

Fire Safety Engineering

Regulation, Control
and Accreditation
Report



THE
WARREN
CENTRE

ACKNOWLEDGEMENTS

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The Warren Centre team hosted 141 attendees at Fire Safety Engineering seminar on 5 Feb 2019.



ABOUT THE WARREN CENTRE

The Warren Centre brings industry, government and academia together to create thought leadership in engineering, technology, and innovation. We constantly challenge economic, legal, environmental, social and political paradigms to open possibilities for innovation and technology and build a better future.

The Warren Centre advocates for the importance of science, technology and innovation. Our 30 years' experience of leading the conversation through projects, promotion, and independent advice drives Australian entrepreneurship and economic growth.

The Warren Centre promotes excellence in innovation through delivering collaborative projects, supporting and recognising innovators across the profession, and providing independent advice to government and industry.

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FIRE SAFETY ENGINEERING PROJECT

This is the second research project of The Warren Centre at the University of Sydney relating to Fire Safety Engineering. The first project in 1989 paved the way for the creation of the Fire Code Reform Centre to co-ordinate fire research nationally in 1994 and gave major impetus to the development of the performance-based Building Code of Australia, published in 1996. This current Warren Centre Project on fire safety engineering will address many of the major challenges facing governments, regulatory authorities and practitioners in relation to fire safety engineering and community safety in buildings.

This is the second report issued in this current series. The report *Current Status of Education, Training and Stated Competencies*, the "Education Report", issued in January 2019.





THE STATE OF FSE REGULATION, CONTROL AND ACCREDITATION IN AUSTRALIA

The Warren Centre presents this second milestone in our Fire Safety Engineering (FSE) Project. The Education Report, the first report issued in this series of original research efforts, systematically evaluated the accreditation of professional engineers, model educational curricula, current accreditation processes and an overview of numerous domestic and international university education programs.

The recent cracking incident at the Sydney Opal Tower in December 2018 and the Neo200 fire at Spencer Street, Melbourne in February 2019 demonstrate serious failures that must be addressed. We hope this research drives the changes needed to improve confidence and performance in the industry.

Given disturbing similarity of the Neo 200 fire, the earlier Lacrosse Building fire, the Grenfell Tower fire in London and other similar global fires, it would be easy to draw the conclusion that the whole performance-based regulatory regime is completely broken and that the sector is producing few high-quality buildings. On the other hand, the demonstration of the full design flexibility, aesthetics, functionality and safety afforded by the performance-based Building Code of Australia is displayed through buildings and structures such as Eureka Tower, Barangaroo, 1 Bligh Street, Adelaide Cricket Ground New Stand, and the Macquarie Bank building in Sydney.

Nevertheless, clearly problems continue to emerge in relation to design, choice of materials, façade design, poor installation, lack of proper inspections and other aspects which shake the confidence of buildings owners and occupants.

While Governments and the Building Ministers Forum continue to struggle to find a way to respond to the façade issues and the Shergold/Weir Building Confidence recommendations, the Warren Centre



for Advanced Engineering continues this industry-initiated effort to define the required performance of fire safety engineers (FSEs) and to lift practice to full and proper professionalisation. This project is focused on the role, regulation, competence, education and accreditation of fire safety engineers. It recognises that while fire safety engineers take the lead on developing fire safety strategies and fire safety designs of buildings, they are but one of the players in the whole design, construction and maintenance life cycle of buildings.

We cannot complete the vital research tasks and communication outreach ahead without further funding to produce evidence-based interim research, to make final recommendations and to drive those recommendations to adoption. Further work needs sponsorship and funding.

If this work is important to you and your organisation, please join us to deliver this vital research undertaking. Contact us to discuss sponsorship at warrenc@sydney.edu.au

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Executive Summary



THIS REPORT AND THE RESEARCH UNDERTAKEN HAS FOCUSED ON THE CURRENT STATUTORY CONTROLS PLACED ON THE PRACTICE OF FIRE SAFETY ENGINEERING IN AUSTRALIA AS A RESULT OF RELEVANT LEGISLATION AND OTHER CONTROLS RELATED TO BUILDINGS, INCLUDING VOLUNTARY INDUSTRY ACCREDITATION SCHEMES SUCH AS THE NATIONAL ENGINEERING REGISTER (NER).

A key issue which follows is the extent to which these controls support or inhibit the use of performance-based fire safety engineering in building design and construction yielding consistent and sound fire safety outcomes and an efficient and effective building industry in Australia.

The research surveyed and investigated each of the eight states and territories in Australia to answer key questions related to the controls on fire safety engineering practice. This report provides the answers to each of the questions asked for each state and territory with references that detail the legislative, regulatory or other documents in which further features can be found.

Table 1 shows that there is absolutely no national consistency in the approach to regulation and controls over fire safety engineering practice in Australia. Only NSW,

Queensland, Victoria and Tasmania have any form of legislative or regulatory controls in place, and they vary significantly from state to state in terminology, processes and procedures.

Only Queensland and Tasmania have licence provisions for fire safety engineers, which means other persons who are not licensed may not undertake fire safety engineering and can be subject to penalties.

Only NSW has any legislative requirement to undertake any mandatory construction site inspections and provide a report to the certifier. Only in three states, namely Victoria, Queensland and NSW, is there a mandatory regulatory requirement to consult with the Fire Brigade on certain matters, although in some other jurisdictions it is done on a voluntary basis.



Construction verification is a critical element in the final delivered quality of a modern building.

These findings of national inconsistency and widespread lack of controls over fire safety engineering practice appear to cast doubts on the quality of performance-based fire safety engineering.

In the ACT, NT, SA and WA, there are no registration or accreditation schemes to identify fire safety engineers or to demonstrate their competency through relevant qualifications or experience.

Given the lack of controls over the practice of fire safety engineering in several states and territories, it follows that there is a lack of audit and enforcement of fire safety engineers and their performance. Thus, there are no requirements or standards against which to judge performance and competency.

These findings of national inconsistency and widespread lack of controls over fire safety engineering practice appear to cast doubts on the quality of performance-based fire safety engineering. Such doubts could potentially erode market confidence in the use of performance-based fire safety engineering and certainly threaten the likelihood of consistently sound fire safety outcomes for the Australian communities where competency and professional performance in practice are not regulated.

The development of a national model set of regulatory controls for fire safety engineering, including design fire safety engineers, peer reviewers, authority approval of Performance Solutions, and fire brigade officials reviewing designs, needs to be developed and implemented across all Australian jurisdictions as soon as possible. It should be based on best practice and aim to achieve national consistency.

1. Introduction

1.1. TASK BRIEF

This project reviewed the current requirements or controls (if any) over practitioners who are employed or engaged in the building (and related) industries in the practice of fire safety engineering. A discussion of what is fire safety engineering and some historical background to the evolution of fire safety engineering in Australia are included in Section 2.

It is not the purpose of this report to recommend new or amended legislation or policy change, as those outcomes will be covered in future Warren Centre reports.

As fire safety engineering currently relates primarily to the building industry, and therefore government regulations intended to control that industry, the performance-based National Construction Code¹ (BCA) and related Australian Standards apply as the dominant design and compliance standard. A generic description of the common themes of all jurisdictions for building control is shown in Figure 1.

A discussion of fire safety engineering, its relationship to the BCA, and related

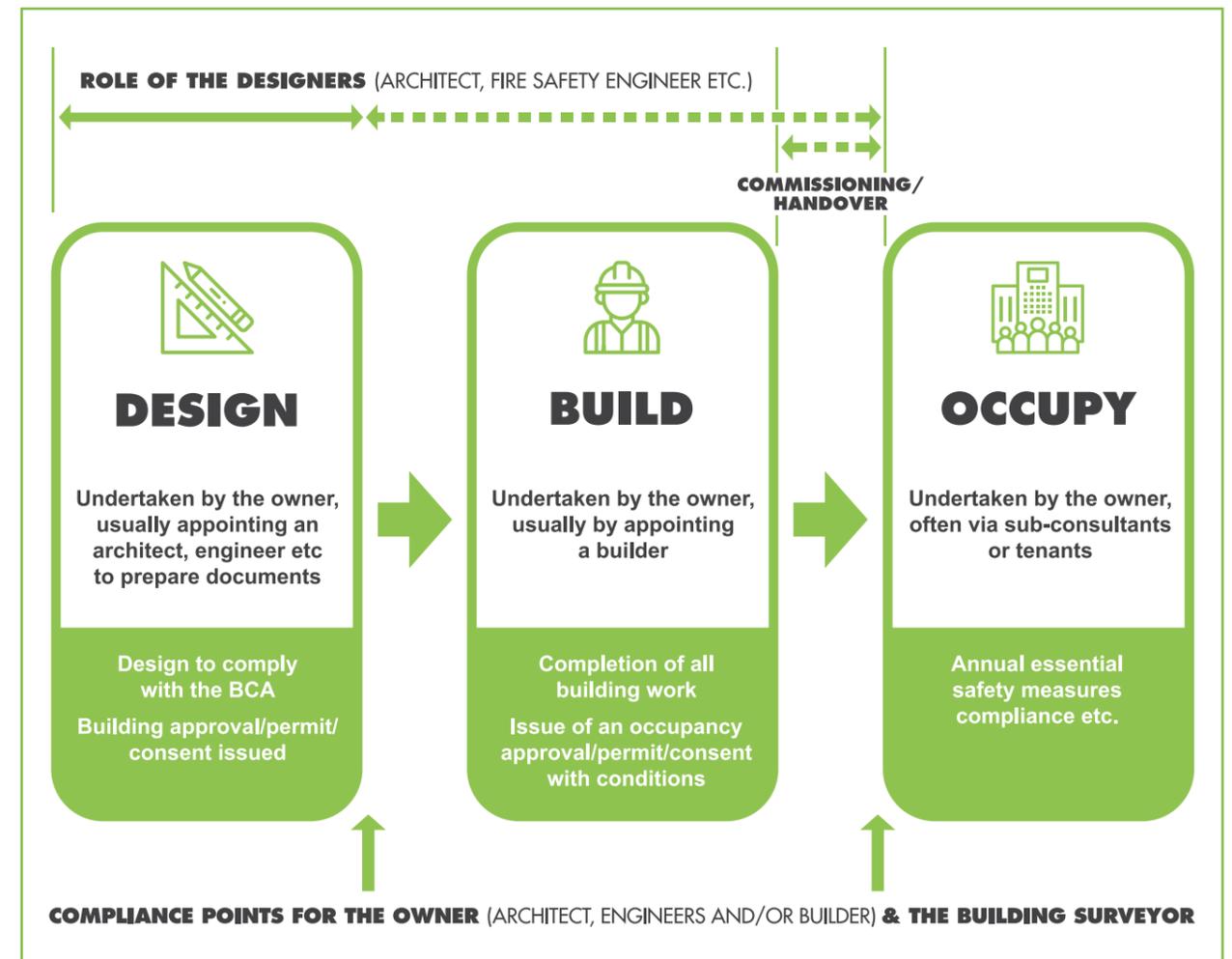


Figure 1: The three phases of the building process under building control legislation across Australia.

