the river edges here are mostly clay (fig 37). The existing flora leads me to believe the Whau Forest will retake to this area, benefiting soil health and stabilising the awa banks. However, this district (the Whau Ward) is an acutely threatened land environment with only 10 per cent of indigenous vegetation cover remaining.⁷⁵

Te Whau Awa prevailing winds are South Westerlies in the winter, changing to light North Easterlies in the Summer. So it was a natural inclination for me to draw the entrance and deck on the left side of the apparatus, where it faces inland, giving a more intimate arrival approach. As you enter inside, revealing the awa, it is like a gift through the windows. Given that the winds will be blustery and cold in winter orienting the entrance on the right side of the apparatus makes sense. This allows for the summer breezes to float through central openings and along the deck and for night purging and in winter, to shelter from the cold, blustery winds and horizontal rains that are common in Auckland.

New Zealand has one mangrove species – the Grey Mangrove.⁷⁶ The exploration into mangroves collaborating with AIO is to understand how this biodiverse living system thrives in this place and how it fits in the resiliency. Mangroves require a place to thrive as they are at risk of disappearing.⁷⁷

Looking after the whole living system that filters down to the awa, whereby the freshwater from the tributaries in the catchment merging into the tidal waters are healthy, allows mangroves to thrive in a healthy awa. The mangroves need a saline and freshwater system to thrive. They can tolerate high salinity by extracting salt through their leaves (fig 38).⁷⁸

Creating a resilient system at Kanae through maintaining a healthy mangrove forest.

75 "Resource Consent Document," Auckland City Council, Contract Report No.4522c April 2019, accessed March 2021, https://www.aucklandcouncil.govt.nz/ResourceConsentDocuments/49BUN60337530AppxIEcological%20Assessment_Part1updated.pdf. 3

76 N Duke, "*Avicennia marina*, Grey Mangrove" The IUCN Red List of Threatened Species 2010, accessed July 2021, https://inaturalist.nz/taxa/75723-Avicennia-marina#New_Zealand

77 Anthony R Cummings, Muna Shah, "*Mangroves in the global climate and environmental mix*," Mangroves: Description and Spatial Distribution, Geography Compass, vol 12, no 1, January 2018, accessed May 2021, <https://onlinelibrary.wiley.com/doi/10.1111/gec3.12353>

78 Duke, "*Avicennia marina*, Grey Mangrove"



[FIG 39] Kanae Site Analysis



about a 2m drop from
the grassy area to
the awa (mud)

when sitting on site
at AIO's location
you cannot see
the motorway
however I shall draw
sight line from Awa
apparatus to motorway
to see if any
visual.
Some 23m out.

KUAKA

461.9m

highly tidal area
4 hour
turn
around.

.2m
to
3.8m
plus.

7930 Sqm²

Archibald
visual from
AIO-Kanae.

between mangroves
9m gap
at entry to Awa.

passive
green
space.

11.3 km
cycle to WGA
Avt

Not a great spot
for kayakers to
disembark at embank
due to
high tide
low tide
4hr.

mature growth
bush +
tree shrubs

KANAE

RE INTRODUCE
WHANU TREE
FOREST ON
KANAE

pylons
located just
off of the
reserve

No traffic
issues
Cul de Sac.

North
easterly
change of
direction
in the
summer

Single
storey
residential
street
leading into Kanae by foot
or
other
of h

South
westerly
in winter

prevailing
winds

Important
ecology
happening

No exit street
No traffic
for

No foot
sees
the m

KUAKA

NORTH



into
(flats)

KA

traffic
by mean
many visits



ing
except
the residents

made
transport

patches for
native birds...

PURKEO

Pylons unseen from A10
but very visual from Kanae Proper.

Ken Maunders Park
not visible from A10
location.
it is walking distance
+ part up the TWP
connection from
Kanae.

Ngahere needs healthy soil and a biodiverse place to thrive. Auckland's Urban Ngahere Forest Strategy has a strategic plan to be put into place by 2050, part of this strategy is to take the pressure off water infrastructure. Using green infrastructure in the form of the Whau Forest creates greater resilience and positive environmental outcomes.⁷⁹ Whau trees are suited to coastal areas and become established fast, starting shrub-like and growing up to a 15-meter height. The leaves are large, broad, yellow-green, and the seed pods start off the same colour as the leaves, spiny and round, turning brown as they mature. They are relatively short-lived, with a 15-year cycle.⁸⁰

The Kuaka fly direct to Aotearoa every Summer from their breeding ground in Alaska without a break. So it is vital to maintain the mangroves in Te Whau Awa as one of their main habitats. Ecosystem benefits from migrating birds like the Kuaka include pest control; for example, they eat insects that are harmful to the local ngahere, pollination and serve as a food source for other wildlife. This filters through the watershed that AIO sits in; maintaining a healthy ecosystem within this nest invites the Kuaka to thrive here.

Oysters have a significant impact on the natural environment by filtering water and helping to control harmful algae blooms in the process. While forming their reefs, they create habitat in the nooks and crannies for juvenile fish and smaller marine life. Sustainability and looking after marine resources are part of the 17 Goals on the United Nations website.⁸¹ These processes help restore our waterways.

AIO provides amenities for oyster reefs and encourages collaboration between non-humans and humans for restoring purposes rather than harvesting purposes. Allowing each nested system within the catchment to thrive enables the whole system to thrive the way nature works.

79 Auckland Council, "Auckland's Urban Ngahere (Forest) Strategy" October 2021, <https://www.auckland-council.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/topic-based-plans-strategies/environmental-plans-strategies/Documents/urban-ngahere-forest-strategy.pdf>. 37

80 "Entelea arborescens," New Zealand Plant Conservation Network, accessed June 2021, <https://www.nzpcn.org.nz/flora/species/entelea-arborescens/>

81 "Goal 14," Department of Economic and Social Affairs, accessed May 2021, <https://sdgs.un.org/goals/goal14>

4.5 Design Proposal

Rohe: 50 Queen Mary Avenue. New Lynn. Tamaki Makaurau

Occupying a position on both sides of TWP sits AIO, a proposal for two Apparatus (Whenua Apparatus and Awa Apparatus) that re-imagine new neighbourhood and awa connections to restore the mauri ora of this place. Sited directly on TWP, AIO provides an opportunity for a re-connection to Te Whau Awa. AIO is a liminal space for the community, non-humans and people to occupy. In architecture, liminal places are the physical spaces between one destination and the next.

The language of Queen Mary Avenue has not been lost on AIO. The Awa Apparatus is three meters in height, shaped by the residential context. It is located within the mudflats, sensitively placed in the only location on Kanae without Mangroves. Within the scope of this research, this location has been without Mangroves.

In contrast, the Whenua Apparatus is 3 storeys high and stands amongst a proposed grove of Whau trees. (Appendix pg 146) These native trees can grow up to 15 meters in height. Being 9 meters, the Whenua Apparatus does not stand out because it celebrates the forest as part of the design and makes a connection with the leafy canopy.

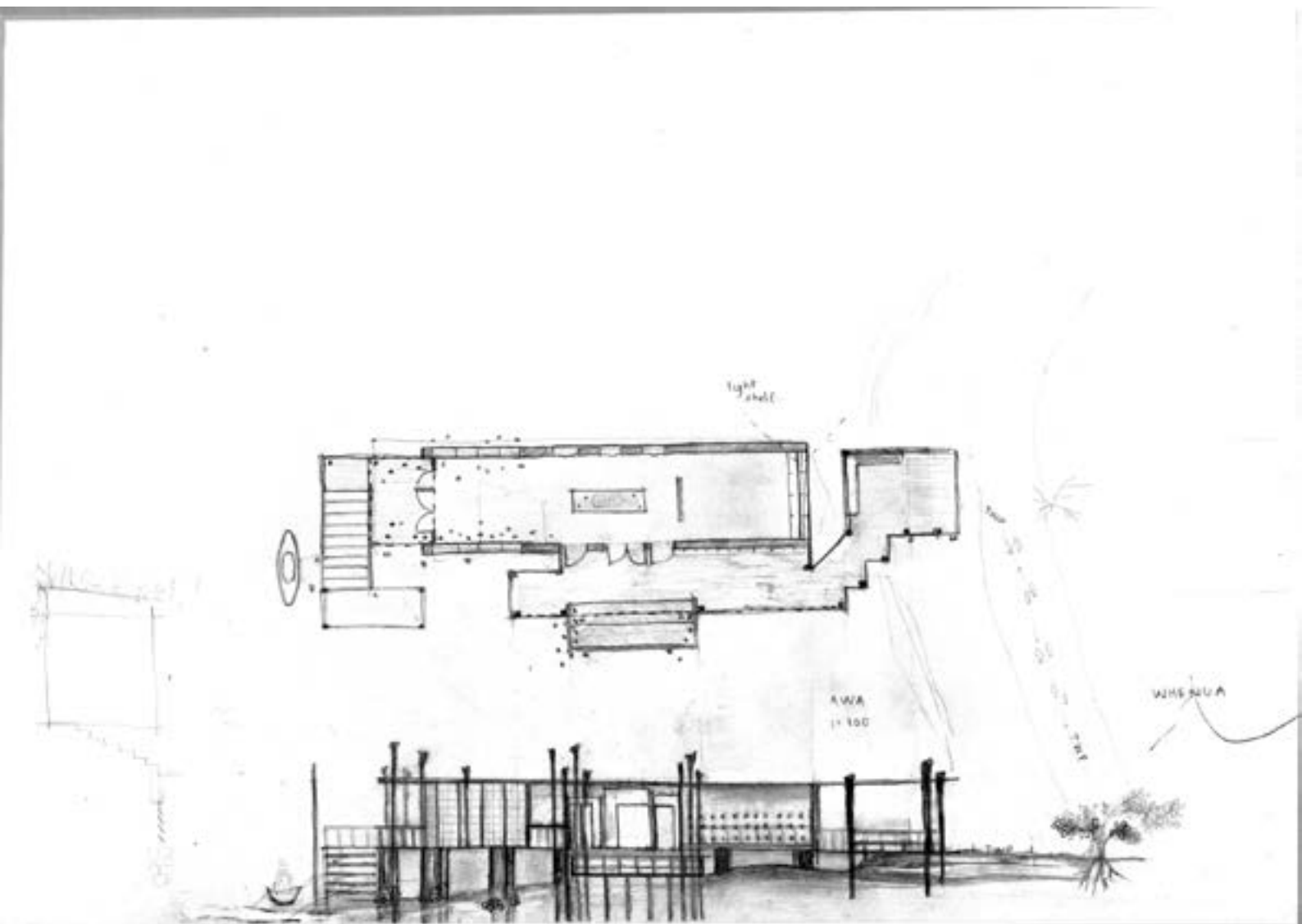
AIO is an architecture in solidarity with non-human others; the name and the architecture hope to bring curiosity to visitors, to acknowledge the mana (the spiritual power) and the Hau (breath of life) of Te Whau. The purpose of AIO is not to exist in a dying ecosystem nor to repair the entire awa and erase the industry along its banks, but to rearrange the relationship between whenua and the non-human socio-ecological relationship.

AIO is a relatively small design but with a lot of complexity. It encourages growth for the climate guardians of Kanae like the mangroves, oysters and the Whau tree. Through the reforestation of the Whau tree and maintaining the health of the mangroves, the site creates a natural resilience to flooding and runoff prevention, air pollution removal, carbon storage, oxygen production, cooling, slows down site erosion, provides recreation opportunities, and will attract indigenous and other fauna.



[FIG 41] Whenua & Awa apparatus collage





Awa Apparatus

Fused in the riparian zone, where it transverses whenua and awa, within the opportunity of a permanent gap in the mangroves, the Awa Apparatus jets some 34 meters toward Waimarumarū. This sheltered place on the awa is bounded by a large 'island' of mangroves. Raised two meters above the mudflats at the low tide, held up with reused timber ferry terminal piles, the Awa Apparatus provides an intertidal habitat that works alongside the existing ecosystem providing a structure for the naturally occurring oyster reefs and supporting plant, animal and microorganisms that inhabit this space.

Upon arrival, where TWP and AIO cross paths, is the threshold where people gather to meet under shelter before indirectly walking up the deck, over the awa, toward the entrance.

Voids in the deck are moments that bring the awa ecosystem to attention, giving glimpses of the biodiverse hotspots underneath. The sheltered deck provides space for viewing, observing, sitting, gathering and at the threshold to the Awa Apparatus, a set of hooks on the wall for school bags, umbrellas and shoes (if required).

You enter into the middle through timber-framed doors with deep reveals. In front of you is a floor to ceiling light-framed timber shelf that holds pouffes for sitting on. As you take a pouffe, a space is left for your belongings or such items. Pouffes can be locally made and serve as an ergonomic and multifunctional piece of furniture for visiting school groups and adults that are easy to stack away.

Opposite the shelf of pouffes are window seats. The deep reveals in these large windows are furnished with locally made cushions and an area that is a great place to sit and work remotely, view the awa, rest and chat. Furniture in the style of sofa tables are dotted around the window area for laptops and the like. The programme is loose, allowing the space to be used for many situations from informal gatherings, school visits and hotdesking for the likes of ecologists working on river health.

Upon entering this long pier style space, it is evident that it is divided into 3, 8-meter x 8-meter internal areas through floor patterns, making it an open plan environment that can be used in many ways.

The Southend space is made quite dark, with fenestration kept to a minimum and a simple white moveable wall that serves as a space divider for projections for artists or groups visiting for speeches, talks, and lessons.

The middle section is where you enter in front of the pouffe shelf. This large floor to ceiling shelf doubles as a place that can be used as a display area or for catered food during events.

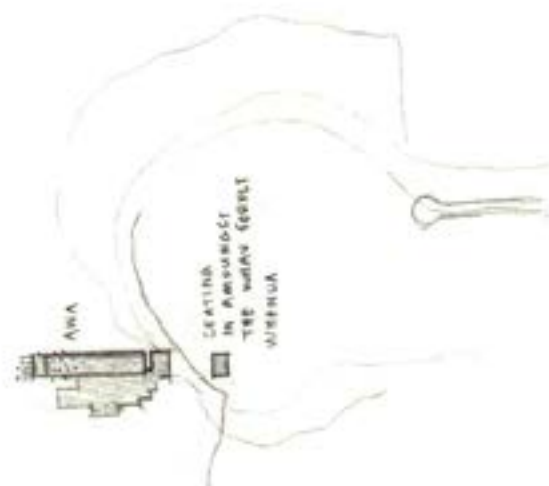
The Northend space is light and airy, and floor to ceiling louvres populate the walls. A moment for supervised observation of the Sky and the Earth is created through a removable transparent 1m x 1m floor cassette and an openable 1m² glass roof window with views of Ranginui (the sky), Tio (oysters) and Whenua, each would have commissioned (mahi toi) artwork from mana whenua, designs that speak to the whakapapa (genealogy) of Te Whau. A strong netting protects observers from falling through the void.

