

PORTFOLIO

MIKI TILTMAN 美希

SELECTED WORKS ————— 2020-2025

ARCHITECTURE GRADUATE

Hello, I'm MIKI TILTMAN 美希

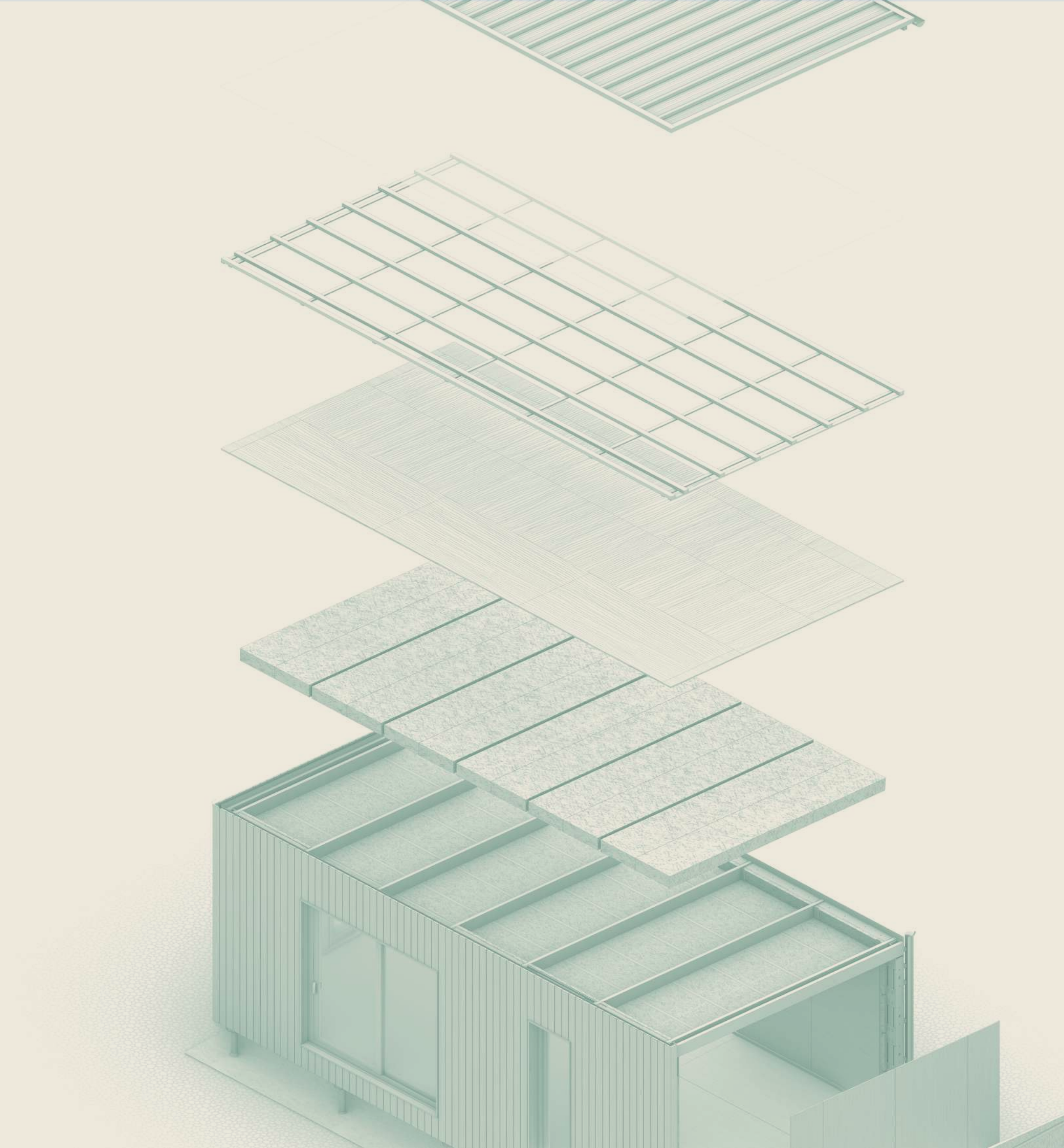
TE HERENGA WAKA, VICTORIA UNIVERSITY OF WELLINGTON, NEW ZEALAND

Bachelor of Architecture
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<https://mikitiltman.myportfolio.com>

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2023 - 2025
Major in Architecture

@miki_create
Aotearoa, New Zealand





Watch for the "why"
behind the thesis!

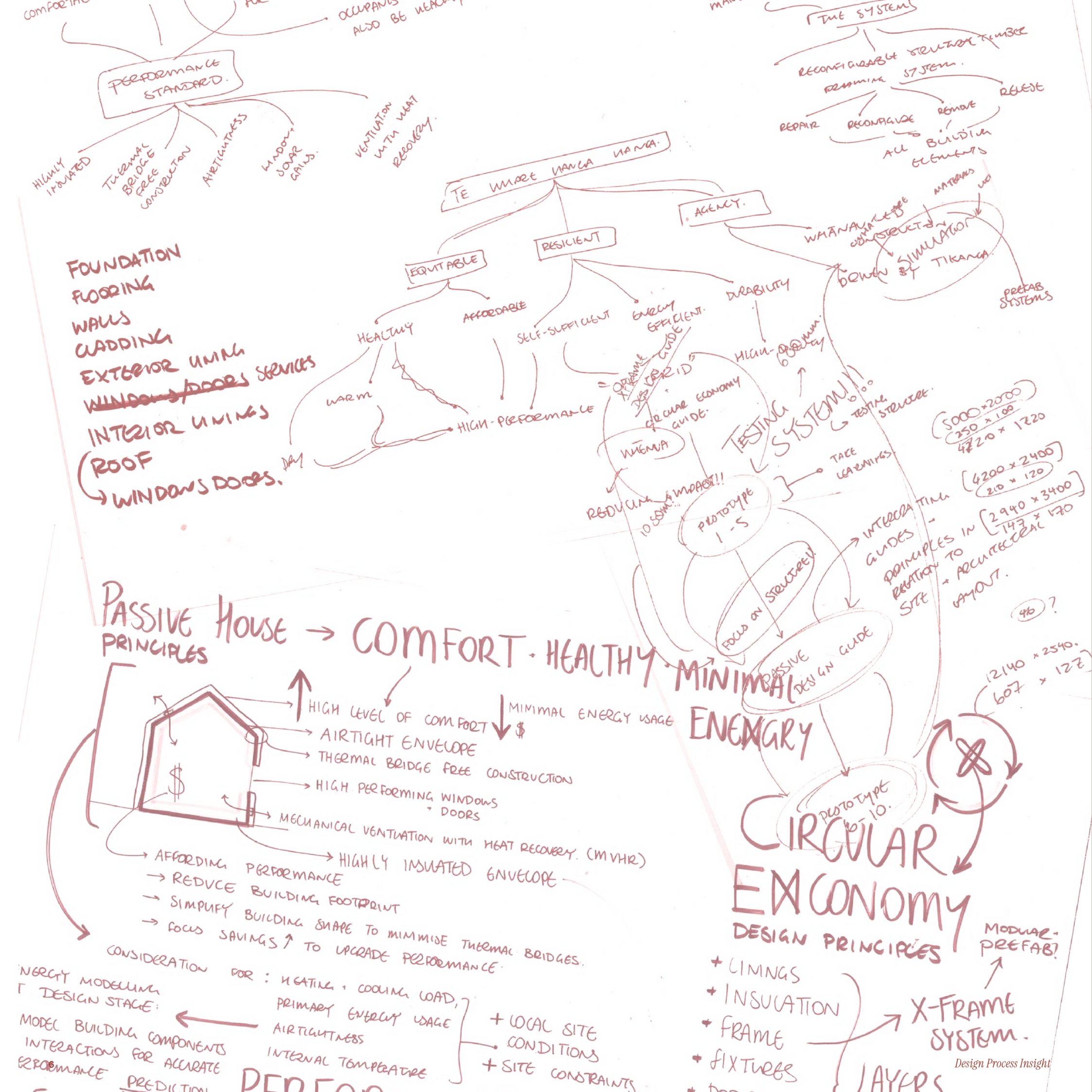
Whānau, Whenua, Whare

Master's Thesis
2024-2025

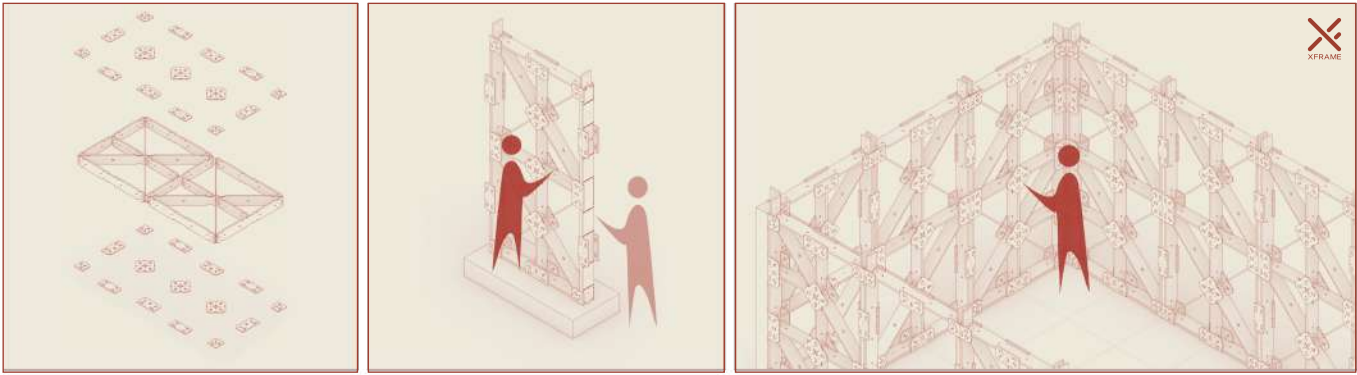
Collaborative Kaupapa with Te Whare Hangahanga + XFrame

The thesis explores the feasibility of prefabricated systems for fast, affordable, and resilient whare construction, guided by Mātauranga Māori values. It focuses on enabling whānau-led, on-site assembly while assessing challenges in system integration and construction methods. Consolidating insights from Passive House principles, CNC-enabled prefabrication, and whānau participation, the research offers a flexible framework for scalable, self-sufficient housing solutions. In collaboration with Te Whare Hangahanga and XFrame, it aims to drive indigenous-led innovation and advance equitable housing solutions.





Master's Thesis
2024-2025

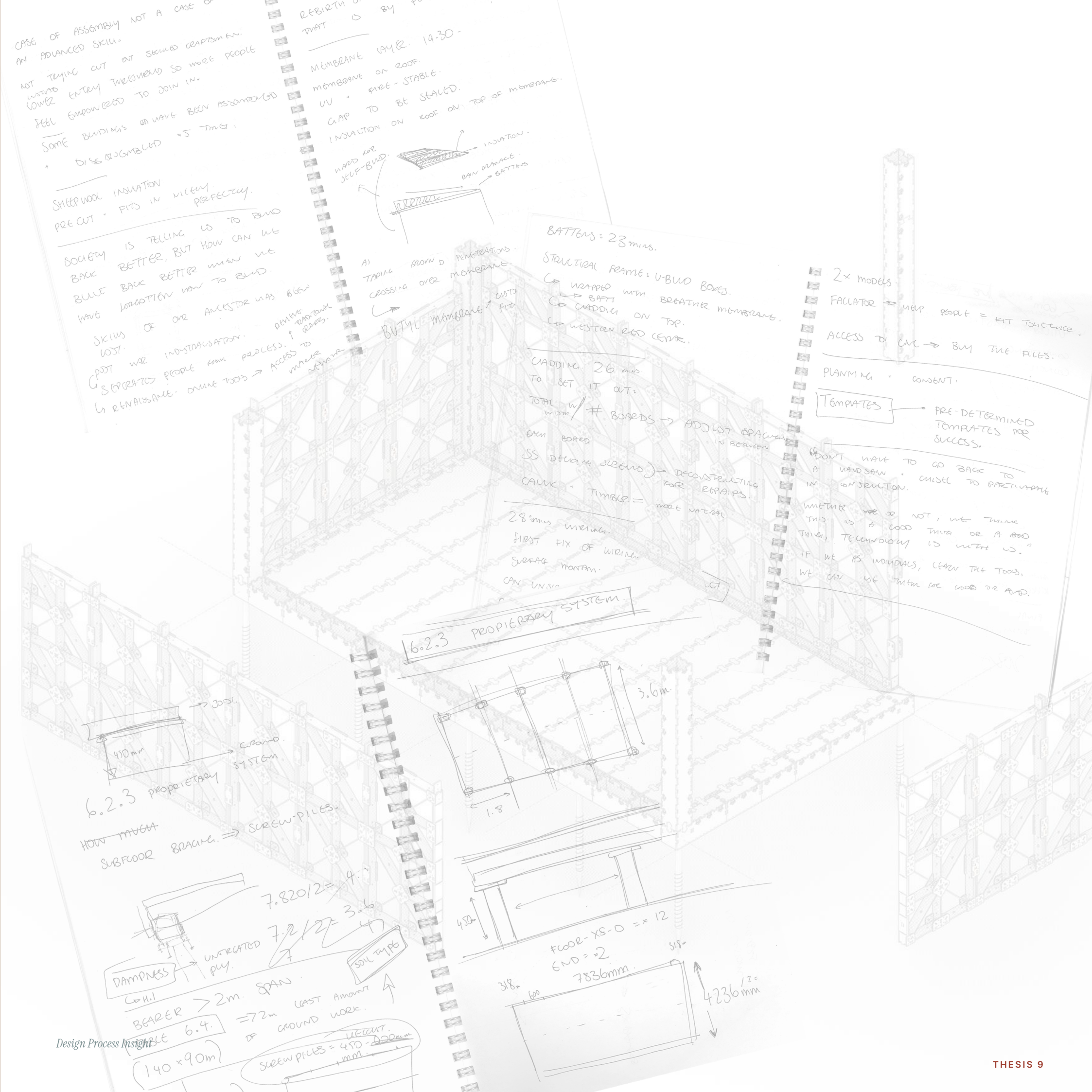


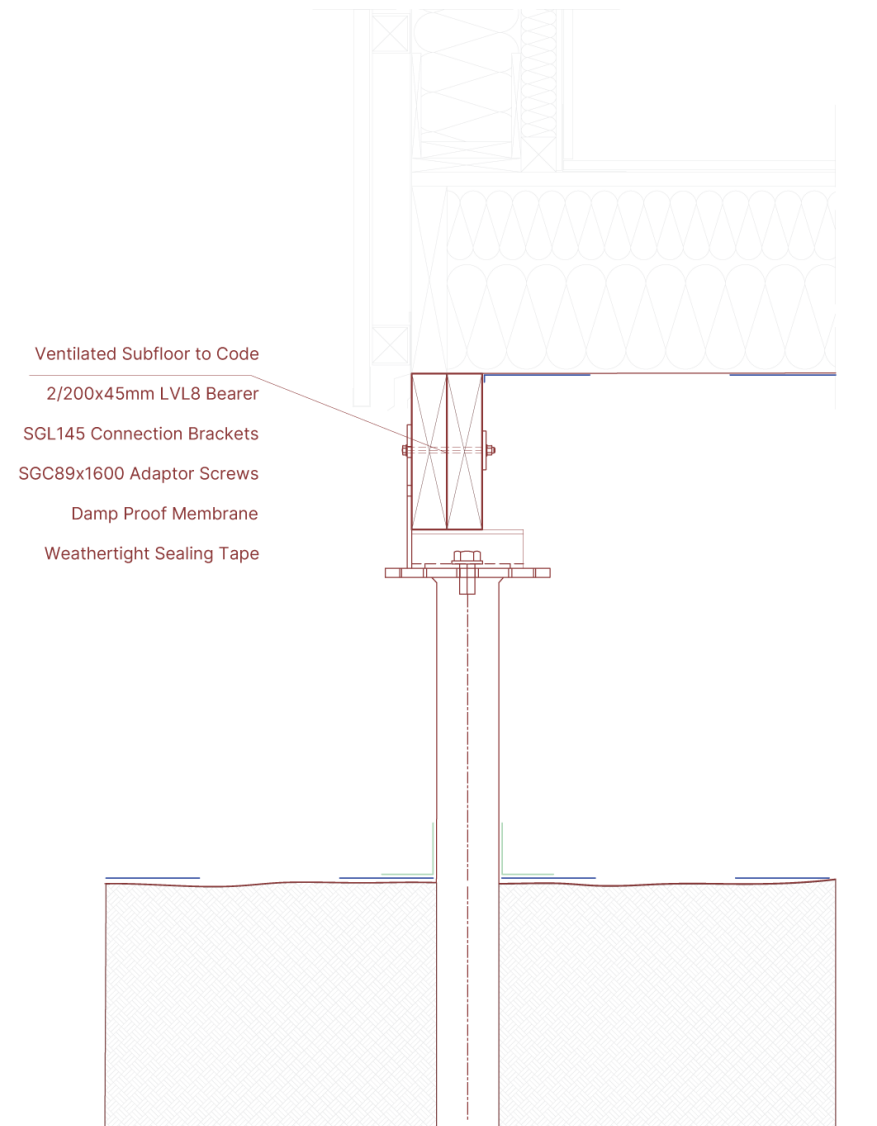
XFrame Wall Panels Facilitating Self-Build

Building on this, the thesis develops a design framework for a 30m² where prototype that responds to systemic challenges—from the housing crisis to environmental concerns for whenua—by embedding Te Whare Hangahanga principles such as Tangata tū, tangata ora, and Tino Rangatiratanga. Emphasising whānau autonomy, sustainability, and resilience, the design cultivates self-build through a simplicity that balances standardisation with flexibility, ensuring every decision supports affordability, durability, and adaptability. Integrating Passive House and Circular Economy principles, it delivers high performance, energy efficiency, and environmental responsibility while navigating trade-offs between cost, materials, and ease of assembly. The research outputs include a prefabrication system, a guidebook, and insights into whānau-led construction, providing a scalable, practical solution that redefines housing as a pathway to resilience, equity, and a future papakāinga vision.