¹ The National Construction Code Series contains the Building Code of Australia Volume One, Volume Two, and the Plumbing Code of Australia. Whilst the concepts and themes in this report are transferable across all three volumes of the NCC, this report primarily relates to the Building Code of Australia, and the term 'BCA' is therefore used throughout.

administrative mechanisms is included in Section 3.

The task brief was as follows:

“What are the current key Fire Safety Engineering (FSE) regulatory and control provisions (building and planning) in each of the major Australian states and territories for;

- (a) A design fire safety engineer, or*
- (b) A peer review fire safety engineer?*

To what extent do these provisions and their application support or inhibit the use

of performance-based FSE and sound fire safety outcomes?

What is the current approach to the accreditation of FSE practitioners in each state and territory?

What type or level of FSE accreditation is required of those approving FSE designs?

What role does proper audit or enforcement of FSEs and other practitioners play in ensuring the Australian community get the full benefits of the performance based fire safety design?”

Fire Safety Engineering is the application of science and engineering principles to protect people and their environments from the destructive effects of fire and smoke.



1.2. CONSUMER PROTECTION AND INSURANCE

Government controls on practice of individuals or companies are typically derived from a need to protect consumers from financial loss (for example builders, motor vehicle sales and painters registration schemes) or to maintain public safety (for example plumbers, electricians, teachers and nurses).

Whether insurance is available, or required, will depend on the reason for governmental control. For example, typically if builders are controlled then they carry insurance for bankruptcy or incapacity to complete the work, whereas architects and engineers carry insurance for professional indemnity (i.e. a failure to act professionally).

It is not the purpose of this report to confirm the reasons for governmental control of fire safety engineers, and it is possible that a case for control for both consumer protection (professional indemnity) and community safety (minimum competencies and experience) is required. Where community safety is the core goal, insurance has little value or will not be available as insurers do not typically provide insurance for public safety. As this issue is primarily one of government policy and market forces, it will not be discussed further.

1.3. DEFINITIONS

Part of the challenge for reporting on the state of fire safety engineering is a lack of agreed definitions and terms both nationally

and internationally. This has been highlighted in Recommendation 22 of the recent federal government *Building Confidence* report² which stated:

“Each jurisdiction has developed different ways of describing the same or similar terms or processes. This is not just a semantic issue. Different terminology makes it very confusing to understand and compare the legal requirements in each jurisdiction. It also makes it difficult for industry to operate across jurisdictions and for jurisdictions to understand each other’s systems when working together at a national level.”

It was therefore required to develop a glossary of terms, and those are included in Appendix A.

1.4. OTHER PRACTITIONERS

Within the building industry in Australia are many practitioners who prepare and document designs or install or certify fire safety systems that satisfy the Deemed-to-Satisfy (DtS) Provisions of the BCA, relevant Australian Standards or other prescriptive standards.³ Whilst these practitioners perform an important role, they not considered to be practicing fire safety engineering for the purposes of this report and are not discussed further.

² Peter Shergold and Bronwyn Weir. Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia, February 2018. https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf.

³ See also Schedule 2 (Dictionary) and the definition of “prescriptive standard” in the *Professional Engineers Act 2002 (QLD)*.

2. Background to Fire Safety Engineering

2.1. WHAT IS FIRE SAFETY ENGINEERING?

Fire Safety Engineering (FSE) is a relatively recent term, having been in common use for only a few decades. In broad terms, it is the application of science and engineering principles to protect people and their environments from the destructive effects of fire and smoke.⁴ In Australia, engineers and other designers have always considered the impact of fire; however this has mostly been within a prescriptive regulatory scheme, with legislatively defined technical requirements and standards.

FSE in Australia evolved out of the regulatory reform agenda of the late 1980s when designers and regulators started seriously questioning the economic efficiency of prescriptive building codes.^{5,6} The Engineers Australia definition of FSE includes that the practice of sound fire safety engineering should:

“achieve reductions of risk for life, property and environmental damage and the implementation of cost-effective fire safety codes and regulations.”⁷

FSE is still in its infancy as an engineering discipline with substantial effort still required to refine competencies, courses, professional practices and other key matters. The term “Fire Safety Engineering” is also known as “Fire Protection Engineering” (mostly in the

U.S.) and is becoming shortened in general industry language to “Fire Engineering”. It has been said that it is impossible to engineer fires, and therefore this report will describe Fire Safety Engineering (i.e. the engineering of fire ‘safety’) as it is a clearer and more accurate term.

2.2. EVOLUTION

The earliest Australian experience with Fire Safety Engineering as a regulatory reform tool can be traced back to the mid 1980s when designers and regulators started seriously questioning the economic efficiency of building codes. In the late 1980s the Australian building industry was caught up in the worldwide impact and application of economic rationalism and micro-economic reform.⁸ The Building Regulation Review Task Force (BRRTF)⁹ was established by the 1989 Special Premiers’ Conference to review technical regulations, codes, standards and other requirements affecting the construction and operation of buildings. Its terms of reference were to recommend procedural reforms which could lead to improved efficiency and reduced cost within the building industry. With estimates of the cost of over-regulation in Australia at that

⁴ Brian J. Meacham, “Fire safety engineering at a crossroad”, Case Studies in Fire Safety, Volume 1, March 2014, pp 8-12, <https://doi.org/10.1016/j.csfs.2013.11.001>.

⁵ Australian Uniform Building Regulations Co-ordinating Council, (1984), *Development of the Australian Model Uniform Building Code*.

⁶ Building Regulation Review Task Force, (Nov 1991), *Micro economic reform: Final Report*.

⁷ See <https://www.engineersaustralia.org.au/Communities-And-Groups/Technical-Societies/Society-Of-Fire-Safety>

⁸ See <http://www.rossgittins.com/2007/09/microeconomic-reform.html>.

⁹ Building Regulation Review Task Force, (May 1991), *Micro economic reform: Fire Regulations*.

It was generally accepted within the building industry and the community that the control of buildings, design, and construction was necessary.

time of at least \$250 million per year,¹⁰ the report made the following comments:

“The existing regulatory system, taken as a whole, greatly inhibits the ability of the industry to efficiently and effectively deliver the products required by industry and consumers....”

Numerous governmental and industry reports^{11,12,13,14} as well as anecdotal and case specific evidence from within the building industry had highlighted the need for reform of building (and planning) controls. There was however no strong evidence to suggest that the building industry should be uncontrolled. It was generally accepted within the building industry and the community that the control of buildings, design, and construction was necessary. For example, the Australian Uniform Building Regulations Co-ordinating Council (which subsequently became the Australian Building Codes Board) objectives at that time were to ensure the Australian Model Uniform Building Code (which became the BCA) was based on a least cost solution and that:

“c) its provisions are assessed on economic grounds designed to ensure that the standards required in building construction carry benefits commensurate with their cost; and

d) its provisions are confined to essential matters of public and consumer protection such as health, safety and amenity.”

Further reports from both the Building Regulation Review Task Force and the Warren Centre highlighted that the cost of over-regulation in the area of fire safety imposed a significant economic burden on society. A significant proportion of the ongoing research into fire regulation reform at that time was undertaken by leading academics and researchers dedicated to creating a more engineering or technical based method of assessment for incorporation into regulations. However, funding was also significantly supported because the policy (political) end of reduced cost was likely to be the outcome. The ABCB in its economic rationale for the draft performance Building Code of Australia 1996¹⁵ stated:

“The objective of this proposal (the BCA) is to provide the community with a building code which sets an acceptable level of public health, safety and amenity but is flexible and performance oriented in its approach.... Innovative products which satisfy the Performance Requirements for health, safety and amenity but with lower resource costs represent a saving to society.”

¹⁰ Building Regulation Review Task Force, (Nov 1991), Micro economic reform: Final Report, p 1.

¹¹ Australian Uniform Building Regulations Co-ordinating Council, (1984), *Development of the Australian Model Uniform Building Code*.

¹² Building Regulation Review Task Force, (Nov 1991), Micro economic reform: Final Report.

¹³ Warren Centre for Advanced Engineering (University of Sydney), (1989), *Fire Safety and Engineering Project Report*.

¹⁴ Building and Development Approvals Committee. Report on the building and development control system in Victoria. Part 1: Building Controls 1977, Part 2: Planning Controls, 1979.

¹⁵ Australian Building Codes Board, (1996), Economic rationale for the draft Building Code of Australia.



University of Sydney, Charles Perkins Centre is an example of Performance-Based fire safety engineering. Photo courtesy of Arup.

However, a review of the New Zealand system by the Australian Fire Authorities Council¹⁶ stated:

“One of the original reform incentives was predicated on the basis of considerable cost saving to the community, however the issue of monetary savings was subsequently removed as a catalyst for building reform. Cost benefits from individual case studies are very difficult

to quantify and some apparent cost savings are simply transfers of cost from one party to another. The proposed reform of building control in New Zealand was not claimed to reduce the costs of any particular building project. While a reduction of building cost is desirable, it is a potential outcome rather than a primary objective of building control reform.”

¹⁶ Kurban N., (1995), New Zealand Study: The implementation and application of performance based regulations in New Zealand and its adoption in Australia, Australian Fire Authorities Council.



Fire sprinklers are an essential element in today's multistorey buildings.

Thus, a significant underlying reason for building (fire safety) reform was a reduced cost objective. Australia's building regulations of this time were acknowledged as providing an extremely high level of life safety to building users and occupants but were however also acknowledged as being incomplete, inefficient, inconsistent and unduly expensive.¹⁷ Statistical evidence analysed during the 1980s shows the number of deaths caused by fires in buildings in Australia at about four fatalities per million population per year.¹⁸ This was approximately half the total number of deaths from all fires and about 1.5% of all recorded accidental deaths and compared more than favourably with rates of 22 and 15 people per million per year for the United States of America and the United Kingdom respectively. In addition to this, about 70% of deaths occurred in residential properties where no specific fire safety regulations were imposed.

The overall level of building fire safety therefore exceeded most other developed countries and was consequently considered to incur substantial cost to the community, relative to our economic status in the world. Both the AUBRCC (now ABCB) and the BRRTF recognised this and recommended development of a National Fire Safety Code (NFSC) to better quantify risk and provide for economic levels of people safety, whilst maintaining current standards. In 1989 the

University of Sydney, through its Warren Centre for Advanced Engineering, completed and published their fire safety and engineering project report which dealt with quantifying the risk of fire in buildings and purpose designing systems to reduce these risks to acceptable levels. The report recommended, among other things, that:

“Current levels of fire safety in Australia be maintained

*Design for fire safety be treated as an engineering responsibility rather than a matter for detailed regulatory control”.*¹⁹

The BRRTF was aware of the work being done at the Warren Centre and in November 1989 held a forum on building fire safety to discuss the systematic risk assessment approach being developed by the Warren Centre. This led to Dr Vaughan Beck (as leader of the Warren Centre team) being requested to prepare an outline specification for development of a national technologically advanced fire safety systems code for Australia. The first draft of this code (the National Buildings Fire Safety Systems Code) was released in May 1991 by the BRRTF,²⁰ and the second version, the Fire Safety Engineering Guidelines (published by the Fire Code Reform Centre), were released in April 1996.

