

Scoping study for an Australian Technical Evaluation Network (ATEN)

Final Study Report

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- Australian Building Codes Board
- Housing Industry Association
- Master Builders Australia
- Australian Certification Authority for Reinforcing and Structural Steel
- Joint Accreditation System - Australia New Zealand
- Australian Insurance Group
- Deutsches Institut für Bautechnik
- World Federation of Technical Assessment Organisations
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Table of Contents

Acknowledgements	ii
Table of Contents	iii
Executive Summary	1
Background	2
Scope and key findings.....	2
Factors to be considered for successful operation.....	3
Next steps.....	4
Abbreviations.....	5
Glossary.....	6
1 Background.....	8
2 Review of Conformity Assessment.....	13
2.1 General.....	13
2.2 Conformity assessment in Australia.....	14
2.2.1 National Construction Code	15
2.2.2 Current system.....	17
2.2.3 Issues with current system	17
2.3 Conformity assessment in other countries.....	20
2.4 Lessons for Australia	23
3 Proposed Australian Technical Evaluation Network (ATEN)	24
3.1 General.....	24
3.2 What can ATEN offer?	25
3.3 ATEN Scheme Rules.....	31
3.3.1 General	31
3.3.2 Framework.....	32
3.3.3 Appraisal process.....	33
3.4 Development of software support.....	36
3.4.1 Requirements for database of building products.....	36
3.4.2 Prototype app for a specific NCC section	36
3.5 Beneficial impact of ATEN.....	36
3.5.1 Societal beneficial impact	36
3.5.2 Economic beneficial impact	38
3.5.3 Environmental beneficial impact.....	39
3.5.4 Beneficial impact for Victoria.....	39
4 Implementation Considerations and Conclusions	42
4.1 General.....	42

4.2	Network Members	42
4.3	Entity structure	42
4.3.1	Options for entity structure	42
4.3.2	Limitation of liability	43
4.4	National and state level implementation	43
4.5	Connection with other related bodies	43
4.5.1	Australian Building Codes Board (ABCB).....	44
4.5.2	Joint Accreditation Scheme of Australia and New Zealand (JAS-ANZ).....	44
4.5.3	National Association of Testing Authorities (NATA)	44
4.5.4	World Federation of Technical Assessment Organisation (WFTAO).....	44
4.6	Attributes for ATEN to operate successfully.....	45
4.7	Support for ATEN to operate successfully.....	45
4.7.1	Financial support.....	45
4.7.2	Non-financial support.....	45
4.8	Concluding remarks	46

Appendices 48

Appendix A: Review of contemporary reports and submissions on non-conforming building products to inform a scoping study on the Australian Technical Evaluation Network (ATEN)

Appendix B: ATEN Workshops

Appendix C: Standards and conformance contribution to Australia's regulatory regime for building products

Appendix D: Australian history of appraisal and certification

Appendix E: Conformity assessment schemes in Australia

Appendix F: Conformity assessment schemes in other countries

Appendix G: Recommended checklist for non-conforming and non-compliant investigations

Appendix H: ATEN and building products for high-risk applications – Discussion

Appendix I: Comparison of CodeMark Australia scheme and proposed ATEN scheme

Appendix J: Preliminary ATEN protocol for technical evaluation

Appendix K: Preliminary ATEN laboratory report template

Appendix L: Preliminary ATEN protocol for risk assessment

Appendix M: Preliminary ATEN Appraisal Report template

Appendix N: Requirements for ATEN database of building products

Appendix O: Software for the determination of Fire Resistance Level (FRL)

Appendix P: Preliminary register of experts and testing facilities

Appendix Q: Potential entity structure for ATEN

Appendix R: Potential ATEN governance for a national approach

Executive Summary

The **Australian Technical Evaluation Network (ATEN)** is a proposed scheme to bring together a network of selected construction experts and testing facilities to evaluate building construction products and systems as to their fitness-for-purpose with initial particular focus on high-risk applications employing performance solutions. ATEN would be formed as a new legal entity to produce consistent, verifiable and independent product Appraisal Reports to support the construction industry supply chain. ATEN key constituents and functions are shown below.

