

UNDER THE COMMISSIONS OF INQUIRY ACT 1908

**IN THE MATTER OF ROYAL COMMISSION OF INQUIRY INTO BUILDING
FAILURE CAUSED BY CANTERBURY EARTHQUAKES**

**KOMIHANA A TE KARAUNA HEI TIROTIRO I NGĀ
WHARE I HORO I NGĀ RŪWHENUA O WAITAHA**

**STATEMENT OF EVIDENCE OF STEPHEN JAMES MCCARTHY IN RELATION TO
THE FORSYTH BARR BUILDING**

DATE OF HEARING: 23 – 24 FEBRUARY 2012

INTRODUCTION

1. My name is Stephen James McCarthy. I am the Environmental Policy and Approvals Manager of the Christchurch City Council ("the Council"). I have worked for the Council since 1 May 2006. During the State of Emergency following the earthquake of 4 September 2010, I was one of the Building Evaluation Managers in the Christchurch City Emergency Operations Centre.
2. I have 36 years of experience working for local government, including 16 years in building control. I have a Degree in Applied Science and a Post Graduate Diploma in Management from Massey University and a Royal Society Diploma in Environmental Health from Wellington Polytechnic.
3. I have been asked to provide evidence to the Royal Commission relating to specific aspects of the Council's involvement with the Forsyth Barr building before and after the earthquake of 4 September 2010 and the Boxing Day aftershock.

DOCUMENTS PROVIDED TO THE ROYAL COMMISSION

4. The documents relating to this building that have been provided to the Royal Commission are:
 - (a) the Building Permit/Building Consent file for the Forsyth Barr building;
and
 - (b) post earthquake files.

SCOPE OF EVIDENCE

5. My evidence will address the following matters:
 - (a) The inspection and certification process that was in place at the time of construction of the Forsyth Barr building.
 - (b) Whether the Council observed debris in the seismic gaps in the stairs at the time of any inspections which took place during any office fit-outs.

- (c) The steps the Council is contemplating as a result of the recommendations in the Department of Building and Housing Stage 1 Expert Panel Report relating to stairs and Practice Advisory 13 issued by the Department of Building and Housing which relates to egress stairs.
- (d) The Civil Defence Emergency Management Response in relation to the building after the 4 September 2010 earthquake.
- (e) Council involvement with the building subsequent to the lifting of the state of emergency on 16 September 2010, but before 22 February 2011.

THE INSPECTION AND CERTIFICATION PROCESS (Paragraphs (a) and (b) above)

6. Council records indicate that the building permit to erect a retail and office building at 764 Colombo Street was approved on 9 May 1988 and uplifted on 19 May 1988. A copy of the permit approval and conditions are attached as **Annexure "A"**.
7. A Design Certificate, dated 7 March 1988, was provided by Russell Arthur Poole for and on behalf of Holmes Consulting Group Limited in relation to the building. A copy of the Design Certificate is attached as **Annexure "B"**. This Design Certificate covered the precast stair connections and layout, including the seismic gap.
8. As I was not employed by the Council at the time of construction of the Forsyth Barr building, my comments below concerning the Council processes followed at the time of construction are based only on a review of material on the Council's building file, the requirements of the Bylaw that was current at the time and from discussion with some building consent officers who were employed by the Council at the time.
9. In 1988 the relevant building bylaw was Christchurch City Council Bylaw 105 (1985). Clauses 2.5, 2.16, 2.19 and 8.2 of the Bylaw set out various relevant obligations for the owner, the builder, the engineer and the Council in relation to

the construction of a building. The relevant parts of these clauses are attached as **Annexure "C"**.

10. Clause 2.15.2 of the Bylaw states that it is the duty of the owner of the land on which work is being carried out, the employer for whom work is being carried out, and the builder or contractor who is carrying out the work, to ensure that the provisions of the Bylaw are fully complied with in the commencement and execution of building work
11. Clause 2.16.1 states that there must be no departure from the permitted plans, drawings or specifications unless amended particulars describing any deviation are supplied to the Council, and the Council Engineer provides approval for the deviation.
12. The requirements relating to inspections during construction are set out in clause 2.19. Other than clause 2.19.3, which refers to an inspection of the foundation excavations before the placing of any site concrete or part of the foundation structure, the clause does not specify any particular mandatory inspections. It appears that this was intended to be left to the discretion of the Council Engineers and the building inspectors who were carrying out the inspections.
13. The Bylaw does include a number of clauses relating to supervision by the designer of specific elements of buildings during construction. Part 8 of the Bylaw relates to concrete elements in buildings. Clause 8.2.6 states that the designer of any concrete element must supervise the construction of the element. The clause states that supervision means general supervision only, which includes such periodic supervision and inspection as may be necessary to ensure that the structural work is executed generally in accordance with the design, as distinct from any special supervision that may be required for a particular situation.
14. Attached as **Annexure "D"** are the Council's inspection records relating to the original construction of the Forsyth Barr building. The records note that the owner's Engineer was "checking before all [concrete] pours", which may have included any concrete pours associated with the installation of the precast stairs. There is no specific record on the Council's files of the Council inspecting the stairs or seismic gaps in the Forsyth Barr building during or on completion of

construction. However, it is possible that additional inspections were carried out by the Council's building inspectors but not specifically referred to in the inspection records.

15. Attached as **Annexure "E"** is a document developed by staff in September 1989 which sets out general guidelines to Council building inspectors about the scope of inspections to be carried out for particular types of buildings. Stair construction is included as a "random inspection" item. The guidelines note that there will often be 3-4 random inspections for larger buildings. I understand that guideline documents such as this were developed from time to time to confirm the general processes expected of building inspectors. The Council has not however been able to locate any earlier guidelines relating to the period when the Forsyth Barr building was constructed.
16. Councils and their building inspectors are not required to be a Clerk of Works or project managers during the construction of buildings, particularly in relation to commercial buildings. The Office of the Ombudsman confirmed this position in a letter to the Council dated 18 December 1986 (**Annexure "F"**).
17. In the case of the Forsyth Barr building, the Council would have been aware that an experienced national building contractor, Fletcher Construction Limited, had become involved with the building project at the time the building permit was issued. The Council was also aware that the design engineers (Holmes Consulting Group Limited) were a competent firm experienced in the design and supervision of multi-storey buildings.
18. Counsel Assisting the Royal Commission has asked the Council to provide evidence about whether debris was observed in the seismic gaps at the time of any Council inspections which took place during any office fit-outs. It is unlikely that an inspector of interior fit-outs would have had a chance to observe the seismic gaps in the stairs. The detail of the seismic gaps shows that a polyethylene tube and a flexible sealant thioflex was to be installed at the floor surface level and the floor was then covered in vinyl flooring material (detail 1 on sheet 217 of the original drawings, BUI.COL764.0003A.8). This would have precluded direct observation of the seismic gaps on the stairs when moving within the building.

19. The Council's files do not contain any record of construction debris or mortar being observed in the seismic gaps in the stairs either during construction or upon subsequent inspections relating to office fit outs.

