



JET GROUTING

Heavy-duty Foundation
Improvement

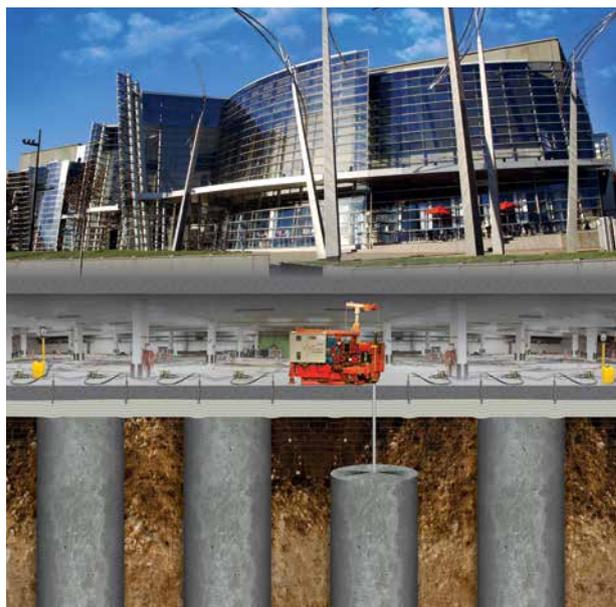
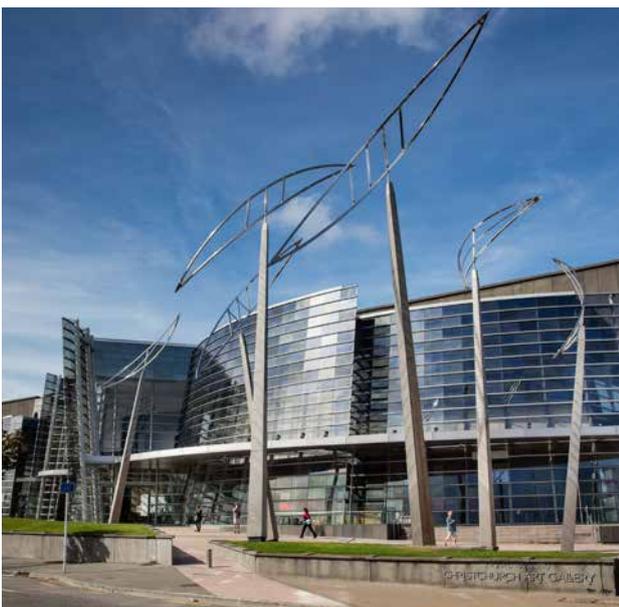
mainmark

Jet Grouting for soil stabilisation, liquefaction mitigation and large-scale structural support



Australia and New Zealand face unique ground and environmental problems, with droughts, floods and liquefaction resulting from earthquakes. These factors result in ground instability and weakness that leads to subsidence, resulting in the need to underpin building foundations.

The world-class, 33,000 tonne Christchurch Art Gallery was badly shaken by the earthquakes that hit New Zealand's South Island in 2010 and 2011. The art gallery's footings had settled differentially across the 6,500m² footprint, with subsidence as much as 182mm in some places. Mainmark devised a 2-stage plan to strengthen the foundation ground using Jet Grouting (installation of 124 jet grout columns) and then to re-level the structure using JOG Computer-Controlled Grouting (350 ports installed, via 40mm penetrations). All this was achieved in only 44 days whilst the building was occupied by the gallery staff and precious artworks.



Mainmark has experience using Jet Grouting across many sectors, supporting large commercial and residential apartment block complexes, schools and even oil reserve tanks.

WHAT IS JET GROUTING?

Jet Grouting is a construction process using a high kinetic energy jet of fluid to break up and loosen ground, and mix it with a cement slurry. This hydrodynamic mix-in-place technique produces a soil cement material, commonly referred to as “jet-crete” or “soil-crete”.

Mainmark’s Jet Grouting process enables us to create a jet-grout stabilised column of soil of up to 60m long x 7m diameter, given certain soil parameters and access. Specific grout column diameters and grout strength can be accurately designed and installed to adequately accommodate both the static building loads and seismic loads.

Jet Grouting makes use of three physical processes, singly or in combination:

- The very high-speed air jet loosens the soil
- The cement slurry adds a binder to the soil mix
- The jetted fluid flushes and displaces excess soil to the surface



JET GROUTING EQUIPMENT

Mainmark’s Jet Grouting equipment is specifically designed for working in locations with limited headroom and space restrictions, drill/grouting plant assemblies are light-weight, approximately 100 – 4,500kgs and can be managed around limited headroom environments.

The main grout batching and recovery plant is able to be located remotely, having a footprint of as little as 150m² (per grout rig setup; grout reservoirs excluded). Reticulation of grout to and from the drill/grout injection heads is via relatively small diameter flexible pipework.

The drill/grouting plant assemblies are relatively compact, quiet and highly mobile, with power-packs located remotely if required. They are ideal for working within limited access and cramped structures, having head room clearances of as little as 2.1 metres.

All excess slurry, when dried, can be excavated by normal soil excavation and transportation plant for disposal, with no remaining fluid to be handled.



APPLICATIONS

- Underpin foundations
- Soil improvement under existing structures to allow additional load bearing capacity
- Seismic up-grade
- Excavation support
- Stabilisation of potential lateral slip in embankments
- Control of Artesian Water and High-Water Table Issues



Mainmark offers unique, innovative solutions for rectifying problems with foundation ground in residential, industrial, commercial and civil engineering situations. For over 25 years Mainmark has led the world in developing and offering Teretek® - the most advanced and accurate system of geo-polymeric (or resin) injection techniques for ground engineering.

We have successfully treated over 30,000 sites in Australasia, varying from small domestic applications to large commercial, industrial, civil and mining projects. Worldwide, Mainmark has completed many tens of thousands of projects.

Mainmark has expanded capabilities to include other innovative ground engineering solutions. As part of post-earthquake remediation works in both Japan and Christchurch, we have developed expertise in technologies such as JOG Computer-Controlled Grouting and our proprietary Terefirm® Resin Injection for ground improvement and liquefaction mitigation.

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