This porosity is created to engage more humans senses than simply sight by including smell and sound. The mud pops, or the water smells salty when the tide is out. You will be able to hear, see and smell this. A sort of untechnical periscope, instead of an apparatus with mirrors or prisms to allow the observer to see things outside of sight, these voids narrow your attention toward the view you may otherwise not sense.

The end wall doors lead you onto a smaller deck where you go down steps to the mud (at low tide) to an even smaller observation deck, where visitors can view the oyster reefs growing on the piles and other agencies working on river health. This is submerged at high tide, where you can approach AIO by waka ama or kayak. You can secure your preferred water transport to a timber fender pile that provides perching space for the non-human.

A forest of columns runs along the deck in homage to the woods that occupied the site before urbanisation. This forest is dedicated to the many birds that perch upon them. This forest of columns runs along the North side deck and will be left behind as part of the awa habitat if deconstruction happens.

N
1-100
WHENUA



TWP

Some treatment
on each facade
of new
+ whetuna



- * CARPENTER + REPAIRS FOR
FOR SALE
- * ALSO USE FOR
PRESERVATION OF
LUNARIES FOR
THE SCHOOLS ETC.

It's about resiliency
regenerative
more than human

Whenua Apparatus

The Whenua Apparatus sits in amongst the proposed Whau Forest as if it was growing from the Earth itself. Consisting of 3 storeys, it reuses clay bricks as the foundation and façade of the ground level, turning into a timber structure and façade as it rises. Programatically, at ground level, the apparatus offers a takeaway for hot and cold drinks and a pre-made food facility with seating inside and in amongst the grove outside. The provisions are minimal but do attend to visiting schools whereby the small community-style kitchen offers space for the teachers and parent helpers to prep the BYO food and drink for the school kids visiting. An accessible toilet, bike racks and informal seating are available outside.

Level 2 is the apartment, defined as a small liminal space for Kaitiaki (such as those working on the Hau o Te Whau project) to live or stay as required.

Level 3 is the seedling house for the reforestation project. Reaching up to Ranginui and the light from Te Rā (The Sun) essential to seedling growth, it acts as a beacon, welcoming attention as a destination and resource for the schools already active in the planting scheme at Te Whau.⁸² To the South of the Whenua Apparatus is a clear area suited for a wetland as part of the wastewater treatment plan. The greywater from the apartment and community-style kitchen and black water from the two toilets on site (apartment and public toilet) is treated on-site using a constructed wetlands system by harnessing the natural functions of certain types of plants and microorganisms that treat wastewater without chemicals.^{83 84}

The variation of light, pattern, space, and texture in both apparatuses mimics nature. The feeling of the timber from the tree and clay bricks from the Earth when you walk into AIO evokes mimicry, along with the narrow size of the floor plates that allow for natural ventilation and views of the green and blue spaces via the fenestration. It is this continuous connection to nature embedding a relationship with this place.

82 "Plant a tree," Te Whau Pathway Project, accessed April 2021, <https://tewhaupathway.org.nz/get-involved/plant-a-tree/>

83 "Water," Te Uru Taumatua, The Living Building Challenge. 2

84 Uli Rambeck, "Botanical wastewater treatment systems – wetlands for on-site domestic wastewater management," accessed June 2021, https://www.waternz.org.nz/Attachment?Action=Download&Attachment_id=1140, 2

AIO employs the principles of regenerative design, and equally important are the long term issues of resilience. A local ecological approach to resilient design at Kanae entails improving water quality with green infrastructure and architecture being connected. Helping stormwater runoff and navigate and away levels during king tides and heavy rain. The heat island effect in this sub-urban setting is also mitigated through the architectural design's planned planting and regenerative approaches.

Each space has a unique scale and spatial quality, and the narrative that supports the design will be a continuation of the existing Whau story.

5

P A R T F I V E

Findings

Part 5 AIO – Findings

5.1 Findings

AIO is the architecture of change, working in harmony with its existing context. It opens a view to the idea of architecture as tool to aid in a healthy awa and whenua through applying natural ecosystem services.

5.2 Findings - Designing an apparatus:

At the beginning of this design process, I became stuck on designing the form of a building. I approached this speculative design as a building/object sitting on the ground, located in a 'neutral' space.

However, I soon realised that this approach was not going to address the relational aspects of my research question, **"Is it possible through a hybrid architectural-landscape intervention to introduce a relationship where more than humans thrive alongside human activity?"**

Instead, as I began to research and understand the relational and regenerative aspects of my question, I made the realisation that I needed to approach the design as an 'apparatus' rather than a conventional building. An apparatus is defined as,

"any system or systematic organisation of activities, functions, processes, etc, directed toward a specific goal."⁸⁵

In the case of AIO, the goal is to generate an intervention that promotes the thriving of human and non-human species at Te Whau, and the speculative design operates to support the system of activities and functions needed to develop and sustain this relationship. I have drawn on the frameworks of More- than-Human, Regenerative Design and Mauri Ora in order to understand the capacity of architecture to operate in this way, not as an object serving human needs but as a system that supports reciprocal relations at Te Whau. In doing so I have specifically designed for Kanae, introducing the connection of Te Whau Pathway in this location, through listening to the whenua and awa and learning the history of this area.

⁸⁵ "Definition of Apparatus," accessed March 2021, <https://www.oxfordlearnersdictionaries.com/definition/english/apparatus?q=apparatus>

5.3 Findings: A 'new' approach to SITE

In order to design an apparatus (rather than an object/building), I have expanded the architectural idea of 'site'. In typical architecture projects site is often understood as a bounded parcel of land with a specific topography, orientation and neighbouring context. In the case of AIO site is expanded to consider relations between awa and whenua and all the conditions that each species requires to thrive, including the relations they have with each other. This has required

1. embracing a systems thinking approach, or an approach of mauri ora by becoming a more-than-human multi-entity community⁸⁶ whereby the animals, climate, atmospheres, and non-human presences like ancestors and spirits possess agency, that 'nature' and 'culture' may not be so separate after all⁸⁷
2. thinking through time - from the life cycle of the oyster to the changes that will occur with climate change and sea-level rise
3. and in response to this, how the use of the apparatus might also change over time, for example, once Kanae is often flooded by the awa.

Additionally, I have had to develop a design methodology that can allow me to work with such relational thinking and process and this expanded approach to site. As already discussed, this has required a move away from Digital CAD software to the use of hand drawing and collage. Hand drawing closes the distance between the maker and the object. It puts the designer in a haptic contact with the object or space. For Kanae, drawing by hand allowed for a sensitivity to line weights and fuzzy edges where whenua and awa meet, so other life forms are included and thought about.

86 Yates, "Transforming Geographies," August 2021. 9

87 Zoe Todd, "An Indigenous Feminist's Take On The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism: An Indigenous Feminist's Take on the Ontological Turn," *Journal of Historical Sociology*, (2016),

5.4 Findings: Limitations

The 'more than human' life-world is a vast web from micro-biological life forms through plants, insects and animals to the atmosphere. Furthermore, if we embrace an ontology of mauri ora, we also need to consider atua and tīpuna and how these reside in phenomena in a western sense considered inanimate, such as mountains and awa.

This generates a vast set of relations in any place, which would require many years to fully know and embrace as part of the whakapapa of a truly relational design. For the purpose of this 90pt thesis, an indicative set of species and features have been central to the design work, but it is important to acknowledge that a fully relational design would require a much longer research period and a more complex and finely tuned apparatus. Essentially I have needed to place some artificial parameters around the project in order to test the idea of an apparatus approach to design at Kanae.

Effectively this research has held the intention to produce a thesis of value to mana whenua and that may have use to them later down the track. This is to follow a treaty approach and the Te Aranga Design Principles - The protection and enhancement of place, Authenticity, and Histories and futures are key Te Aranga principles⁸⁸ that relate to AIO. The fabric of the Māori cultural landscape includes all physical and spiritual dimensions of whanau (family), hapu (clans or descent groups of iwi) and iwi. It is restoring authenticity and connection⁸⁹ However, currently mana whenua are collaborating on live research on Wai ō te Whau, their limited time is precious and focused on live research projects. As this is the case it wasn't appropriate to ask for their time to help with my research, therefore in order to understand Wai ō te Whau from their perspective I have drawn on their published works only. This is a practical limitation of the work at this level.

88 Jacqueline Paul, *"Exploring Te Aranga Design Principles in Tāmaki,"* (Bachelor of Landscape Architecture (Hons), Unitec, June 2017, 5

89 "Cultural Landscape," *Te Aranga: Maori cultural landscape strategy,* 2008, accessed April 2021, https://content.aucklanddesignmanual.co.nz/design-subjects/maori-design/te_aranga_principles/Documents/TeArangaStrategy28Apr08_lr.pdf 1 - 17

How do we get massive changes? This functional dimension is that we work with life as a whole system. Every living being is connected. With a system we need to be engaged in is so much bigger than site. The story I need to tell is the regenerative systems that are in place, where the overall living systems cooperate. One boundary that we have is place, it is one.

In this functional dimension, one of the requirements is that we operate as a whole, life works as a whole system. Not in parts.

5.5 Thesis Conclusion

Researching the work and ethos of Ghosthorse, Meyer and Yates have me rethinking the language we use. There are many components to life that are not physically seen, which also have an impact on the whole picture and the system of communication that is not just spoken.

Trying to answer the thesis question, "Is it possible through a hybrid architectural-landscape intervention to introduce a relationship where more-than-human thrives alongside human activity?", becomes even more important because of the way we are meant to live today, with nature and not against nature.

The opportunity exists to use a positive narrative in the language and systems thinking to support our understanding of Mauri Ora and Regenerative Design as demonstrated in AIO. Existing natural seen and unseen entities must not be eradicated but seen holistically as opportunities for regenerative design.

You will see that nothing has been eradicated but poetically or holistically accommodated in AIO.

The consumption of water is holistic in AIO because the wastewater is not taken away through mains systems to be chemically treated. It has been assuaged toward a wetland to naturally be cleaned and released into the awa.

Wai being a sentient entity is able to function byway of its own Kaupapa.

Architecture can be an interpretation of how we see ourselves in the future. It is more than a built environment but it is a possibility of holistic co-occupation of place. This research aimed to create a dialogue around the connections to whenua and awa through mauri ora and regenerative design approaches.

Reflecting on my research, I have learnt that architecture can be a powerful tool as an apparatus for ecology. Not to dispel the ability to create a built environment, but to work alongside ecologies and to understand the seen and unseen in the human and non-human ecologies.

So I bring to your attention that **It is possible through a hybrid architectural-landscape intervention to introduce a relationship where more-than-human thrives alongside human activity.**

It is possible
through a hybrid
architectural-landscape
intervention to introduce
a relationship where
more-than-human
thrives alongside
human activity.

[FIG 44] Polyp wai hou (Fresh water Polyp eDNA amples taken from Te Whau Awa



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Glossary ^{90 91}

A

Awa	River
Aotearoa	New Zealand
Atua	Ancestors with continuing influence

H

Harekeke	Flax
Huahuanga mo huri re ao	School of Future Environments & Architecture
Hau	Breath of Life
Hikurangi	West Auckland

I

Iwi	Tribe
Ika	Fish

K

Kūtai	Mussels
Kaitiaki	Guardian
Kaitiakitanga	Guardianship
Kuaka	Godwits
Kai	Food
Kanae	Mullet
Kanae	Queen Mary Reserve
Karaka	Green Bay
Kaupapa	Strategy, theme, philosophy

M

90 "Glossary," Auckland Design Manual, Resources, accessed March 2021, <https://www.aucklanddesignmanual.co.nz/resources/glossary>

91 "N1. Glossary of Māori terms," Unitary Plan, Auckland Council, accessed March 2021, https://unitaryplan.aucklandcouncil.govt.nz/Pages/Plan/Book.aspx?exhibit=AucklandUnitaryPlan_Print, 1 - 8

Manaakitanga	Hosting/Generosity
Miharo	Extraordinary
Moana	Sea
Matangaro	Unseen
Motu mānawa	Pollen Island
Mauritanga	The act of maintaining or enhancing mauri
Mahinga kai	Traditional food gathering
Mauri	Aliveness
Mauri ora	Aliveness/thriving
Maunga	Mountain
Maungakiekie	One Tree Hill
Mahi toi	Art work
Mānawa	Mangrove
Maramataka	Māori Lunar Calendar
N	
Ngahere	Forest
O	
Ora	Thriving
R	
Ranginui	The Skyfather/ The Heavens
Te Rā	The Sun

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[FIG 45] Te Whau Awa Mudflats



Appendix

Appendix

One

Site

Study

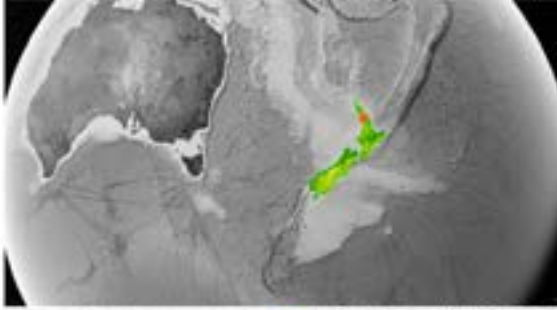
Each image depicting the
context of place

The images bringing into
focus that an ecological area
is connected to the whole
planet

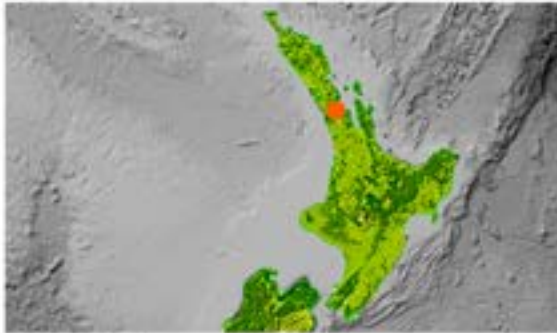
This living-world that each
ecosystem is a part of
functions together, and if one
does not thrive, it will impact
the others

Refer back to pg 35

Achieving net positive
impacts for ecology starts
by looking at the bigger
picture



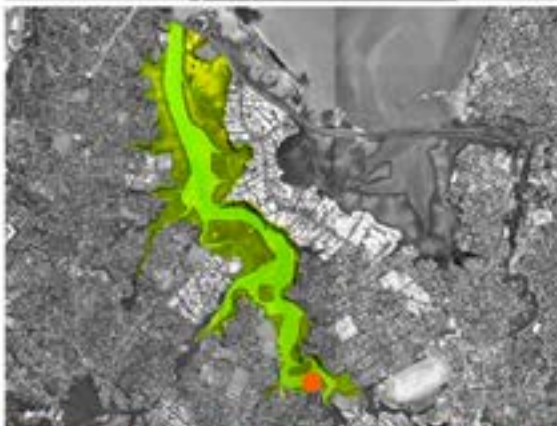
Aotearoa



Tamaki Makaurau



Te Whau Awa



Waimarumaru & Kanae



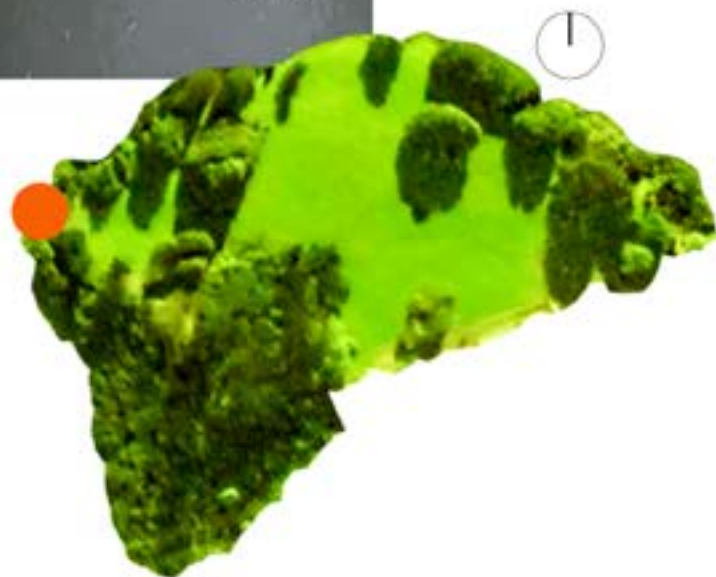
Fuzzy edges are the places
that can be hard to perceive

This edge is not a separation
between awa and whenua

Low tide



Spring tide



Mother earth 's cellular memory

The mangroves did not grow
in this part of Kanae.

