



Country Fire Authority

Metropolitan Fire & Emergency Services Board

Community Safety Directorates

Guideline 33

Performance Based Design within the Built Environment

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TABLE OF CONTENTS

1. PURPOSE	4
2. SCOPE	5
3. DEFINITIONS	6
4. VICTORIAN FIRE SERVICES OBJECTIVES	8
5. THE VICTORIAN FIRE SERVICES ROLE IN THE BUILDING APPROVAL PROCESS	9
5.1 Application for Building Permit	9
5.2 Application for Occupancy Permit	9
5.3 Chief Officer to be notified of issue of Certificate of Final Inspection	10
5.4 Chief Officer - Right of Appeal	10
5.5 Minimum Documentation Requirements	10
5.6 Modifications and Referrals	10
6. DESIGN AND APPROVAL OF FIRE SAFETY ALTERNATIVE SOLUTIONS	12
6.1 Independence	12
6.2 Registered Building Practitioners & Regulation 113	13
6.3 Building Code of Australia	13
6.3.1 To the degree necessary	13
6.3.2 Consideration of A0.5	14
6.3.3 Consideration of A0.9	14
6.3.4 Consideration of A0.10	15
6.3.5 Minimum BCA Information Required	16
7. INTERNATIONAL FIRE ENGINEERING GUIDELINES	17
7.1 Fire Engineering Process	17
7.2 Fire Engineering Brief (FEB)	18
7.3 Fire Engineering Report (FER)	18
8. FIRE BRIGADE INTERVENTION	20
9. CONCLUSION	21

ABBREVIATIONS

ABCB	Australian Building Codes Board
AFAC	Australasian Fire Authorities Council
AHJ	Authority Having Jurisdiction
AIBS	Australian Institute of Building Surveyors
BAB	Building Appeals Board
BC	Building Commission of Victoria
BCA	Building Code of Australia
CFA	Country Fire Authority
DTS	Deemed-to-Satisfy
FEB	Fire Engineering Brief
FER	Fire Engineering Report
FBI	Fire Brigade Intervention
FBIM	Fire Brigade Intervention Model
FBO	Fire Brigade Operations
IFEG	International Fire Engineering Guidelines 2005
MFB	Metropolitan Fire and Emergency Services Board
RBS	Relevant Building Surveyor
VFS	Victorian fire services (CFA and MFB)

1. PURPOSE

The principle purpose of this guideline is to identify and provide guidance to the building industry of the Victorian fire services (CFA and MFB) expectations that they be included as a major stakeholder in the development and approval of a BCA fire safety Alternative Solution.

This guideline aims to achieve this through the provision of supplementary information and advice that is not already contained within the Building Act 1993, Building Regulations 2006, the Building Code of Australia or any building or fire safety specific standard, guideline or practice note.

This guideline expands and is complementary to the legislation and framework currently identified by the International Fire Engineering Guidelines 2005, as approved and endorsed by peak industry bodies.



2. SCOPE

This guideline is relevant to all building work¹ that is carried out in the state of Victoria regardless of whether the Chief Officers of the Victorian fire services are prescribed reporting authorities for the purposes of an application for a building or occupancy permit or not.

The scope of this guideline encompasses the development of performance based fire safety building designs where the Victorian fire services are engaged as stakeholders to the development of a fire safety alternative solution either voluntarily or via the statutory process. This includes the development of:

- (a) A Fire Engineering Brief (FEB); and
- (b) A Fire Engineering Report (FER); and
- (c) Regulation 309 report and consent applications associated with the above.

Dangerous goods and planning permit issues have also been considered during the development of this document but are not directly covered by this guideline.

As the Victorian fire services objectives apply throughout all fire services functions, this guideline applies to stakeholders who are involved with project initiation, development, delivery, certification and implementation of performance based designs within the built environment.

¹ For the purposes of this guideline the terms 'Building work' also include a 'change of use' of a building

3. DEFINITIONS

The following definitions apply for the purpose of this guideline.

“Act”

Means the Building Act 1993

“Alternative solution”

Has the same meaning as Clause A1.1 of the BCA.

“Fire safety alternative solution”

Encompasses all of the performance requirements listed in the definition of “fire performance requirement” in Regulation 105 of the Building Regulations 2006.

“Analysis”

Means the process by which objectives, acceptance criteria, fire scenarios, trial concept designs and the level of evaluation, as identified in the Fire Engineering Brief, are considered and applied by the fire safety engineer for the purpose of demonstrating compliance with relevant building legislation and the relevant performance requirements of the BCA.

“Approval”

Means the granting of a building permit, occupancy permit, certificate of final inspection, certificate of compliance or a form of consent from an Authority Having Jurisdiction (AHJ).

“Assessment”

Has the same meaning as Section 0.5.1 of the International Fire Engineering Guidelines (Edition 2005), which is replicated in italics below.

“The process carried out by the AHJ, which may involve the assessing, verifying, reviewing, and / or comparing a fire engineering solution and / or alternative building solution for compliance with the BCA and adequacy of documentation to demonstrate compliance with the applicable legislation for the purpose of granting an approval.”

“BCA”

Means the Building Code of Australia and includes any amendment or replacement of the Building Code of Australia.

“Design”

Has the same meaning as Section 0.5.1 of the International Fire Engineering Guidelines (Edition 2005), which is replicated in italics below.

“This process is carried out by the fire engineer and may involve analysis, evaluation and engineering, with the aim of meeting the objective of the particular building or facility.”

“Determination”

Refers to the function undertaken by the AHJ in arriving at a decision as to whether compliance has been achieved or not.

“DTS”

Means deemed-to-satisfy, which has the same meaning as Section A1.1 of the Building Code of Australia.

