

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

Earthquake Expectation Data

Story: Evaluation of Alternative Rebuild Options

Theme: Governance and Decision Making

A paper which details earthquake expectation data, supplied to SCIRT by GNS Science.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz



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The data in the following table has been supplied to SCIRT following a recent GNS revision of modelling of expectation and impacts of earthquakes in the Canterbury region.

The scale of the events involved is selected by GNS to be sufficient to cause liquefaction in Christchurch, where SCIRT in-ground infrastructure rebuild activities are centred. There are four principal source areas as indicated by the magnitude range and location radius in the table.

The expected number of events is shown for SCIRT use in comparisons of construction resilience and cost that are used in selection of design options.

Earthquake Sufficient to Cause Liquefaction in Christchurch		Expected Number of Events	
Magnitude Range	Radius (km) from Eastern Christchurch	Next 5 years	Next 20 years
5.8 ~ 6.5	10 km	0.142	0.25
6.5 ~ 7.0	50 km	0.072	0.17
7.0 ~ 7.5	100 km	0.033	0.10
>7.5	200 km	0.052	0.20
Cumulative Total (Average Number)	All events	0.30	0.72
Probability	An event	26%	51%
Cumulate Number Range (95% confidence)	All events	None to 2	None to 3

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