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## SUPPLEMENTARY EXPERT WITNESS STATEMENT

Planning Panels Victoria  
Bayside Planning Scheme Amendment C192bays

14 March 2024

Prepared for Bayside City Council under the instruction of Harwood Andrews  
Lawyers by:

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# CONTENTS

1	INTRODUCTION .....	1
1.1	Purpose .....	1
1.2	Instructions .....	1
1.3	Reports and documents relied upon .....	2
1.4	Any questions falling outside the expert's expertise.....	2
1.5	Summary opinion .....	2
1.6	Declaration .....	4
2	ISSUES.....	5
2.1	The need for maintenance .....	5
2.2	Novel Techniques and New Materials.....	5
2.3	Characteristics of Modernist design.....	7
2.3.1	Flat roofs .....	7
2.3.2	Windows .....	8
2.3.3	Indoor / outdoor transitions.....	8
2.3.4	Detailing.....	9
2.4	Design intent and like-for-like replacement.....	9
2.5	Environmental performance .....	10
3	EXAMPLES OF SUCCESSFUL REPAIR, REFURBISHMENT AND UPGRADING OF POSTWAR MODERNIST HOUSES.....	11
	Table 1 Examples of listed Modernist houses that have been successfully upgraded.....	11
4	CONCLUSION .....	14

# 1 INTRODUCTION

## 1.1 Purpose

[1] This supplementary statement of evidence has been prepared to assist the Panel considering Bayside Planning Scheme Amendment C192bays and has been prepared by me as the principal author of the statement of evidence dated 9 February 2024. My qualifications, experience and relevant expertise are set out at sections 1.2 and 1.3 of my statement of evidence.

[2] On 29 February 2024, Lester Townsend, Panel Chair wrote to Bayside City Council in which he identified a number issues raised during the hearing in relation to the innovative nature of Modernist design, the use of novel materials and the relative importance of detailing and materials in Modernist design compared to other architectural styles. In the letter Panel directed that:

*Council may submit further evidence from Mr Gard'ner and a closing submission on the appropriateness of the Panel's alternative preliminary conclusion (and related issues) by 14 March 2024. It is not anticipated that the Hearing will need to be reconvened and will proceed through a written process unless the Panel has questions for Mr Gard'ner.*

*If the evidence raises issues that go to its recommendations for a specific property it will give the property owner a right to be heard in respect of the evidence and to question Mr Gard'ner. The Panel does not anticipate this will be the case.*

## 1.2 Instructions

[3] On 1 March 2024, I received the following written instructions by email from Ms Kim Piskuric, Principal of Harwood Andrews Lawyers:

*As recently discussed, the Panel has raised an issue in the hearing and we have sought leave (and been granted leave) to file a supplementary witness statement from you addressing this issue.*

*... in particular we would like you to provide your expert opinion on the following statement from the Panel –*

*"Issues of building condition, the feasibility of 'like-for-like' replacement of elements, the durability and maintenance of design features and detailing and compliance with contemporary building codes may play out differently at a planning permit stage for modernist buildings compared to building from other eras."*

*You should prepare your supplementary statement in accordance with the practice note for the provision of expert evidence and as part of your existing brief in this matter.*

*You statement is due to be filed on 14 March 2024.*

### 1.3 Reports and documents relied upon

[4] As well as drawing on my own knowledge as a conservation architect I have had regard to the following technical and popular publications:

- Arden, S. & Bowman, I. *The New Zealand Period House: A Conservation Guide*, Random House, New Zealand, 2004.
- Austin, F., Reeves, S. and Alexander, A., *Beaumaris Modern*, Melbourne Books, 2018.
- Callan, P. *The New Modernist House: Mid-Century Homes Renewed for Contemporary Living*, Thames & Hudson, Australia, 2023.
- Chitty G. & Baker, D. ed. *Managing Historic Sites and Buildings: Reconciling Presentation and Preservation*, Routledge in association with English Heritage, UK, 1999.
- Department of Environment and Heritage Protection (QLD) *Technical Note: Conserving Roofs*, State of Queensland, 2014.
- Lewi, H. & Goad, P. *Australia Modern: Architecture, landscape & design*, Thames & Hudson, Australia, 2019.
- Macdonald, S. ed. *Modern Matters: Principles & Practice in Conserving Recent Architecture*, Donhead, UK, 1996.
- Macdonald, S. ed. *Preserving Post-War Heritage: The Care and Conservation of Mid-Twentieth-Century Architecture*, Donhead, UK, 2001.