“Engineering Judgement”

The ISO defines engineering judgment as:

“The process exercised by a professional who is qualified by way of education, experience and recognised skills to complement, supplement, accept or reject elements of a quantitative analysis.”

“Fire Brigade Intervention”

Means all fire agency activities from the time of notification up to fire extinguishment and overhaul and includes fire brigade operations (Appendix C refers)

“Fire Brigade Operations”

Means all fire fighter activities from time of arrival at an incident including set up, search and rescue, fire attack extinguishment and overhaul (Appendix C refers).

“Fire Engineering”

The International Organisation for Standardisation (ISO) defines fire engineering as:

“The application of fire engineering principals, rules and expert judgement based on a scientific appreciation of the fire phenomena, of the effect of fire, and the reaction and behaviour of people in order to:

- *save life, protect property and preserve the environment and heritage;*
- *quantify the hazards and risk of fire and its effects;*
- *evaluate analytically the optimum protective and preventative measures necessary to limit, within prescribed levels the consequences of fire.”*

“FSE”

Means a person who is a registered building practitioner in the category of engineer, class of fire safety engineer, in accordance with the Building Act 1993.

“RBS”

Means the relevant building surveyor, which has the same meaning as Section 3 of the Building Act 1993.

“Stakeholder”

Means all the individuals or groups that are likely to be affected by the building solution.

“Victorian fire services”

Means the Metropolitan Fire and Emergency Services Board and the Country Fire Authority.

4. VICTORIAN FIRE SERVICES OBJECTIVES

The three main legislative and corporate objectives, which govern the activities of the Victorian fire services, encompass the protection of life, property and the environment. There are however other Acts and Regulations that are specific to the built environment that may, on occasions, conflict with the Victorian fire services objectives.

Notwithstanding these inconsistencies, the Victorian fire services have a legal obligation to inform building owners, developers and property managers and any other relevant authority of any perceived risks that their buildings may pose, which adversely affects fire brigade intervention (FBI) and fire brigade operations (FBO).

The Victorian fire services advocate that any fire safety alternative solution that is developed, which addresses the fire performance requirements of the BCA, must give reasonable consideration to the following objectives.

Objective 1 - Protection of Occupants

Occupants under normally anticipated conditions, must be able to leave the building (or remain in a safe refuge until rescued by the Fire Service) without being subjected to untenable conditions;

Objective 2 - Fire Brigade Intervention

Fire fighters must be given reasonable time to enter buildings to conduct occupant search and rescue activities and to carry out internal fire fighting before exceeding conditions that are likely to threaten fire fighter safety and prior to building collapse (mitigation of unexpected catastrophic failure); and

Objective 3 - Protection of Buildings

Under reasonable circumstances, structures must not collapse onto adjacent property, and fire spread must be prevented. Furthermore, fire spread within a building must be limited.

Where the Victorian fire services identify that a fire safety alternative solution fails to reasonably consider these three specific objectives, the Victorian fire services are unlikely to offer their support to that fire safety alternative solution.

The Victorian fire services affirm their expectations that any fire safety alternative solution must also consider the broader community, economic and environmental impacts of fire.

5. THE VICTORIAN FIRE SERVICES ROLE IN THE BUILDING APPROVAL PROCESS

Section 3 of the Building Act defines a 'reporting authority' as being a person or body that the Building Act or Building Regulations requires to report on and consent to an application for a permit.

In the case of an application for a building permit or an occupancy permit, the Chief Officers of both the Country Fire Authority and the Metropolitan Fire and Emergency Services Board are prescribed as reporting authorities.

5.1 Application for Building Permit

The Chief Officer of the CFA and the Chief Officer of the MFB are a reporting authority for the purposes of the Act and regulations. Relative to an application for a building permit in relation to the prescribed matters set out in Regulation 309 (1) of the Building Regulations 2006, the Chief Officer is the prescribed reporting authority where these matters do not meet the DTS provisions of the BCA.

Regulation 309 (2) provides that the Chief Officer may consent (with recommendations if needed) to a variation of the deemed-to-satisfy requirements of the BCA if he or she is satisfied that a satisfactory degree of fire safety will be achieved by that alternative solution.

Where the Chief Officer imposes recommendations within a report in relation to a prescribed matter, Clause 7(2) of Schedule 2 of the Building Act 1993 requires that those recommendations must be implemented by the RBS in deciding an application for a building permit.

Building practitioners need to be aware that the Building Act 1993 does not prevent the Chief Officer making recommendations relating to non-prescribed fire safety matters (i.e. items not listed in Regulation 309) when taking into consideration the safety of any occupants of the building and the prevention of fire spread to or from an adjoining building or property.

The Chief Officer must be satisfied that a reasonable fire fighting environment exists and the suitable fire fighting facilities and equipment are available for the safe and effective use by occupants and attending fire fighters.

Whilst the Victorian fire services recognise that an RBS is not bound to implement any recommendations relating to non-prescribed matters, Section 23 of the Act requires the RBS to notify the Chief Officer that the recommendations will not be implemented and to also provide the Chief Officer a copy of the permit without delay from the date that the permit was issued.

In relation to an application for a Building Permit, Section 24(1)(a) of the Building Act states that:

“Subject to section 24A and Division 4, the relevant building surveyor must not issue a building permit unless he or she is satisfied that the building work and the building permit will comply with this Act and the building regulations.”

5.2 Application for Occupancy Permit

Under Regulation 1003 (1)(a), a further report and consent of the Chief Officer must be obtained in relation to the application for an Occupancy Permit where the Chief Officer was a reporting authority in respect of the application for a building permit.