The make shift concrete
ramp, it was used as an
informal entry point into the
awa

The reclaimed land sits
exactly two meters above the
awa bed, the tide does not
exceed this edge (yet)

Refer back to page 46



The reclaimed part of Kanae
has soil that was deposited
pre 1959

The where abouts that this
soil came from is unknown to
the best of my knowledge

refer back to page 87



The Whau seed, pod and tree

[refer back to page 97](#)



Site is Clay soil

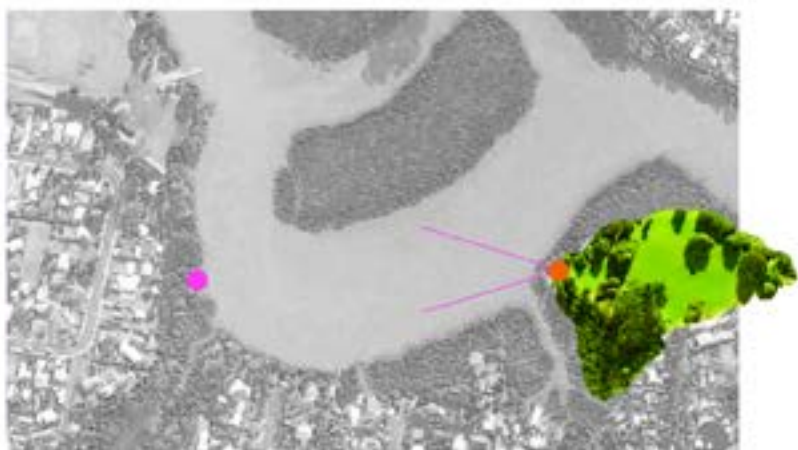


The intertidal area at site
Te Whau Awa is a shallow
estuary, it is a well-mixed
duo of salt and fresh water
from top to bottom
Covered at high tide and
uncovered at low tide

Low
tide



Spring
tide



The unwanted vertical elements of the pylons in a neighbourhood and the health risks they pose jolt responses from climate activists to replace these giants with renewable energy. From an AIO prospective the more-than-human element like the sun and wind

Observations of conflicting elements across site, this land is council owned, a closed tip and it sits alongside the pylon corridor



Appendix Two Design Study

L2
apartment 10 x 10m

Living
Sleeping
outdoor deck area
storage
cleaning
washing

Green roof
water catchment
solar / pvc
patch: for
more than
human.

• Food + drink to go AL
fridge + cupboard under bench
dishwasher under bench
pos computer
cabinet food gear
Coffee gear
bench space
rubbish bin / compost bin
3m x 1500 x 900 high

WHENUA

programmatic
brief

• stakeholders •

Spaces

Outside
Japanese style
shower for after
awa washing.

Seating area.
outdoor table mixed use
for: ecologist.
planting.
sitting around.

• foresting •
• whau tree.
unlimited space along
the awa
Kanae =

Bike + AL
trailer area
bike fix it
stuff
cleaning area
outside ??
4m x 2000

AL + L1
Pulley System

Toilets AL

- 3 unisex
- 1 accessible
- per 30 people
- 1800 x 2100
- poo pond.

10 x 10m Glass / Seedling house. L1
x 4m
height

- Seedling table x 2
2m x 1m x 900 high
- hang tools

- Soil storage
- Seed bank
- recycle bin
- toilet - unisex accessible x1
- seedling tray area
- stairs

outside

2m wide x 4m height

circulation

around the awa structure

- contact w the mud
- "muddy urbanism"
- + high tidal area

• Learning •

- projection wall or gorilla glass
- permeable ground area for wet raincoats shoes
- bag area
- pool or stool area
- space for 30 kids + 2 teachers + parent help.

visiting
• ecologist
+ scientist.

AWA
programatic brief

• stakeholders.

spaces.

+
• ecologist
area

desk / table
visiting
guest
chairs or
stools around
the table
remote work
style.

look out
space

across the
awa
for everyone.

Green roof

Solar or pvc
water collection
Patch: 4 all
more than human.



pots
ventilation
shade options
heating
insect protection
insect mesh curtains
rain water harvesting
accessories
wind protection



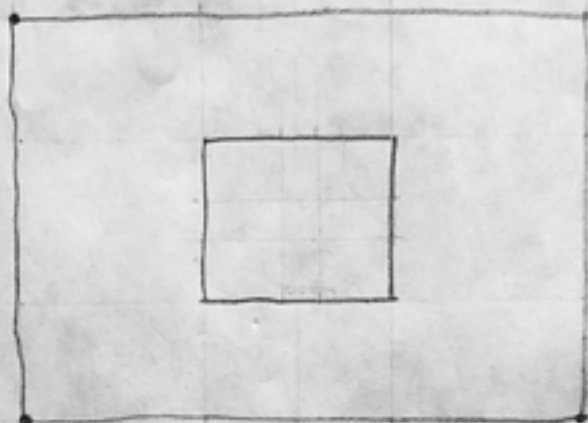
Exploration of form.

These elements of the vertical stick like columns were carried through to the rectilinear design.



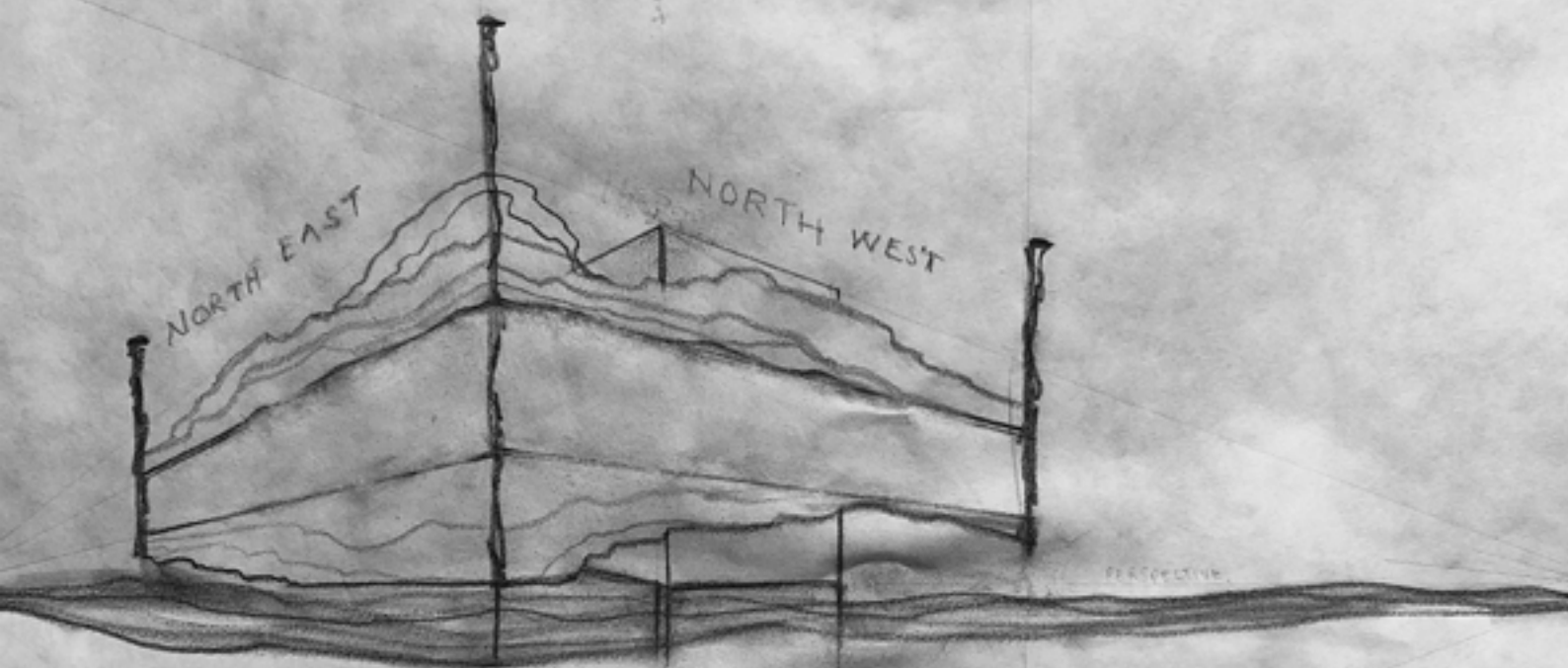
Exploration of form.

Creating the relationship
between Awa and Whenua,
between AIO's interior space
and its external environment

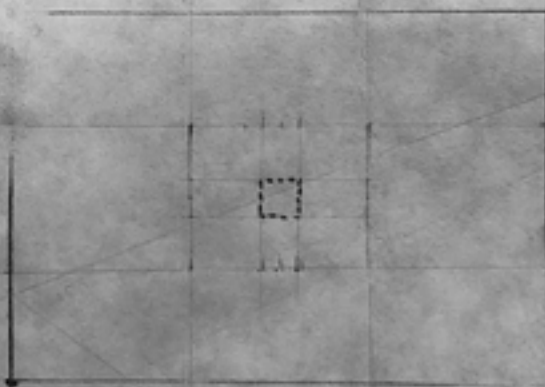


ctr structure!

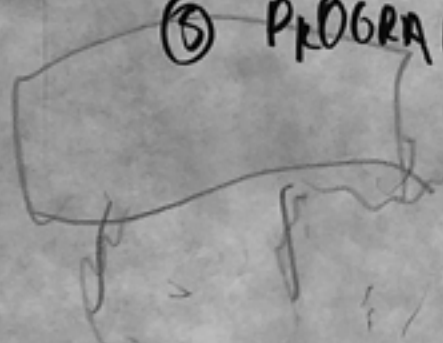
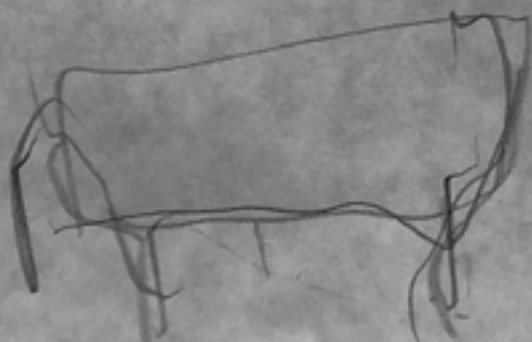
PLAN 1:100 03



PERSPECTIVE



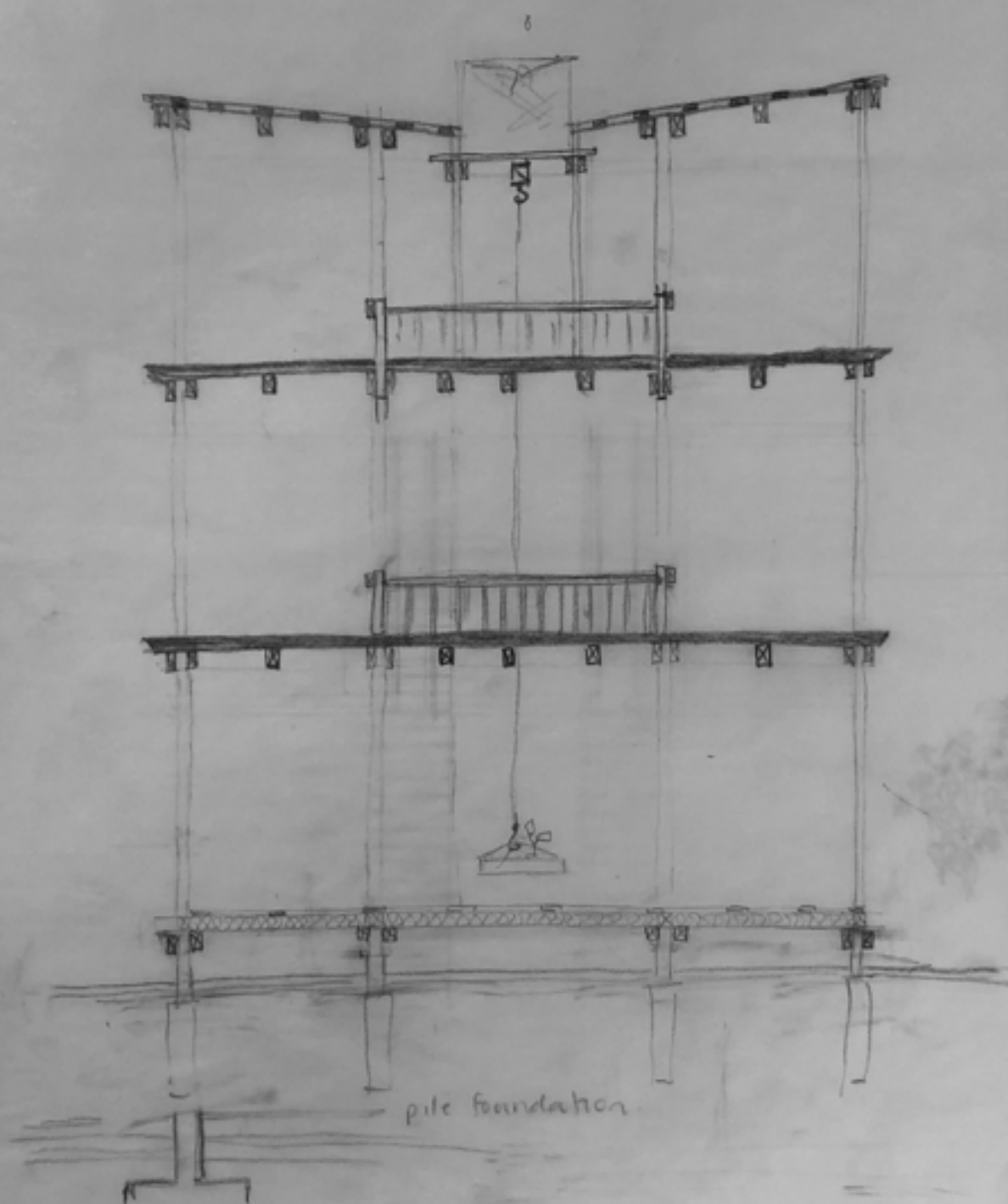
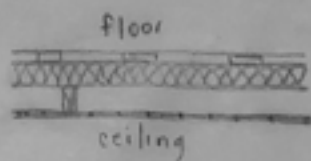
- ① POROSITY
- ② TRANSPARENCY
- ③ LIVING / GROWTH
- ④ INTEGRATION
- ⑤ PROGRAMME



Exploration of form.