### 1.4 Any questions falling outside the expert's expertise

[5] No questions have been raised in the supplementary instructions that fall outside my expertise.

### 1.5 Summary opinion

[6] It is my view that:

- There is no notable difference between the durability and maintenance of features associated with Modernist buildings – and their compliance with contemporary building codes – compared to buildings from other eras.

- Buildings of all periods – including the postwar period – require periodic maintenance and repair. Maintenance and repair works to Modernist buildings can generally be undertaken with readily available materials without the need for specialist craftspeople;
- Although the novel use of reinforced concrete and curtain glazing systems in some postwar buildings have known systemic failure issues, none of the properties considered by the Panel into C192bays were constructed using these systems;
- The prevalence of flat-roofed construction on Modernist-style postwar housing can exacerbate water ingress. However, it is noted that when roofs are due for replacement, long run steel roofing of a minimum 1 in 30 (2°) pitch can be installed to avoid future ponding issues and will still retain the flat roofed Modernist aesthetic;
- The use of fast-grown softwoods in the place of hardwood for window joinery in the postwar years (rather than hardwood) can reduce the lifespan of these elements especially when not regularly painted and maintained. Replacement with hardwood (when required) will significantly expand the longevity of these elements;
- The creation of at-grade interfaces between interior living spaces and exterior terraces can cause water to sit against timber sills and bottom rails exacerbating timber decay in these locations. It is noted that this can be simply rectified by providing for a drain at the junction between the terrace and the glazing;
- The relative importance of the outward expression of the materiality of building elements is frequently greater than the authenticity of the fabric itself and therefore like-for-like repair can be highly successful in postwar Modernist houses;
- The upgrading of any dwelling built more than 30 years ago to meet current standards of environmental performance can be complex but postwar Modernist houses are not inherently more difficult to retrofit than building from any other era;
- There are numerous examples of successful repair, renovation and upgrading of postwar Modernist houses within the City of Bayside and across Victoria more broadly, with a number of these also being subject to the Victorian Heritage Register or the Heritage Overlay; and
- Postwar Modernist houses do not inherently suffer from defects or mechanisms of failure that are unique to this era of construction or architectural style and their repair and upgrading can satisfactorily be addressed through the planning permit process in the same manner as changes to listed buildings of earlier periods. A finding that such buildings are inherently flawed risks the protection of this important building typology in the future.

## 1.6 Declaration

- [7] 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.

A handwritten signature in blue ink, appearing to read 'Jim Gardner', with a long horizontal stroke extending to the right.

Jim Gardner, Director - GJM Heritage

## 2 ISSUES

### 2.1 The need for maintenance

- [8] The need for maintenance of postwar-era buildings does not differ from that of the Victorian, Edwardian or interwar-era buildings that preceded them. This is articulated in Susan Macdonald's chapter 'Defining an Approach: A methodology for the repair of post-war buildings' in *Preserving Post-War Heritage: The Care and Conservation of Mid-Twentieth-Century Architecture* (Macdonald S. ed., 2001), which reads:

*Maintenance is essential for any building, and the misconception that modern buildings are maintenance-free has resulted in the premature failure of the fabric of many post-war buildings ... Maintenance is a cost-effective way of prolonging the life of a building: well-planned and regular maintenance can extend the period between major repair programmes considerably. (p.39)*

- [9] Similarly, Catherine Croft and Dr Elaine Harwood in their chapter titled 'Conservation of Twentieth-Century Buildings: New rules for the Modern Movement and After?' in *Managing Historic Sites and Buildings: Reconciling Presentation and Preservation* (Chitty & Baker, 1999) acknowledges the common misconception that Modernist buildings did not require maintenance in the manner of buildings of previous generations:

*The belief, widely held in the middle decades of [the twentieth] century, that modern materials would be 'maintenance free' has left our generation with not only a repair bill but a disillusionment with these materials because they could not fulfil such wild expectations. (p.161).*

- [10] The introduction of 'wonder materials' in the postwar years including long-run profiled metal roofing, asbestos cement sheeting and reinforced concrete amongst others, led to designers and property owners alike failing to consider the design life of these materials or the need to maintain them to enhance the building's longevity. This is not generally a function of the materials themselves but rather the lack of maintenance that has led to premature failure – notwithstanding the small number of common issues discussed further below.

