

Ngā Mokopuna

Te Herenga Waka—Victoria University of Wellington



Overview

UN SDG	Aligned to NZIA Sustainable Outcomes
	Good Health and Wellbeing Design Principle: Healthy, comfortable spaces connected to nature
	Sustainable Water Cycle Design Principle: Restore natural water cycles, reduce demand
	Social and Cultural Sustainability Design Principle: Honour Te Tiriti, strengthen belonging
	Net Zero Embodied Carbon Design Principle: Build less, build light, build for longevity

Ngā Mokopuna, formerly known as the Living Pā, represents a significant evolution in sustainable design in Aotearoa New Zealand. Designed by Tennent Brown Architects for Te Herenga Waka – Victoria University of Wellington, this tertiary education building is targeting Full Living Building Challenge (LBC) Certification, the most rigorous benchmark for sustainable buildings globally. The project exemplifies the integration of cultural identity, regenerative design and advanced environmental performance.

Ngā Mokopuna enhances the visibility of the university’s marae, functioning as both a practical facility and a cultural symbol of kaitiakitanga (guardianship) and manaakitanga (care and hospitality). It is designed to act not just as a place of learning but as a kaiako (teacher) itself, teaching through its form, materials and operation.

Typology	Tertiary education campus (wānanga)
Architect	Tennent Brown Architects
Certification target	Living Building Challenge (Full Certification); B Corp (Tennent Brown Architects); JUST Label – Social Justice Programme

Key Sustainability Features

At a Glance

Client Te Herenga Waka— Victoria University of Wellington	Location Te Herenga Waka Marae, 42–50 Kelburn Parade, Te Whanganui-a-Tara Wellington
Architect Tennent Brown Architects	Climate Zone 3
Cultural lead Professor Rawinia Higgins	Gross floor area 3,099 m ² (excluding wharehau)
Main contractor L.T. McGuinness	Completion 2025
Photographer Jason Mann	

Cultural and Design Context

Situated on a narrow, steep site, Ngā Mokopuna replaces five colonial villas with a three-storey building nestled between Te Tumu Herenga Waka (the wharehau) and Kelburn Parade. The building’s design reflects a deep connection between Tāngata (people) and Te Taiao (the natural world) and is grounded in a strong Māori worldview.

Led by Deputy Vice-Chancellor Professor Rawinia Higgins and developed with extensive input from Māori studies, architecture, science, and health faculty, the design emerged from a collaborative, kaupapa Māori process. The result is a building that expresses Te Tiriti o Waitangi, accessibility, inclusivity, and the revitalisation of Māori spaces within institutional contexts.

Ngā Mokopuna supports the university’s strategic direction to uplift Māori knowledge, leadership, and visibility on campus—replacing colonial infrastructure with a new marae-based living lab.



Energy Performance and Resilience

Ngā Mokopuna is 100% electric and designed to generate 105% of its annual energy needs through a rooftop photovoltaic (PV) system supported by lithium battery storage. The predicted total energy use is 72 kWh/m²/year, while early data indicates actual use at 45.2 kWh/m²/year, showcasing exemplary energy efficiency.

A naturally ventilated building, it uses thermal mass, passive stack ventilation, and ceiling fans for comfort cooling, with no mechanical air conditioning. The roof design supports solar arrays and includes large skylights to increase daylighting and support the stack effect. Central voids promote air movement and enhance interior connectivity across all floors.

The building is designed for one week of power resilience and three days of water and food resilience, a critical feature in the face of climate unpredictability.



Water Independence

In alignment with LBC’s Net Positive Water imperative, Ngā Mokopuna is entirely self-sufficient in water use. 100% of its potable water is sourced from rainwater collected on-site, filtered, and UV treated. The building is disconnected from the city’s potable water supply.

Water-saving technologies include:

- Vacuum toilets using just 0.9L per flush
- Greywater systems for toilet flushing and planter irrigation
- Evapotranspiration planters that aid greywater disposal

An on-site wastewater treatment plant (WWTP) with treated water “handprinted” to the adjacent Murphy building



Low Embodied Carbon and Material Selection

Ngā Mokopuna prioritises carbon sequestering materials, particularly through its mass timber superstructure. The primary structure comprises CLT, LVL, and Glulam timber, with minimal use of steel or concrete. Timber was also used extensively in cladding, joinery, and flooring.

Key strategies to reduce embodied carbon include:

- Use of local and thermally modified New Zealand-grown pine
- Reuse of salvaged materials (e.g., Abodo cladding from a previous project)
- Use of low-impact concrete blends with Environmental Product Declarations (EPDs)
- Avoidance of Red List materials through extensive material vetting
- Selection of HDPE piping instead of PVC for its recyclability and compliance with LBC material standards

The building is designed for a 60-year lifespan with the intention of lasting well beyond that through adaptable use and durable materials.

Construction Waste Minimisation

Ngā Mokopuna achieved 99.19% diversion of construction waste from landfill, exceeding many LBC thresholds.