Statistical evidence analysed during the 1980s shows the number of deaths caused by fires in buildings in Australia at about four fatalities per million population per year.

¹⁷ Building Regulation Review Task Force (Nov 1991), Micro economic reform: Final Report.

¹⁸ Warren Centre (University of Sydney), (1989), Fire Safety and Engineering Project Report, p.6.

¹⁹ Warren Centre (University of Sydney), (1989), Fire Safety and Engineering Project Report, p 19.

²⁰ Building Regulation Review Task Force, (May 1991), Micro economic reform: Fire Regulations, Appendix A.

3. Fire Safety Engineering and the BCA

3.1. THE BUILDING CODE OF AUSTRALIA (BCA)

The Building Code of Australia 1990, a predominantly prescriptive document, was re-written by the newly formed Australian Building Codes Board (ABCB) from 1994 to 1996. It incorporated a qualitative performance-based compliance approach. The qualitative performance-based BCA'96 was then released in late 1996 (and adopted by most Australian states and territories by the end of 1997).

The BCA allowed engineers for the first time to design solutions (called 'alternative solutions' under the BCA and now called 'Performance

Solutions') to be a more flexible, innovative, efficient and effective solution for compliance with the Performance Requirements of the BCA. The BCA did not include specific measurable (quantitative) acceptance criteria, and the ongoing issue of designing to a qualitative BCA has raised questions as to what is 'engineering design', what is 'expert judgement', and what are appropriate engineering qualifications for this new specialised area of practice. There is continuing discussion and debate within and outside of the engineering community about the development of Fire Safety Engineering.²¹



Chadstone Shopping Centre. Photo courtesy of Arup.

²¹ Stephen Kip, "A report card on Fire Safety Engineering in the Australian building industry – Has it achieved its objectives and where is it heading?", paper presented at the Engineers Australia Society of Fire Safety FSE 2004 International Conference in Sydney, Australia, 2004.

3.2. ROLE OF INTERNATIONAL FIRE SAFETY ENGINEERING GUIDELINES

The International Fire Safety Engineering Guidelines (IFEG) were published by the Australian Building Codes Board (ABCB), who also publish the BCA, as a collaborative venture among the National Research Council of Canada (NRC); International Code Council (ICC) United States of America; Department of Building and Housing New Zealand (DBH); and the ABCB. The IFEG describes that the following organisations have endorsed the Australian parts of the document as describing an appropriate process for design and approval of fire safety in buildings by competent practitioners:²²

“The Australian members of the Australasian Fire Authorities Council (AFAC), The Australian Institute of Building Surveyors (AIBS),

The Institution of Engineers Australia (IEAust), and

The Society of Fire Safety.

The Insurance Council of Australia (ICA) states it also supports the aims of the document”.



The IFEG therefore represents the current ‘state of the art’ methodology and technical resources for FSE in Australia although as a ‘guideline’ document it is not adopted in legislation in any Australian jurisdiction. The Guide to the BCA²³ and some relevant state or territory documents such as Victorian Practice Note 29-2018²⁴ also include reference to use of the IFEG to establish compliance with the BCA, and therefore any practitioner who did not consider using the IFEG would need to have a reason why not, in order to satisfy their professional duty of care obligations.

In 1994, Engineers Australia established the Society of Fire Safety (SFS) to foster excellence in fire safety in Australia.

²² International Fire Engineering Guidelines, 2005, extracted from page 4 (before the foreword).

²³ Australian Building Codes Board, ‘Guide to the BCA’, the guide to clause A0.8 of the BCA.

²⁴ See http://www.vba.vic.gov.au/__data/assets/pdf_file/0014/21083/PN-29-2018-Using-Vol-One-and-Two-of-the-National-Construction-Code.pdf, first issued 1997.

Accreditation is a necessary step to ensure the competence and integrity of fire safety engineering practitioners.

The IFEG discusses in detail, in several locations, the design process, undertaken by Fire Safety Engineers and specifically states in Section 0.4.2;

“Accreditation is a necessary step to ensure the competence and integrity of fire safety engineering practitioners. This is particularly important because fire safety engineering is a relatively new discipline. In Australia, there are a number of accreditation schemes in operation. The Institution of Engineers, Australia has set criteria for fire safety engineering as an area of practice of its National Professional Engineers Register (NPER, now NER). In addition, various State and Territory legislation provides for accreditation or registration of fire safety engineers within their jurisdiction. In some cases the legislation recognises a number of accreditation bodies both national and local for the administration of the accreditation or registration process.”

The IFEG therefore confirms and supports the roles, responsibilities, procedures and design and approval methodologies of appropriately qualified and accredited fire safety engineers of BCA Performance Solutions and provide an important document for practitioners to meet their ‘duty of care’²⁵ and ethical obligations²⁶ to clients and the community.

3.3. FSE IN OTHER APPLICATIONS

The role of Fire Safety Engineering is perhaps even more suited to other non-building, areas such as process design (for example, thermal power plants, petro-chemical facilities, etc.) However, its specific use has been limited and specialised. This is perhaps due to the close relationship to Risk Engineering and because, for most designs, fire safety is only one (sometimes small) part of the overall acceptable design risk profile. Additionally, the current training programs in Australia for fire safety engineering have a strong building (specifically BCA) focus which inhibits the expansion of graduates into other areas.²⁷

²⁵ See <http://www.constructionlawmadeeasy.com/Negligence>.

²⁶ See <https://www.engineersaustralia.org.au/ethics>.

²⁷ The current Warren Centre FSE Education Project, (Task 3.1.1) covers this matter in much greater detail.

3.4. THE SOCIETY OF FIRE SAFETY (SFS) AND ENGINEERS AUSTRALIA

Engineers Australia has capacity to establish learned technical societies where the need arises and in 1994 established the Society of Fire Safety (SFS) to foster excellence in fire safety in Australia.

As a learned society, the aims are to draw together individuals who are actively engaged in fire safety, in order to provide a national focus and leadership for the development, understanding, practice and application of fire safety engineering to achieve reductions of risk for life, property and environmental

damage and the implementation of cost-effective fire safety codes and regulations.²⁸

The SFS continues to play a pivotal role in the development and evolution of Fire Safety Engineering, particularly as it relates to the BCA. A key role of learned technical societies of Engineers Australia is to allow non-engineering members to participate, with the ultimate goal of eventually providing the appropriate pathways for those eligible society members to become full members of Engineers Australia.



²⁸ Technical Societies of Engineers Australia Guidelines and Regulations, Issue: 1 Revision: 7 May 2006, Clause 7.01.

3.5. ACCEPTANCE OF THE NER

The Engineers Australia National Engineering Register (NER)²⁹ is a voluntary register (with an underlying professional accreditation scheme) established by the peak engineering body within Australia. It has a category for fire safety engineering. The NER goals are simply stated as:

“The National Engineering Register (NER) is a comprehensive directory of Australian engineers who have met the high standards of professionalism expected within the industry. Engineers Australia created the NER to provide engineering professionals and employers with a tool that connects talent to opportunities.”

In the absence of a mandatory national registration system for fire safety engineering practice, design and certifying fire safety engineers in the Australian Capital Territory, Northern Territory, South Australia and Western Australia operate under the self-regulatory system the National Engineering Register (NER). This is a non-mandatory industry-based approach only.

Design and certifying fire safety engineers in Queensland, Tasmania, NSW and Victoria require state registration, licensing or accreditation, and NER is acceptable for admission to these schemes.

There is another accreditation scheme established internationally by the Institution of Fire Engineers (IFE) for fire safety engineers which is recognised by some states.



Under the Australian constitution, building regulations are a state and territory matter, not a federal matter.

²⁹ See <https://www.engineersaustralia.org.au/Engineering-Registers/National-Engineering-Register>

4. Outcomes

Government Regulation of Fire Safety Engineering

Building regulations which adopt the BCA and regulate practitioners who apply the BCA are a state and territory matter,³⁰ and therefore each jurisdiction has adopted its own approach to the question of how, or if, engineers or other designers should be regulated to practice in the building industry.

THE FOLLOWING EIGHT QUESTIONS WERE ADDRESSED FOR EACH STATE AND TERRITORY'S REGULATOR AND LEGISLATION:

Question 1 (Accreditation, Registration or licensing)

“What are the requirements for registration/licensing or accreditation of fire safety engineers in your state or territory?”

Question 2 (Role in preparing design documents)

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

Question 3 (Peer review)

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

Question 4 (Role during construction)

“Does the fire safety engineer have a role in the construction process?”

Question 5 (Role in commissioning and handover)

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

Question 6 (Professional practice)

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

Question 7 (Consultation with fire brigade)

“Is there a legislative requirement to consult with the relevant fire brigade?”

Question 8 (Offence provisions)

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

³⁰ See https://www.aph.gov.au/About_Parliament/Senate/Powers_practice_n_procedures/~/_link.aspx?_id=6ED2CAE61E7742A1B2C42F95D4C05252

All of the eight jurisdictions were contacted with the questions above, with three of the eight providing written responses. For other states and territories not responding, the information was taken from referenced regulatory documents for those jurisdictions.

Further analysis of the engagement of fire safety engineers for each state and territory is provided in the following sections.

Table 1 provides a summary of the current requirements in each state and territory for the practice and engagement of fire safety engineers.

The roles, responsibilities, procedures and design and approval methodologies for fire safety engineers are also described in the International Fire Safety Engineering Guidelines 2005 which could apply as they are referenced in the Guide to the BCA (see also Section 3.2 of this report). However only specific legislative or statutory controls are described in the following analysis.

1 Bligh St, Sydney. Photo courtesy of Arup.



TABLE 1 : REQUIREMENTS FOR PRACTISING AS A FIRE SAFETY ENGINEER IN AUSTRALIA

JURISDICTION	Regulator	Accreditation, registration or licensing for design fire safety engineer	Accreditation, registration or licensing for peer review or certification by fire safety engineer as part of the approval process	Statutory requirement to consult with Fire Brigade for fire safety engineer	Offences where fire safety engineer not used by owner, or where practitioner not registered or licensed
ACT	Environment, Planning & Sustainable Development Directorate	NO	NO	N/a	N/a
NSW	Building Professionals Board	YES (accreditation in prescribed cases)	YES (competent fire safety practitioner, in prescribed cases)	YES (in prescribed cases)	YES (in some cases)
NT	Building Practitioners Board	NO	NO	N/a	N/a
QLD	Board of Professional Engineers	YES (registration)	YES (registration)	YES (in prescribed cases)	YES (professional engineering service)
SA	Department of Planning, Transport and Infrastructure	NO	NO	N/a	N/a
TAS	Consumer, Building and Occupational Services	YES (license)	YES (license)	NO	YES
VIC	Victorian Building Authority	YES (registration)	YES (registration)	YES (in prescribed cases)	NO (unless practitioner using title 'engineer')
WA	Department of Mines, Industry Regulation and Safety, Building and Energy Division (Building Commission)	NO	NO	N/a	N/a

Each jurisdiction has adopted its own approach to the question of how, or if, engineers or other designers should be regulated to practice in the building industry.