In relation to an application for an Occupancy Permit, where the transmission signal of alarms are required to be connected to a fire station or other approved monitoring service, the report and consent of the Chief Officer must also be obtained in accordance with Regulation 1003 (1)(b).

Section 44 of the Building Act confirms that-

“44 Refusal of occupancy permit

The relevant building surveyor must not issue an occupancy permit under this Division—

- (a) unless the building, or the part of the building, to which the permit applies is suitable for occupation; and...”*

5.3 Chief Officer to be notified of issue of Certificate of Final Inspection

Under Regulation 1015 (2), if a Certificate of Final Inspection (CFI) is issued in respect of building work where an Occupancy Permit is not required to be obtained and where the Chief Officer was a reporting authority in respect of the application for the relevant building permit, the relevant building surveyor must notify the Chief Officer within 10 days after the issue of the CFI that the CFI has been issued.

5.4 Chief Officer - Right of Appeal

Under Section 138(5) of the Act, the Chief Officer may choose to appeal the decision of the RBS to not implement any (non prescribed) recommendations of the Regulation 309 or 1003 (1) report within the building or occupancy permit.

5.5 Minimum Documentation Requirements

When the Victorian fire services receive a report and consent application, they are legally obliged to provide a report in relation to that application for a building permit. Under these circumstances, it is imperative that the design documentation that accompanies the Regulation 309 report and consent application be clearly definitive of the proposed building and also be consistent with the documentation requirements of Regulation 301(3) shown below.

“An application for a building permit must contain sufficient information to show that the building work will comply with the Act and these Regulations and the relevant provisions of this Part.”

Additionally Regulation 302(e) of the Building Regulations requires that:

“An application for a building permit to construct a building must be accompanied by a copy of any computations or reports necessary to demonstrate that the building will, if constructed in accordance with the computations and reports, comply with the Act and these Regulations.”

It therefore follows that it is the responsibility of the applicant to demonstrate that a fire safety alternative solution achieves compliance with the BCA. It is the RBS' responsibility to ensure that the application does in fact comply and satisfies the methodology for compliance of an alternative solution in the BCA.

5.6 Modifications and Referrals

In relation to Section 160 modification applications and Section 160A referrals that are made to the Building Appeals Board (BAB), Section 162 (1) (a) (i) of the Act requires that before a determination can be made by the BAB, the BAB must consult—

“...any authority that would be a reporting authority if the application were an application for a permit; and...”

The Chief Officer of the CFA and the Chief Officer of the MFB are both reporting authorities for fire safety matters pursuant to Regulation 309 and are therefore required to be consulted by the BAB prior to determining the modification application or referral.



6. DESIGN AND APPROVAL OF FIRE SAFETY ALTERNATIVE SOLUTIONS

6.1 Independence

The design of a fire safety alternative solution and the approval of a fire safety alternative solution are two separate functions that should not, under any circumstances, be undertaken by the same building practitioner or by different practitioners that are employed by the same corporate business entity. This distinct separation between the design and approval process is further underpinned by the requirements of Section 79(1) of the Building Act 1993, which is indicated below.

79 Circumstances in which private building surveyor may not act

(1) Subject to subsection (2), a private building surveyor must not accept an appointment to carry out any functions set out in section 76 in relation to a building or building work if the private building surveyor—

- (a) prepared the design of the building or building work; or
- (b) is, or within the prescribed period was, employed or engaged by the person or body which prepared the design of the building or building work other than an appointment to carry out a function set out in section 76; or
- (c) has a direct or indirect pecuniary interest in the body which prepared the design of the building or building work; or
- (d) has a direct or indirect pecuniary interest in the building or building work or in any body carrying out the building work.

Penalty: 100 penalty units.

This view is further supported by Section A2.4 of the Building Commission Practice Note “2006-29 – Using the BCA”, which adds further clarity to the role of the RBS as indicated below.

A2.4 Assessment Methods

“The RBS’ are reminded that they can also use an assessment method to check the alternative solution, but that section 79 of the Act prohibits the RBS from designing the building work. Where an approval is based on use of an alternative solution, this means that the use of an assessment method by the RBS must not be the sole method of determining compliance”.

The Victorian fire services assert that this guidance clearly confirms that, whilst an RBS can use the assessment methods contained in part A0.9 of the BCA to determine whether a fire safety alternative solution meets the Performance Requirements, the fire safety alternative solution itself must be designed and developed by an independent practitioner as indicated within Appendix A.

The argument of independence is further supported by the Building Act in the application of Section 160A. This section of the Act enables the Building Appeals Board (BAB) to determine whether a particular design of a building or an element of a building complies with the Act, the Building Regulations or any document applied, adopted or incorporated in the Building Regulations. This is important to note, as this BAB function is available to any building surveyor who wishes to maintain a level of independence. The risk to a building surveyor in issuing a building permit which includes alternative solutions which have been determined by the BAB as meeting the performance requirements of the BCA is substantially reduced. This process of an independent panel of industry peers reviewing and making a determination ultimately supports maintaining the independence of the Building Surveyor.

6.2 Registered Building Practitioners & Regulation 113

Notwithstanding Section 160 modification applications and Section 160A referral applications to the BAB that are made under the Act, the Victorian fire services consider that the design of a fire safety alternative solution that encompasses the fire safety performance requirements of the BCA, should only be undertaken by a building practitioner registered in the category of Fire Safety Engineer.

Additionally, the Victorian fire services consider that it is appropriate that only Building Surveyors who hold the prerequisite academic qualifications referred to in regulation 113 (a) to be suitably qualified to carry out the determination function referred to in regulation 113 (c).

Regulation 113 confirms that -

“Despite anything to the contrary in the BCA... it is the Relevant Building Surveyors role to determine that an alternative solution complies with a fire performance requirement of the BCA.”

