



# Process for the development of Performance Solutions

## Regulation Impact Statement for decision 2020

The Australian Building Codes Board has developed this Decision Regulation Impact Statement, which accords with the requirements of *Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies*, as endorsed by the Council of Australian Governments in 2007. Its purpose is to inform interested parties and to assist the Australian Building Codes Board in its decision making on proposed amendments to the National Construction Code.

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## Version history

Original

Publish date: May 2020

Print version: 1.0

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## Glossary

Term	Meaning
Deemed-to-Satisfy Provisions	Means provisions which are deemed to satisfy the Performance Requirements.
Performance Requirement	Means a requirement which states the level of performance which a Performance Solution or Deemed-to-Satisfy Solution must meet.
Performance Solution	Means a method of complying with the Performance Requirements other than by a Deemed-to-Satisfy Solution.

## Acronyms

Abbreviation	Full Name
ABCB	Australian Building Codes Board
AIA	Australian Institute of Architects
AIBS	Australian Institute of Building Surveyors
AIRAH	Australian Institute of Refrigeration, Air-Conditioning and Heating
BCA	Building Code of Australia
BCR	Building Confidence Report
COAG	Council of Australian Governments
DTS	Deemed-to-Satisfy
EA	Engineers Australia
HIA	Housing Industry Association
IFEA	Institute of Fire Engineers Australia
IFEG	International Fire Engineering Guidelines
IRCC	Inter-jurisdictional Regulatory Collaboration Committee
MBA	Master Builders Australia
MPA	Master Plumbers Association
NCC	National Construction Code
OBPR	Office of Best Practice Regulation
PBDB	Performance-based Design Brief
PCA	Plumbing Code of Australia
PS	Performance Solution
RICS	Royal Institute of Chartered Surveyors
RIS	Regulation Impact Statement
SFS	Society of Fire Safety
UDA	(National) Urban Development Institute
VM	Verification Method

## Introduction

### Performance-based building code

Governments have long supported a focus on outcomes rather than inputs where a case for regulation is established. By communicating the level of desired performance and avoiding prescription, the objective of the regulation can be achieved with the added benefits of freedom and flexibility for innovation and unnecessary restrictions on competition minimised. Such requirements are referred to as 'performance-based' regulations (Performance).

Performance-based codes rely on three elements, a code, acceptable solutions and design and evaluation tools. When the performance-based building code was introduced in Australia as the Building Code of Australia (BCA) 1996, the first two elements were already well developed. These informed the expectations that would be set through the Performance Requirements, which at a mandatory level, describe the community expectations a building must meet.

Historically, compliance was considered against prescriptive Deemed-to-Satisfy (DTS) Provisions. However, with buildings becoming increasingly complex mixes of classifications (uses), and innovative designs and materials becoming more prevalent, rigid building approval systems also needed to evolve through verification frameworks. Initially, no framework for the evaluation of 'alternative solutions' (i.e. Performance Solutions) or the methods for their assessment was mandated. It also meant uptake of Performance, was slow as it required expert judgements to be routinely made. This led to some within industry to question the appropriateness of such regulatory systems, despite an overarching advocacy for flexibility.

### ABCB Guidelines on the use of Performance

As part of its efforts to encourage the increased and competent use of Performance and avoid conflicting with state governments' role in administering the provisions, the ABCB produced a number of guidelines and education materials to support the use of

Performance Solutions. Most recently, an ABCB guidance document has been developed with the assistance of industry and governments.<sup>1</sup>

## **Review finds building regulatory system in need of reform**

Following a number of high-profile building failures, a review of building regulatory systems found public confidence in industry's ability to deliver safe building outcomes is diminishing.<sup>2</sup> The Building Ministers Forum (BMF) in 2017, commissioned Professor Peter Shergold AC and Ms Bronwyn Weir to undertake an expert assessment of Australia's building regulatory and compliance systems. Their Building Confidence Report (BCR) found systematic issues and set out a series of recommendations aimed at ensuring compliance and enforcement systems deliver buildings that meet the objectives of the NCC and improve public trust in building regulatory systems. The BCR recommendations aim to address, as a package, issues that can occur at all stages of the construction process, from design to occupation and use,. The twenty four recommendations from the BCR are designed as a cohesive response aimed at addressing significant and systematic deficiencies in the registration and training of practitioners, roles and responsibilities of regulators, the role of fire authorities, integrity of building surveyors, collecting and sharing information, adequacy of documentation and record keeping, inspection regimes, post construction management, building product safety and complexity of buildings.

The BMF has provided in-principle support to the report and implementing the BCR recommendations nationally. The approach to Performance Solutions is singled out in two recommendations, for their lack of adequate processes and required documentation, resulting in:

- some new buildings not achieving compliance with the NCC's Performance Requirements; and

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<sup>1</sup> The Guideline was endorsed by IFEA, MPA, UDI, RICS, EA, AIA, HIA, MBA, AIRAH and AIB. See: <https://www.abcb.gov.au/Resources/Publications/Education-Training/Development-of-Performance-Solutions>

<sup>2</sup> Weir, B Shergold. P, (2018) Building Confidence Report.

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- some building approvals not providing transparency and accountability for decisions associated with Performance Solutions.

## **Mandating ABCB process for development of Performance Solutions**

The NCC amendment sits within the Building Confidence National Framework (National Framework) and contributes to helping implement BCR recommendations 8 and 14, ensuring expectations of the process for Performance Solutions are clearly articulated. Effectiveness is, however, reliant on the remaining BCR recommendations to address, more fundamentally cultural, competency and enforcement issues that affect the implementation of the NCC.

While some states have commenced consulting on potential changes to their administrative systems, the ABCB has been tasked with assisting with the National Framework.<sup>3</sup> Within this Framework, a proposal to formalise a process for the development of Performance Solutions has emerged.

This Decision Regulation Impact Statement (RIS) examines a proposal that seeks to mandate the process set out in the ABCB guideline on the development of Performance Solutions to ensure all building and plumbing Performance Solutions are appropriately developed and documented. Amendments to the NCC's Governing Requirements would require the process to be followed as a general obligation when preparing a Performance Solution.

It is proposed that all Performance Solutions be:

- developed under a nationally consistent process, where stakeholder involvement, expertise and testing and/or modelling is commensurate with the technical complexity and risk associated with the solution, and;

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<sup>3</sup> Building Ministers' Forum Communique, July (2018). Available from: <https://www.industry.gov.au/sites/default/files/2019-07/bmf-communique-18-july-2019.pdf>

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- clearly documented with respect to the levels of safety and health, amenity and accessibility, and sustainability delivered.

This Decision RIS focuses on the marginal impacts of changing current practice for assessment and documentation of Performance Solutions and the administrative regulatory burden. It does not assess the merits or value of performance-based codes, the benefits of which are well established by previous reports.

The Decision RIS is based on the Consultation RIS released between 24 February and 22 March 2020. Feedback from stakeholders is summarised in the consultation section. Where specific issues and evidence was received, discussion and analysis is updated throughout the Decision RIS.

## Background

### National Construction Code (NCC)

The introduction of the performance-based BCA in 1996 formalised the outcomes or targets for what were then described as ‘alternative solutions’, now ‘Performance Solutions’ for any area of construction regulated by the NCC.<sup>4</sup> The NCC is given legal effect by building legislation in each state and territory. This legislation consists of an Act of Parliament and subordinate legislation (e.g. building Regulations), which empower the regulation of certain aspects of buildings and structures and contains the administrative provisions necessary to support and give effect to the legislation.

The NCC is subordinate legislation to a state or territories Building Act and Regulations and enactment is acknowledged as the domain of individual building or plumbing administrations. Administration covers a range of building-related issues, including roles and responsibilities within the system for design, certification, issuance of permits, inspections, occupancy certificates and accreditation of materials and components, proportionate liability, private certification, dispute resolution, registration, compliance and enforcement. The assessment and approval of a building solution against the NCC is a state function, administered by a combination of local authorities (e.g. councils) and private building surveyors.

### International Fire Engineering Guidelines (IFEG) for Performance Solutions

In 2002, key stakeholders (Australasian Fire and Emergency Service Authorities Council (AFAC), Australian Institute of Building Surveyors (AIBS) and the Society of Fire Safety (SFS)) expressed concern about the appropriateness of the processes being used for Performance Solutions for fire safety and formally raised the issue with governments. In response, the ABCB, in collaboration with industry, delivered a seminar series in capital cities promoting the use of appropriate processes. The

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<sup>4</sup> With the expansion of the NCC, areas of construction regulated by the NCC now include fire, health and safety, amenity, accessibility and energy efficiency and plumbing.

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message focused on a process for defining the solution, analysis, stakeholder engagement and documentation and would go on to be reflected in the International Fire Engineering Guidelines (IFEG).<sup>5</sup> Fire related Performance Solutions developed and documented in accordance with the IFEG are widely accepted as more likely to deliver an outcome that satisfies the intent and expectations of the NCC due to the rigour of its process. In 2015, another seminar series was undertaken to address similar stakeholder concerns.

Since 2014, the ABCB has been consulting with industry and government on ways to improve the use of the performance-based NCC and the uptake of performance-based design. Predominantly, this has involved research and development of methods to quantify the Performance Requirements. These efforts have resulted in some stated targets for Performance Requirements and often quantified by Verification Methods (VMs). Some VMs prescribe processes and documentation in recognition that approval and acceptance of Performance Solutions is an inherently administrative task that goes beyond technical verification. Examples of such VMs includes the Fire Safety Verification Method (FSVM), Access VM DV2 in NCC Volume One.

## **ABCB Guideline for the Development of Performance Solutions**

The ABCB also produces non-mandatory guidance documents to assist in the preparation and assessment of Performance Solutions. The ABCB 'Guideline for the Development of Performance Solutions'<sup>6</sup> was adapted from the IFEG process in recognition that a Performance Solution can be used in any other area of the NCC. It was developed in association with and endorsed by key industry stakeholders, including the ABCB's national technical committees, the Building Codes Committee (BCC) and Plumbing Codes Committee (PCC).

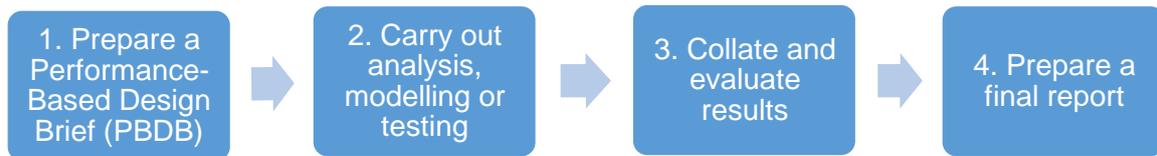
The Guideline consolidated the IFEG process into four steps as follows:

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<sup>5</sup> IFEG produced by ABCB with NRC in Canada, ICC in United States of America, DBH New Zealand was published in 2005.

<sup>6</sup> Available from: <https://www.abcb.gov.au/Resources/Publications/Education-Training/Development-of-Performance-Solutions>.

Figure 1 Model Performance Solution Process



Key to the process is the development of a Performance-Based Design Brief (PBDB), to define the proposed solution, the applicable NCC Performance Requirements, acceptance criteria and the assessment methods. The emphasis of the IFEG and the Guideline is on stakeholder involvement in the PBDB, to define the risks and complexity of the design. The remaining steps are required to be undertaken to an extent proportionate to the proposals' risk and complexity.

## Existing state and territory guidance and requirements

State and territory governments have also responded to the absence of a formal verification framework by providing guidance on the development of Performance Solutions. For example, the Victorian Government has a practice note on the development of Performance Solutions that has been in place since 2014.<sup>7</sup> The Victorian Building Regulation, Regulation 38, provides general direction on the development and documentation of Performance Solutions.<sup>8</sup> The Western Australian Government has also published guidance on the development of Performance Solutions,<sup>9</sup> but is limited in application to housing and fire safety.

Stakeholder involvement is also required to some extent in jurisdictions. In New South Wales (NSW), referral to the fire brigade is a requirement of building approval for fire

<sup>7</sup> Updated in 2018, See: [https://www.vba.vic.gov.au/\\_data/assets/pdf\\_file/0007/45844/Industry-Guide-Performance-Solutions.pdf](https://www.vba.vic.gov.au/_data/assets/pdf_file/0007/45844/Industry-Guide-Performance-Solutions.pdf)

<sup>8</sup> Victorian Building Regulations (2018) Retrieved from: [http://www.legislation.vic.gov.au/domino/Web\\_Notes/LDMS/LTObject\\_Store/ltobjst10.nsf/DDE300B846EED9C7CA25761600A3571/2E7A3D35A8D6F9C6CA2582C600815A1B/\\$FILE/18-38sra004%20authorised.pdf](http://www.legislation.vic.gov.au/domino/Web_Notes/LDMS/LTObject_Store/ltobjst10.nsf/DDE300B846EED9C7CA25761600A3571/2E7A3D35A8D6F9C6CA2582C600815A1B/$FILE/18-38sra004%20authorised.pdf)

<sup>9</sup> Performance Solutions for housing projects (2018) See: [https://www.commerce.wa.gov.au/sites/default/files/atoms/files/ib\\_102\\_performance\\_solutions\\_for\\_housing\\_projects.pdf](https://www.commerce.wa.gov.au/sites/default/files/atoms/files/ib_102_performance_solutions_for_housing_projects.pdf)

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safety matters specified by their regulations<sup>10</sup>; in Victoria referral is required for a fire safety system that does not meet the DTS Provisions<sup>11</sup>; in Queensland referral extends to a Performance Solution for a residential or residential care building<sup>12</sup>; and in Western Australia, in commercial buildings where a Performance Solution is proposed. Additionally, in Western Australia the Building Act requires the Fire and Emergency Services (FES) Commissioner to be provided with detail to enable an assessment of the building against the brigade's operational requirements.<sup>13</sup>

In Tasmania, the fire engineer is required to possess the requisite skills, competence and experience in the area where they are practicing. The building surveyor is required to review the Performance Solution and determine whether or not the proposed solution is likely to achieve an acceptable level of performance. In the case of fire safety, in preparing their assessment the building surveyor is required to refer the proposal to the Tasmania Fire Service (TFS) for its comments on the operational aspects of the Performance Solution. If the building surveyor does not implement the recommendations, the TFS can appeal to the Resource Management Planning Appeals Tribunal (RMPAT) against the decision.