### 2.2 Novel Techniques and New Materials

- [11] The postwar period saw the rapid development of, and growth in the use of, machine-made materials and façade systems. These included precast and off-form reinforced concrete, steel and aluminium framed curtain glazing systems and novel materials such as glass reinforced plastic (GRP). The failure of some of these materials and systems – most notably the

carbonation of concrete and subsequent corrosion of reinforcing bars causing spalling (commonly known as 'concrete cancer') are well documented (Chilly & Baker, 1999; Macdonald, 1996; Macdonald, 2001 & Lewi & Goad, 2019). While common in postwar civic, institutional, commercial, social housing and industrial applications these novel materials and building systems are much less typical in domestic architecture and are not found in any of the examples before the Panel considering C192bays.

- [12] Susan Macdonald in 'Reconciling Authenticity and Repair in the Conservation of Modern Architecture' in *Modern Matters: Principles & Practice in Conserving Recent Architecture* (Macdonald, 1996) recognises that the use of novel techniques and new materials such as reinforced concrete and curtain glazing can lead to material failures:

*One of the characteristics of modern architecture is the use of new materials or the use of traditional materials in new ways. Using new materials which did not have a proven performance record or traditional materials used in new ways built problems into the building fabric resulting in premature failure. A lack of understanding of the projected performance of these modern materials and a lack of maintenance inevitably caused failure. Many of the new materials were erroneously believed to be low-maintenance or maintenance-free. Concrete, for instance, was thought to last indefinitely. (p.90)*

- [13] In my opinion these issues can easily be overstated in the context of the City of Bayside Postwar Modern Residential Study. While this statement can be applicable to large scale buildings of the postwar period, the examples before Panel almost exclusively utilise tried and tested materials, such as concrete slab foundations, light timber framed construction, brick or timber cladding, painted timber joinery and profiled galvanised steel roofing.

- [14] This is not to say that there was not innovation in the use of materials and building techniques in domestic architecture as evident in the work of internationally renowned innovators such as Frank Lloyd Wright at famous houses such Failing Water, Bear Run, Pennsylvania. Locally Robin Boyd was also known for innovative, and at times experimental, techniques such as the catenary cable-supported roof of the Boyd II House, Walsh Street, South Yarra; however, this degree of experimentation is not found in the vast majority of postwar Modernist houses nor any of the examples before the Panel considering C192bays.

- [15] While recognising that there are some materials associated with the Modernist movement that have systemic repair issues – reinforced concrete or curtain glazing for instance – few of these have widespread application in domestic architect and none are found in those before Panel.



## 2.3 Characteristics of Modernist design

- [16] While the majority of construction used in the postwar Modernist houses being considered through Amendment C192bays use tried and tested materials and construction techniques, some common design features can – if not maintained – lead to premature failure.
- [17] As Patricia Callan author of *The New Modernist House: Mid-Century Homes Renewed for Contemporary Living* identifies, there are a relatively small number common issues that are inherent in much of postwar Modernist-style domestic architecture:

*Modernist domestic architecture is not without its archetypal issues. Flat rooflines built for their sleek visual impact can be a nightmare of chocked box gutters causing terrible leaks, a conspiracy of wear, mediocre engineering and poor materials. Glazing of Mid-Century Modern homes, though extensive can be of scant thickness, making for dramatic heat loss and higher energy use. Though common, like all repairs they are readily addressable, not insurmountable. (p. 20)*