	Who they are	Responsibility
ATEN	Legal entity employing key staff with necessary skills	Responsible for conducting the Selection and Review and Attestation functions of conformity assessment, based on advice from the ATEN Reference Groups when necessary
Network Members	Selected construction experts and testing facilities	Responsible for conducting the Determination function of conformity assessment
Reference Groups	Selected experts from the Network Members and possibly others to advise on specific fields or projects	Responsible for providing advice for the Selection and Review functions of conformity assessment

Key ATEN constituents

Recent reports, including the Shergold and Weir report¹, the Senate Inquiry report² and Victorian Cladding Taskforce³, have made recommendations that aspects of the construction conformity assessment system require improvement. The ATEN scheme aligns with these recommendations and more importantly, it generates new technical information that is necessary for potential solutions to work. The scoping study has consulted with stakeholders, drawn on overseas experience and Australian industry expertise and it identified that it would provide numerous benefits, including:

- Enhanced safety and public confidence in the building and construction industry through a new robust conformance pathway especially for innovative products.
- More efficient product conformity assessment services through *one stop shop* collaboration, better information sharing and improved risk management.
- Increased economic activity and skills-based jobs in the construction products supply chain through support of innovation, research, and education.
- Enhanced trade opportunities by facilitating mutual recognition in international markets underpinned by consistent, verifiable and independent construction product appraisals.

¹ Shergold, P., & Weir, B. (2018). *Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*. Retrieved from <https://www.industry.gov.au>.

² Senate Economics References Committee. (2018). *Non-conforming building products: the need for a coherent and robust regulatory regime*. Retrieved from <https://www.aph.gov.au>.

³ The State of Victoria Department of Environment, Land, & Water and Planning. (2019). *Victorian Cladding Taskforce: Report from the Co-Chairs, July 2019*. Retrieved from <https://www.planning.vic.gov.au/>

Background

The scoping study for ATEN was carried out with the support of Victoria Government Future Industries Fund and a consortium led by Swinburne University of Technology in collaboration with the Victorian Building Authority (VBA), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Association of Consulting Structural Engineers Victoria (ACSEV), and National Association of Steel-framed Housing (NASH).

At its core, ATEN is to support product innovation, enhance evaluation efficiency, and improve life safety and confidence in the building construction industry.

Scope and key findings

This scoping study has examined the changing operating environment for the design and construction of buildings (and associated building products) that has emerged over the last fifty years. It has looked at the nature of market failures apparent in Australia's technical and conformance infrastructure; how such issues are addressed by some of our major trading partners and how they could be better addressed by ATEN for Australia; what the ATEN scheme could look like; and how it might be technically implemented.

The study concludes that from a technical point of view, it is feasible to organise a network of selected construction experts and testing facilities to evaluate building products and produce Appraisal Reports on their fitness-for-purpose. ATEN's proposed operational model has many common features with the European Technical Assessment (ETA) of the European Organisation for Technical Assessment (EOTA) that has operated successfully in Europe and elsewhere for many years, and it would bring Australia into line with international best practice with minimal risk and demonstrable benefits.

The ATEN scheme is consistent with many of the recommendations of recent reports that have highlighted the need for improvement. For example:

- ATEN's Appraisal Reports will be a much-improved documentation of product technical properties (Shergold and Weir Recommendation 13).
- ATEN's approach to evaluation of performance-based solutions is in accordance with Shergold and Weir Recommendations 14 and 15 on approval of performance solutions.
- ATEN's role as an independent third-party fits with Shergold and Weir Recommendation 17.
- Also, the Appraisal Report is a necessary document for the certification of fire safety systems (Shergold and Weir Recommendation 19).
- ATEN's risk-based approach to appraisal would fulfil the recommendation on high-risk products (Shergold and Weir Recommendation 21).

Further, with the experience gained in assessing product fitness-for-purpose, ATEN could also extend its function (when requested) to assist with review of complex performance-based designs and investigate instances of non-conformance or non-compliance.

This scoping study has been undertaken through a period of ongoing policy review in relation to solutions for the challenges of systemic failures in the building regulatory system, including failures in the conformance standards infrastructure. The ATEN scheme has the characteristics of a public good service as it would generate positive externalities by improving building safety and market confidence outcomes. Its services would be available to all product and technology suppliers within

its remit, and its methodology for assessing performance solutions would be a unique contribution to the market.

ATEN can fit in with current Australian conformity assessment system. It is not intended that it replace or interfere with any existing conformity assessment bodies but may well be helpful in facilitating the work of these bodies.

ATEN could operate under different types of structure and governance with different degrees of legal liabilities. This study recommends that ATEN operates as a company limited by guarantee or possibly as an incorporated association. It could be a public or private organisation, or a public-private partnership. In any case, it should be not-for-profit. The most appropriate form will be dependent on government policy on future conformity assessment for Australia and preference of initial funding bodies.