A lack of national consistency and uniformity in the regulation and guidance of Performance Solutions exists where governments attempt to address this issue at a state level. This patchwork approach does little for national companies, product manufacturers or proactive national industry associations attempting to deliver compliant processes, products, education or training.

Similarly, some states require documentation of decisions for Performance Solutions:

- Notification, under Western Australian Building Regulation 16(3)(b) , if the application of a building permit is in respect to a Class 1 or Class 10 building, details of the Performance Solution that is proposed to be used must accompany the application.<sup>14</sup>

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<sup>10</sup> See Clause 144A of the Environmental Planning and Assessment Regulations 2000.

<sup>11</sup> Victorian Building Regulations (2018) Schedule 8, Regulation 129.

<sup>12</sup> Queensland Sustainable Planning Regulation (2009), Table 1, Schedule 7.

<sup>13</sup> Consulting with referral authorities, such as the fire brigade, does not amount to an obligation to adopt their advice or recommendations.

<sup>14</sup> Western Australian Building Regulations (2012) Part 3, Clause 18B for Class 2- 9 buildings.

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- The Queensland Fire and Emergency Services scope of referral in Schedule 9 of the Planning Regulation 2017 includes all buildings with special fire services, in addition to all fire safety related Performance Solutions . The Queensland Building Act requires a statement of reasons in the decision notice when approving a Performance Solution, including how the building work complies, how the building work differs from the DTS Provisions and any test results and reports relied upon as the basis of decision.<sup>15,16</sup>
- The Victorian regulations require that, in issuing a building permit or certificate of compliance, the relevant building surveyor record in writing the Performance Requirement that the solution complies with and details of any assessment methods, expert judgement, details of any test or calculations, standards or other information they rely on in making the decision.<sup>17</sup>
- In 2017, the NSW Government introduced a number of reforms to enhance the fire safety of new and existing buildings. These reforms included new requirements for the provision of a 'Performance Solution report' for developments incorporating Performance Solutions relating to a 'fire safety requirement'. Among other things, the report must include a copy of the brief on which the justification for the Performance Solution is based. Performance Solution reports are not required for Class 1a and 10 buildings.<sup>18</sup>

The Consultation RIS asked stakeholders: where they were aware of other circumstances in which documentation was mandatory?

Forty per cent of all respondents noted jurisdictional differences.

One respondent advised that mandatory documentation was required in Queensland in all cases where Performance Solutions are used. Other jurisdictional differences in

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<sup>15</sup> Ibid, Clause 4, Section 68A.

<sup>16</sup> Queensland Building Act (1975) Chapter 3, Section 26.

<sup>17</sup> Victorian Building Regulations (2018) Clause 38 and Clause 124.

<sup>18</sup> NSW (2000) Environmental Planning and Assessment Regulations. Clause 130 and 144A.

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process included NSW and Victoria (Performance Solutions relating to fire) and the Australian Capital Territory (Performance Solutions relating to energy).

An individual submission pointed out that the Disability Standards for Accessible Public Transport requires all transport operators to demonstrate and document how Performance Solutions are able to provide public transport (including public transport buildings) without discrimination 'as far as possible'.<sup>19</sup>

A private building surveyor also reported that for all Australian Defence Projects, the Director Estate Engineering Policy (DEEP) requires all Performance Solutions relating to fire safety to follow the IFEG process, including a list of DTS Provisions, Performance Solutions, acceptance criteria, etc. as part of the Defence approval process.

It is not known the extent to which Defence buildings or public transport buildings are constructed each year. However, it is thought to be a small contribution to new stock.

An industry association commented that:

*“Most states and territories either have or are in the process of developing further measures currently around peer review and documentation for Performance Solutions arising from the Shergold Weir Report. Therefore, the NCC will be creating duplication of processes and create confusion and inconsistencies by including these provisions.”*

In July 2019 the BMF requested the ABCB, through the establishment of an Implementation Team and the National Framework, to develop proposals that respond to all BCR recommendations. Recommendation 14 suggests strengthening the process for developing Performance Solutions in the NCC to ensure that a nationally consistent approach is taken in addressing the problem. Hence, the aim of the proposal is not to create duplication and inconsistency but rather ensure a nationally consistent framework exists for developing Performance Solutions.

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<sup>19</sup> Disability Standards for Accessible Public Transport (2002) Part 33.5.

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The authors of the BCR advocate for national consistency in the implementation of the recommendations and national industry organisations have advocated for national consistency in the development of responses by the BCR Implementation Team.

The analysis accounts for jurisdictional differences through the cost-benefit analysis by recognising that not all Performance Solutions will be impacted by Options 2 and 3. Further, the decision to adopt the proposed provisions in the NCC will be made by the Board, which includes representatives from each state and territory.

The above state specific examples suggest existing Performance Solution documentation requirements predominately relate to fire safety. The proposal being considered extends the minimum requirements for documentation, analysis and consultation to all NCC Performance Solutions.<sup>20</sup>

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<sup>20</sup> Australian Building Codes Board Intergovernmental Agreement (IGA), (2019)

## Problem

Performance Solutions require careful consideration given the latitude for judgement to be applied, particularly for health and safety risks. In the time since its introduction, no single defined framework for consideration of Performance Solutions has emerged. The veracity of analysis and quality of decisions has repeatedly been brought into question. Most recently the BCR highlighted the potential for gaps to exist between the intentions of a performance-based code and its enactment.

The nature of the problem therefore consists of two factors:

- a lack of clarity around the expectations in the development of a Performance Solution and the decision-making process at assessment; and
- a lack of transparency in the documentation of Performance Solutions.

The hypothesis this RIS will consider is whether a change to the Governing Requirements of the NCC to require a consistent process for Performance Solutions will lead to improvements in building outcomes and confidence.

## Clarity around expectations in the development of a Performance Solution

Under an agreement between all levels of government, the ABCB develops and maintains the NCC, which is then adopted by states and territories into building regulation under state or territory building Acts. In developing a Performance Solution both the Governing Requirements and the Performance Requirements must be met. The NCC contains Governing Requirements that generally describe the application of the NCC in five parts:

- A1: Concepts and conventions that need to be taken into account;
  - A2: Methods of demonstrating compliance and the steps that must be taken under various pathways;
  - A3: Applying the NCC with state and territory legislation that can override the NCC;
-

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- A4: the scope and function of Referenced Documents; and
- A5: Documentation and evidence required to show compliance with the NCC for a material, product, form of construction and design.

A Performance Solution must be 'shown to comply' with the relevant Performance Requirements.<sup>21</sup> The NCC details a combination of Assessment Methods including, Evidence of Suitability in accordance with A5 and comparison with the DTS Provisions or expert judgement. Evidence used must be appropriate to the use of the material, product, form of construction or design to which it relates, yet documentation is reportedly poor.<sup>22,23</sup> The NCC's Governing Requirements and most state and territory governments do not mandate the process for the assessment of a Performance Solution. In concept, a Performance Solution could be developed based on one individual's expert judgement. These judgements and the level of competency required should be commensurate with the complexity of the Performance Solution.

Acceptance of a Performance Solution is the role of the appropriate authority. However, roles and responsibilities of parties involved in the building approval, construction and certification process, are unique to each jurisdiction's administrative system. Some define roles to limit involvement of approval authorities in the development of a solution. Others require disclosure and documentation for certain building classifications or topics such as fire safety or disability access.<sup>24</sup>

This arrangement gives rise to the potential for administrative overlap or gaps to exist between the intentions of performance-based codes and their enactment. The potential for confusion of functions and roles under a performance-based framework were conceptually explored in a discussion paper in 1998 by the Inter-jurisdictional Regulatory Collaboration Committee (IRCC). Given the latitude for judgement, Performance Solutions require careful consideration both at design and approval. This

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<sup>21</sup> National Construction Code Volume One (2019) Section A2.2 (2).

<sup>22</sup> National Construction Code Volume One (2019) Section A5.1(1).

<sup>23</sup> Weir, B Shergold, P (2018) Building Confidence Report. Page 30.

<sup>24</sup> Western Australian Consultation RIS - Reforms to the building approval process. (2019) Page 16.

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was underscored when discussing the subtle differences in design or use that have a major influence over fire safety.<sup>25</sup>

*'The relationship between the acceptance criteria and the relevant Performance Requirements is often a matter of engineering judgement...can vary between practitioners and from project to project'.*

Such judgements are complex and in effect require levels of rigour, analysis and competency of those developing Performance Solutions.

Identification of the risks to a building, the appropriate selection of calculation techniques (where available and required), scenarios to be tested and agreement between all parties is a fundamental issue. The approval authority alone is unable to address these considerations.<sup>26</sup> For the development of fire-life-safety solutions, these considerations were proposed to be managed collaboratively under a formalised design review and hazard assessment procedure or Fire Engineering Brief (FEB). Now common practice for large or complex Performance Solutions, concerns have been raised that Performance Solutions may still not be subject to consultation and analysis commensurate with the complexity or risk involved, particularly for small or simple Performance Solutions. According to the BCR, fire authorities have expressed clear concerns on behalf of brigades about their lack of involvement in the development of a Performance Solution for fire:

*"[if] IFEG was closely followed, the quality of fire engineering designs would improve and fire authorities would be consulted early on all designs involving Performance Solutions as part of the fire engineering design process. This would help fire authorities gain confidence in the capability of fire safety engineers to design acceptable fire safety solutions".*

This lack of confidence appears to be with regard to both the process followed and the capability of a practitioner.

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<sup>25</sup> International Fire Engineering Guidelines (2005).

<sup>26</sup> Inter-jurisdictional Regulatory Collaboration Committee (1998) Performance Based Building Regulations, Discussion Paper. Page 90.

## Transparency and Documentation

The BCR notes that fundamental to a performance-based approach to building regulation producing benefits is:

*“... a high level of awareness and understanding across the building and construction industry of how compliance can be achieved by incorporating the Performance Requirements within the design process. Second, there needs to be strong public trust that the Performance Requirements are being met and, in particular, that health and safety is assured.”<sup>27</sup>*

It concludes that neither of these requirements are presently being fully met. Undermining public trust is the lack of transparency in decision making and record keeping. Attempts to audit buildings have revealed that ‘as constructed’ documentation is often not available or accurate.<sup>28</sup>

Two of the recommendations of the BCR single out Performance Solutions for the lack of adequate processes and documentation required. The BCR suggests that this is resulting in buildings not achieving compliance with the NCC’s Performance Requirements, as well as not providing transparency and accountability for decisions.

The BCR suggests confidence in outcomes can clearly only be achieved where there is an effective disclosure regime and when scrutiny is central to public accountability:

*“It is widely reported that the standard of documentation supporting Performance Solutions is poor. There is a lack of basic information on matters such as the relevant Performance Requirements and the Assessment Methods applied.”*

The BCR also states:

*“Confidence in the NCC requires an effective disclosure regime... Decisions made during the design and construction of a building need to become an accessible record. Scrutiny is vital to public accountability. Those responsible*

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<sup>27</sup> Weir, B Shergold, P (2018) Building Confidence Report. Page 9. (Reference to meeting the Performance Requirements in this context is unlikely to be referring to just Performance Solutions, but a general compliance with the NCC of all solutions.)

<sup>28</sup> Victorian Cladding Taskforce (2019) Report from the Co-Chairs. Page 32. See: [https://www.planning.vic.gov.au/data/assets/pdf\\_file/0019/426034/DELWPO124\\_Victorian\\_Cladding\\_Taskforce\\_Final\\_Report\\_July\\_2019\\_v9.pdf](https://www.planning.vic.gov.au/data/assets/pdf_file/0019/426034/DELWPO124_Victorian_Cladding_Taskforce_Final_Report_July_2019_v9.pdf)

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*for making and certifying decisions under the NCC need to be identified so that they can be held accountable for their decisions.”*

The BCR was published in 2018 and involved widespread consultation with government and industry. The recommendations have since been supported by all governments and key industry stakeholders.<sup>29</sup>

A number of state government reviews of regulatory systems have delivered similar findings that support the shortcomings.<sup>30</sup> A summary of those that reflect the intent of improved documentation (Recommendation 14) include:

- Queensland – *‘A minimum standard of design documentation should be established’* (Wallace Review - Recommendation 105).<sup>31</sup>
- NSW – *‘Standardised report requirements be developed for all classes of alternative solutions’* (Lambert Review - Recommendation 6.2.6).<sup>32</sup>
- Victoria – *‘There was inadequate information for 96 per cent of the 401 permits reviewed to demonstrate compliance with critical provisions of the Act, the regulations and the BCA.’* (VAGO Report).<sup>33</sup>

Those review recommendations<sup>34</sup> that relate to the process (Recommendation 14 and 8) of developing fire safety Performance Solutions (alternative solutions) found:

- *‘That properly qualified and experienced people are required in the design, installation and commissioning of fire safety alternative solutions.’*
- *‘The potential impact of the failure to meet critical fire safety provisions can obviously be significant...There was also no evidence of approved alternative solutions needed to mitigate the issue identified in each case.’*

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<sup>29</sup> The recommendations of the BCR report are a result of widespread and targeted consultation with industry and government and are part of a broader package of reform still to be delivered. The Building Ministers’ Forum recently agreed to the establishment of an ABCB implementation team to assist in developing a consistent approach to implementation of the BCR recommendations.

