Australian Institute of Architects

# Independent Bushfire Inquiry

Submission to the Government of New South Wales

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## SUBMISSION BY

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## PURPOSE

- This submission is made by the Australian Institute of Architects (the Institute) to provide information on the response by the Institute and members to the 2019-20 bushfire season.

## INFORMATION

The Australian Institute of Architects (Institute) is the peak body for the architectural profession in Australia. It is an independent, national member organisation with around 12,500 members across Australia and overseas. More than 3,000 of these are based in New South Wales.

The Institute exists to advance the interests of members, their professional standards and contemporary practice, and expand and advocate the value of architects and architecture to the sustainable growth of our communities, economy and culture.

The Institute actively works to maintain and improve the quality of our built environment by promoting better, responsible and environmental design.

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## 1. INTRODUCTION

The Australian Institute of Architects (the Institute) is the peak body for the architectural profession in Australia, representing around 12,500 members, with over 3000 members residing in New South Wales. The Institute works to improve our built environment by promoting quality, responsible, sustainable design. Architecture influences all aspects of the built environment and brings together the arts, environmental awareness, sciences and technology. By combining creative design with technical knowledge, architects create the physical environment in which people live, which in turn, influences quality of life. Through its members, the Institute plays a major role in shaping Australia's future.

The Institute mobilised early to provide as much support to the architectural profession, and in turn the community, as possible during the 2019-20 bushfires which ravaged Australian communities over the Christmas and New Year period.

Across Australia, communities were also mobilising to provide assistance in every possible way to family, to friends and to complete strangers. The stories of kindness, compassion and generosity witnessed directly or seen in the media show the Australian spirit is strong, providing a source of hope for many who have faced an extremely dark and difficult time. The Institute would like to thank those dedicated volunteers and emergency services who worked tirelessly to battle the fires and give support to those in need.

In recognition of the scale and severity of these unprecedented events, the Institute attempted to provide both immediate support, together with subsequent relief projects and volunteering initiatives to facilitate the rebuilding of communities throughout 2020 and beyond. These activities are outlined in detail in Section 4.

This is not a short-term activity. The Institute is supporting and enabling the architectural profession to not only contribute to rebuilding what has been lost, but to build back better. In the medium to longer term, where and the way we live and organise our communities, and how and where we build our houses also play an important part in how we prepare and respond to bushfire threats in the future.

The Institute welcomes the opportunity to make a submission to the NSW Independent Bushfire Inquiry. The comments below relate to the response by the Institute and its members to the events of the 2019-20 bushfire season.

## 2. 2019-20 BUSHFIRE SEASON

The 2019–20 Australian bushfire season, started with a series of uncontrolled fires in June 2019, peaking during December–January with the fires burning more than 46 million acres of land including at least 80 percent of the Blue Mountains World Heritage area in NSW and 53 percent of the Gondwana world heritage rainforests in Queensland.[i]

Destroying over 5,900 buildings including 2,779 homes and killing at least 34 people[ii] the cost of dealing with the bushfires, before the outbreak of the Covid-19 crisis, was expected to exceed the A$4.4 billion of the 2009 Black Saturday Fires[iii] as tourism sector revenues fell more than A$1 billion.[iv]

More than a billion native animals including 800,000 in New South Wales have been estimated to have been killed[v], along with a large number of livestock including at least 100,000 sheep on Kangaroo Island alone[vi]. Hundreds of thousands of fish also died in the Macleay River in northern NSW because of the ash and sludge from the fires. [vii]

During the peak of the fires, air quality dropped to hazardous levels[viii] and by 7 January 2020, the smoke had moved approximately 11,000 kilometres across the South Pacific Ocean to Chile and Argentina.[ix] NASA has estimated that 306 million tonnes (337 million short tons) of CO2 were emitted during the bushfires, which is over half of Australia's annual carbon emissions[x].

## 3. REBUILDING WHAT HAS BEEN LOST

The physical destruction accompanying disasters, including the 2019-20 bushfires, typically creates an urgency to rebuild damaged communities and help survivors get their lives back on track. There are many inspiring examples of how architects, planners and other built environment professionals have contributed to rebuilding.