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act 2004 (ACT)*
- *Building (General) Regulation 2008 (ACT)*
- *Construction Occupations (Licensing) Act 2004 (ACT)*
- *Construction Occupations (Licensing) Regulation 2004 (ACT)*

05. Fire Safety Engineering IN THE AUSTRALIAN CAPITAL TERRITORY

5.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in the Australian Capital Territory?”

The Australian Capital Territory (ACT) currently does not require engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance. By way of contrast, builders,³¹ building surveyors,³² plumbers,³³ and electricians³⁴ are required to be licensed. Architects are required to be registered.³⁵

5.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

³¹ See <https://ablis.business.gov.au/service/act/construction-occupation-licence-builder/3856>.

³² See <https://ablis.business.gov.au/service/australian-capital-territory/building-approval/34583>.

³³ See https://www.planning.act.gov.au/customer_information/industry/industry_groups/plumbers_and_drainers_information.

³⁴ See <https://ablis.business.gov.au/service/act/construction-occupation-licence-electrician/3855>.

³⁵ See https://www.accesscanberra.act.gov.au/app/answers/detail/a_id/3686/.



The Australian Capital Territory (ACT) currently does not require engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance.

5.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

5.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

5.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

5.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation in legislation. There is however an over-arching requirement that all ‘fire protection’ Performance Solutions must be referred to the fire brigade.³⁶

5.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

5.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation and no offences prescribed.

In ACT, there is however an over-arching requirement that all ‘fire protection’ performance solutions must be referred to the fire brigade.

³⁶ Building Regulations 2008 (ACT), sch 2 pt 2.2 item 6.



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Environmental Planning and Assessment Act 1979 (NSW)*
- *Environmental Planning and Assessment Regulation 2000 (NSW)*

6.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in New South Wales?”

The requirements are for the accreditation of a C10 fire safety engineer as set out in the Building Professionals Board Accreditation Scheme (the Scheme).³⁷

The Scheme:

- recognises the following for a person seeking to be a C10 fire safety engineer:
 - a degree in fire safety engineering from a university within the meaning of the *Higher Education Act 2001*; or
 - registration on the National Engineering Register in the Occupational Category of Professional Engineer in the General Area of Practice of Fire Safety Engineering.



Sydney has undergone significant construction development in recent years.

³⁷ See <http://www.bpb.nsw.gov.au/engage-certifier/what-type-certifier-do-i-need>.

06. Fire Safety Engineering IN NEW SOUTH WALES

Applications for certain approvals involving a Performance Solution for fire and life safety must be referred to Fire & Rescue NSW.

It requires that a person seeking to be a C10 fire safety engineer must have a minimum of three years recent practical experience relevant to the category of accreditation to the satisfaction of the Board. This can include fire safety engineering including assessing reports, plans and specifications of an appropriate range of proposed building works involving Performance Solutions for fire safety and assessing the construction of an appropriate range of building works involving Performance Solutions for fire safety for compliance with the BCA.

The requirement to be accredited as a C10 fire safety engineer is limited to the functions of a fire safety engineer as required by the *Planning Act* and *Planning Regulation* as addressed in answering Q2 and Q5 below.

Where there is no legislative requirement for an A category certifier to rely on a C10 fire safety engineer (see Q2 and Q5 below), any performance (alternative) solution in respect of a fire safety requirement must be prepared by or on behalf of a competent fire safety practitioner. Currently, the determination of whether an individual is a competent fire safety practitioner is the responsibility of the certifying authority.

In the future, competent fire safety practitioners will be accredited by recognised co-regulatory schemes, which are proposed to include a wide variety of professionals, including fire safety engineers, fire safety system designers, installers, and service contractors. (For more

information about the accreditation scheme, see <https://www.fairtrading.nsw.gov.au/trades-and-businesses/business-essentials/information-for-specific-industries/fire-safety-practitioners>.)

6.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

In NSW, the design and certification of relevant fire safety systems in class 2 through class 9 buildings must be undertaken by a competent fire safety practitioner in accordance with clause 136AA and clause 146B of the Regulations.

Applications for certain approvals involving a Performance Solution for fire and life safety must be referred to Fire & Rescue NSW (FRNSW) prior to that approval being issued, and a request for Fire & Rescue NSW to inspect a completed building subject to such an approval must be submitted prior to occupation so that Fire & Rescue is given an opportunity to inspect the building.

The *Planning Regulation* requires that a Performance Solution involving specific fire safety Performance Requirements must be

prepared by a C10 fire safety engineer and generally requires that any application for approval involving a Performance Solution for any Category 2 fire safety provision³⁸ must be referred to Fire & Rescue NSW where the proposal is for the erection, rebuilding, alteration, enlargement or extension of:

- a) a class 9a building proposed to have a total floor area of 2,000 m²; or b) a building (other than a class 9a building) that is proposed to have:
 - i. a fire compartment with a total floor area of more than 2,000 m²; or
 - ii. a total floor area of more than 6,000 m².

The *Planning Regulation* requires that the Performance Solution referred must be prepared by a C10 fire safety engineer.

The role of FRNSW and the C10 fire safety engineer prior to an occupation certificate being issued is addressed in the answer to Questions 5 and 7 below.

6.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

Whilst there is no legislative requirement for a C10 fire safety engineer to peer review a report prepared by another C10 fire safety engineer, it is not uncommon for an A category certifier to require that complex Performance Solutions required to be referred to FRNSW are peer reviewed by an independent C10 fire safety engineer.

6.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

There is no legislative requirement for the role of a C10 fire safety engineer or a competent fire safety practitioner during construction. A C10 fire safety engineer or a competent fire safety practitioner, where involved in the design (see Q2) or where involved in the occupation (see Q5), may be consulted during construction to clarify the intent of the Performance Solution, or where changes during construction necessitate a modification of the Performance Solution or an additional Performance Solution.

³⁸ BCA, Performance Requirements CP9, EP1.3, EP1.4, EP1.6, EP2.2 or EP3.2.

6.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

For a C10 fire safety engineer who prepared a Performance Solution who was required to be referred to FRNSW prior to the approval being issued, that C10 fire safety engineer is required (see Q2 above), prior to the occupation certificate being issued, to provide a report that includes a statement that the building work relating to the original Performance Solution has been completed and is consistent with that Performance Solution.³⁹

The A category certifier must not issue an occupation certificate for a building subject to a Performance Solution in respect of a fire safety requirement unless it has received the report from the C10 fire safety engineer.

In NSW, an A category certifier must work with FRNSW for Performance Solution reports.

6.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEGs, practice notes etc)?”

The following provisions in the Scheme apply to a C10 fire safety engineer where performing their functions as an accredited certifier:

- Must comply with the code of conduct for accredited certifiers contained in Schedule 4 of the Scheme.
- Must participate in and satisfy the requirements of the Board’s continuing professional development program as specified in Schedule 5 of the Scheme.
- May be required to undertake specific education or training courses in addition to participating in and satisfying the requirements of the continuing professional development program.

The relevance of the abovementioned legislation is untested where a C10 fire safety engineer provides fire safety engineering services but does not issue certification as a C10 fire safety engineer. The regulator advises that professional practice standards for competent fire safety practitioners will be determined upon finalising the accreditation scheme.



Fire & Rescue NSW has 6,800 firefighters and 5,800 community fire unit members.

6.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

The role of FRNSW during the design, including the requirement to consult, is addressed in Question 2.

An A category certifier must request⁴⁰ that FRNSW furnish it with a final fire safety report for a building subject to a Performance Solution as soon as practicable after receiving

an application for an occupation certificate. FRNSW may furnish the final fire safety report.

An A category certifier must not issue an occupation certificate for that building unless it has taken into consideration any final fire safety report for the building that has been furnished to it within 7 days after FRNSW receives the request for the report.

The FRNSW final fire safety report, if provided, must specify whether or not FRNSW is satisfied:

- that the building work complies with any Performance Solution in respect of a Category 2 fire safety provision that was the subject of the approval.

³⁹ Environmental Planning and Assessment Regulation 2000 (NSW), reg 152B.

⁴⁰ Environmental Planning and Assessment Regulation 2000 (NSW), reg 152.

An A category certifier must request⁴¹ that FRNSW furnish it with a fire safety system report as soon as practicable after receiving any application for an occupation certificate for a class 2 or 3 building for building work that involved installing, extending or modifying a relevant fire safety system⁴² in that building.

The A category certifier must not issue an occupation certificate for that building unless it has taken into consideration any fire safety system report for the building that has been furnished to it within 10 days after FRNSW receives the request for the report. The fire safety system report must be in writing and must specify whether or not FRNSW is satisfied that the relevant fire safety system is capable of performing to at least the standard in the current fire safety schedule for the building.

6.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

The answers to Q6 above apply. A fire safety engineer issuing a certificate as a C10 fire safety engineer can be subject to disciplinary procedures if they fail to adhere to the abovementioned legislation in Question 6.

The relevance of the abovementioned legislation in Q6 is unknown where a C10 fire safety engineer provides fire safety engineering services but does not issue certification as a C10 fire safety engineer.

Where the legislation does not require that a C10 fire safety engineer must prepare a Performance Solution, an A category certifier can only accept a Performance Solution in respect of a fire safety requirement that was prepared by or on behalf of a competent fire safety practitioner (clause 130 and clause 144A).

⁴¹ Environmental Planning and Assessment Regulation 2000 (NSW), reg 152A.

⁴² Environmental Planning and Assessment Regulation 2000 (NSW). Relevant fire safety systems include hydraulic fire safety systems, fire detection systems and mechanical ducted smoke control systems in accordance with reg 152A(7).





FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act (consolidated) (NT)*
- *Building Regulations (NT)*

07. Fire Safety Engineering IN THE NORTHERN TERRITORY

7.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/ licensing or accreditation of fire safety engineers in the Northern Territory”

The Northern Territory (NT) currently does not require fire safety engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance.

By way of contrast; certifying structural, mechanical and hydraulic engineers, builders, building surveyors, and certifying architects are required to be registered.⁴³ Plumbers⁴⁴ and electricians⁴⁵ are required to be licensed.

⁴³ See <https://bpb.nt.gov.au/application-forms>.

⁴⁴ See <https://plumberslicensing.nt.gov.au/>.

⁴⁵ See <https://electricallicensing.nt.gov.au/>.

7.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

7.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.



Regulation of fire safety design and construction is highly inconsistent across Australia.

7.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

7.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

Does the fire safety engineer have a role in the construction process?

7.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

7.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

7.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation and no offences prescribed.

08. Fire Safety Engineering IN QUEENSLAND



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act 1975 (QLD)*
- *Building Regulations 2006 (QLD)*
- *Professional Engineers Act 2002 (QLD)*
- *Professional Engineers Regulation 2003 (QLD)*
- *Sustainable Planning Regulation 2009 (QLD)*

8.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in Queensland?”