<sup>30</sup> Weir, B Shergold, P, (2018) Building Confidence Report. Page 30.

<sup>31</sup> Review of the Building Act 1975 and building certification in Queensland, [1311] Page 71.

<sup>32</sup> Outcome sought by the proposed reforms. Independent Review of the Building Professionals Act (2005) – Final Report.

<sup>33</sup> Victorian Auditor-General, Compliance with Building Permits, Victorian Government Printer (2011) Victorian Auditor-General, Victoria’s Consumer Protection Framework for Building Construction, Victorian Government Printer (2015), Melbourne. Page 24.

<sup>34</sup> The following recommendations though relevant are wider ranging and rely on other recommendations of BCR report: 6.1.15, 6.28, 6.5.8, 7.4.2 of the Lambert Review.

### Decision RIS: Process for the Development of Performance Solutions

The Victorian Building Commission (now the Victorian Building Authority), in consultation with stakeholders should:

- *develop standard templates and procedures to require building surveyors to adequately document their assessment approach and basis of their decisions; and,*
- *require building surveyors to demonstrate, using these templates and procedures, their consideration and acquittal of mandatory safety and technical requirements.*

The Consultation RIS asked stakeholders whether they agreed with the description of the problem and whether there were any other characteristics not described.

A total of 49 individual submissions were received in response to the Consultation RIS, encompassing 40 individuals, 3 product manufacturers, 2 state building authorities and 4 industry bodies. Of the responses received, the majority (71 per cent) felt that the nature and extent of the problem had been adequately described.

Of those that disagreed with the description of the problem, three themes were relevant to the proposal; targeting, necessity and productivity.

## Targeting

One individual felt that the proposal was not addressing the larger problem of education and awareness of how to comply with the NCC's Performance Requirements. This view was linked to the belief that there is a low level of enforcement (citing private certification as a contributing factor).

The role of the NCC in addressing administrative problems was also challenged by an industry association which felt that the problem was better addressed by state and territory building regulations. This was repeated in another submission by an individual who felt that there was no demonstrated problem relating to the core objectives of the NCC (safety, health, amenity, accessibility and sustainability) and that it therefore should not be solved through the NCC.

## Necessity

The issue of regulatory burden was also raised. In particular, two respondents questioned the impact of the proposed process on 'simple' Performance Solutions and the use of VMs. The application to low-rise residential buildings Class 1 and 10 buildings was also suggested as unnecessary by an industry association.

*"If the proposed changes do proceed, Performance Solutions for Class 1 and 10 buildings and simple solutions that involve a minor modification from a prescriptive DTS requirement must be exempt from this provision otherwise it will create an unnecessary level of complexity and administrative burden. The Performance Solutions for those building types are generally very simple solutions for elements such as minor ceiling height reductions or alternate materials that do not materially change the building. Simple plumbing and drainage solutions should also be exempt for similar reasons."*

## Productivity

A representative from the childcare industry also strongly opposed the application of the proposal to early childhood centres, believing that it was unnecessary and an unproductive regulatory burden, and that other more cost-effective options were available.

The ABCB recognises the importance of continued education and awareness relating to use of the NCC, as well as the need for improved auditing and enforcement. These issues are currently being considered separately as part of the National Framework agreed to by the BMF in response to the BCR recommendations.

The problem relates to public confidence and ensuring that societal expectations of a rigorous process being followed when designing and constructing buildings in Australia is achieved in practice. This follows a number of high-profile cases of building failures where the process followed, in documenting and approving the building, was found to be deficient and consequently may have contributed to structural and fire safety problems.

### Decision RIS: Process for the Development of Performance Solutions

Although the approval pathways will differ by building and solution, the process problems extend to all objectives covered by the NCC (structure, health, amenity, accessibility and sustainability). So while injury and fatality data is a good indicator, in terms of life safety, an absence of obligations for an adequate process to be followed and documented for Performance Solutions leads to latent risk and obscures the basis for decisions when maintaining buildings. Failures that arise from undocumented solutions or other causes may also be (mis)attributed to Performance Solutions. Exempting certain solutions (either 'simple' or non-life safety) from a minimum process and documentation would further complicate and undermine confidence in both a performance-based system and the attainment of the NCC's core objectives.

The process followed is also proposed under Option 2 to be consistent for all topics and commensurate to the nature and complexity of the Performance Solution being developed. Hence, the same level of rigor associated with a complex solution would not be expected for a simple solution. Existing guidance material addresses this issue (and the topics cited), which is likely to receive more promotion. Under Option 3 an additional judgement around what life safety issues are covered by solutions would also be required.

The Consultation RIS asked stakeholders whether they had any examples of residential or commercial buildings where rectification work was required as a consequence of a Performance Solution followed.

A number of examples were provided for residential and commercial buildings, with 28 per cent citing examples in both residential and commercial buildings.

From the perspective of a local council building surveyor:

*“Aspects of various high-rise residential buildings, commercial buildings and industrial buildings did not comply with the DTS provisions of the BCA Volume One, and the alleged Performance Solution was not detailed in the documentation accompanying the Construction Certificates issued by private accredited certifiers and lodged with Council (NSW jurisdiction).”*

### **Decision RIS: Process for the Development of Performance Solutions**

*Some years after Occupation Certificates were issued, fire safety concerns were brought to Council's attention (non-compliance with the DTS provisions), but no Performance Solution could be identified on the Construction Certificate files.*

*There was no record of a Performance Solution being applied to the developments.”*

From the perspective of a state government department:

*“We are aware of instances where the operator of a commercial building was completely unaware of ongoing operational requirements the building had due to the implementation of Performance Solutions in the design of the building to ensure the safety of occupants.”*

From the perspective of a product manufacturer:

*“We have not seen rectification work being needed, but we have seen many issues where the Performance Solution process was followed and the design was needed to change due to lack of expertise in signing-off the Performance Solutions. Therefore, we have seen significant costs in design time and delays. In one particular example, the fire brigade would not sign-off on a project and it had to go to an appeals board to get sign-off. Even though the Performance Solution process was agreed to by the appeals board in 2013, some local brigades still will not sign off on these types of solutions today in 2020.”*

From the perspective of a building consultant:

*“We are aware of at least one major residential building (with more than 40 residential apartments) where the plumber was issued with a Rectification Notice by a state building authority due to major roof plumbing defects. The plumber then obtained a Performance Solution from another plumber who acted as consultant; that Performance Solution excused all of the defects on the basis that the installation still performed and hence was acceptable, however, no evidence was presented (nor any obtained by the consultant) to show how the installation would equal or exceed the requirements of AS/NZS3500.3 or SA HB*

39. *The consultant in question carried out no calculations, did no physical testing and did not even attend the site.”*

These examples highlight the nature of the problem and make a case that improvements to the process can reduce the likelihood of each problem occurring. The examples also show that other benefits may accumulate other than avoided rectification costs. These benefits relate to better information to end users, particularly in regard to maintenance expectations; greater auditing ability through improved record keeping; and greater national consistency in recognising commonly approved Performance Solutions.

## **Extent of the Problem**

Currently some degree of process and documentation, to meet the obligations of the NCC Governing Requirements and other state and territory regulations, should be expected by the appropriate authority. The extent of the problem is influenced by the number of Performance Solutions undertaken where the process and documentation is either inadequate or not undertaken at all.

## **Use of Performance**

There is uncertainty over the extent that Performance Solutions are used, as data is not consistently captured or reported as part of approval documentation by states and territories. Given a lack of adequate reporting and documentation, the extent of use of Performance Solutions is not known with certainty.

Enquiries with state and territory building authorities suggest that information may be captured by local authorities, although it is generally not coordinated or consistent. Anecdotally, the use of Performance Solutions is generally lower in residential (Class 1) buildings – due to their lesser comparative size, complexity, variability, cost and margins – as well as in plumbing.<sup>35,36</sup>

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<sup>35</sup> 6% of survey respondents identified plumbing as the sector where they predominantly involved in the development of Performance Solutions.

<sup>36</sup> The CIE (2014) Report on the benefits of a Performance-based NCC.

## Decision RIS: Process for the Development of Performance Solutions

Notwithstanding the lack of reliable data, the estimates in Table 1 have been derived using figures from voluntary reporting of around two-thirds of local government areas in one state (Western Australia), which if reflective of other jurisdictions would imply the following:

**Table 1: Implied proportion of solutions using performance-based design**

<b>Class 1</b>	<b>Sample</b>	<b>State<sup>2</sup></b>	<b>Australia<sup>3</sup></b>	<b>Percentage</b>
Number of buildings	6,711	20,729	116,548	(100%)
Number of Performance Solutions	594	1,741	3,345 <sup>2</sup>	(2.87%)

<b>Class 2 – 9</b>	<b>Sample</b>	<b>State<sup>2</sup></b>	<b>Australia<sup>3</sup></b>	<b>Percentage</b>
Number of buildings	1,156 <sup>4</sup>	3,240 <sup>6</sup>	24,000	(100%)
Number of Performance Solutions	62 <sup>4</sup>	792 <sup>5</sup>	3,052	(12.72%)

Notes:

1. Jurisdictional data based on totals by Class - September 2018 to September 2019
2. Extrapolated based the sample's share of state development.
3. Calculated using a five-year average of building approvals from 2013 to 2018 for state share of national data.
4. September 2018 to September 2019 (Excluding Class 2 and Class 3 buildings).
5. Number of Performance Solutions assessed by a state fire authority annually.
6. Jurisdictional data including Class 2 buildings.

The Consultation RIS asked stakeholders whether they had any information relating to the extent Performance Solutions were used in residential and commercial buildings.

Of those that responded to the question, most (12 out of 15) stakeholders agreed that the extent of Performance Solutions used in residential buildings is small, with responses ranging from 0 to 3 per cent.

There were three exceptions:

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1. In one jurisdiction, a number of residential buildings using a Verification Method to demonstrate compliance with the NCC under a Performance Solution for energy efficiency were doing so inappropriately.<sup>37</sup>
2. An industry association estimated one in five Class 1 buildings built would use Performance Solutions. This reflected the use of polystyrene cladding and other cladding products with no corresponding DTS provisions.
3. A state building administration suggests that the use of Performance Solutions in Class 1 buildings may be more widespread, however, they are not often identified as a Performance Solution due to the minor nature of the departure from the DTS Provisions or a lack of understanding of what constitutes a Performance Solution.

For commercial buildings, the number of Performance Solutions could be higher than reported in the Consultation RIS based on responses received. One stakeholder raised weatherproofing as an example of where a Performance Solution would be required because no corresponding DTS Provisions exist. Three respondents (an individual and two industry associations) also commented that multiple Performance Solutions are often used in commercial buildings.

Previous ABCB consultation has indicated that Performance Solutions are not evenly distributed, including where its use would be expected to be widespread.<sup>38</sup> A number of behavioural barriers to classifying solutions as Performance Solutions could lead to under-reporting due to the need to pay fees, limitations on licencing or a desire to avoid the administrative burden (residential buildings).

As no additional evidence or data was provided, previous surveys of practitioners involved in performance-based design were interrogated. Those that reported a proportion of projects using Performance Solutions provide an indication of its distribution, which if representative of the broader industry, suggests:

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<sup>37</sup> The Verification Method was subject to amendment in NCC 2019 to address its inappropriate use in some cases. See: [https://www.commerce.wa.gov.au/sites/default/files/atoms/files/ib\\_89\\_0.pdf](https://www.commerce.wa.gov.au/sites/default/files/atoms/files/ib_89_0.pdf)

<sup>38</sup> An ABCB survey of practitioners in 2013 revealed relatively low levels of understanding that Performance Solutions were needed to satisfy FP1.4, despite this being the only avenue for compliance for many cladding systems in Class 2-9 buildings

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- for residential (Class 1 and 10) a large number of respondents were involved in fewer projects using Performance Solutions. The median of responses to the 2019 survey lies between 20-30 per cent, and the mode 1-10 per cent.
- in commercial buildings, the proportion of respondents involved with projects with Performance Solutions was larger, with the median being between 51-60 per cent, and the mode 91-100 per cent.

To apply these results to the analysis would be too crude a metric, as it assumes all respondents are involved in an equal share of the same type of projects. These results are also likely to overestimate the use of Performance Solutions, as the survey intentionally excluded respondents who were not involved in Performance Solutions. Notably, it supports the view that Performance Solutions in Class 1 and 10 buildings are not distributed equally and, on average, could be lower. The central estimates for residential buildings, therefore, remain unchanged in line with the majority of feedback. Sensitivity analysis has been expanded to test the outcomes associated with a 20 per cent uptake of Performance Solutions in Class 1 and 10 buildings, which aligns with the views of the abovementioned industry association.

In response to the feedback provided, the number of Performance Solutions of commercial buildings has been doubled since the Consultation RIS. This is intended to reflect the fact that both the number of buildings using Performance Solutions and the number of topics covered (i.e. the number of Performance Solutions used in each building) could be higher.

The Consultation RIS asked stakeholders if they were aware of any studies on the costs of rectifying building work as a result of inadequate Performance Solutions.

The Consultation RIS attempted to determine the size of the problem in terms of annual rectification work. This was not able to be established from the responses received.

The inadequacies of the process for Performance Solutions has resulted in costly rectification work and legal fees both in Australia and internationally. Where inadequate solutions have been found, they have typically been in the area of fire safety, external cladding, energy efficiency and weatherproofing. There is, however, anecdotal

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information from industry sources and media reports that problems occur in all areas covered by the NCC, largely in commercial buildings (including multi-storey residential) and less frequently in the domestic housing sector.

When problems do occur, the cost of rectification work can vary greatly and is often dependent on the size and use of the building in addition to the extent the Performance Solution influences the physical features of the building.