The scoping study has addressed a number of the technical issues that have been identified to ensure feasibility of implementation. Protocols for testing and appraisal of new innovative products and general scheme rules have been drafted for consideration. These protocols address the process for assessment of risk, technical evaluation of building products as well as appraisal and laboratory reporting. Some specific deliverables from this study include:

- A feasibility review on a database for new construction products: A preliminary proposal for ATEN register database for appraised building products has been prepared following a comparative review of six conformity assessment systems from Australia, NZ, EU and US. There will be a need for the detailed categories and structure of the database to be further developed with industry during potential ATEN implementation.
- Prototype web-based software for a specific section of the National Construction Code (NCC): A prototype software for Fire Resistance Level (FRL) for specific items of Classes 2, 3, and 9a buildings has been developed. The intention is to demonstrate an example benefit of ATEN in reinforcing and clarifying complex NCC Clauses by a software to produce consistent interpretation and also to serve as an educational tool.
- A register of practitioners and organisations that would participate in the network. Seventy experts from Australian universities, testing facilities, commercial entities and industry bodies have agreed to be included in an ATEN register which will form part of the network.

Factors to be considered for successful operation

For ATEN to operate successfully, the cooperation of key parties, including the manufacturers/suppliers, designers, regulators, and building surveyors is required. While ATEN can operate under a number of possible entity models, certain attributes are considered essential:

- ATEN should operate as an independent not-for-profit organisation, with financial assistance for its initial establishment and operation. *Independent* and *not-for-profit* are important for its credibility.
- A connection should be established between ATEN and the building regulatory systems to reinforce and clarify compliance pathways. The Appraisal Report will be a cost to the manufacturer/supplier. Hence, recognition of Appraisal Reports as evidence of suitability would be required.

There are several ways that governments, regulators and industry associations can support ATEN. Examples include:

- The Australian Building Codes Board (ABCB) could consider specific inclusion of Appraisal Report as part of the *evidence of suitability* (Section A5.2) in the NCC. Further, limited types of *evidence of suitability* may be allowed for high-risk applications to ensure compatibility of the level of rigour of product evaluation to the risk associated with the application.
- Regulatory authorities and building certifiers could refer to ATEN as an authoritative source of expertise for investigation of non-conforming, non-complying incidents or for a second opinion when faced with more complex performance proposals.
- Guidelines for government procurement could give preference to products with ATEN appraisals.
- Industry associations could make their memberships aware of ATEN existence and encourage its use.

Next steps

This scoping study has confirmed the need for ATEN, its technical feasibility, how ATEN would fulfil the identified needs and realise its benefits.

The next steps are focused on the potential implementation of ATEN. There are a number of specific issues which require additional consideration as part of the implementation process which include:

- Whether ATEN appraisal could be mandatory, voluntary or a combination of both: The ATEN scheme can work for all scenarios. However, the operational requirements will be different as the volume of work will change significantly depending on the choice made.
- How the Appraisal Report is to be used as part of a revised conformity assessment system: ATEN can serve as an effective and efficient tool to support the relevant evaluation criteria for the newly defined *building complexity* levels which are under public review (in late 2019) through the ABCB for an out-of-cycle amendment to NCC 2019. It is important to ensure that there is consistency in interpretation of performance requirements and associated rigour of evaluation if there are multiple paths for conformity which may not be equivalent.
- Entity structure: Several feasible options (e.g. including company limited by guarantee and incorporated association) have been put forward with the final decision being dependent on the preference of the initial funding stakeholders to launch ATEN. The business plan would follow from this decision. Operational considerations in relation to insurance of the ATEN entity and its network members, handling of intellectual properties and creation of non-disclosure agreements would require careful attention to ensure appropriate protections. Existing international practice and local industry certification schemes suggest that these matters can be resolved appropriately.
- Ongoing surveillance of appraised products: This is important to maintain the validity of the ATEN Appraisal Reports. The surveillance can be undertaken by specified Inspection Bodies or alternatively undertaken by ATEN if it is decided that it is to have this additional function.

Some of these issues are related to government policy settings. Therefore, it is recommended that implementation work is to be undertaken in close consultation with the relevant state, territory and/or federal government to ensure efficient and successful rollout. Furthermore, the financial requirements to set up and operate the ATEN scheme will depend on the decisions related to the issues mentioned above. However, given the well documented deficiencies of the conformity assessment system in Australia and the associated safety and economical risks, and also the demonstrated successful operation of similar schemes in other countries the financial requirements can be estimated and justified.