The areas of engineering on the Register of Professional Engineers in Queensland (RPEQ) include electrical, fire engineering (assessed by IFE), fire safety engineering (assessed by Engineers Australia), mechanical and building services.



The *Professional Engineers Act (QLD)* prohibits a person who is not a registered professional engineer from carrying out professional engineering services except under the direct supervision of a registered professional engineer.

8.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

A RPEQ (fire safety engineer) is required to be involved where a Performance Solution for a fire safety system is proposed, except where the relevant legislation provides an exception (e.g. minor work or situations where the impact of the work is considered minimal).

The RPEQ (fire safety engineer) prepares a fire safety engineering report addressing the relevant Performance Requirements subject to the Performance Solution, and the general approach (although not legislated) appears to be to use the International Fire Engineering Guidelines 2005 (IFEG).

The role of the RPEQ (fire safety engineer) is restricted to preparing the fire safety engineering brief and report and does not include preparing documents for fire services or other designs or checking the detailed design of systems.

8.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

There is no legislative requirement for a RPEQ (fire safety engineer) to peer review a report prepared by another RPEQ (fire safety engineer) or prepare/review any other design documentation.

8.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

Whilst there is no legislative requirement for a RPEQ (fire safety engineer) during construction, the reality is that the RPEQ (fire safety engineer) is often involved during construction to clarify the intent of the Performance Solution or where changes during construction necessitate a modification of the Performance Solution or an additional Performance Solution. This process is often complicated and may involve referral to the Fire Brigade, changes to the approval or a new approval.

8.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

Whilst there is no legislative requirement for a RPEQ (fire safety engineer) in the commissioning and final building handover process, the reality is that a building certifier will likely require that the RPEQ (fire safety engineer) certify that they have witnessed at least that the fire safety system and ideally the whole building subject to the Performance Solution has been installed and operational.

8.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

RPEQs are bound by the Code of Practice for Registered Professional Engineers.⁴⁶ The following is an extract from the BPEQ website:⁴⁷

“The Code is developed by BPEQ in collaboration with professional organisations and universities and is reviewed at least once every three years. The Code is intended to provide guidance to registered professional engineers as to appropriate professional conduct or practice; set out the minimum levels of professional conduct required to be met by registered professional engineers in Queensland so that they can carry out their roles within a framework of integrity, care for the public, and competency; and assist the Queensland Civil and Administrative Tribunal in determining whether the registered professional engineer has behaved in a way that constitutes unsatisfactory professional conduct, or practice.”

⁴⁶ Code of Practice for Registered Professional Engineers, BPEQ, <https://www.bpeq.qld.gov.au/images/documents/Forms/170629%20Code%20of%20Practice.pdf>.

⁴⁷ See https://www.bpeq.qld.gov.au/BPEQ/Resources/BPEQ/Navigation/CodesandGuides/CodeofPractice/Resources_-_Code_of_Practice.aspx.

8.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

There is a legislative requirement to refer an application for building work to the Queensland Fire and Emergency Services (QFES) for applications involving the following (being an extract from Table 1 in Schedule 7):⁴⁸

- (a) “A fire safety system for a building or structure, other than a temporary structure or special structure as defined in the *Building Act*, schedule 2, if the building work—
- (i) REQUIRES SPECIAL FIRE SERVICES MENTIONED IN SCHEDULE 8, PART 1; OR
 - (ii) INCLUDES AN PERFORMANCE SOLUTION ASSESSED AGAINST THE PERFORMANCE REQUIREMENTS OF THE BCA, VOLUME 1, OR THE QUEENSLAND DEVELOPMENT CODE, PART 2.2, FOR THE FIRE SAFETY SYSTEM; OR
 - (iii) INCLUDES AN PERFORMANCE SOLUTION ASSESSED AGAINST THE RELEVANT PERFORMANCE REQUIREMENTS OF THE BCA OR THE PERFORMANCE CRITERIA STATED IN THE QUEENSLAND DEVELOPMENT CODE, PART 2.3, FOR THE FIRE SAFETY SYSTEM

- (b) A fire safety system for a budget accommodation building as defined in the *Building Act*, section 216, if the work involves a solution—
- (i) ASSESSED AGAINST—
 - (A) THE PERFORMANCE CRITERIA STATED IN THE QUEENSLAND DEVELOPMENT CODE, PART 2.1; OR
 - (B) THE PERFORMANCE REQUIREMENTS OF THE BCA, VOLUMES 1 AND 2, FOR THE FIRE SAFETY SYSTEM; AND
 - (ii) THAT INCLUDES FIRE SAFETY MANAGEMENT PROCEDURES AS A CONDITION OF THE USE AND OCCUPATION OF THE BUILDING
- (c) A water-based fire safety installation for a building or structure, if the building work includes—
- (i) THE INSTALLATION OF THE WATER-BASED FIRE SAFETY INSTALLATION; AND
 - (ii) AN PERFORMANCE SOLUTION ASSESSED AGAINST THE PERFORMANCE CRITERIA 3, 4 AND 5 OF THE QUEENSLAND DEVELOPMENT CODE, PART 6.1
- (d) Building work to which the Queensland Development Code, part 3.7, performance criteria P1 applies, if the building work includes an Performance Solution assessed against performance criteria P1;

⁴⁸ See “Guidelines for special fire services and referrals to the Queensland Fire and Rescue Service”, February 2013, www.hpw.qld.gov.au/SiteCollectionDocuments/SpecialFireServicesGuidelines.pdf. This text is extracted from *Sustainable Planning Regulation 2009 (QLD)*, Table 1, Sch 7.

8.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

RPEQs are bound by the:

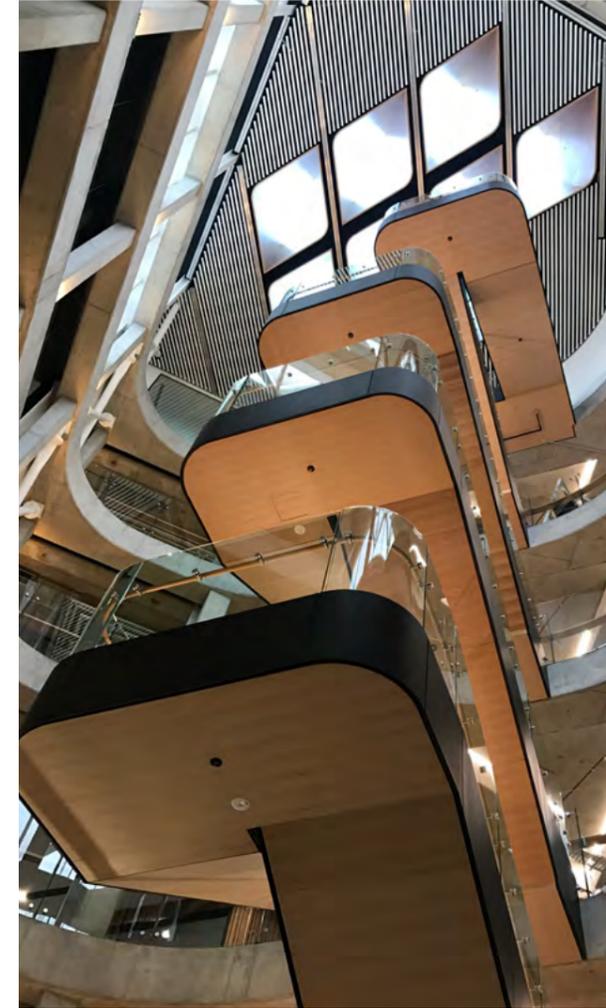
- i. Code of Practice for Registered Professional Engineers;
- ii. *Professional Engineers Act 2002 (Qld)*; and
- iii. *Professional Engineers Regulation 2003 (Qld)*;

Pursuant to the *Professional Engineers Act*, a person who is not a registered professional engineer must not carry out professional engineering services except under the direct supervision of a registered professional engineer.

Section 113 of the *Professional Engineers Act* regulates a person who is not a registered professional engineer or a person holding themselves out to be a registered professional engineer. Failure to comply with this provision is a criminal (non-indictable) offence with fines of up to \$126,000.

Whilst the general approach is that a building certifier should not accept a Performance Solution addressing a fire safety system from a person who is not a RPEQ (fire safety engineer), there appears to be nothing restricting a building certifier from accepting such a Performance Solution from anyone who is not a RPEQ as the offence applies to the engineer.

Barwon Water, Victoria. Photo courtesy of Arup.



- (e) Building work to which the Queensland Development Code, part 3.7, performance criteria P3 applies, if the building work—
- (i) DOES NOT COMPLY WITH THE QUEENSLAND DEVELOPMENT CODE, PART 3.7, ACCEPTABLE SOLUTION A3(1)(A)(II), (2) OR (3); AND
 - (ii) INCLUDES AN PERFORMANCE SOLUTION ASSESSED AGAINST THE QUEENSLAND DEVELOPMENT CODE, PART 3.7, PERFORMANCE CRITERIA P3; AND
- (f) A residential care building under the Queensland Development Code, part 2.2.”



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Development Act 1993 (SA)*
- *Development Regulations 2008 (SA)*

09. Fire Safety Engineering IN SOUTH AUSTRALIA

9.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in South Australia?”

South Australia (SA) currently does not require engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance. By way of contrast, builders,⁴⁹ plumbers and electricians are required to be licensed.⁵⁰ Architects⁵¹ and building surveyors⁵² are required to be registered.

9.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

9.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

⁴⁹ See <https://www.sa.gov.au/topics/business-and-trade/licensing/licence-check>.

⁵⁰ See <https://www.sa.gov.au/topics/energy-and-environment/electrical-gas-and-plumbing-safety-and-technical-regulation/licensing/licensing>.

⁵¹ See <https://www.archboardsa.org.au/for-public/register-of-architects/>.

⁵² See <https://www.sa.gov.au/topics/planning-and-property/land-and-property-development/engaging-building-industry-professionals/list-of-registered-private-certifiers>.