There is limited information in Australia and internationally on the total cost of inadequate Performance Solutions. One study from New Zealand found that the cost of inadequate Performance Solutions could be in the range of \$12 billion in 2008 dollars. This report included both residential and commercial buildings and found many factors contributing to a systematic failure of performance-based design. The greatest weakness has been described as “naive blind faith” that the industry would self-correct deficiencies without any emphasis on accountability.<sup>39</sup> No other studies on the total cost of inadequate solutions are known.

The New Zealand experience shows that the cost of rectifying a single storey dwelling may range between \$50,000 and \$110,000 and for a sole-occupancy unit within an apartment building between \$30,000 and \$36,000. A breakdown of these costs in 2019 Australian dollars is shown in Table 5.

**Table 2 Single and multi-dwelling cost parameters**

Type of expense	Single dwelling	Single dwelling	Sole-occupancy unit	Sole-occupancy unit
<i>Intervention</i>	<i>Targeted</i>	<i>Full reclad</i>	<i>Targeted</i>	<i>Partial</i>
Design	\$4,474	\$13,422	\$2,013	\$2,461
Legal	\$26,844	\$67,111	\$12,527	\$14,317
Experts	\$4,474	\$8,948	\$4,027	\$4,921
Consequential	\$8,948	\$8,948	\$8,053	\$10,738
<b>Total</b>	<b>\$44,740</b>	<b>\$98,429</b>	<b>\$26,621</b>	<b>\$32,437</b>

<sup>39</sup> May, P. LAW & POLICY, Vol. 25, No. 4, (2003) Performance-based Regulation and Regulatory Regimes: The Saga of Leaky Buildings.

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Source: Weather tightness – Estimating the cost (PWC 2009)

To determine whether the costs incurred in New Zealand could be similar to the costs incurred in Australia, several Australian examples were assessed using case law files.<sup>40,41,42</sup> In one known case, the façade of an office building required full replacement, after approval for occupation, when it was found that water penetration was not addressed at the time of assessment. The cost of this rectification was not made publicly available, however, it is highly likely to be at least consistent with the New Zealand experience.

One residential apartment was also found to require removal and replacement of its façade equivalent to \$72,000 per sole-occupancy unit, with one other complex incurring a rectification cost of \$60,000 per sole-occupancy unit following deficiencies with the way the buildings were assessed. In these examples, the costs incurred by the Australian market may be at least equal to the reported costs in New Zealand, and could be much higher.

Although Australian examples of complete failure are rare, there are documented examples of whole building failures where design choices in pursuit of increased sustainability have led to fire and increased risks to life safety.<sup>43</sup> A lack of technical knowledge by decision makers, and a lack of involvement of specialists at the design stage, is cited as among the root causes of impacts to construction schedules and costs.

The Consultation RIS asked stakeholders whether they agreed with the rectification costs outline in Table 5.

Many respondents expressed the view rectification costs varied depending on building type, size and the extent of the problem, which led to difficulty responding to this question. Of those that expressed an opinion on the reported costs, 58 per cent agreed

<sup>40</sup> NSW Land and Environmental Court. See: <http://www.lec.justice.nsw.gov.au/>

<sup>41</sup> Victorian Buildings Appeals Board. See: <https://www.buildingappeals.vic.gov.au/decisions-and-statistics>

<sup>42</sup> ACT Civil and Administrative Tribunal. See: <http://www8.austlii.edu.au/au/act/>

<sup>43</sup> Meacham, B. et. el. (2012) Fire Safety Challenges of Green Buildings. See: [https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Building-and-life-safety/rffiresafetygreenbuildings-\(2\).ashx?la=en](https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Building-and-life-safety/rffiresafetygreenbuildings-(2).ashx?la=en)

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and the remainder suggested costs were understated and could be much higher depending on the circumstance.

Following stakeholder feedback, the sensitivity analysis has been revised to include a high and very high scenario for rectification costs.

The Consultation RIS asked stakeholders whether stakeholder involvement in determining acceptance criteria would lead to a higher confidence in Performance Solutions.

There was a mixed response to this question with the majority believing better building outcomes would be achieved. 43 per cent said yes, 27 per cent said no and 14 per cent said that they were unsure. No respondents elaborated on their response.

The Consultation RIS asked stakeholders whether they believed that better building outcomes would be achieved by improvements to the Performance Solution process.

Most stakeholders responded to the question and 67 per cent felt that greater stakeholder involvement would lead to better building outcomes.

Of those that thought outcomes would improve, one individual pointed out that proper design and forethought would improve the reliability of solutions. This was also reflected by another individual:

*“Traceable outcomes give auditable information and allows quick and cheap resolution of building disputes as well as defining the areas required to be rectified.”*

Respondents also felt that the industry needed clearly defined rules when developing Performance Solutions and that the proposal, if implemented, would make practitioners more accountable. This was particularly reflected by a response from an advocate for small business who felt that having a clearly defined set of rules was important in boosting consumer confidence.

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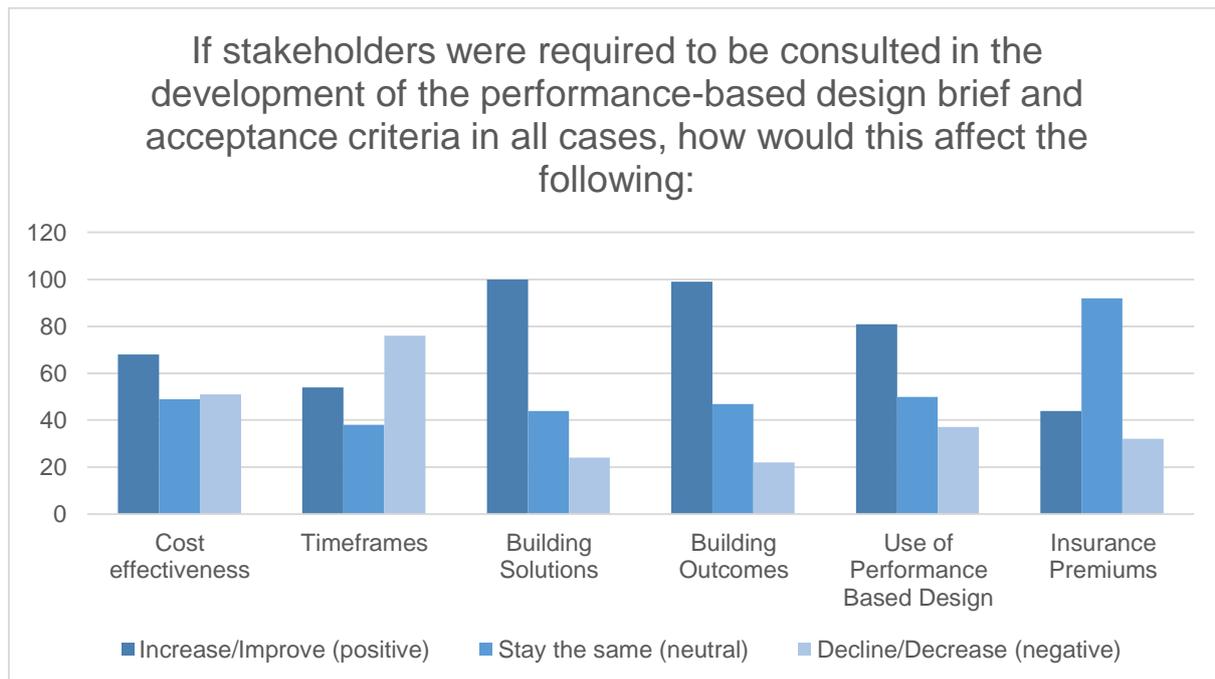
While believing better building outcomes would be achieved by this proposal, one surveyor commented that the introduction of this process may have limited effectiveness without corresponding change to streamline issues within the DTS Provisions. On this basis, they felt the change may be better delayed until NCC 2022 is adopted.

Of those who thought building outcomes would not improve, one described it as being potentially 'an administrative nightmare', while another thought that it would only add cost and time to the approval process. A further two respondents suggested that it would only be effective if it were supported by enhanced education of practitioners.

One respondent considered that the IFEG already clearly defined the expectations of practitioners when developing Performance Solutions and questioned the need for more intervention other than a greater degree of enforcement.

These results generally reflect those of an ABCB survey conducted in 2019 of expectations that both outcomes, and use of performance-based design, would improve through stakeholder involvement:

Figure 2: Users expectations of consulting stakeholders



Source: ABCB Survey, 2019

The final analysis reflects that not all Performance Solutions will be impacted by the proposed changes. Those practitioners adequately undertaking the process, and in the case of jurisdictions with requirements for both consultation and documentation (e.g. fire solutions in some states), will not be impacted under either option. In this way, costs are expected to be proportional to the effectiveness of the options.

The cost-benefit analysis summarises the costs associated with each option. These costs reflect the incremental administrative costs associated with improving the Performance Solution process.

## Objectives

The objectives of the proposal are to ensure that Performance Solutions:

- are developed using an appropriate process using methods commensurate with the complexity and risk posed by the design;
- meet the relevant Performance Requirements of the NCC;
- achieve the required level of health and safety, amenity, accessibility and sustainability; and

- are well documented, transparent and enable accountability.

## Options

There are three options presented for decision-makers.

### Option 1: Maintain the status quo

The status quo involves the ABCB promoting non-regulatory guidance to provide information on the process to be used for the development and documentation of NCC Performance Solutions. Under this option there would be no change to the content of the current NCC. The non-regulatory document would continue to be used to explain the NCC's intent for the consistent development and documentation of Performance Solutions.

The status quo is the default choice for decision-makers in considering alternatives to achieve the objectives. Where the incremental impacts of other options would result in more costs than benefits, or would be ineffective in addressing the problem or achieving the objectives, this analysis will conclude in favour of the status quo.

The status quo will be regarded as a baseline, as a basis to determine the incremental impacts of the other options.

### Option 2: Amend the NCC Governing Requirements to include a mandatory process for the development and documentation of a Performance Solution

This option would require all Performance Solutions regardless of topic, size or complexity, to be subject to the process proposed in Attachment A to an extent commensurate with the complexity and risk of the design.

The intent of Option 2 is to address the need for clear expectations for the development and documentation of all NCC Performance Solutions. The proposal requires the involvement of stakeholders in both the performance-based design brief, setting

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acceptance criteria and evaluation of results to overcome the problem and ensure adequate decisions are made.

This will be implemented through an amendment to the NCC's Governing Requirements, formalising the intent of the NCC and content of current guidance material.

### **Option 3: Restrict the application of the solution to life safety matters (fire and structure)**

This option would apply as per Option 2, but only require its application to solutions involving 'life safety' matters. A recent survey of industry practitioners conducted by the ABCB found that Performance Solutions relating to fire<sup>44</sup> ranked highest among respondents (both commercial and residential) and would represent the majority (assumed to be at least half) of Performance Solutions in commercial buildings (including Class 2 multi-storey residential buildings). Hence, the impacts of this option are assessed on the basis of it constituting 60 per cent of Option 2.

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<sup>44</sup> Of the total solutions ranked, fire safety (Fire Separation, Safe Movement and Egress) solutions constituted 60 per cent in Commercial buildings.

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## International Approaches

The following international approaches were reviewed as being either performance-based or similar to the structure of the NCC.

### Canada

In most Canadian jurisdictions, the building verification and approval process includes verification at the design stage, during construction and before occupancy. Review and acceptance is generally undertaken at the municipal level by the authority having jurisdiction (AHJ). Canadian Codes are 'Objectives' based. A solution can either be DTS or an alternative solution. A building applicant must demonstrate compliance is at least equivalent. The final acceptance of an 'alternative solution' is the decision of the AHJ, and may in some cases require prior acceptance by provincial or territorial boards or commissions.

### New Zealand

The New Zealand Building Code is similar in structure to the NCC. 'Alternative Solutions' are required where 'Acceptable Solutions' are not used. Solutions are considered by building consent authorities (usually Local Councils) and these authorities need to be satisfied "on reasonable grounds" that the proposed requirements will meet the Code. No specific process is mandated, but general guidance on the burden of proof and the role of evidence is provided.

Development of a Fire Engineering Brief (FEB) is recommended to ensure agreement between stakeholders on assessment methods, acceptance criteria and the process or peer review. Assessment is the responsibility of the consent authority, which is required to be accredited by an independent Building Consent Accreditation Body, established in 2004. Peer review may be sought by the BCA in assessing all or specific aspects of a proposed Alternative Solution and the qualifications of the practitioners involved. Specific guidance has been issued for the 'fire safety design for tall buildings'. A systematic (verification) approach to the assessment of alternative fire safety solutions is also now required and alternative pathways are reportedly rare.

## United States

In the United States, building regulation consists of model codes that are primarily prescriptive. Alternative designs, often termed 'equivalencies', are allowed. However, there is not a consistent and established process for their assessment.

## United Kingdom

As of January 2020, a full independent review of the United Kingdom's building regulations has resulted in more than 50 recommendations, which are at various stages of implementation. These address systematic issues, including a lack of clarity around responsibility and enforcement, but maintain a performance or 'outcomes' based framework. Reforms focus on high risk residential buildings (those greater than 10 storeys), but the government's responses suggest their application will be extended further. Reforms of relevance to this RIS include recommendations to improve the limited requirements for documentation and design changes approval, and project documentation and accountability.

## Impact Analysis

This section provides an assessment of the incremental costs and benefits associated with Option 2 and Option 3 when compared with the status quo baseline.

### Groups Impacted by the Options

This analysis identifies the following impacted stakeholder groups–

- Individuals, e.g. owners and occupiers of new buildings.
- Businesses, e.g. developers, builders, building practitioners, testing bodies and private certifiers, building designers and architects.
- Government, e.g. state and territory building authorities and fire authorities and local government.
- Education providers, e.g. universities and Registered Training Organisations (RTO's).

