



WATER PETAL CASE STUDY TE KURA WHARE

LOCATION

TE UREWERA, NEW ZEALAND

TYPE

CULTURAL CENTER

SIZE

18,800 SQUARE FEET

DAILY OCCUPANTS

50 FULL-TIME, 150 VISITORS

RAINWATER HARVESTED/YEAR

363,500 GALLONS

WASTEWATER TREATED/YEAR

96,200 GALLONS

CLIMATE

SUB-TROPICAL

56 inches of rain/year

131 days of precipitation/year

The Tūhoe iwi (or nation) of the Māori people called Te Urewera home until the 1930s, when many of them left the land in search of employment. Currently, approximately 85% of Tūhoe live outside of their homeland, and those that still reside in Te Urewera face an unemployment rate four times the New Zealand average. In 2014, the iwi negotiated a Treaty with the Crown to re-establish their autonomy and address the largest impacts of colonization. Crucially, the Treaty returned 500,000 acres of Tūhoe land in Te Urewera. Chief Executive of Tūhoe's Tribal Authority Kirsti Luke, along with others in the community, envisioned a space that would store and enrich Tūhoe history and culture while acting as a literal embodiment of their autonomy. The partnership between the iwi and their design team resulted in a beautiful example of Net Positive Water rooted within its cultural context.

SYSTEMS

The building they constructed together is called Te Kura Whare (The Schoolhouse), and it is entirely Net Positive. The building is not connected to any municipal systems - it collects, treats and re-infiltrates all of the water it uses on-site.

RAINWATER HARVESTING

Two 25,000 liter cisterns store the rainwater harvested from Te Kura Whare's roof. The water is treated using a UV filter and provides all the potable water for the building, including the cafe and event space.

STORMWATER MANAGEMENT

The team identified a portion of their site that was prone to ponding in heavy rains; rather than design expensive drainage infrastructure, they constructed a storage pond. In the winter, the pond can hold 3,000 m³ of overflow from the cisterns. As the rain ebbs and the pond drains naturally, a lush landscape is revealed.

GREYWATER AND BLACKWATER TREATMENT

There is no water reuse in place at Te Kura Whare for cultural reasons. All of 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.

RAINWATER COLLECTION PIPES

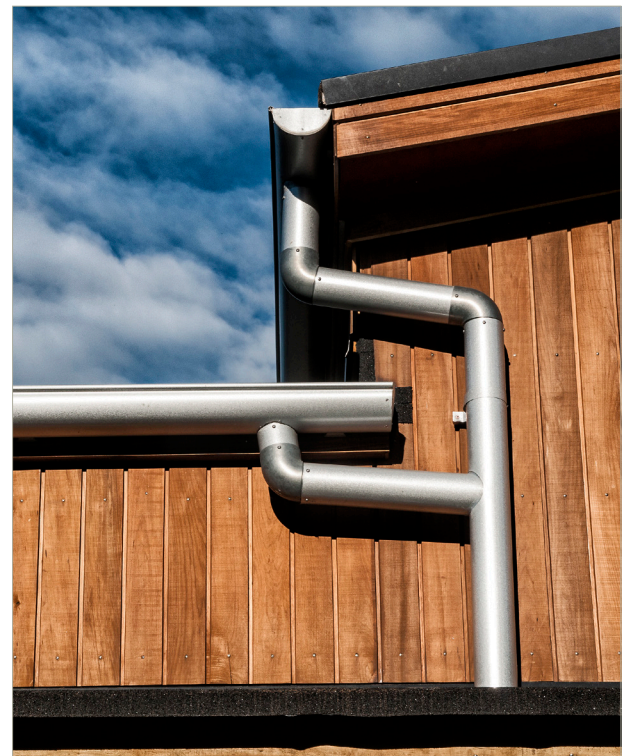


IMAGE COURTESY TE URU TAUMATUA

WATER PETAL CASE STUDY POLICY SOLUTIONS

NEW ZEALAND PROCESS

Generally, the water permitting process in New Zealand requires consent from the regional council at the planning stage and a final sign-off on the systems before occupancy.

Much like in the United States, the regional authorities in New Zealand exercise varying levels of stringency. For example, the rural region in which Te Kura Whare is situated doesn't require any consent at all if the water is entirely managed on-site. This level of oversight is markedly different from the city of Auckland, where teams have encountered much less willingness to give consent to similar systems.

In order to ensure a smooth process regardless, the team set up several meetings with the local and regional authorities while they were designing Te Kura Whare. Once the team reached the building permit stage, the regional authorities simply requested a certificate from the engineers stating that the system would meet their requirements.

SIGNAGE AT TE KURA WHARE



WASTEWATER TREATMENT

Though the project is located right next to the main sewer facility for the village, the Tūhoe people were adamant that their project remain independent from any municipality. Members of the design team had experience installing constructed wetlands, and the alluvial soils provided excellent drainage on-site. The regional council confidently approved their system.

CULTURAL RESISTANCE

The values and vision of the Tūhoe people inspired the design team to produce a truly Net Positive building. However, cultural perspectives surrounding wastewater did present a unique challenge to the engineers tasked with calculating the water balance for the building.

In general, the Tūhoe did not like the idea of bringing greywater back into the building for reuse, and they believed composting toilets were a step backwards for their community. Ultimately, the team was able to design a building that relies on high-efficiency fixtures while respecting the cultural values of its occupants, but it would have been difficult without the large quantity of rainfall on-site.

RAINWATER COLLECTION

The Whakatane District Council (Te Kura Whare's regional authority) clearly outlines the regulatory steps for buildings interested in collecting and drinking rainwater, even if they have municipal access. After working with the team to calculate the correct cistern size and treatment measures, the Council provided them with a building consent for their system.

LASTING IMPACT

As a Living Building, Te Kura Whare represents the autonomy and sustainability of the Tūhoe people. At the opening celebration in 2014, hundreds of Tūhoe gathered from around the country to commemorate this commitment to their homeland and their future.