The Victorian fire services recommend that when an RBS assesses a building permit application for a proposed fire safety alternative solution, the RBS should engage a competent ‘third party’ practitioner to review the submitted design. The ‘third party’ practitioner conducting any such review should be an independent person (see Appendix A) and be a registered fire safety engineer (FSE) with the Building Practitioners Board. The Victorian fire services also believe that it is desirable for the ‘third party’ practitioner to be a Professional Engineer on the National Professional Engineers Register (NPER).

Consequently the Victorian fire services’ submit that—

It is not the relevant building surveyor’s role to design the fire safety alternative solution.

6.3 Building Code of Australia

The provisions of the BCA, in particular the ‘performance requirements’ represent the legal benchmark that all building solutions must satisfy. Regulation 109 of the Building Regulations 2006 makes it clear that the BCA is adopted into and forms part of the Regulations. Clause A1.5 of the BCA also makes it clear that buildings must be designed and constructed so that they comply with all relevant provisions in sections A to I (inclusive) of the BCA.

In relation to determining whether a fire safety alternative solution complies with the fire performance requirements of the BCA (Regulation 113 refers), the RBS must not make a determination unless he or she has certain qualifications or relies on particular certificates.

6.3.1 To the degree necessary

The applicability of the fire performance requirements of the BCA to a building solution are governed by the words ‘to the degree necessary’. Clause A1.7 (b) of the BCA deals with the interpretation of the words ‘to the degree necessary’, and states that—

“A reference in a Performance Requirement of the BCA to “the degree necessary” means that consideration of all the criteria referred to in the performance requirement will determine the outcome appropriate to the circumstances. These words have been inserted to indicate that in certain situations it may not be necessary to incorporate any specific measure to meet the Performance Requirement.”

This interpretational provision of the BCA acknowledges that ‘to the degree necessary’ is intended to mean that the specific measure in a performance requirement may not always be required, but the outcome must be determined by considering all of the criteria in the performance requirement.

6.3.2 Consideration of A0.5

The basis of any fire safety alternative solution should be consistent with the compliance regime that is outlined in Clause A0.5 of the BCA in that it should specify how each Performance Requirement will be satisfied.

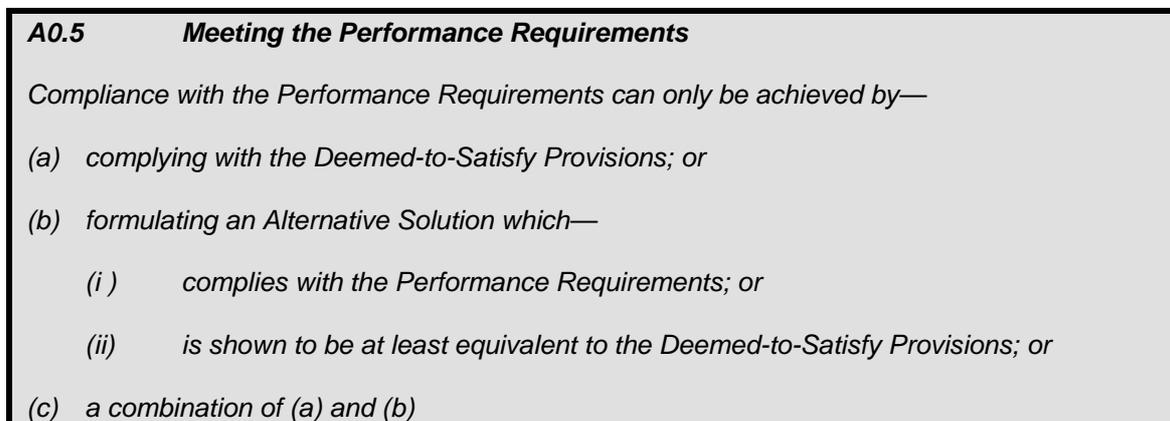


Figure 6.1 – Clause A0.5 of the BCA

6.3.3 Consideration of A0.9

Clause A0.9 lists the assessment methods that are available to building practitioners when undertaking analysis or assessment.