### Assumptions and Parameters

The following key parameters and assumptions have been used in the preparation of this impact analysis:

- The annual number of new houses constructed each year is 116,000.<sup>45</sup>
  - ABS (2019) Building Activity, Catalogue 8752.0. Table 37.
- The annual number of commercial building approvals is not collected nationally. The Western Australian Department of Mines, Industry Regulation and Safety has provided the ABCB with data on commercial building activity occurring within its jurisdiction. It is known through ABS comparison that Western Australia accounts for approximately 17 per cent of all commercial building activity occurring annually, inferring the annual number of new commercial buildings constructed each year is 24,000.
  - Unpublished Western Australia data.

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<sup>45</sup> A five year average of total completions for new houses between 2014 and 2018 has been taken.

## Decision RIS: Process for the Development of Performance Solutions

- Extrapolated using ABS (2019) Building Activity, Catalogue 8752.0. Table 71.
- The proportion of total completions reported using at least one Performance Solution is 15 per cent of all new commercial buildings (3,600 commercial buildings) and approximately 3 per cent of all new residential buildings (3,480 new houses).<sup>46</sup>
  - Unpublished data from the Western Australian Department of Mines, Industry Regulation and Safety.
- The estimated proportion of Performance Solutions not following a component of the process currently is shown in Table 6.

**Table 3 Percentage not undertaking a component of the process**

Component	Percentage residential	Percentage commercial
Not undertaking a Performance-Based Design Brief	21%	9%
Not undertaking stakeholder consultation	24%	19%
Not undertaking testing and modelling	30%	14%
Not providing documentation	12%	9%

Source: ABCB Survey, 2019.

- The estimated proportion of Performance Solutions not following a component of the process adequately is shown in Table 7.

**Table 4 Percentage not adequately undertaking a component of the process**

Component	Percentage residential	Percentage commercial
Not adequately undertaking Performance-Based Design Brief	37%	41%
Not adequately undertaking stakeholder consultation	51%	40%
Not adequately undertaking testing and modelling	37%	43%
Not adequately providing documentation	41%	43%

Source: ABCB Survey Results, 2019.

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<sup>46</sup> According to stakeholder opinion, the number of solutions was under-reported by the Consultation RIS, particularly in commercial buildings. The final analysis assumes multiple solutions may be present in commercial buildings (a higher concentration).

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- An important variable is the complexity of a solution. The need for an adequate process is generally one that reflects the commensurate risk or complexity of a solution. Where a VM exists and is widely used, such as JV3 in NCC Volume One, the parameters of the analysis are largely set through the method itself. However, some Performance Requirements remain unquantified, others may allow significant flexibility and be subject to guidance or common practice (e.g. engineering judgement or comparison to the DTS). For these reasons, the cost of developing a solution can vary significantly and cannot be known with certainty. An estimate has been developed based on the broad proportions outlined in Table 8.

**Table 5 Estimate of composition of total costs associated with Performance Solutions in commercial buildings**

Component	Cost of professional fees	Proportion of total professional fee
Performance-Based Design Brief	\$2,000	20%
Stakeholder Consultation	\$1,500	15%
Testing and Modelling	\$6,000	60%
Documentation	\$500	5%
Average fee commercial building	\$10,000	100%

Notes:

1. A Performance Solution in a residential building has been assumed to be half the cost of a Performance Solution in a commercial building, reflective of lower resources, variability in size and complexity and available cost savings.
2. Total professional fees exclude the cost of the building or plumbing solution.

Two respondents to the Consultation RIS commented that the scope and complexity of Performance Solutions can vary considerably depending on the nature of the Performance Solution. This would also have an impact on the costs associated with a Performance Solution. They considered use of a single cost for commercial solutions and a single cost for residential solutions may not be reflective of the range of costs associated with Performance Solutions. The rates used in the Consultation RIS have been maintained as an average cost. For Option 2, while some approvals will exceed these costs, many Performance Solutions, such as those that are suggested as relatively small or simple in nature, are likely to be much lower (the majority in residential buildings).

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For Option 3, where the majority of solutions involve fire safety and structure, the average cost could be significantly higher. However, stakeholder feedback suggests most elements of the process are already reflected in most jurisdictions for fire (the majority of this Option's scope).

- An analysis of the costs from the New Zealand leaky buildings experience suggests the costs of rectification in 2019 Australian dollars could conservatively be estimated as shown in Table 9.

**Table 6 Single and multi-dwelling cost parameters**

Type of expense	Single dwelling	Single dwelling	Sole-occupancy unit	Sole-occupancy unit
<i>Intervention</i>	<i>Targeted</i>	<i>Full reclad</i>	<i>Targeted</i>	<i>Partial</i>
Design	\$4,474	\$13,422	\$2,013	\$2,461
Legal	\$26,844	\$67,111	\$12,527	\$14,317
Experts	\$4,474	\$8,948	\$4,027	\$4,921
Consequential	\$8,948	\$8,948	\$8,053	\$10,738
<b>Total</b>	<b>\$44,740</b>	<b>\$98,429</b>	<b>\$26,621</b>	<b>\$32,437</b>

Source: Weather tightness – Estimating the cost (PWC 2009)

Assessment of cases of recent rectification work in Australia has shown that the costs incurred in Australia are equal to or higher than those shown in Table 9.

## Option 1 – Retain the status quo

The impacts of the status quo are those reflected in the problem section of this RIS:

- Expectations of the process for documentation remains unclear and increases latent risks in the form of buildings constructed that are unlikely to achieve the required levels of safety, health, amenity, accessibility or sustainability.
- Undocumented solutions restrict transparency, accountability and undermine building administration.

Confidence in the building industry's ability to deliver safe buildings will remain stagnant. Under a system where documentation is not a minimum requirement, confidence in Performance Solutions could be lower due to a misattribution from other

causes. In the event of more building failures (an extreme case), it may also prompt governments to consider returning to more prescriptive regulation, impacting on an industry where buildings are becoming more complex, innovation is increasing and proprietary systems are often used. Performance-based regulation is more responsive to this type of environment and contributes significantly to national productivity.

## **Option 2 – Amend the NCC Governing Requirements to include a mandatory process for the development and documentation of a Performance Solution**

This option would require all Performance Solutions use the ABCB's process for formulating and approving Performance Solutions. The process would be reflected in the Governing Requirements of all Volumes of the NCC.

The process is aimed at formalising a nationally consistent approach to assessing Performance Solutions, based on the process proposed in Attachment A. This option would require all Performance Solutions, regardless of topic, size or complexity, to be subject to the process, but importantly, to an extent commensurate with the complexity and risk of the design (in other words, not a one size fits all approach).

### ***Qualitative Costs***

It could be argued that formalising the existing guidance material in the NCC, which has been developed and promoted by the ABCB, is the status quo and simply reflects the current intent of the NCC and the expectations of state and territory building control systems. On this basis, changes to the NCC would impose no additional cost on industry. However, in those cases, where the intent of the NCC and guidance documents have not been followed and sub-standard Performance Solutions developed, industry should expect to incur greater costs.

Arguably, changes to the Governing Requirements is simply further confirmation of what was always expected (i.e. Performance Solutions need to be properly documented by those practitioners using them to test and justify their application against the Performance Requirements; enable those approving them to be able to

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assess their adequacy; and provide a record for future auditing and owners of buildings to reference).

The costs associated with Option 2 will be highly dependent on the extent to which industry has been developing Performance Solutions in line with guidelines and the intent and objectives of the NCC. In a scenario where decisions have been made without adequate analysis, additional costs will be incurred. These costs may include the engagement of experts, time to consult with stakeholders, additional analysis and the preparation of associated documentation. These costs are considered by the quantitative cost section below.

### **Quantitative Costs**

Consistent with the stated problem, irrespective of the qualitative assessment above, the impact analysis adopts the approach that as expectations are not legislated or consistent, incremental costs will be incurred by industry where a step in the current process is either 'inadequately' or 'not undertaken'. In addition to the ABCB survey results, the following key parameters and assumptions have been used in preparation of the quantitative costs:

- The annual number of new houses constructed each year is 116,000.<sup>47</sup>
- The annual number of new commercial buildings constructed each year is 24,000.<sup>48</sup>
- The proportion of total completions using at least one Performance Solution is 30 per cent of all new commercial buildings and approximately 3 per cent of all new residential buildings.
- The assumed average number of Performance Solutions used is 2 for commercial buildings and 1 for residential buildings.
- The estimated proportion of Performance Solutions not currently following a component of the process is that shown in Table 6.

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<sup>47</sup> A five year average of total completions ABS (2014-2018) Building Activity, Catalogue 8752.0. Table 37.

<sup>48</sup> The annual number of commercial building approvals is not collected nationally. Estimate based on: [https://www.commerce.wa.gov.au/sites/default/files/atoms/files/final\\_report\\_security\\_of\\_payment\\_reform\\_in\\_the\\_wa\\_building\\_and\\_construction\\_industry.pdf](https://www.commerce.wa.gov.au/sites/default/files/atoms/files/final_report_security_of_payment_reform_in_the_wa_building_and_construction_industry.pdf) Page 341. Extrapolated using ABS (2019) Building Activity, Catalogue 8752.0. Table 71. multi-residential buildings are included in commercial building category.

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- The assumed increase in total professional fees is estimated to be 8 per cent where the process is currently inadequately undertaken and 108 per cent where components of the process are not undertaken at all.<sup>49</sup>

The increases in professional fees applied using the above assumptions is shown in Tables 10 & 11.

**Table 7 Estimates of marginal annual increase in cost for proportion not undertaking a component of the process**

Component	Commercial	Residential
Performance-Based Design Brief	\$2,799,360	\$789,264
Consultation	\$4,432,320	\$902,016
Testing and modelling	\$13,063,680	\$2,818,800
Documentation	\$699,840	\$225,504
Total Annual Cost	\$20,995,200	\$4,735,584
<b>Present Value Cost</b>	<b>\$157,783,804</b>	<b>\$35,589,014</b>

**Table 8 Estimate of marginal annual cost for proportion not adequately undertaking a component of the process**

Component	Commercial	Residential
Performance-Based Design Brief	\$944,640	\$103,008
Consultation	\$691,200	\$141,984
Testing and modelling	\$2,972,160	\$257,520
Documentation	\$247,680	\$57,072
Total Annual Cost	\$4,855,680	\$559,584
<b>Present Value Cost</b>	<b>\$36,491,563</b>	<b>\$4,205,404</b>

Note: Present Values have been calculated using a 7% discount rate over a 10 year period.

The total aggregate annual cost is estimated to be \$31,146,048<sup>50</sup> or \$234,069,785<sup>51</sup> in Present Value terms. These impacts will not be distributed equally on all Performance

<sup>49</sup> ABCB Survey Results (2019) approximately 50% of respondents identified an increase in professional fees. The average increase in professional fees was approximately 8% this is applied to the proportion inadequately undertaking a step. The 108% increase is applied to the proportion not currently undertaking a step in the process, in recognition that no cost is currently incurred for that step.

<sup>50</sup> This is the sum of the total annual costs in Tables 10 and 11.

<sup>51</sup> This is the sum of the total Present Value Costs in Tables 10 and 11.

Solutions and can be assumed to reduce to zero the closer current processes reflect the proposal.

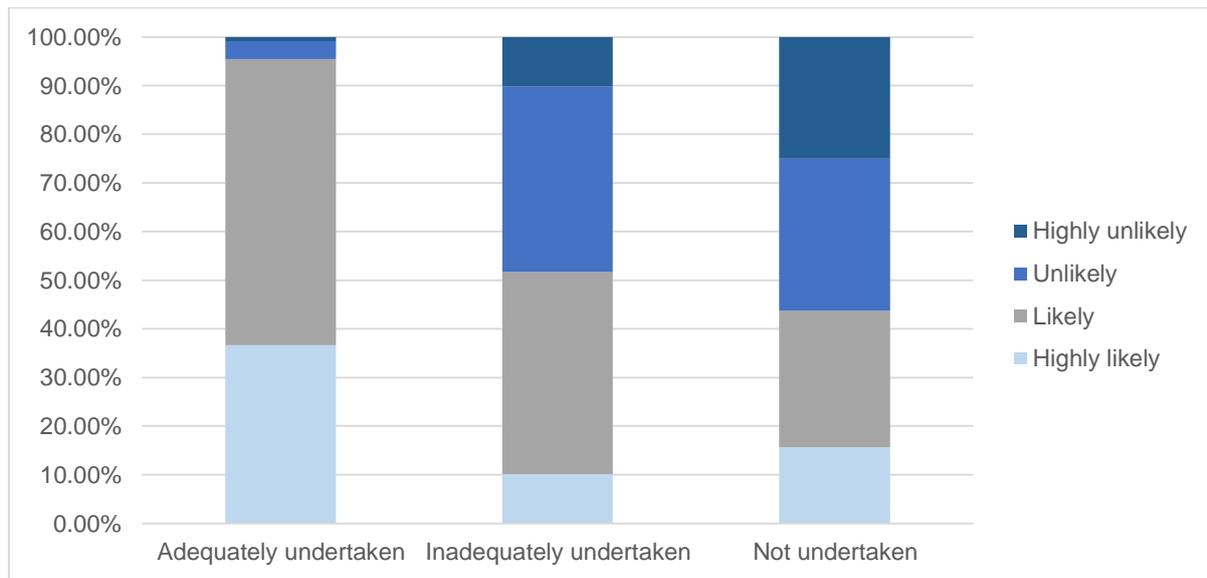
### ***Qualitative Benefits***

A national process helps ensure variations are minimised in both the process and guidance around the development of Performance Solutions that meet the NCC. Stakeholders have expressed higher confidence in the objectives of the NCC being met where the proposed process is followed. State and territory governments will benefit from not having to maintain separate legislation and guidance material. The ABCB survey asked respondents to advise the extent that the steps identified in the ABCB guideline were:

- Adequately undertaken
- Inadequately undertaken
- Not undertaken.