In many cases their efforts have facilitated the re-establishment of eroded communities and created a sense that the worst was over and things are getting better. Post-disaster recovery and reconstruction also presents an opportunity to reduce vulnerability to future disasters and to build community resilience in physical, social, environmental and economic terms.

We note *SGS Economics & Planning* research that suggests that Australia-wide, some 2.2 million people live in high or extreme bushfire risk areas.[xi] This suggests a fundamental legacy issue of up to one million existing houses in bushfire prone areas currently with little or no bushfire protection. This must be addressed.

Professor Helen Lochhead, the current National President of the Institute and Dean of the Faculty of Built Environment at the University of New South Wales Sydney, commented widely in the Australia media on the need for sensible, thoughtful design to ensure appropriate reconstruction, for the longer term.[xii]

Key issues highlighted by Professor Lochhead included that it is possible to rebuild in bushfire affected zones so long as the designs are well located and compliant with the Australian Standard AS3959 Construction of buildings in bushfire-prone areas, and use best practice planning principles.

In the majority of cases, it is possible to design much better, more fire resistant, more sustainable and climate responsive houses, than what was there before. For this reason, rebuilding should begin only after the site is assessed and confirmed as being suitable for reconstruction, and time is taken to ensure that the best possible design solution can be reached.

### 3.1 Construction in bushfire prone areas (AS 3959 – 2018)

Feedback from our membership has indicated particular problems in trying to apply Australian Standard (AS) *AS 3959-2018: Construction of Buildings in Bushfire-prone areas* when upgrading existing properties – as the AS 3959 Standard pre-supposes new construction. When dealing with existing buildings within bushfire prone areas. The vast majority of existing construction cannot meet the exacting AS 3959 requirements physically and/or at any cost and we note the AAMI insurance industry suggestion of additional building costs for Bushfire Attack Level BAL-40 and Flame Zone BAL-FZ construction requirements may be $100,000's. [xiii]

This issue is particularly evident in NSW where the Environmental Planning and Assessment Regulation 2000 (the EP&A Regulation) require a complete house bushfire upgrade if adding 50 percent or more to building plan area/volume. Due to the extent of 'non-conforming' materials and products, upgrading may not be possible. The undesirable consequence may be demolition and complete rebuilding for a marginally safer home (compliant to *AS 3959-2018*); abandonment of any upgrading at all; or on-selling to a new and un-suspecting buyer. Anecdotally, we also know of 'informal' bushfire upgrades that are undertaken in such a way to avoid any approach to approval authorities. Alterations and/or additions have become especially problematic in terms of meeting bushfire regulations. This is an area that requires a detailed regulatory review.

### 3.2 Bushfire water spray systems (AS 5414 – 2012)

In part, the answer to the bushfire upgrading regulations and costs should lie in a wider application and acceptance of an upgraded edition of *AS 5414-2012: Bushfire water spray systems* in dealing with bushfire prone properties more generally. Sprinkler systems have been utilised for a nearly a century to reduce fire risk in commercial buildings – including external protection of glazing near boundaries or adjacent buildings.

Anecdotal evidence from the recent bushfires suggested that twelve Nerrigundah (NSW) residents were saved at the Rural Fire Service RFS 'tin shed' by a roof-top water spray system. [xiv] However the current version of AS 5414-2014 is highly limited in utility as it states that water spray systems are only suitable up to Bushfire Attack Level BAL-19. The Institute believes that there is widespread potential for enhanced bushfire safety to be delivered through water spray systems and to much higher BAL levels, bringing many 'non-conforming' buildings in line at a fraction of the cost and difficulties seen when attempting to deliver upgrades that meet *AS3959-2018: Construction of Buildings in Bushfire-prone areas*.

We would like to highlight the recent PhD research evidence from Dr Alan Green at the Sustainable Building Research Centre, University of Wollongong (2019). Dr Green has been leading work focused on the analysis of external water spray systems designed to protect buildings from bushfires. Experiments have been undertaken to reveal the detailed behaviour of water sprays and the effects of wind on system performance. Computational fluid dynamics simulations are also being used to improve the understanding of how well these spray systems perform and where they can be usefully deployed.[xii]

New research like that undertaken by Dr Green, along with evidence collected following the 2019-20 Bushfire season must result in a technical revision of the relevant Australian Standards currently in operation. This should include a reassessment of the regulatory and practical benefits of installing water spray systems (including removing the regulatory limitation around BAL-19).