**RESPONSE TO DEPARTMENT OF BUILDING AND HOUSING RECOMMENDATIONS
(Paragraph (c) above)**

20. Counsel Assisting the Royal Commission has asked the Council to provide evidence about the steps the Council is contemplating as a result of the recommendations in the Department of Building and Housing Stage 1 Expert Panel Report relating to stairs and Practice Advisory 13 issued by the Department of Building and Housing which relates to egress stairs.
21. Practice Advisory 13 states that its purpose is to alert practising structural engineers assessing existing multi-storey buildings throughout New Zealand to issues relating to the safety of stairs. The Practice Advisory draws attention to the findings of the technical report prepared by Beca for the Department of Building and Housing, a related report prepared by Professor Des Bull for the Royal Commission, and a SESOC Practice Note regarding the "Design of conventional structural systems following the Canterbury Earthquakes".
22. In the "Actions to be taken" section of the Practice Advisory, the Department instructs territorial authorities to bring the Advisory to the attention of building owners when advising them of the need to renew their annual Building Warrant of Fitness. The Practice Advisory also instructs Building Consent Authorities to bring the Advisory to the attention of building owners when building consent applications are made for any work on a multi-storey building with sliding stair details.
23. The Council is accordingly sending out copies of Practice Advisory 13 with the Building Warrant of Fitness reminder letters which are sent to building owners annually. The Council will also draw the Advisory to the attention of any owners applying for building consents relating to work on multi-storey buildings with sliding stair details.

24. The Council is also aware that the Canterbury Earthquake Recovery Authority has commenced a process to require that owners provide a structural assessment of their buildings to allow continued occupation or re-occupation of the building. The structural assessment would include an assessment of any stairs in the building and this information is being shared with Council

EVENTS AFTER THE 4 SEPTEMBER 2010 EARTHQUAKE (Paragraphs (d) and (e) above)

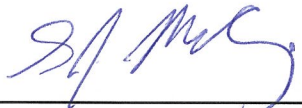
25. The Council's records indicate that a Level 2 Rapid Assessment was undertaken by the property manager's structural engineer, Beca, on 5 September 2010 and the building was assessed as "Restricted Use – Y2" (**Annexure "G"**). The assessment noted that the "stairs have generally settled and may be unstable". A further structural assessment was recommended and the form stated that "stair landing bulkheads need to be removed to allow investigation". The form also noted that there had been damage to a steel beam supporting the car ramp which needed to be propped.
26. Beca carried out a further assessment on 6 September 2010. Beca's "Level 2 Seismic Assessment" is attached as **Annexure "H"**. The Seismic Assessment notes that temporary propping had been carried out to allow pedestrian access to the carpark and that the stairs contained sufficient capacity for normal use. Beca therefore recommended that the building be changed to category "G2-Inspected" (**Annexure "I"**) and it appears that the placard was accordingly changed.
27. The Council's records also include an undated Level 1 Rapid Assessment which recorded the building as "Inspected-Green" and noted estimated overall building damage as "none".
28. The Council has no record of a cordon being required for the building at any stage.
29. The Council corresponded with various parties between 4 September 2010 and 22 February 2011 regarding pending applications for office fit outs on level 7 and 13 of the building. An application for an office fit out on level 7 was received

on 4 November 2010 (ABA10107585) and was later cancelled on 10 December 2010. An application for an office fit out on level 13 was received on 20 January 2011 (ABA10108665) and was issued on 22 February 2011.

30. The technical report prepared by Beca for the Department of Building and Housing refers to various other inspections and repair work undertaken in relation to the Forsyth Barr building between 4 September 2010 and 22 February 2011. The Council holds no records of inspections or repair works other than as referred to above.

Dated: 21 February 2012

Signed by:



Name: Stephen James McCarthy

Position: Environmental Policy and Approvals Manager

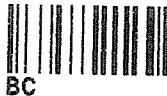
"A"

CITY OF CHRISTCHURCH

CITY WORKS AND PLANNING DEPARTMENT

P.O. BOX 237, CHRISTCHURCH, NEW ZEALAND

Myer & Hamilton



1 May

1988

File No: (1) (1)

0000000000

re Building Application No.

3056

30/40/100/764

12 X Sutherland

Dear Sir/Madam, your application for permission to

erect a retail and office building at 764 Colombo Street

has now been approved. Before work is commenced the undermentioned fees must be paid and a building permit uplifted from this office.

Water Connection Charge	
Subdivision Fee	
Building Permit Fee	12,586.80
Building Research Levy	17,160.00
Vehicle Crossing	307.50
Drainage Permit/ Footpath Opening Fee	191.40
	<u>Indemnity (optional)</u>
Total GST Inclusive.....	<u>30,747.70</u>

The Building Permit Application is approved subject to the following amendments to your proposal.

Conditions attached

88-0548

Note: A Reserve Contribution of \$91,300 GST Inclusive for a development notification is to be paid before the permit can be issued.

This notice of approval supercedes the former approval notice dated 26 April 1988.

Sheet 1.

If the permit is not uplifted within three months of this date the application will be cancelled and the plans disposed of.

Yours faithfully

M. Drake
For City Engineer

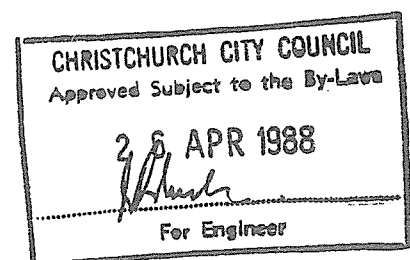
cc. Mynter Developments Ltd
PO Box 987
CHRISTCHURCH

Ferran Mahoney
PO Box 1527
CHRISTCHURCH

Holmes Consulting
PO Box 701
CHRISTCHURCH

BUILDING PERMIT CONDITIONS FOR 764 COLOMBO STREET

1. The Engineer responsible for the structural design (including the foundation system) confirming in writing that the intent of his design has been complied with before the building is occupied.
 2. Details of the verandah transition being submitted for approval.
 3. The North East down pipe discharging into the sump in the side channel via a separate pipe.
 4. The ROW levels, having a sump level of RL 13.950, and the pavement graded toward the sumps at 1%.
 5. That in the event that reflected light from the verandah is established as a nuisance it shall be the responsibility of the owner to abate that nuisance. Failure to abate the nuisance would be considered sufficient reason for the Council to require the removal of the verandah as allowed by Clause 3.9 of By Law No 105 (1985).
 6. Any advertising signs being the subject of a separate permit application.
 7. The street number No 764 being clearly displayed prior to the building being occupied.
 8. One commercial vehicle extension 2.5m long being installed.
 9. All areas used by motor vehicles, being formed and sealed.
 10. Where applicable all stormwater from buildings, concrete and/or sealed areas being piped to side channel and pipes being kept clear of vehicle crossing.
 11. A separate drainage permit is to be obtained from this office and an approved storm water disposal system is to be installed within twenty eight days of the roof being fitted.
 12. All domestic water pipes from meter being installed by Craftsman Plumbers.
 13. Water connections and Fire Service supply be applied for and paid separately.
- N.B. Your attention is drawn to the Christchurch Drainage Board's requirements attached to the plans.



