

# Entire House Raised 60mm & Re-supported

## INDUSTRY

Residential

## STRUCTURE

House

## PROBLEM

Earthquake remediation

## LOCATION

Christchurch, New Zealand

## DURATION / YEAR

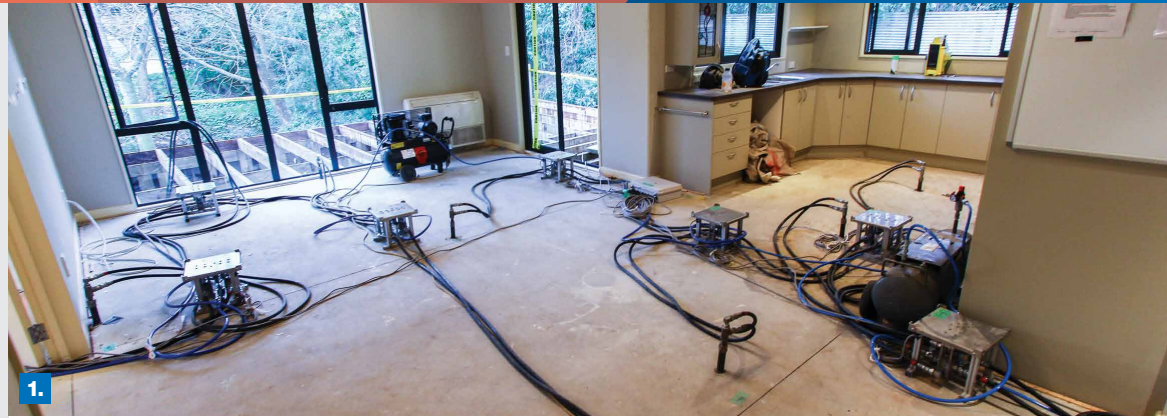
11 days / 2013

## TECHNOLOGY

JOG Computer  
Controlled Grouting

## BUSINESS UNIT

Mainmark New Zealand



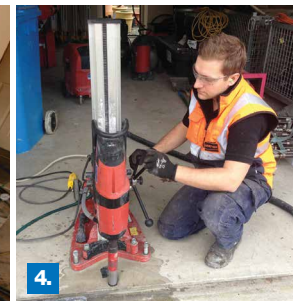
1.



2.



3.



4.

## Summary

This large residence in Christchurch suffered differential settlement of an average 55mm from the 2010 & 2011 earthquakes. Set on a raft concrete slab, the whole house had subsided and tilted.

It was rectified by Mainmark using JOG integrated computer grouting to raise the building back to within 10mm of its design levels.

## Objectives

The house was built adjacent to a creek and there was a high water table in the area. The sandy foundation had liquefied causing subsidence.

## Solution

JOG integrated computer grouting was used to raise the floor slab and to even up the differences in settlement across the structure.

Access was difficult, across a light timber bridge over a creek and along a lane shared with neighbours. So the JOG batching & pumping equipment and the project control centre had to be incrementally installed in the garage.

At 56 locations right across the slab, penetrations were cored and injection ports were installed through the concrete slab, for injection of the high mobility grout.

With continuous monitoring by laser level and theodolite, the injection sequence and volumes were controlled to effect an average lift of 55mm. The maximum lift, at the most subsided location, was 66mm.

The project, including establishment and equipment removal, took eleven days. As required, the floor slab was raised to within specification.

Pictured above: 1. 56 JOG injection points were established throughout the house for simultaneous injection lifting. 2 & 3: The grout batching and pumping set up in the garage. 4. Coring for the injection penetrations.