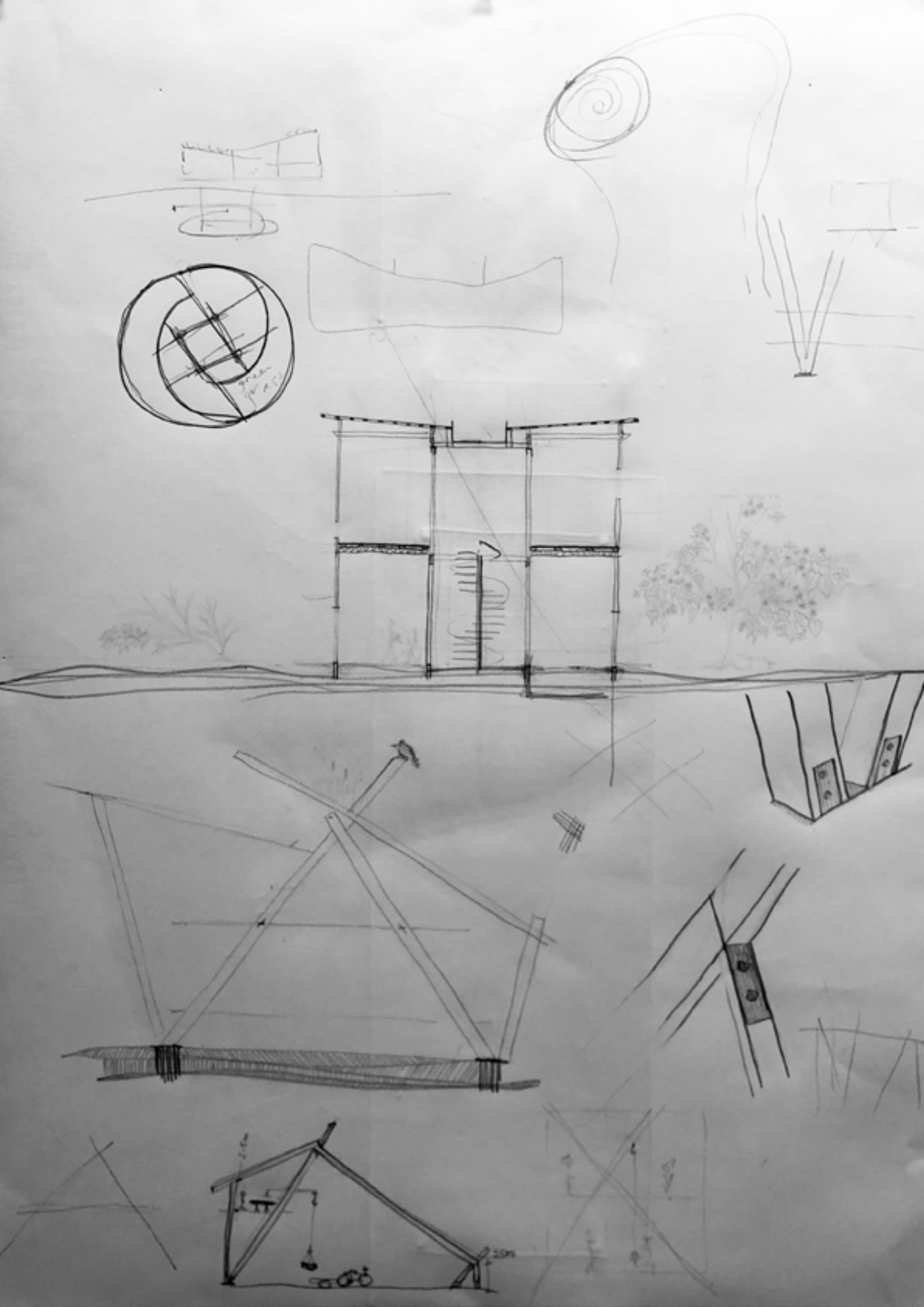
Feeling out the circulation
and the structural elements

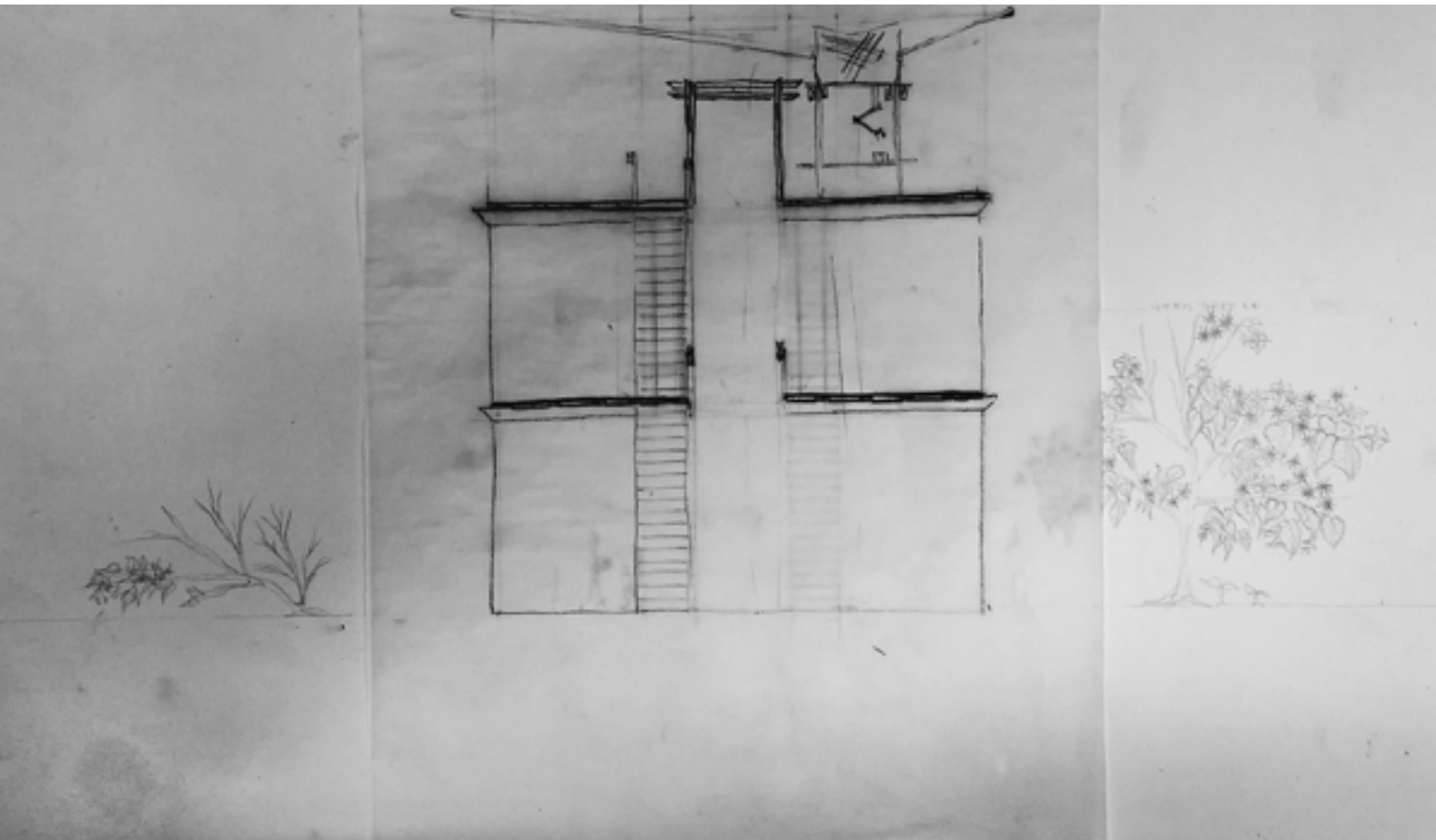
Surface and depth, space
and solid



Exploration of form.

Understanding the function
of AIO and what is to
happen inside these spaces

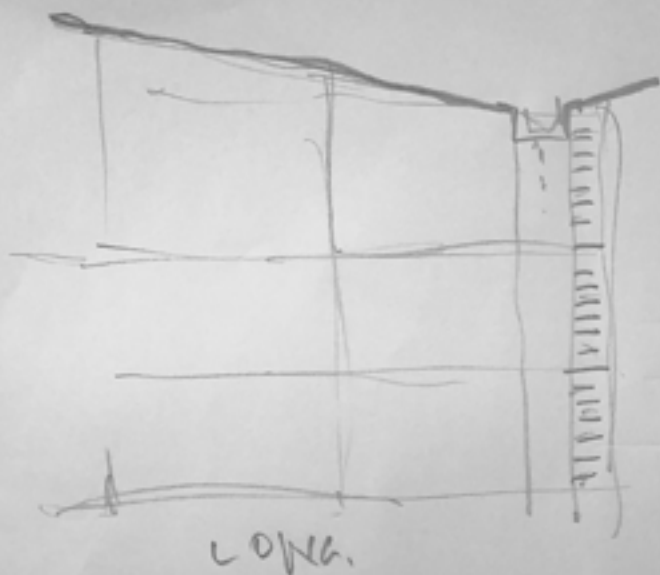




Exploration of form.

Moving the circulation

Playing with form



L2

L1

GL

Inverting the
triangular pitched
style roof

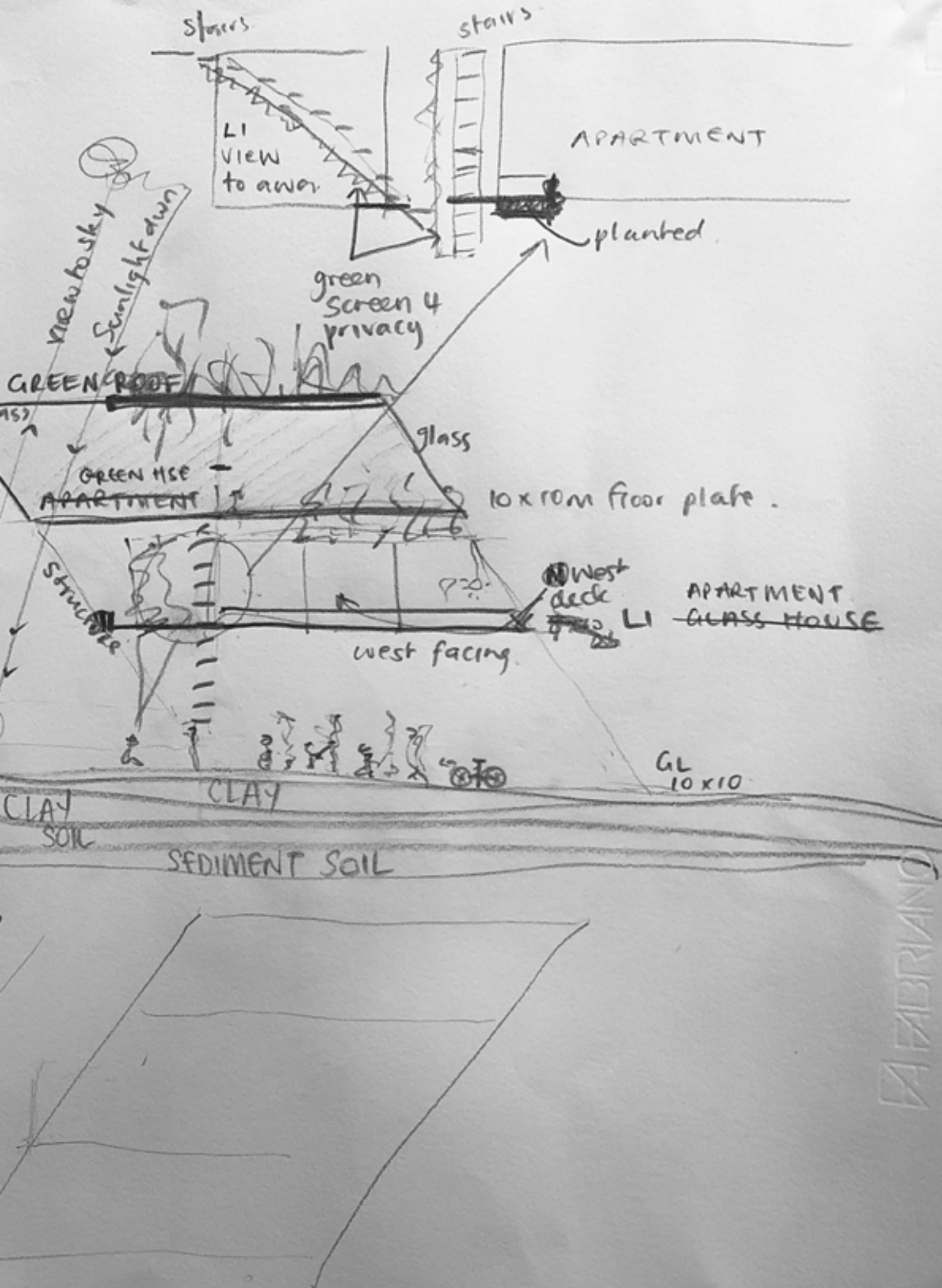
North West
Facing

Ann.

glass
L2

TWP

these
doors
have no
step
accessible
by
pool
wall.
rain coat
hooks
lip step to hook
Shoes under



Appendix Three Further Design Drawings

Exploration of form.

Te Whau Pathway directly inbetween the Whenua and Awa apparatus, as part of the apparatus ...

