KDC

In the matter of 85-89 SUTTON STREET, NORTH MELBOURNE
AMENDMENT C207 TO THE MELBOURNE PLANNING SCHEME:ARDEN –MACAULAY HERITAGE AMENDMENT

Re:

Expert Witness Statement of Mr Kevin Desmond Campbell

Name and address

Kevin Desmond Campbell

Kevin Campbell Consultants

34 Burgundy Drive

DONCASTER VIC 3108

Area of expertise

Kevin Campbell has over fifty years experience in concrete technology, design, specification, construction and repair.

Statement identifying the expert's area of expertise to make the report

Kevin Campbell was involved in the campaign to save the Denneys Lascelles Austin Wool Store in Geelong. This structure was the most significant wool store constructed in Australia, built 1910-1911.

Kevin Campbell produced a report on the proposed retention of a section of the AFL Waverly Grandstand. My report was in agreement with the final decision of the Panel.

Kevin Campbell has been involved in the trials of repair techniques on the Barwon Sewage Aqueduct Geelong, built 1914-1915.

For the past 15 years Kevin Campbell has presented the lectures on Inspection and Repair of Building Facades at Melbourne University in the Department of Architecture, Building and Planning.

Kevin Campbell recently produced the specification and supervised the repair of the oldest building in the Bourke Street Mall, 274-278 Bourke Street. A significant element was the clay brick parapet.

Kevin Campbell has been involved in the repair of:

- The Shrine of Remembrance, St Kilda Road
- Old Treasury Building, Spring Street
- National Gallery, Canberra

John Honner of SBA Law has requested that Kevin Campbell consider and give an opinion on the following brief as prepared by Juin Choo of SBA Law.

Brief

(i) The present structural integrity and condition of the building on the property.

(ii) To the extent that the building is required to be retained in full, the feasibility in structural and cost terms of adaptive re-use of the building eg, conversion to residential apartments.

(iii) To the extent that only the northernmost four bays of the building addressing Sutton Street are required to be retained:
   a. If the wall or exterior sections of the northernmost four bays addressing Sutton Street were retained (Façade) and the remainder of the building demolished, will the Façade hold or will it likely collapse?
   b. What, if any, reinforcement work is required to retain the Façade?
   c. To the extent that any such reinforcement work is required, what are the estimated costs of such works?
   d. If the Façade is retained, how and to what extent will it affect the construction of any additional building proposed to be built on the Property?
   e. If the Façade is retained, how and to what extent will the adaptive re-use of the Property be affected?

(iv) What works, if any, are required to keep the building in good usable condition or to otherwise conserve the building? What are the estimated costs of such works?

The following documents were supplied:

1. Letter from City of Melbourne to Dustday dated 1 May 2013
2. Melbourne Planning Scheme Amendment C207 Explanatory Report
3. Arden Macaulay Structure Plan 2012
4. Arden Macaulay Heritage Review February 2012 – Statements of Significance (refer to page 87)
5. Heritage Overlay Schedule Clause 43.01 (refer to page 6, HO1118)
6. Arden-Macaulay Heritage Review, Consultant's Report 2012 (only pages 530 to 538 included)
7. Letter from Dustday to City of Melbourne 19 June 2013
8. Heritage Appraisal prepared by Lovell Chen dated August 2013
9. Title Search of the Property with Plan of Subdivision
10. Planning certificate for the Property
11. Miscellaneous informative documents relating to the Property.

Floor plans of the building have not been supplied by the client

Further formal documentation in relation to Amendment C207 and the Arden Macaulay Structure Plan 2012 can be found online at the following websites:

http://www.melbourne.vic.gov.au/BuildingandPlanning/Planning/planningschemeamendments/Pages/AmendmentC206C207.aspx

http://www.melbourne.vic.gov.au/BuildingandPlanning/FutureGrowth/StructurePlans/ArdenMacaulay/Pages/Information.aspx

Kevin Campbell Consultants were not supplied with a condition inspection from the Melbourne City Council regarding the risk to safety of the public if portions of the concrete cladding or glazing fall from the building on to the footpath or street.

Description of building

The six-level red brick sawtooth profile building of 1956 includes:

- **Modernist design character devoid of any stylistic ornament of most previous wool stores in the city**
  - Does not comply with current Standard Codes for durability of concrete, expansion joints in brickwork, capping to protect brick ties from corrosion and steel frames window and glazing
- **A vast floor space with the requisite sawtooth roof on the top floor**
  - A vast open floor space on the top floor can be converted into residential apartments
  - Sawtooth roof can be reproduced in concrete
  - All other floors have a large number of columns which could be a restriction to planning requirements
- **Roof clad with deep profile corrugated fibre cement sheet**
  - Asbestos cement sheeting is not acceptable in modern construction and should be removed
- **Continuous aluminium frame glazing strips encircle the building, divided by brick clad spandrels**
  - There are no aluminium frame glazing strips on the building. A significant number of the steel frame glazing strips have failed
- **Window glazing with heat absorbing glass**
  - Large areas of window glazing have failed
- **A concrete encased steel frame expressed on the exterior of the building**
  - Large lengths of the steel frame are severely pitted

    Google map of November 2009 shows large lengths of the steel frame, column and beams with concrete spalling.

Comments as requested

(i) **The present structural integrity and condition of the building on the Property.**

The façade of the building is in an advanced stage of deterioration. Extensive reconstruction would be required to comply with current Australian standards and the Building Code of Australia.

The structural steel column sections are extensively corroded and severely pitted. The steel sections require grit blasting and coating with a zinc epoxy for durability. The concrete fireproofing has failed requiring complete replacement with a 32MPa concrete, galvanised fabric and increased cover to comply with *AS3600 Concrete Structure Code*.
Drip grooves should be incorporated in the soffits of the lintel beams.

All the steel window frames and glazing require replacement. Potential falling glass shards are a hazard.

There are no expansion joints in the brickwork. Expansion joints require full depth chasing out to 15mm width and sealed with sikaflex.

Condition of the building

The state of the external fabric of the building

- Columns - failed fire protection
- Corroded beams - failed fire protection
- Window frames - failed structurally
- Glazing - failed due to shards
- Sawtooth brickwork - failed
- This building could be replaced by a precast concrete structure with a red brick patterned finish and a sawtooth parapet.
  A Victorian Producers Co-operative Company sign could be included on the top floor of the new structure.

(ii) **To the extent that the building is required to be retained in full, the feasibility in structural and cost terms of adaptive re-use of the building eg, conversion to residential apartments.**

The internal concrete elements, floor, columns and beams are generally in good condition but are only 20-25MPa compressive strength and not suitable for exposure to the elements. The top floor columns are cracked due to expansion of brick sawtooth parapet elements and require extensive repair. The brick sawtooth parapet elements require removal and reconstruction with more stable brickwork. There is some corrosion of internal columns and beams due to ingress of water.

Reconstruction of the façade would require full scaffold and

encapsulation.

Gary Georgeson of Vertitech Australia has nominated a budget in the order of ten million dollars ($10,000,000) for façade reconstruction for the North and Western Facades.

(iii) **To the extent that only the northernmost four bays of the building addressing Sutton Street are required to be retained:**

(a) If the wall or exterior sections of the northernmost four bays addressing Sutton Street were retained (Façade) and the remainder of the building demolished, will the Façade hold or will it likely collapse?

The northern façade is likely to disintegrate due to poor detailing, failed glazing, brick expansion and spalling of fire proofing on columns and beams.

(b) What, if any, reinforcement work is required to retain the Façade?

The façade would require extensive reinstatement/reconstruction to comply with current Standard Codes.

