

## REFERENCE PROJECT

### Geotechnical: Wharf Upgrade Project: Soil Nail Anchors

Location: Waitangi Wharf, Chatham Islands  
Date: April 2018  
Consultant: Memorial Park Alliance

As part of a larger scope of works to maintain the integrity and upgrade the usability of the Waitangi Wharf, the Memorial Park Alliance (HEB, Downer & Tonkin and Taylor) identified a sandstone rock outcrop to be stabilised.

Slope stability would be achieved in the form of 100mm diameter x 9m deep holes, with fully grouted soil nail anchors on a 2 x 2.5m square-grid. Anchors comprised a 32mm galvanised steel tendon. The surface was then shaped to accept the final headplate: a 700mm square structural mortar bearing plate.

Abseil Access was the successful tenderer for the works, due to our proven track record with the Alliance, and successful completion of other works of similar specification and complexity.

A pneumatically powered DTH-Hammer suspended A-frame drill rig was selected to form the holes – this setup performed extremely well in the weathered sandstone strata.

Temporary works included installation of ground anchors to support personnel and drilling equipment, and sections of formwork to enable support of the bearing plates.

Aside from the physical works, the logistics of sending equipment to an island 1500km from NZ was overcome with careful and accurate planning and execution by the Alliance and Abseil Access Project Managers.

Just over 10% of the anchors were subject to load tests, and 9 samples of grout were tested as part of the quality management plan. Each anchor was tensioned to 40Nm using a calibrated torque wrench then finalised by adding corrosion protection.

Practical completion was achieved within our predicted timelines, with all QA surpassing client requirements.

**Anchoring Technique:** Open-hole drilling with DTH-Hammer, post-grouted  
**Design Load of Anchor:** 164kN  
**Bar type:** Reid Bar RB32G solid bar  
**Hole Diameter:** 100mm  
**Maximum Depth:** 8.7m  
**Design Grout Strength:** 40MPa after 28-days  
**Bearing Plate Spec:** 135mm thick x 700mm square 50MPa