9.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

9.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

◆ South Australia (SA) currently does not require engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance. ◆

9.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

9.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

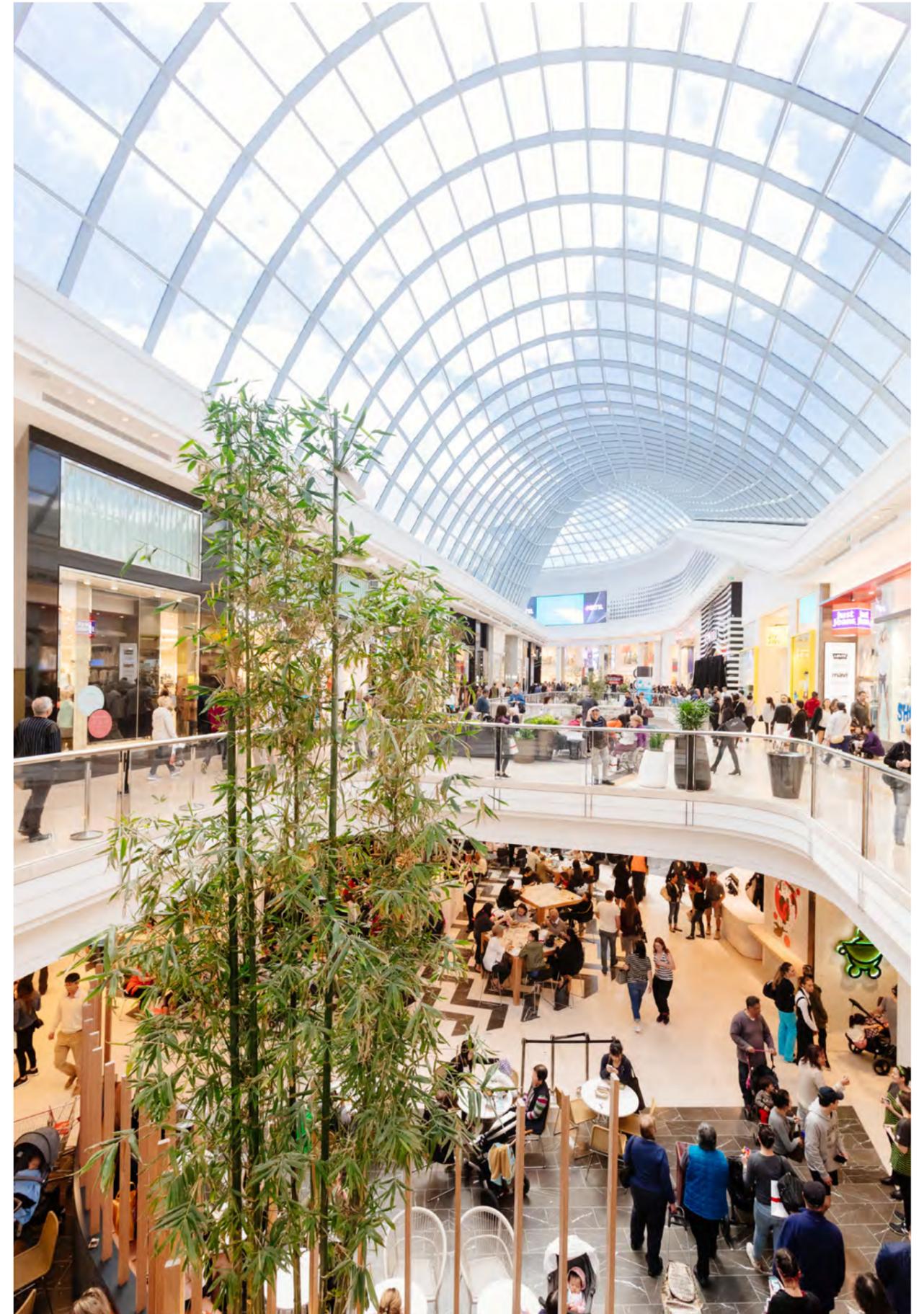
As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

9.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation and no offences prescribed.



Chadstone Shopping Centre. Photo courtesy of Arup.



10. Fire Safety Engineering IN TASMANIA

FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act 2016 (TAS)*
- *Building Regulations 2016 (TAS)*
- *Occupational Licensing Act 2005 (TAS)*
- *Occupational Licensing (Building Services Work) Regulations 2016 (TAS)*

10.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in Tasmania?”

Tasmania (TAS) currently requires fire safety engineers, building services engineers and civil engineers practicing in the building industry to be licensed and to carry professional indemnity insurance. Also, builders, building surveyors, architects, plumbers and electricians are required to be licensed.⁵³

10.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

There are no roles defined in legislation.

10.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

There are no roles defined in legislation.

⁵³ See <https://www.cbos.tas.gov.au/topics/licensing-and-registration/search-licensed-occupations/find-a-licensed-tradesperson>.



10.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

There are no roles defined in legislation.

10.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

There are no roles defined in legislation.

10.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

There are no roles defined in legislation and not currently a code of practice (see 8.8.2).

10.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

There are no roles defined in legislation.

10.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

Pursuant to the *Occupational Licensing Act 2005* a person must not hold themselves out as a practitioner, building services provider or a contractor (i.e. engineer) when that is not the case. A licensed engineer must also comply with any relevant codes of practice. Sections 25 and 38 of the *Occupational Licensing Act 2005* regulates any person who is not a licensed engineer or who is a person holding themselves out to be a licensed engineer. Failure to comply with this provision is a criminal (non-indictable) offence with fines of up to \$10,000. There is no offence committed if a person practices as a fire safety engineer and is not registered but does not call themselves a fire safety engineer. This is typical of ‘registration’ rather than ‘licensing’ schemes.

11. Fire Safety Engineering IN VICTORIA



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act 1993 (VIC)*
- *Building Regulations 2018 (VIC)*

11.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in Victoria?”

Victoria requires engineers practicing in the building industry to be registered and to carry professional indemnity insurance (in most cases). Also, builders, building surveyors, architects and others are required to be registered.⁵⁴ Plumbers⁵⁵ and electricians⁵⁶ are required to be licensed.



Melbourne property expansion has been significant in recent years.

⁵⁴ See <http://www.vba.vic.gov.au/practitioners/building-registrations>.

⁵⁵ See <http://www.vba.vic.gov.au/practitioners/plumbing-registration-and-licences>.

⁵⁶ See <https://www.esv.vic.gov.au/licensing-coes/electrical-licences/electricians-licence/>.

The Victorian Building Authority (VBA) is responsible for administering the scheme for the registration of building practitioners in Victoria. The term ‘building practitioner’ is defined in section 3 of the *Building Act 1993* (the Act) and includes an engineer engaged in the building industry.⁵⁷

There are four prescribed classes of engineer within the building practitioner category of ‘engineer’, including the class of engineer (fire safety).⁵⁸ For the purposes of the VBA’s response, reference to ‘fire safety engineer’ in this document means a building practitioner registered in the category of engineer, class of engineer (fire safety).

The Victorian Building Authority registers all building practitioners and cannot grant an application for registration as a building practitioner as a fire safety engineer, unless it is satisfied that:⁵⁹

- a) if the applicant is a natural person, the applicant either –
 - i. holds the prescribed qualification for registration, or
 - ii. unless the regulations otherwise provide in relation to a category or class, holds a qualification that the VBA considers is, either alone or together with any further certificate, authority, experience or examination equivalent to a prescribed qualification; and
- b) if the applicant is a body corporate, the requirements in s171A and 171B of the Act have been met; and
- c) if the applicant carries on business, or intends to carry on business, as a building practitioner as a member of a partnership,

the requirements in s171C of the Act have been met; and

- d) the applicant is a fit and proper person to be registered having regard to –
 - i. the personal probity requirements set out in s171D of the Act; and
 - ii. the financial probity requirements set out in s171E of the Act; and
- e) the applicant is not an excluded person; and
- f) the applicant has paid the appropriate application fee; and
- g) the applicant meets any other prescribed requirements.

The prescribed qualification for registration as a fire safety engineer is:⁶⁰

- a) the successful completion of –
 - i. a Graduate Certificate in Performance-Based Building and Fire Codes from Victorian University and any prescribed qualification for registration in the class of engineer (civil), engineer (mechanical), or engineer (electrical); or
 - ii. a Master of Engineering (Building Fire Safety and Risk Engineering) from Victoria University; or
 - iii. a current certificate of registration as a fire safety engineer on the National Engineering Register (NER); and

b) at least three years of practical experience.

Practical experience must have been obtained in the seven years before the application for registration was made.⁶¹

⁵⁷ *Building Act 1993 (VIC)*, s 3.

⁵⁸ *Building Regulations 2018 (VIC)*, sch 9, part 3.

⁵⁹ *Building Act 1993 (VIC)*, s 171.

⁶⁰ *Building Act 1993 (VIC)*, s 3.

⁶¹ *Building Regulations 2018 (VIC)*, reg 258(2).

In Victoria there are four prescribed classes of engineer within the building practitioner category of ‘engineer’, including the class of engineer (fire safety).

11.1. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

Registered fire safety engineers can issue certificates of compliance,⁶² but this is not mandatory. There are no other documents specifically prescribed for fire safety engineers.

11.2. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

Registered fire safety engineers can issue certificates of compliance⁶² to assist the building surveyor as part of the permit process, but this is not mandatory. There are no other documents specifically prescribed for fire safety engineers.

11.3. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

Registered fire safety engineers can issue certificates of compliance for inspections, but this is not mandatory.⁶³ There are no other documents specifically prescribed for fire safety engineers.

11.4. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

There are no roles defined in legislation.

⁶² Section 238(1)(a) of the *Building Act 1993 (VIC)* provides that the building surveyor may rely on a certificate issued by fire safety engineer that a Performance Solution complies with the Building Code of Australia (BCA).

⁶³ *Building Act 1993 (VIC)*, s 238(1)(a).

11.5. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

A registered building practitioner (including engineers) must perform work as a building practitioner in a competent manner and to a professional standard⁶⁴. The VBA Practice Notice 63 (issued June 2018) provides guidance (in addition to that provided in the BCA) on formulating and assessing Performance Solutions. It is relevant to a registered fire safety engineer.⁶⁵

11.6. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

There are no roles defined in legislation, but “prescribed fire safety matters” (fire-fighting equipment)⁶⁶ must be referred to the relevant fire brigade for consent if DtS provisions are not satisfied (i.e. a Performance Solution is required).

11.7. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

Section 169 of the *Building Act 1993* requires that a person must not represent or imply that they are registered when that is not the case. Failure to comply with this provision is a criminal (non-indictable) offence with fines of up to \$65,000. There is no offence committed if a person practices fire safety engineer and is not registered but does not call themselves a fire safety engineer. This is typical of ‘registration’ rather than ‘licensing’ schemes.

There are no roles defined in legislation.

⁶⁴ Building Regulations 2018 (VIC), reg 265.

⁶⁵ See http://www.vba.vic.gov.au/__data/assets/pdf_file/0013/20380/PN-63-2018-Performance-Solution-Procedures-and-Documentation.pdf.

⁶⁶ Building Regulations 2018 (VIC), reg 129.



Grenfell Tower tragedy London, June 2017.



FOR THIS JURISDICTION THE RELEVANT LEGISLATION IS AS FOLLOWS:

- *Building Act 2011 (WA)*
- *Building Regulations 2012 (WA)*

12. Fire Safety Engineering IN WESTERN AUSTRALIA

12.1. QUESTION 1

ACCREDITATION, REGISTRATION OR LICENSING

“What are the requirements for registration/licensing or accreditation of fire safety engineers in Western Australia?”

Western Australia currently does not require engineers practicing in the building industry to be registered, accredited or licensed, or to carry professional indemnity insurance. By way of contrast, builders, building surveyors and painters are required to be registered.⁶⁷ Plumbers⁶⁷ and electricians⁶⁸ are required to be licensed, and architects are required to be registered.⁶⁹

The Building Commission has a Guidance Note for assessment of external combustible cladding that suggests, “The fire safety engineer should be suitably qualified and experienced to carry out the specific fire safety assessment”. There is no further guidance on how that suitability is assessed.