(c) To the extent that any such reinforcement work is required, what are the estimated costs of such works?

Gary Georgeson of Vertitech Australia has estimated that reconstruction of the four bays of the building facade would require a budget in the order of two million dollars ($2,000.000). Protection of internal concrete from the elements due to the low strength concrete would be required if open to the elements.

(d) If the Façade is retained, how and to what extent will it affect the construction of any additional building proposed to be built on the Property?

The typical construction system in Melbourne for multi-storey apartments is by the use of precast concrete walls.

The retention of the facade would have no influence on any additional building proposed for the property in structural terms.

The major impact would be the loss of visibility of the existing building and the saw tooth brickwork parapet.

(e) If the Façade is retained, how and to what extent will the adaptive re-use of the Property be affected?

The close-spaced internal columns would be restrictive in the planning for apartments.

The Façade cannot be retained as such, it requires rebuilding.

Only the structural steel beams and columns may remain as per the original design. Their shape and size would require an increase in dimension to comply with current codes.

(v) What works, if any, are required to keep the building in good usable condition or to otherwise conserve the building? What are the estimated costs of such works?

The façade requires complete reconstruction:

- Fire proofing of structural steel
- Expansion joints in brickwork
- Complete replacement of steel window frames and glazing
- Removal of asbestos

Façade repair in the order of ten million dollars ($10,000,000) budget

Internal repair is required due to low strength concrete, only 20-25MPa compressive strength, if exposed to the elements.

Summary

The building is a utilitarian building purpose built with a finite structural life span.

There are examples of sawtooth brickwork parapets on other projects in Melbourne CBD which are performing as per the original design concept.

AS 3600 Concrete Structures Code uses durability requirements to achieve a 40-50 year life span. The exposed concrete should be a minimum of 32MPa rather than 20-25MPa as tested by Sharp & Howells, Industrial Chemists.

The building has achieved its life purpose.

The structure was designed and detailed for a finite life which has now passed.

Australian Standard AS3600 Concrete Structure Code has standards for durability of concrete and fire resistance of concrete which have resulted from extensive research of recent years.

Clay brick buildings constructed during the 1950's have not performed well due to the change of manufacture from pressed bricks to extruded bricks.

There have been considerable incidences of brick expansion. In the 1950's there were incidences of labour and material shortages resulting in low quality construction.

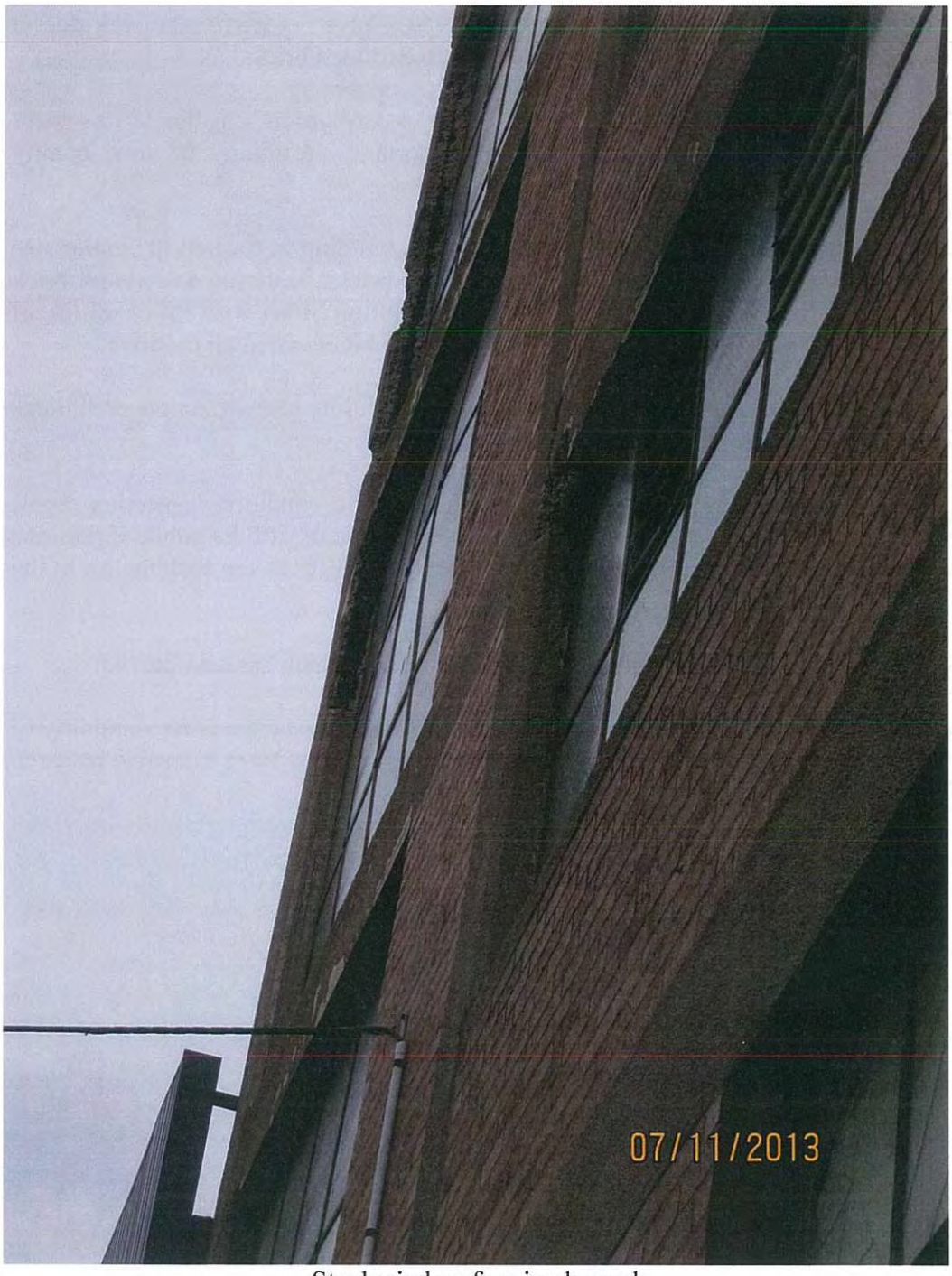
Kevin Campbell Consultants recently supervised a building in Carlton of similar size with exposed concrete beams and columns of clay bricks, featuring a sawtooth brick parapet. This building is of similar age to 85-89 Sutton Street with structural life of another 40 years due to good detailing and the use of higher strength concrete.

The present area is a pedestrian zone with potential falling glass, concrete and bricks hazards.

Kevin Campbell Consultants were not supplied with a condition inspection report from the Melbourne City Council regarding the risk to safety of the public if portions of the concrete cladding, glass shards and brickwork fall from the building on to the footpath or street.

The structure was designed and detailed for a finite life which has now passed.

Australian Standard AS3600 Concrete Structure Code has standards for durability of concrete and fire resistance of concrete which have resulted from extensive research of recent years.

