



**Tonkin & Taylor**

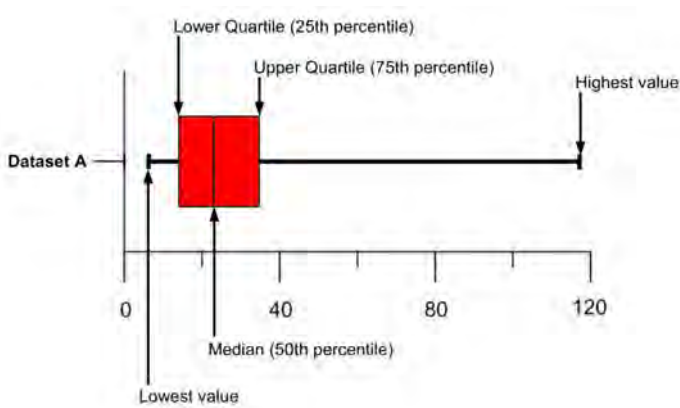
## **Appendix K: Observed Liquefaction performance at approximately 100 year PGA**

**ENVIRONMENTAL AND ENGINEERING CONSULTANTS**

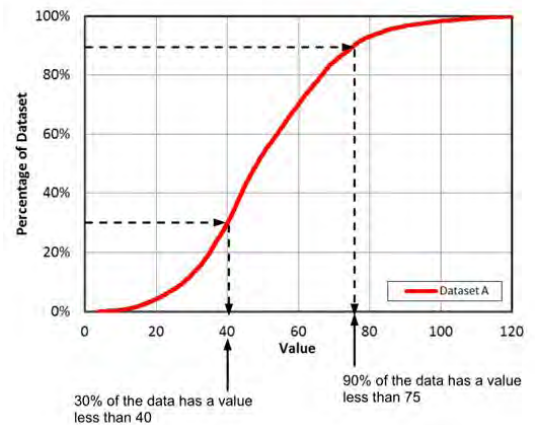


# KEY

## Box and Whisker Plots



## Cumulative Frequency Plot




## LEGEND


### Observed Vulnerability Index

 N/A


Site did not experience UoC PGA (normalised to M7.5) between 0.15g and 0.25g in any of the four main earthquakes in the Canterbury Earthquake Series.

 No Observed Vulnerability


Site experienced UoC PGA between 0.15g to 0.25g in one to four earthquakes, and no consequential effects of liquefaction were observed in these events (only none to minor liquefaction observation category).