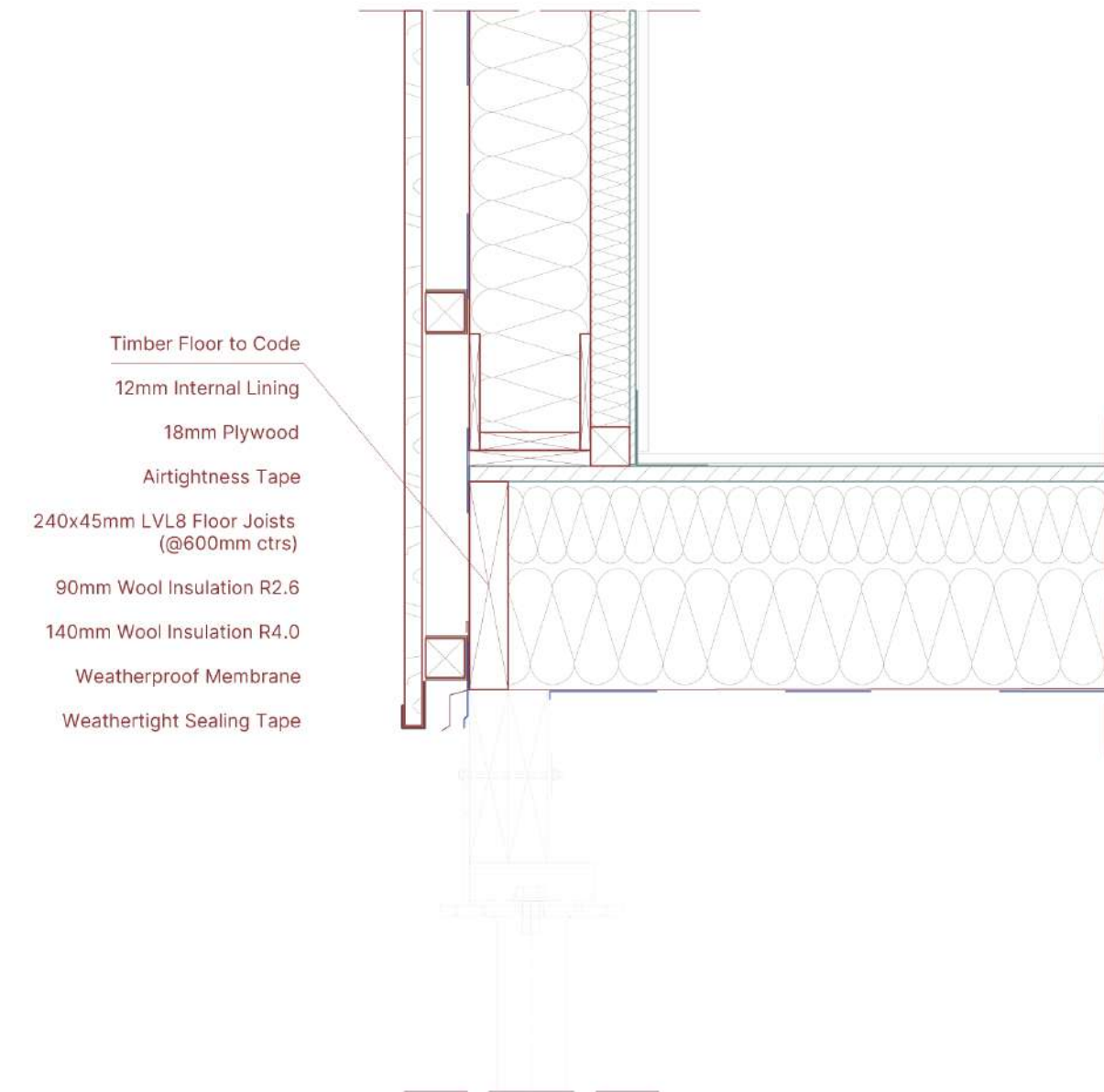
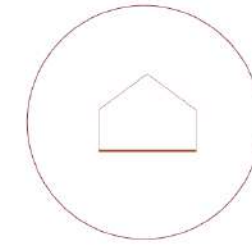


Where Prototype in Site Context

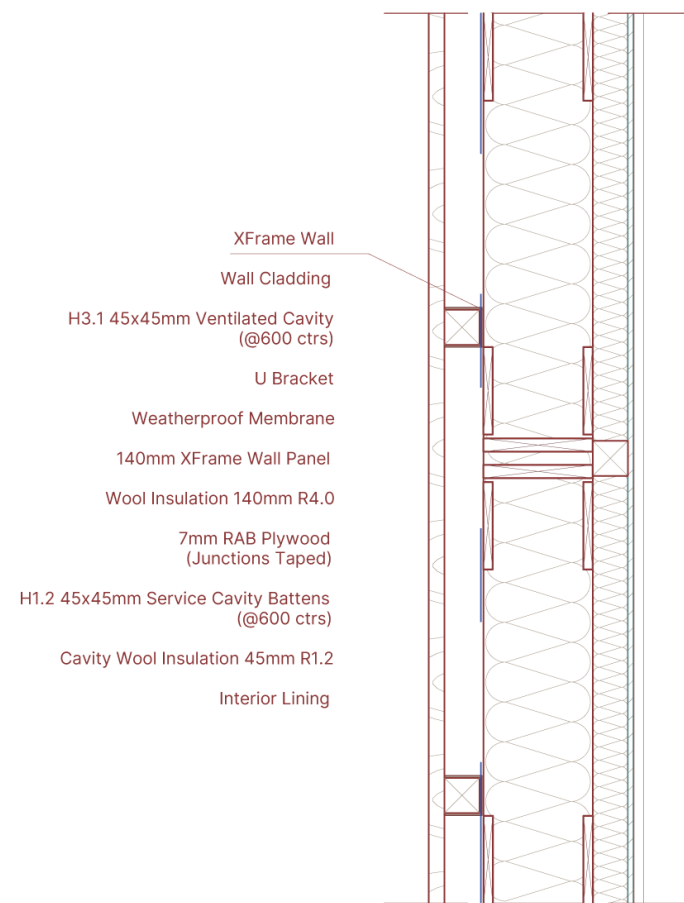
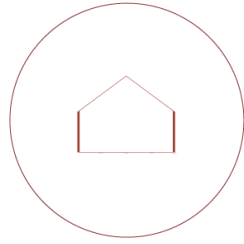




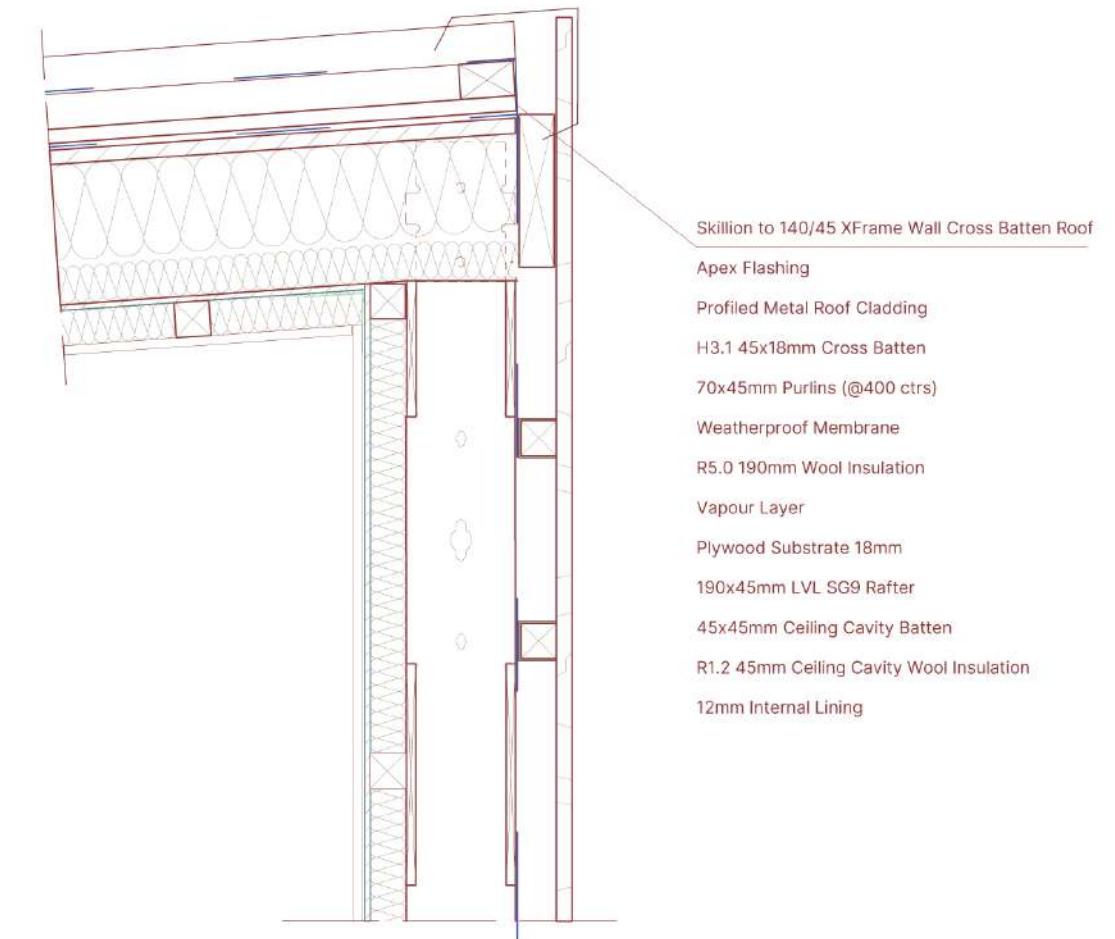
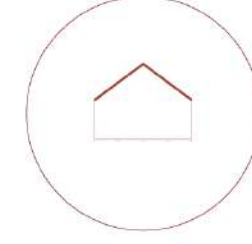
Foundation Detail



Floor Detail



Wall Construction Detail



Roof Apex Detail



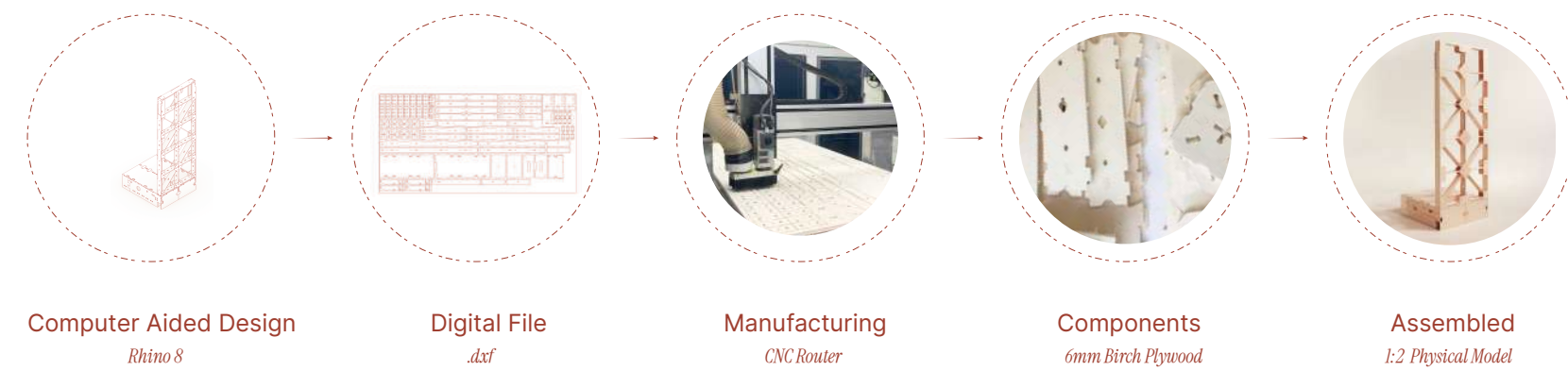
Whare Prototype Detailed Section



Whare Prototype Papakāinga Potential



Whare Prototype Interior



Adopted Digital Workflow



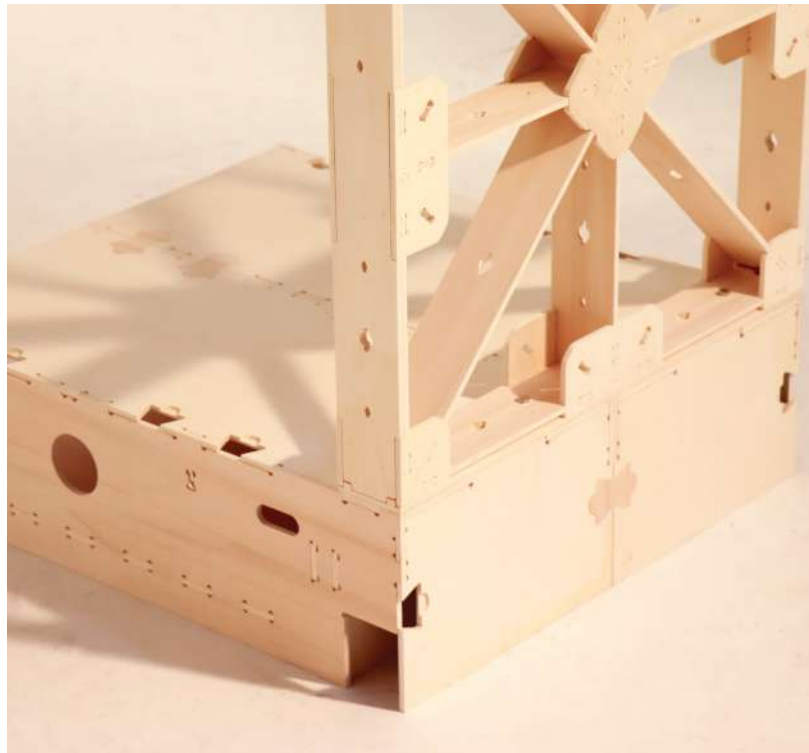
1:2 Physical Model
WikiHouse Floor Block (SKYLARK250-XS) +
XFrame Wall (2700mm)
Prefabricated Plywood System Test



