EQC
EARTHQUAKE COMMISSION
Komihana Ruwhenua

FACT SHEET

What was the Ground Improvement Pilot Project?

The Ground Improvement Pilot Project (the Pilot) involved the construction of a range of ground improvement methods in Christchurch and Kaiapoi between October 2013 and January 2015 across 31 residential properties with liquefaction vulnerability. The pilot was the second workstream in the GIP, following the Ground Improvement Science Trials. The work was funded by the Earthquake Commission (EQC) and coordinated by Tonkin + Taylor (T+T).

What was the purpose of the Pilot?

The primary objectives of the Pilot were to:

- Establish a market cost for the selected shallow ground improvement methods
- Assess contractor capability to construct the works
- Enhance understanding and acceptance of the ground improvement methods to promote a more holistic approach to building on residential land vulnerable to liquefaction
- Assess the practicality of constructing the works
- Establish what consents were required for construction.

What were the benefits of the Pilot?

Key benefits from the Pilot included:

- That shallow ground improvement methods were proven to be practical to construct on residential properties
- An increase in local contractor capability for residential ground improvement works
- Increased knowledge of typical construction costs and affordability of ground improvement
- Development of a standard specification for constructing ground improvement works
- Confidence in design and construction of ground improvement methods on residential properties.

How were properties selected for the Pilot?

One of the main aims of the Pilot was to test the selected ground improvement methods on a representative sample of residential properties in Christchurch and Kaiapoi.

After consultation with property owners, properties were selected based on:

- Their soil and groundwater conditions
- The size and location of the various areas vulnerable to liquefaction
- Whether they were roadside or rear properties for ease of access
- Their position next to other selected properties for some types of ground improvement
- Properties listed on the Hazardous Activities and Industries List (HAIL) or non-HAIL sites
- Whether there were obstructions, such as access bridges, streams and trees
- Health and safety considerations.

One of the main aims of the Pilot was to enhance understanding and acceptance of the ground improvement methods to promote a more holistic approach to building on residential land vulnerable to liquefaction

Roller compactor constructing reinforced gravel raft

Construction of in-situ mixed soil-cement raft

Construction of stone columns

Construction of driven timber poles

Directional drill constructing HSM beams

Which ground improvement methods were constructed?

The ground improvement methods used were:

- Reinforced gravel rafts
- Reinforced soil-cement rafts
- Stone columns
- Driven timber poles
- Horizontal Soil Mixed (HSM) beams.

The Pilot involved ten competitive tenders and one direct appointment to select the contactors for the construction works.