### 3.3 Australian Building Codes Board Guidelines: private bushfire shelters

Professor Lochhead has expressed highlighted that remote locations with a single access approach, surrounded by bush and without any support infrastructure or any potential for a fire break, should be considered unsuitable for reconstruction and seen as inherently vulnerable.

For the many existing properties in these circumstances, consideration must be given to updating the Australian Building Codes Board (ABCB) *Performance Standard Guideline: Private Bushfire Shelters (2014*). This document requires design by a certified Fire Engineer - to the criteria established in the *Guidelines* - and then review and acceptance by another such professional before submission for approval. This double certification is a major disincentive and has resulted in a lack of 'pre-approved' bushfire shelters available for purchase and installation. Another associated issue is that in NSW a 'private' shelter is only applicable to Class 1a dwellings, whereas Victoria permits up to 12 persons in a Class 1b structure.

### 3.4 Other bushfire safety factors

More effective solutions may require people working together, and where a settlement has been affected, communities can and should be part of the future planning and decision-making process, so investment and reconstruction benefit the broader community. For example, it may be possible to build back safer community infrastructure and put in fire breaks in public spaces to protect housing against fire travel in the future.

Key considerations for rebuilding, which architectural design can support, include ensuring adequate clearing around the house, self-cleaning gutters, fire resistant decking on verandahs, enclosed underside of buildings to prevent embers getting trapped underneath the floor, and adequate stored water, whether tanks, pools, ponds or dams in more isolated areas to fight fires if they do occur.

The use of fire-resistant materials such as masonry, brickwork or rammed earth, and concrete should also be considered, with combustible materials deliberately limited.

Observing that these design considerations are more sustainable and cost effective in the long term, resilient buildings are not beyond the reach of the average person. Rather they are designed sensibly, sustainably and for the longer term, and acknowledge the climate and environment in which we live.

## 4. INSTITUTE RESPONSE TO THE 2019-20 BUSHFIRE SEASON

The Institute immediately provided full unrestricted access to a wide range of relevant Acumen practice notes providing a resource base covering information on building in bushfire prone zones and on the provision of pro bono services.

We moved quickly to develop a series of online education and continuing professional development resources. Fires and other natural disasters affect more and more areas across Australia with increasing frequency and intensity.

Accordingly, it is not just a subset of architects such as those who are practicing in rural and regional areas who need to be upskilled. The Institute is motivated to ensure that communities that need expertly equipped professionals such as architects to help them build back better have access to that expertise.

The Institute has also positioned itself to leverage the skills of members to provide pro bono architectural services for bushfire affected homeowners – Architects Assist - and as a complementary program have launched a Foundation to supporting post-fire design and rebuild programs across Australia over the longer term.

Key details of these initiatives are outlined below and all resources mentioned can be accessed at: www.architecture.com.au/about/national-bushfire-response/

### 4.1 Architects educate: Acumen practice notes

A range of Acumen practice notes have been made freely available, rather than only available for members of the Institute. Two key practice notes include:

- ***Designing to heal: post-disaster rebuilding to assist community recovery***

  Increasing the chances that recovery projects will resonate with the community requires getting the process and the product of design right. This resource outlines the relevance and significance of disasters and post-disaster recovery and highlights the need of designers to harness community skills, emphasises survivor participation in the planning and realisation of their post-disaster environment, and suggests some characteristics of design that may smooth the path to recovery.

- ***Development in bushfire prone areas***

  Bushfire has long been a part of Australian landscape however there are now new levels of bushfire frequency, severity and unpredictability across much of Australia – and indeed globally – requiring a greater regulatory response. The previous bushfire season pattern is no more, with record heat and drying creating extreme fire weather patterns.

  The risk is spreading from the rural and urban-bushland interface, across more of the landscape and into towns and cities. This resource provides an overview of bushfire attack, the Fire Danger Index, the regulatory framework plus outlines regulatory and development concerns currently applicable at the state and territory level.

### 4.2 Architects educate: continuing professional development

The Institute has developed a suite of online education and professional development training to prepare and support architects and built environment professionals to contribute successfully to disaster recovery. This training will be available free of charge via the Institute website until late May 2020.