MIT Glass House
 for structure
 not for structure.
 green walls
 glass

○ outdoor lighting
 for the area / water tree

THICKENS IN
 THE MIDDLE
 THINS OUTWARDS
 FOR STRUCTURE
 LIKE A HUMAN JOINT
 GLOW LIGHTING

COLOURS FROM WITHIN

in garden forks
 every surface
 - a battery
 - a sensor
 - pvc

WHAT IS
 STRONG
 LIKE
 ALUMINUM



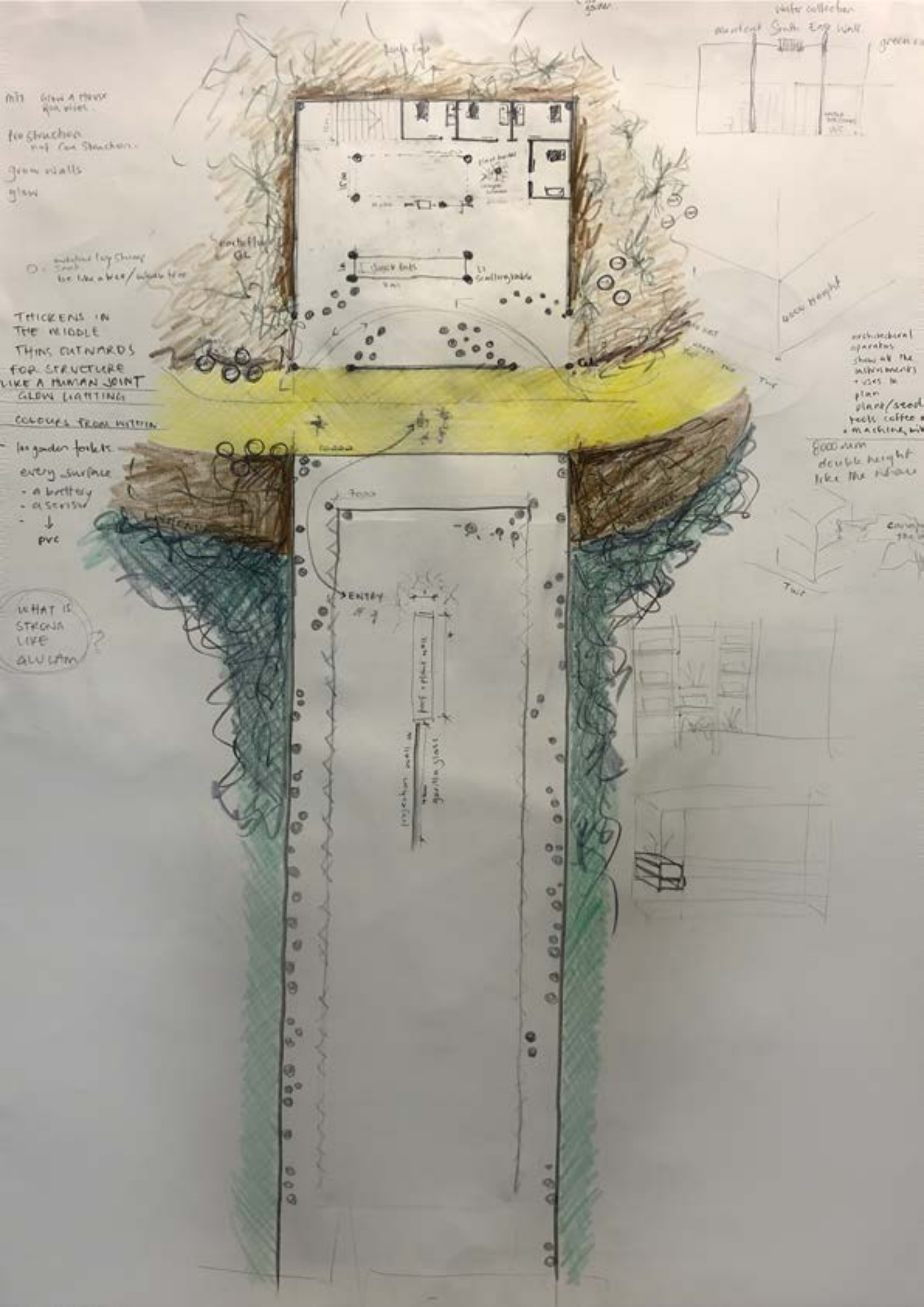
water height

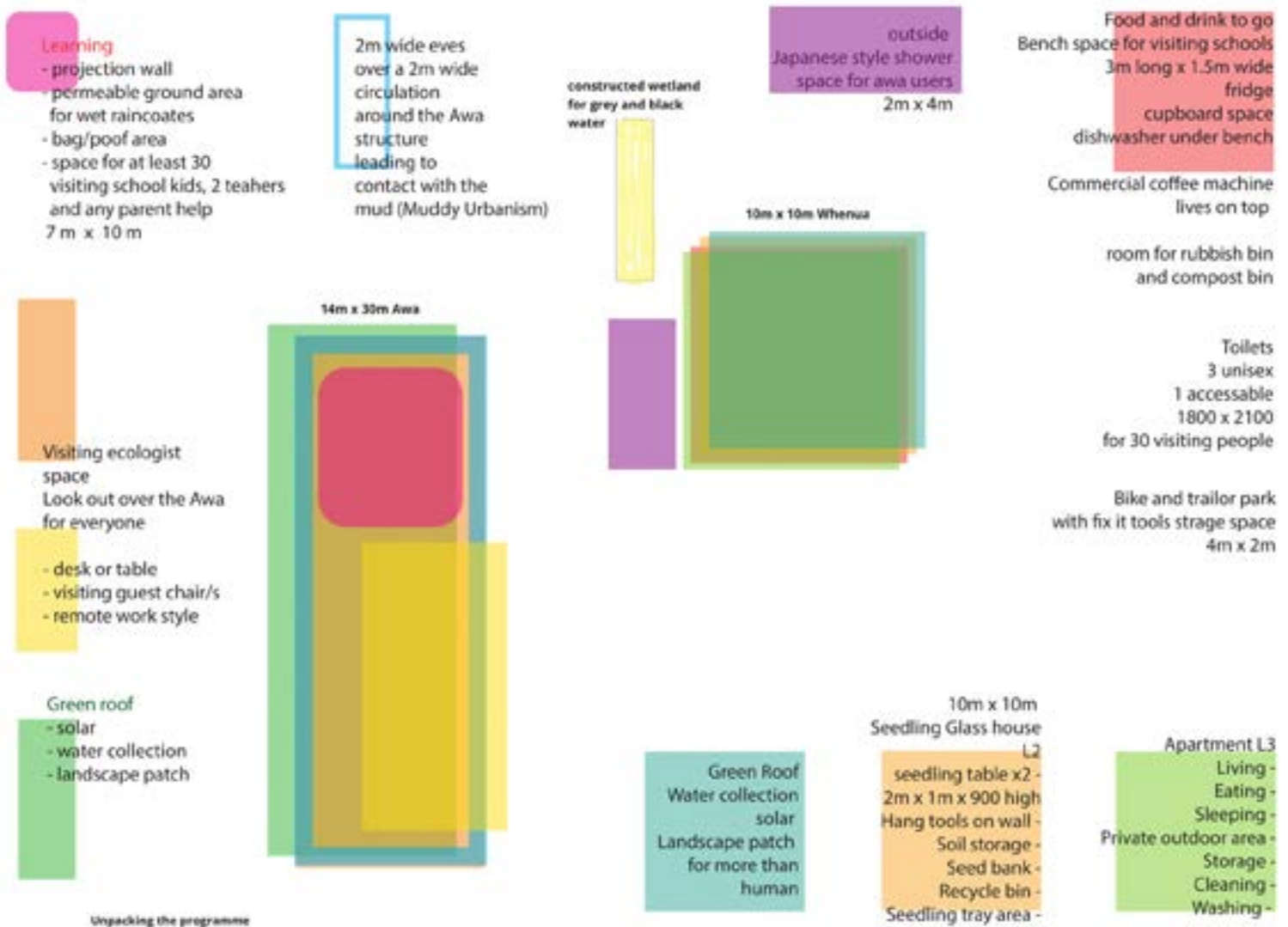
architectural
 operators
 show all the
 instruments
 + uses to
 plan
 plans/stool
 back coffee
 + machines, etc

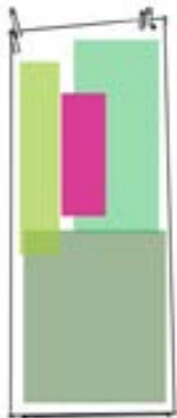
8000 mm
 double height
 like the house

around the

Two







Energy for the architectural apparatus will be collected through mounted PVC panels on the roof or pvc in the windows as the fenestration is large

....



Green roof and water collection

Pulley system access between LT to GL

Waste water treatment

Black water from the toilet i treated onsite
The process starts with a traditional septic tank for primary treatment, then effluent is held in a holding tank before being pumped into the passive wetland waste treatment system.

Like the Tuhoe wetland, it is banded gravel beds planted with appropriate flora where the semi treated water flows, a process which moves nutrients and bacteria from the water.

Septic tank complete with pump moves through first stage treatment - sediment basins through to the wetland filter basin then dispersal of treated water via sub terrain dispersal field



Parti diagramming

Facades of the Whenua Apparatus



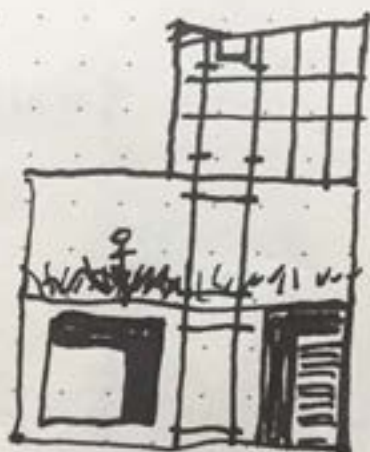
WEST



NORTH



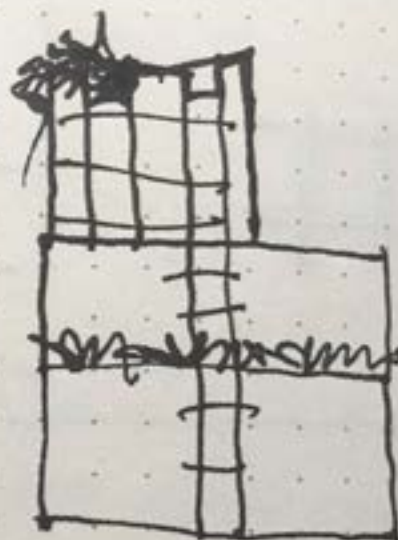
EAST



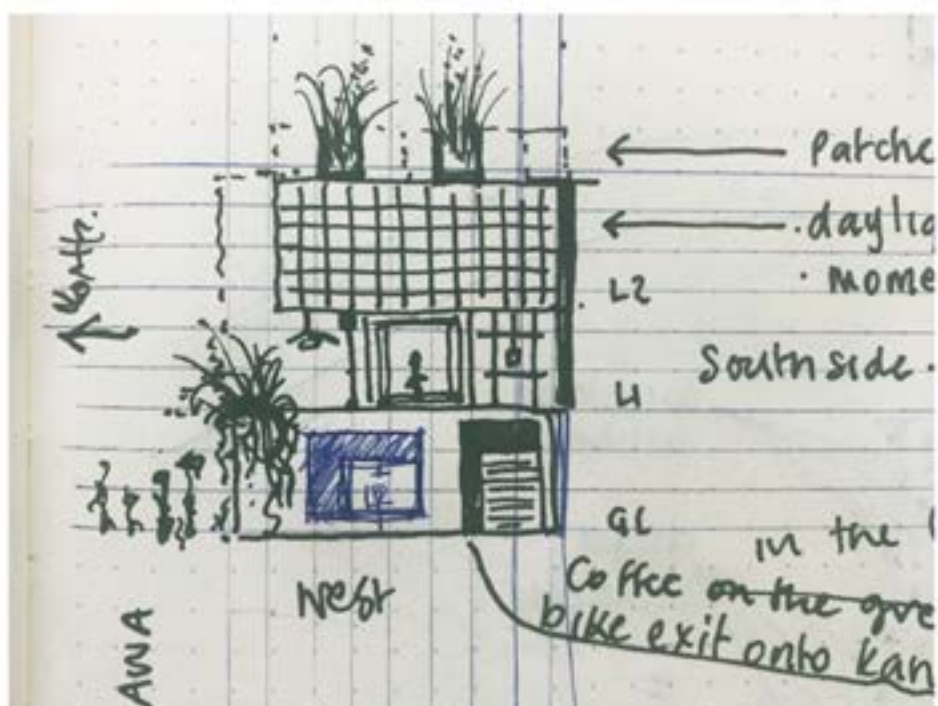
WEST



NORTH.



EAST

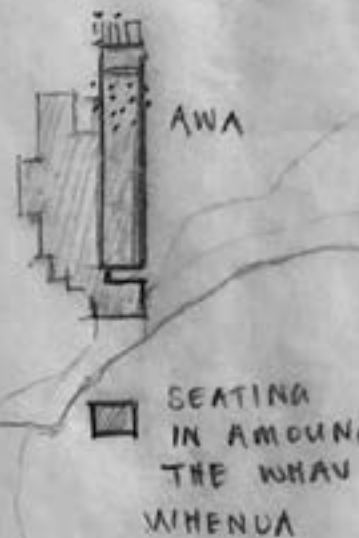


TWP



* COFFEE + PREPARED FOOD
FOR SALE

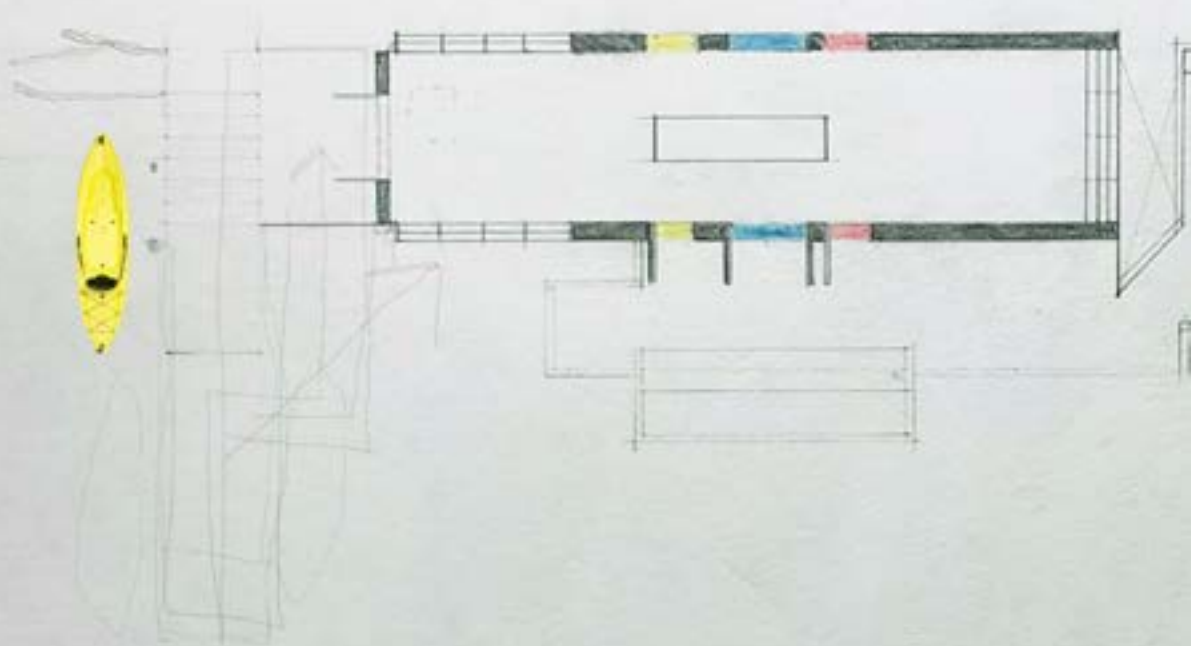
* ALSO USED FOR
PREPERATION OF
LUNCHES FOR
PRE SCHOOLERS ETC..