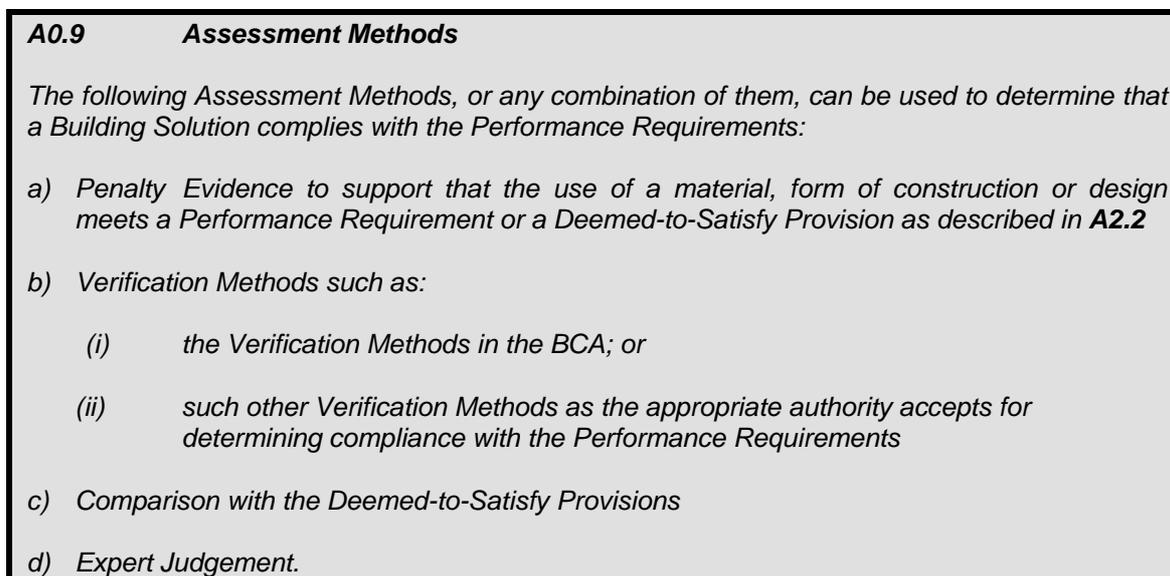


Figure 6.2 – Clause A0.9 of the BCA

In relation to the 'Comparison with the Deemed-to-Satisfy provisions' assessment method listed in clause A0.9 (c) of the BCA, the Victorian fire services consider that the use of this method must be supported by—

- A suitable mix of qualitative and quantitative analysis where the extent of qualitative or quantitated analysis is discussed and agreed upon by all stakeholders as part of the Fire Engineering Brief stage.
- A direct measurement of the applicable DTS solution that is relevant to the proposed Building Solution is to be undertaken, i.e. The comparative analysis must consider the same building classification, type of construction, number of storeys, egress provisions and any active and passive fire safety protection systems that would ordinarily be present in the applicable DTS solution.

The Victorian fire services consider that the use of A0.9 (d) – Expert Judgement, should only be utilised where the options provided by A0.9 (a), (b) and (c) have been exhausted. If expert judgement is ultimately utilised to analyse a design, the VFS strongly recommends that a 'third party' practitioner be appointed to independently review the proposed 'Expert Judgement'. The 'third party' practitioner conducting any such review should be an independent person (see Appendix A) and be a registered fire safety engineer (FSE) with the Building Practitioners Board.

The extent to which any assessment method is proposed to be used within the design of the fire safety alternative solution should be discussed and agreed upon by all stakeholders as part of the FEB development.

If during the course of analysis it is identified that a Deemed-to-Satisfy requirement will not meet the relevant Objective(s), Functional Statement(s) and / or Performance Requirement(s) of the BCA, comparison with this Deemed-to-Satisfy requirement becomes redundant and will not be supported by the Victorian fire services. A typical example of this will be disabled egress provisions where there is not a Deemed-to-Satisfy requirement.

6.3.4 Consideration of A0.10

Clause A0.10 of the BCA outlines how the relevant Performance Requirements are required to be selected and met to determine that a fire safety alternative solution complies with the BCA.

<p>A0.10 <i>Relevant Performance Requirements</i></p> <p><i>In order to comply with the provisions of A1.5 (to comply with Sections A to J inclusive) the following method must be used to determine the Performance Requirement or Performance Requirements relevant to the Alternative Solution:</i></p> <p>(a) <i>Identify the relevant Deemed-to-Satisfy Provision for each Section or Part that is to be the subject of the Alternative Solution.</i></p> <p>(b) <i>Identify the Performance Requirements from the same Sections or Parts that are relevant to the identified Deemed-to-Satisfy Provisions.</i></p> <p>(c) <i>Identify Performance Requirements from other Sections and Parts that are relevant to any aspects of the Alternative Solution proposed or that are affected by the application of the Deemed-to-Satisfy Provisions, that are the subject of the Alternative Solution.</i></p>

Figure 6.3 – Clause A0.10 of the BCA

Practitioners should be aware that when designing or assessing a fire safety alternative solution, they should clearly stipulate within their design and assessment documentation, the chosen compliance mechanism and the assessment method(s) that have been used in determining that the fire safety alternative solution complies with the Performance Requirements of the BCA.

The Victorian fire services also contend that identification of the relevant Performance Requirements is fundamental to the design and approval of a fire safety alternative solution. In particular, appropriate consideration must be given to addressing A0.10 (c) to ensure that all sub-systems of a fire safety design are addressed by the analysis. A good example of this process is contained within Section 1.2.8.2 of the IFEG.

6.3.5 Minimum BCA Information Required

In all instances, the practitioner undertaking the design of the fire safety alternative solution should ensure that the following minimum information is included within the fire safety alternative solution documentation.

- i. An indication as to how the performance requirement will be met, i.e. by formulating a fire safety alternative solution that complies with the performance requirements [A0.5 (b)(i)], demonstrating that the design is equivalent to the deemed-to-satisfy solution [A0.5 (b)(ii)] or via combination of deemed-to-satisfy and fire safety alternative solution [A0.5 (c)]; and
- ii. The identification of the chosen assessment method or methods which will be used to demonstrate how their fire safety alternative solution(s) will comply with the relevant performance requirements of the BCA [A0.9]; and
- iii. The identification of relevant DTS provisions and both the directly and indirectly related Performance Requirements of the BCA, consistent with Clause A0.10.

If this information is not documented within the fire safety alternative solution, the Victorian fire services, the RBS or any other third-party peer-reviewer cannot satisfactorily undertake an accurate assessment of the fire safety alternative solution as they are not fully aware of the philosophy of the design.

7. INTERNATIONAL FIRE ENGINEERING GUIDELINES

The International Fire Engineering Guidelines 2005 (IFEG) is recognised as an appropriate framework for developing a fire safety alternative solution and is endorsed by the following bodies.

- Australian Institute of Building Surveyors (AIBS)
- Australasian Fire Authorities Council (AFAC)
- Institute of Engineers Australia – Society of Fire Safety
- Australian Building Codes Board (ABCB) ²

The IFEG recognise that fire brigade intervention is a significant design consideration when a fire safety alternative solution is developed that addresses the fire performance requirements of the BCA. Accordingly, the Victorian fire services consider themselves to be a legitimate stakeholder in any design process associated with the development of a fire safety alternative solution relating to fire safety.

