



# What is T-Rex shake testing?

Liquefaction shake testing, or 'T-Rex shake testing', is a specialised method to test the soil behaviour of the natural ground or where ground improvement has been constructed. A T-Rex shake test involves shaking the ground in stages, with shaking becoming stronger after each stage of shaking. During shaking, instrumentation in the ground monitors the response of the soil.

## How is T-Rex shake testing done?

To shake the ground, a 'shaker' truck is used. This specialist truck, the 'T-Rex shaker', was brought to Christchurch from the University of Texas at Austin.

The T-Rex is a 29-tonne truck that can produce large vibrations by shaking. The truck is a large all-wheel drive vehicle with the shaker set between the front and rear axles. It is able to shake test the ground with sufficient energy to trigger liquefaction to a depth of 3m - 4m below the surface.

## Why do we use the T-Rex and what does it test?

Researchers used T-Rex shake testing to help determine shear strain and pore water pressure response of the natural unimproved ground to different levels of shaking.

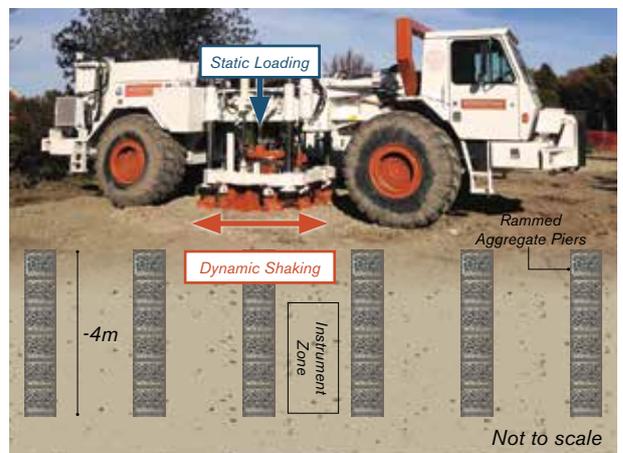
The T-Rex was then used to examine how effective various ground improvement methods were at reducing shear strains and pore water pressure build up, thereby increasing the liquefaction resistance of the soils. By trigger shaking the ground to liquefaction, researchers were able to measure how much each ground improvement method strengthened the ground compared to the unimproved natural soils.

T-Rex shake testing does not adversely affect the ground being tested, so it can be repeated on the same area of constructed ground improvement for many different levels and durations of shaking. The truck uses a staged approach where it increases vibrations to induce liquefaction.



'T-Rex' – a shaker truck used for liquefaction shake testing

A T-Rex shake test examines how effective various ground improvements are at developing a thicker non-liquefying crust



Cross-sectional perspective of the T-Rex in place to shake the Rammed Aggregate Pier ground improved test panel