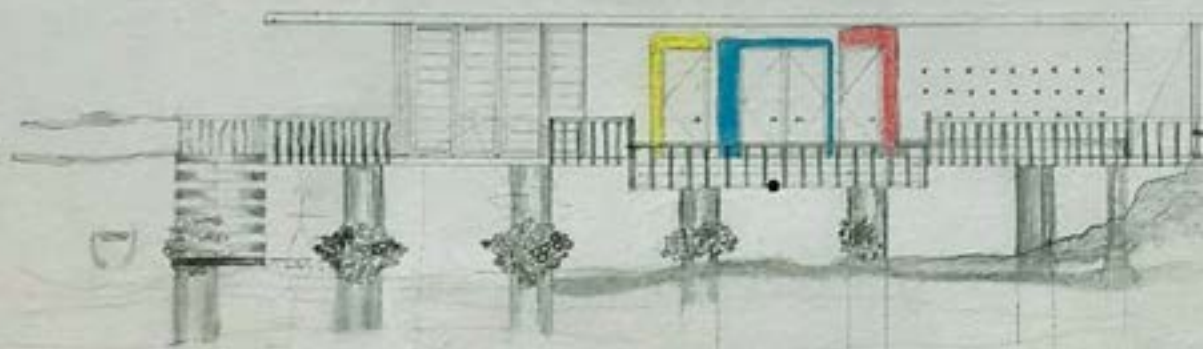


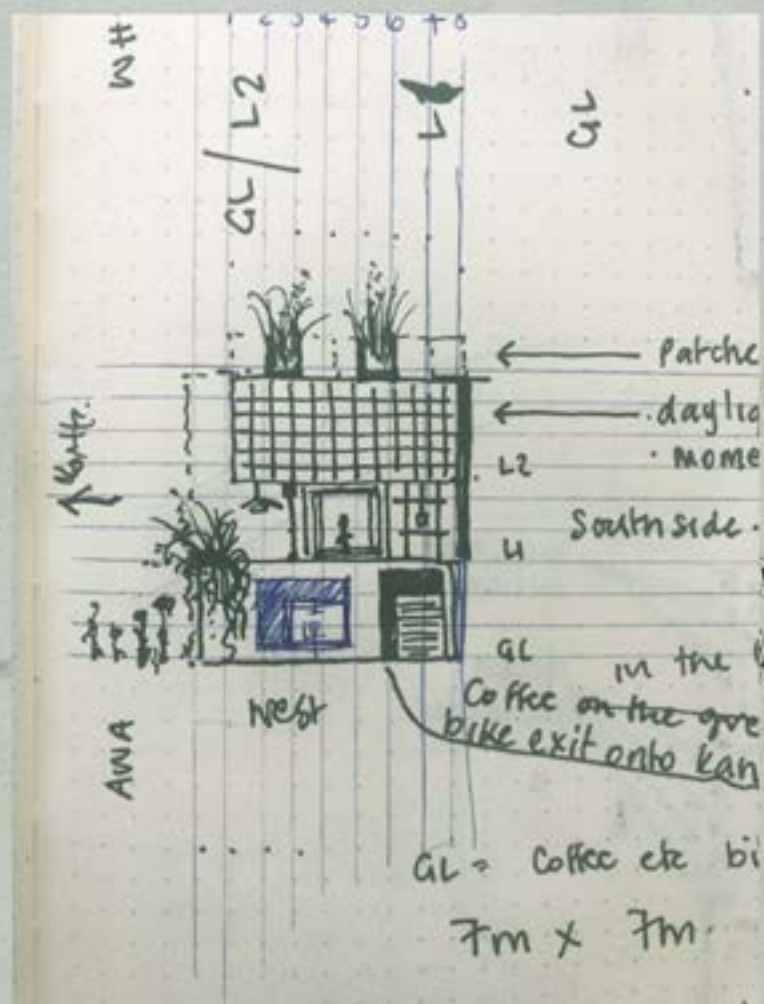
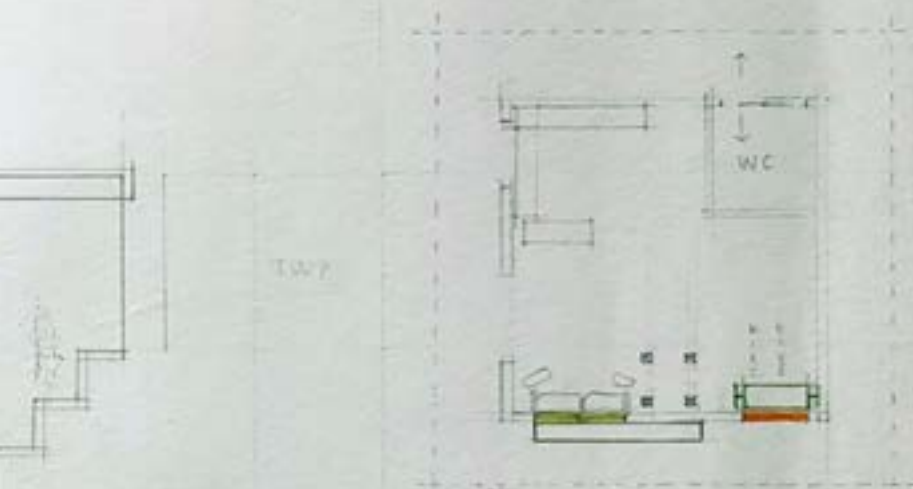
Plans of the Whenua Apparatus

1st
FOREST



Tio, mangroves and
planting in and around
AIO as approach to
regeneration and resiliency







Collaging the Awa

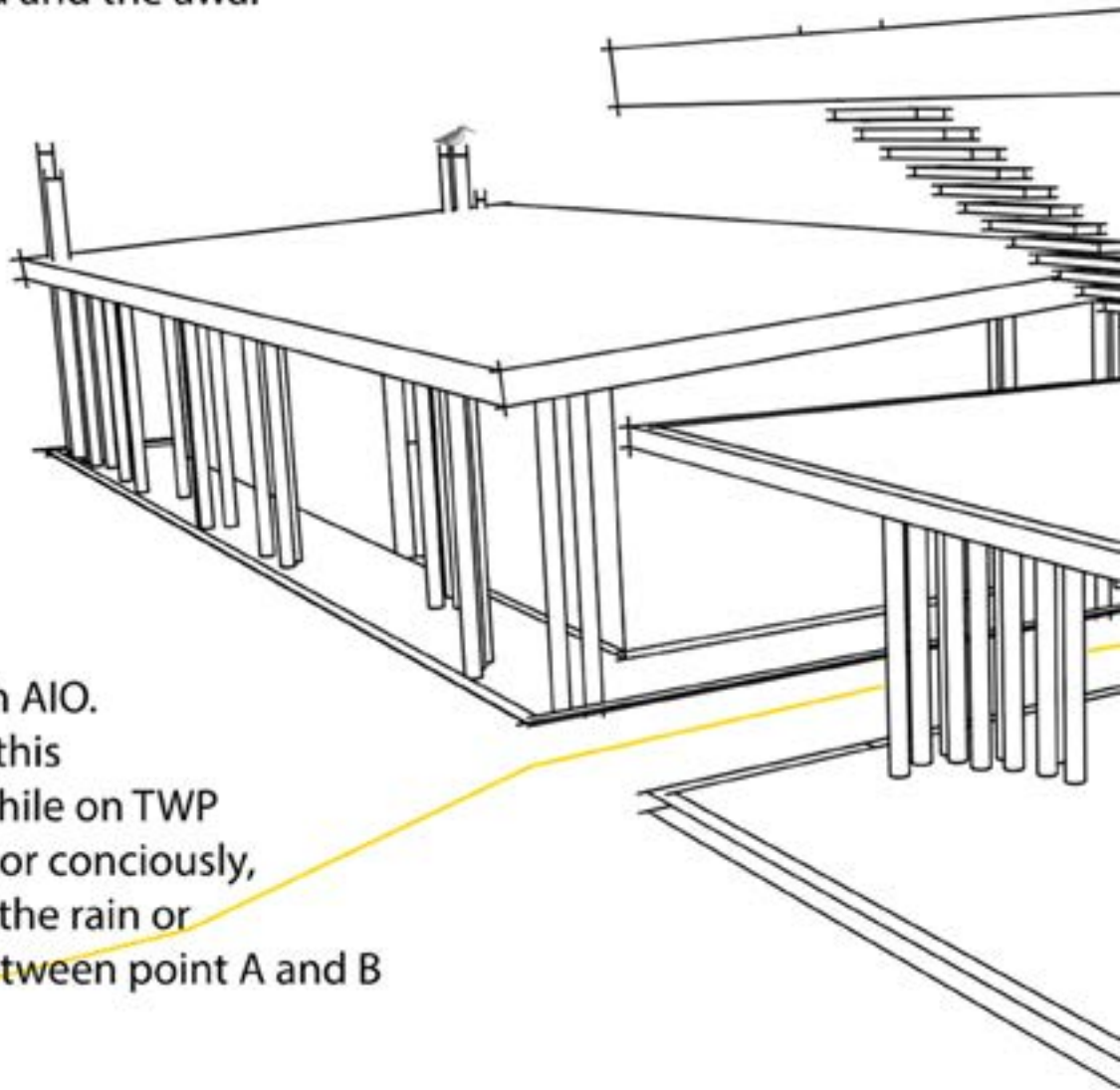


Apparatus

Awa structure
is 3500mm tall with a sloped
roof of 10 degrees, for roof water collection.
It narrows down the South East facade and opens up the
North West facade.

The columns through out the entire structure will be at differing heights and vary
for the preffered perchers.

A naturally ventulated 6m wide x 20m long aparatus
with 2m wide deep eaves and a 2m wide
decking area to circulate around and
interact with the mud and the awa.

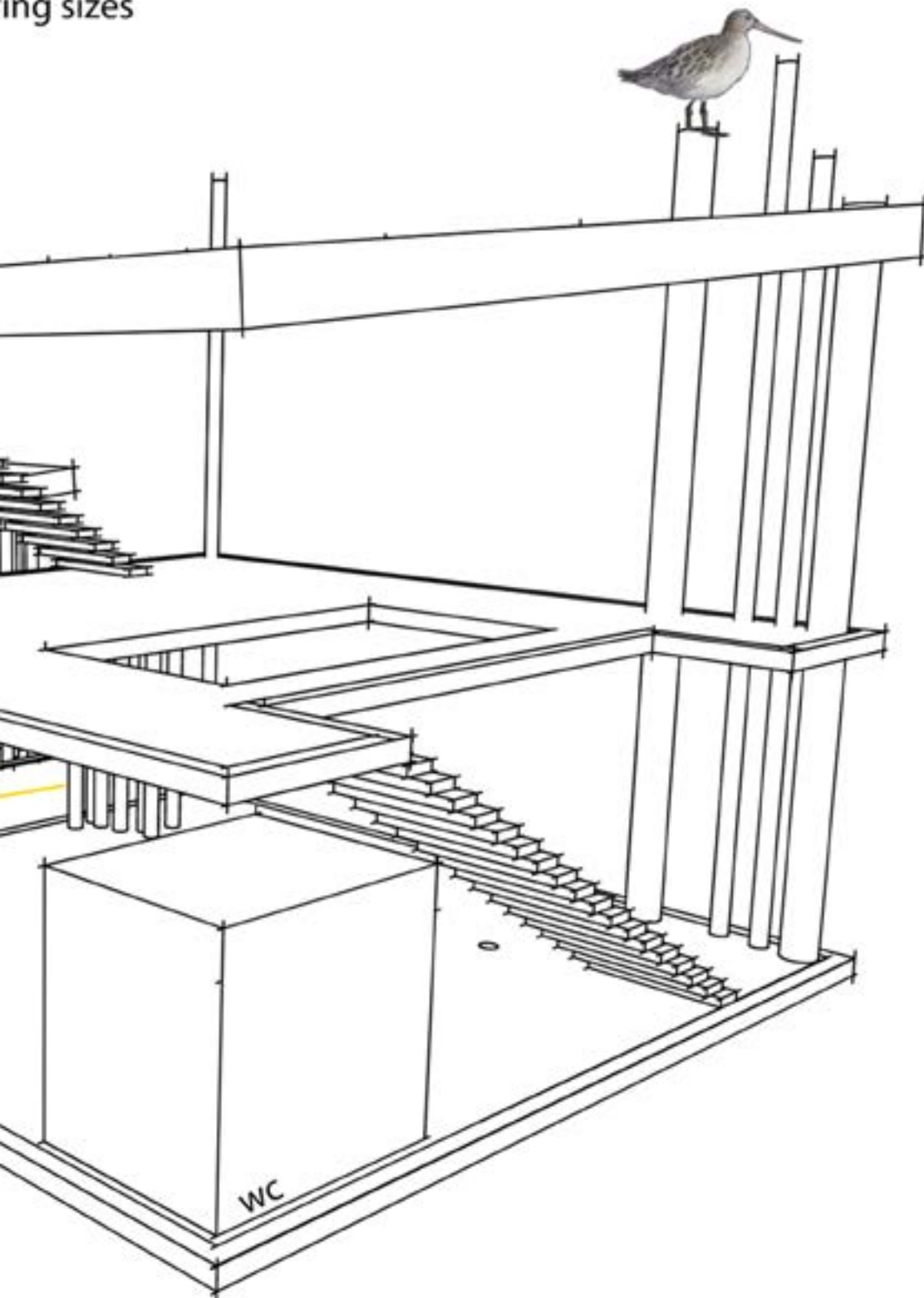


Te Whau Pathway
interacts directly with AIO.
You walk inbetween this
speculative design while on TWP
interacting passively or conciously,
seeking shelter from the rain or
a destination stop between point A and B