"8"

84/40/133/



DESIGN CERTIFICATE

764 Colombo

To THE CHIEF BUILDING INSPECTOR,
CHRISTCHURCH CITY COUNCIL,
CHRISTCHURCH

re LANDMARK TOWER, CHRISTCHURCH
(Project Title)

I, RUSSELL ARTHUR POOLE, being a Registered Engineer and holding a current Annual Practising Certificate and being a Member of the Association of Consulting Engineers New Zealand and a ~~XXXXXX~~ Director of HOLMES CONSULTING GROUP LIMITED, hereby certify that:

- This Consulting Practice has been engaged to design and execute the appropriate engineering calculations for the podium structure and superstructure for a 20 storey tower block
(Description & Type of Structure)

proposed to be constructed for Paynter Holdings Limited
(Name of Owner)

located at the south east corner of Colombo and Armagh Streets, Christchurch
(Street Address)

on Lots 1 & 2, D.P. 8856, Lots 1 & 4, D.P. 14231
(Legal Description of Site)

- The accompanying 61 sheets of Drawings titled and numbered as per the attached drawing schedule ^(number) and dated 4.3.88 and Specification Sections numbered 4.0, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 7.0, 8.0, 9.0 adequately illustrate the design of the structure.

- I have exercised reasonable control over the design processes for the works defined above which have been designed in accordance with sound and widely accepted engineering principles to support the loads specified in NZS 4203 : 1984

and various aspects of the design are in accordance with the following relevant authorities refer Design Features Report No.2 dated 4.3.88

- I believe the stresses in the various materials of construction and force resisting elements of the structure including the foundation strata under the above loads are such as to ensure the safety and stability of the structure if the works are constructed in accordance with the above described drawings and specifications.

The name and qualifications of the principal structural designer are refer Design Features Report No.2 dated 4.3.88

Signature of ACENZ Member R A Poole Date 7 March 1988

Professional Qualifications B.E. (Hons), M.S. (Calif), M.I.P.E.N.Z. Registration No. 3950

For and on behalf of HOLMES CONSULTING GROUP LIMITED

Address 61 Cambridge Terrace
P.O. Box 701,
CHRISTCHURCH

ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND
A Division of the Institution of Professional Engineers New Zealand

- 2.4.2 In addition to the application form required under 2.4.1, where the proposed building or part of the building is the subject of specific design, the Engineer may require the applicant's designer to complete and sign additional forms as applicable.

Note: Such forms include a Structural Design Features Summary and a Fire Safety Features Summary.

2.5 CONTENTS OF APPLICATION

- 2.5.1 Every application shall set out:
- (i) The legal description and particulars of the site.
 - (ii) The full names and addresses of the owner of the site, the employer for whom the work is being done, the builder and, where necessary, the designer.
 - (iii) The locality of the proposed work.
 - (iv) The estimated value of the work.
- 2.5.2 Where not clearly shown or stated in the drawings and specifications required under 2.6, the following information shall be given as a signed statement on, or attached to, the application form:
- (i) The proposed use or occupancy of every part of the building.
 - (ii) The nature of the ground on which the building is to be placed and the subjacent strata. Data from investigation and tests shall be sufficient to demonstrate to the Engineer that the strata will support the building without detrimental settlements. For one storey residential buildings the observed behaviour of adjacent similar buildings may be accepted as sufficient demonstration.
- 2.5.3 For buildings for which specific design has been necessary and to assist local authority officers to obtain information, or have queries answered by the appropriate person or persons to speed up the issue of a permit a statement of responsibility for documentation shall be supplied containing the name of the person or organisation directly responsible for each of the following:
- Principal Consultant
 - Architectural Drawings
 - Structural Engineering Design
 - Structural Engineering Drawings
 - Compliance with town planning requirements
 - Compliance with fire safety requirements

- 2.5.4 For a building required by this Bylaw to be the subject of specific design, the applicant may, and if the Engineer so requires the applicant shall, submit a structural design features summary or a fire safety features summary or both.

2.6 PLANS AND SPECIFICATIONS

2.6.1 General

- 2.6.1.1 Together with every application there shall be submitted to the Engineer, in duplicate, detailed plans, elevations, cross-sections, and specifications, which shall together furnish complete details of design, and the qualities and descriptions of construction materials and workmanship, and which shall be of sufficient clarity to show, to the satisfaction of the Engineer, the exact nature and character of the proposed undertaking and the provision made for full compliance with the requirements of this Bylaw and any other relevant bylaw in force at the time of the application.

- 2.6.1.2 In addition to the structural details required, the plans and sections shall show every floor of the proposed building, the dimensions, position and intended use of the rooms, and the situation of the flues, fireplaces, stoves and chimneys. The plans and sections shall further show the levels of all floors and the ground levels, both existing and proposed, adjoining the building, to proposed means of water supply and also the means proposed to deal with all stormwater and drainage.

- 2.6.1.3 All drawings shall be drawn accurately, clearly and indelibly at an appropriate scale with printing of a size appropriate for microfilm copying, and shall be reproduced upon cloth or approved paper.

- 2.6.1.4 When lodged, the application and drawings and other documents accompanying the application shall become the absolute property of the Council.

2.6.2 Structural Details

- 2.6.2.1 For every building, except as set out in 2.7, with a framework or bearing-wall system wholly or partly subject to structural design under this Bylaw, and in every other case where the Engineer may reasonably require it, there shall also be submitted to the Engineer such stress diagrams, computations, and other data as are necessary to show that the design complies with all the requirements of this Bylaw and any other relevant bylaw in force.

2.15 EFFECT OF PERMIT

- 2.15.1 Every permit shall be deemed to operate as a permit to erect on the site shown in the application, a structure as therein described, subject to compliance in every respect with the requirements of this Bylaw.
- 2.15.2 It shall be the duty of the owner of the land upon which any work is being or is proposed to be done and of the employer for whom work is being or is proposed to be done and of the builder, contractor or person in charge who is doing or proposing to do such work, to see that the provisions of this Bylaw are fully complied with in the commencement and execution of such work and all such persons shall be liable for any breach here of.

2.16 DEVIATION FROM PERMIT

- 2.16.1 After a permit has been issued no departure shall be made from any of the particulars supplied upon any plan, drawing, specification, or document deposited with the application upon which the permit was issued, unless amended particulars clearly describing the intended deviation are supplied to the Engineer at his office, and the Engineer shall have given his written approval of the deviation.

2.17 PERMIT NOT TO BE DEEMED TO AUTHORISE OTHERWISE THAN IN ACCORDANCE WITH LAW

- 2.17.1 No permit, permission, certificate or authority expressed or implied, given by the Council or by the Engineer or other officer of the Council, shall authorise any building to be erected otherwise than in accordance with law.

2.18 PERMIT VOID IF WORK NOT COMMENCED OR COMPLETED

- 2.18.1 Any permit issued for building construction shall be deemed to expire and be void if work of construction is not commenced thereunder within the period of six calendar months from the date of issue thereof:

All the works covered by the permit shall be completed within the time stated by the Engineer in such permit.

Provided that the Engineer may from time to time by writing under his hand grant an extension of the aforesaid periods should he consider the cause of delay to warrant such extension, and every such extension shall have the effect of continuing the validity of the permit for the period or until the date set out in the extension, but not in any case for a period exceeding twelve months from the day the extension was granted.