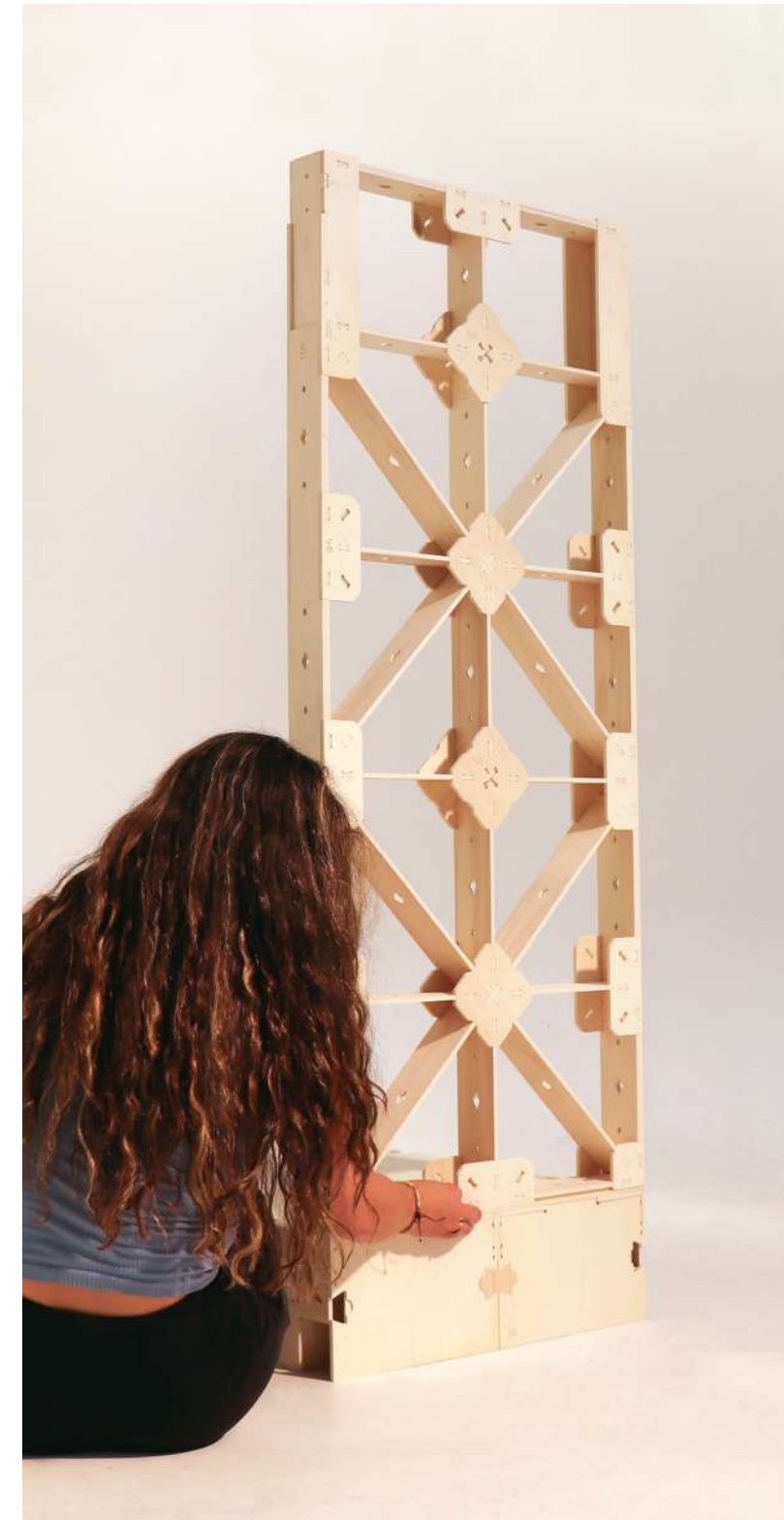
Plywood Components



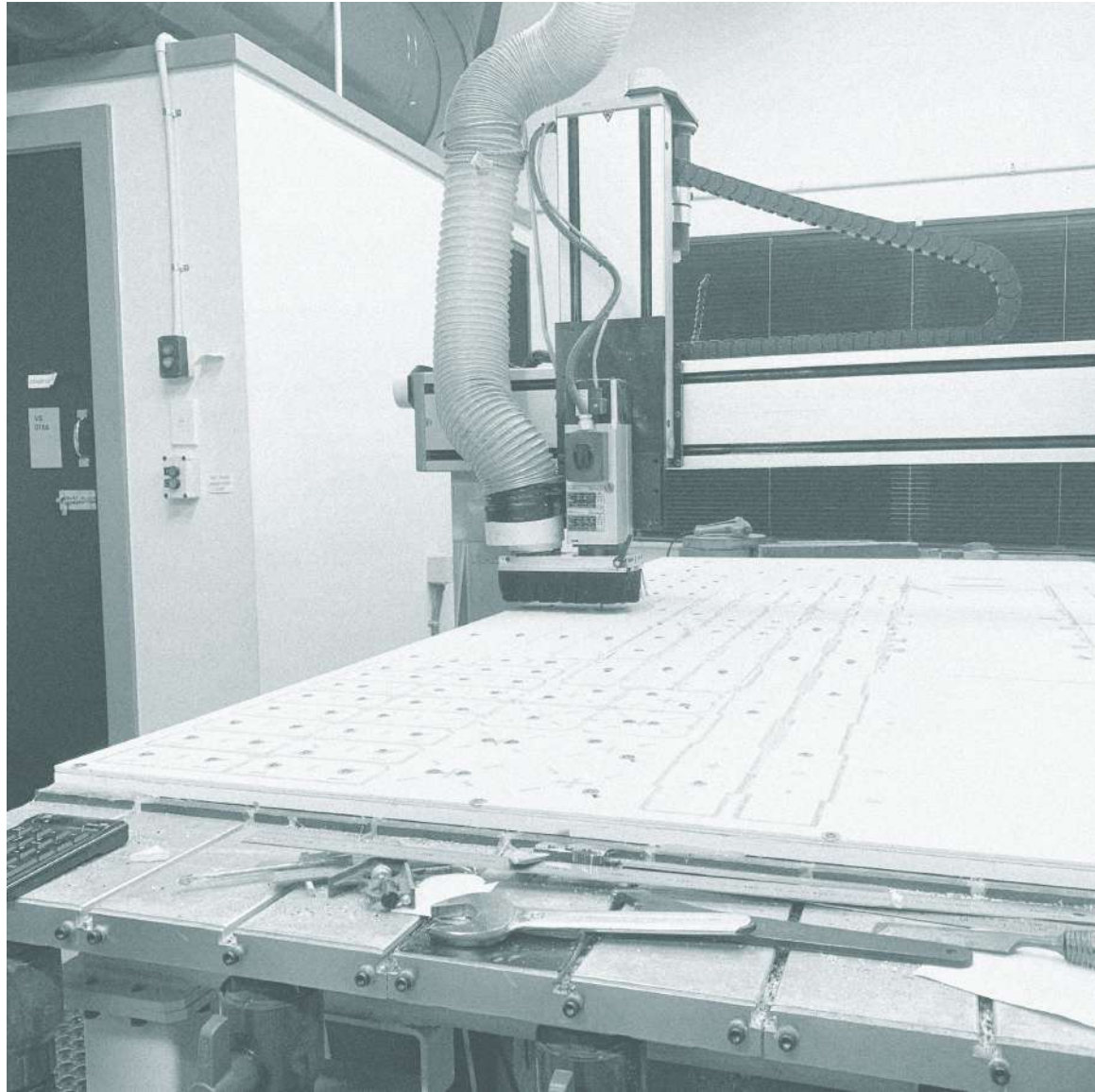
Model Close-Up Details



Model Details



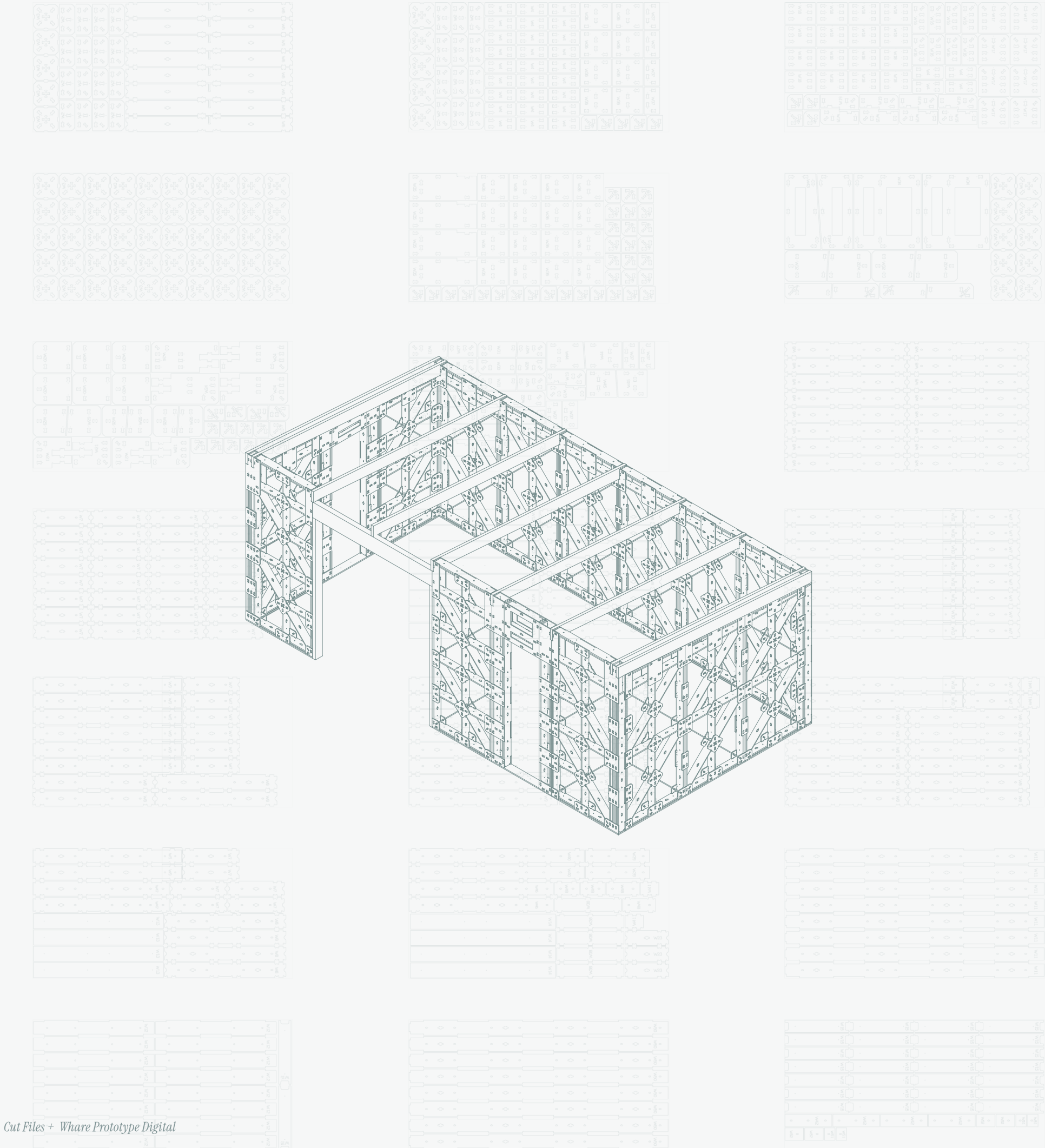
XFrame + WikiHouse 1:2 Partial Physical Model