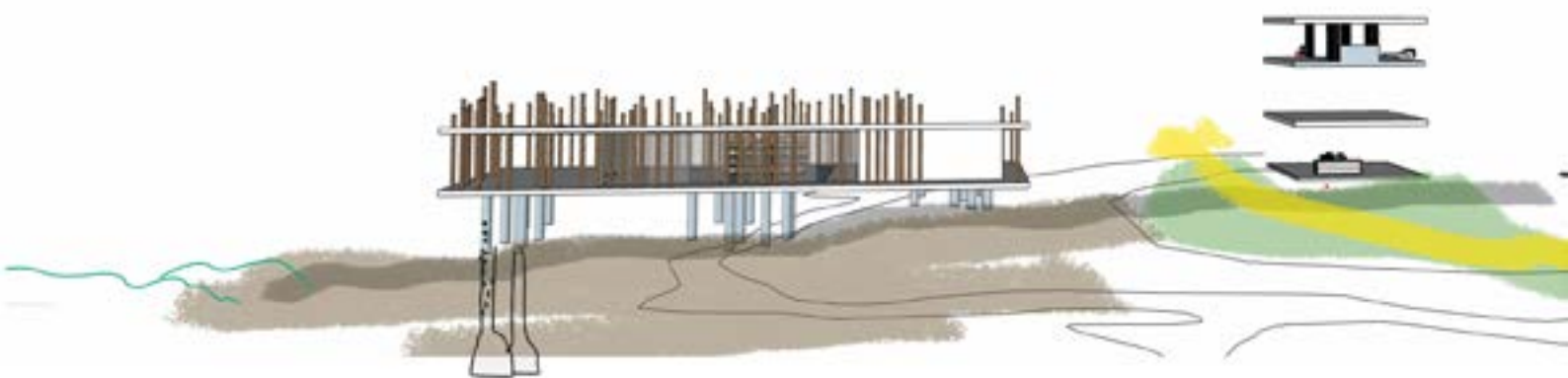
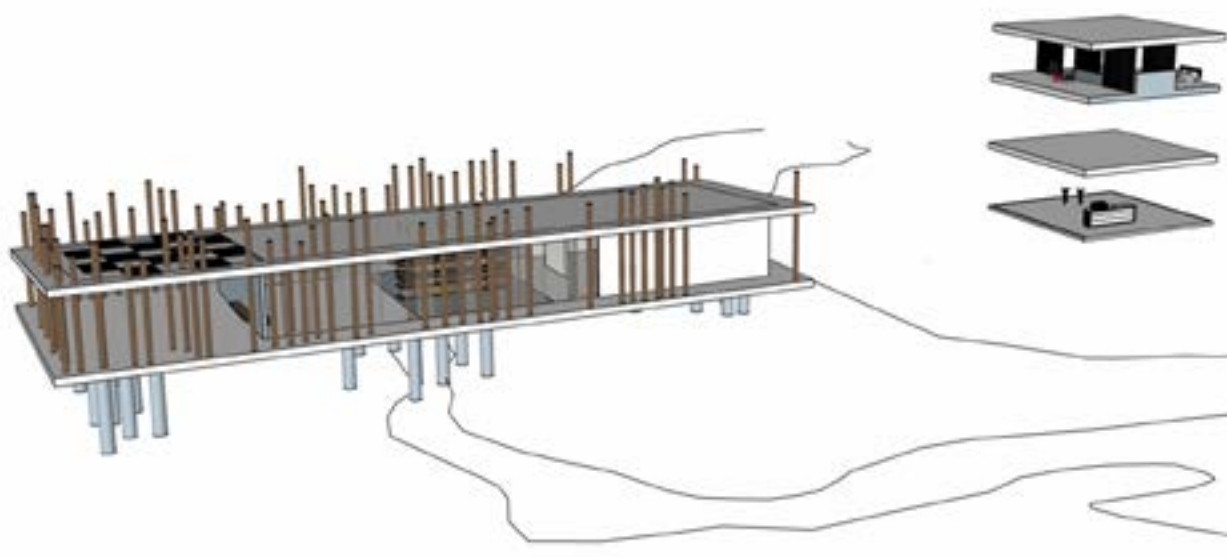
Whenua structure sits 8m tall.
2 levels at 3500mm in height each, to mimic the tallness
of the Whau tree.

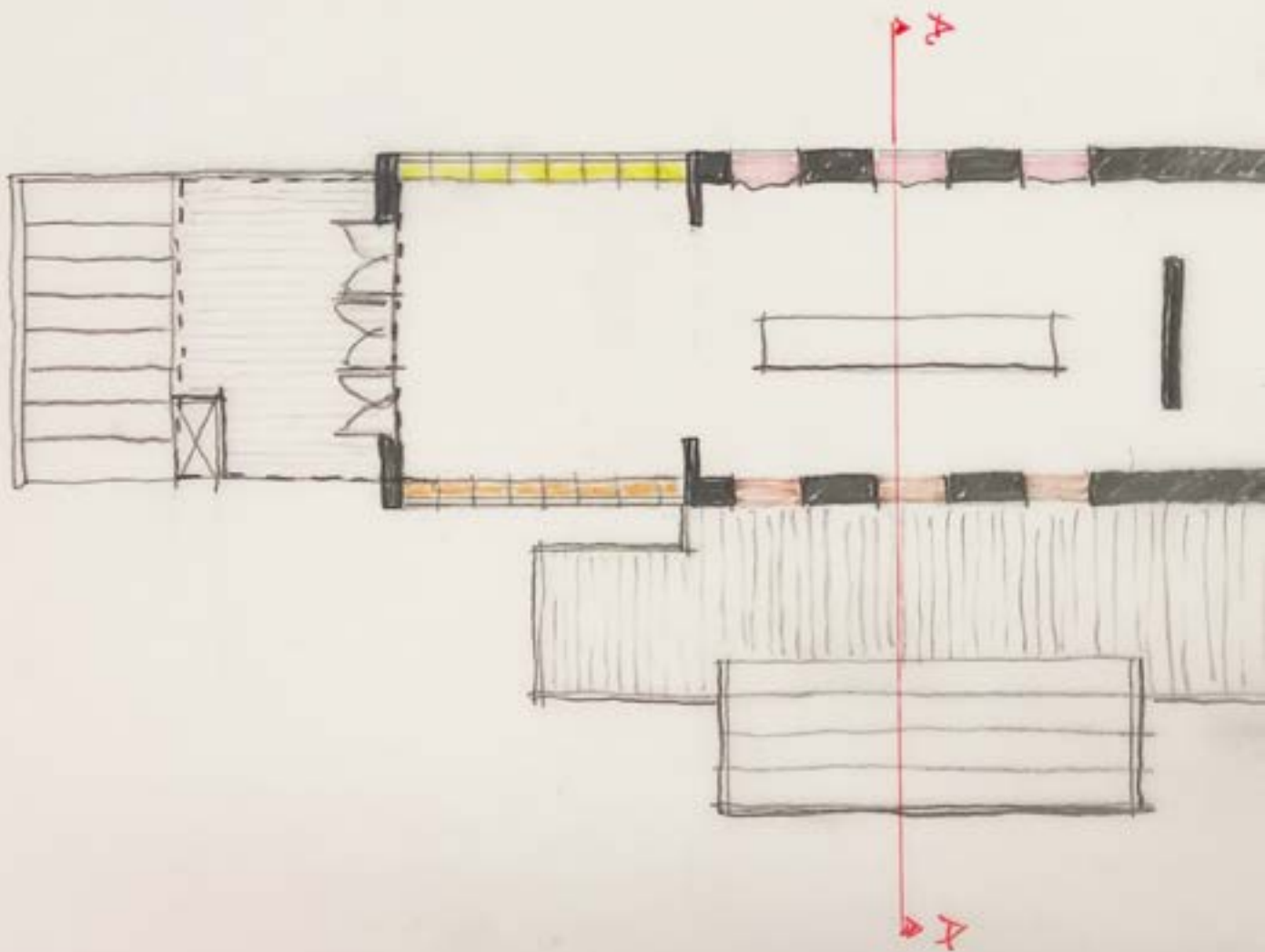
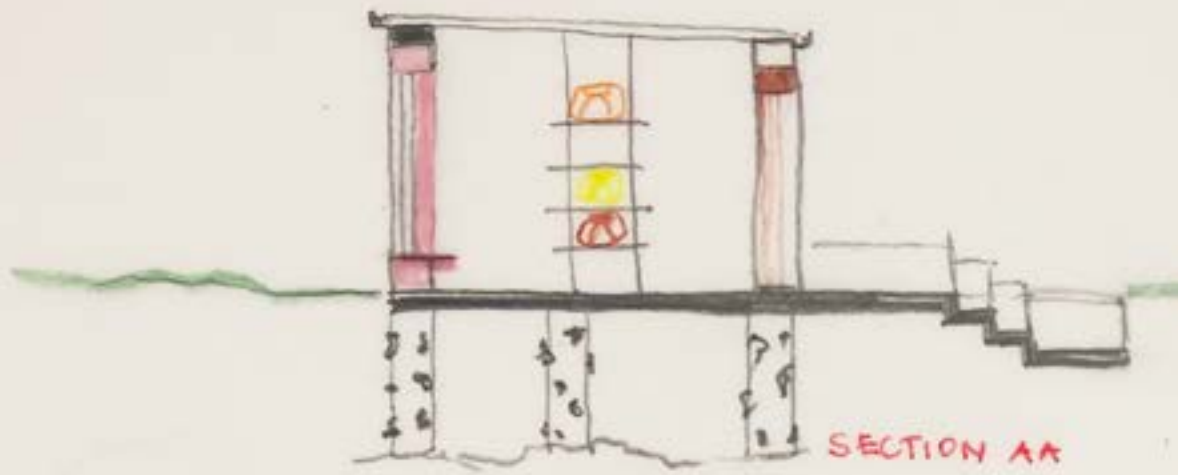
The green roof has a 10 degree slope for water collection and opens up the
north west facade for solar gain.

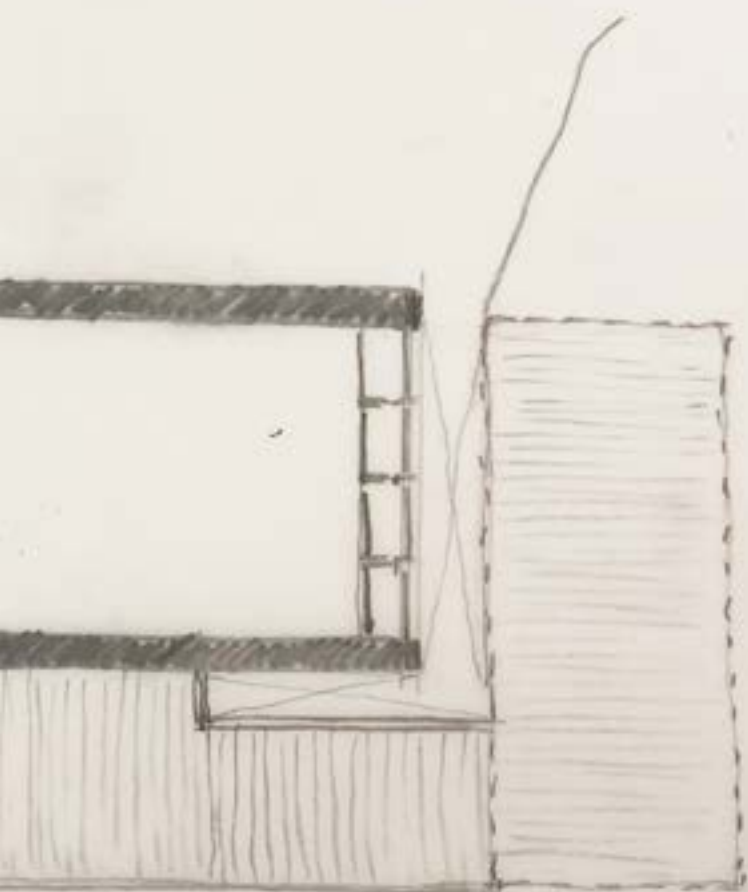
ing sizes



Architectural tectonics







AWA

WHENVA

7.5

6

know to help
kids to keep still
while learning and
adults too 😊
locally made by
local + imported
materials.

pool wall 4m x 8m

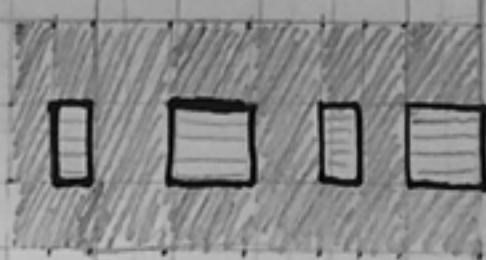
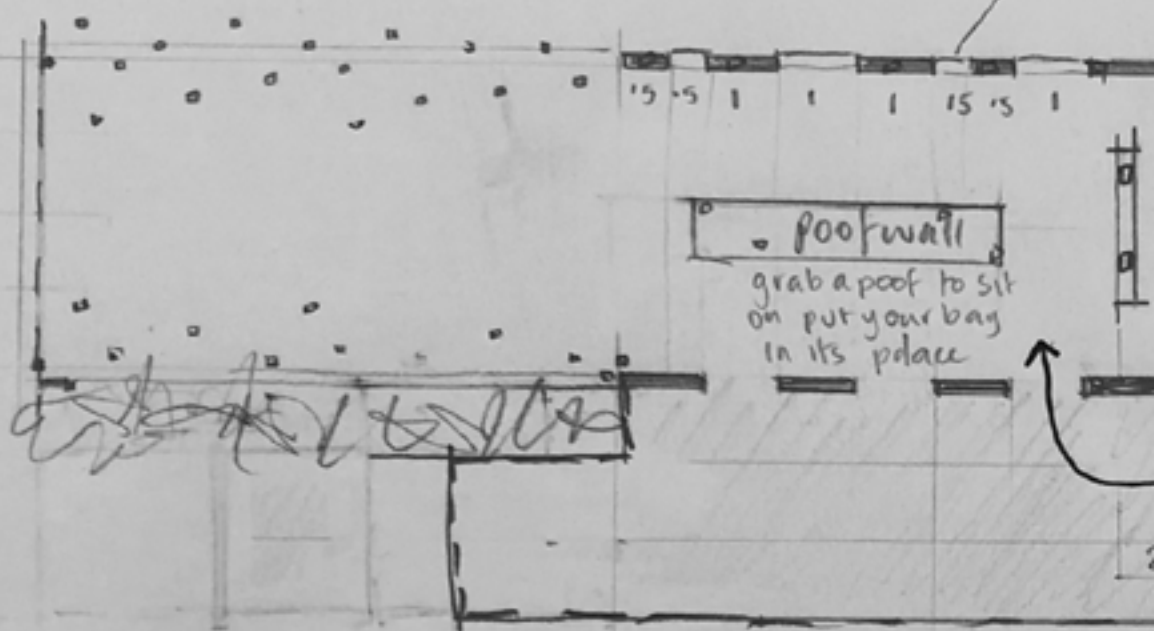
deep sill