2.19 INSPECTION

- 2.19.1 It shall be a condition of every permit issued under this Bylaw that the Engineer or any Inspector appointed by the Council shall be entitled at all times during the normal working hours or while work is being done, with such assistants as he may think necessary, to enter the premises and inspect the whole or any part of the work.
- 2.19.2 The owner, the employer for whom the work is being done, the builder and every person engaged in the erection of a building, shall give every reasonable facility to an Inspector and his assistants to inspect the whole or any part of the work.
- 2.19.3 The builder shall provide facilities for the inspector to examine the foundation excavations before the placing of any site concrete or of any part of the foundation structure. In addition, the builder shall give the inspector specific notice as defined in 2.19.5 before any structural concrete is placed in the excavation to enable the inspector to examine all reinforcing steel.
- 2.19.4 If the Engineer should require that inspection be made of, or before, other particular operations, for example the placing of concrete in key parts of the structure and the closing in of timber framing, he shall so notify the builder in writing or endorse his requirements on the drawings at the time of issue of the permit. The builder shall give the inspector specific notice of such operations.
- 2.19.5 For the purposes of this Clause, specific notice is defined as being not less than 24 hours notice, which time shall include one complete working day as normally worked by the Council staff.
- 2.19.6 In addition, the Engineer may in relation to any building do anything that he considers reasonably necessary to enable him to determine whether or not the requirements of this Bylaw have been complied with.
- 2.19.7 The Engineer may, if satisfied that any building is being erected in contravention of this Bylaw, by notice in writing:
- (i) given to the builder, require the builder to stop building operations to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw, and/or
 - (ii) given to the owner, require that the owner cause building operations to stop to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw,

- 24 -

(iii) given to the employer for whom work is being done, require that the employer cause building operations to stop to such extent as the Engineer thinks necessary in each case until the Engineer is satisfied that the builder can and will comply with the provisions of this Bylaw,

and every person failing to comply with or observe any such notice shall be guilty of an offence against this Bylaw.

2.19.8 If work is commenced contrary to any provision of this Bylaw the person commencing or doing that work, or the owner or employer authorising the commencement or the carrying out of the work shall, on receipt of notice in writing from the Engineer carry out or cause to be carried out any works as may be required by the Engineer including the removal, alteration or pulling down of the said work. Any person who fails to comply with any such notice shall be guilty of a continuing offence against this Bylaw.

2.20 PERMISSION TO USE ROAD

2.20.1 The applicant for a building permit shall, wherever work is adjacent to a road or public space, also make application to the Engineer for permission to enclose, cover over, or use such portion of the road or public place as may be necessary for the execution of the work or in the interest of public safety.

2.20.2 The application shall be made at the office of the Engineer on a form provided for that purpose. It shall be accompanied by such further particulars as may be required by the Engineer who may in granting approval impose such conditions as he thinks fit, having particular regard to the safety and convenience of the public.

2.20.3 It shall be an offence for any person to erect or authorise the erection of any scaffolding, gantry, hoarding, or barricade on a road or any public place in connection with the erection, alteration, repair, renovation, or demolition of any building or structure unless approval has first been obtained from the Engineer and any deposit or fee required in connection therewith has been paid or agreed to in writing.

2.20.4 Nothing in this Clause shall relieve any person from the responsibility of providing the necessary safeguards to protect the users of any road or public place from danger due to any excavation made or obstacle placed or dropped by him.

2.21 EXCAVATIONS ADJACENT TO ROADS

2.21.1 Where building foundations require an excavation to be made adjacent to the road, the builder shall take such precautions deemed necessary by the Engineer to ensure that the road is maintained in a stable and safe state. The walls of any such excavation shall be supported by a structural system within the property.

PART 8 CONCRETE

8.1 OBJECTIVE AND APPLICATION

8.1.1 Objective

This part of the Bylaw sets down the design and construction requirements for buildings or parts of buildings constructed of concrete.

8.1.2 Application

Specific calculations to establish that a building complies with the structural design requirements for this Bylaw shall not be required for concrete buildings that comply in all respects with a recognised code of practice for such buildings. Such a code of practice shall stipulate limitations to the scope of buildings to which it applies.

8.2 GENERAL CRITERIA

8.2.1 Design Loads

All concrete elements shall be designed to resist the loads specified in Part 11 of this Bylaw.

8.2.2 Design Method

"Detailed structural design of buildings or elements of buildings shall be in accordance with methods that:

- (a) Admit of a rational analysis appropriate to the established properties and behaviour of all the constituent materials and elements, and
- (b) Are approved by the Engineer as being appropriate to achieve adequate strength, serviceability, and where necessary, ductility to sustain the various loading conditions required under Part 11.

8.2.3 Serviceability

8.2.3.1 Deflection

Members subject to flexure shall be designed to have adequate stiffness to limit deflections or any deformations which may adversely effect the serviceability of the structure.

8.2.3.2 Cracking

The cracking of concrete under service load shall be limited so that appearance or durability of the structure is not adversely affected having regard to the requirements of the particular scheme.

8.2.3.3 Creep

Consideration must be given to the long term effects of concrete creep and stress adjustments due to temperature and repetitive loadings.

8.2.4 Prestressed Concrete

8.2.4.1 All structural elements of prestressed concrete shall be designed to comply with the strength and serviceability requirements of this Bylaw. The design shall consider all critical stresses in the structural element from the time of initial stress application to the stresses on the structural element in the final structure.

8.2.4.2 Stress concentrations adjacent to the anchorage elements must be considered at design stage and differential movement between prestressed elements and other structural elements must be allowed for.

8.2.5 Design Certification

The designer of any concrete element shall provide calculations which establish that the concrete element has been designed in accordance with the requirements of this Bylaw or alternatively certify in an approved manner that the design method conforms with the requirements of a recognised code of practice.

8.2.6 Supervision

The designer of any concrete element shall supervise the construction of that element or arrange to have the work supervised by an agent appointed by him. Supervision in this context means general supervision only and includes such periodic supervision and inspection as may be necessary to ensure that the structural work is executed generally in accordance with the design as distinct from any special supervision that may be required for a particular situation.

8.3 MATERIALS AND WORKMANSHIP

8.3.1 Materials

All concrete aggregate, cementitious materials, reinforcement, admixtures and miscellaneous materials used in the construction of concrete elements shall be manufactured in accordance with the requirements of a recognised New Zealand Standard.

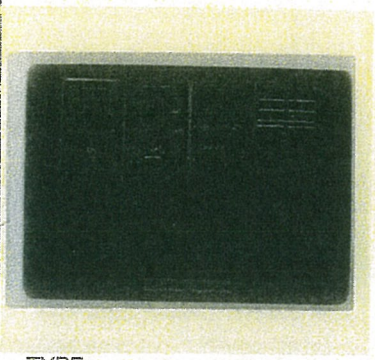
8.3.2 Workmanship

The workmanship employed in the construction of concrete elements shall be in accordance with a recognised code of practice which will ensure desirability and weather-proofing appropriate to the intended use of the building.

