

## REFERENCE PROJECT

### Geotechnical: Soil nails and micropiles

Location: Frances Hodgkins Retirement Village,  
Dunedin  
Date: July 2017 – Feb 2018  
Consultant: Geosolve Ltd



Following a series of extreme weather events, sections of the buildings at the Retirement Village were compromised due to the slope below losing integrity and form.

The main body of work consisted of over 200 4m – 7m deep fully grouted soil nail anchors in a 1.5m offset square-grid, in a 100mm diameter hole, with a 25mm GRP solid tendon.

Some of the soil nail locations were underneath the building, so we had to consider the working height of the drill rig and service strikes. The pile legs of the building were supported with pile end-caps anchored with 4m deep Titan 30 self-drilling anchors surrounded by reinforced concrete. To aid the relief of hydrostatic tension, a series of pin-pointed sub-horizontal drains 7m deep were installed around the slope.



The ground consisted of reclaimed quarry materials, sections of highly weathered basalts, with a surface of clays and construction waste materials. Varying drilling techniques were employed for overcoming the difficult ground conditions in order to achieve a successful soil nail.



All of the tested soil nails passed stringent tests, with 3 samples of grout per batch taken as part of the quality management plan. Each soil nail was tensioned in order to pull the mesh tight and the bearing plate perpendicular to the ground.

Practical completion was achieved within our predicted timelines, with all QA surpassing client requirements, and our control of site safety was complimented by the Ryman H&S Team.



**Anchoring Technique:** Open-hole drilling and self-drilling  
**Design Load of Soil Nail:** 105kN  
**Bar types:** Bluey 25mm GRP, Titan 30 and R32 hollow-bar  
**Hole Diameters:** 50, 65 and 100mm  
**Maximum Depth:** 7.0m  
**Design Grout Strength:** 40MPa after 28-days  
**Concrete Strength:** 40MPa  
**Mesh Facing:** DT Galv Coated with Erosion Control Matting

