HolmesConsultingGroup

STRUCTURAL AND CIVIL ENGINEERS

REPORT

Press Building

Preliminary Seismic Assessment Report

PREPARED FOR

Ganellen, Christchurch City Council

3 March 2011

Introduction

Holmes Consulting Group have been engaged by Ganellen to undertake a seismic assessment the Press Building located at 32 Cathedral Square, Christchurch.

The purpose of our review is to comment on the further damage that has occurred to the building in the February 22 earthquake, and make a recommendation for repair or demolition.

The February 22 earthquake measured 6.3 on the Richter Scale, and was centred near the head of the Heathcote Valley, at a depth of approximately 5 km. It produced spectral accelerations in or around the CBD that are considered to be in excess of the 2,500 year return period earthquake (which is equivalent to 1.8 times the full code load for Christchurch).

The building has partially collapsed, so this report has been complied from an exterior review, and anecdotal evidence from an Urban Search & Rescue (USAR) engineer who has entered the building during their operations.

Scope of Work

The scope of work for this preliminary report included the following:

1. An external review of the structure.
2. Discussion with USAR.
3. Report on our findings and recommendations.

Limitations

Findings presented as a part of this project are for the sole use of Ganellen and the Christchurch City Council in its evaluation of the subject properties. The findings

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Building Description

The Press Building consists of four levels above a partially submerged basement. The floors are constructed of in-situ concrete with unknown quantities of steel reinforcing. The floors are supported internally on secondary concrete 'arch' beams, spanning between primary steel beams which are supported by cast iron columns. The floors have perimeter beams which appear to tie the floor diaphragm to the vertical support structure of the perimeter walls.

The North and East walls are constructed of unreinforced masonry (URM) which reduces in thickness up the height of the structure. The façade walls on the West and South faces of the building are a mixture of URM and stonework.

The southeast corner of the building has a partially protruding tower that rises approximately 8m above the adjacent roof parapet. The parapet and tower roof have undergone previous strengthening during the 1970's.

The Lateral load resisting system is provided primarily by the east, north and central east-west masonry/concrete walls. The façade walls on the west and south faces of the structure do not contribute significantly to the lateral resistance but have a moderate level of ductility during seismic events.

Building Performance

Externally, the following observations can be made:

- The upper level has collapsed entirely onto the fourth floor.
- Most of the parapets were immediately dropped, with the exception of the south wall parapet, which has subsequently been removed by USAR.
- The corner tower roof has toppled back onto the fourth floor, with the masonry under it completely collapsed.
- The south facade has suffered further cracking and damage.
- The west facade has also cracked, and has an outwards lean over the central portion above the roof level.

Internally, it is understood that the main brick shear wall is severely cracked with significant permanent offsets at all level, in the region of up to 50mm wide. The rear lightwell has suffered considerable damage also, and is understood to be severely compromised.

Figure 1: View of roof/fourth floor from above

Figure 2: South facade. Note parapet since removed

Figure 3: West facade

Conclusions

In our opinion, the building is irretrievably damaged. While it may be technically possible to preserve some remaining parts of the building, there are practical reasons why this is not recommended:

1. The parapet and the while upper storey have been lost. This has affected the scale of the building, and the parapet was one of the major heritage items of the building.

2. The interior of the building is so severely damaged that only the facade can really be retained, comprising the south and west walls. In order to do this, a gantry will be required outside the building. Half the length of the west facade is on Press Lane and therefore there is not sufficient room for a reasonable gantry. The south facade is on Worcester Street, and hence a gantry is unlikely to be acceptable there either.

3. The west facade appears to have separated from the third floor over the central portion of its length.

4. The Oamaru stone of the facade was inappropriately repaired some years ago, using gunite. This is causing further deterioration of the original stonework.

5. Not a technical issue, but this building will have a stigma attached due to its collapse and subsequent death of occupants.

If you have any questions or require more information please call.

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