Hence, the competence of the solution is only assumed if all steps are adequately followed in the process. Amendments to the NCC would ensure expectations are clear about documenting what consultation with stakeholders was undertaken and what acceptance criteria was agreed. Comparing 'likely' or 'highly likely' responses to the question of how likely a process was to meet the NCC Performance Requirements, shows these reduce significantly where 'inadequate' or 'not undertaken' steps were nominated. 'Highly unlikely' responses more than double in proportion. This is shown by Figure 3.

**Figure 3 Reported likelihood of a solution meeting the Performance Requirements of the NCC, grouped by response to adequacy of steps**



Source: ABCB Survey, 2019

When a Performance Solution is proposed, acceptance criteria must be developed in order to analyse the outcome of the design. The relationship between the acceptance criteria and the relevant Performance Requirement(s) is often a matter of engineering and professional judgement. As a condition of developing a Performance Solution, clearly articulating the steps undertaken will benefit regulatory authorities who rely on the documented process when auditing the adequacy of the solution. State and territory governments will also benefit from not maintaining separate legislation and guidance material.

In the case of widespread system failure, governments are often left as the insurer of last resort.<sup>52</sup> Therefore, improving the process reduces governments' and the community's exposure to private risk taking.

As part of the Consultation RIS, stakeholders were asked whether there were any other qualitative benefits to consider. Other benefits of the proposal raised related to better information to end users, particularly in regard to maintenance expectations; greater

<sup>52</sup> Australian Financial Review (2019) Federal government must lead on building insurance crisis, PCA says. See: <https://www.afr.com/property/commercial/federal-government-must-lead-on-building-insurance-crisis-pca-says-20190628-p52271>

auditing ability through improved record keeping; and greater national consistency in recognising commonly approved Performance Solutions.

### **Quantitative Benefits**

Consultation on this proposal did not provide any representative data on the occurrence of defects and associated costs across the building stock annually. However, a number of studies on the costs of defects in Australia are now known.

In 2019, a survey of 1,222 homeowners found:

- for apartments, 4 per cent of owners had to pay above \$50 000 for repairs, 23 per cent paid between \$5 000 to \$50 000 and 74 per cent paid up to \$5 000;
- for houses, 5 per cent of owners had to pay over \$20 000 for repairs, 27 per cent paid between \$5 000 and \$20 000, and 68 per cent paid up to \$5 000.

In addition, property owners faced delay costs with 21 per cent of owners waiting for between 3 to 6 months for the completion of repairs and 9 per cent for more than 6 months.

In a survey of strata owners in NSW, conducted by the University of NSW in 2009, 10 respondents indicated that defects would cost \$10 million to remedy.

Some high-profile cases also provide information in rectification costs. The fire at Lacrosse Apartment in Melbourne in 2014 resulted in a claim of \$24 million by owners, with the court finding the fire engineer, building surveyor, the architect and builder were jointly liable and ordered to pay costs of \$5.7 million to the owners<sup>53</sup>. Also the recent structural rectification of Mascot Towers are also reported to have cost over \$50 million.<sup>54</sup> Both these examples show that, where problems do arise, they are very

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<sup>53</sup> These costs were not as a result of an inadequate Performance Solution, but could be considered indicative.

<sup>54</sup> Australian Broadcast Corporation (2020) *Mascot Towers repair bill to hit \$53 million prompting owners to consider selling*. Accessed 24 April 2020. ><https://www.abc.net.au/news/2020-04-16/mascot-towers-repair-bill-from-cracks-hits-53-million-dollars/12153368><

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costly and consequences can extend beyond rectification to occupation displacement and stress, and business continuity, particularly in the case of high-rise construction.

The extent of the problem of building rectification work is also better understood through studies on existing buildings.

A study in 2019, which examined 212 building defect reports found:<sup>55</sup>

- Building fabric and cladding accounted for 40 per cent of defects, followed by fire protection (13 per cent), water proofing (11.5 per cent), roof and rainwater disposal (9 per cent), and structural (7 per cent).
- Structural defects resulted in building damage (35 per cent) and multiple other impacts (35 per cent), followed by water ingress, moisture, and rust.
- Two recurring triggers for defects identified by the report were the motivation to make a profit, which incentivises cheaper building solutions; and time pressure on completions that resulted in mismanaged construction processes and inferior builds.

The NSW Lambert Review in 2016 used data on complaints to Fair Trading NSW to estimate a break-down of defects, which shows external water penetration constitutes 10 per cent of complaints.

Although these studies do not provide information on the extent that inadequate Performance Solutions are contributing to the problem annually, they do provide insight into the extent of the problem more broadly and frame plausible thresholds for break-even scenarios.

### **Option 3 Restrict the application of the process to topics of fire and structure**

This option would require that all Performance Solutions relating to fire and structure use the ABCB's Performance Solution process. The process would be referenced in

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<sup>55</sup> Johnson N. and S. Reid (2019) An examination of building defects in residential multi-owned properties.

the Governing Requirements of all Volumes of the NCC and be specific to Performance Solutions relating to life-safety (fire and structural solutions).

### ***Qualitative Costs***

This option would impose similar costs to Option 2. However, there is likely to be a need for separate guidance, education and training material depending on the topic targeted. Inconsistency with the long-stated position of the ABCB and education material produced to date is likely to lead to misinterpretation by NCC practitioners by tacitly indicating that there is no need to properly document Performance Solutions for topics other than life-safety.

Transparency in decision making and stakeholder agreement to acceptance criteria is already a component of some VMs outside fire and structure. It could create some confusion if this were to appear unnecessary or only desirable. A key feature of this measure is to contribute to changing industry culture in the use of a performance-based code, which is made more difficult if it is explicitly acknowledged that the expectation is that some Performance Solutions do not need to be subject to consultation and adequately documented.

### ***Quantitative Costs***

The costs of this option will be a subset of the costs of Option 2. It is not known with certainty the proportion of fire and structural solutions. As the proposed process has its origins in engineering, the degree of use in this area would be expected to be higher, noting it was the most commonly nominated area where Performance Solutions were used by respondents to ABCB surveys.

Examining the proportion of 'adequate' responses where fire and structure were nominated by respondents suggests adequacy in this area is not significantly higher. The value of fire Performance Solutions is also on average likely to be higher.

As such, this analysis assumes that 60 per cent of all Performance Solutions relate to fire and structure.

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Should this assumption hold, the annual cost of this option would be \$18,687,629, or \$140,441,871 in Present Value terms using a discount rate of 7 per cent over 10 years.

### **Benefits**

The amendment of the Governing Requirements will provide a clearer indication of government expectations about compliance with the process for practitioners to follow and governments or third parties to enforce. The proposed changes will, therefore, better reflect government and community expectations when a Performance Solution is developed. Consistent with the survey feedback, by following the process there is a much better chance that Performance Solutions will comply with the NCC's Performance Requirements and that the building meets community expectation in terms of safety.

In the case that a complaint is lodged or where there is an issue with a building that is limited to fire or structural solutions, governments will have access to documentation for the purpose of auditing and determining compliance with the NCC's Performance Requirements.

Over time, and combined with other measures, this should result in improved building outcomes, reducing costs of rectification and disputation, lifting confidence in the industry and potentially contributing to lowering professional indemnity insurance for practitioners.

The Consultation RIS asked stakeholders whether there were any other qualitative or quantitative costs and benefits to consider associated with implementing Options 2 or 3.

One respondent felt that various psychological impacts – particularly stress – were experienced by owners, usually arising from financial pressures related to the devaluation of properties and drawn-out rectification processes. It is acknowledged that stress is an impact associated with building defects that require rectification work, although this impact is difficult to quantify. In this sense, stress is a qualitative cost of the status quo which may be avoided under Option 2 or Option 3.

Five stakeholders commented on the issue of insurance. One respondent suggested Professional Indemnity (PI) insurance premiums would decrease, however, they did not elaborate further. Most stakeholders (4 out of 5) felt that insurance premiums will be unaffected by the proposed changes with one citing that there are other factors that would overrule any administrative changes to the Performance Solution process. This conclusion is also consistent with the results of the recent ABCB survey (Figure 2).

## **Break-Even Analysis**

There remains limited evidence to indicate the extent of the problem in monetary terms annually. In such circumstances a break-even analysis can be helpful to indicate the frequency of benefits required relative to an option's costs to inform the feasibility of the option.

A break-even analysis calculates the benefits needed to equal the costs using a key assumption. In this case the key assumption is the number of buildings that require rectification and the costs associated with that rectification. However, with the limited information that is available, estimates that take account of the uncertainty need to be carefully selected. One example, both likely to affect all building archetypes and requiring a Performance Solution, is problems associated with non-DTS cladding.

Benefits are calculated by multiplying the key assumption to determine the frequency of avoided failures over a forty-year period and derive the Present Value benefit that would be required to offset the Present Value cost.

The number of buildings required to avoid rectification work per year for the calculated benefits to equal or exceed the costs for both options is shown in Table 12 for residential buildings and Table 13 for commercial buildings.

**Table 9 Break-even analysis for residential buildings**

	Present Value Costs	Assumed rectification cost (per dwelling)	Annual number of buildings avoiding rectification to Breakeven
Option 2	\$39,794,418	\$98,429	3.8
Option 3	\$23,876,651	\$98,429	2.3

Notes:

1. Present Value costs calculated using a 7% discount rate over a ten year period.
2. Required Present Value benefits calculated using a 7% discount rate over a forty-year period.
3. Costs of rectification based on full replacement cost of external façade.
4. Option 3 calculated based on the assumption that fire and structure account for 60% of all Performance Solutions.

**Table 10 Break-even analysis for commercial buildings**

	Present Value Costs	Assumed rectification cost (per SOU)	Annual number of buildings avoiding rectification to Breakeven
Option 2	\$194,275,367	\$32,437	4.7
Option 3	\$116,565,220	\$32,437	2.8

Notes:

1. Present Value costs calculated using a 7% discount rate over a ten year period.
2. Required Present Value benefits calculated using a 7% discount rate over a forty-year period.
3. Costs of rectification based on full replacement of fabric of sole-occupancy units (SOUs within Class 2 buildings) based on 12 SOUs per building.
4. Option 3 calculated based on the assumption that fire and structure account for 60% of all Performance Solutions.

As can be seen above, a small number of buildings are required in order for the costs to equal the benefits.

There is insufficient data to include other commercial building types in the break-even analysis. However, these break-even thresholds would equate to failures in 0.02 per cent of new commercial buildings (offices, retail buildings, etc.) and industrial buildings (warehouses, factories, etc.) annually. This is well within plausible limits when applying the rate of defects under contemporary studies to the assumed use of Performance.

The Consultation RIS asked stakeholders whether they believed the benefits would outweigh the costs.

Fifty-one per cent of respondents agreed benefits would outweigh costs with only 7 per cent of those believing that Option 3 may be more effective in addressing the problem than Option 2. One advocacy group expressed the opinion that applying the process to all NCC objectives (Option 2) was essential to ensure the suitability of future solutions.

One respondent (an engineer) felt the problem was most observable in fire safety engineering. Another respondent shared similar experiences and felt that the solution may not be as applicable where VMs are used. They suggested that an alternative option could be to apply to the process to only those Performance Solutions where a VM is not used.

Of those that disagreed (31 per cent), one respondent felt that the problem was not resulting in injuries and fatalities and, therefore, was not a problem, while another felt the benefits would only be achieved when designers better understood performance-based design. While the problem is most observable in fire safety engineering, both the ABCB survey and responses to the Consultation RIS indicate the problem in other areas of the NCC. In this regard, a more complete solution may be preferable. While use of VMs differ in their approach, meeting the Performance Requirements cannot be achieved without demonstrating a quantified benchmark or that a predetermined acceptance criteria has been met. Stakeholder consultation, including gaining agreement from an approval authority to the use of the VM at a minimum, is required. Adequate project documentation to reflect this agreement and the results of the process applies equally to where VM equivalence to DTS and expert judgement is used as a means of demonstrating compliance with the Performance Solutions.

The analysis supports the need for greater education and awareness to ensure that the proposal is effective in addressing the problem. The ABCB is building on a range of materials it has developed over the past two years to promote the competent use of a performance-based code through developing an enhanced education and awareness initiative as part of its response to the BCR recommendations. It is

envisaged that this will include training modules, greater information on performance-based design and scaling the assessment process.

## Sensitivity Analysis

This section examines the sensitivity of the quantitative analysis to variations in key assumptions underpinning the aggregate (gross) impact analysis. The sensitivity analysis has been conducted on three areas noting:

- A real discount rate of 7 per cent has been used in the quantitative analysis and sensitivity will be tested from a lower bound of 3 per cent to an upper bound of 11 per cent.
- The cost of rectification could vary depending on size and use of the building. Since the Consultation RIS, the sensitivity analysis has been updated to reflect the opinion that rectification costs could be higher for commercial buildings. The sensitivity analysis will test a high scenario of +30 per cent and a very high scenario of +50 per cent. The sensitivity analysis for rectification costs for residential buildings remains unchanged from the Consultation RIS.
- Stakeholder feedback to the Consultation RIS also indicated that, where Performance Solutions are used in commercial buildings, the number of solutions used may be higher. Although no new evidence was received, the central analysis has been updated since the Consultation RIS to reflect stakeholder opinion. As the total may vary due to the number of solutions per building, the sensitivity analysis will maintain 1 solution as the low test and very high 3 solution scenario.
- One industry association felt that the use of Performance Solutions in residential buildings (Class 1 and 10 buildings) could be much higher (in the range of 20 per cent). The sensitivity analysis has been revised to test this scenario.