### 2.3.1 Flat roofs

- [18] Houses built from the mid-1950s to the mid-1970s are now at – or have exceeded – the 50-year design life<sup>1</sup> of profiled metal roofing systems meaning that replacement is likely to be required if this has not already occurred on postwar Modernist houses.
- [19] The lower pitch of flat roofs – i.e. roofs with a pitch of less than 5° (approx. 1 in 12) are more prone to ponding and leaking as identified in the discussion on Modernist houses in *The New Zealand Period House: A Conservation Guide* (p.25), which goes on to note that “*Steep pitches present fewer issues, as dirt and water run off readily, and for this reason steeper-pitched roofs last longer*” (p.128). This is not to say that a flat roof will inherently fail, however cleaning roofs of leaves and debris and checking fixings and joints becomes more important than might be the case on a steeper pitched roof.
- [20] While the original roofs may not have been installed at the minimum falls now required by the National Construction Code (NCC) – 2° (approx. 1 in 30) for trapezoidal profiles – compliant falls of replacement long run profiled roofing can be accommodated without adversely affecting the flat roofed Modernist aesthetic of these houses.

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<sup>1</sup> [https://fielders.com.au/wp-content/uploads/dlm\\_uploads/Fielders-Roofing-Walling-Manual.pdf](https://fielders.com.au/wp-content/uploads/dlm_uploads/Fielders-Roofing-Walling-Manual.pdf)

### 2.3.2 Windows

[21] A common feature of postwar Modernist architecture is a more extensive use of glazing than was evident in either previous generations or the more orthodox project housing of this period. Susan Macdonald in 'Reconciling Authenticity and Repair in the Conservation of Modern Architecture' in *Modern Matters: Principles & Practice in Conserving Recent Architecture* states:

*One of the characteristics of modern architecture is the volumetric role of the horizontal openings of light, simple frames that provide light to the interior.*

...

*Metal ... and timber (often softwood) were used with an emphasis on prefabrication and economy of construction. (p.95)*

[22] The increased use of less durable softwoods in the postwar period was driven by the shortage of building materials at the time in combination with the rapidly increased emphasis on mechanisation for the creation of building materials. The use of softwood in relatively slender profiles for window joinery – including full height window and door frames in close proximity to paved, lawn or garden – makes these more prone to local timber decay, particularly when not regularly painted or if vegetation is allowed to trap moisture close to them. Having said that, all timberwork will decay over time if not regularly painted or if it is subjected to damp conditions for long periods of time. Timber window frames, weatherboards, fascias and bargeboards on any house of any period – heritage listed or not – will decay, fail and require periodic repair or replacement. These repairs can be readily undertaken without adversely affecting the significance of the property and are technically no more difficult than undertaking a similar repair on a late-nineteenth or early twentieth century house. Arguably, the repair of casement windows commonly found on postwar Modernist houses is less complex than repairing traditional sash windows with their sash boxes, pullies, ropes and weights and decorative elements on timber window surrounds.

### 2.3.3 Indoor / outdoor transitions

[23] A closely aligned issue to the failure of timber joinery is the impact of the common architectural and programmatic desire to create a seamless transition between interior and exterior living spaces in Modernist houses. Systems, such as the Stegbar 'Windowwall' developed in collaboration with Robin Boyd, enabled these free flowing indoor/outdoor spaces to be created. As noted by Professor Hannah Lewi, in the foreword to *The New Modernist House: Mid-Century Homes Renewed for Contemporary Living*:

*Other common traits include a great attention to the flow from inside to outside and a transparency that frames the gardens and landscapes beyond (p. 7)*

[24] The absence of a traditional threshold or difference in level between the exterior paving or landscaping and the interior can trap moisture at the base of joinery units, exacerbating decay. The issues associated with drainage at thresholds or the trapping of moisture at the base of walls can be readily rectified by the introduction of a discreet drainage channel to capture and direct water away from building fabric and by the management of vegetation in these areas.