Part A2.3.1 of Building Commission Practice Note 2006-29 endorses the use of the IFEG as follows:

A2.3.1 International Fire Engineering Guidelines

The International Fire Engineering Guidelines provide a link between the regulatory system and fire engineering and provides guidance for the process of fire engineering along with methodologies and data that can be used by suitably qualified and competent practitioners (refer to regulation 113).

Figure 7.1 – Part A2.3.1 Building Commission Practice Note 2006-29

7.1 Fire Engineering Process

Section 1.1.1 of the IFEG expresses the typical fire engineering process in five general stages. This process is reproduced below.



Figure 7.2 – Figure 1.1.2 of IFEG Typical fire engineering process

Having established this typical process, the IFEG provides guidance on how each step in the process should be addressed.

The Victorian fire services expect that as a minimum, the fire engineering process indicated in Figure 7.2 to be followed when developing a fire safety alternative solution that addresses the fire performance requirements of the BCA. The Victorian fire services further expect that the degree of adherence to the fire engineering process outlined in the IFEG is a matter that must be discussed and consented to by all the relevant stakeholders at the Fire Engineering Brief (FEB) stage.

² The Australian Building Codes Board are the publishers of the IFEG 2005.

7.2 Fire Engineering Brief (FEB)

Section 1.2 of the IFEG provides the following commentary in relation to the importance of developing a FEB.

“The FEB is an essential part of the fire engineering process. Where appropriate it allows the broader community aspirations to be taken into account during the development and evaluation of alternative solutions, whilst at the same time ensuring that levels of safety accepted by the community are maintained.

In the case of a fire engineering analysis that considers a simple departure from a deemed-to-satisfy or prescriptive provision of the relevant building code, the FEB might be a short document, however for large and / or complex projects the FEB could be a major document.

Ideally, the FEB should be developed collaboratively by all the relevant stakeholders but this may vary according to the particular circumstances of the project as discussed in Section 1.2.2 of the IFEG.”

Figure 7.3 – IFEG discussion regarding importance of FEB

Chapter 1.2 of the IFEG provides clear guidance on the development of a FEB. This includes a breakdown of each step in the process and the type of information that should be presented to relevant stakeholders to comment on in relation to the development of a fire safety alternative solution. The Victorian fire Services expects a FEB to be prepared and developed by a registered Fire Safety Engineer.

Where the Victorian fire services are consulted and contribute to the development of a FEB during the stakeholder consultation process, the outcomes of the subsequent analysis and conclusions drawn from the parameters set by the FEB are likely to be supported during the building approval process.

Where the Victorian fire services are not consulted in relation to the development of a FEB it is likely that the outcomes of the FER will not meet the Victorian fire services objectives. In these instances the FSE and the other design team stakeholders will be informed that the Victorian fire services are unable to endorse the outcomes of the fire safety alternative solution represented in the FER.

Appendix B of this document provides a general indication on how the Victorian fire services approach reviewing a FEB and examples of questions that are likely to be asked with respect to each step in the process.

7.3 Fire Engineering Report (FER)

The framework that is associated with the preparation of a fire engineering report (FER) and the manner in which it is presented to an FEB Stakeholder, the AHJ, Victorian fire service representatives or the third party peer reviewer, is generally outlined within Section 1.11.2 of the IFEG.

Notwithstanding the limitations of this framework, the Victorian fire services maintain that—

- i. Any reports that are submitted to them for consideration or review be listed or identified as ‘STAKEHOLDER REVIEW’ or ‘FINAL’ versions;
- ii. The FERs be legible, appropriately structured, contain qualified recommendations as well as appropriate references to Appendices, i.e., fire modelling results, FBIM, minutes of meetings, fire test data, water authority hydraulic reference data, etc.;
- iii. The referenced working design documentation be clearly identified within the FER (including the date and revision number);
- iv. The FER should reference the FEB that was endorsed by the stakeholder group;

- v. Where a FEB has not been compiled and agreed to by all relevant stakeholders, then it should be clearly stated within the FER; and
- vi. Where a variation to a prescribed fire safety matter is proposed (under Regulation 309) or a variation to the fire alarm connection arrangements is proposed (under Regulation 1003), the FER should account for any impact of those variations on the assessment and or the assumptions made in the assessment.

8. FIRE BRIGADE INTERVENTION

The assessment of fire brigade intervention (FBI) is a significant consideration when a fire safety alternative solution is developed, which encompasses any one or all the ten (10) fire performance requirements of the BCA that specifically encompass fire brigade intervention. In order for these performance requirements to be satisfied, the assessment of FBI must be considered in the design process of a fire safety alternative solution

What is Fire Brigade Intervention?

FBI encompasses all fire brigade activities from the time of notification up to fire extinguishment and overhaul, and includes fire brigade operations.

Contained within Appendix C of this guideline is a graphical interpretation of the terms 'fire brigade intervention' and 'fire brigade operations' as defined by the Australasian Fire Authorities Council (AFAC).

The use of the AFAC Fire Brigade Intervention Model (FBIM) is one such engineering tool that can be utilised to address the fire performance requirements of the BCA where FBI is a consideration. The tool can be utilised by practitioners to determine the time taken for the attending fire brigades to complete tasks commencing from fire notification through to fire control and extinguishment.

Consultation with the Victorian fire services during the FEB stakeholder consultation stage will determine the extent of a FBI assessment within an FER.

The Victorian fire services contend that an FER that simply acknowledges the location of fire stations and the indication of a 90% percentile kerb side arrival time, does not appropriately constitute the assessment of fire brigade intervention.

