

NEW ZEALAND CONSTRUCTION NEWS

Pumped! Riding the waves at Wero

By Lynne Richardson



The grade 2 Tamariki River at Vector Wero Whitewater Park will provide a challenge for those new to whitewater kayaking and rafting

Tucked away in the corner of the site office is a purple kayak, and I've been told to bring a lifejacket along with a high-vis vest and hard hat for my visit. Welcome to the Vector Wero Whitewater Park construction site.

Anyone that drives along Auckland's Southern Motorway past Manukau can't have failed to have noticed the earthworks and massive concrete-lined trenches that have slowly been evolving alongside the distinctive waka-shaped Vodafone Events Centre. Now it's a shimmering lake of blue water, with what looks like an extra log-flume ride or two for the nearby Rainbow's End.

This is no theme park though. Vector Wero Whitewater Park is a first for New Zealand – an international-standard white-water canoeing, kayaking and rafting facility that will be used for recreation, water sports, emergency services training, school programmes and youth development.

It's part of a staged redevelopment of the entire site: the Sir Noel Robinson Conference Centre opened in January this year, and there are plans for a container village of food stalls, an art gallery, exhibition space and an outdoor amphitheatre.

PUMPED WATER

The park is wholly man-made and includes a 140 m long, 1.8 m deep lake suitable for stand-up paddleboarding, canoe polo and water confidence courses, and two whitewater 'rivers' – a 300 m long, grade 3–4 course (called the River Rush) for

whitewater kayaking, canoe slalom and rafting; and a 200 m long, grade 2 course (the Tamariki River) suitable for training and those willing to give whitewater a go.

It also includes a world-first – a man-made 4.5 m waterfall, over which 4000 litres of water will pour every second.

Two 'travellers' – mechanical conveyors – transport those from the lake to the holding ponds at the top of each river course, meaning kayakers and rafters don't even have to get their feet dry between their runs down the rapids.

Gravity has little or no impact on the water flow though. Seven large-scale industrial pumps will control the 20 million litres of water that flow through the park, pumping 10.5 cumecs (cubic metres per second) down the short course, 12 cumecs down the long course, and 4 cumecs over the waterfall – that's enough to fill an Olympic-sized swimming pool in just 95 seconds!

The benefit of having controlled water is that, in the event of an emergency, the pumps can be turned off and the water will stop flowing, enabling a rescue mission to get underway almost immediately.

A LONG-HELD DREAM

The park has been a long time in the making. The Second Nature Charitable Trust (formerly the Counties Manukau Pacific Trust) is the custodian of the site that includes the Vodafone Events Centre and Vector Wero Whitewater Park.

Richard Jeffery, the trust's CEO, says they originally envisioned

a stadium for the land behind the events centre (which opened in 2005), but the figures did not add up to have another stadium in Auckland.

But that is where Ian Ferguson saw his opportunity. A gold medalist at the 1984 and 1988 Olympics, Mr Ferguson (or Ferg as he's more widely known) had long held a dream to build an Olympic-quality whitewater river in New Zealand – in fact, two rivers and a waterfall, to be exact. It seemed an impossible dream at the time, but he passed the dream on to Richard Jeffery and the Second Nature Charitable Trust.

They worked tirelessly to raise money and grow the project, and finally, in May 2013, after years of business planning, public debate and visionary ideas, seed funding support from Auckland Council for the \$37 million facility was approved and the trust was able to refine the business plan for the park.

COMMUNITY SUPPORT

The balance of the funds was raised from a number of corporate sponsors and community and gaming trusts, including the Sir Woolf Fisher Trust and the Northern Foundation, plus funds from the Lottery Significant Projects Fund, the Prime Minister's Discretionary Fund and the Lottery Community Grants Fund.

Support for the project also came from organisations such as John Walker's Find Your Field of Dreams, Water Safety New Zealand, Auckland Secondary Schools Heads Association, the

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- 1 A first for New Zealand, Vector Wero Whitewater Park is an international-standard whitewater canoeing, kayaking and rafting facility, with a man-made lake, two river runs and a waterfall
- 2/3/4 Concrete grades, drops, groynes and obstacles built into the river beds generate the rapids in the channels, and relocatable obstacles can be anchored into the river bed to make different formations
- 5 Two 'travellers' transport kayakers and rafters from the lake to the holding ponds at the top of each river course

2014, and a sod-turning ceremony was held in December before construction got underway in early 2015 following the delivery of the finalised plans.

SPECIALISED DESIGN

Vector Wero Whitewater Park was designed by a consortia including New Zealand-based Gaia Engineers (formerly the geotechnical team from Peters and Cheung) for the civil engineering, Jacobs Engineering for the structural work, and Creative Spaces for the architectural design, along with US company Whitewater Parks International (WPI) which is renowned for developing state-of-the-art whitewater sports facilities.