Two themes have been covered. The first “Building back better” uses case studies and a wide range of expert presenters to explore ecology, impact, design, planning, building, and rebuilding after a bushfire. The second theme covers interacting with clients and community after trauma and addresses interpersonal communication and process management between architects and clients after traumatic events. Key details of the training include:

- ***Building back better***

  The three seminars that make up this training pack include (1) Bushfire – Ecology and Impact, (2) Bushfire – Design and (3) Bushfire – Planning, Building, Rebuilding, Landscaping, Codes and Australian Standards. Over 350 architects, other design professionals (interior architecture and landscape architecture) and members of the public registered to attend the training, with each seminar filmed to create the online resource.

- ***Interacting with clients and community after trauma***

  While this training forms a critical part of the response by the Institute to the 2019/20 bushfires it is also applicable to other situations, disasters or extreme events causing trauma.

  As noted above this training seeks to address interpersonal communication and process management between architect and client after a traumatic event and explores how disasters disrupt many aspects of community life. The potential role of architects in helping communities recover after disasters and how this differs from normal circumstances is also covered.

### 4.3 Architects Assist: http://architectsassist.com.au/

As the 2019 bushfires claimed first homes, architecture and design practices began responding with offers of assistance to those who has lost everything and did not have sufficient means to start rebuilding their lives and livelihoods. However, with the growing scale of the disaster, it soon became obvious that the resources of individual firms would not be enough to assist all those requiring help.

Architects Assist (AA) was established by Jiri Lev on 4 January 2020 as an initiative of the Australian Institute of Architects. By February, it represented a coordinated effort of over 550 architecture firms from across Australia, dedicating their resources to pro bono work, with additional 1500 students and graduates of architecture also registering to assist. In late February 2020, AA also began to integrate professionals from related fields across the built environment industry, such as landscape architects and planners.

AA acts as a referral service between potential clients – bushfire affected homeowners and businesses - and registered architects. AA does not provide architectural services. AA will seek to encourage built outcomes that are: architecturally considered, owner-builder friendly, resilient in natural disasters, built with sustainable materials, compact and spatially efficient and affordable.

### 4.4 Architects Donate: supporting post-fire design and rebuild programs across Australia

The “Architects Donate” Foundation aims to draw donations from Institute members to support rebuilding efforts following the bushfires. Architects Donate seeks to drive financial support from the 12,500 Institute members and their communities and is designed to allow all members and colleagues to play their part. Staff of the Institute have also been encouraged to donate a day’s pay to the Foundation.

100% of the funds donated will be used to directly support rebuilding efforts following disasters and will be aimed at Australian communities most in need. All donations above $2 are tax-deductible.

i https://www.theguardian.com/environment/2020/jan/17/its-heart-wrenching-80-of-blue-mountains-and-50-of-gondwana-rainforests-burn-in-bushfires
ii https://www.sbs.com.au/news/the-numbers-behind-australia-s-catastrophic-bushfire-season
iii https://www.theguardian.com/australia-news/2020/jan/08/economic-impact-of-australias-bushfires-set-to-exceed-44bn-cost-of-black-saturday
iv https://www.reuters.com/article/us-australia-bushfires-idUSKBN1ZF027
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vii https://www.theguardian.com/world/2020/jan/17/hundreds-of-thousands-of-fish-dead-in-nsw-as-bushfire-ash-washed-into-river
viii https://www.msn.com/en-us/lifestyle/lifestyle-buzz/how-the-australian-bushfires-will-impact-health/ar-BBZ4Jgl
ix https://www.sbs.com.au/news/dateline/australia-bushfire-smoke-travels-12-000-kms-to-chile https://www.theguardian.com/australia-news/2020/jan/07/australian-bushfire-smoke-drifts-to-south-america-un-reports
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xi https://www.sgep.com.au/publications/insights/the-growing-risk-from-natural-perils
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xiii AAMI 2016, 'Check that your home is properly covered in the event of a bushfire', https://www.aami.com.au/home-insurance/bushfireprevention.html
xiv https://www.abc.net.au/news/2020-01-14/nerrigundah-fire-town-will-rebuild-after-bushfire-crisis/11863354
xii https://www.bnhcrc.com.au/research/phd-sprinklersystems