In all instances, the assessment of FBI should conclusively demonstrate that fire fighters will be given a reasonable period of time to enter a building, to conduct occupant search and rescue activities. Additionally the assessment of FBI should also demonstrate that fire fighters are able to carry out containment and extinguishment operations, before the conditions within the building are likely to threaten their safety and prior to the collapse of the building (mitigation of unexpected catastrophic failure).

Supplementary information and guidance to the AFAC FBIM can also be obtained within MFB Guidelines GL-17 and GL-20, regardless of the building location in the first instance.

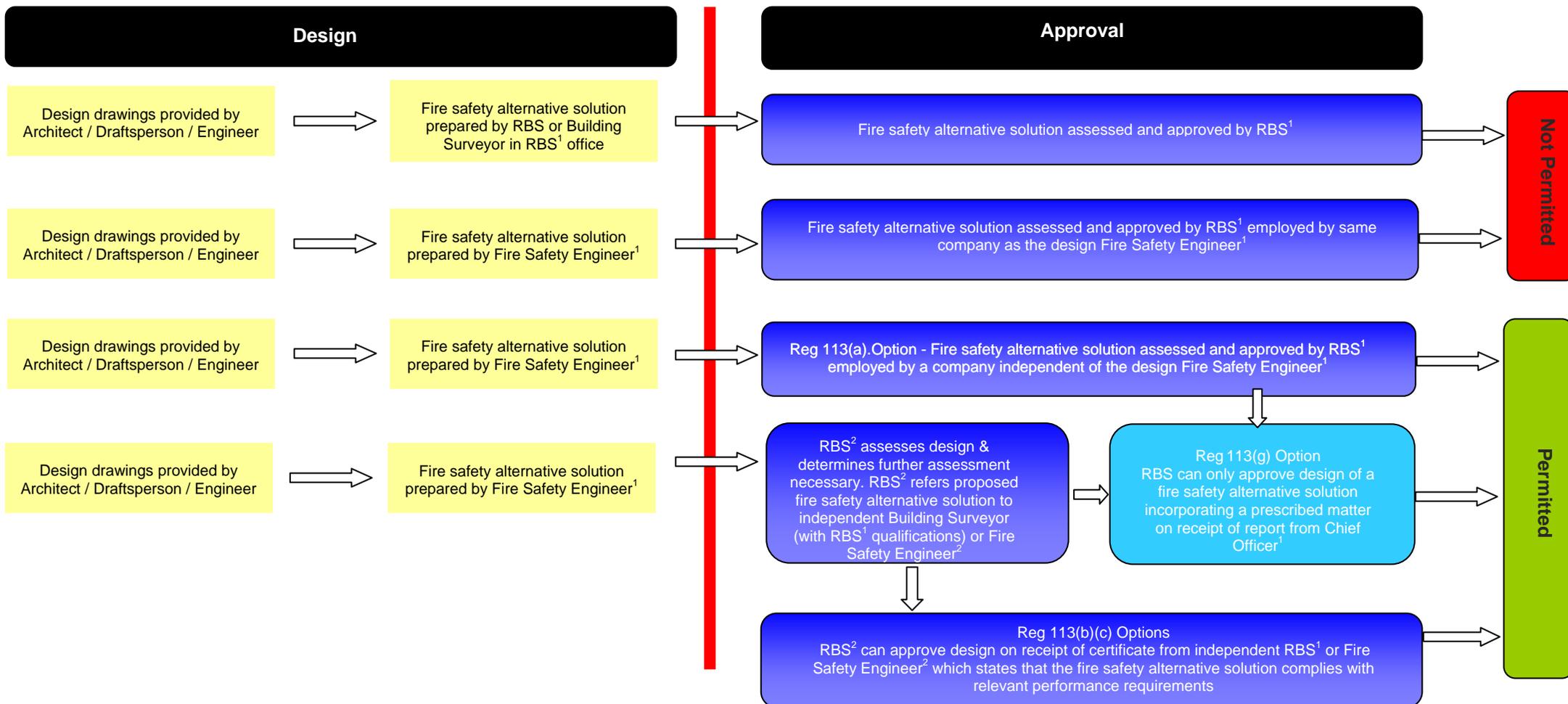
9. CONCLUSION

The safety of the Victorian community and the built environment that exists within it, can only be maintained when the practitioners involved in the building design and approval process, properly uphold the legal requirements of the (Victorian) Building Act and Regulations, as well as the technical provisions of Building Code of Australia and the industry endorsed International Fire Engineering Guidelines. Those practitioners who concurrently utilise these documents with the principles and information contained within this Guideline during the building design and approval process, will generally ensure that the Victorian community's interests will be safe guarded.



APPENDIX A –

Independence of Design and Approval



RBS¹ = Building Practitioner registered in the category of Building Surveyor who is the Relevant Building Surveyor for the project in accordance with the Building Act 1993 and holds the Graduate Certificate in Performance Based Building and Fire Codes from Victoria University or Approved Equivalent in accordance with Regulation 113(a) of the Building Regulations 2006.

RBS² = Building Practitioner registered in the category of Building Surveyor who is the Relevant Building Surveyor for the project in accordance with the Building Act 1993

Fire Safety Engineer¹ = Building Practitioner registered in the category of Fire Safety Engineer who prepared the design

Fire Safety Engineer² = Building Practitioner registered in the category of Fire Safety Engineer who did not prepare the design

Note: this table does not indicate options for determining approval offered by regulations 113(d), 113(e) and 113(f) which are valid options in accordance with the regulations.

