

Waitangi Wharf Upgrade - a lifeline for the Chatham Islands



Client

The NZ Department of Internal Affairs.

Project overview

Almost 800km from Wellington lies an archipelago of 10 islands rich with kai moana, aquatic animals and birdlife.

The Chatham Islands is New Zealand's easternmost community, with some 600 residents inhabiting Waitangi and Pitt Islands. The remainder of the Chathams form one of our most remote and valued conservation reserves.

A primary sector economy focused on fishing, agriculture and tourism, the Chatham Islands recorded \$45.7 million in GDP and \$69 million worth of exports (Department of Internal Affairs, 2013). Chatham Island exports are 150 percent of their GDP, well above the current national level of 30 percent and the New Zealand Government's economic growth target of 40 percent.

Waitangi Wharf is a critical lifeline - it's the only cargo-handling facility for exports and essential supplies, such as diesel for the electricity grid and fuel for air services.

The NZ Department of Internal Affairs, on behalf of the Chatham Island Council and Chatham Enterprise Trust, requested that the Memorial Park Alliance - comprising NZTA, HEB, Downer, Tonkin + Taylor and AECOM - deliver \$56 million worth of urgent upgrade works because it was severely degraded.

The upgrade was to make shipping more reliable, improve the health and safety of wharf operations and future-proof the wharf for the community's expanding export and production requirements, while improving animal welfare for exported livestock.

It encompasses:

- Reclamation of 9,500m² of land for a new port
- Construction of new commercial and fishing wharves and a 180 m long breakwater
- Dredging of the approach and berthing area
- Establishment of two quarries to provide aggregate for reclamation fill and breakwater armour
- Establishment of a concrete batching plant and construction yard to produce the three thousand concrete armour units required to withstand the local wave climate.

The Waitangi Wharf Upgrade project progressed from concept design, through consenting and detailed design within 12 months; an extremely tight timeframe for a project of this scale and complexity.

Extensive community engagement was undertaken throughout the process, including requirements at the port and surrounding areas, existing coastal processes and likely effects of the development, along with options for social and environmental improvements.

The engagement and consultation additionally led to design of an improved boat haul-out area, relocation of shellfish within the development area and replenishment of the main Waitangi Beach with clean sands dredged from the bay. To satisfy the submissions of a well-regarded ornithologist about the endangered Chatham Islands shag, a Seabird Management Plan was approved and implemented.

The limited availability of local rock suitable for armour stone required an innovative breakwater design featuring single-layer, interlocking Xbloc concrete armour units to be used for the first time in New Zealand.

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The Royal New Zealand Navy's Devonport ship simulator was used to model approach and departure routes for the upgraded wharf, verifying that the design would allow for safe navigation. The Navy also created a three-dimensional model of Waitangi Bay and its existing and planned wharves to illustrate how varying winds, waves and tides would affect a ship's performance.

Testing of a model of the planned breakwater was undertaken at the Sydney Water Research Laboratory. Results showed the design would cope with the harsh conditions in Waitangi Bay. The laboratory testing included the stability of the Xbloc armour units, as well as assessing wave overtopping and wave loads to assist in maximising the efficiency of the design.

"The project was extremely successful" says T+T Project Director Mark Foster.

"In 13 months we went from having a problem with an ill-defined scope, to a solution defined with price certainty, government funding, and all environmental approvals - quite an undertaking."

A recent survey showed that the level of public consultation and communication by the project team was considered to be exemplary. Completion of the wharf upgrade was completed on time and on budget and was officially opened by Deputy Prime Minister, Rt Hon Winston Peters in March 2018.