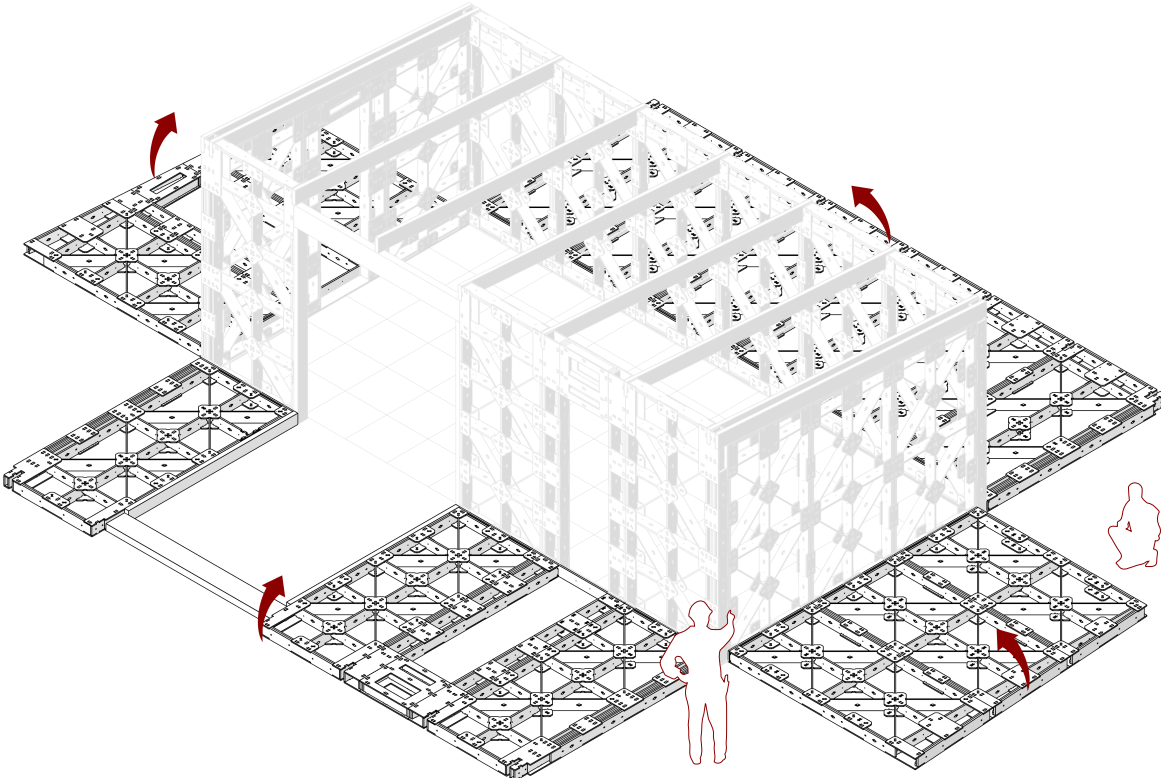
CNC Router



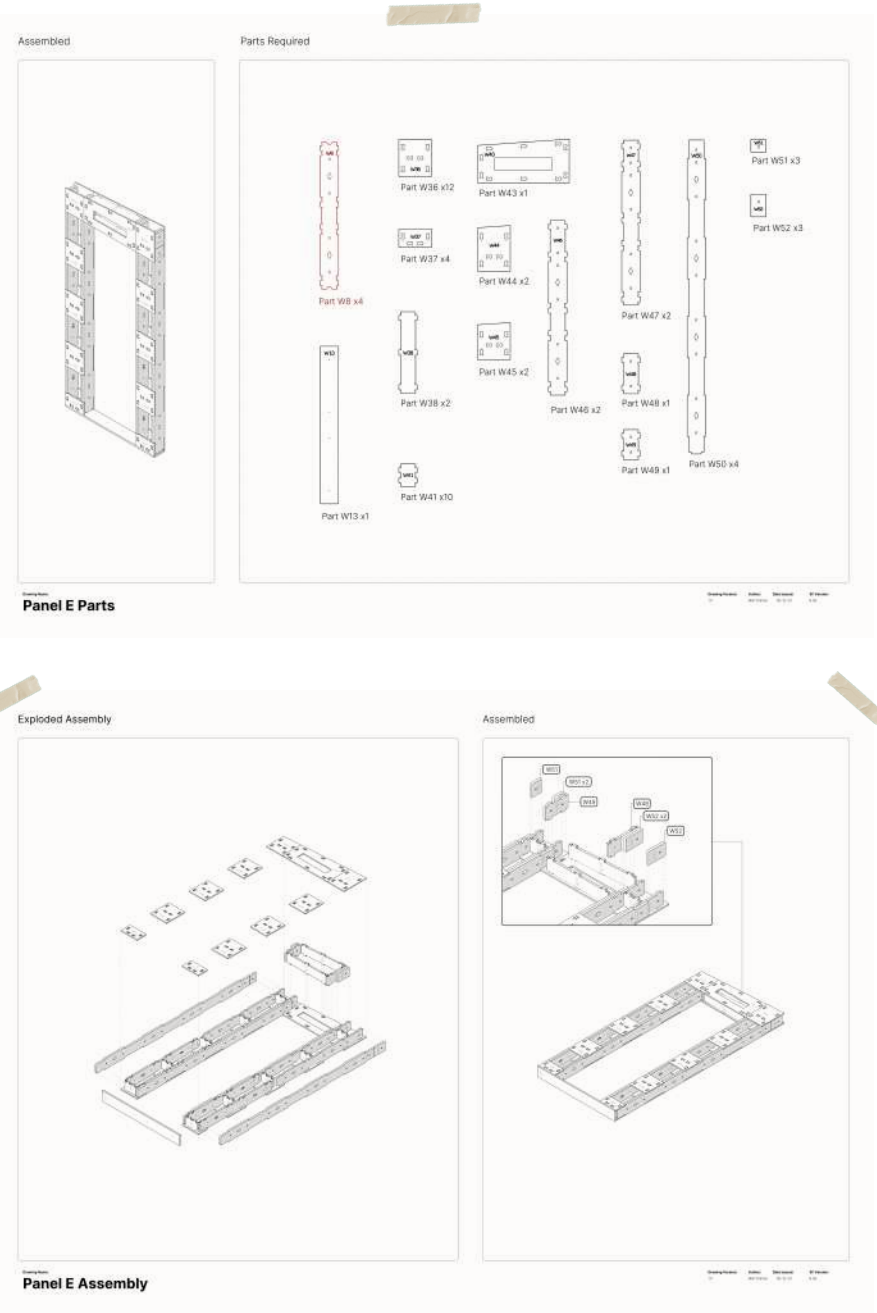
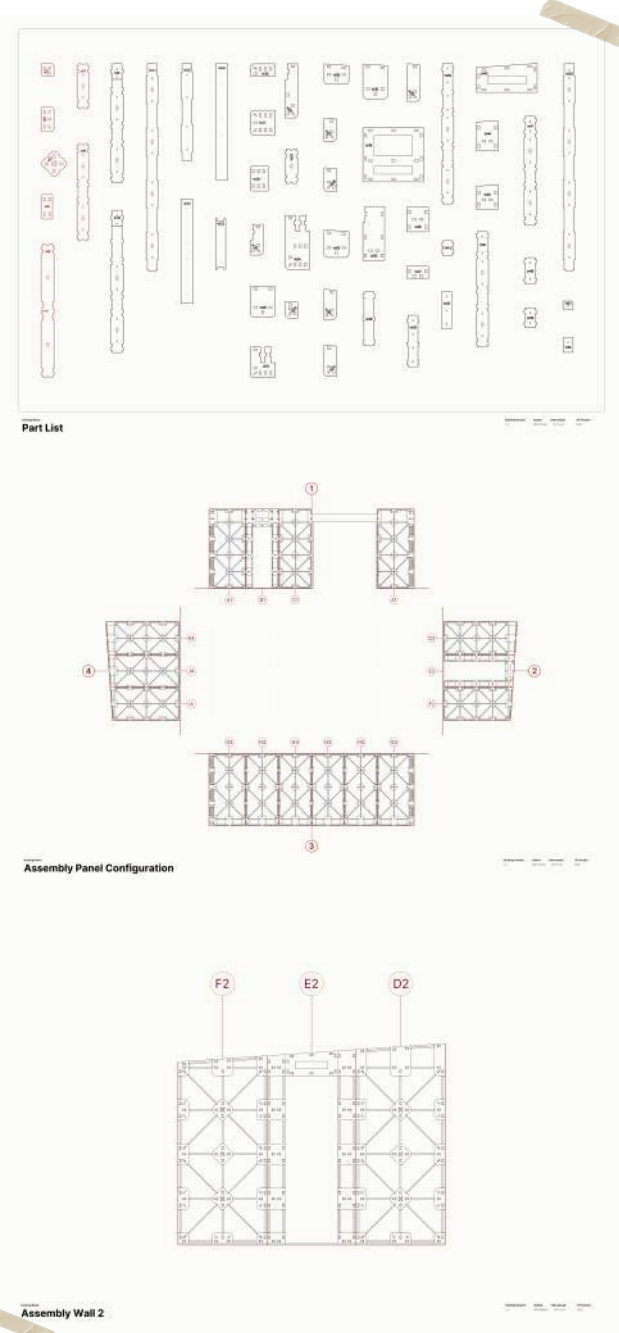
Developing the cut files was a crucial part of the thesis, deepening my understanding of digital manufacturing while developing the whare prototype and custom XFrame components. I worked directly with XFrame to refine the digital model, organising the pieces into sheets for efficient CNC cutting. These cut files were then sent to Te Whare Hangahanga, enabling them to fabricate and assemble the structure themselves. This process led me to create assembly instructions for the XFrame panels, requiring careful consideration of user experience and the clearest way to communicate each step. Through this, I gained valuable insights into the importance of simplifying complex construction processes for self-builders.



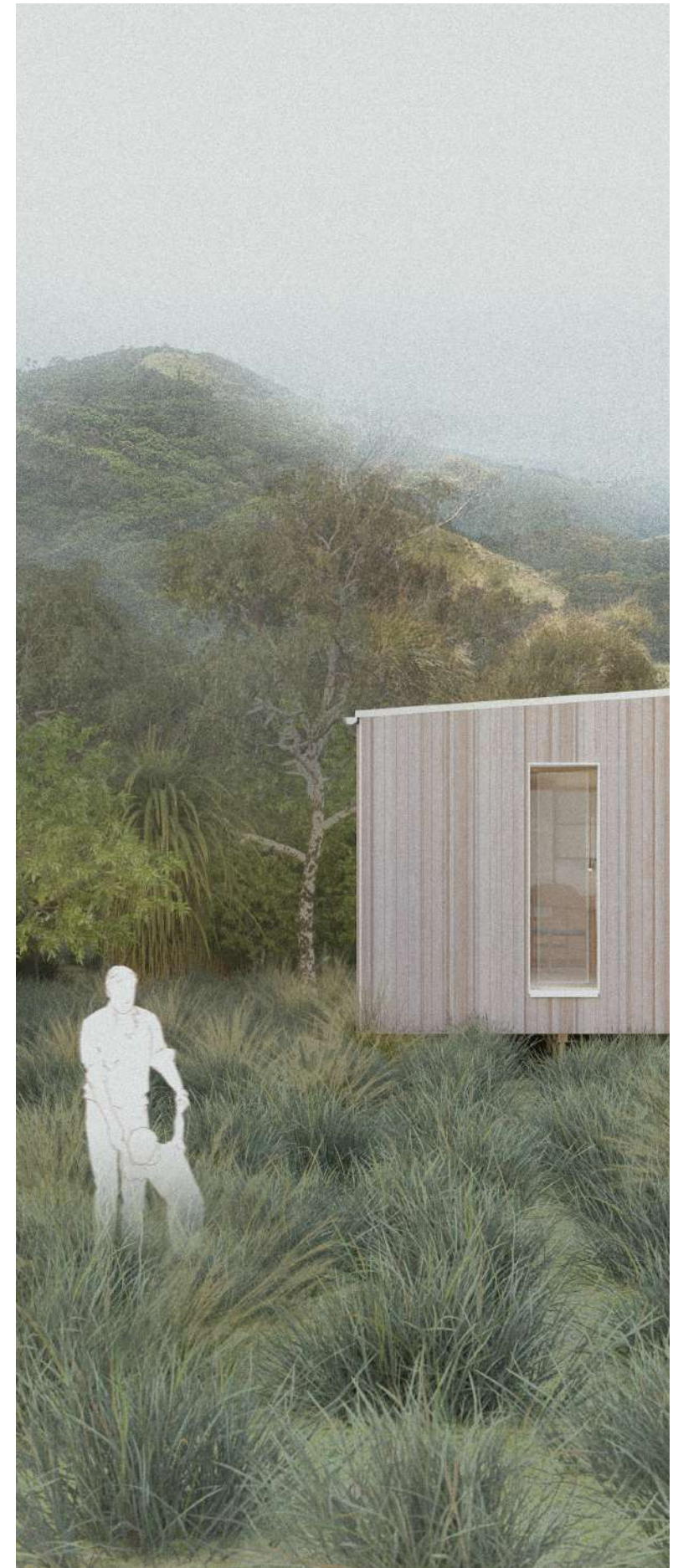
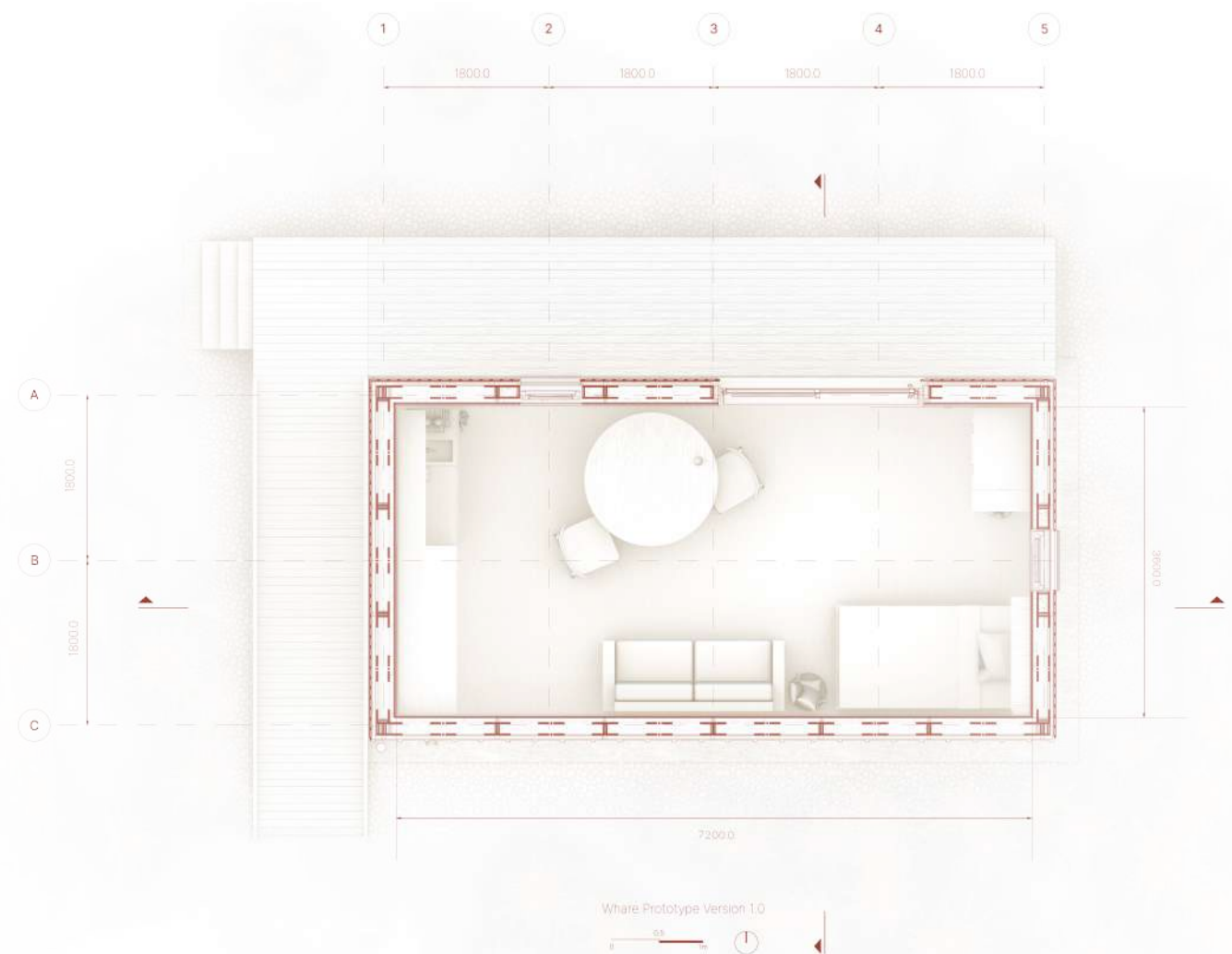
Cut Files + Whare Prototype Digital



XFrame Wall Panel Proprietary Assembly Drawings



XFrame Wall Panel Assembly Drawings

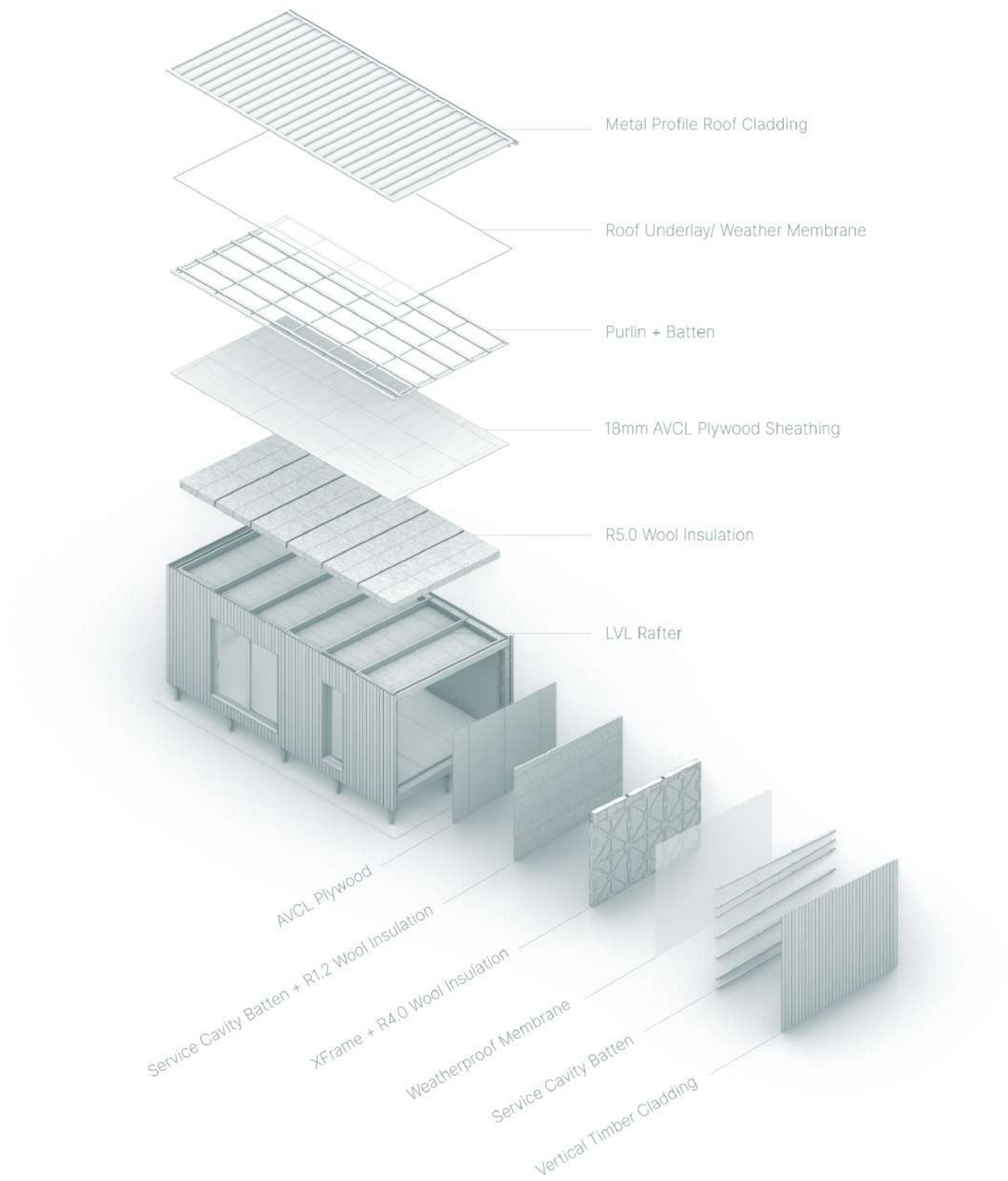


Whare Prototype Exterior in Site Context



Construction Layers Detailed Close-Up

Exploring Passive House principles was key to validating the whare prototype design, testing different layers in PHPP to assess performance. At the same time, the self-build aspect required evaluating construction methods that balance ease of assembly with sustainability and efficiency. There was no single perfect solution—each approach had trade-offs. Throughout this process, it was essential to reflect on Te Whare Hangahanga's driving principles and requirements, ensuring that the design remained aligned with their vision for equitable, resilient, and autonomous housing. This experience reinforced the importance of adaptability, ensuring both performance and buildability meet the needs of whānau-led construction.