APPENDIX B –

General questions that may be asked at the Fire Engineering Brief stage

Scope of Project	Extent of project
Relevant Stakeholders	The Victorian fire services may also indicate Worksafe or other agencies. Are the owner and Insurer aware of the design?
Principal Building Characteristics	Do these adequately reflect the proposed use—including disabled occupants?
Dominant Occupant Characteristics	Do these adequately detail the proposed building construction and reflect the proposed use—including disabled occupants?
General Objectives	Are the Fire Services objectives incorporated?
Hazards and Preventative and Protective Measures	Have all likely hazards been identified? Have appropriate preventive and/or protective measures been identified, including those to assist fire brigade intervention? For example have BCA Clauses E1.10 and E2.3 been considered?
Trial Designs for Assessment	Do trial designs reflect reasonable options?
Non-compliance Issues and Specific Objectives or Performance Requirements	Have all the DTS non-compliance been identified? Have all the relevant DTS provisions and performance requirements been identified in accordance with clause A0.10 of the BCA? What assessment method(s) is proposed under A0.9 of the BCA?
Approaches and Methods of Analysis	Is comparative or absolute analysis proposed? Will deterministic or probabilistic approaches be used? Are the above processes appropriate? Is adequate sensitivity analysis proposed? How will fire brigade intervention be analysed?
Acceptance Criteria and Factors of Safety for the Analysis	Do the acceptance criteria reflect the General Objectives? Has fire brigade intervention & tenability criteria been incorporated? Are factors of safety adequate?
Fire Scenarios & Parameters for Design Fires	Are fire scenarios proposed credible? Are design fire sizes supported by scientific test data or recognised reference material?
Parameters for Design Occupant Groups	Have the most common, influential or vulnerable occupant groups been identified? Has the design considered disabled egress?
Standards of Construction, Commissioning, Management, Use and Maintenance	Is required maintenance possible? Is required management or use realistically achievable? How will these requirements be captured in the approval process? Are the owner and insurer aware?
The FEB Report	Has the FEB Report been agreed to by all relevant stakeholders?

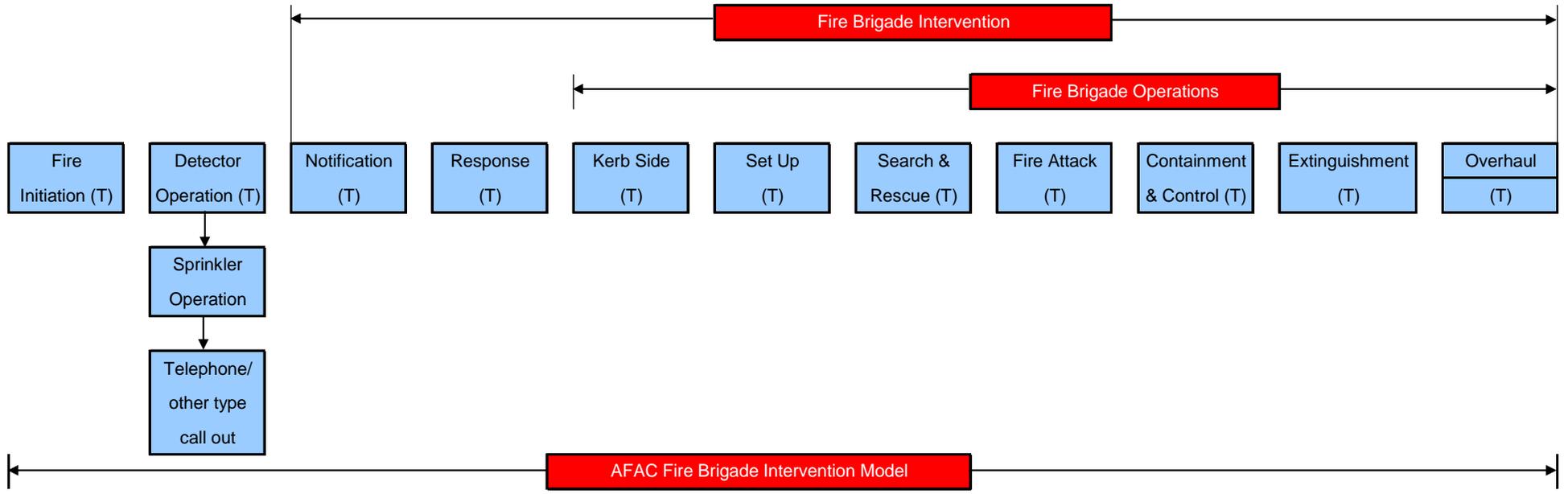
APPENDIX C – Fire Brigade Intervention

Fire Brigade Intervention:

All fire agency activities from the time of notification up to fire extinguishment and overhaul, and includes fire brigade operations.

Fire Brigade Operations:

All fire fighter activities from the time of arrival at an incident, including set up, search and rescue, fire attack extinguishment and overhaul.



APPENDIX D –

Performance Requirements relating to Fire Brigade Intervention

- CP1: Structural stability appropriate to fire brigade intervention.
- CP2: Avoid fire spread within and between buildings appropriate to fire brigade intervention.
- CP9: Access for fire brigade vehicles and personnel.
- DP5: Fire isolated exits appropriate to fire brigade intervention.
- EP1.3: Fire hydrant design to facilitate the needs of the fire brigade.
- EP1.5: Suitable means for the brigade to undertake a fire attack.
- EP1.6: Suitable facilities in a building to coordinate fire brigade intervention.
- EP2.2: Occupant evacuation time appropriate to fire brigade intervention.
- EP3.2: Emergency lifts to facilitate fire brigade activities.
- GP4.4: Fire safety system for a building in an alpine area to facilitate fire fighting operations.