Abbreviations

ACCC	Australian Competition and Consumer Commission
ABCB	Australian Building Codes Board
ACP	Aluminium composite panels
ACSEV	Association of Consulting Structural Engineers Victoria
ATEN	Australian Technical Evaluation Network
AVCP	Assessment and verification of constancy of performance
BMF	Building Ministers' Forum
BRAC	Building Regulations Advisory Committee
BRANZ	Building Research Association of New Zealand
CAB	Conformity Assessment Body
CCMC	Canadian Construction Materials Centre
CPR	Construction Products Regulation (for Europe)
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DIBt	Deutsches Institut für Bautechnik
DTS	Deemed-to-satisfy
EOTA	European Organisation for Technical Assessment
EPS	Expanded polystyrene
EU	European Union
ICC-ES	International Code Council Evaluation Service
ISO	International Organisation for Standardisation
JAS-ANZ	Joint Accreditation Scheme of Australia and New Zealand
NASH	National Association of Steel-framed Housing
NATA	National Association of Testing Authorities
NCBP	Non-conforming building products
NCC	National Construction Code
QA	Quality assurance
VBA	Victorian Building Authority
WTO-TBT	World Trade Organisation – Technical Barriers to Trade

Glossary

Accreditation: third-party attestation of a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks (ISO 17000).

Appraisal: in the context of this report appraisals provide technical opinion in relation to the whether the appraised product meets the relevant performance requirements for the intended use.

Assessment and Verification of Constancy of Performance (AVCP) system: is a harmonised system defining how to assess products and control the constancy of the assessment results based on health and safety implications. Five different systems are in place for construction products in the Construction Products Regulation for Europe.

Attestation: issue of a statement, based on a decision following review, that fulfilment of specified requirements has been demonstrated (ISO 17000).

Audit: systematic, independent, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled.

Certification: is the process of certifying that certain product meets specific stipulated criteria typically in standards or specifications. On the other hand in Australia, the CodeMark Certificate of Conformity is one of the several options available for meeting the *evidence of suitability* required of Volume 1 and 2 of the NCC (i.e. the Building Code of Australia).

Deemed-to satisfy (DTS) and performance solutions: are alternative paths defined in the NCC for demonstration of compliance with its stated performance requirements.

European Technical Assessment: is a document providing information on the performance assessment of construction products which are not covered by a harmonised standard. It is issued by a technical assessment body authorised by a member state, for the purpose of obtaining the CE marking under the Construction Products Regulation (CPR).

Evaluation: combination of the **selection** and **determination** functions of conformity assessment activities (ISO/IEC 17065, see Section 2.1 for details of ISO Conformity Assessment).

Fit-for-purpose: in the context of this report and in relation to construction products means it is suitable for use for its intended purpose. This can be demonstrated by, but not limited to, satisfying all of the relevant performance requirements of the NCC and other relevant specifications.

Inspection: examination of a product design, product, process or installation and determination of its conformity with specific requirements or, on the basis of professional judgement, with general requirements (ISO 17000).

Product certification schemes: rules, procedures and management for carrying out certification related to specified products as stipulated in ISO/IEC 17067. Activities within a scheme consist of six functions: (i) Selection, (ii) Determination of characteristics, (iii) Review, (iv) Decision, (v) Attestation, and (vi) Surveillance. All certification schemes involve (i) to (v). Different types of certification schemes can result from the activities selected for (vi).

Product: result of a process (ISO 17065, originated in ISO 9000:2000). In this report product also refers to material, component, or system which can be made up of several elements (e.g. wall panels of frames and cladding and/or lining).

Specified requirements: need or expectation that is stated (ISO 17000). For construction products, specified requirements are generally contained in standards and regulations. For most products, conformity can be demonstrated by **testing** and **inspection** with available prescribed procedures. For new or innovative products, prescribed procedures for **testing** and **inspection** may not be available.

Statement of conformity: the document that conveys the assurance that the **specified requirements** have been fulfilled.

Surveillance: systematic iteration of conformity assessment activities as a basis for maintaining the validity of the statement of conformity (ISO 17000).

Testing: determination of one or more characteristics of an object for conformity assessment, according to a procedure (ISO 17000).

