

In the matter of the Commissions of Inquiry Act 1908

And

In the matter of the Canterbury Earthquakes Royal Commission

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**Brief of evidence of Bruce Duncan Galloway relating to 242 - 246 High  
Street for hearing week commencing 13 February 2011**

**Date: 8 February 2012**

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- 1 My full name is Bruce Duncan Galloway.
- 2 I am a Senior Project Engineer employed by Holmes Consulting Group Limited (**HCG**).
- 3 I hold a bachelor's degree in civil engineering, BE (Hons) (Civil) conferred by the University of Canterbury. I am a Chartered Professional Engineer, CPEng (Structural), a member of the Institution of Professional Engineers of New Zealand, MIPENZ, and a Level 2 USAR Engineer.
- 4 I have nine years postgraduate experience in engineering.

#### **Scope of Evidence**

- 5 I, on behalf of HCG, provide this Brief of evidence in response to the Canterbury Earthquakes Royal Commission's letter dated 9 November 2011 in relation to the building at 242 - 246 High Street (the **Building**).

#### **Inspection on 20 September 2010**

- 6 I am asked if, in carrying out the inspection on 20 September 2010, I reviewed the make safe work that had been carried out or if I carried out any further inspection of the Building. I am further asked if the inspection on 20 September 2010 was for the purpose of a peer review of the inspection on 10 September 2010.

#### **Response**

- 7 I attended the Building on 20 September 2010 to review the temporary securing works for the southern parapet (as specified by Mr Boys in his site report dated 15 September 2010). The inspection was not a peer review of Mr Matthew's inspection on 10 September 2010.

- 8 I gained access to the general roof area but my observations were restricted only to the works being carried out by the contractor on the southern parapet.
- 9 I completed a site report providing advice to the contractor with respect to the temporary securing works being carried out to the southern parapet.
- 10 My site report notes that a metal strap has been installed to the front parapet as required. It also notes that chimneys have been removed from the south parapet down to roof level.
- 11 The site report notes my observation that the majority of the (southern) parapet appears to be relatively undamaged except for a short segment approximately half way along the roof. I state that this segment should be removed down to roof level and note that once this work is complete the parapet will be considered to be as stable as it was before the earthquake. Longer term, I recommended that the parapet be investigated with a view to securing the taller sections of the parapet.
- 12 A copy of my site report is **attached [A]**.

#### **Make safe work**

- 13 I am asked if the make safe work had been commenced as of 20 September 2010.

#### **Response**

- 14 The temporary securing work for the southern parapet was being carried out by a contractor when I visited the Building on the 20 September 2010. Observations were carried out by me on 20 September 2010 and Mr Boys on 21 September 2010 to review the temporary securing works as they progressed and on completion.

#### **Extent of Involvement post 20 September 2010**

- 15 I am asked if I had any further involvement with the Building.

**Response**

- 16 Mr Boys completed a site report on 21 September 2010 advising that the loose masonry had been removed and the temporary securing detail (for the south-west parapet) had been completed.
- 17 Mr Boys also filled out a Christchurch EQ RAPID Assessment Form – Level 2, which was subsequently signed by me following an internal review of the damage observed and temporary securing works carried out. A copy of this EQ RAPID Assessment Form - Level 2 is **attached** [B].
- 18 I had no further involvement with the Building after that.

**Photographs**

- 19 Photographs taken during my site visit are **attached** [C].

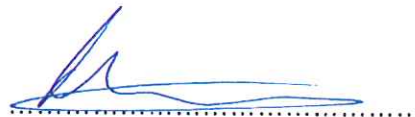
**Conclusion**

- 20 I am asked to provide any observations/comments that might be relevant to the issue the Commission will have to address in relation to the Building i.e. the collapse of the northern wall.

**Response**

- 21 I can think of nothing further that might assist the Commission with this issue.

Date: 8 February 2012



**Bruce Duncan Galloway**

"A"

HolmesConsultingGroup



Project Name 242 High Street  
 Project No: 105315  
 S.R. No:  
 Date: 20 September 2010  
 Reviewed By: Bruce Galloway

SITE REPORT

STRUCTURAL AND CIVIL ENGINEERS

Work Reviewed:

Securing of parapets.