#### 2.3.4 Detailing

[25] The detailing of postwar Modernist architecture celebrated simple forms, clean lines and unadorned details. This can result in designs with minimal or no eaves overhang or the absence of flashings to fascia boards or other elements. However, the absence of eaves is not unique to postwar Modernist buildings with many Victorian and Edwardian-era houses forgoing any eaves overhang. Even today thousands of project homes are constructed cheek-by-jowl with no eaves overhang. The maintenance and environmental performance issues associated with an eaves-less roof design is, in my opinion, in no way unique to this period of construction or style of architecture.

[26] The addition of flashings to direct water and protect the upper surfaces of timber fascias and other elements can be simply added using folded metal which will substantially increase the life of these elements. Again, this is no different to the addition of flashings that may be required to be installed to stone and render details of earlier building typologies to prolong the life of these elements. In my opinion, a minor change of this type would not adversely affect the significance of the heritage place and would improve weathertightness and prolong the life of heritage fabric. As with other buildings subject to the Heritage Overlay, this can be readily addressed through establish approval pathways.

#### 2.4 Design intent and like-for-like replacement

[27] The honest expression of materiality or ‘truth to materials’ is an important aspect of the design of many postwar Modernist houses. This is, for instance, evident in the work of Alistair Knox who celebrated fired clay and mud brick and timber, expressing these honestly in his designs. While the physical expression and visibility of the materials are important, the fabric of these is less important. Bricks and glass are generally machine made, the windows were fabricated at the Stegbar or other similar factories, and the timber kiln dried, cut and dressed mechanically.

[28] Having said that, the permanent or irreversible obscuring of a material that formed an important part of the architectural expression of the house - such as the thick bagging/rendering of the face of the bricks at 27 Bolton Avenue, Hampton for instance – will have an adverse impact on significance even though the original brick wall cladding continues to exist under the applied cement finish.

[29] In my opinion, for Modernist buildings, it is therefore generally less important whether or not a particular timber board or window frame is authentic original fabric but rather:

1. will the material – face brickwork or stone cladding for instance - remain visible i.e. will it be rendered or otherwise obscured?; and
2. does the form and profile of the replacement material match the fabric to be replaced?; and
3. is the design intent of the architect still clearly legible?

In this respect, I consider there is frequently more opportunity for successful like-for-like replacement of early or original fabric in a postwar building than in earlier periods where the handmade joinery or craftsperson carved, rubbed or moulded decorative elements are key features of the heritage values of those places.

## 2.5 Environmental performance

[30] The insulation of new dwellings did not become a requirement until the 1996 Building Code of Australia (BCA) with minimum energy efficiency standards only being introduced in 2003. The substantial majority of houses built before this time, whether they are of a Modernist or traditional design do not meet the current NCC requirements in relation to energy efficiency. The upgrading of any dwelling built more than 30 years ago to meet current standards of environmental performance can be a complex exercise, regardless of whether it is of a Modernist-style design.

[31] It is well recognised that large expanses of single glazing exacerbate solar gain and heat loss (Callan, 2023; Macdonald, 1996) however there are slim-profile, sealed double glazed units (of as little as 16mm thick) that can be installed in relatively slender (34mm thick) timber frames<sup>2</sup> to improve environmental performance without loss of design integrity.

[32] It is my view that postwar Modernist houses are not inherently more difficult to retrofit in this way than any other residential building typology. In fact, Modernist buildings offer some benefits in environmental performance through their flat roofed form which provides a straightforward, and frequently secluded platform on which photovoltaic arrays can be installed with limited, or no, visual impact from public realm views.


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<sup>2</sup> <https://www.thermawood.com.au>