**Table 11 Sensitivity analysis – Residential**

Sensitivity	Option 2 - Cost	Option 2 – Break-even	Option 3- Cost	Option 3 – Break-even
Lower bound discount rate (3%)	\$46,523,923	2.3	\$27,914,354	1.4
Upper bound discount rate (11%)	\$34,614,765	5.5	\$20,768,859	3.3

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<b>Sensitivity</b>	<b>Option 2 - Cost</b>	<b>Option 2 – Break-even</b>	<b>Option 3- Cost</b>	<b>Option 3 – Break-even</b>
Lower bound rectification costs (-30%)	\$39,794,418	5.4	\$23,876,650	3.2
Upper bound rectification costs (+30%)	\$39,794,418	3.0	\$23,876,651	1.8
Low number of residential Performance Solutions (1%)	\$13,264,806	1.3	\$7,958,884	0.8
Very high number of residential Performance Solutions (20%)	\$265,296,115	25.2	\$159,177,669	15.1

The sensitivity analysis for residential buildings shows that equivalent to between 1 and 25.2 dwellings would need to avoid rectification work (full replacement of cladding and substantial replacement of timber framing) per year for the benefits to equal the costs. This range is largest when varying the number of solutions. Based on the weight of opinion through feedback to ABCB consultations, this is considered unlikely. However, it has been included to give recognition to other opinions that cited clusters, or a larger number of solutions, many of which would follow a simple process. It should be noted that this unlikely high use scenario would imply a lower average cost per solution and require lower breakeven than are reflected.

**Table 12 Sensitivity analysis – Commercial**

<b>Sensitivity</b>	<b>Option 2 - Cost</b>	<b>Option 2 – Break-even</b>	<b>Option 3- Cost</b>	<b>Option 3 – Break-even</b>
Lower bound discount rate (3%)	\$227,128,647	2.8	\$136,277,188	1.7
Upper bound discount rate (11%)	\$168,988,431	4.1	\$101,393,059	2.5
High rectification costs (+30%)	\$194,275,367	3.6	\$116,565,220	2.1
Very high rectification costs (+50%)	\$194,275,367	3.2	\$116,565,220	1.9
Lower bound use of Performance Solutions (1 Solution)	\$137,862,787	1.2	See footnote	-

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Sensitivity	Option 2 - Cost	Option 2 – Break-even	Option 3- Cost	Option 3 – Break- even
Upper bound use of Performance Solutions (3 Solutions)	\$290,482,364	7	See footnote	-

The sensitivity analysis for commercial buildings shows that between 1.2 and 7 apartment buildings (containing 12 SOUs or more) are required to avoid rectification work per year for the benefits to equal the costs.<sup>56</sup>

Given the assumed increase in use of Performance Solutions under the high and (unlikely) very high scenarios tested, and the extent of buildings impacted by rectification under contemporary studies, the above rates of avoided failure are all considered small and plausible under the status quo.

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<sup>56</sup> The number of solutions for Option 3 is not further inflated. The model adopts a simplifying assumption that Performance solutions under Option 3 impose 60% of the costs of Option 2. However, the predominant scope of Option 3 in commercial buildings is fire safety and is covered by current state regulations, the current assumptions are considered conservative.

## Effectiveness of all Options

The impacts of alternative options have been considered on the basis of full compliance. However, overall effectiveness will be influenced by the extent of behavioural change and other administrative processes (e.g. education, auditing and enforcement).<sup>57</sup>

## Enforcement

A broadly applied process (Option 2) is expected to provide consistency and clarity, and be simpler to communicate, educate and enforce. It is also supported by existing guidance and supporting materials.

Option 3 would only reinforce the current situation for Performance Solutions for fire with the additional process and the level of documentation required of practitioners extending to structure. As amendments are principle-based, industry is likely to require new guidance information, templates and examples to aid interpretation. Yet providing exemptions for other areas under Option 3 could infer no process is required, and this would be an unintended consequence.

## Changing behaviour

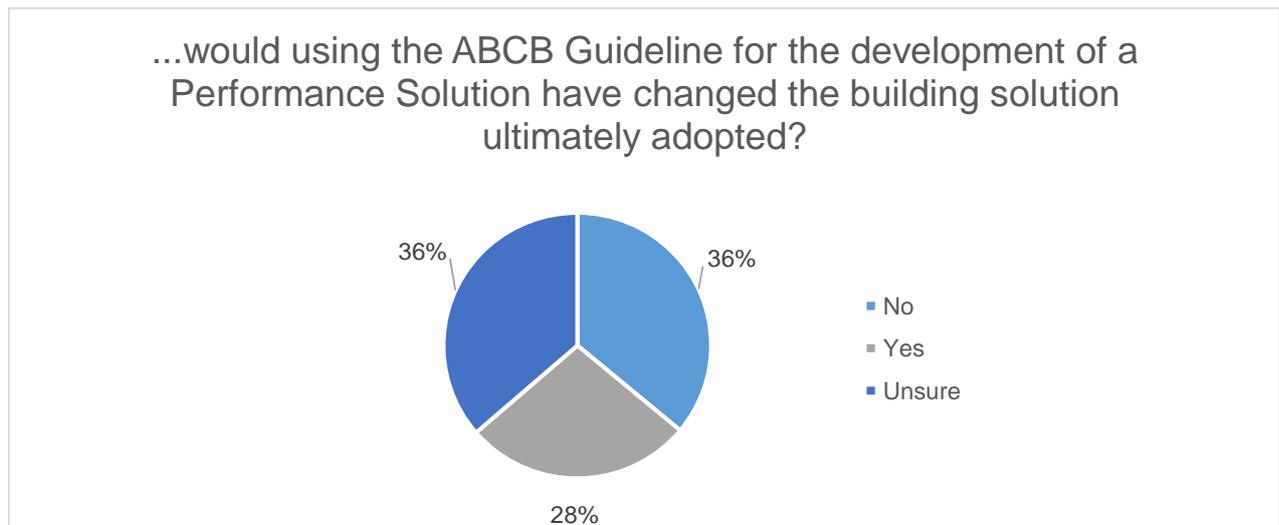
Under all options it is acknowledged that there are degrees of flexibility that reduce the effectiveness of the process. The extent that guidance has been effective under the status quo is reflected in the problem. Feedback from previous surveys, industry associations, individuals and state administrations suggests, in the absence of regulation, use and expectations of a consistent process will continue to be low under the status quo. Both regulatory options could be expected to increase the effectiveness of guidance. Under Option 2, the scaling of the process against a solution is intended to be managed through stakeholder consultation. This is where the majority of survey respondents felt building outcomes would positively change, as shown in Figure 3.

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<sup>57</sup> Enforcement is a function of state and territories and generally delegated to private certifiers.

There was no clear agreement between responses when respondents were asked if using the ABCB Guideline for the development of a Performance Solution would have changed the actual building solution ultimately adopted. This is shown in Figure 3 below. The only sector where the majority responded that this would be the case was 'Government'.

**Figure 3 The impact of the ABCB Guideline**



Source: ABCB Survey, 2019.

This implies that, while rigour would improve, construction costs are less likely to change. Where limited to 'life safety matters' under Option 3 (to the extent Performance Solutions are able to be classified as solely fire and structural solutions) compared to the status quo, effectiveness of achieving the NCC objectives may increase under Option 3.

## Unintended Consequences

The goal of this proposal is to ensure that the right balance between process and flexibility is achieved. This goal is aimed at enhancing the use of Performance Solutions while safeguarding the public against the inherent risks of insufficient process and documentation when they are developed.

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In some states and territories the accreditation of building surveyors to approve Performance Solutions is limited, which may constrain their wider use. In all cases, the analysis assumes building surveyors are operating within their area of expertise. If there is a culture of operating outside their expertise, the proposed changes will contribute to revealing and correcting this culture through greater documentation and auditing ability.

Further, in Australia, the approval authority should not be a party to the design team developing any Performance Solutions, but rather act as an independent reviewer of the output of that process. The documenting of the process for Performance Solutions, as reflected in the FSVM, may help reinforce this distinction.

Option 3 proposes to limit the application of the process to ‘life safety issues’, assumed to be fire and structure. However, Performance Solutions that seek objectives such as access and energy efficiency have also been shown to have the potential to significantly impact life safety. Given the inter-reliance of the Performance Requirements, classifying Performance Solutions as life safety or fire and structure, would require further amendments to guidance and could lead to some confusion, disagreement and delay. This option may also undermine a degree of current compliance in other topics through implying lesser importance for the process.

## Regulatory Burden

The Australian Government ‘Guide to Regulation’ discusses the importance of cutting red tape and includes a key principle for Australian Government policy makers, being:

*“The cost burden of new regulation must be fully offset by reductions in existing regulatory burden.”*

All regulatory costs, whether arising from new regulations or changes to existing regulation, must be quantified using the Regulatory Burden Measurement (RBM) framework. The framework must also be used for quantifying regulatory savings, where applicable.

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As measured in accordance with the framework, the regulatory cost from implementing Option 2 would be \$23,406,979.<sup>58</sup> The Commonwealth's share of this would be \$2,600,775.<sup>59</sup> Note, no exclusion has been made on government-to-government regulatory costs. That is, excluding the regulatory burden costs associated with local government building surveyors. This decision has been made on the basis that excluding local government certifiers from the RBM framework would not materially impact the calculated costs.

Governments of the states and territories are not required under COAG policy to identify regulatory offsets. Some jurisdictions may have their own mechanisms regarding regulatory offsets, which would be a matter for those jurisdictions to consider.

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<sup>58</sup> This has been calculated by annualising the Present Value of Option 2 in accordance with the RBM framework.

<sup>59</sup> This has been calculated by dividing the annual burden by the Commonwealth's contribution to the decision (1/9<sup>th</sup>).

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## Consultation

There has been acceptance from the majority of stakeholders consulted of the need for a consistent process to be followed when developing and documenting Performance Solutions, particularly in the area of fire safety.

### Consultation as part of the Increased and Competent Use of Performance project

Over the past 5 years, as part of the ABCB's Increased and Competent Use of Performance project, the ABCB has been directly consulting with industry and governments on ways to improve the use of the performance-based NCC and the uptake of performance-based design. In addition to the quantification of all Performance Requirements, much of the consultation has focused on the appropriate methods of analysis, decision and documentation. The existing guidance document developed as part of this project received the full support of industry and governments. There is also agreement from the majority of stakeholders consulted that industry needs to do more to demonstrate the processes followed when developing Performance Solutions including in areas outside of fire safety.

### Stakeholder views received via national education seminars and panel sessions

In 2002, some stakeholders were concerned about the processes used for performance-based fire safety solutions. In response, the ABCB in collaboration with the key stakeholders delivered a national seminar series in all capital cities to promote the use of the processes outlined in the IFEG. The central message was that the development, analysis, stakeholder engagement and documentation of Performance Solutions is critical to the process.

In 2015, stakeholders again expressed concern that the appropriate process was still not being used for the development of fire safety Performance Solutions. In response,

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the ABCB delivered panel sessions in all capital cities on the importance of the process.

Industry has been directly consulted during the development of all performance-based design guidance documents and feedback has been sought on the process of developing Performance Solutions during a number of education seminars.

### **Stakeholder consultation on proposed Performance Solutions process**

Both the Board and BMF were consulted on the need for further direction on the development of Performance Solutions. The impact that guidance material has had on improving the processes applied, as evidenced by its uptake, indicates there is a residual gap between regulation and enforcement. The Board and the BMF subsequently agreed to the National Framework, including changes to the NCC's Governing Requirements, being consulted on as part of the public consultation on the NCC's 2019 out-of-cycle amendment. Consultation occurred between 23 September and 11 October 2019 and feedback on these changes were considered in the development of this Decision RIS. Information and data was separately sought from state and territory building administrations on the use of Performance Solutions to inform this assessment. To address uncertainties, the ABCB's national technical committees, the Building Codes Committee and Plumbing Code Committee, reviewed this analysis and its assumptions. They were specifically asked to consider the:

- costs of Performance Solutions (total fees);
- extent Performance Solutions are used in the commercial and residential sectors;
- if the value of (qualitative) benefits are likely to exceed the costs;
- the effectiveness of the proposal; and
- any unintended consequences.

Feedback has been taken into consideration in the preparation of this analysis and its options, particularly the preference of some to restrict the application of the changes to fire and structure Performance Solutions (Option 3). The extent to which Performance Solutions documentation should be applied, particularly in relation to

residential buildings and plumbing applications, was questioned. However, this is an issue of enforcement, not the specific problem that this proposal seeks to address.

## **Performance Solutions Process Consultation RIS**

The Consultation RIS was released for public submission from 24 February to 22 March 2020. A total of 49 submissions were received in response to the Consultation RIS, encompassing 40 individuals, 3 product manufacturers, 2 state building authorities and 4 industry bodies. Responses to the consultation questions have been included throughout this Decision RIS and the final analysis has been updated as appropriate.

The full list of questions can be seen below, along with a summary of the responses provided.

### **Problem section**

#### **Consultation Questions:**

- Do you agree with the nature of the problem?
- Are there any other characteristics not described?
- Are you aware of other circumstances when documentation is mandatory?
- Are you aware of any residential buildings which required rectification as a consequence of the Performance Solution process followed?
- Are you aware of commercial buildings which required rectification as a consequence of the Performance Solution process followed?

Of the responses received, the majority (71 per cent) felt that the nature and extent of the problem had been adequately described.

Of those that disagreed with the description of the problem, three themes were relevant to the proposal: targeting, necessity, and productivity.

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- Targeting: The proposal does not address the lack of education and awareness of Performance Solutions, which is argued by one respondent to be the larger problem.

The ABCB recognises the importance of continued education and awareness relating to use of the NCC as well as the need for improved auditing and enforcement which are issues currently being considered separately as part of the response to the recommendations of the BCR.