1 Background

There is a gap in the Australian conformity assessment system for providing independent verifiable information on the fitness-for-purpose of building construction products to conform with the provisions of the National Construction Code (NCC), especially so for new and innovative products requiring *performance solutions*.

Evaluating all relevant performance aspects of a building product in terms of fitness for intended use is a very complex task. There is no single independent institution in Australia that has this capability. The necessary expertise and testing infrastructure are not easily accessible or sufficient. Indeed, based on a detailed expert review undertaken by Business Victoria under its Future Industries Sector Strategy for construction released in 2016⁴ it was identified that one of the six priorities which require resolution is the need to “streamline compliance pathways for new construction materials and products”. In particular, this review identified the following critical actions:

- advocate for a national certification system for high-risk building products,
- secure priority access to structural, fire and acoustic testing, and
- provide clear information on building standards and the regulation of building work.

Developing this streamlined (i.e. reinforced and clarified) compliance pathway for the building product supply chain will provide an evidence base to allow jurisdictions to operate more effective enforcement regimes. It will also facilitate the development and uptake of innovative products and will have significant benefits for the community, industry and regulators.

Recent incidences and reports, have highlighted systemic failures in the building regulatory system, including in the technical and conformance infrastructure. These failures have contributed to non-conformance and non-compliance in building works. Government reports have discussed most of these incidences and failures, namely the Victorian Cladding Taskforce⁵, the Shergold and Weir (commissioned by the Building Ministers’ Forum) report⁶, and a Senate Inquiry report⁷.

Non-conforming building products refer to products that claim to be something that they are not, do not meet required standards for their intended use, or are marketed or supplied with the intent to deceive those who use them (e.g. a building product that is labelled or described as being non-combustible but which is actually combustible is a non-conforming building product)⁸.

Non-compliant building products refer to products which are used in situations where they do not comply with the requirements of the NCC (e.g. a building product that is combustible, and described as such, but is used in a situation where a non-combustible product is required under the NCC is a non-complying product)⁸.

⁴ Victorian Government, Department of Economic Development, Jobs, Transport, & Resources. (2016). *Construction Technologies - Sector Strategy, Victoria's Future Industries*. Retrieved from <https://www.business.vic.gov.au/>

⁵ The State of Victoria Department of Environment, Land, & Water and Planning. (2019). *Victorian Cladding Taskforce: Report from the Co-Chairs, July 2019*. Retrieved from <https://www.planning.vic.gov.au/>

⁶ Shergold, P., & Weir, B. (2018). *Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*. Retrieved from <https://www.industry.gov.au>.

⁷ Senate Economics References Committee. (2018). *Non-conforming building products: the need for a coherent and robust regulatory regime*. Retrieved from <https://www.aph.gov.au>.

⁸ Australian Building Codes Board. (2015). What are non-conforming building products? Retrieved from <https://www.abcb.gov.au/NCBP/Non-conforming-building-products/What-are-non-conforming-building-products>

Shergold and Weir formed the opinion that the nature and extent of problems identified in relation to the building and construction industry were significant and concerning. They concluded that the current compliance and enforcement frameworks have been inadequate from preventing non-compliance in building works.

The report's goal is to enhance public trust through effective implementation of building and construction standards that protect the interests of those who own, work, live, or conduct their business in Australian buildings. They made recommendations to create a national best practice model, or framework, to strengthen the effective implementation of the NCC.

Twenty-four recommendations were made to improve the effective implementation of the NCC and confidence in the construction industry. Six of these recommendations are relevant to building product conformity assessment within the new framework proposed in the Shergold and Weir Building Confidence report:

- **Recommendation 13:** "That each jurisdiction requires building approval documentation to be prepared by appropriate categories of registered practitioners, demonstrating that the proposed building complies with the National Construction Code".
- **Recommendation 14:** "That each jurisdiction sets out the information which must be included in performance solutions, specifying in occupancy certificates the circumstances in which performance solutions have been used and for what purpose".
- **Recommendation 15:** "That each jurisdiction provides a transparent and robust process for the approval of performance solutions for constructed building work."
- **Recommendation 17:** "That each jurisdiction requires genuine independent third-party review for specified components of designs and/or certain parts of buildings".
- **Recommendation 19:** "That each jurisdiction requires registered fire safety practitioners to design, install and certify the fire safety systems necessary in commercial buildings".
- **Recommendation 21:** "That the Building Ministers' Forum agrees its position on the establishment of a compulsory product certification system for high-risk building products".