### 3 EXAMPLES OF SUCCESSFUL REPAIR, REFURBISHMENT AND UPGRADING OF POSTWAR MODERNIST HOUSES

- [33] There are numerous examples of successful repair, renovation and upgrading of postwar Modernist houses within the City of Bayside and elsewhere across Australia, including those documented recent survey *The New Modernist House: Mid-Century Homes Renewed for Contemporary Living* by Patricia Callan. These examples demonstrate that the conservation and adaption of postwar Modernists houses for contemporary standards of living is readily achievable. In fact, the free-flowing, open plan spaces inherent in the design of the Modernist houses, which has continued to influence the planning of houses, is frequently more conducive to twenty-first century living than the compartmentalised planning of nineteenth and early twentieth century houses.
- [34] The inclusion of a postwar Modernist house on the VHR or the Heritage Overlay does not prohibit the changes necessary to maintain repair, upgrade, refurbish or adapt these houses. Inclusion on the Heritage Overlay will not affect the ability for cyclical maintenance to occur or periodic like-for-like repair, both of which can be done without triggering a planning permit under Clause 43.01-1 of the Victoria Planning Provisions. Other, more substantial changes that might be required or desired by property owners to a postwar Modernist house would need to consider the heritage significance of the place and the heritage provisions of the Bayside Planning Scheme in the same way that any other listed property would, regardless of whether that be Victorian, Edwardian or interwar in origin.
- [35] Table 1 below includes a small selection of postwar Modernist properties either included in the VHR, the Heritage Overlay or are proposed to be included on the Heritage Overlay through Amendment C192bays that have been successfully refurbished and upgraded without loss of heritage value.

Table 1 Examples of listed Modernist houses that have been successfully upgraded

Case studies			
Name	Address	VHR / Heritage Overlay	Photograph
Kagan House (Anatol Kagan, 1953) (AKA 'Bell House')	12 Yarravale Road, Kew	Boroondara HO530 – Yarra Boulevard Precinct, Kew	 <i>Kennedy Nolan Architects</i>

<p>Ivanhoe East House (Hipwell, Weight &amp; Mason 1960) (AKA 'Leatarn')</p>	<p>413 The Boulevard, Ivanhoe East</p>	<p>Banyule HO177 – "Leatarn" – House, 413 The Boulevard, Ivanhoe East</p>	 <p><i>City of Banyule (Victorian Heritage Database)</i></p>
<p>Lipson House (Walters, Grodski &amp; Associates, 1969)</p>	<p>3 Exon Street, Brighton</p>	<p>Bayside Interim HO834</p>	 <p><i>GJM, April 2021</i></p>
<p>Baird House (John Baird, 1957)</p>	<p>15 Hume Street, Beaumaris</p>	<p>Bayside Interim HO808</p>	 <p><i>GJM, October 2021</i></p>
<p>Lind House (Anatol Kagan, 1954-55)</p>	<p>450 Dandenong Road, Caulfield North</p>	<p>VHR H2387</p>	 <p><i>Heritage Victoria, 2017 (VHD)</i></p>
<p>Snelleman House (Peter McIntyre, 1954)</p>	<p>40 Keam Street, Ivanhoe East</p>	<p>VHR H2282</p>	 <p><i>Heritage Victoria (VHD)</i></p>
<p>Heide II (David McGlashan, 1965)</p>	<p>7 Templestowe Road, Bulleen</p>	<p>VHR H1494</p>	 <p><i>Lovell Chen, 2014</i></p>

Robin Boyd House II (Robin Boyd, 1958)	290 Walsh Street, South Yarra	VHR H0879	 <p data-bbox="1077 492 1428 526"><i>Open House Melbourne</i></p>
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## 4 CONCLUSION

- [36] It is my view that, like any period of construction or architectural style, postwar Modernist houses display a common set of attributes or characteristics that create particular management issues. However, this is no different to any other period of listed building which will have common issues associated with its design and construction, such as the need for restumping due to timber piles set in earth, rising damp due to the absence of a damp proof course, brick/cracking repair due to low-fired nineteenth century bricks, or the need to periodically repoint soft lime-based mortars. These mechanisms of failure common to nineteenth and early twentieth century buildings have been and continue to be appropriately remediated on thousands of buildings currently on the Heritage Overlay.
- [37] Likewise, it is my opinion that postwar Modernist buildings do not pose any unique or particular repair, management or conservation issues that cannot or should not be dealt with through the usual planning permit process as it applies to listed buildings of the preceding two centuries.
- [38] It is my view that there is no evidence to support a claim that the condition, feasibility for like-for-like replacement, the durability and maintenance of design features and detailing and compliance with contemporary building codes may play out differently at a planning permit stage for Modernist buildings subject to Amendment C192bays compared to other buildings from other eras. Such a finding risks the protection of this important building typology in the future.