- Necessity: The proposals will result in an increase in regulatory burden, without any resulting benefits (especially for simple Performance Solutions).

The process followed is proposed to be commensurate to the nature and complexity of the Performance Solution being developed. Hence, the same level of rigor associated with a complex solution would not be expected for a simple solution. Existing guidance material addresses this issue (and the topics cited) which is likely to receive more promotion.

- Productivity: A representative from the childcare industry also strongly opposed the proposal applying to early childhood centres believing that it was an unnecessary and unproductive regulatory burden, and that other more cost-effective options were available.

The problem relates to public confidence and ensuring that societal expectations of a rigorous process being followed when designing and constructing buildings in Australia is achieved in practice.

The Consultation RIS asked stakeholders whether they were aware of other circumstances when documentation was mandatory. Forty per cent of all respondents noted jurisdictional differences. Updates were made for the Decision RIS to reflect information received.

The Consultation RIS asked stakeholders whether they had any examples of residential or commercial buildings where rectification work was required as a consequence of the Performance Solution followed. A number of examples were

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provided for residential and commercial buildings, with 28 per cent citing examples in both residential and commercial buildings.

Extracts of these responses can be found in the Problem section of this RIS.

### Extent of the problem

#### Consultation Questions:

- Do you have information on the extent of use of Performance Solutions in Class 1 and 10 buildings?
- Do you have information on the extent of use of Performance Solutions in Class 2 to 9 buildings?
- Is stakeholder involvement in determining acceptance criteria likely to lead to higher confidence in Performance Solutions?
- Do you agree with the estimates on the extent Performance Solutions are used in residential and commercial buildings?
- Are you aware of any studies on the costs of rectifying building work as a result of inadequate Performance Solutions?
- Do you agree with the costs associated with rectification work outlined in Table 5?

The Consultation RIS asked stakeholders whether had any information relating to the extent Performance Solutions were used in residential and commercial buildings.

Of those that responded to the question, most (12 out of 15) stakeholders agreed that the extent to which Performance Solutions are used in residential buildings is small, with responses ranging from 0 to 3 per cent. The central estimates for residential buildings, therefore, remain unchanged in line with the majority of feedback.

Sensitivity analysis has been expanded to test the outcomes associated with a 20 per cent uptake of Performance Solutions in Class 1 and 10 buildings, which aligns with the views of a particular industry association.

For commercial buildings, the extent of Performance Solutions could be higher than reported in the Consultation RIS based on responses received. One stakeholder raised weatherproofing as an example of where a Performance Solution would be required

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because no corresponding DTS Provisions exist. Three respondents (an individual and two industry associations) also commented that multiple Performance Solutions are used in commercial buildings.

To reflect the potential for the effect of under reporting / higher concentration of topics in some commercial buildings, both the number of buildings and the number of topics used have increased equivalent to double the assumed number of buildings and solutions under the Consultation RIS.

The Consultation RIS asked stakeholders whether stakeholder involvement in determining acceptance criteria would lead to a higher confidence in Performance Solutions.

There was a mixed response to this question with the majority believing better building outcomes would be achieved. 43 per cent said yes, 27 per cent said no and 14 per cent said that they were unsure. No respondents elaborated on their response.

The Consultation RIS attempted to determine the size of the problem in terms of annual rectification work. This was not able to be established from the responses received.

## Impact analysis

### Consultation Questions:

- Are there any other qualitative costs and benefits to consider under each option?
- Are there any other quantitative costs and benefits (e.g. reductions in insurance premiums) to consider under each option?
- Do you have any examples of costs associated with rectification work where a Performance Solution was developed inadequately?
- Do you have any examples of costs associated with rectification work where a component of the Performance Solution process was not followed?
- In the absence of better information, do you agree with the cost of rectification estimates outlined in Table 9 relating to weatherproofing?
- Do you agree that the benefits will outweigh the costs under each option?

The Consultation RIS asked stakeholders whether there were any other qualitative or quantitative costs and benefits to consider associated with implementing Option 2 or 3.

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One respondent felt that various psychological impacts – particularly stress – were experienced by owners, usually arising from financial pressures related to the devaluation of properties and drawn-out rectification processes. It is acknowledged stress is an impact associated with building defects which require rectification work, although this impact is difficult to quantify.

Five stakeholders commented on the issue of insurance. Most stakeholders (4 out of 5) felt that insurance premiums will be unaffected by the proposed changes with one citing that there are other factors which would overrule any administrative changes to the Performance Solution process. This conclusion is also consistent with the results of the recent ABCB survey (Figure 5).

One respondent suggested Professional Indemnity (PI) insurance premiums would decrease, however, they did not elaborate further.

The Consultation RIS attempted to draw out examples of costs associated with rectification work where a Performance Solution was developed inadequately, or a component of the Performance Solution process was not followed. No examples were provided.

The Consultation RIS asked: In the absence of better information, do you agree with the cost of rectification estimates outlined in Table 9 relating to weatherproofing? Of those that responded to this question, just over two thirds agreed with the estimates. Of those that disagreed, three said that the costs are understated. Others said that the cost is unquantifiable, as rectification costs will vary greatly on a case by case basis.

Fifty-one per cent of respondents agreed benefits would outweigh costs with 7 per cent of those believing that Option 3 may be more effective in addressing the problem than Option 2. One advocacy group expressed that in their opinion applying the process to all topics (Option 2) was essential to ensure the suitability of future solutions.

One respondent (an engineer) felt the problem was most observable in fire safety engineering. One other respondent shared similar experience and felt that the solution may not be as applicable where VMs are used. They suggested that an alternative option could be to apply the process only to those Performance Solutions where a VM is not used.

Of those that disagreed (31 per cent) that benefits will outweigh costs, one respondent felt that the problem was not resulting in injuries and fatalities and, therefore, was not a problem, while another felt the benefits would only be achieved when designers better understood performance-based design.

## **Effectiveness of all Options**

The Consultation RIS asked stakeholders whether they believed that better building outcomes will be achieved by making changes to the Performance Solution process.

Most stakeholders responded to this question, with 67 per cent agreeing that greater stakeholder involvement would lead to better building outcomes.

Of those who thought building outcomes would not improve, one described it as being potentially 'an administrative nightmare' while another thought that it would only add cost and time to the approval process. A further two respondents suggested that it would only be effective if it were supported by enhanced education of practitioners and on its own it would not be effective solution.

One respondent considered that the IFEG already clearly defined the expectations of practitioners when developing Performance Solutions and questioned the need for more intervention other than a greater degree of enforcement.

These results generally reflect those of an ABCB survey in 2019 of expectations, which indicated that both outcomes and the use of performance-based design would improve through stakeholder involvement. It should be noted that effectiveness will be subject to enforcement being concentrated on those practitioners using processes that are not consistent with current regulation or guidance.

## Implementation

The Consultation RIS asked, if the proposed changes are adopted, should a 12-month transitional period be included prior to its implementation?

Two-thirds felt a transitional period was appropriate. Of those that didn't agree, there was a mixed response. Some felt that the problem required fixing immediately, while others felt it should be timed to align with other changes to the NCC. One response raised the alternative of staged adoption, i.e. Option 3 for Amendment 1 to NCC 2019 and Option 2 in 2022. The final analysis is unable to analyse the impacts of such a delay due to the coarseness of data and assumptions.

## Conclusion

Where no action is taken to formalise the principles of an agreed process for Performance Solutions, the problem described in this RIS will continue. Reviews citing a lack of transparency in the documentation of Performance Solutions has brought into question the ability for a performance-based code to meet community expectations. The continuation of a performance-based regulatory system relies on confidence in its use and clarity in the principles for the development of Performance Solutions. Confidence is likely to be lower as a result of the misuse, or misattribution of Performance associated with building failures.

Currently, processes and documentation are developed to meet a patchwork of state obligations or voluntary adherence with the principles of guidance. Feedback on the Consultation RIS suggests, a proportion of Performance Solutions, if measured against the ABCB Guideline, would be incomplete or inadequate, and that the likelihood of these solutions meeting the NCC would be low.

Feedback on the Consultation RIS also suggested that the extent Performance Solutions are utilised by industry and the adequacy of the solutions is not known with certainty. This is also evidenced by the lack of data on the use of Performance Solutions in each jurisdiction.

The final analysis has been updated to incorporate information received during public consultation. The costs of each option have increased and both Option 2 and Option 3 will impose costs of \$234,069,785 and \$140,441,871 respectively in Present Value terms. The extent of their impact will be in proportion to the extent current processes are considered inadequate and result in behavioural change. The magnitude of impacts (both costs and benefits) are subject to uncertainty, therefore conservative estimates were adopted particularly around the extent of use.<sup>60</sup> As evidenced by the BCR, the administrative system influences the proposal's future effectiveness.

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<sup>60</sup> The extent Performance Solution process followed is dependent on enforcement.

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Stakeholder feedback largely confirmed that survey responses are representative of current behaviour. Around half of all Performance Solutions in use could be impacted to varying degrees. The costs are considered small in the context of the potential benefits of achieving the objective of adequately demonstrating compliance with the NCC in a nationally consistent manner. This is reaffirmed by the results of the break-even analysis, which shows that given the potential costs of rectification, avoided failures required to offset the costs each year are small and plausible.

Option 3 limits both costs and the ability to fully achieve the objective. Its effectiveness is likely to be lowered further due to its limited scope being predominantly already covered by processes in states regulations for fire safety solutions, which appear not to have led to significantly higher levels of confidence. There are also likely to be difficulties practically delineating a 'life-safety' issue from other topics. Negative unintended consequences will result if there is a reduction in currently adequate processes due to implying a lesser importance for areas other than fire and structure.

Stakeholder consultation suggests clarity in roles and expectations, building solutions and outcomes improve the closer the proposed process is observed. The conclusion is, therefore, that Option 2 would be most complete and effective in addressing the problem and would deliver the highest (qualitative) benefits. Option 2 is the recommended option of this Decision RIS.

## **Implementation**

If decision makers support changes to the NCC, the provisions outlined in Attachment A will form part of Amendment 1 of NCC 2019. Two-thirds of responses to the Consultation RIS suggested a transitional period would be appropriate.

There was a mixed response from stakeholders on the length of the transition, some felt that the problem required immediate rectification while others felt it should be timed to align with other changes to the NCC. One respondent suggested staged adoption, i.e. Option 3 for Amendment 1 to NCC 2019 and Option 2 in 2022.

The final analysis is unable to analyse the impacts of such a delay due to the coarseness of data and assumptions. Qualitatively, it supports the view of the majority

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of stakeholders that it would be desirable to allow further education and promotion of guidance to be progressed.

This would address the scaling of the process, and its application to other topics, noting to date fire safety has been well supported yet for other topics, including structural solutions, appear not as well understood. A transitional period of no longer than 12 months like that which would typically occur for in some states and territories is recommended to allow further communication and guidance material to be developed.

# Attachment A

## Part A2 Compliance with the NCC

### A2.2 Performance Solution

- (1) A *Performance Solution* is achieved by demonstrating—
  - (a) compliance with all relevant *Performance Requirements*; or
  - (b) the solution is at least *equivalent* to the *Deemed-to-Satisfy Provisions*.
- (2) A *Performance Solution* must be shown to comply with the relevant *Performance Requirements* through one or a combination of the following *Assessment Methods*:
  - (a) Evidence of suitability in accordance with *Part A5* that shows the use of a material, product, *plumbing* and *drainage product*, form of construction or design meets the relevant *Performance Requirements*.
  - (b) A *Verification Method* including the following:
    - (i) The *Verification Methods* provided in the NCC.
    - (ii) Other *Verification Methods*, accepted by the *appropriate authority* that show compliance with the relevant *Performance Requirements*.
  - (c) *Expert Judgement*.
  - (d) Comparison with the *Deemed-to-Satisfy Provisions*.
- (3) Where a *Performance Requirement* is satisfied entirely by a *Performance Solution*, in order to comply with (1) the following method must be used to determine the *Performance Requirement* or *Performance Requirements* relevant to the *Performance Solution*:
  - (a) Identify the relevant *Performance Requirements* from the Section or Part to which the *Performance Solution* applies.
  - (b) Identify *Performance Requirements* from other Sections or Parts that are relevant to any aspects of the *Performance Solution* proposed or that are affected by the application of the *Performance Solution*.

**Note to pre-publication draft:**

Inclusion of A2.2(4), including its accompanying note and explanatory information, in this amendment is subject to consideration of impact analysis that is yet to be completed.

- (4) Where a *Performance Requirement* is proposed to be satisfied by a *Performance Solution*, the following steps must be undertaken:
  - (a) Prepare a *performance-based design brief* in consultation with relevant stakeholders.
  - (b) Carry out analysis, using one or more of the *Assessment Methods* listed in (2), as proposed by the *performance-based design brief*.

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- (c) Evaluate results from (b) against the acceptance criteria in the *performance-based design brief*.
- (d) Prepare a final report that includes—
  - (i) all *Performance Requirements* and/or *Deemed-to-Satisfy Provisions* identified through A2.2(3) or A2.4(3) as applicable; and
  - (ii) identification of all *Assessment Methods* used; and
  - (iii) details of steps (a) to (c); and
  - (iv) confirmation that the *Performance Requirement* has been met; and
  - (v) details of conditions or limitations, if any exist, regarding the *Performance Solution*.

### **Note:**

A2.2(4) does not take effect until 1 July 2021.

### **Explanatory information:**

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More information on NCC compliance methods is located at [www.abcb.gov.au](http://www.abcb.gov.au).

A2.4(2)(a) references A2.2. Therefore when using a combination of *Performance Solutions* and *Deemed-to-Satisfy Solutions* it is necessary to comply with A2.2(4) where a *Performance Requirement* is proposed to be satisfied by a *Performance Solution*.