Roof + Wall Construction Performance Layers



Cladding Install

Outer Envelope



Weather Resistive Wrap around structure



Fix U-Brackets @ 600 centres through Wrap to XFrame Wall Panels



Fix 45×45mm Ventilated Cavity Battens



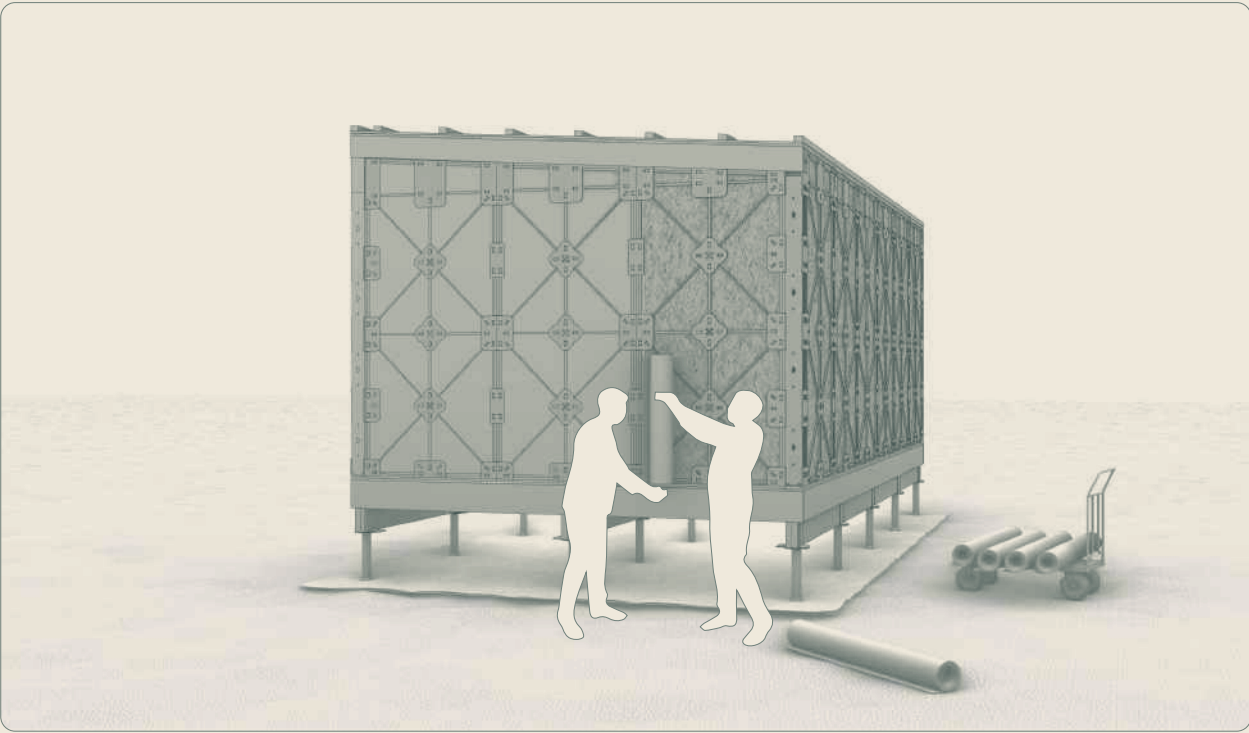
Fix Vertical Cladding to Cavity Battens



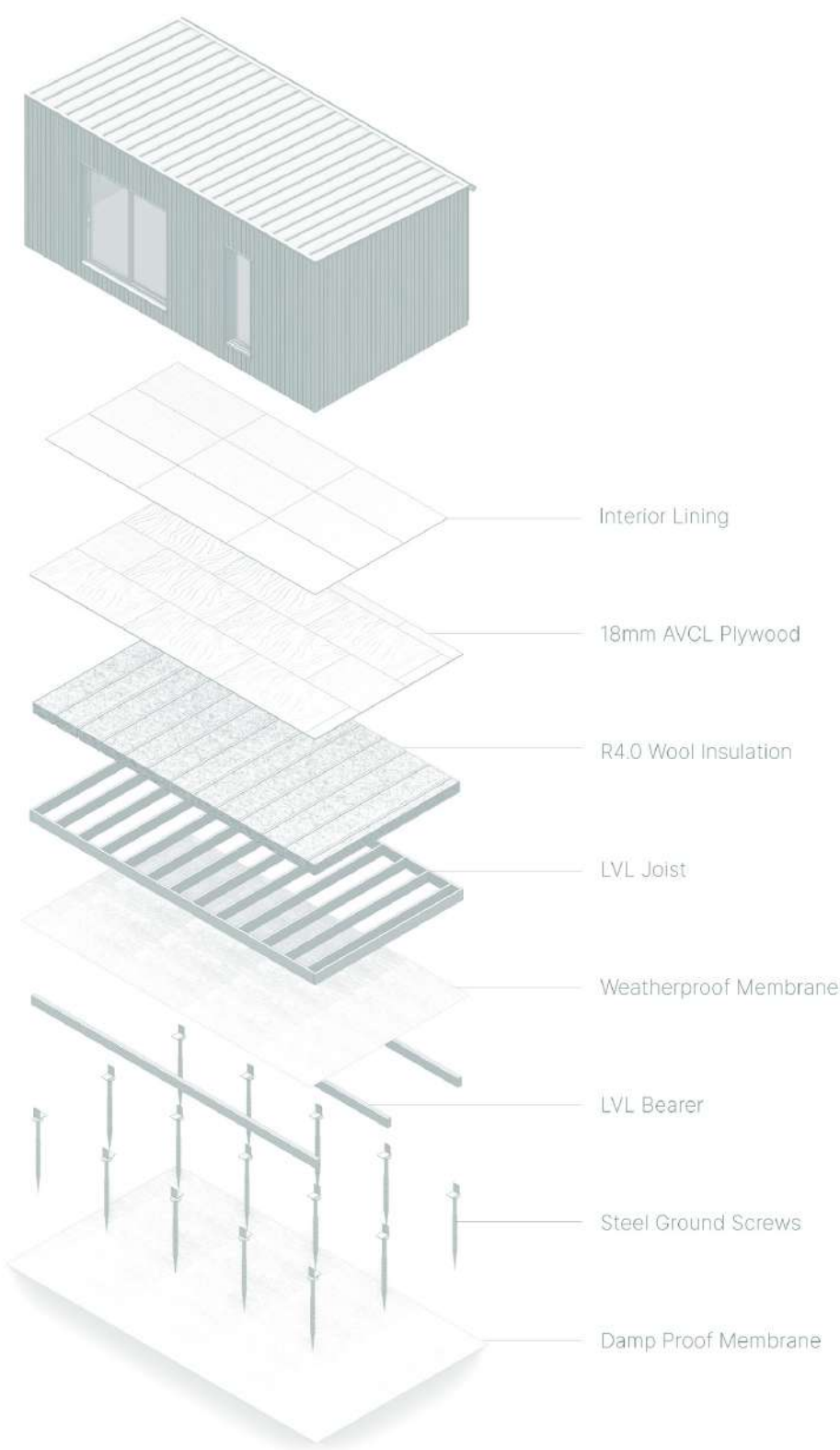
Follow Cladding manufacturers installation guides



Screw U-Bracket through to XFrame



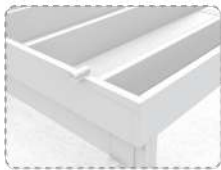
Construction Layers Detailed Close-Up



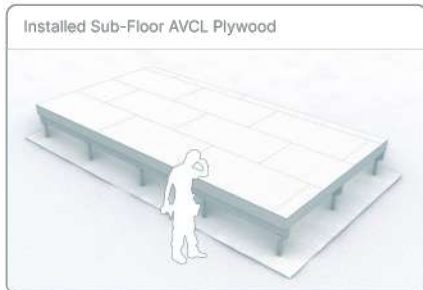
Foundation + Floor Construction Performance Layers