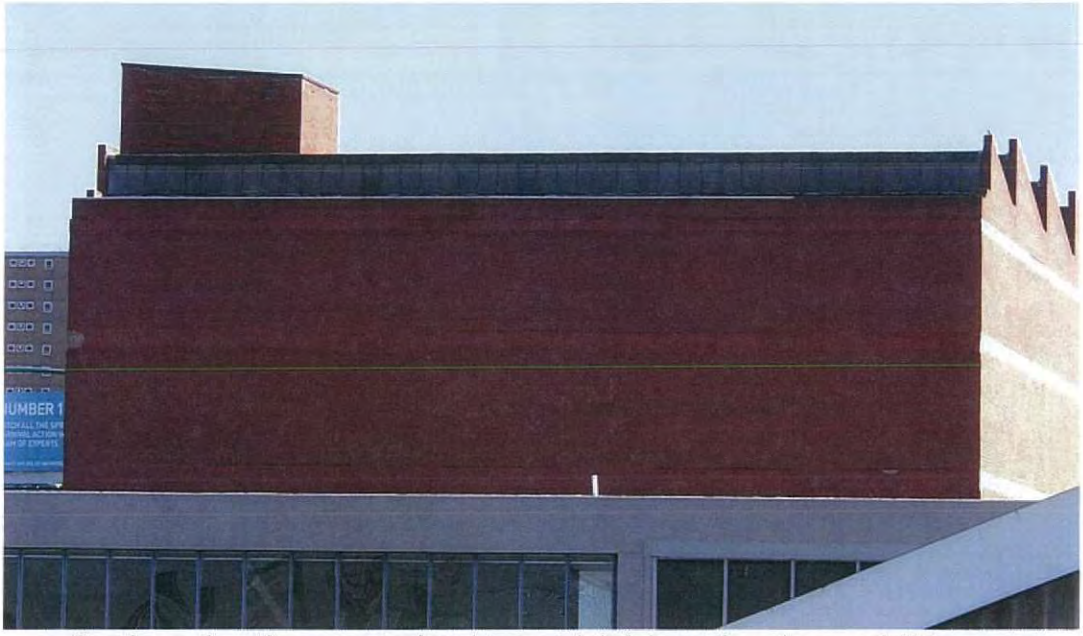


Steel window framing bowed

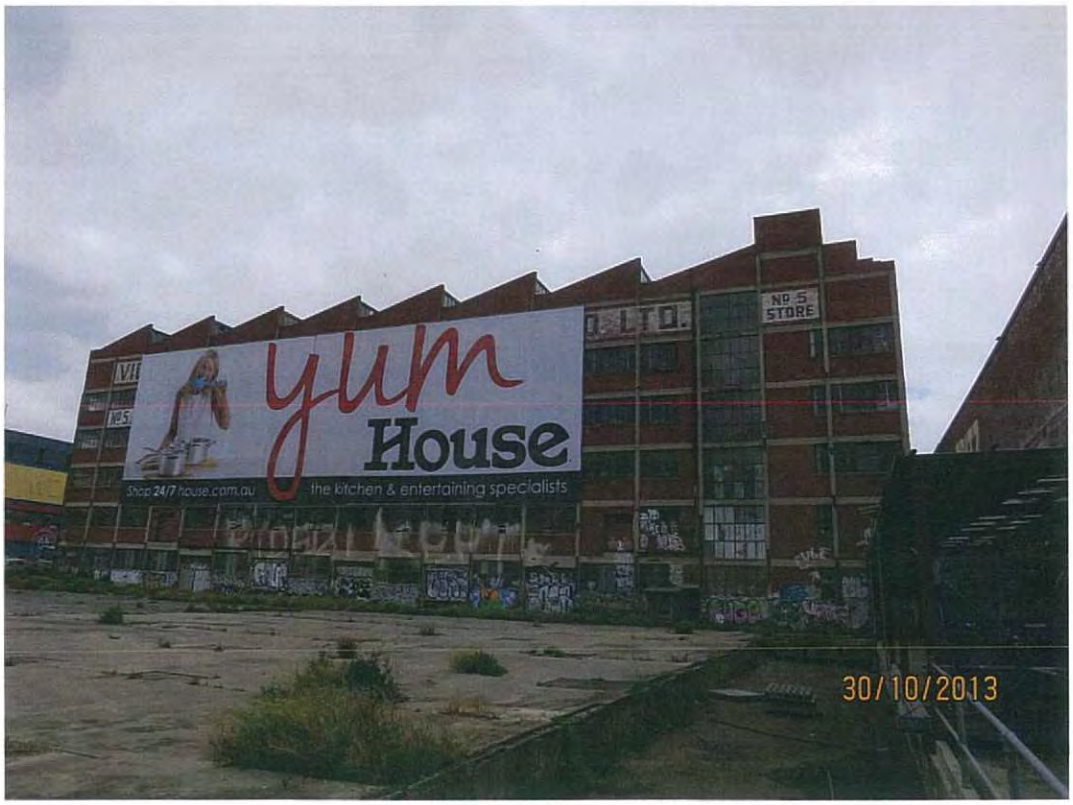
Steel window framing bowed. Glazing breaking into shards. Will fall on footpath.

Solid mortar joints – no allowance for expansion

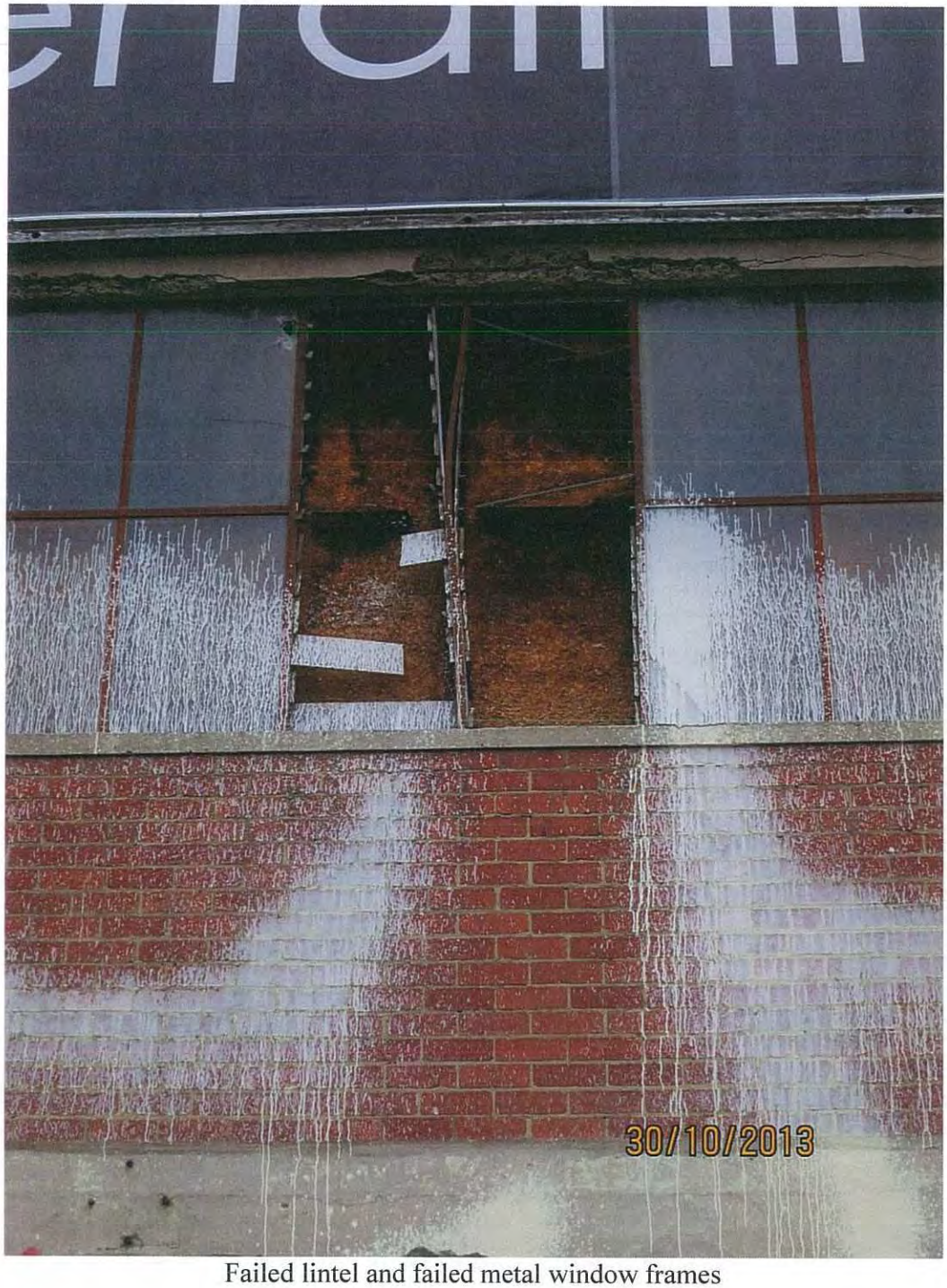
Expansive brickwork spalling. Spalling concrete due to steel corrosion.