Observations &amp; Comments:

- Metal strap installed to front parapet corner as required.
- Chimneys removed from South parapet down to roof level. The majority of the parapet appears relatively undamaged except for a short segment approximately half way along the roof. Please remove this segment of parapet (approximately 2m long 0.7m high) down to roof level (also adjacent 5m long section).
- Once this work is complete the parapet is considered to be as stable as it was before the earthquake. Long term, we recommend the parapet be investigated with a view to securing the taller sections of the parapet.

Report Prepared By:

Bruce Galloway  
 PROJECT ENGINEER

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New Zealand

Offices in

Auckland

Hamilton

Wellington

Queenstown

San Francisco

Copies to:

"B"

# Christchurch Eq RAPID Assessment Form - LEVEL 2

Inspector Initials  
Territorial Authority

ALB (Holmes)  
Christchurch City

Date  
Time

21/9/10  
9:40

Final Posting  
(e.g. UNSAFE)

GREEN

Building Name

Short Name

Address

242 High St

GPS Co-ordinates

S°

E°

Contact Name

Contact Phone

Storeys at and above  
ground level

3

Below  
ground  
level

1

Total gross floor area  
(m<sup>2</sup>)

300

Year  
built

No. of residential Units

—

Type of Construction

Timber frame

Steel frame

Tilt-up concrete

Concrete frame

RC frame with masonry infill

Concrete shear wall

Unreinforced masonry

Reinforced masonry

Confined masonry

Other:

Primary Occupancy

Dwelling

Other residential

Public assembly

School

Religious

Commercial/ Offices

Industrial

Government

Heritage Listed

Other

Photo Taken

Yes

No

Investigate the building for the conditions listed on page 1 and 2, and check the appropriate column. A sketch may be added on page 3

Overall Hazards / Damage

Minor/None

Moderate

Severe

Comments

Collapse, partial collapse, off foundation

Building or storey leaning

Wall or other structural damage

Overhead falling hazard

Ground movement, settlement, slips

Neighbouring building hazard

Electrical, gas, sewerage, water, hazmats

Damage to masonry (chimney +  
parapet) removed/secured.

Record any existing placard on this building:

Existing  
Placard Type  
(e.g. UNSAFE)

YELLOW

Choose a new posting based on the new evaluation and team judgement. Severe conditions affecting the whole building are grounds for an UNSAFE posting. Localised Severe and overall Moderate conditions may require a RESTRICTED USE. Place INSPECTED placard at main entrance. Post all other placards at every significant entrance. Transfer the chosen posting to the top of this page.

INSPECTED

GREEN

G1

G2

RESTRICTED USE

YELLOW

Y1

Y2

UNSAFE

RED

R1

R2

R3

Record any restriction on use or entry:

Further Action Recommended:

Tick the boxes below only if further actions are recommended.

Barricades are needed (state location):

Detailed engineering evaluation recommended

Structural

Geotechnical

Other recommendations:

Other:

Bruce Galloway  
Holmes Consulting Group  
366 3366

Estimated Overall Building Damage (Exclude Contents)

None

0-1 %

31-60 %

2-10 %

61-99 %

11-30 %

100 %

Inspection ID: \_\_\_\_\_ (Office Use Only)

Sign here on completion

Date & Time  
ID

21/9/10 9:40am

Structural Hazards/ Damage	Minor/None	Moderate	Severe	Comments
Foundations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roofs, floors (vertical load)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Columns, pilasters, corbels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Diaphragms, horizontal bracing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Pre-cast connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Beam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Non-structural Hazards / Damage</b>				
Parapets, ornamentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Minor Cracking in remaining parapets will require remedial work - not life threatening</i>
Cladding, glazing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ceilings, light fixtures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Interior walls, partitions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Elevators	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Stairs/ Exits	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Utilities (eg. gas, electricity, water)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Geotechnical Hazards / Damage</b>				
Slope failure, debris	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ground movement, fissures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Soil bulging, liquefaction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>General Comment</b>				

**Usability Category**

Damage Intensity	Posting	Usability Category	Remarks
Light damage	Inspected (Green)	G1. Occupiable, no immediate further investigation required	
Low risk		G2. Occupiable, repairs required	
Medium damage	Restricted Use (Yellow)	Y1. Short term entry	
Medium risk		Y2. No entry to parts until repaired or demolished	
Heavy damage	Unsafe (Red)	R1. Significant damage: repairs, strengthening possible	
High risk		R2. Severe damage: demolition likely	
		R3. At risk from adjacent premises or from ground failure	