In February 2019, and subsequently, in July 2019, the Building Ministers' Forum (BMF) made clear in its Communiqués⁹, that it recognises Australia faces national health and safety challenges in the technical and regulatory infrastructure that is essential for maintaining minimum standards for structure and fire resistance in buildings through the NCC. The BMF set in train an implementation plan to address the recommendations of the Shergold and Weir Building Confidence report, through a strengthened Australian Building Codes Board (ABCB), including on issues that bear directly on the need for an improved conformity assessment system.

A final Senate Inquiry report also concluded that "... there has been a serious breakdown in the regulation and oversight of both non-conforming and non-compliant building products¹⁰," particularly in relation to the certification process of building products, manufactured in Australia and overseas.

⁹ BMF Communiqués of 8 February 2019 and 18 July 2019.

¹⁰ Victorian Government, Department of Economic Development, Jobs, Transport, & Resources. (2016). *Construction Technologies - Sector Strategy, Victoria's Future Industries*, p. 7.

A detailed review of contemporary reports and submissions on non-conforming building products (NCBPs) is provided in Appendix A. This review includes reviewing of 154 publicly available submissions¹¹ to the Senate Economics References Committee Inquiry on NCBPs between 2015 and 2018. Of those submissions, 23 were found to be most relevant to this study.

Furthermore, formal published industry reports have highlighted incidences of non-conformity and non-compliance in the building industry, including:

- the Australian Industry Group¹²,
- various confidential reports from the Australian Steel Institute, and
- numerous case studies in non-certified imported plywood by the Engineered Wood Products Association of Australasia.

In the industry reports, the term *non-conforming* has not been used in the technical meaning of the expression. Nevertheless, what has been reported so far belong to a number of categories of incidents including:

- products that fail to perform as expected,
- complaints from industry that certain products fail to meet the Australian standard specifications (with or without evidence and/or with or without estimates of consequences), and
- outright illegal acts such as counterfeit products, counterfeit certification, and misleading claims.

There have also been two public research reports from Swinburne University of Technology which have highlighted the difficulties involved in the investigation of NCBP incidents:

- (i) "Provision of research to improve the evidence base relating to non-conforming building products" (Draft 2 v07 Final report 5 February 2019) by Professor Russell Kenley and Dr Toby Harfield of Faculty of Business and Law: This project was commissioned by the Western Australian Government on behalf of the Senior Officers' Group and the Building Ministers' Forum. In relation to the evidence base, the investigation highlighted the difficulties in obtaining verifiable empirical evidence.
- (ii) "Non-conformance Prevalence, Testing Capacity and Nature amongst Specific Building Product Categories" (Final Industry Report December 2018) by Prof. Emad Gad, Prof. Lam Pham, Dr. Jessey Lee and Dr. Yusak Oktavianus of Faculty of Science, Engineering and Technology: This project was sponsored by Sustainable Built Environment – National Research Centre with funding from Western Australian Department of Mines, Industry Regulation and Safety (DMIRS) and Queensland Department of Housing and Public Works (DHPW). The project identified at least six areas where non-conformity might be a problem but focussed on two specific problems suggested by DMIRS and DHPW. The data generated from these investigations were kept in-confidence because of their sensitivity. The investigation concluded that "... there is a lack of independent verifiable information of the performance and use of building products and the accessibility for those who need this information."

¹¹ Parliament of Australia. *Submissions*. Retrieved from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming_products/Submissions

¹² The Australian Industry Group. (2013). *The quest for a level playing field: The non-conforming building products dilemma*. Retrieved from North Sydney, NSW: <https://www.aigroup.com.au/policy-and-research>

The above reports highlighted various problems with the investigation of NCBP incidences, including:

- (i) it could be very expensive to generate the data, and
- (ii) when an issue is identified, it is not certain how it should be dealt with¹³.

In summary, there are many reasons for non-conforming and non-compliant building product incidents. The most serious is when the incidence is only a symptom of a much more serious underlying cause that may affect many products; such as inadequate original product assessment in terms of fitness-for-purpose or changes in the manufacturing of the product not aligned with its original assessment.

To address the issues and concerns that have been discussed in this section, a scoping study for the Australian Technical Evaluation Network (ATEN) has been undertaken with the support from Victoria Government Future Industries Fund. The consortium for the scoping study is led by Swinburne University of Technology in collaboration with the Victorian Building Authority (VBA), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Association of Consulting Structural Engineers Victoria (ACSEV), and National Association of Steel-framed Housing (NASH).