Southern elevation spray painted to match brick work and conceal distress.
Part eastern elevation – note: no expansion joints in southern elevation or eastern elevation. No capping on saw tooth brickwork. Capping on plant room brickwork

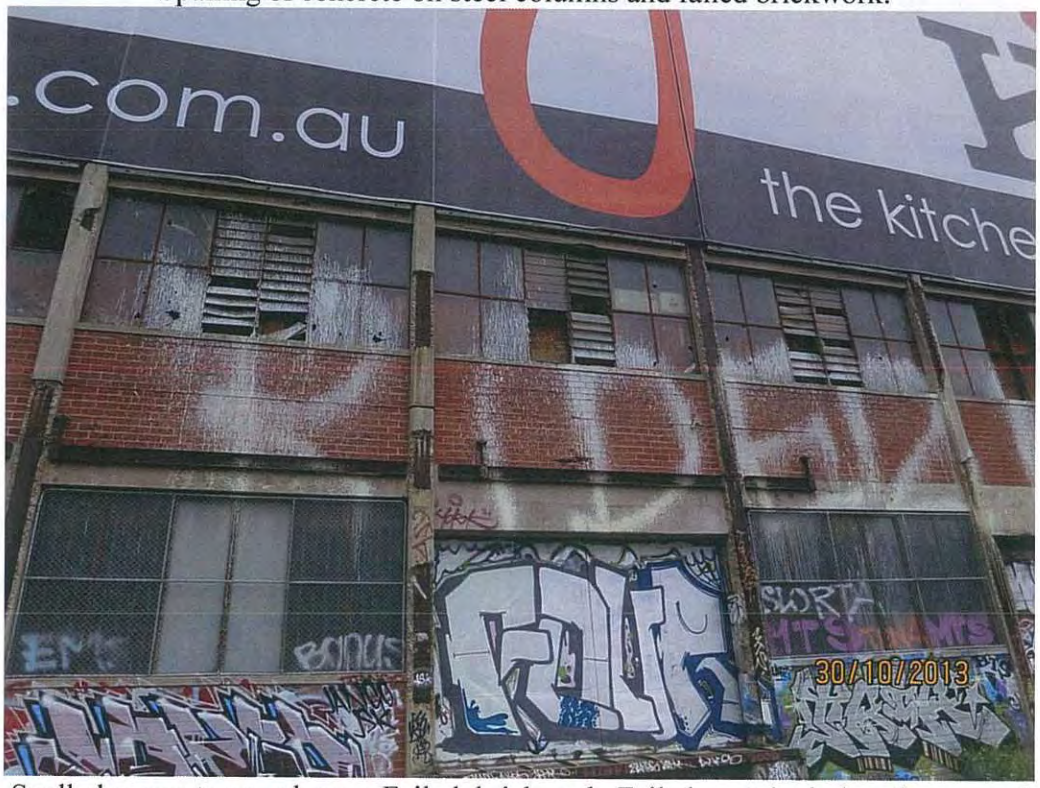


Western elevation



Failed lintel and failed metal window frames

Spalling of concrete on steel columns and failed brickwork.



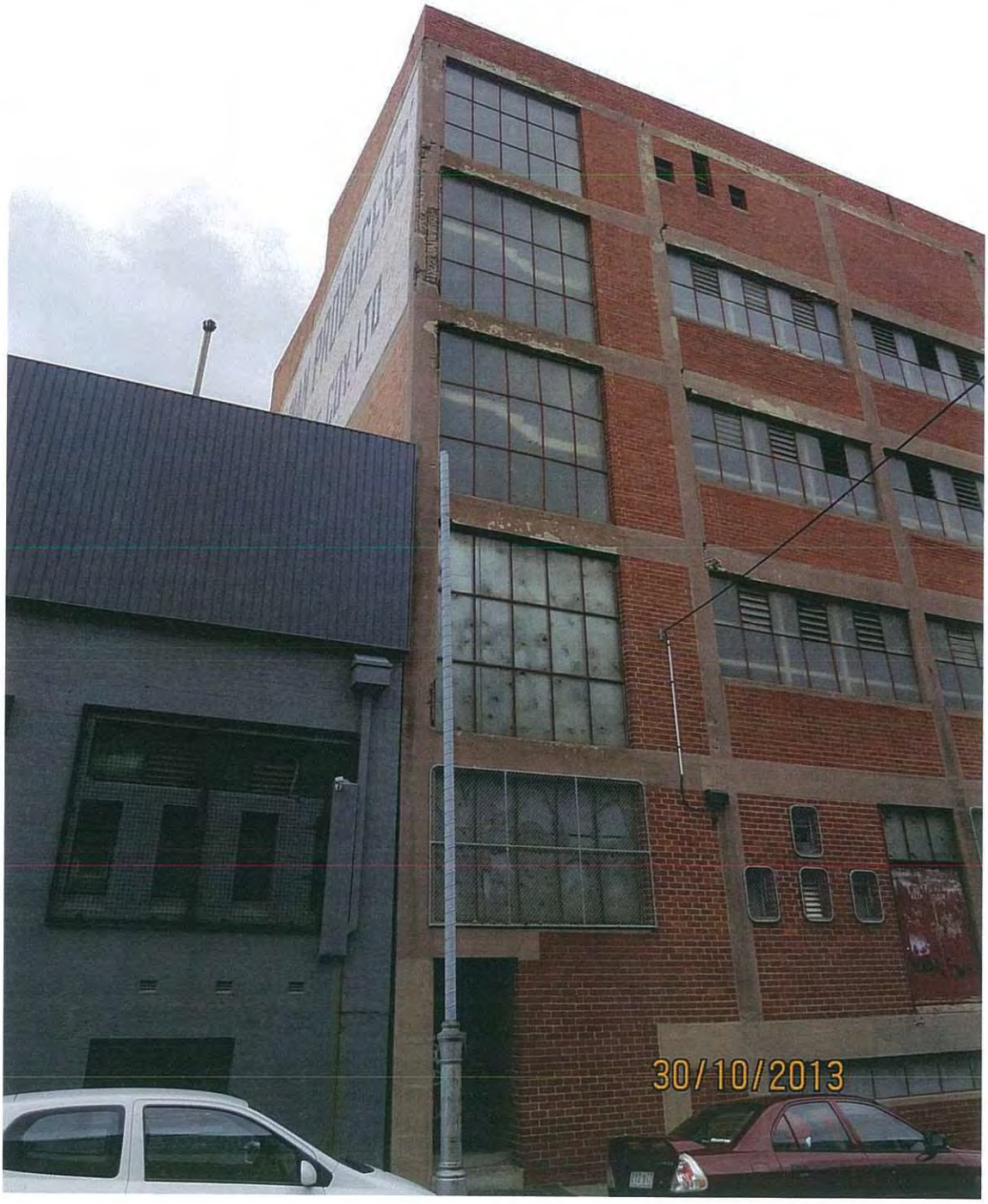
Spalled concrete on columns. Failed brickwork. Failed metal window frames and glazing.

