

## **City Care Milton Street Depot – Parks Store BU 1141-005 EQ2**

### **Detailed Engineering Evaluation Quantitative Report – SUMMARY**

Version 1

#### **Address**

245 Milton Street  
Sydenham  
Christchurch



## **Background**

This is a summary of the Quantitative Assessment report for the building structure, and is based on the document 'Guidance on Detailed Engineering Evaluation of Earthquake Affected Non-residential Buildings in Canterbury – Part 2 Evaluation Procedure' (draft) issued by the Engineering Advisory Group (EAG) on 19 July 2011.

A Qualitative Assessment report was issued to CCC on 22 June 2012.

The Parks Store is located at the City Care Milton Street Depot at 245 Milton Street, Sydenham, Christchurch. It is a masonry blockwork structure and was constructed in 1964 and has an approximate floor area of 90m<sup>2</sup> internally. No drawings are available. Calculations have been undertaken as part of the Quantitative Assessment.

## **Key Damage Observed**

Visual inspections on 1 February and 29 August 2012 indicate the building has suffered moderate earthquake damage. The key damage observed includes:

- Cracking to the blockwork mortar throughout the building.
- Minor cracking to the concrete bond beam.

## **Critical Structural Weaknesses (CSW)**

The following Critical Structural Weaknesses have been identified as a result of our Quantitative Assessment.

- Unreinforced masonry blockwalls
- Site characteristics due to liquefaction occurring on the Milton St site

## Indicative Building Strength (from Detailed Assessment)

The building has been assessed to have a seismic capacity of 14%NBS in its undamaged state, using the New Zealand Society for Earthquake Engineering (NZSEE) Detailed Assessment guideline 'Assessment and Improvement of the Structural Performance of Buildings in Earthquakes' (AISPBE), 2006, and is therefore classified as Earthquake Prone and Seismic Grade E.

Our assessment has identified the structural components that have governed/limited the building's undamaged seismic performance, and their potential failure mechanisms, are as follows:

- The in-plane shear capacity of the unreinforced masonry walls, which is 14%NBS in both directions.

The structural damage observed is moderate and the seismic capacity is considered to have reduced by around 30% due to the damage, reducing the seismic capacity to around 10%NBS in its damaged state.

## Recommendations

In order that the owner can make an informed decision about the on-going use and occupancy of their building the following information is presented in line with the Department of Building and Housing document 'Guidance for engineers assessing the seismic performance of non-residential and multi-unit residential buildings in greater Christchurch', June 2012.

The building is considered to be earthquake prone, having an assessed capacity less than 33%NBS, and is classified as Seismic Grade E. The risk of collapse of an earthquake prone building of this grade is considered to be more than 25 times greater than that of an equivalent new building.

For greater Christchurch the definition of a "dangerous" building in the Building Act has been extended (by the Canterbury Earthquake (Building Act) Order 2011) to include buildings at risk of collapsing in a moderate earthquake, that is earthquake prone buildings with a capacity at or below 33%NBS and is classified as Seismic Grade E. Where council requires a dangerous building or an earthquake prone building to be upgraded, it may prohibit the use of the building until the works are carried out.

The building has suffered damage to the seismic or gravity load resisting system that is sufficient to impair or significantly reduce the ability to resist further loads. It is in a condition under which further deterioration may be expected in future aftershocks.

With consideration to the earthquake damage and the existing hazards observed, in its current state the building is not capable of resisting a moderate earthquake without collapse (its assessed capacity is less than 33%NBS).

It is recommended that:

- A full damage assessment is carried out for insurance purposes.
- A verticality and level survey could be carried out to determine the extent of settlement of the building for insurance purposes.

Repairs that would bring the building back to an "as new" condition are typically entitled under typical replacement insurance policies. We suggest you consult with your insurance advisor as to how you wish to proceed.