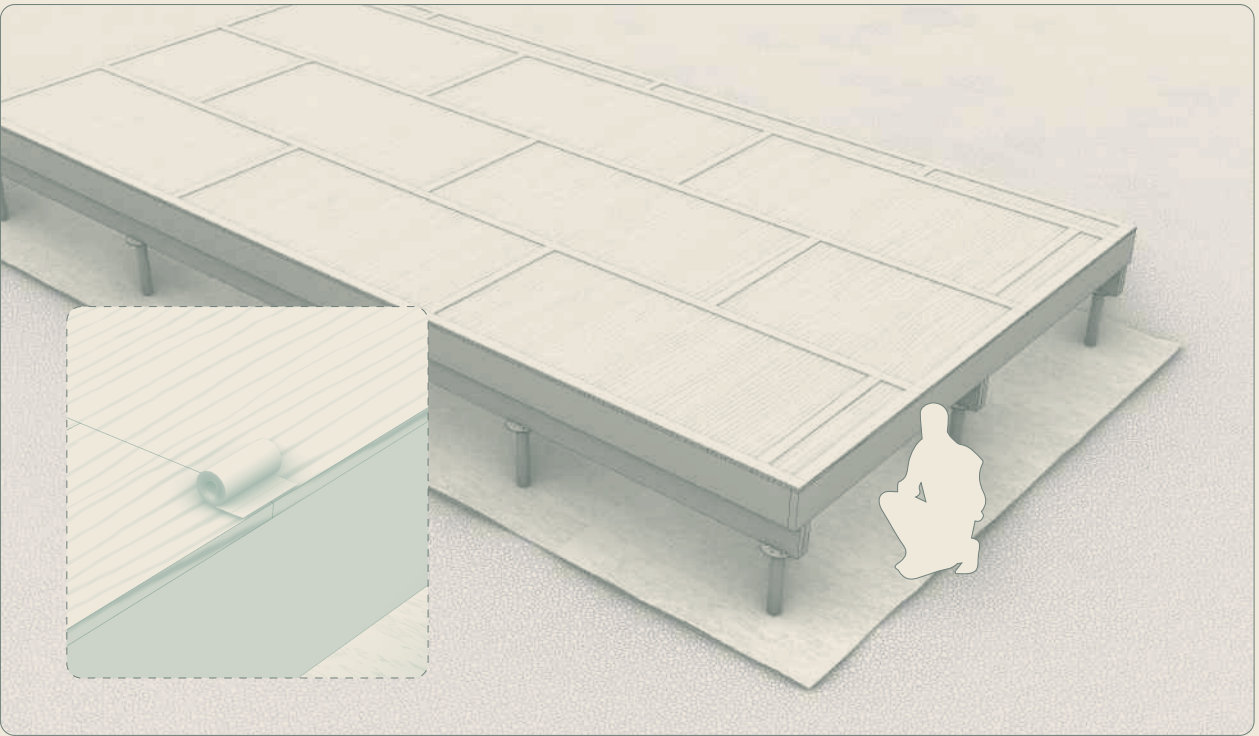
Floor Construction

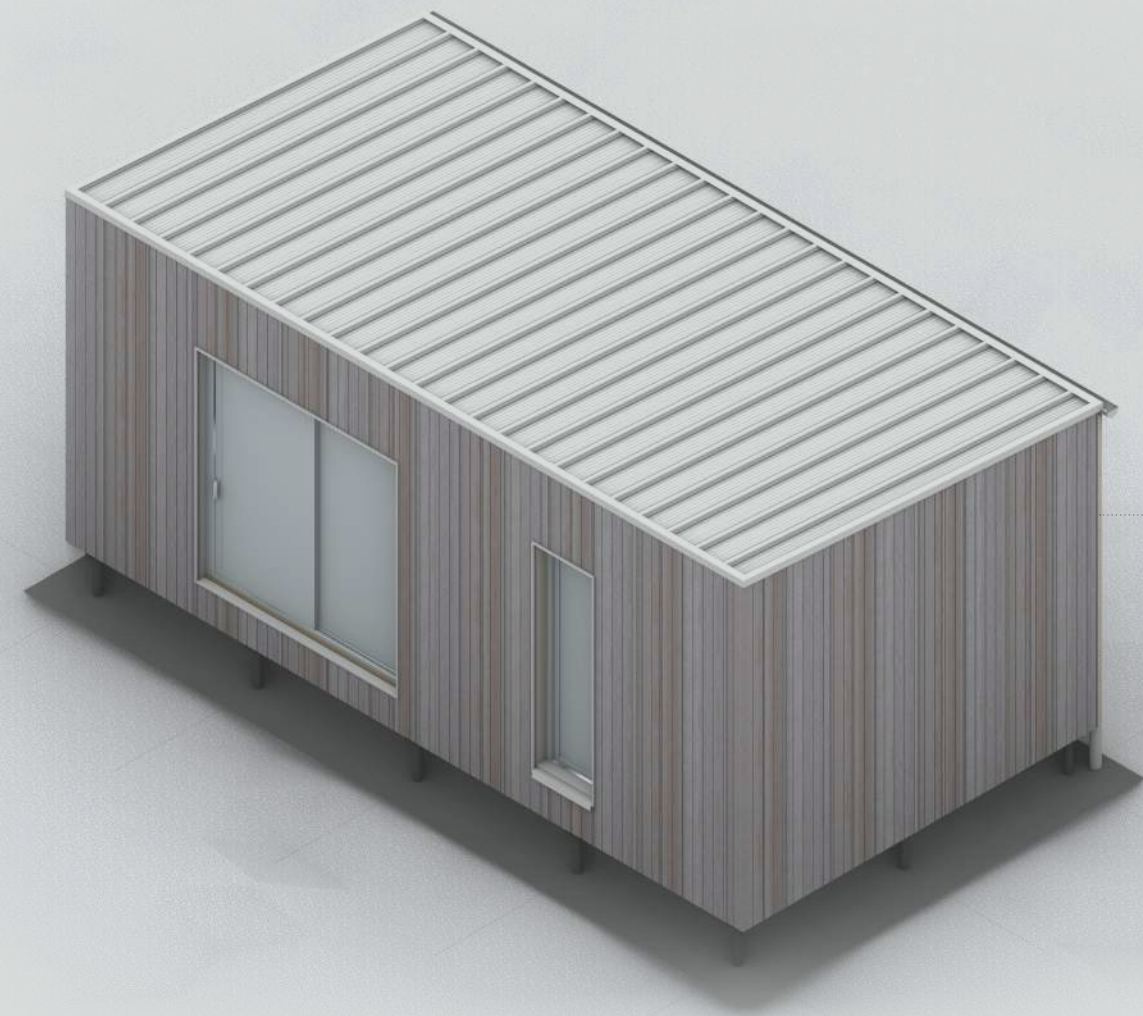


Tape edges and junctions with weather resistive tape



Tape edges and junctions with airtight tape

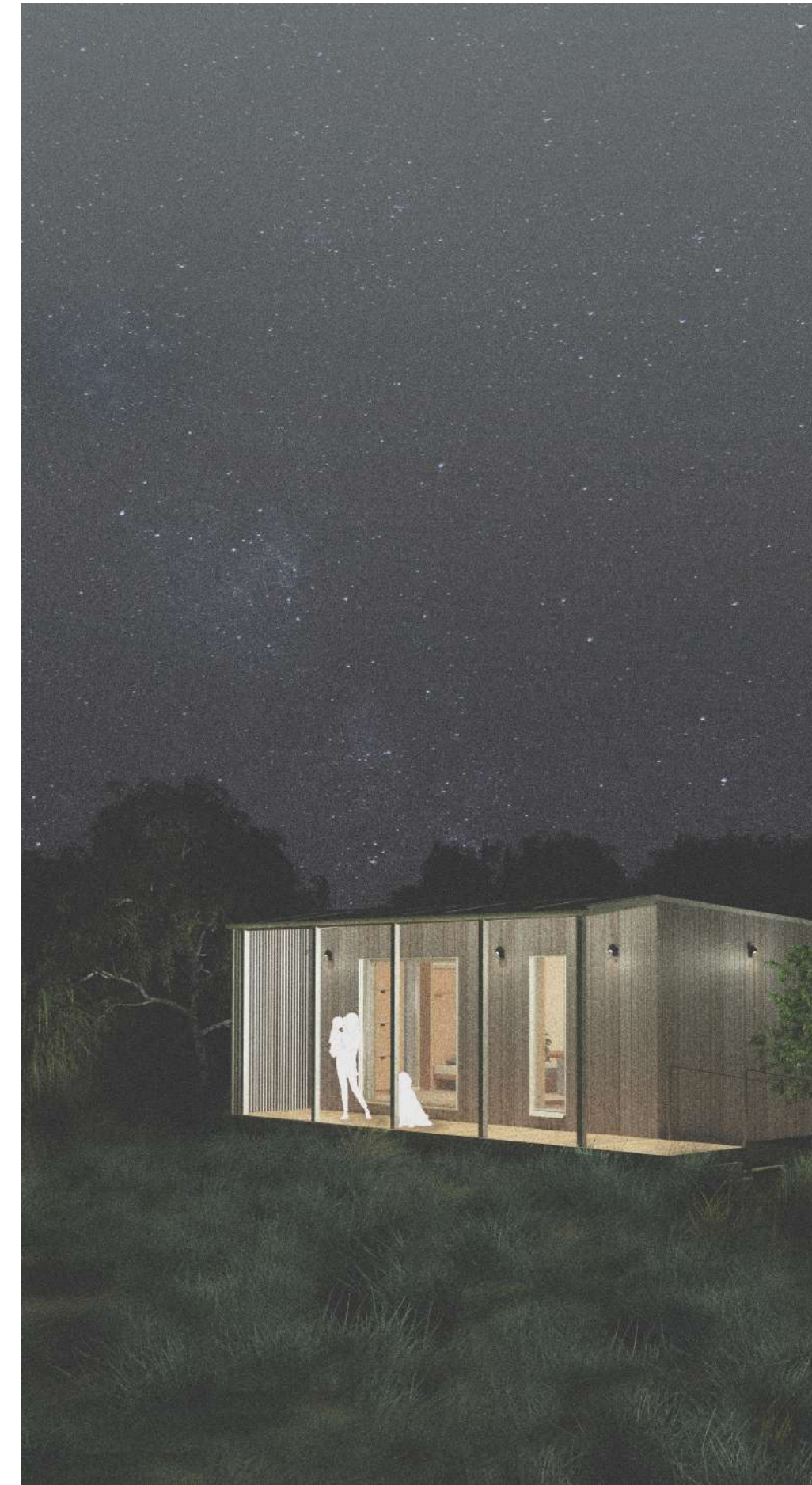




Scalable Prototype Potential for Papakāinga Vision



Papakāinga Potential Visual



Pō Mārie Whare Prototype Visual



Kaiwharawhara Ferry Terminal in Site Context

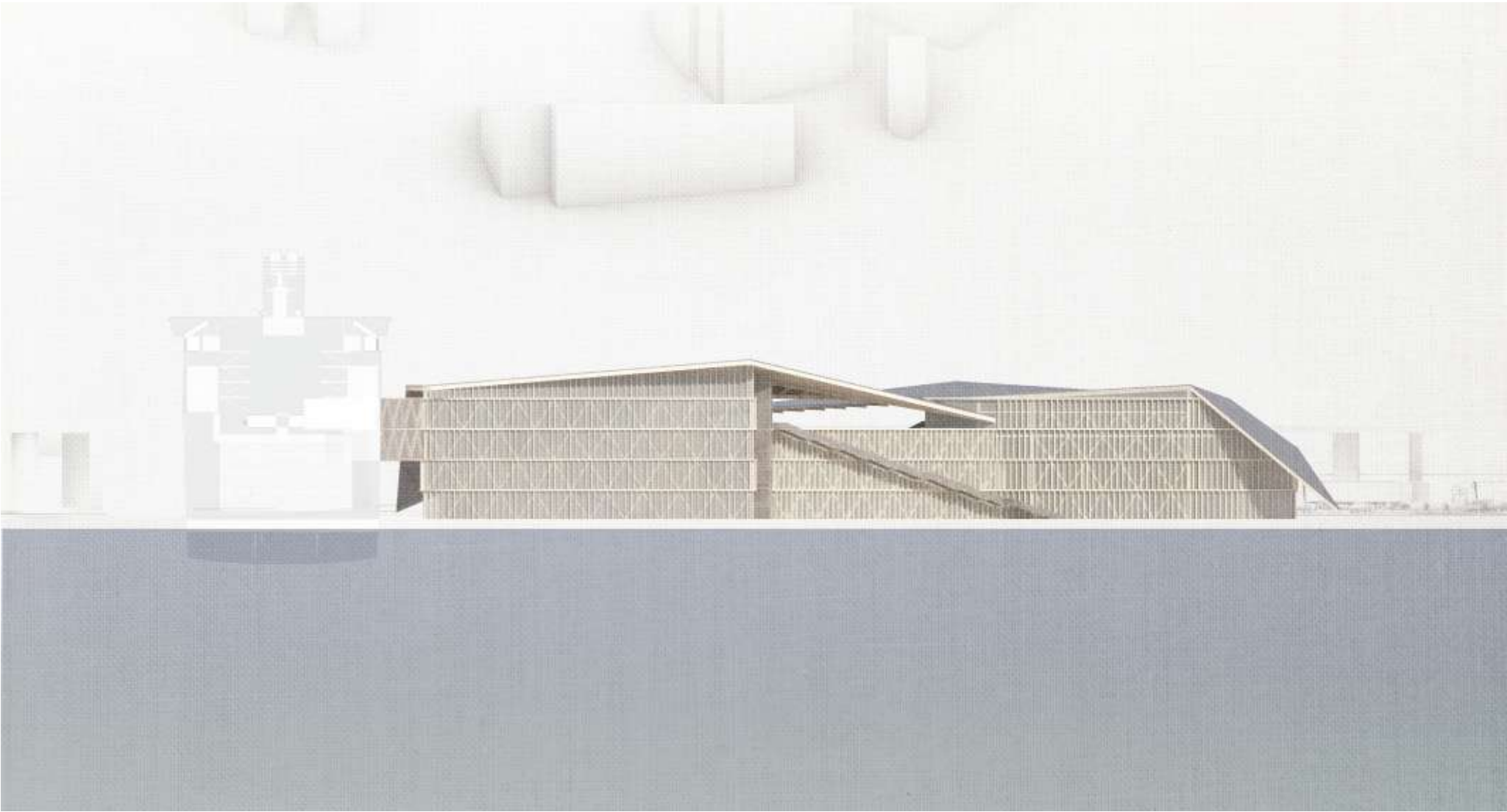
Kaiwharawhara Ferry Terminal

Fourth Year 2023

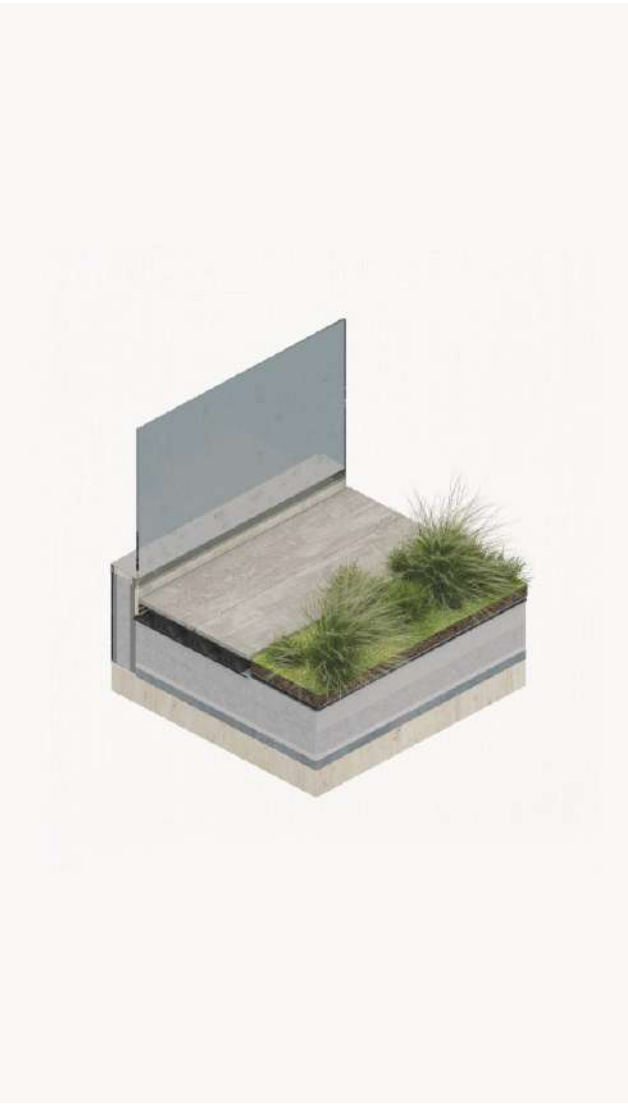
Design Capstone Project



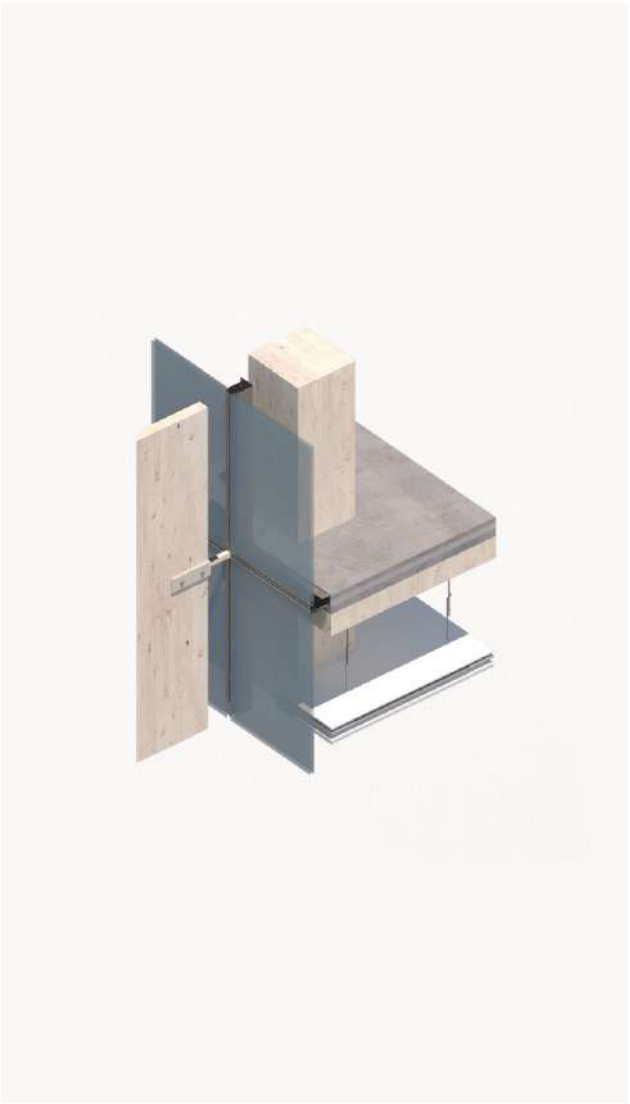
Te Whanganui-a-Tara, Aotearoa
Wellington, New Zealand
Commercial Scale