Severely corroded steel column. Failed reinforcement and spalled concrete. Inadequate cover.

Catch fan required over adjacent building to collect spalls.

Northern elevation spalled concrete from columns and beams. Hoarding or gantry required.

Northern elevation spalled concrete from column. Hoarding or gantry required.



Spalling concrete from columns and beams. Gantry or hoarding required to protect pedestrians who use the footpath.

Eastern elevation – no expansion joints – brick expansion causing cracking of brickwork and perimeter beam

Spalls from Southern façade onto adjacent building

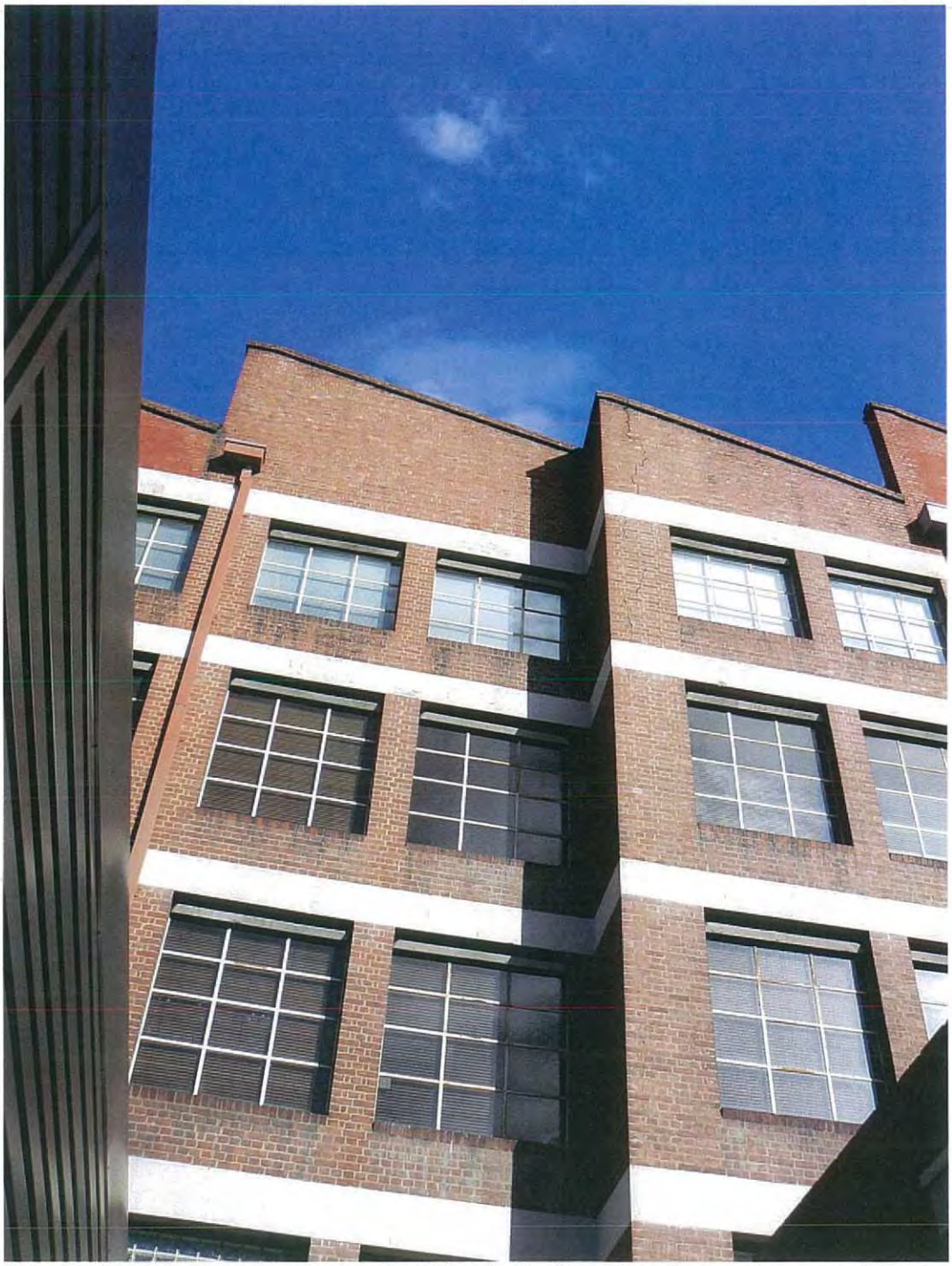
Spalling of Southern façade

Western façade – corrosion of steel window frame and cracked window panes. Spalling concrete lintel

Expansive bricks in sawtooth brickwork require complete replacement

Internal concrete framework showing corrosion of reinforcement due to low strength concrete and moisture ingress into building

Bowing window frame causing glazing to break into shards



Saw tooth roof of clay brick on a building in Carlton. Repaired under supervision by Kevin Campbell Consultants in 2006.

Note: cappings on parapet and flashings on the sofitt of lintel to protect steel window frames.

APPENDIX

KEVIN CAMPBELL B.Tech (Civil Eng) FIE Aust CPEng

I, Kevin Desmond Campbell, Chartered Professional Engineer, Fellow of the Institution of Engineers, Australia, Life Member of the Concrete Institute of Australia, of 34 Burgundy Drive Doncaster in the State of Victoria, am a professional engineer with over fifty years experience in the design, manufacture and erection of concrete structures. From 1961 to 1966 I was a manager involved in production and erection of precast concrete building elements, from 1966 to 1993 I was a regional manager of the Cement & Concrete Association of Australia and from 1993 to the present a consulting engineer specialising in concrete technology and forensic engineering.

I was chairman of the industry committee that drafted the Victorian 'Code of Practice for Tilt-Up Construction', an invited voting member of the Standards Australia committee that drafted AS3850 - 1990 'Tilt-up Concrete and precast concrete elements for use in buildings' (parts 1-3) and Technical Secretary of the Concrete Institute of Australia committees which produced 'Recommended Practice for Design and Detailing of Precast Concrete' and 'Recommended Practice for Precast Concrete Façade Connections' and 'Code of Practice for Sprayed Concrete'.

I was involved in the initial development of AS3610 - 1990 'Formwork for Concrete' as a member of the Standards committee.