12.2. QUESTION 2

ROLE IN PREPARING DESIGN DOCUMENTS

“What is the role of the fire safety engineer in preparing design documents and are there legislative requirements or guidelines that define this?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation. However, the WA Department of Fire & Emergency Services (DFES) has published a guideline⁷⁰ on fire safety engineered Performance Solutions. This document encourages use of the IFEG.

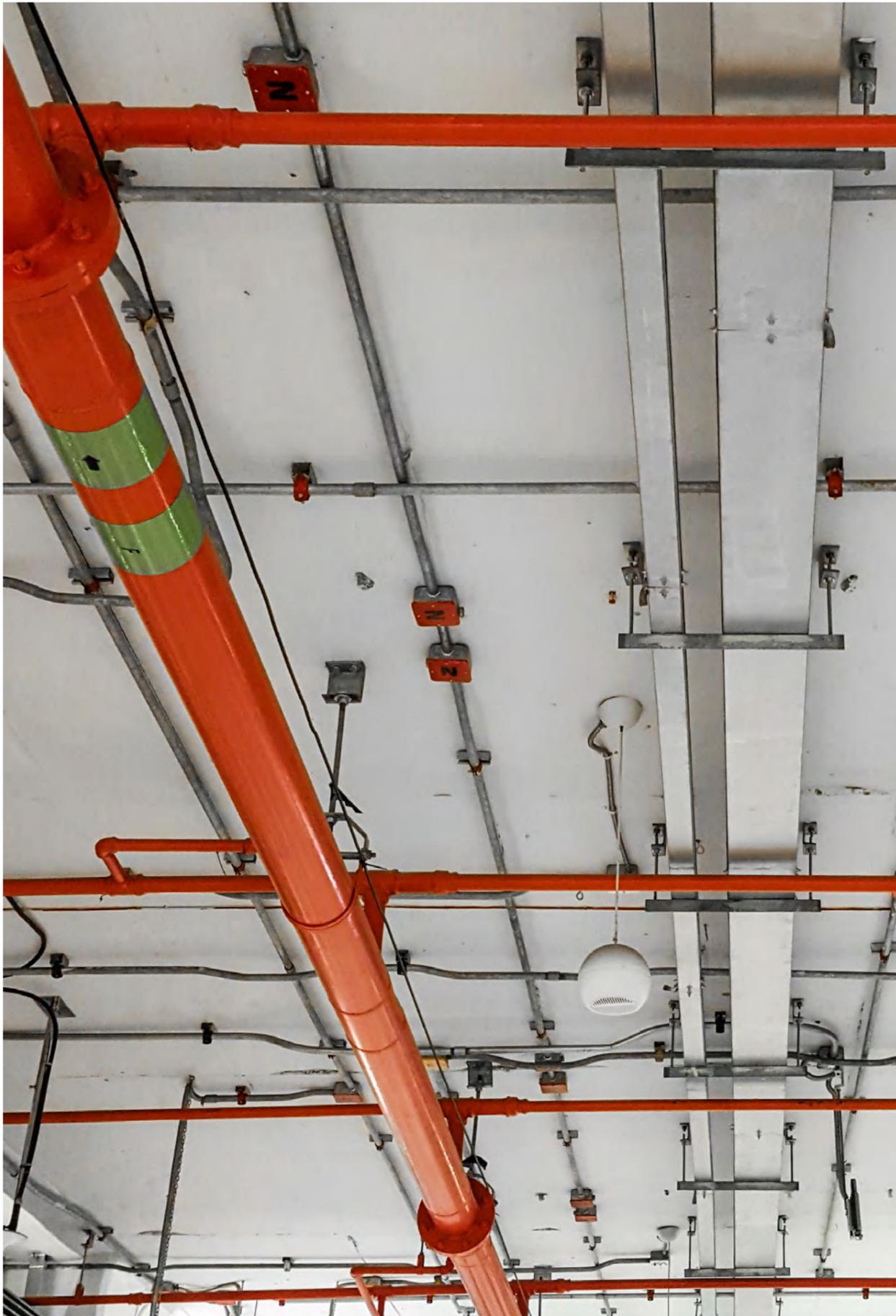
Plumbers and electricians are required to be licensed.

⁶⁷ See <https://www.commerce.wa.gov.au/building-commission/find-registered-building-service-provider>.

⁶⁸ See <https://www.commerce.wa.gov.au/energysafety/licensing-electrical-workers-and-electrical-contractors>.

⁶⁹ See <http://www.architectsboard.org.au/index.php?id=53>.

⁷⁰ See https://www.dfes.wa.gov.au/regulationandcompliance/buildingplanassessment/Guidelines/GL-15_Fire_Engineered_Performance_Solutions.pdf



Fire sprinkler design is critical to the final building safety.

12.3. QUESTION 3

PEER REVIEW

“What is the role of the fire safety engineer as an independent peer reviewer of other designs?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation, other than those in the IFEG (see 12.2).

12.4. QUESTION 4

ROLE DURING CONSTRUCTION

“Does the fire safety engineer have a role in the construction process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

12.5. QUESTION 5

ROLE IN COMMISSIONING AND HANDOVER

“Does the fire safety engineer have a role in the commissioning and final building handover process?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

12.6. QUESTION 6

PROFESSIONAL PRACTICE

“What are the professional practice responsibilities of a fire safety engineer (i.e. IFEG, practice notes etc)?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation.

12.7. QUESTION 7

CONSULTATION WITH FIRE BRIGADE

“Is there a legislative requirement to consult with the relevant fire brigade?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation. The WA DFES guideline only applies to those who choose to consult with the fire brigade.

12.8. QUESTION 8

OFFENCE PROVISIONS

“Are there any offence provisions if persons practice as a fire safety engineer and are either not appropriately registered/licensed or accredited, or practice inappropriately?”

As there is no requirement for accreditation, registration or licensing, no roles are defined in legislation and no offences prescribed.

13. Conclusions

THIS REPORT AND THE RESEARCH UNDERTAKEN HAS FOCUSED ON THE CURRENT STATUTORY CONTROLS PLACED ON THE PRACTICE OF FIRE SAFETY ENGINEERING IN AUSTRALIA AS A RESULT OF RELEVANT LEGISLATION, REGULATIONS AND OTHER CONTROLS RELATED TO BUILDINGS.

A key issue which follows is the extent to which these controls support or inhibit the use of performance-based fire safety engineering in building design and construction and lead to consistent and sound fire safety outcomes and an efficient and effective building industry.

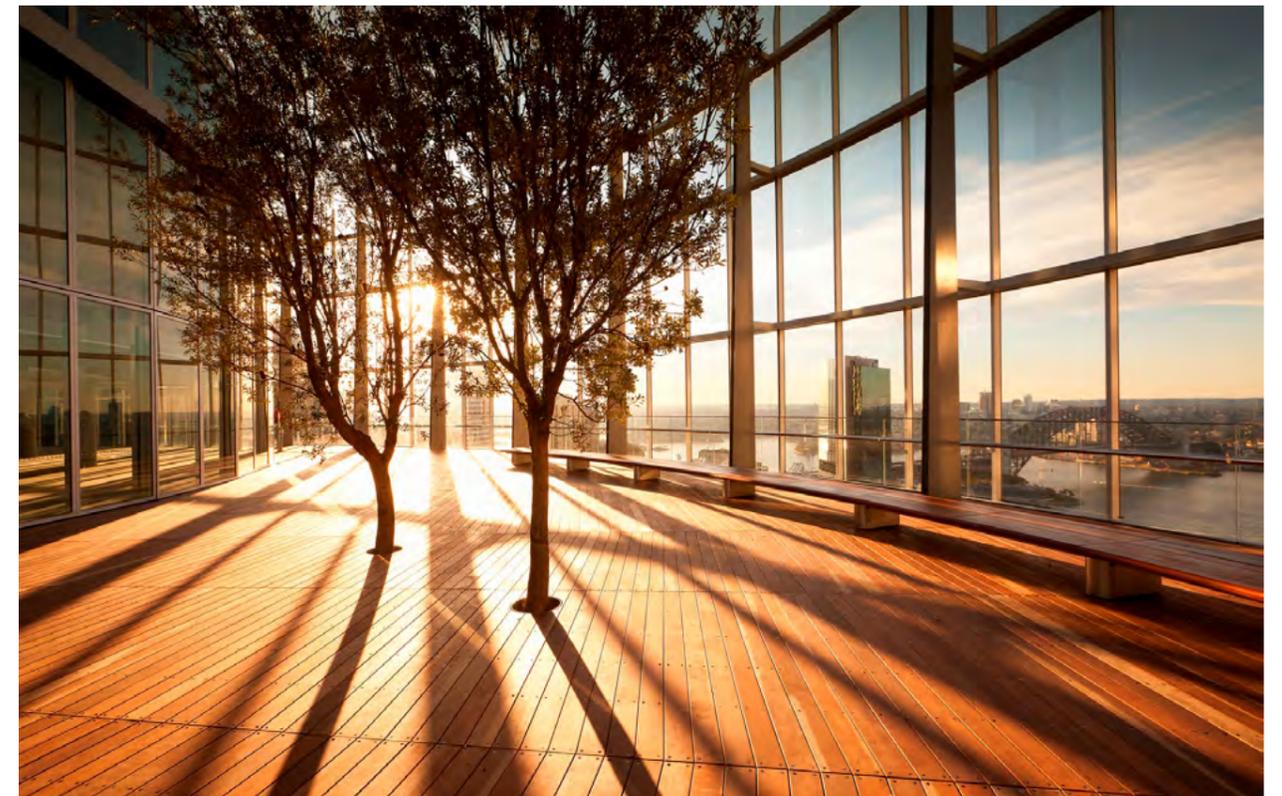
Fire safety engineering fits within a broader building approval and compliance context and a great deal of the problems identified by others⁷¹ relate to approval, inspection and commissioning of buildings, and the compliance processes generally. There is clearly a need for reform and better control over the building approval and certification

process, and this report highlights the need to set the role of fire safety engineers in this bigger compliance and certification picture, including:

- National consistency of registration, licensing and accreditation;
- Clear roles and responsibilities for design, construction and commissioning; and
- Clear compliance methodology and procedures (including products and systems).

The research was based around asking each of the eight states and territories in Australia

1 Bligh St, Sydney - Rooftop. Photo courtesy of Arup.



⁷¹ See for example, Shergold and Weir, *Building Confidence*, 2018.

to answer eight key questions related to the controls on fire safety engineering practice. The report provides the detailed answers to each of the questions asked for each state and territory with references that detail the legislative, regulatory or other documents in which fuller or further details can be found.

To provide relevant context to the issues addressed, some history of the development of the performance-based Building Code of Australia (BCA) now found in the National Construction Code (NCC) is provided in Sections 2 and 3 of this report.

Table 1 shows that there is absolutely no national consistency in approach to regulation and controls over fire safety engineering practice. Only NSW, Queensland, Victoria and Tasmania have any form of legislative or regulatory controls in place, and they vary significantly from state to state in terminology, processes and procedures.