"D"

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS
		Found Power. 21-5-88.
		Main Rott. Lift pits before permit
		Engineer checking before all power
		Set out by surveyor for 3 months to
	10-8-88	Main Problem on this job is perfection of the street. Carrying

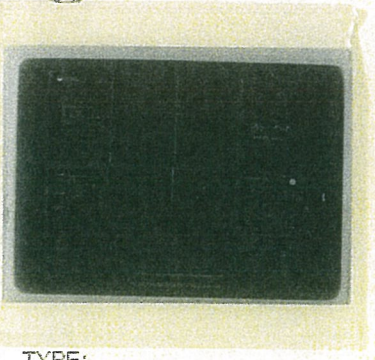
Permit No. 0548 (1) Rates CEN/88 0548 (1)



TYPE: Office Building

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS
		most Pairs
	13-10-88	Paving level 15.
	16-10-88	Level 16 - Windows started
		Gip Beand not fixed
		Correctly Gordon Fletcher & Frank Abolty Advised & to correct with checks

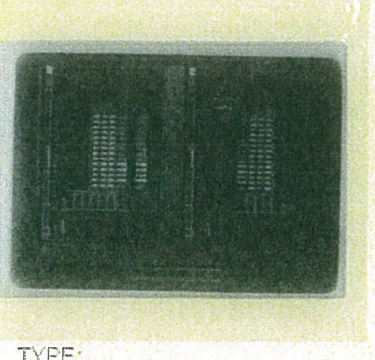
Permit No. 0548 (2) Rates CEN/88 0548 (2)



TYPE: Office Building

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS
	3-11-88	FK Not in Planning Dept at Tablets Chris Elliott to Advise method of F.R.R. to Street FK not approved
	16-11-88	Meeting on Site Rob KS & Bill Carey & Maloney

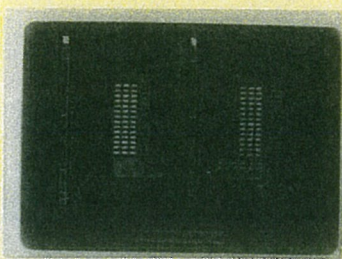
Permit No. 0548 (3) Rates CEN/88 0548 (3)



TYPE: Office Blding

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS
	10-11-88	Windows appear wrong Bill to provide full information re glazing issues FRB & Fixing Gib.
	22-11-88	Letter Sent to W/M Fixing Gib correctly Now

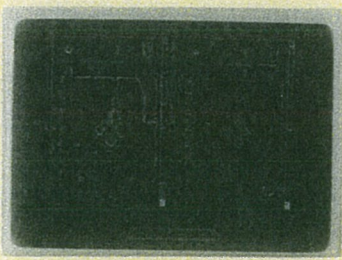
Permit No. 4 0548 2 CEN 88 0548



TYPE:
Office Blding

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS
	30-11-88	OK
	16-12-88	Colico Started all frame Still have areas to finish Rob onsite back work over fire dampers with Bill Gregory of W/M to come with with details

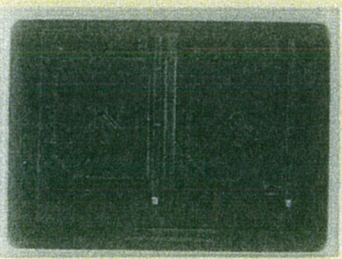
Permit No. 0548 5 CEN 88 5 0548



TYPE:
Office Blding

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS
	3-2-89	Extra Structure Fixed on roof Details to come clearly. Details Approved

Permit No. 0548 5 CEN 88 6 0548



TYPE:
Office Blding

884X1 Zion, IL, U.S.

884X1 Zion, IL, U.S.

884X1 Zion, IL, U.S.

STREET ADDRESS

764 Colombo St

BU/40

139 / 764

Permit No.

0548

CEN 88 0548

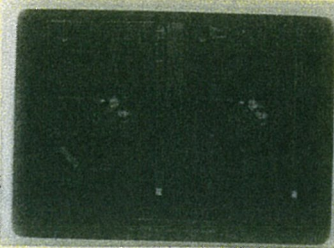
7

CODE

DATE

COMMENTS

15-1-90 Handrail on sign front



TYPE:

Office Blding

804X1 ZION, N. U.S.

STREET ADDRESS

764 Colombo St

BU/40

139 / 764

Permit No.

0548

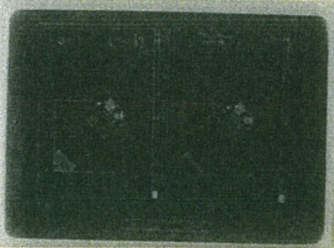
CEN 88 0548

8

CODE

DATE

COMMENTS



TYPE:

Office Blding

804X1 ZION, N. U.S.

STREET ADDRESS

764 Colombo St

BU/40

139 / 764

Permit No.

0548

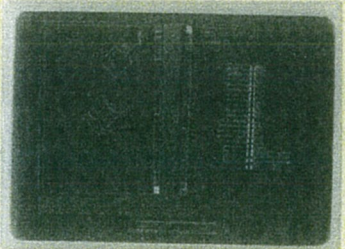
CEN 88 0548

9

CODE

DATE

COMMENTS



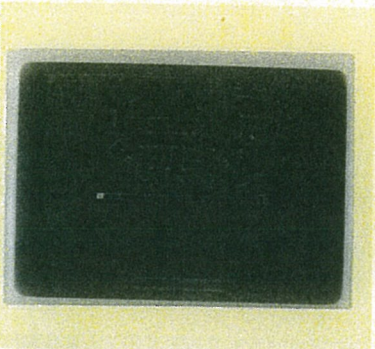
TYPE:

Office Blding

804X1 ZION, N. U.S.

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS

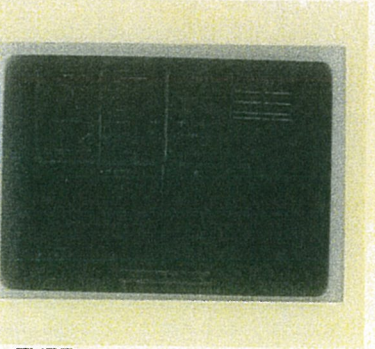
Permit No. 0548 (10) GEN 88 0548 (10)



TYPE: Office Bldg

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS
	4-5-88	Basic
	5-8-88	Change finish all application building is to high with small holes against building
		OK.

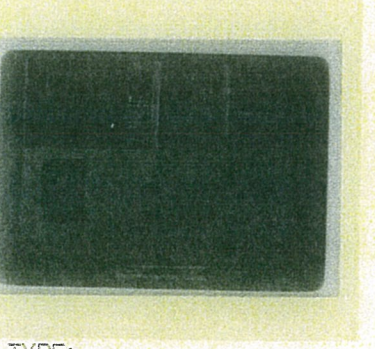
Permit No. 0549 (11) GEN 88 0549 (11)



TYPE: Contry

STREET ADDRESS	BU/40	
764 Colombo St	139 / 764	
CODE	DATE	COMMENTS
	13-2-88	West Side remove & Hauling

Permit No. 0549 (12) GEN 88 0549 (12)



TYPE: Contry

104X1 MICRORITE ZION, N. U.S.

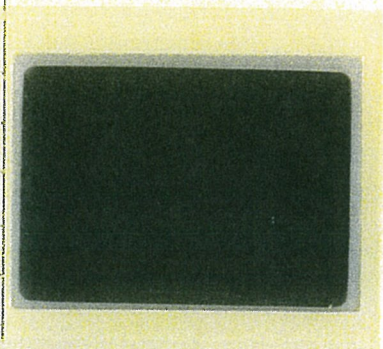
104X1 MICRORITE ZION, N. U.S.