I was a member of the following Standards Association of Australia committees:

- Permanent Way Materials – timber, steel and concrete products
- Tilt-Up Construction
- Precast Concrete
- Formwork for Concrete

Chairman, Occupational Health & Safety, Victoria Code of Practice on Tilt-Up Construction 1987

Qualifications B.Tech (Civil Engineering 1957 Adelaide)

Memberships

- Institution of Engineers, Australia, Fellow Chartered Professional Engineer
- Australian Corrosion Association, Member
- Concrete Institute of Australia, Life Member
- American Concrete Institute, Member
- National Trust, Member

Other

- Registered Building Practitioner
- Structural Engineer
- Consulting Engineer

Publications

Author or Co-Author

Concrete Practice Notes (C&CA) 1987
Concrete Basics – Awarded AFCC Victorian & National Award
Durability of Concrete
Foundations and footings for light structures
Local Roads Management Manual – ARRB Transport of Research 2000-
Chapter on repair of bridges

Lecturer University of Melbourne

Architecture, Building & Planning Department

- Formwork for Concrete
- Concrete Surface Finishes
- Sprayed Concrete
- Concrete Investigations – surveys etc
- Concrete repair and Protection
- Weathering of facades

Name: **KEVIN DESMOND CAMPBELL**

Qualifications: B Tech (Civil Eng) Awarded 1958 by the University of Adelaide
Fellow, Institution of Engineers, Australia. C. P. Eng.
Registered Building Practitioner, Victoria
Registered Structural Engineer, Queensland

Significant projects, inspections and repair:

Consultant - Kevin Campbell Consultants

- Arcadia Apartments
- AFL Park Waverly
- AMP St James
- ARRB Bridge Management Manual
- Bolte Bridge
- Ballarat Police & Law Courts
- Collins Place
- Museum
- The Shrine of Remembrance
- MCG – Olympic Grandstand
- Footscray Plaza
- Kooyong Tennis Club
- Monash University – Caulfield

- Victoria Barracks
- Australian Sugar Refinery
- Barwon Aqueduct
- Bendigo Council Offices
- Harding-Kendall Bridge
- La Trobe University
- Richmond Fire Station
- Mornington Fire Station
- Station Pier – Port Melbourne
- Whitten Oval
- National Gallery of Australia – Canberra
- Newstead Aquatic Centre
- Aqualink Box Hill
- Austin Hospital
- Knox Private Hospital
- Genazzano College
- RMIT
- Trinity College
- Mandeville Hall
- Carey Grammar
- 23-31 Lincoln Square
- 253-255 Bourke St
- 253 Flinders Lane
- 274-278 Bourke St – oldest building in Mall
- 139 Moorabeel St, Geelong
- Bowstring Truss Building, Geelong
- Frankston Pier Hotel
- Sandringham Hotel
- Old Treasury Building
- Raymond Priestly – Melbourne University
- Redmond Barry – Melbourne University
- Union Building – Melbourne University
- Ward McKenzie – Altona
- 7 Towers Rd, Toorak
- 7-19 Ballantyre St, South Melbourne
- 134 Flinders St, Melbourne
- 165 Flinders Lane
- 442 St Kilda Rd

September 1973- June 1994	Cement & Concrete Association of Australia Regional Manager - Victoria
July 1966 - August 1973	Cement & Concrete Association of Australia Regional Manager - South Australia

1961 – 1966	Pioneer Concrete Pty Ltd Production Manager then Marketing Manager, Precast Concrete & Dimension Stone Products - South Australia and Victoria
1958 - 1961	South Australian Government Authority - Engineering and Water Supply Department – Design - Construction –Bridges/Drainage

Professional Affiliations:

Fellow Institution of Engineers
Secretary Structural Branch 1976 (Vic)
Chairman Structural Branch 1977 (Vic)
Life Member, Concrete Institute of Australia, Secretary SA then Victoria of Concrete Institute of Australia (28 years)
Member, Australian Corrosion Association
Member, American Concrete Institute
BAP Member, SAI, Global
Registered Building Practitioner, Victoria – Structural Engineer

Overseas Study Tours

1992	South Africa-Europe-USA (12 weeks)
1982	Europe-USA-Canada (6 weeks)
1972	USA-Europe (4 weeks)

Additional Relevant Experience

All published in 1980's
Technical Secretary, Concrete Institute of Australia
Code of Practice Committees
Design and Detailing of Precast Concrete
Connection Details for Precast Concrete
Sprayed Concrete

Significant Research & Development Activities:

Significant involvement in the development of Architectural Concrete Finishes

Development of Tan Cement and Off White Cement

Development of reconstructed stone (granite) and simulated stone finishes for precast concrete.
Research on expansive clays

Publications Author or Co-Author

Concrete Practice Notes (CACA) 1987
Concrete Basics - Awarded AFCC Victorian and National Award

	Durability of Precast Concrete Architectural Concrete Finishes CACA Footing and Slab Design
Papers to Professional Institutions:	Tilt Up Construction - Structural Engineering Conference Adelaide 3 papers – CIA Conferences
Present Research & Development Activities	Deterioration Science Renewal Engineering Corrosion Inhibitors, Silanes, Cathodic Protection Realkalisation, polyurethane grouts

Declaration

Kevin Campbell declares that he has read the EXPERT WITNESS CODE OF CONDUCT.
I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Kevin Campbell declares that he has complied with the requirements set out in the EXPERT WITNESS CODE OF CONDUCT.

Kevin Desmond Campbell
2013

WORLD RECOGNISED
ACCREDITATION
NATA ACCREDITED LABORATORY
NUMBER 15132

Enclosed is your report as detailed below:

DIVISION 6 DEMOLITION / REFURBISHMENT ASBESTOS SURVEY AND RISK ASSESSMENT

For

KEVIN CAMPBELL CONSULTANTS

Of

85-89 SUTTON STREET, NORTH MELBOURNE

6 November, 2013

Report Reference: 19984-1
Copy: 4
Copy 1: Kevin Campbell Consultants
Copy 2: Kevin Campbell Consultants
Copy 3: Identifibre Pty. Ltd.
Copy 4: PDF Copy

Report Prepared By	Report Authorised By	Date Authorised
Michael Retra	Jade Forrest	7 November, 2013

Division 6 Demolition / Refurbishment Asbestos Survey and Risk Assessment Report of

85-89 Sutton Street, North Melbourne

1.0 Table of Contents

2.0 Scope of Risk Assessment

This report presents the findings of a Division 6 demolition / refurbishment asbestos materials survey and risk assessment conducted for Kevin Campbell Consultants of 85-89 Sutton Street, North Melbourne, on 6 November, 2013. This report satisfies the requirements of Division 6 – Demolition and refurbishment where asbestos is present of the ***Victorian Government Occupational Health and Safety Regulations 2007 Chapter 4 Part 4.3***.

The purpose of the survey and risk assessment is to ensure that asbestos materials are identified in order that any associated risk can be controlled before and during planned works.

This building was constructed prior to 1985. The premises have been constructed primarily of brick walls with concrete floors and a corrugated asbestos cement roof.

Where asbestos materials are found to be present, appropriate recommendations have been made for the control of any associated risk.

3.0 Survey Method

The scope of the survey was limited to a visual examination of accessible and representative construction materials and the collection of materials suspected to contain asbestos. Representative samples of suspected asbestos containing materials were collected where it was possible to do so without substantially damaging decorative finishes or waterproofing membranes etc. No destructive sampling or damage to the existing finishes and services was performed to obtain samples or gain access to otherwise inaccessible areas. Due to the destructive nature of the sampling process, it is not possible to collect samples of all materials. Where it was not possible to collect a sample of a material, the inspector has used his/her professional experience to make a judgement on the hazard status of the material or the areas concerned. Where the inspector suspects or believes the material may represent a hazard, this has been recorded in this report and these materials must be treated as containing asbestos. If work is required to be performed on these materials, they must first be analysed to confirm the presence, or absence, of asbestos.

This survey does not include any assessment of soils, underground storage tanks or any other environmental contaminants which may be present in the grounds.