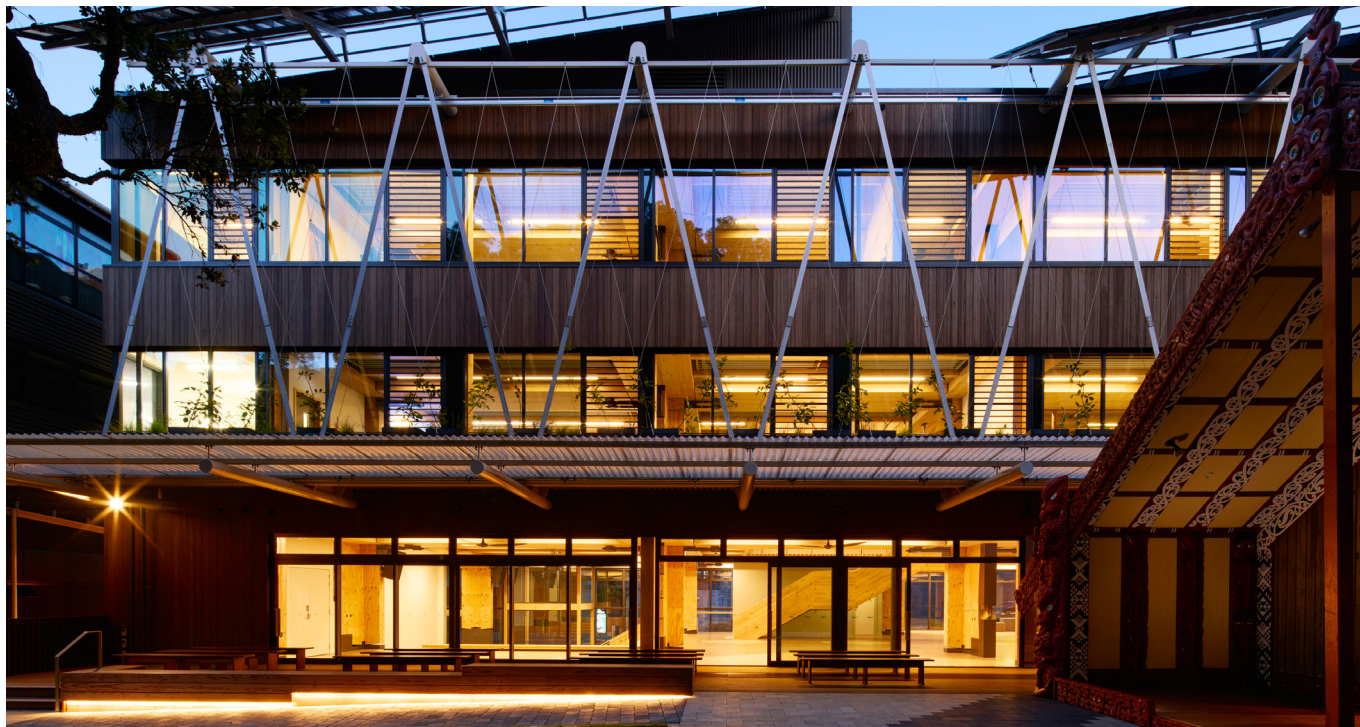
Strategies included:

- A dedicated waste management coordinator on-site
- Off-site prefabrication of mass timber elements
- Manufacturer take-back schemes for insulation, carpet, and acoustic panels
- Modular design to reduce offcuts (e.g., 1200mm sheet modules)
- Innovative reuse of soft plastics in products like Saveboard
- Reuse of existing furniture, landscaping materials, and Māori carvings

A key learning was the importance of early buy-in from all stakeholders, including contractors, consultants, and the client. Waste minimisation was most effective when waste was prevented from arriving on-site in the first place.

2030 Kaitiakitanga Building Performance Targets for Non-residential Builds (Offices)

Metric	2030 Target	This project
Operational energy	<75 kWh/m ² /yr	45.2 kWh/m ² /yr metered
Embodied carbon	<750 kgCO ₂ e/m ²	419 kgCO ₂ e/m ² Modules A-D
Potable water	≥40% reduction	0 L/person/day from mains
Overheating	<1% occupied hrs >28°C	Tested to TM52 during design, mitigated through window reduction and shading but not quantified in final design
100% electric - No fossil fuels	100% Electric - No fossil fuels	Yes – 130% generation metered



Ecological and Biophilic Strategies

Three biophilic design workshops informed the project's approach to nature connection.

Features include:

- Retention of the campus's oldest pōhutukawa tree
- Over 28 local, eco-sourced native species
- Integration of rongoā (medicinal), weaving, and edible plants
- Hanging and street planters irrigated via greywater
- A daylighted rill of the Kumutoto Stream through the ātea entrance
- An ecological review using the SER 5-star framework, guiding long-term enhancements

These strategies reestablish the site's pre-development hydrology and ensure a dynamic, evolving landscape that supports indigenous biodiversity and education.

Social and Cultural Outcomes

At its heart, Ngā Mokopuna is a deeply culturally sustainable building. It is the first university building of its kind in Aotearoa New Zealand led by Māori and designed to replace colonial-era villas with spaces that embody Māori aspirations.

Cultural and social sustainability strategies include:

- Full accessibility, informed by consultation with disability services
- Ground floor community spaces, including wharekai and gathering rooms
- Affordable student meals to support student wellbeing
- Mahi toi (artworks) by Māori artist David Hakaraia, enhancing cultural expression
- A design narrative that fosters belonging and connection for Māori students and staff

Conclusion

Ngā Mokopuna is more than a sustainable building, it is a living expression of values, bringing together Māori knowledge systems, regenerative design, and high-performance environmental outcomes. As a future recipient of Living Building Challenge Full Certification, it will join an elite group of only 38 buildings worldwide to have met this standard.

The project stands as a beacon of indigenous-led, climate-resilient design, one that teaches, protects, and uplifts all who engage with it. It sets a precedent for culturally grounded, ecologically regenerative, and socially just architecture in Aotearoa New Zealand and beyond.



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