104X1 MICRORITE ZION, N. U.S.

STREET ADDRESS 764 Colombo St BU/40 139 / 764

Permit No. 0549 (3) GEN 88 0549 (3)

CODE	DATE	COMMENTS



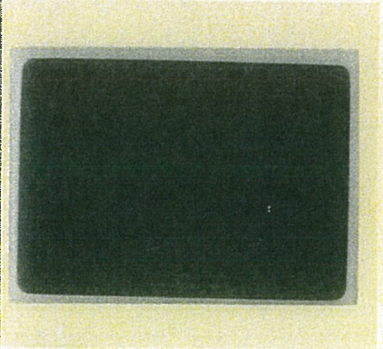
TYPE: Contry

104 X 1 MICRON® Zion, IL U.S.

STREET ADDRESS 764 Colombo St BU/40 139 / 764

Permit No. 0549 (4) GEN 88 0549

CODE	DATE	COMMENTS



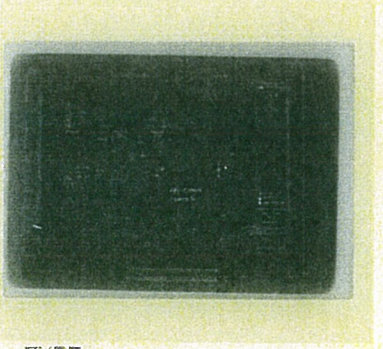
TYPE: Contry

104 X 1 MICRON® Zion, IL U.S.

STREET ADDRESS 764 Colombo St BU/40 139 / 764

Permit No. 0549 (5) GEN 88 0549

CODE	DATE	COMMENTS

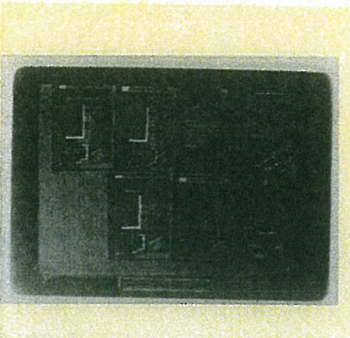


TYPE: Contry

104 X 1 MICRON® Zion, IL U.S.

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS

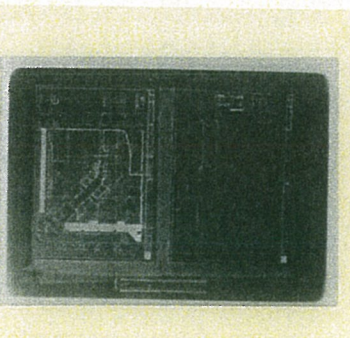
Permit No. 88-548 (11) Amended (11)
 Checked & CEN 88-548



TYPE:
Office

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS

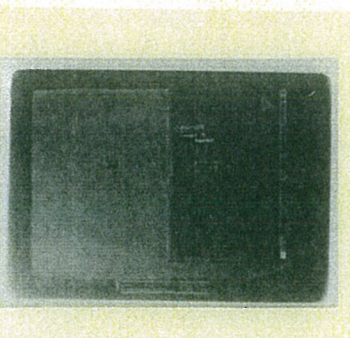
Permit No. 88-548 (12) Amended (12)
 Checked & CEN 88-548



TYPE:
Amended

STREET ADDRESS		BU/40
764 Colombo St		139 / 764
CODE	DATE	COMMENTS

Permit No. 88-548 (13) Amended (13)
 Checked & CEN 88-548



TYPE:
Amended

STREET ADDRESS

76A Columbus St

BU/40

139 76A

Permit No.

88-548

Amended

(14)

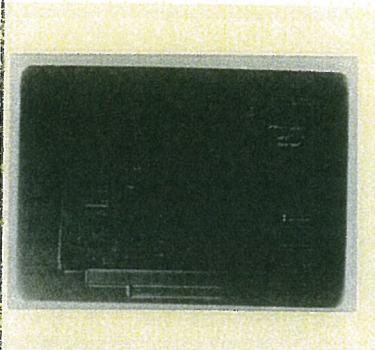
14

CCN 88 548

CODE

DATE

COMMENTS



TYPE:

Amended

" E "

BUILDING PERMIT RELATED INSPECTIONS

Residential (Dwellings, Flats, accessory buildings)

Industrial (Factories, Warehouses etc)

Commercial (multi storey offices, retail shops etc.)

Pre Permit Site Inspection:

(application lodged)

Check for: (features not always adequately presented)

- | | |
|------------------------------------|------------------------|
| 1) true representation of the site | 5) drainage outfall |
| 2) topographical features | 6) access |
| 3) boundary definition | 7) trees (protected) |
| 4) ground conditions | 8) minimum site levels |

Post Permit Inspections:Foundations - (Mandatory) (24 hours notice required before placing concrete)

Foundation excavation - depth - bearing - reinforcing steel - siting requirements - floor level. (often at least two visits required to inspect staged progress).

Random inspection (appropriate to the building design)

Erection of timber frame - concrete panels - block walls - structural integrity - bracing - veneer construction - concrete floors - etc.

Pre lining fixing (mandatory) (compliance with approved plans)

- completed timber frame - bracing - insulation - ventilation - primary connections - moisture check of timber frame - etc. (Often at least two inspections to ensure all features are inspected).

Random inspection

fire safety requirements - separation between floors/occupancies - appropriate linings - duct penetrations - stair construction - guard rails - fire and smoke stop door requirements - access for disabled etc. (Often at least 3-4 inspections on larger buildings).

Additional Inspections: (some not permit related)

verandahs - hoardings - scaffolding on legal road - signs - demolition of buildings - annual fire safety and egress inspections of licenced buildings - unit and flat plan compliance etc.

Final Inspection: (Building Bylaw requirements complied with)

- to ensure - All health and safety requirements met.
- Insulation envelope complete.
 - Other acts - regulations where applicable.
 - Job record completed and filed.


 A handwritten signature, possibly 'WJ', followed by the date '22/9/89'.

"F"

REF: 4/1

Office of the Ombudsman

4th floor

163-165 The Terrace

Wellington

Telephone: 739 533

P.O. Box 10152

The Terrace, Wellington

- C O P Y -

18 December 1986

Dear Mr Williams,

re: Building Inspector Liability

Further to my letter of 3 December, I advise that I have analysed the thirteen complaints received by the Office of the Ombudsman from owners about the issuing or enforcing of building permits in relation to the complainants' own property.

The major theme running through the cases is the false expectation that the function of the inspector is to act as clerk of works or architect and to supervise construction closely. In the words of the late Lester Castle in one case (C971), the expectation was that the inspector would "ensure that the builder is complying with the instructions and expectations of the property owner employing him". Regularly Ombudsmen have had to disabuse complainants of this belief and to affirm that the role of the inspector is to ensure that the Council's by-laws are observed. To the extent that many complaints are caused by this false expectation, it would be in your and other local authorities' interests to disabuse the public of it.