4.0 Limitations of a Building Survey

The survey attempted to locate all the asbestos materials, however as the survey involves a visual inspection and sampling process, only those materials that are physically accessible can be located and identified. Therefore, it is possible that materials which may be concealed within inaccessible areas / voids, or are contained within operational electrical or mechanical equipment, may not be located during the survey. Such concealed and / or inaccessible areas fall into a number of categories:

1. Inside set ceilings or wall cavities.
2. Building facades or other height restricted areas.
3. Those areas accessible only by dismantling equipment, performing minor local demolition works or disturbing live electrical control or transmission equipment, or entering restricted high voltage enclosures.
4. Service shafts, ducts etc, concealed within the building structure or internal areas of plant or equipment.
5. Totally inaccessible areas such as voids and cavities created and intimately concealed within the building structure. These voids are only accessible during building works.
6. Under croft areas considered to be confined spaces

Therefore, without substantial demolition of the building, it is not possible to guarantee that every source of asbestos has been detected.

4.1 Specific Areas Not Accessed

The following areas were not accessed during this assessment:

- Within the lift shaft in the south west corner of the building due to destructive access requirements
- All rooftop areas due to safe working height restrictions
- Lift motor room due to the lift being operational
- Various areas within the building which were blocked by stored items

During the course of any refurbishment works, care should be exercised when entering previously inaccessible areas and it is imperative that work cease pending further sampling if asbestos materials or unknown materials are encountered.

5.0 Survey Findings – Discussions and Recommendations

The following discussions and recommendations are designed to facilitate development of strategies and protocols for dealing with different asbestos materials and hazard situations. With this in mind, each different type of asbestos material identified is discussed in a sub section specific to that particular material.

5.1 Identified Materials

Asbestos materials have been identified at this site in the following forms:

- Woven asbestos rope (deemed to be present)
- Asbestos cement products
- Asbestos cement roof
- Black tar (Zelemite) electrical board
- Millboard (deemed to be present)
- Fire doors (deemed to contain asbestos)

Observation of the general guidelines and the specific recommendations, which follow, will help to minimise any potential exposure of personnel to asbestos.

5.2 Asbestos Containing Materials

Asbestos containing materials present a health hazard when respirable asbestos fibres become airborne and are inhaled or ingested. Friable (or non-bonded) asbestos materials have a higher propensity to produce elevated airborne fibre concentrations than non-friable asbestos materials. These materials therefore present a greater risk to health. For this reason the comments and recommendations in this report place emphasis on the friability and condition of the identified asbestos containing materials.

5.2.1 Woven Textile / Rope

Woven asbestos products are friable materials, usually in the form of textile or rope. These products have a high percentage of asbestos content, in some cases they are woven entirely from asbestos. In the form of a woven textile, usually only chrysotile (white asbestos) is used, however in the case of rope, amosite (brown asbestos) is sometimes present as a core around which chrysotile is wound.

The degree to which these materials will present a risk to personnel of exposure to airborne asbestos will depend on a number of factors such as their condition, location and the likelihood that they will be disturbed. Where amosite is present or the material has degraded due to long exposure to heat it is likely to be very friable and present an increased risk.

Asbestos woven rope has been deemed to be present within the window frames of the sawtooth roof clerestory windows.

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos woven textile / rope using a class A licensed asbestos removalist if likely to be disturbed during works.

5.2.2 Asbestos Cement Products

Asbestos cement products are generally regarded as non friable materials. Provided the cement matrix remains stable and no airborne dust is produced, these products present a negligible health risk. External surfaces of asbestos cement products are prone to gradual degradation and softening under normal environmental influences.

Where asbestos cement sheeting has been identified as a backing material for ceramic tiles, it should be assumed that any other area of ceramic tiles including those mounted to masonry walls, might also be mounted on asbestos cement sheeting.

Asbestos cement products have been identified in the following locations:

- Lining the wall above the main electrical board in the north east corner of the ground floor
- Deemed to be present lining walls behind ceramic tiles throughout the toilets in the north east corner on all levels where toilets are present

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos cement products using a class A or B licensed asbestos removalist if likely to be disturbed during works.

5.2.3 Asbestos Cement Roofs

The upper surfaces of asbestos cement roofs are prone to gradual degradation and softening under normal environmental influences. Movement of personnel across degraded cement sheet roofs may cause abrasion of the soft surface resulting in the creation of airborne asbestos dust.

Under normal weathering conditions asbestos cement roofs release asbestos fibre from the upper roof surface which is washed into the gutters. If the gutters become blocked or if the roofs down pipes are not correctly sumped, asbestos fibre can accumulate. When dry these deposits of loose asbestos fibre can present a significant airborne asbestos risk if disturbed.

Corrugated asbestos cement sheet has been identified cladding the roof of this building.

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos cement roof and any associated asbestos fibre deposits using a class A or B licensed asbestos removalist if likely to be disturbed during works.

5.2.4 Black Tar (Zelemite) Electrical Boards

Older style electrical backing boards typically contain chrysotile (white) asbestos. These boards are usually black in colour. Due to their solid nature these boards present an extremely low risk of exposure of personnel to airborne asbestos. The risk level is only likely to be elevated should the boards be machined, tooled or abraded in some manner.

Asbestos containing black tar (Zelemite) electrical boards have been identified mounted on the wall in the north east corner on all levels.

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos containing electrical boards using a class A or B licensed asbestos removalist if likely to be disturbed during works.

5.2.5 Millboard

Millboard is a moderately friable asbestos material which can disintegrate if subjected to abrasion or vibration. The asbestos fibres within the millboard are not firmly bound within a stable matrix as is the case with asbestos cement products. For this reason millboard materials can present a moderate risk to personnel of exposure to airborne asbestos.

Asbestos millboard has been deemed to be present as internal lining to the timber frames on which the above black tar (Zelemite) electrical boards are mounted.

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos millboard using a class A licensed asbestos removalist if likely to be disturbed during works.

5.2.6 Fire Doors

Asbestos containing fire doors present a negligible health risk to personnel. These doors contain a friable to moderately friable asbestos material. However the asbestos is encapsulated within the outer casing of the door. Respirable fibre is therefore prevented from being released into the atmosphere. The level of risk to personnel is only likely to be elevated should the door be damaged, such that the internal insulation is exposed.

It should be noted that in order not to compromise the integrity and fire rating of fire doors, sampling is limited to accessible sections of these doors. Usually access is available only at latch and handles mechanisms. Therefore it would be prudent to assume that all fire doors contain asbestos unless sampling confirms otherwise.

All fire doors throughout this building are deemed to be asbestos containing.

Refer to the Asbestos Materials Register at the end of this report for further details.

Recommendation

Remove asbestos containing fire doors using a class A licensed asbestos removalist if likely to be disturbed during works.

6.0 General Guidelines for Treatment of `In Situ' Asbestos Materials

To minimise the possibility of liberation of respirable asbestos fibres, the following general guidelines regarding asbestos-containing products should be observed at all times:

1. All asbestos-containing materials should be kept in good repair.
2. Asbestos-containing materials should never be tooled, cut, sanded, abraded, machined, or subjected to excessive vibration.
3. Personnel should be advised of the presence and location of asbestos-containing materials in the workplace. This is essential where friable materials are present. Maintenance personnel or contractors who are likely to disturb 'in situ' asbestos products in the course of their duties must be supplied with suitable personal protective equipment and appropriate training whenever they are required to work in high risk asbestos environments.
4. Areas containing friable or damaged asbestos materials should be isolated from personnel.
5. As far as is practicable all asbestos-containing materials should be appropriately labelled.
6. Consideration should be given to replacement of all asbestos-containing materials (particularly friable materials) with non-asbestos containing alternatives, whenever and wherever this is practicable.
7. Before any demolition or refurbishment takes place, the risk to personnel arising from the work must be assessed. The results of this assessment must be made available to persons responsible for carrying out the demolition or refurbishment. This also applies to the removal of redundant equipment.