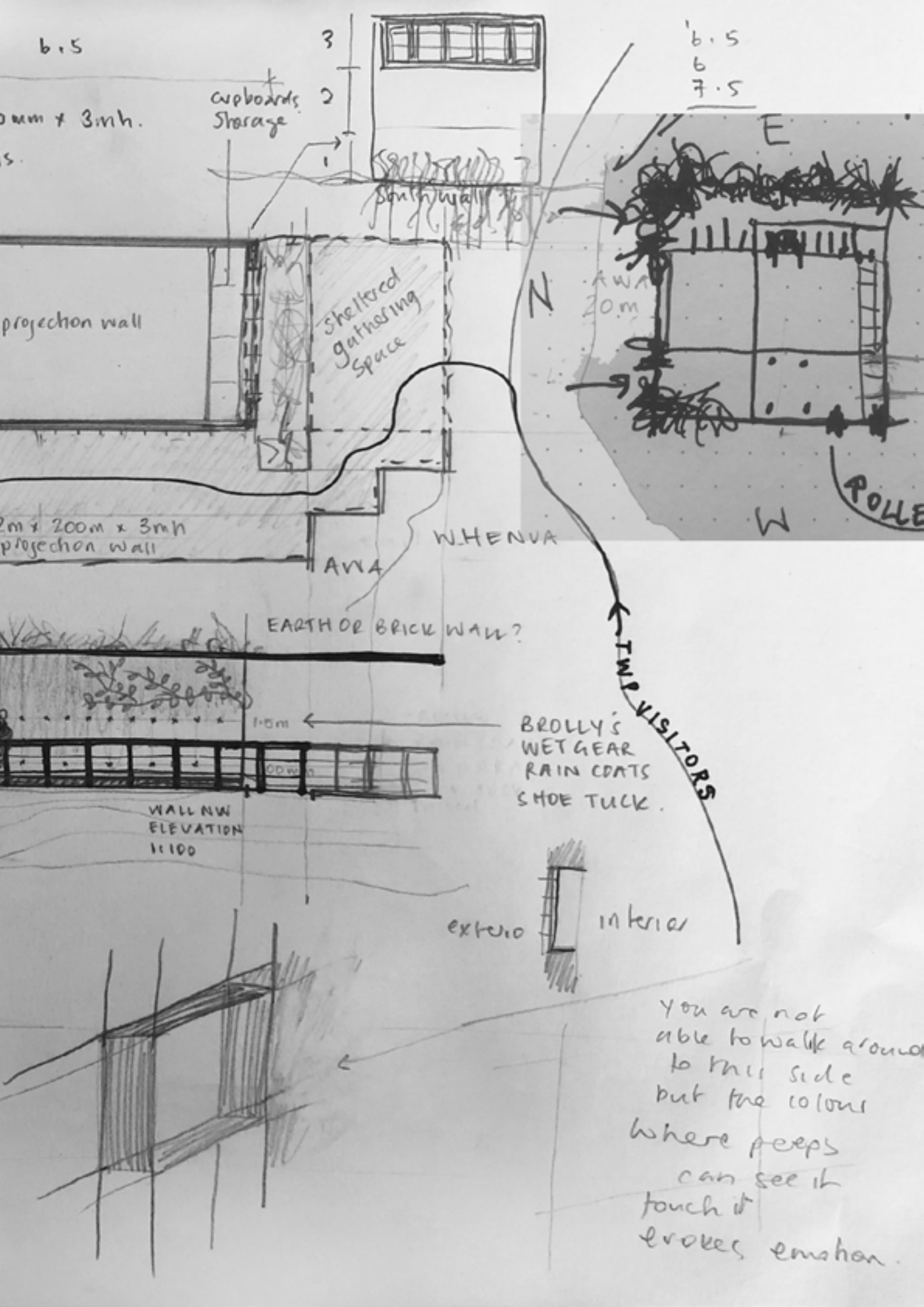
1.5 1 1 1 1.5 1

pool wall

grab a pool to sit
on put your bag
in its place

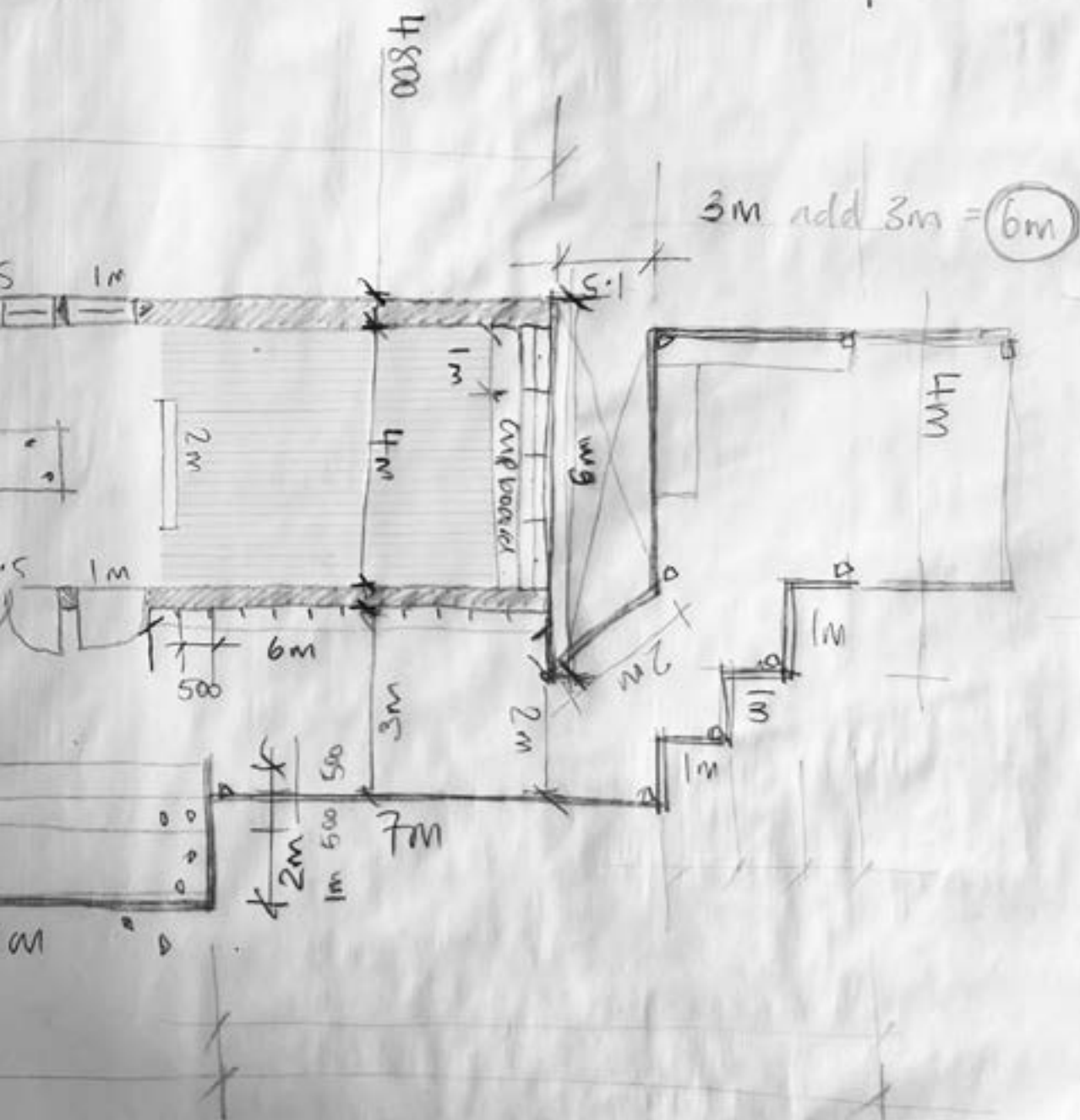
THERMAL
LOUVRE WINDOWS.





4

400
walls
for the
windows
Seats.



AWA APARATUS PLAN 1:100

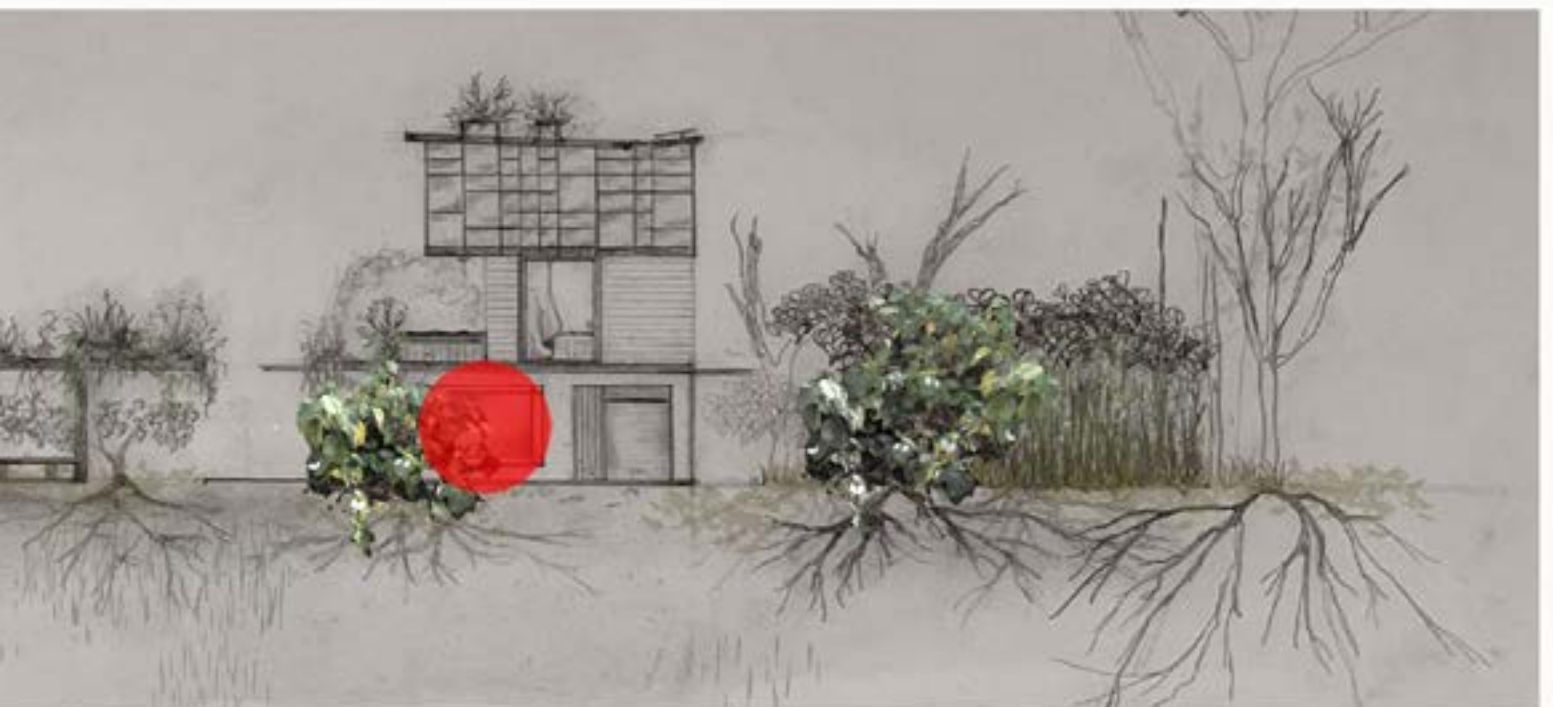
Design explorations

Interior





The wilding of ngahere creeping through thresholds

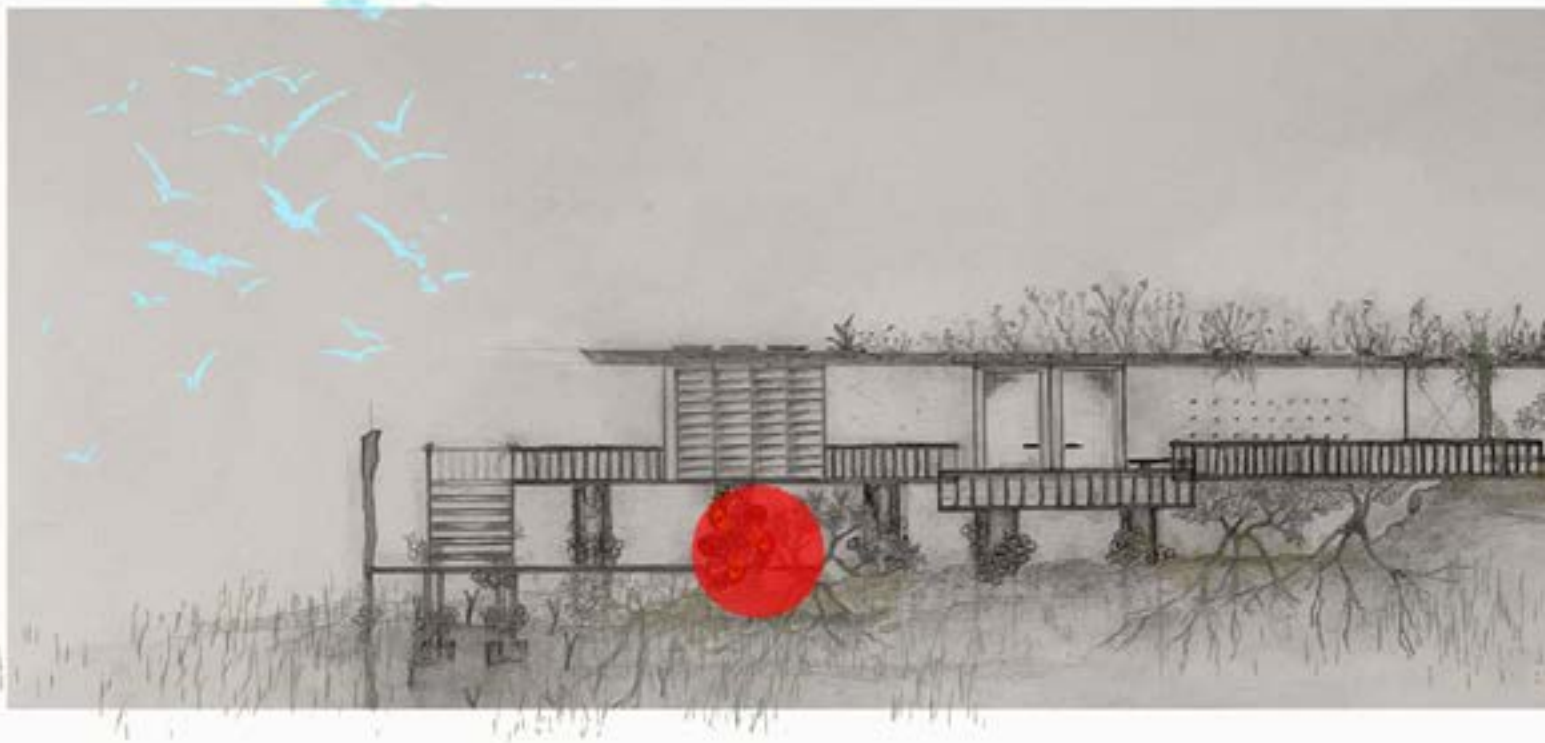




The inbetween space,
the interstice where AIO
connects Te Whau Pathway
to the Awa Apparatus and
the Whenua Apparatus



The piles are the sm
where tio create tio
the apparatus system
of the resiliency of k
sediments and water
the food cycle circu



smooth surface
reefs, part of
m, part
keeping the
er clean and
lating