 Minor Observed Vulnerability

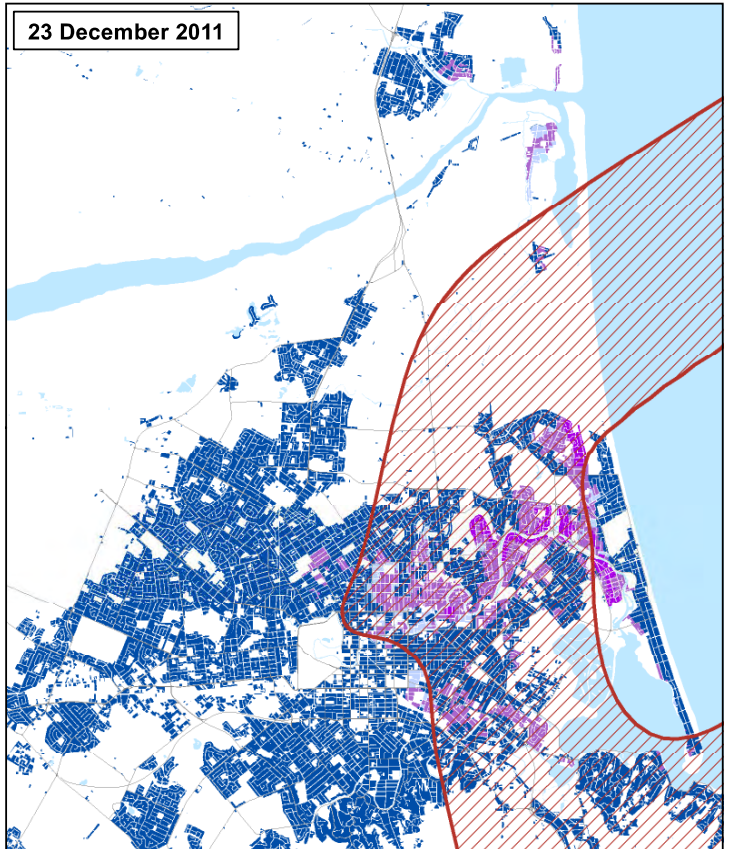
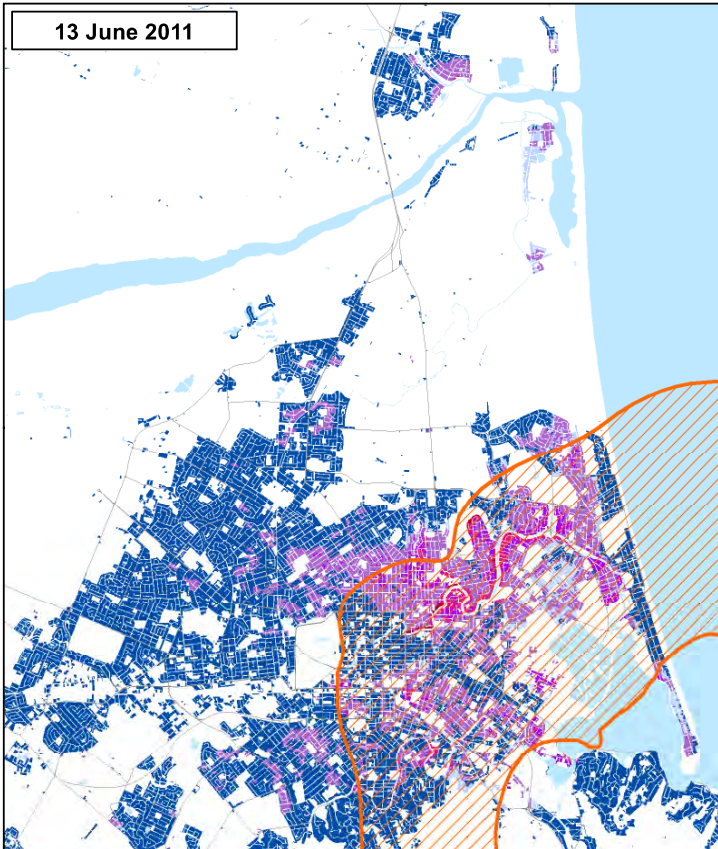
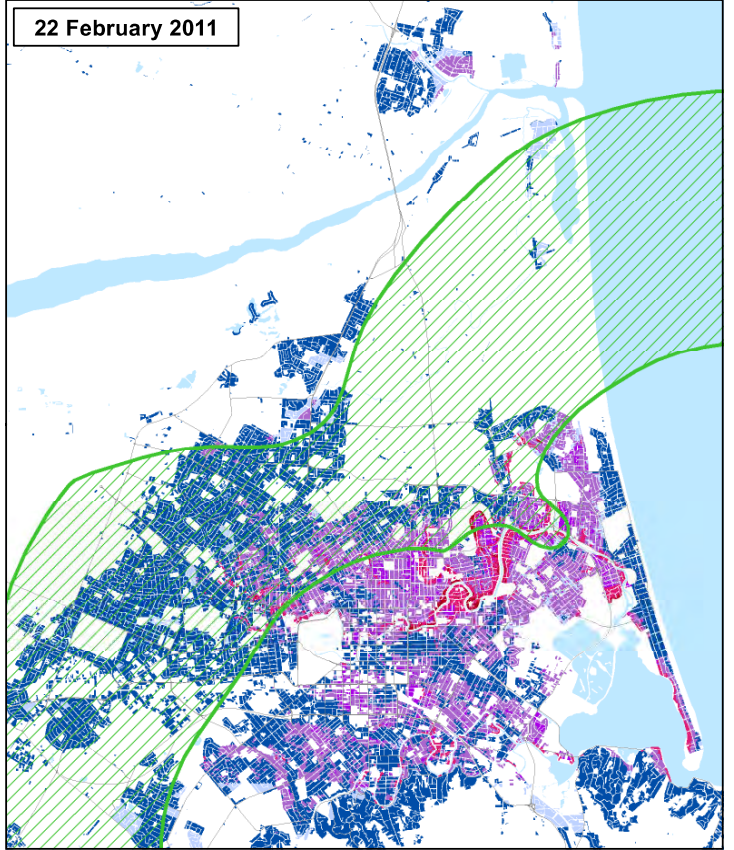
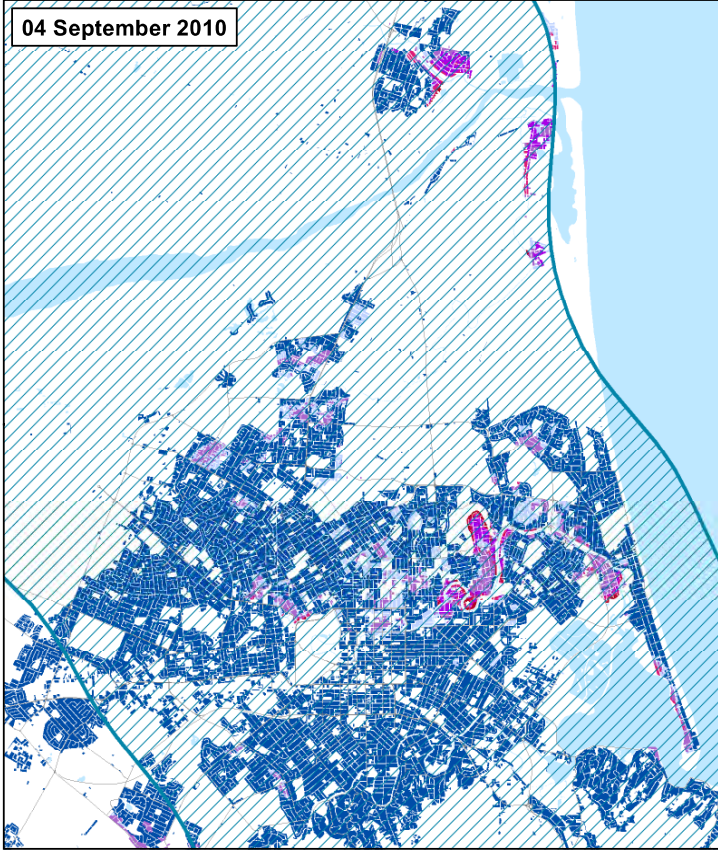
Site experienced UoC PGA between 0.15g to 0.25g in three to four earthquakes, but consequential effects of liquefaction were observed for only one of these events.