7.0 Removal of Asbestos-Containing Materials

In accordance with the provisions of **Division 6 – Demolition and refurbishment where asbestos is present** of the ***Victorian Government Occupational Health & Safety Regulations 2007 Chapter 4 Part 4.3***, all asbestos-containing materials which are likely to be disturbed by planned demolition or refurbishment works should be (so far as is practicable) removed prior to commencement of those works.

It is recommended that all removal of asbestos products should be performed by approved asbestos contractors. Where friable materials are to be removed this must be done by an approved Class A contractor. Non friable materials may be removed by either a Class A or B contractor.

It is recommended that static air monitoring be conducted during all asbestos removal works.

Removal of asbestos materials must be conducted in a manner that will eliminate (so far as is practicable) the release of airborne asbestos fibres. The asbestos contractor must ensure that any control measures used to control the risk associated with exposure to airborne asbestos fibres are properly used, installed and maintained.

Part 4.3 – Asbestos of the ***Victorian Government Occupational Health and Safety Regulations 2007 Chapter 4*** requires that at the end of the removal process a visual inspection of the asbestos removal area should be performed by an independent person to verify that there is no asbestos residue remaining as a result of the removal work. In the case of friable materials clearance air monitoring must be conducted within the enclosed area to verify that asbestos fibre levels are less than 0.01 fibres per millilitre. Clearance monitoring may also be appropriate where non-friable materials have been removed from internal or enclosed areas. An asbestos hygienist is an appropriate person to give guidance in these matters and to provide air monitoring and inspections services.

8.0 Asbestos Works by Non Approved Personnel

We recommend that approved asbestos removal contractors should be used, whenever and wherever work involves the removal or disturbance of asbestos containing materials.

We note however, that on some occasions such works may be of a very minor nature or it may be necessary to minimise immediate health risk in an emergency situation, and that the duration of the works would be measured in minutes rather than hours. Where these minor works involve only non-friable asbestos materials, the probability of creating elevated airborne asbestos fibre concentrations would be low. Works of this nature may include:

- the removal of a single sheet of asbestos cement, or pieces of asbestos cement debris following damage to some 'in situ' sheeting;
- the sealing of damaged edges of cement sheeting, or;
- the removal of a few vinyl floor tiles.

Division 7 – Removal of Asbestos of the ***Victorian Government Occupational Health and Safety Regulations 2007 Chapter 4 Part 4.3*** recognises that some minor works may be such that the use of an approved asbestos removal contractor may not always be necessary. Under the Regulations there is provision for these works to be carried out by non-approved personnel. The Regulations allow non-approved persons to carry out asbestos removal works for **a maximum of one hour in any seven-day period**. This only applies to non-friable asbestos materials. Any such person must have appropriate training and be provided with suitable Personal Protective Equipment.

Where non-approved personnel are involved in any work involving asbestos materials we make the following recommendations:

- Asbestos works involving non approved personnel must not be allowed to commence without prior written approval from the officer responsible for Health and Safety matters. Failure to do this may breach the 'Duty of Care' provisions of the Occupational Health & Safety Act.
- Non-approved personnel should be prohibited from carrying out any work which involves the disturbance of friable asbestos materials.
- All personnel required to carry out work involving asbestos materials, must be trained in the use of appropriate Personal Protective Equipment and the handling and disposal of asbestos materials.
- Protective respiratory equipment and clothing must always be worn during these works. Appropriate protective equipment would include, as a minimum, a class P2 half face respirator (replaceable filter or disposable face piece) and a disposable protective suit with hood.
- All removed asbestos containing materials as well as clothing and disposable respirators used during the asbestos works must be placed in sealed asbestos waste bags or containers. These bags or containers should have labels attached, which advise of the health hazard related to the contents, and must be disposed of in an approved manner, as asbestos waste.

The Environmental Protection Authority regulates the transportation and disposal of asbestos waste of an industrial origin. Owners of vehicles that transport any amount of industrially sourced asbestos waste must hold a permit to transport proscribed waste.

9.0 Qualitative Risk Assessment

Asbestos materials are identified through a combination of visual inspection and material sampling. The qualitative risk assessment is based upon an evaluation of factors such as the location and condition of the identified material, whether the nature of the work carried out in the area is likely to disturb the material and any other information considered important or relevant. As part of the risk assessment process, each asbestos hazard identified has been allocated a **Priority Rating**.

Priority Rating for Control of Asbestos Materials
The following priority rating system has been incorporated into the Asbestos Materials Register. The priority rating system is designed as a guide to those responsible for the development of a comprehensive asbestos management plan. The actual setting of priorities for asbestos hazard control procedure implementation will be dependent not only on the allocated rating, but also on factors such as changes to work practices or the physical environment which would occur during the refurbishment or demolition. Notwithstanding this, the allocated rating does provide a reasonable guide to appropriate priority setting with regard to the current condition of the material.

Priority 1: Immediate Elevated Risk Level
A material, which due to its present condition and location, presents an immediate health risk. Immediate control measures are required and the area containing this material must be isolated from personnel. Abatement of this particular hazard is strongly recommended at the earliest practicable time.

Priority 2: Potential Elevated Risk Level
Damaged or unstable material, which if disturbed is likely to present an immediate health risk, with the likelihood that contamination will spread to other areas. Control measures to stabilise this material should be initiated immediately, with removal of this material being considered.

Priority 3: Low Risk Requiring Minor Maintenance
A stable material, which has some minor areas of damage requiring remedial action or is likely to be subject to damage or to degrade due to environmental conditions or proposed works. Maintenance work should be performed to stabilise and repair damaged areas. Controls must be implemented to protect these materials from further damage or degrading factors.

Priority 4: Negligible Risk under Present Conditions
A stable material, which is unlikely to present a risk to health unless damaged, tooled, cut, sanded, abraded or machined. It is recommended that these materials be maintained in good order. Reassessment of the priority rating will be required if planned works are likely to have an impact on these materials.

10.0 Asbestos Materials Register

85-89 Sutton Street, North Melbourne							6 November, 2013
Material	**Location**	**Sample Number**	**Asbestos present Y/N**	**Friable Y/N**	**Condition**	**Priority Number**	**Comments / Recommendations**
Asbestos woven rope (deemed to be present)	Within the window frames of the sawtooth roof clerestory windows	-	Yes	Yes	Concealed	3	Must be removed by an approved asbestos contractor if likely to be disturbed by the proposed works
Flat cement sheet	Ground floor, north east corner, lining the wall above the main electrical board	-	Yes	No	Satisfactory	3	
	All levels where toilets are present in the north east corner, deemed to be present lining walls behind ceramic tiles throughout the toilets	-	Deemed	No	Concealed	3	
Corrugated cement sheet	External, cladding the roof of the building	-	Yes	No	Satisfactory	3	
Black tar (Zelemite) electrical boards	All levels, north east corner, mounted on the wall	-	Yes	No	Satisfactory	3	
Millboard (deemed to be present)	Internal lining to the timber frames on which the above black tar (Zelemite) electrical boards are mounted	-	Deemed	No	Concealed	3	
Fire door cores	All fire doors throughout this building are deemed to be asbestos containing.	-	Deemed	No	Concealed	3	

NOTE: The following areas were not accessed during the site investigation:

- Within the lift shaft in the south west corner of the building due to destructive access requirements
- All rooftop areas due to safe working height restrictions
- Lift motor room due to the lift being operational
- Various areas within the building which were blocked by stored items

Priority rating for control of asbestos materials.
1: Immediate elevated risk level. **2:** Potential elevated risk level. **3:** Low risk requiring control or removal prior to works. **4:** Negligible risk under present conditions.

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