Its projects include the Lee Valley White Water Centre, which served as the venue for the London 2012 Olympic canoe/kayak slalom events, and currently the Deodoro Whitewater Stadium, part of the X-Park Sports Complex being prepared for the Rio de Janeiro Olympics this year. The company got its start and was recognised for its innovative work on the Penrith Whitewater Stadium, which was built for the Sydney 2000 Olympic Games.

WPI managing director Bob Campbell says the dual whitewater course design at Vector Wero Whitewater Park is one of their specialities. "We successfully introduced it at the 2012 London Olympic venue," he explains. "Two independent channels allow operators to stage everything from international-level competitions to world-class rafting experiences on one course, while simultaneously supporting intermediate-level and often community-oriented paddling activities on the other. This can be done with extreme cost-effectiveness since, by design, the second channel operates at a fraction of the cost of the first."

COMPLEX CONSTRUCTION

RCP project manager Matt Lory says Vector Wero Whitewater Park has been a difficult construction project. "No one has built anything like this before in New Zealand," he says. "There are no New Zealand guidelines, standards or regulations for building a whitewater park. We received excellent guidance from the team at WPI."

Operation of the facility will fall under the Adventure Activities Regulations which are administered by WorkSafe New Zealand.

Being a greenfields site, the land first had to be cleared of old agricultural drains before excavation for the lake and river trenches could get underway. Most of the earth has been trucked across the site to form a mound behind the events centre, and it is envisioned this will be formed into an amphitheatre bowl.

The main consideration was water containment, Matt says. "The ground is mostly clay, and the engineers came up with a truly innovative idea. They figured out that by mounding up the clay, then stabilising it with cement, they could create a hard waterproof cap on the ground. We haven't needed to use a waterproof membrane," he explains.

All the channels were laid using shotcrete – with 6200 cu m of concrete supplied by Allied Concrete – then hand-trowelled to create the smooth surfaces. "The shape of each channel had to be spot-on," Matt says. "There could only be 50 mm variance from the design parameters."

The short course was laid first, followed by the long course and then the lake bed, which was finished prior to winter last year.



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MAKING WAVES

Concrete grades, drops, groynes and obstacles built into the river beds generate the rapids in the channels, and each groyne can be fine-tuned to provide optimum rapids by adding or subtracting relocatable obstacles which are anchored into the river bed in different formations. "It's a bit like using Lego blocks – you can make an underwater obstacle, or a reef, or a breaking rock," Matt says.

Another challenge was the site itself, he adds. "It's a very constrained site, with the Southern Motorway on the eastern boundary and the events centre on the western side. We had to be sure of the work flow and access for cranes and concrete pumps. Once one section was laid, it was effectively out of bounds for all heavy equipment."

The water for the park – sourced from a combination of a local bore, harvested rainwater and the main town supply – was turned on in early March this year. It took about two weeks to fill the lake. Landscaping is close to completion, and the park management team have been running extensive tests on the pumps and control systems for the water flow. The water is treated from an onsite treatment plant using filtration and ultraviolet (UV) disinfection.

OLYMPIAN MANAGEMENT

In November 2015, it was announced that Ian Ferguson would be the general manager of Vector Wero Whitewater Park, thus finally realising that long-held dream. Part of his role has been to develop the schools programme, which aims to give 15,000 students each year from Years 7–13 an introduction to whitewater conditions.

Courses will be available in river safety (including river crossings), flatwater and whitewater kayaking, and rafting. All programmes are subsidised by the Second Nature Charitable Trust.

"Most drownings in New Zealand are in moving water. Bringing young people to Vector Wero Whitewater Park will develop their respect for whitewater within a tightly controlled environment, and pushing their boundaries will build their self-esteem," Ferg says. "If we can get a group of students to take a raft over the waterfall, they will believe they can do anything. Who knows, some may even think they can win an Olympic medal!"

And while these youngsters might not recognise Ferg for his record-breaking Olympic performances, young Olympic hopefuls and businesses looking for a team-building challenge most certainly will.

Vector Wero Whitewater Park will be open to the public, and will be officially opened by the Prime Minister John Key at the end of April; schools programmes will commence in May. The park will host the water events for the World Masters Games in 2017.

wero.org.nz



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tourism industry, and sports groups with a vested interest seeking a world-class, year-round training venue, such as Canoe Slalom New Zealand.

In December 2014, RCP was appointed as the project manager, bringing its wealth of experience from delivering other sports facilities and commercial, industrial and healthcare projects across New Zealand. Initially appointed to provide comprehensive project management services for the construction of Vector Wero Whitewater Park, RCP was subsequently engaged to manage delivery of the design for the facility, which was achieved in February 2015.

Being an early contractor involvement (ECI) project, HEB Construction was awarded the lead contract in September

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