The objective of this study is to scope the technical feasibility of the ATEN scheme to meet the identified needs by the Victorian Government under its Future Industries Sector Strategy and recommendations of various reports as outlined earlier. In other words, the ATEN scheme is to generate independent, consistent, verified information on the fitness-for-purpose of building construction products in the form of an Appraisal Report that can be used as evidence of meeting all relevant performance requirements of the NCC and/or other relevant specifications. The key outcomes from the study are listed below.

- (i) Review of conformity assessment including current Australian and international practice and limitations of the Australian system (Section 2).
- (ii) Description of the ATEN scheme and technical components of the ATEN scheme, including Appraisal Report and laboratory report templates, protocols for risk assessment, technical evaluation, and investigation of non-conforming and non-compliant building products (Section 3).
- (iii) Development of an example prototype web-based software for a complex section of the NCC and the requirements for a database of appraised building products (Section 3).
- (iv) Identification of beneficial impact of the ATEN scheme (Section 3).
- (v) Development of register of construction experts and testing facilities that may participate in the network (Section 4).
- (vi) Implementation considerations, including potential entity structure, connection with other related bodies, attributes and support for ATEN to operate successfully, and concluding remarks (Section 4).

In this report ATEN refers to the scheme and also the name of the legal entity that is to run the scheme.

¹³ It is noted that the ABCB has recently established a reporting procedure on NCBP incidents on its website.

The work completed as part of the scoping study has been in consultation with various stakeholders. Specifically, two industry workshops were held in February and September 2019. The workshop programs and key participating organisations are provided in Appendix B.

This scoping study has not focused on the financial requirements of ATEN. However, it has provided comparisons with other similar schemes in other countries which serve a similar purpose and can be used as a guide for future investments once the preferred structure and governance of ATEN has been decided.

“ATEN’s new collaborative linkages across Australia’s testing houses, laboratories, the engineering design community and the wider construction sector will bring wide expertise to deal more effectively with product non-conformance and deliver safer buildings for Australia. ATEN will also create new pathways to lift market adoption of innovative products and new technologies, with positive investment and employment outcomes for Australian manufacturing.”

Ivan Donaldson

Former General Manager of ABCB

2 Review of Conformity Assessment

2.1 General

Conformity assessment is a demonstration that a product, material, component, or system (collectively referred to as *products* from herein) meets specific requirements. It is a critical process to ensure the safe and correct use of construction products. Construction products are defined as products used in construction works which includes building and civil engineering works.

Conformity assessment processes both internationally and in Australia need to be viewed through international frameworks such as that defined in the International Organisation for Standardisation (ISO). ISO/IEC 17000¹⁴ describes conformity assessment as four key functions (see Figure 2-1):

- **Selection:** sets the scope of the assessment, involves planning and preparation activities in order to collect or produce all the information and input needed for the *determination* function (includes test methods, type of test facility, and materials to be tested)
- **Determination:** describes activities which assess whether the product fulfils the selected requirements (activities may include testing and analysis, engineering assessment, and inspection).
- **Review and Attestation:** **Review** is the final stage of checking that the selected requirements have been reliably demonstrated (e.g. reviewing test reports). **Attestation** is a clear statement of conformity that the product fulfils the selected requirements.
- **Surveillance:** provides ongoing monitoring of continued conformity and consists of systematic iteration of the three functions above.

In current Australian practice, a laboratory test report for a building product is often seen as analogous to conformity assessment, when in fact it only represents the *determination* function. Applying the four functions in ISO/IEC 17000 as a theoretical framework when evaluating differing conformity systems will avoid misunderstanding and aid comparison between differing regulatory approaches.

In the following subsections the current Australian conformity assessment system is reviewed and compared with international systems such as in America, Japan, and the European Union. A list of key terms used in conformity assessment methodology which is consistent with ISO and the European Union is provided in the Glossary.