 Moderate Observed Vulnerability

Site experienced UoC PGA between 0.15g to 0.25g in two to four earthquakes, and consequential effects of liquefaction were observed in about half of these events.

 Major Observed Vulnerability

Site experienced UoC PGA between 0.15g to 0.25g in one to four earthquakes, and consequential effects of liquefaction were observed in either 75% or all of these events.



**LEGEND**

**Magnitude Weighted PGA**

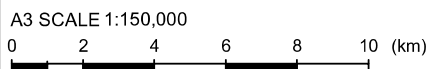
- Sept - 0.15 to 0.25g
- Feb - 0.15 to 0.25g

**Land Damage Index**

- Jun - 0.15 to 0.25g
- Dec - 0.15 to 0.25g
- 1 - None Observed
- 2 - Minor
- 3 - Moderate
- 4 - Major
- 5 - Severe
- 6 - Very Severe

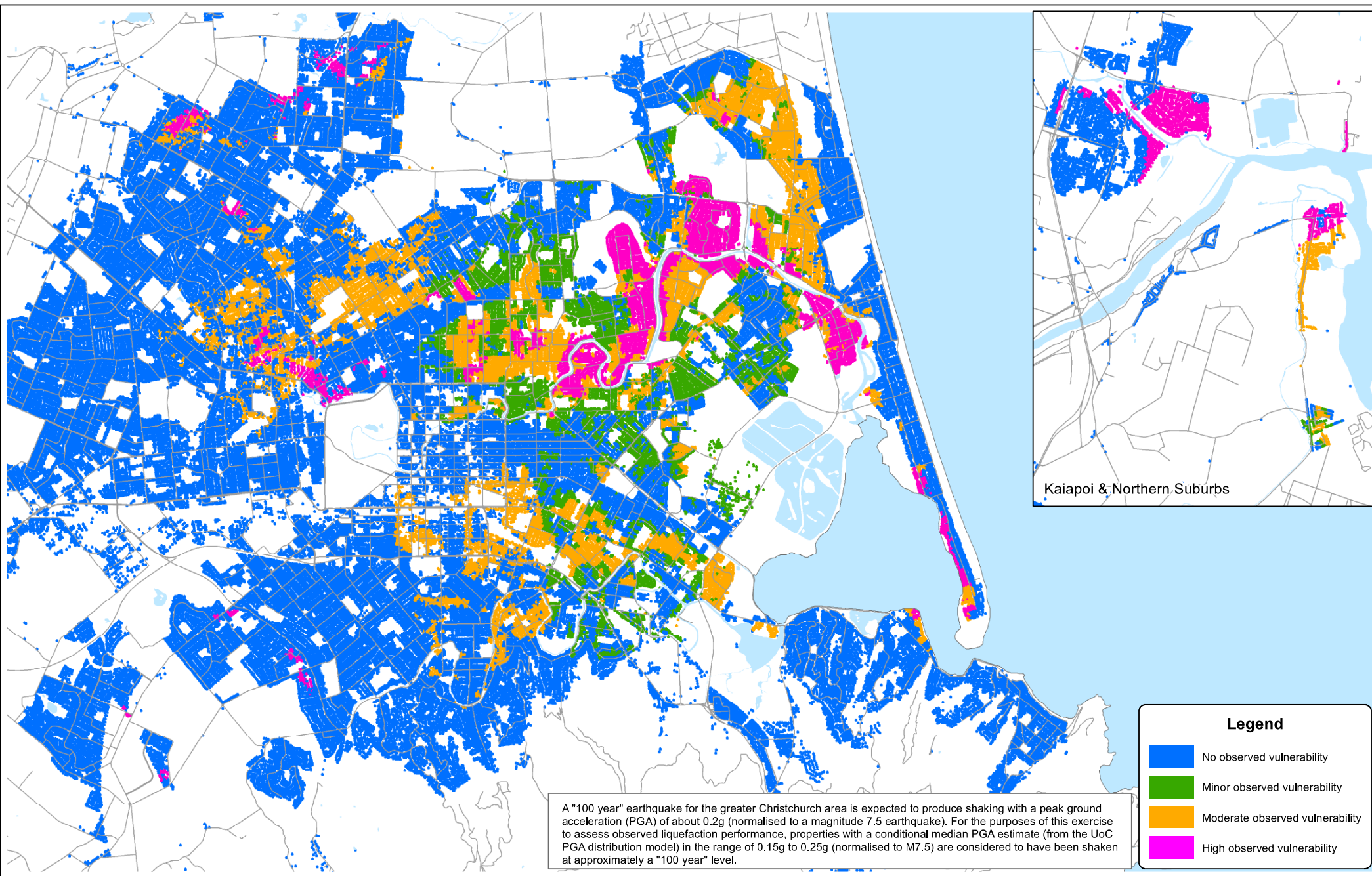


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DRAWN	JEL	Feb,13
CHECKED		
APPROVED		
ARCFILE 52020-0200-PGA28.mxd		
SCALE (AT A3 SIZE)		
Prepared by Tomlin & Taylor Ltd		
Ref. 52020-0200		

**EARTHQUAKE COMMISSION**  
**CHRISTCHURCH CITY & KAIAPOI**  
 Areas Which Experienced a Magnitude Weighted PGA Between 0.15 - 0.25g for the Four Main Events  
 FIGURE No. Figure K1  
 Rev. 0



A "100 year" earthquake for the greater Christchurch area is expected to produce shaking with a peak ground acceleration (PGA) of about 0.2g (normalised to a magnitude 7.5 earthquake). For the purposes of this exercise to assess observed liquefaction performance, properties with a conditional median PGA estimate (from the UoC PGA distribution model) in the range of 0.15g to 0.25g (normalised to M7.5) are considered to have been shaken at approximately a "100 year" level.

**Legend**

- No observed vulnerability
- Minor observed vulnerability
- Moderate observed vulnerability
- High observed vulnerability

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A3 SCALE 1:60,000  
 0 1 2 3 4 (km)



DRAWN	CXP	Feb.13
CHECKED		
APPROVED		
ARCFILE	52020-0200-LDF44	
SCALE (AT A3 SIZE)	1:60,000	
Prepared By	Tonkin & Taylor Ltd.	
Ref.	52020-0200	

**EARTHQUAKE COMMISSION**  
**CHRISTCHURCH CITY & KAIAPOI**  
 Observed Liquefaction Performance at  
 Approximately 100 year PGA (Magnitude Weighted)  
 FIGURE No. **Figure K2** Rev. 0

Date: 28/02/2013 Time: 8:54:30 a.m.