Kaiwharawhara Ferry Terminal Elevation



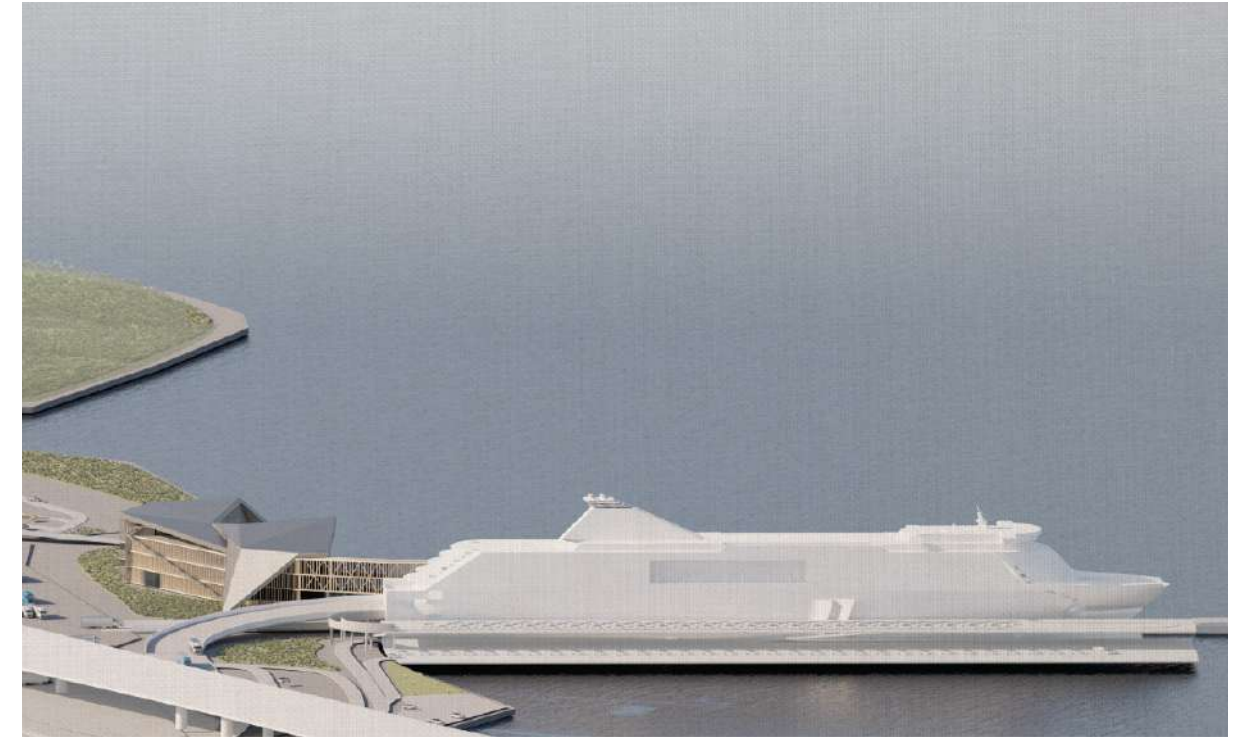
Roofscape 3D Detail



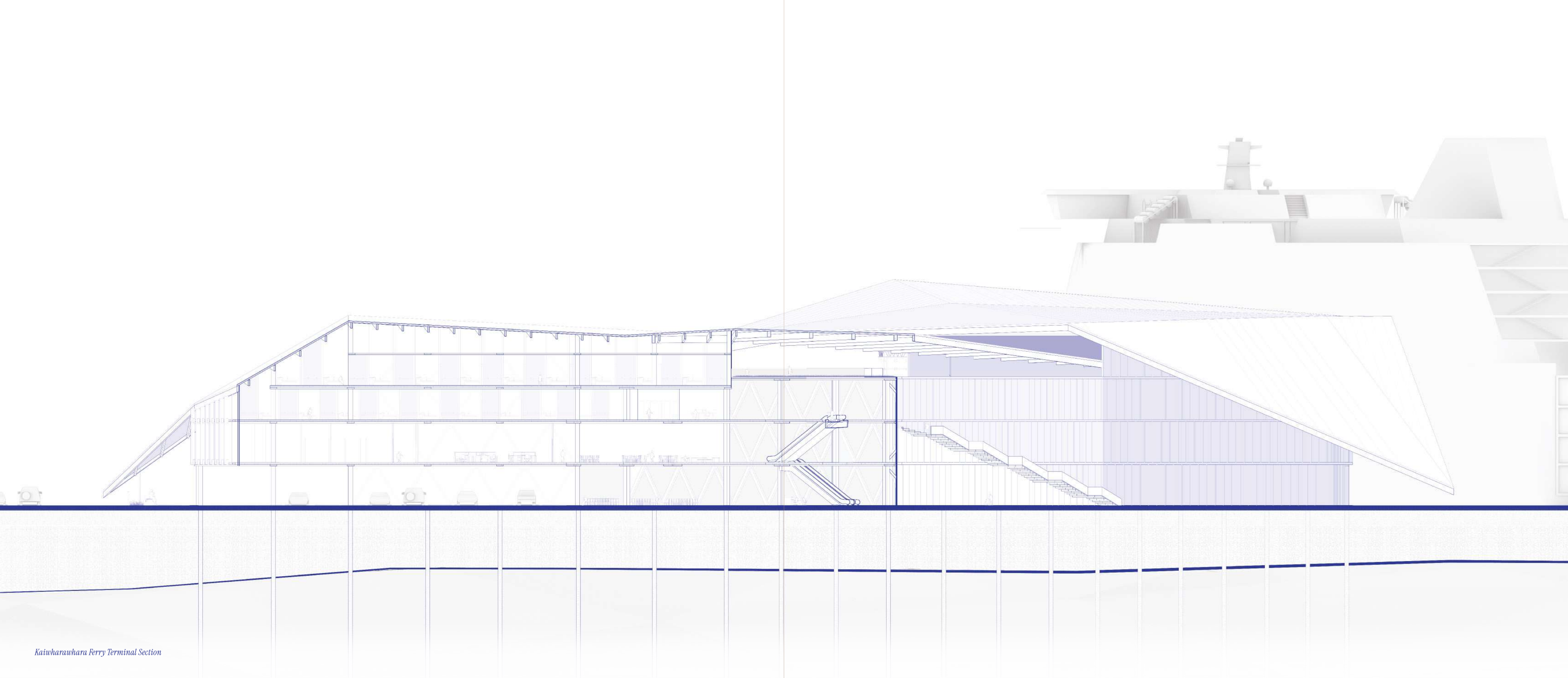
Facade 3D Detail



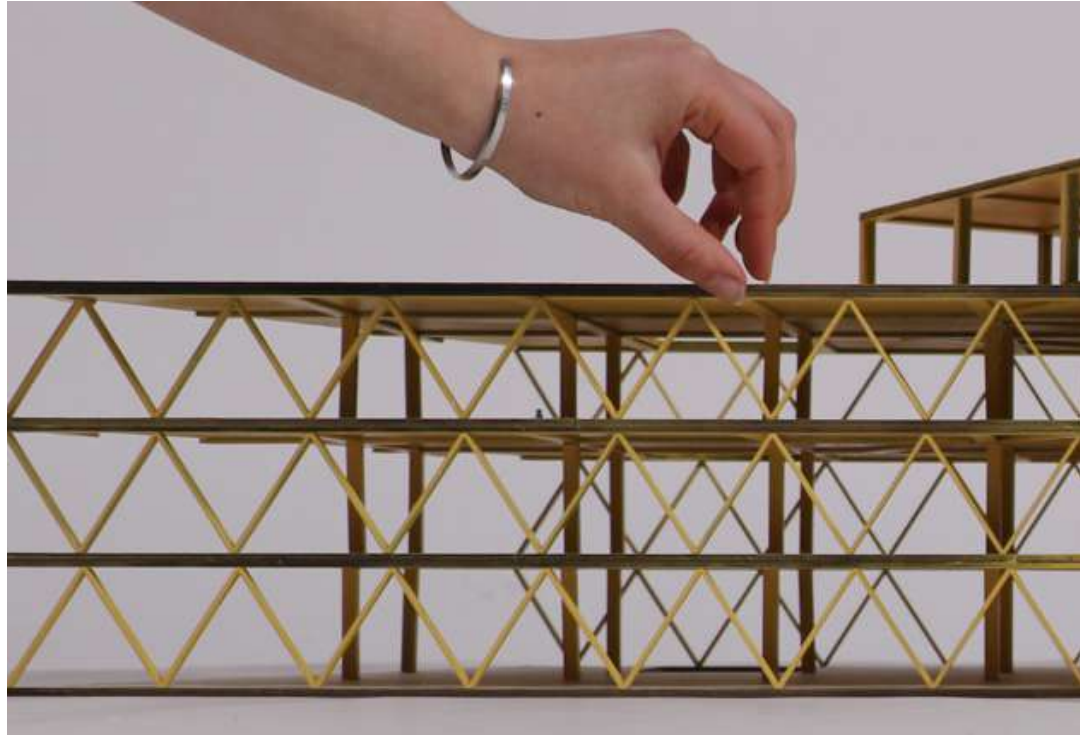
Interior View Facing Te Whanganui a Tara



Kaiwharawhare Ferry Terminal in Te Whanganui a Tara



Kaiwharawhara Ferry Terminal Section



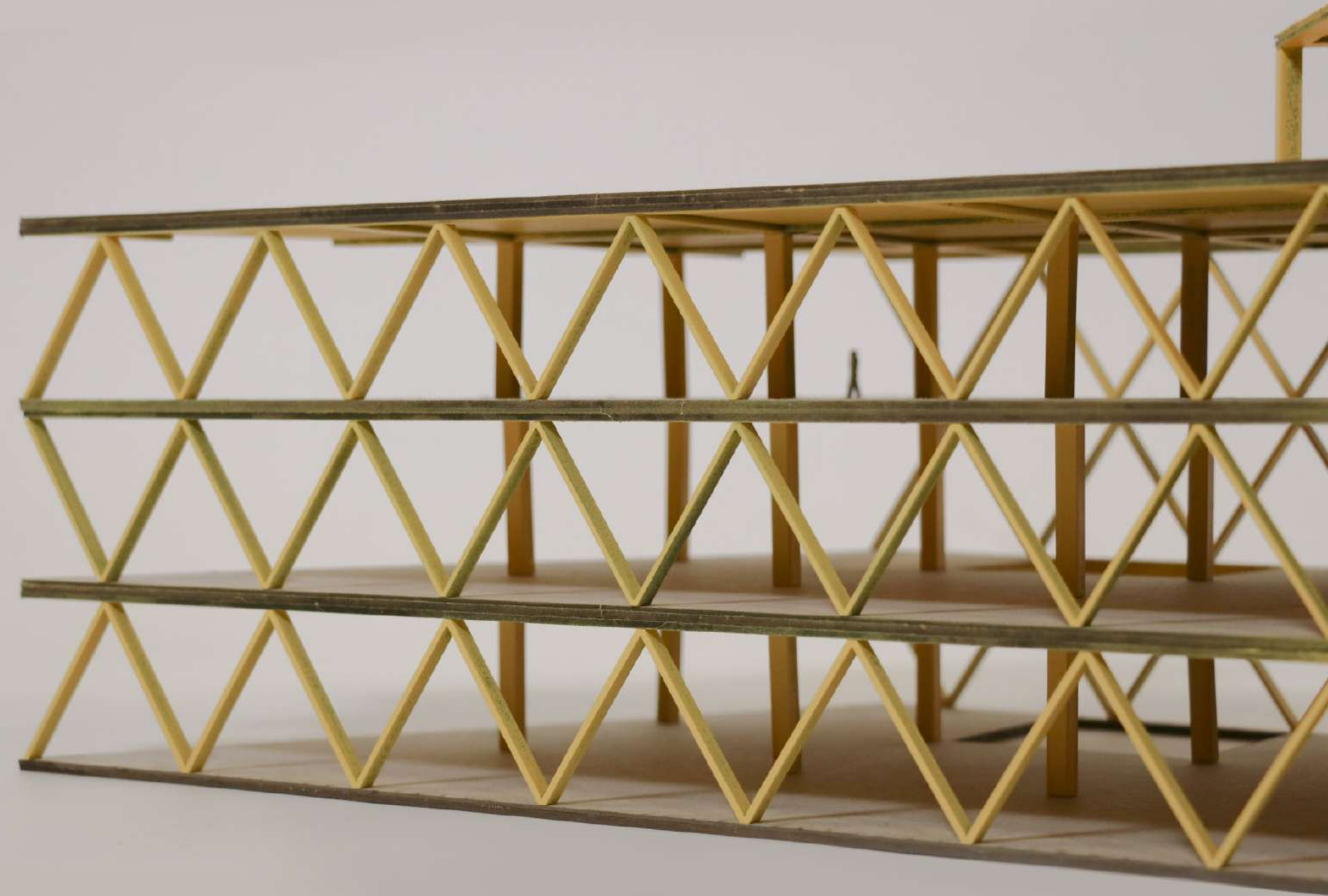
*Kaiwharawhara Ferry Terminal
Structural Model*