Other significant points arising from a consideration of the complaints are that:

- (a) Deficiencies in building operations often involve failings by a number of people or organisations: the builder (or plumber, electrician etc.), the architect or engineer, the local authority or the owner. When, as is usually the case, only one of these is within the Ombudsman's jurisdiction (the local authority) it would not be for the Ombudsman to allocate responsibility, though there may be some cases where the facts are such that an assessment of the overall loss caused by a local authority could be made.
- (b) Building permits often have conditions materially affecting the owner who is unaware of the

- 2 -

conditions. Had the owner known of them the owner may well have been in a position to take steps to ensure satisfactory work by the builder.

It appears to me, and you will recall my mentioning this, that many problems could be avoided by bringing owners into the actual process of applying for and uplifting building permits. Owners need not be required to apply for or uplift permits, but when they do not do so I suggest that an additional copy of the permit be sent to the owner him or herself, attached to which would be an explanation of the requirements for inspection and the functions of the inspector. Where an owner applies for or uplifts the permit, that explanation should be attached to the permit or copy application. The ideal solution, in my view, would be to ensure that the owner applies for and receives the permit after certifying that he understands the conditions and the role of the building inspector. That however, while ideal, may have some practical problems.

Yours sincerely,

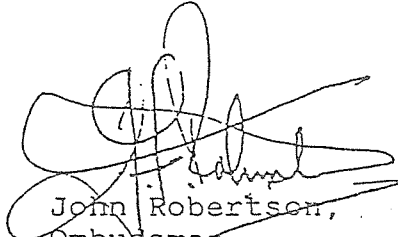
sgd "J. F. Robertson"

John Robertson,
Ombudsman.

Mr C.H. Archer
Secretary/Treasurer
Municipal Association of NZ
PO Box 1214
WELLINGTON

Copy for your information.

RECEIVED
19 DEC 1986


John Robertson,
Ombudsman.
15/12/86

Christchurch Eq RAPID Assessment Form - LEVEL 2

Inspector Initials
Territorial Authority

PLB - BECA
Christchurch City

Date
Time

5/9/10
12:30

Final Posting
(e.g. UNSAFE)

Restricted
Use (Y2)

Building Name

Forsyth Barr

Short Name

Address

764 Armagh Street

GPS Co-ordinates

S° E°

Contact Name

Collivers

Contact Phone

Storeys at and above
ground level

17

Below
ground
level

1

Total gross floor area
(m²)

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

Stairs have generally
settled and may be
unstable.

Record any existing placard on this building:

Existing
Placard Type
(e.g. UNSAFE)

Inspected

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:

Other recommendations: Stair landing bulkheads need to be removed to allow emergency

Estimated Overall Building Damage (Exclude Contents)

None

0-1 %

31-60 %

2-10 %

61-99 %

11-30 %

100 %

Sign here on completion

Pat. Bell (BECA)

Date & Time
ID

5/9/2010 2:15 pm

Inspection ID: PLB57 (Office Use Only)

Lot 1, DP S4507, Parcel 867436

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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Beam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	- Apparent Damage to base of steel beam supporting car ramp sheared through welded connection ~ 30mm settlement
Non-structural Hazards / Damage				
Parapets, ornamentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	Minor damage to roof tiles
Interior walls, partitions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Elevators	<input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>	Not Inspected
Stairs/ Exits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	stair settlement ~ 40mm under supports at level 7.
Utilities (eg. gas, electricity, water)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Geotechnical Hazards / Damage				
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"/>	

General Comment

- Stair supports need to be investigated prior to upgrading to 'green'
- Beam under car ramp needs propping

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	

Sketch (optional)
Provide a sketch of the entire building or damage points. Indicate damage points.

A large rectangular grid for sketching, consisting of approximately 20 columns and 25 rows of squares. Two binder rings are visible at the top edge of the grid, securing it to the page.

Recommendations for Repair and Reconstruction or Demolition (Optional)

A series of horizontal lines for writing recommendations, consisting of approximately 15 lines spaced evenly down the page.

3 Inspection ID: _____ (Office Use Only)

"H"

J

764 Colombo St

Pwpi 867436

Forsyth Barr House - Level 2 Seismic Assessment

By: Peter Beazley, Rob Jury

Date: 6 September 2010

Subject: Forsyth Barr House Level 2 Seismic Assessment

Our Ref: 5320000

Lot 1 DP 54507

Level 2 Seismic Assessment

Scissor stair flights

Following the first level 2 assessment completed on 5 September 2010, further access was required to assess the damage to the scissor stair around the landing area as noted in the assessment. A contractor was brought in to assist with removal of the stair bulkhead on the level 7 landing, which we believed to be the most damaged stair. The following points were observed:

- Beam and connections supporting the base of the stair (~380-PFC) appeared to be in good condition.
- Fire proofing material was intact.
- Flexural cracking in the base of the lower knee of the scissor flight has resulted in residual deformation of the stair, with the stair settled by ~40mm at that location.

The majority of the stair flights had similar damage, although it is believed that level 7 was the most damaged and therefore representative of the remaining stairs. Although the deformations in the stairs are significant, we believe that the stairs still contain sufficient capacity for normal use.

Car Ramp

As noted in the Level 2 assessment, a failed weld in the beam supporting the car ramp on Level 2 has failed resulting in ~40mm of settlement. *Temporary* propping will be required from the beam down to the level 2 slab, then also down from level 2 to level 1 slab. *down to the slab.*

This propping will allow pedestrian but not vehicle access to the supported ramp.

Recommendations

- Cleaning of loose debris from the seismic separations at the base of all stairs.
- Propping of Car ramp beam to level 2 slab below, and a further prop from that slab to the level 1 slab below that.

- *The scissor stairs are available for normal use after health and safety issues have been addressed.*
- *The loose debris should be cleared from the seismic separated gaps at the end of each stair flight to allow movement as originally intended.*
- *The current temporary propping to the car park ramp beam at level 2 will allow pedestrian access but not vehicle access to the supported ramp.*



PBRJ61

File Note

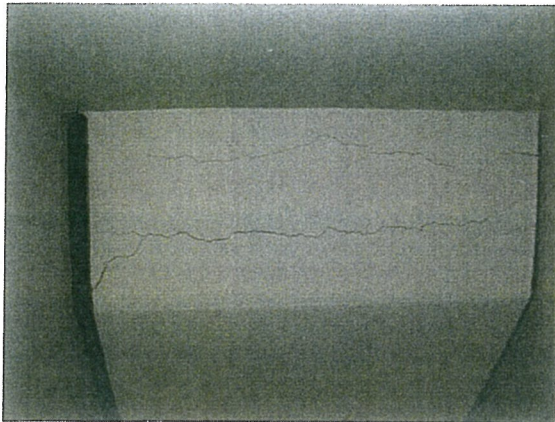


Photo 1. Flexural cracking in base of stair



Photo 2. Spalling of concrete at stair knee.



Photo 3. Debris in Seismic separation



Photo 4. Broken Weld

Christchurch Eq RAPID Assessment Form - LEVEL 2

Inspector Initials
Territorial Authority

PLB-BeCA
Christchurch City

Date
Time

5/9/10
12:30

Final Posting
(e.g. UNSAFE)

Restricted Use (Y2)

Building Name

Forsyth Barr

Short Name

Address

Armagh Street

GPS Co-ordinates

S° E°

Contact Name

Colliers

Contact Phone

Storeys at and above ground level

17

Below ground level

1

Total gross floor area (m²)

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

ORIGINAL

Now G2, refer attached

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Building or storey leaning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wall or other structural damage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overhead falling hazard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ground movement, settlement, slips	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Neighbouring building hazard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical, gas, sewerage, water, hazmats	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Stairs have generally settled and may be unstable.