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P1010365



P1010368

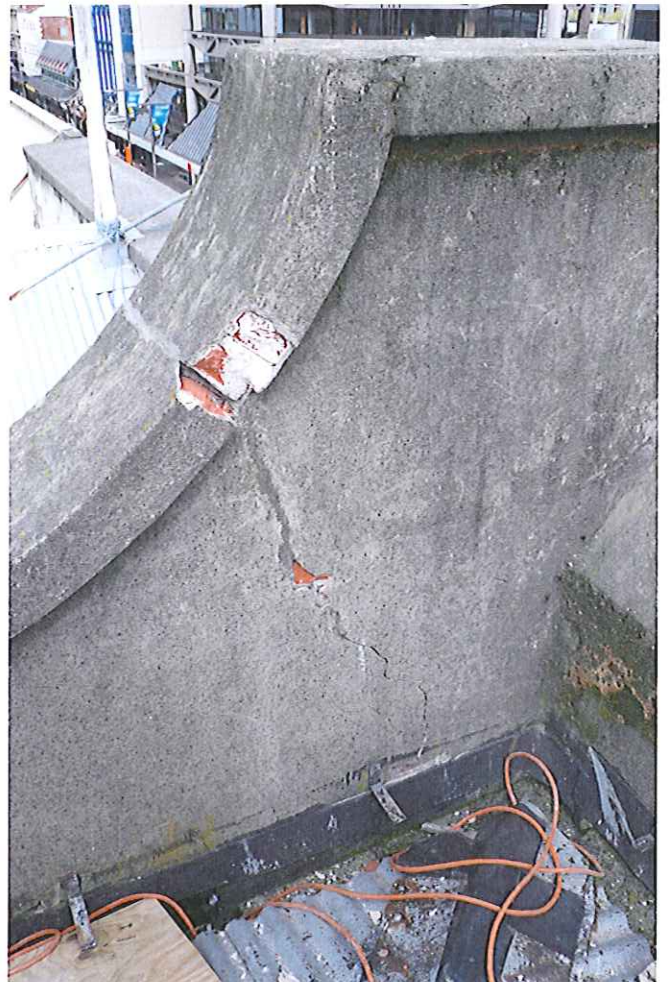
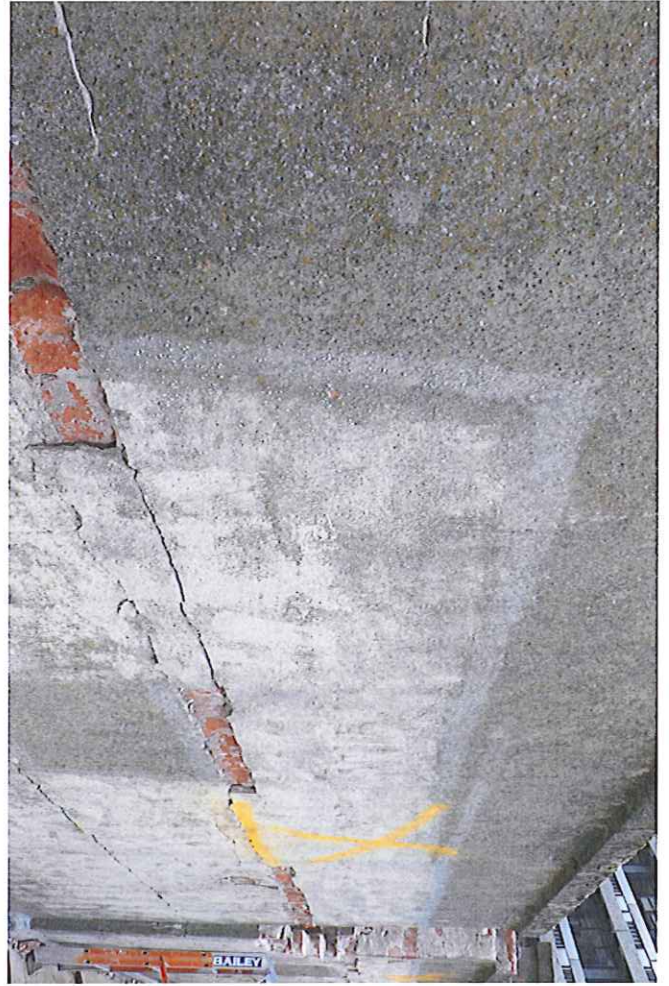
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