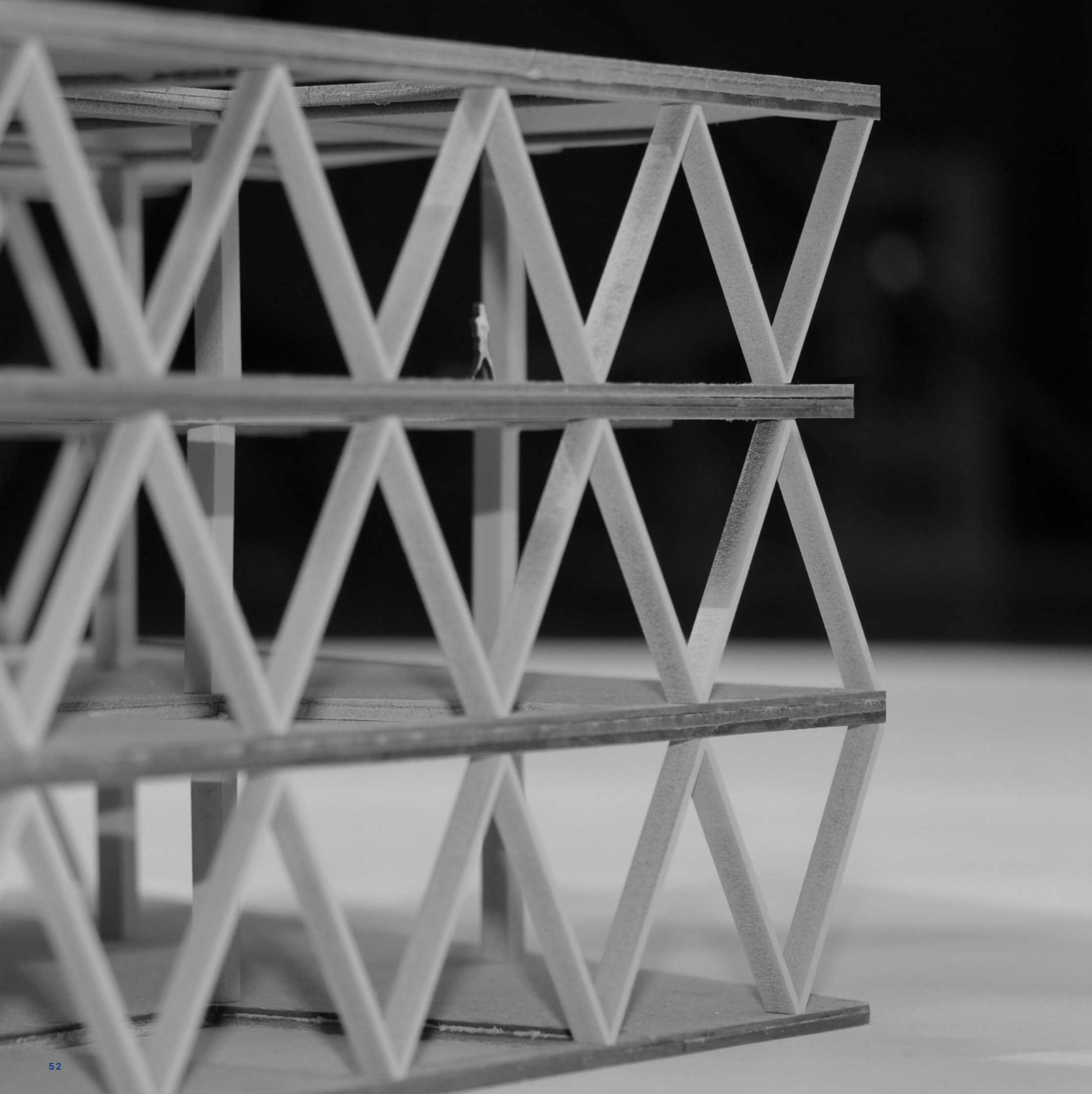
Fourth Year 2023

1:100

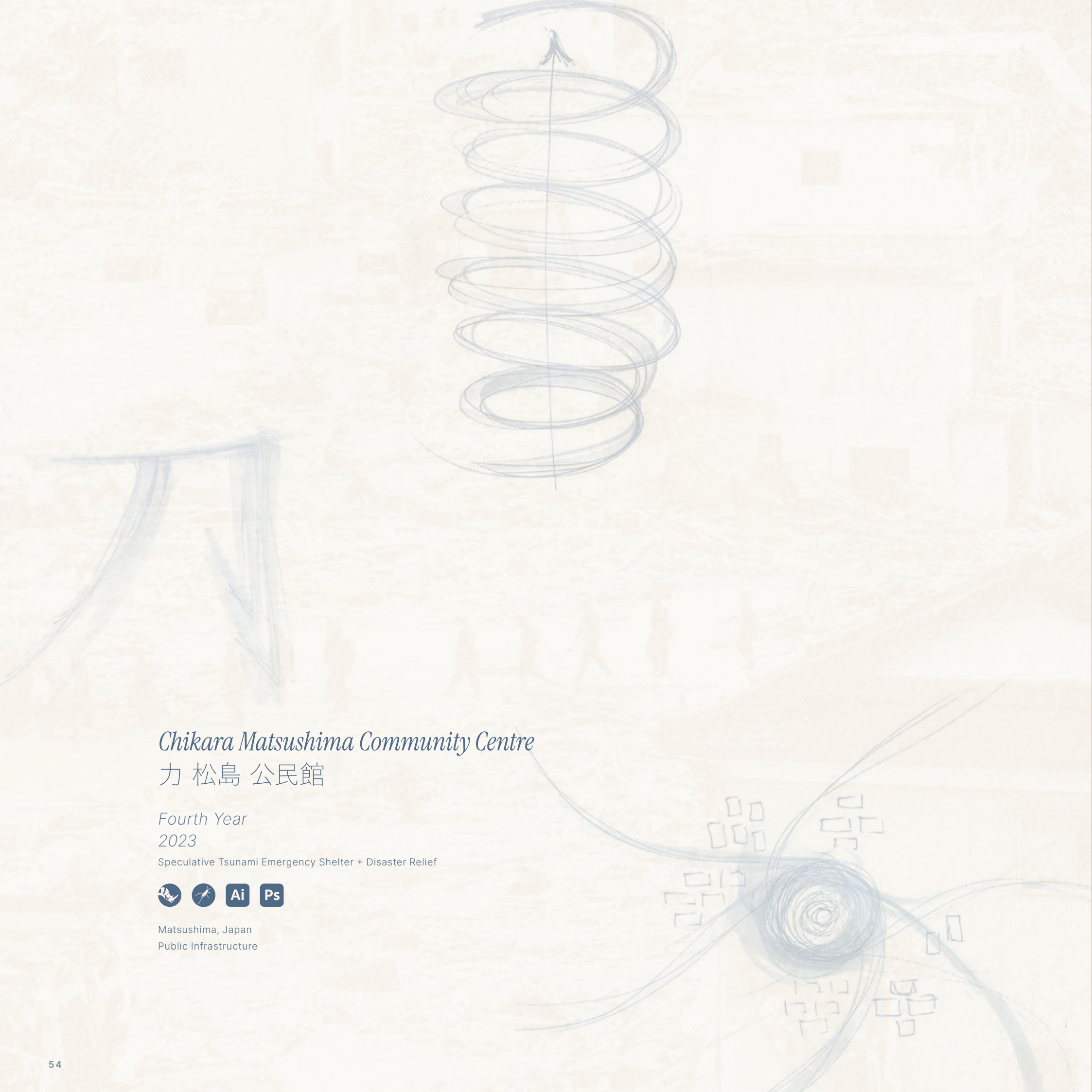
MDF + 3mm Cardboard

Lasercut





Passanger Walkway to Ferry Terminal

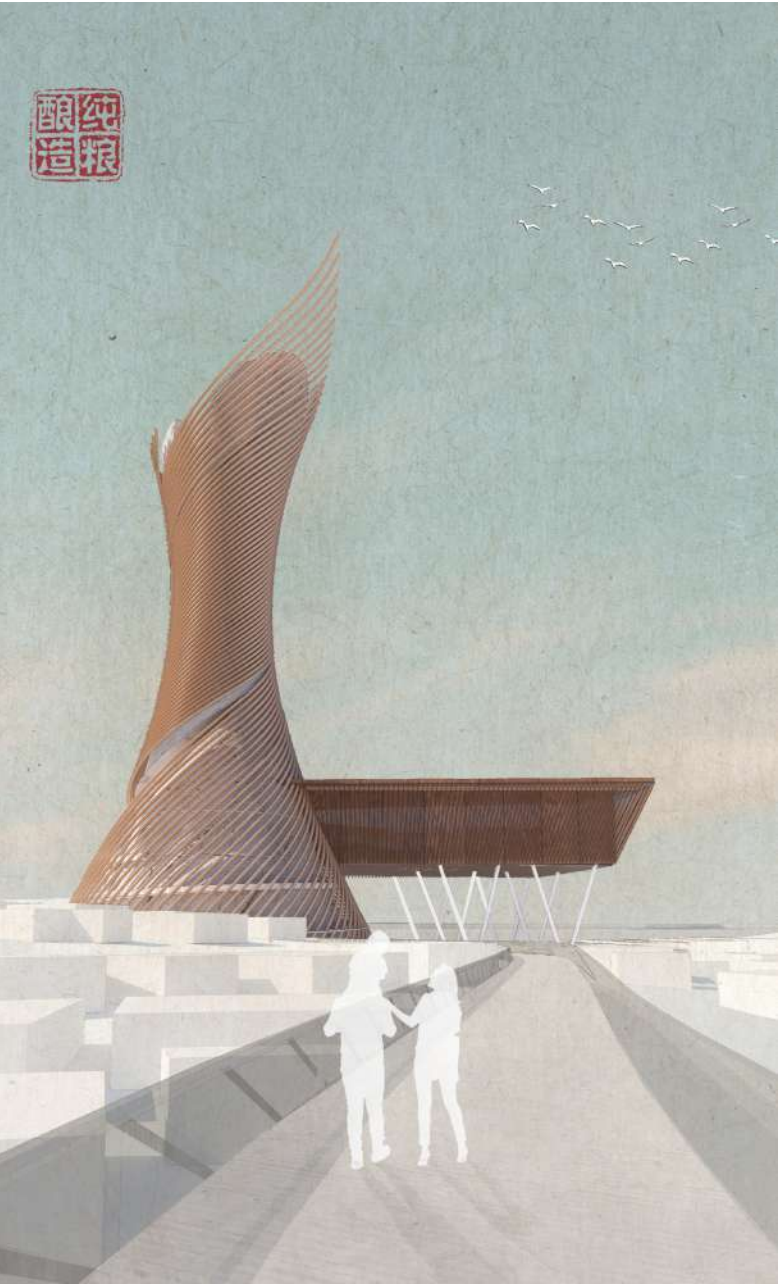


Chikara Matsushima Community Centre
力 松島 公民館

Fourth Year
2023
Speculative Tsunami Emergency Shelter + Disaster Relief



Matsushima, Japan
Public Infrastructure



Elevated Bridge Walkway to Chikara Community Centre



Tea House Evacuation Mid Point



Tea House Ramp Access to Emergency Evacuation Route



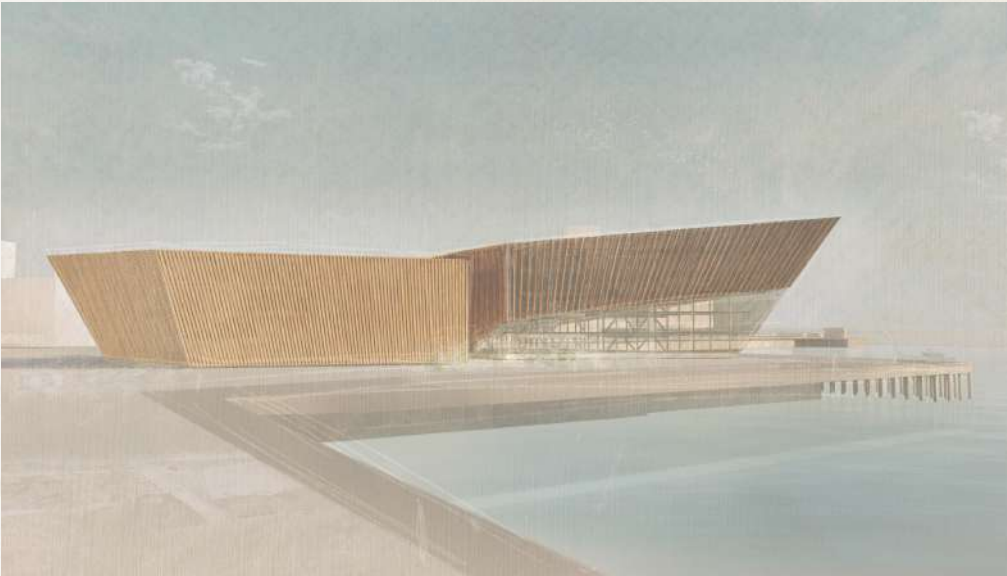
Ramp Around Structure



Library Floor Normative + Emergency Use



Site Plan



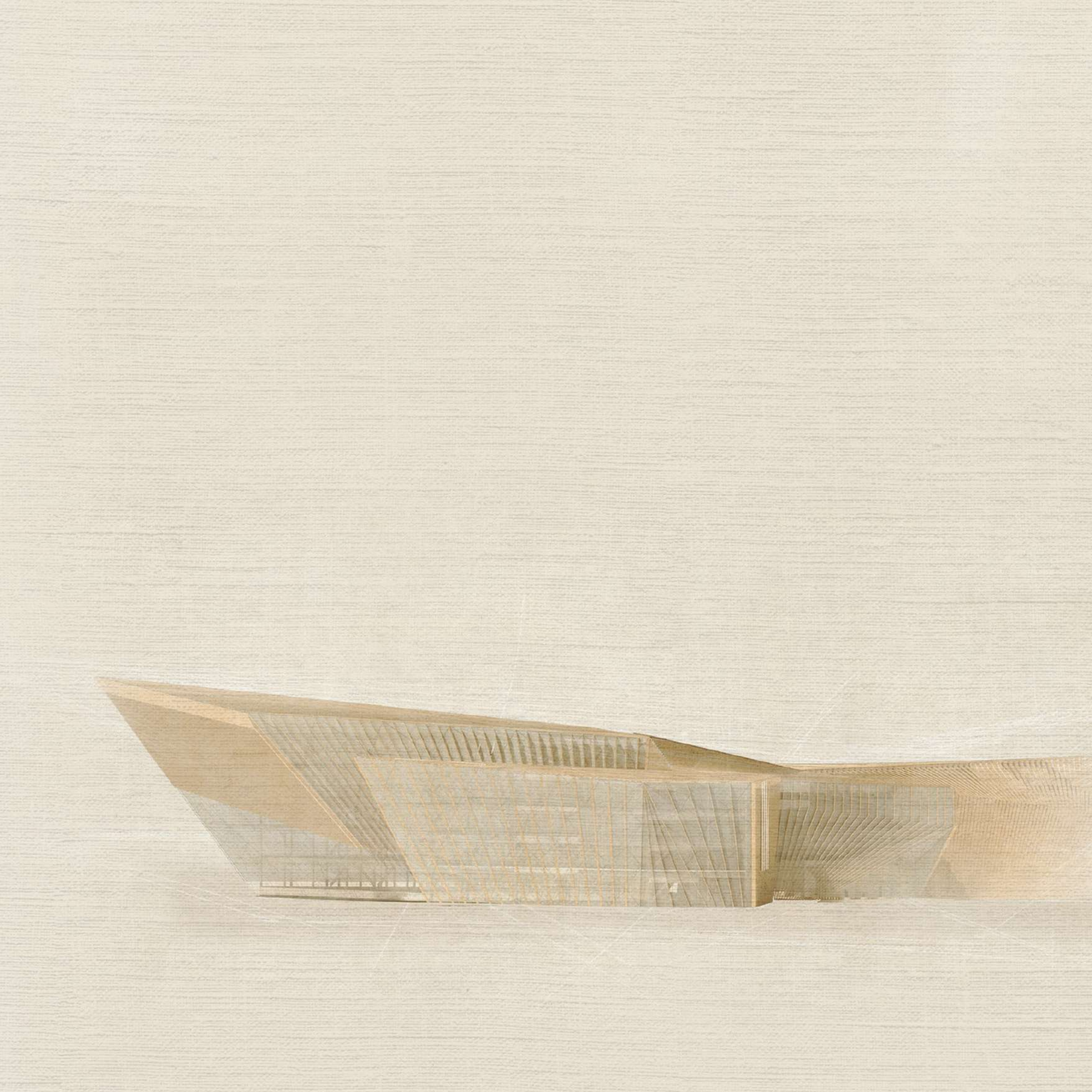
Te Papa Redesign

Third Year
2023

Speculative Design Capstone Project



Te Whanganui-a-Tara, Aotearoa
Wellington, New Zealand
National Museum



Te Papa Entrance



Exhibition Display

Shelly Bay Library

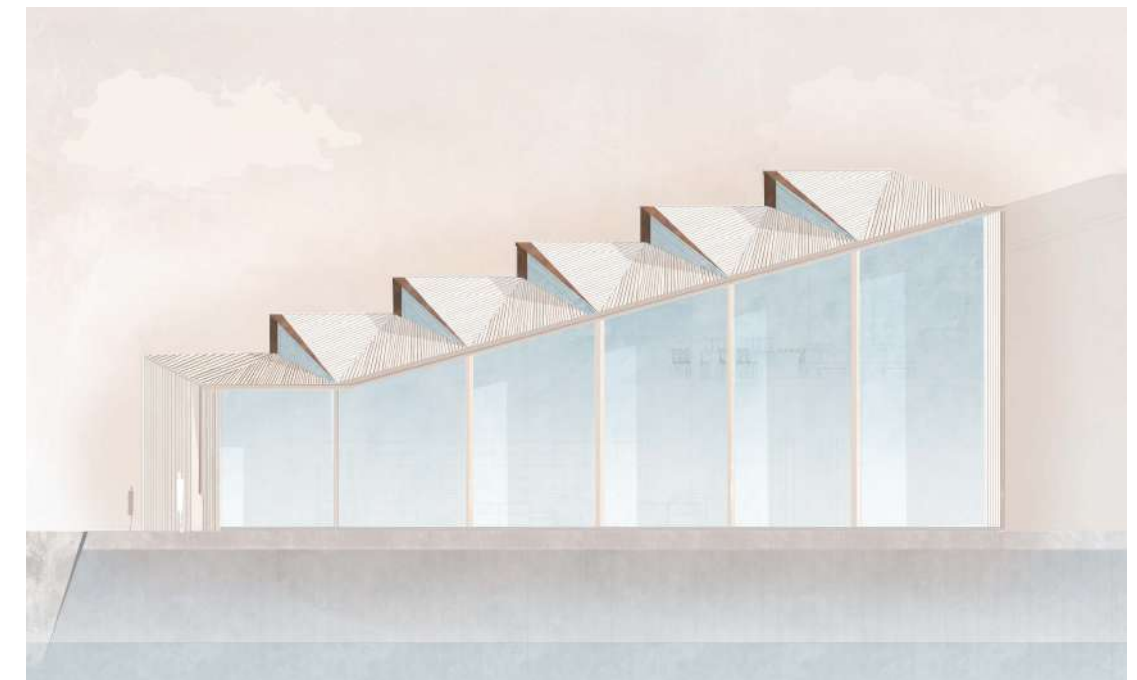
Second Year 2021

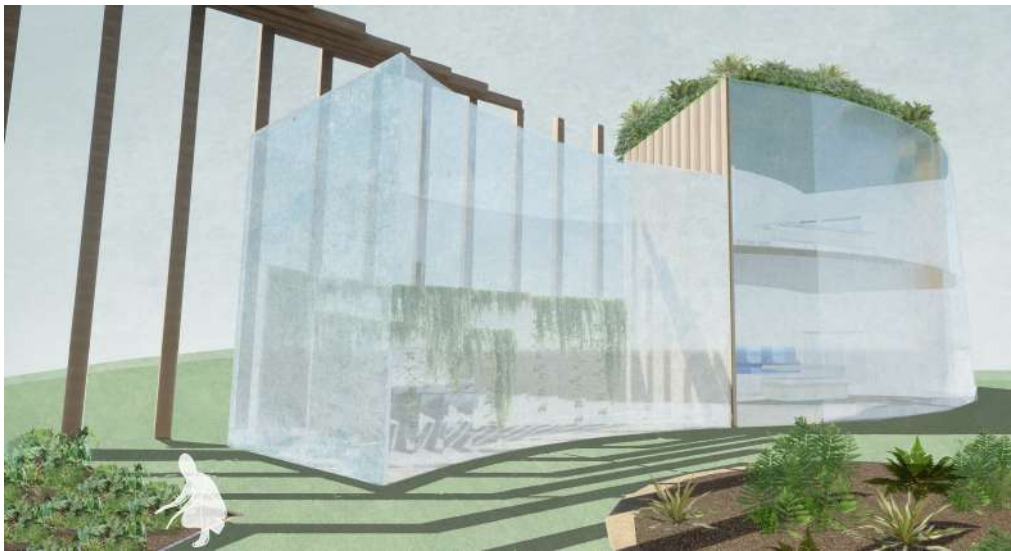
Design Capstone Project



Te Whanganui-a-Tara, Aotearoa
Wellington, New Zealand
Public Infrastructure

*"An extension of the existing structural and cultural context,
the Shelly Bay library speaks to a revitalisation whilst sparking a
conversation between old and new."*





Masterplan

Matiu / Somes Island

Second Year 2021

Design Processes



Te Whanganui-a-Tara, Aotearoa
Wellington, New Zealand

Master Planning + Whare Kai Typology



Thank you ありがとう Tēna koe

MIKI TILTMAN 美希