Record any existing placard on this building:

Existing Placard Type (e.g. UNSAFE)

Inspected

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:

Other recommendations: Stair landing bulkheads need to be removed to allow washgate

Estimated Overall Building Damage (Exclude Contents)

- None
- 0-1 %
- 2-10 %
- 11-30 %
- 31-60 %
- 61-99 %
- 100 %

Lot 1
DP54507

Sign here on completion

Patricia BeCA (BECA)

Date & Time
ID

5/8/2010 2:15 pm

Inspection ID: PLBS (Office Use Only)

PNP
867436



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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Beam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	- Apparent Damage to base of steel beam supporting car ramp sheared through welded connection ~ 30mm settlement
Non-structural Hazards / Damage				
Parapets, ornamentation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	Minor damage to roof tiles
Interior walls, partitions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Elevators	<input type="checkbox"/>	N/A	<input type="checkbox"/>	Not Inspected
Stairs/ Exits	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	stair settlement ~ 40mm under supports at level 7.
Utilities (eg. gas, electricity, water)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Geotechnical Hazards / Damage				
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"/>	

General Comment

- Stair supports need to be investigated prior to upgrading to 'green'
- Bedm under car ramp needs propping

Usability Category

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

Sketch (optional)
Provide a sketch of the entire building or damage points. Indicate damage points.

A large grid for sketching a building or damage points. The grid is approximately 15 columns wide and 25 rows high, providing a structured area for drawing and marking damage points.

Recommendations for Repair and Reconstruction or Demolition (Optional)

A series of horizontal lines for writing recommendations for repair and reconstruction or demolition. There are approximately 15 lines provided for text entry.

Forsyth Barr House - Level 2 Seismic Assessment

By: Peter Beazley, Rob Jury Date: 6 September 2010
 Subject: Forsyth Barr House Level 2 Seismic Assessment Our Ref: 5320000

Level 2 Seismic Assessment

Scissor stair flights

Following the first level 2 assessment completed on 5 September 2010, further access was required to assess the damage to the scissor stair around the landing area as noted in the assessment. A contractor was brought in to assist with removal of the stair bulkhead on the level 7 landing, which we believed to be the most damaged stair. The following points were observed:

- ▣ Beam and connections supporting the base of the stair (~380-PFC) appeared to be in good condition.
- ▣ Fire proofing material was intact.
- ▣ Flexural cracking in the base of the lower knee of the scissor flight has resulted in residual deformation of the stair, with the stair settled by ~40mm at that location.

The majority of the stair flights had similar damage, although it is believed that level 7 was the most damaged and therefore representative of the remaining stairs. Although the deformations in the stairs are significant, we believe that the stairs still contain sufficient capacity for normal use.

Car Ramp

As noted in the Level 2 assessment, a failed weld in the beam supporting the car ramp on Level 2 has failed resulting in ~40mm of settlement. Propping will be required from the beam down to the level 2 slab, then also down from level 2 to level 1 slab.

Temporary has been provided down to the slab. This propping will allow pedestrian but not vehicle access to the supported ramp.

Recommendations

- ▣ Cleaning of loose debris from the seismic separations at the base of all stairs.
- ▣ Propping of Car ramp beam to level 2 slab below, and a further prop from that slab to the level 1 slab below that.
- ▣ The scissor stairs are available for normal use after health and safety issues have been addressed.
- ▣ The loose debris should be cleared from the seismic separated gaps at the end of each stair flight to allow movement as originally intended.
- ▣ The current temporary propping to the car park ramp beam at level 2 will allow pedestrian access but not vehicle access to the supported ramp.

File Note

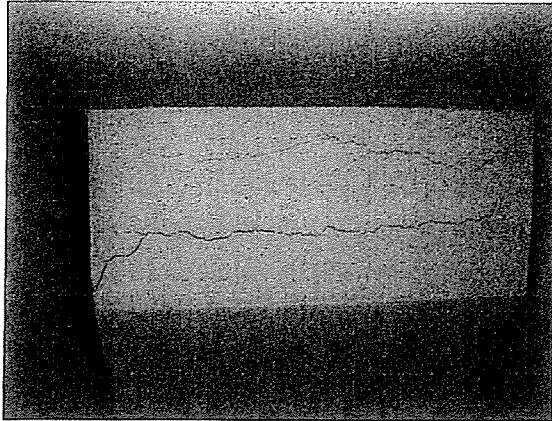


Photo 1. Flexural cracking in base of stair

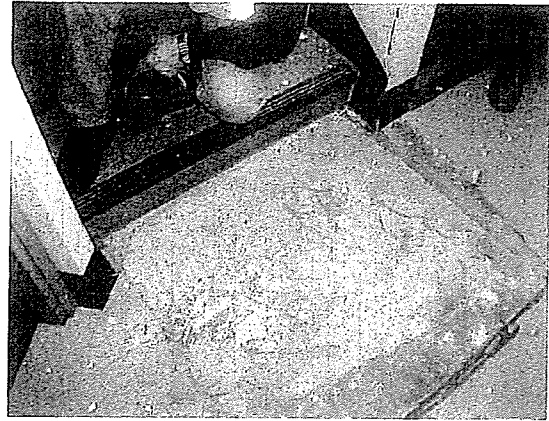


Photo 2. Spalling of concrete at stair knee.

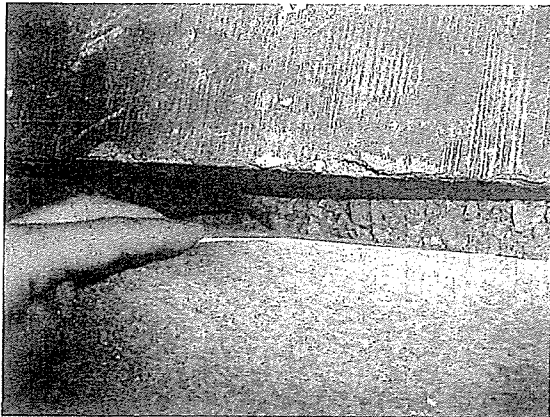


Photo 3. Debris in Seismic separation

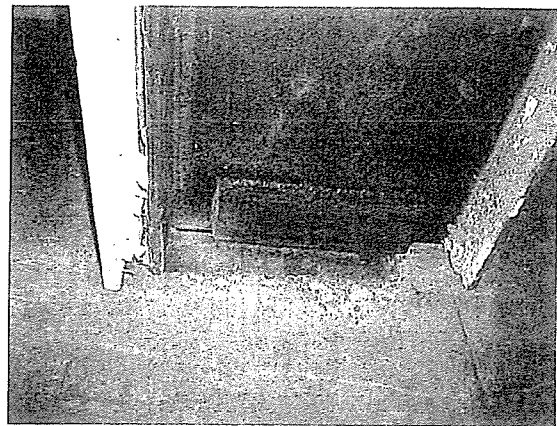


Photo 4. Broken Weld