Only Queensland and Tasmania have licence provisions for fire safety engineers, which means other persons who are not licensed may not undertake fire safety engineering and can be subject to penalties. In Victoria and NSW, which have professional registration schemes for fire safety engineers, it seems apparent that there is nothing to stop a non-fire safety engineer from practicing, nor a certifier accepting a fire safety engineering report from a non-registered fire safety engineer, if person does not hold themselves to be a fire safety engineer. Given no offenses are committed, there are no penalties for such actions.

There are no mandatory legislative requirements for fire safety engineering design reports, including those with Performance Solutions, to be peer reviewed by a registered, licensed or accredited independent fire safety engineer. However, in practice some certifiers

or fire brigades request such a peer review be undertaken.

Only NSW has a legislative requirement to undertake any mandatory construction site inspections and provide a report to the certifier. Only in three states, namely Victoria, Queensland and NSW, is there a mandatory regulatory requirement to consult with the Fire Brigade on certain matters, although in some other jurisdictions it is done on a volunteer basis.

In the ACT, NT, SA and WA, there are no registration or accreditation schemes to identify fire safety engineers or to demonstrate their competency through relevant qualifications or experience.

Given the lack of controls over the practice of fire safety engineering in several states and territories, it follows that there is a lack of audit and enforcement of fire safety engineers and their performance, with no requirements or standards against which to judge performance and competency.

These findings of national inconsistency and widespread lack of controls over fire safety engineering practice appear to cast doubts on the quality of performance-based fire safety engineering. Such doubts could potentially erode market confidence in the use of performance-based fire safety engineering and certainly threaten the likelihood of consistently sound fire safety outcomes for the Australian community where competency and professional performance in practice is not regulated.

We conclude that a national model set of regulatory controls for fire safety engineering, including for design fire safety engineers, peer reviewers, authority approval of Performance Solutions, and fire brigade officials reviewing

designs, needs to be developed and implemented across all Australian jurisdictions as soon as possible. It should be based on best practice and be aimed to achieve national consistency.

We recommend that, at the conclusion of this Warren Centre research project program, the Warren Centre write to the Building Ministers Forum and recommend that the BMF instigate work aimed at providing Australia's building industry with a regulatory regime for Fire Safety Engineering that is:

- totally uniform and consistent throughout Australia; and
- designed so that it can be replicated in other areas of regulation, thus creating a single, Australia-wide, regime of building control.

13.1. FURTHER AND FUTURE WORK

It is hoped that all the following research tasks for this Warren centre project will assist Australian jurisdictions and professional bodies in reaching a level of national consistency for fire safety engineering and the building approval process generally.

Appendix A

Glossary of Terms

TERM	DEFINITIONS AND NOTES OF EXPLANATION Where definitions are included in the NCC Volume One Building Code of Australia, they are in bold . Other definitions or notes of explanation have been developed in this Warren Centre Project as a means to use consistent language throughout the Project reports.
<i>ABCB</i>	The Australian Building Codes Board (ABCB) is a Council of Australian Government (COAG) standards writing body that is responsible for the development of the NCC, comprised of the BCA and PCA. The ABCB is a joint initiative of all three levels of government in Australia. <i>(ABCB)</i>
<i>Accreditation</i>	<p>Refers to professional accreditation from organisations like EA NER and IFE, which look at educational achievements and supervised experience plus CPD <i>(Peter Johnson)</i></p> <p>This also applies to accredited education courses for fire safety engineering, which there is one at UQ <i>(Peter Johnson)</i></p> <p>A scheme that captures appropriately qualified practitioners, sets minimum standards of professional practice and requires appropriate levels (if any) of insurance for consumers. <i>(See the Warren Centre's forthcoming Report on the State of Fire Safety Engineering Regulation, Control and Regulation in Australia, the "Task 1.1 Report".)</i></p> <p>Products (Certificate of Accreditation) - A certificate issued by a State or Territory accreditation authority stating that the properties and performance of a building material or method of construction or design fulfil specific requirements of the BCA <i>(NCC, vol 1, amdt 1)</i></p>
<i>Administrative Provisions</i>	<p>These are usually covered in the enabling or subordinate legislation and/or regulations at the State and Territory level and include (NCC):</p> <ul style="list-style-type: none"> • Plan submission and approval procedures • Issue of permits • Inspections and audits • Provision of evidentiary certificates • Issue of certificates • Review and enforcement of standards • Fees and charges
<i>Appropriate Authority</i>	The relevant authority with the statutory with the statutory responsibility to determine the particular matter. <i>(NCC, vol 1, amdt 1)</i>
<i>Appropriately Qualified Person</i>	<p>A person recognised by the appropriate authority as having qualifications and/or experience in the relevant discipline in question. <i>(NCC, vol 1, amdt 1)</i></p> <p>The person does not necessarily need to be licensed or registered unless required by the State or Territory regulatory system. <i>(NCC, Guide, amdt 1)</i></p>
<i>Assessment Method</i>	<p>Means a method that can be used for determining that a Performance Solution or Deemed-to-Satisfy Solution complies with the Performance Requirements. <i>(NCC, vol 1, amdt 1)</i></p> <p>The means by which a building proponent proves that a solution achieves the Performance Requirements. These include:</p> <ul style="list-style-type: none"> • Evidence to support that the use of a material or product, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision as described in A2.2 • Verification Methods • Expert Judgement • Comparison with the Deemed-to-Satisfy Provisions <p><i>(NCC, vol 1, amdt 1)</i></p>
<i>Building Code of Australia (BCA)</i>	Forms part of the National Construction Code, which contains technical provisions for the design and construction of buildings and other structures. The BCA addresses structural adequacy, fire resistance, access and egress, services and equipment, energy efficiency and sustainability, and provisions for the health and amenity of occupants. <i>(NCC, vol 1, amdt 1)</i>

TERM	DEFINITIONS AND NOTES OF EXPLANATION
<i>Building Solution</i>	<p>A solution which complies with the Performance Requirements and is a:</p> <ul style="list-style-type: none"> • Performance Solution • Deemed-to-Satisfy Solution • Combination of both solutions <p>(NCC, vol 1, amdt 1)</p> <p>This term has been replaced with the terms Deemed-to-Satisfy Solution and Performance Solution. It has been retained as some jurisdictions still refer to this term. (NCC, Guide, amdt 1)</p>
<i>Certification</i>	In NSW, such “licensed” engineers are called C10 certifiers in FSE with the emphasis on certification rather than design (<i>Peter Johnson</i>)
<i>Deemed-to-Satisfy Provisions</i>	Make up the bulk of the NCC. Means provisions deemed to satisfy the Performance Requirements. (NCC, vol 1, amdt 1)
<i>Deemed-to-Satisfy (DTS) Solution</i>	<p>A method of satisfying the Deemed-to-Satisfy Provisions. (NCC, vol 1, amdt 1)</p> <p>Should be used if any designer, builder or the like, does not want to develop a new means of compliance with the Performance Requirements. (NCC, Guide, amdt 1)</p>
<i>Design fire safety engineer</i>	A building practitioner who prepares (designs) a Performance Solution in relation to any fire safety matter in the BCA.
<i>Equivalent</i>	Equivalent to the level of health, safety and amenity provided by the Deemed-to-Satisfy Provisions. (NCC, vol 1, amdt 1)
<i>Fire Brigade</i>	<p>Means a statutory authority established under an Act of Parliament having as one of its functions the protection of life and property from fire and other emergencies. (NCC, vol 1, amdt 1)</p> <p>It may be a professional brigade with full-time firefighters or a volunteer brigade. Many companies employ their own private fire services. The standard of these private fire services varies greatly. They are excluded from the definition of a fire brigade. (NCC, Guide, amdt 1)</p>
<i>Fire Safety Engineer</i>	An appropriately qualified and experienced practitioner who, through sound and robust engineer practice, provides services that achieve reductions of risk for life for people in buildings, reduction in property and environmental damage from building fires and the implementation of cost-effective fire safety codes and regulations.
<i>Fire Safety System</i>	<p>One or any combination of the methods used in a building to:</p> <ul style="list-style-type: none"> • Warn people of an emergency • Provide for safe evacuation • Restrict the spread of fire • Extinguish a fire <p>and includes both active and passive systems.</p> <p>These systems may be active, passive or any combination of the two.</p> <p>Active Systems</p> <ul style="list-style-type: none"> • Sound systems and intercom systems for emergency purposes • Emergency lighting • Exit signs • Sprinkler systems • Fire hydrant systems • Fire hose reel systems • Smoke and heat vents • Mechanical smoke-exhaust systems • Portable fire extinguishers <p>Passive Systems</p> <ul style="list-style-type: none"> • Fire-isolated stairways, ramps and passageways • Fire walls <p>Other fire-resisting building elements (NCC, Guide, amdt 1)</p>

TERM	DEFINITIONS AND NOTES OF EXPLANATION
<i>Licensing</i>	A government legislative scheme that captures appropriately qualified practitioners, to the exclusion of any other persons or practitioners and sets minimum standards of professional practice and requires appropriate levels (if any) of insurance for consumers. Persons not licensed are prohibited from practice (i.e. plumbing, electrical or driving licensing schemes)
<i>National Construction Code (NCC)</i>	The NCC provides the minimum necessary requirements for health, safety, amenity and sustainability in the design and construction of new buildings throughout Australia. It comprises of the BCA plus the PCA and is given legal effect by relevant legislation in each State and Territory. (ABCB)
<i>Peer review fire safety engineer</i>	A building practitioner who independently reviews a Performance Solution design not prepared by them, in relation to any fire safety matter in the BCA.
<i>Performance-Based Design Brief (PBDB)</i>	A document that is developed in collaboration with key stakeholders as part of a proposed performance-based design and approval process. When completed, the PBDB becomes the platform upon which the proposed design is constructed. It records fundamental activities and outcomes of the performance-based design process, as agreed during key stakeholder negotiations. When finalised, all critical activities and outcomes would have been identified. (NCC)
<i>Performance Requirement</i>	<p>Means a requirement which states the level of performance which a Performance Solution or a Deemed-To-Satisfy Solution must meet. (NCC, vol 1, amdt 1)</p> <p>Performance Requirements outline the levels of accomplishment different buildings must attain. There are three options to comply with the Performance Requirements: Deemed-to-Satisfy Solutions, Performance Solutions or a combination of both (NCC, vol 1, amdt 1)</p>
<i>Performance Solution (Alternative Solution)</i>	<p>Means a method of complying with the Performance Requirements other than by a Deemed-To-Satisfy Solution. (NCC, vol 1, amdt 1)</p> <p>A Performance Solution is unique for each individual situation. These solutions are often flexible in achieving the outcomes and encouraging innovative design and technology use.</p> <p>It is a route which is not included in a DTS Solution. It complies with the NCC when the Assessment Method demonstrates compliance with the Performance Requirements. If it is demonstrated to be at least equivalent to a DTS Provision, the Performance Solution is deemed to have achieved compliance with the relevant Performance Requirement. (NCC, vol 1, amdt 1)</p>

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