

Heritage Building Re-levelled



INDUSTRY

Heritage

STRUCTURE

Building

PROBLEM

Earthquake remediation

LOCATION

Kaiapoi, New Zealand

DURATION / YEAR

35 days / 2015

TECHNOLOGY

JOG Computer
Controlled Grouting

BUSINESS UNIT

Mainmark New Zealand

Above: Earthquakes resulted in substantial damage to this Category One Heritage listed building in Kaiapoi, New Zealand.

Summary

This 130-year old building suffered significant damage in the earthquakes that hit New Zealand's South Island in 2010 and 2011. A well known Kaiapoi landmark, the old Bank of New Zealand building was built in 1833. As a Category One Heritage New Zealand listed building, it was important to the owner, local council and the local community that the building be repaired and restored.

The 250-tonne building had subsided across the entire footprint towards the North East corner by more than 200mm.

Objectives

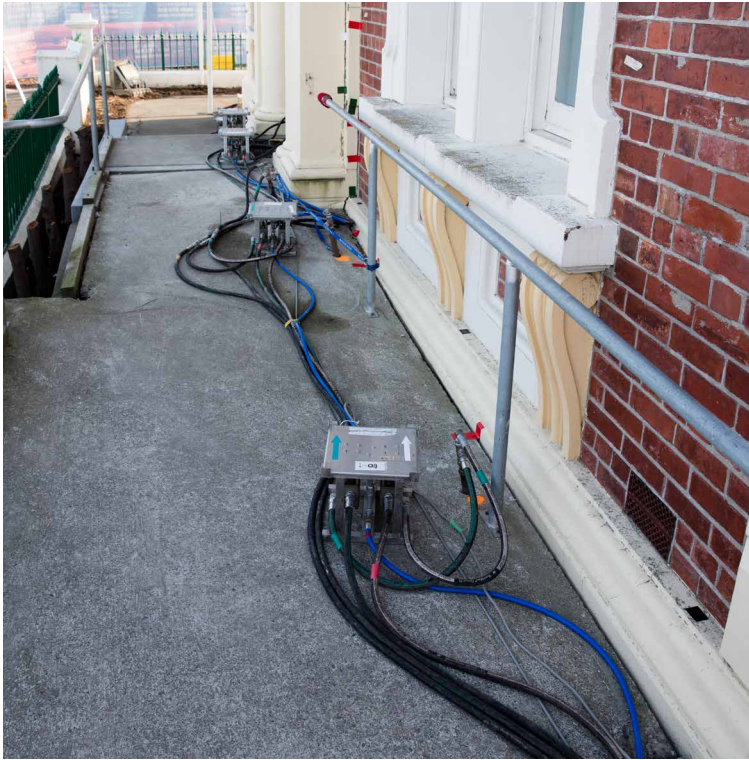
To ensure the entire structure was uniformly and continually supported, and then raised back to level without any new stresses being introduced or effecting the structural integrity of the building throughout the repair.

As with any remediation on a heritage building, it was imperative any further damage be kept to an absolute minimum, ensuring reparation costs could stay within budget.

Solution

JOG computer-controlled grouting was used on the project. JOG is a non-invasive method, delivering a highly controlled, precise and gentle lift.

Heritage Building Re-levelled continued



Above: JOG androids were placed at pre-determined, strategic points, internally and externally. Use of this non-invasive technology meant any further, significant damage to the heritage building was avoided.

The building's construction, current condition and the degree of lift required were all considerations in the design of the injection array. One hundred 40mm diameter injectors were installed beneath the perimeter and internal foundations of the building, including the existing bank safe. There was minimal impact to the historic floors, which meant they did not need to be removed.

Lifting was gentle, uniform and gradual, protecting the fragile nature of the building. Continuous surveying, internally and externally, was delivered via a fully automated Trimble monitoring system and manual assessment. The high degree of monitoring was a key contributor in achieving such an accurate and precise outcome.

Remediation and re-levelling was entirely successful, delivering a sound base for the building's footings and restoring the building back to level. The non-invasive method applied ensured no further significant damage or consequent costs, allowing the restoration of the project to continue as planned.