¹⁴ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2014). *ISO/IEC 17000:2004, Conformity assessment - Vocabulary and general principles*. International Organisation for Standardisation

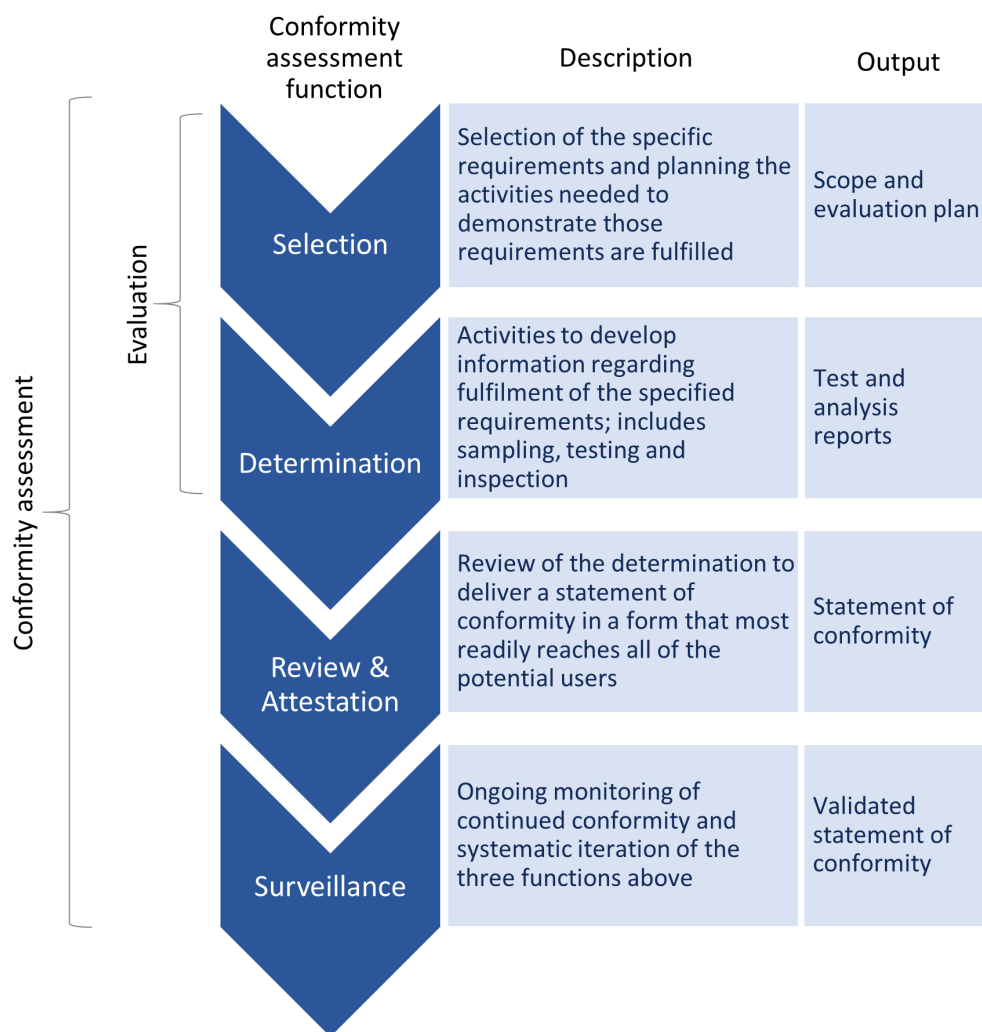


Figure 2-1: Conformity assessment in accordance with ISO/IEC 17000

2.2 Conformity assessment in Australia

Australia is geographically large but with a small population and limited facilities for testing and appraisal. No single institution in Australia is capable of offering the full range of testing and appraisal of construction products. The suppliers or manufacturers of new products at present have to search for institutions that can carry out evaluation for their products.

Furthermore, Australia has a contestable market-based conformity assessment system for building construction overseen by government but largely delivered by the private sector. It does not have a culture requiring conformity assessment. As a federation, the responsibility for building control rests with the states and territories. The task of ensuring building work, including building products, are compliant with the requirements of NCC¹⁵ (Volume 1 Part A2) is given to building surveyors/certifiers (consenting authorities) who could be from either private or public sectors (nowadays largely in the private sector). In carrying out this task, the building surveyors are guided by NCC 2019 Volume1 Part A5 *Documentation of design and construction*. Various forms of documentary evidence are considered suitable and *certification*

¹⁵ Commonwealth of Australia and the States and Territories of Australia. (2019). *National Construction Code: Volume One*. Canberra, Australia: Australian Building Codes Board

of building products is not mandatory. Thus, the existing system is difficult to navigate particularly for the adoption of new construction products.

A further discussion on the Australian system of building regulations with a focus on conformance is provided in Appendix C.

“To achieve both confidence and innovation in construction, Australia needs to introduce a means of verifying building products and performance solutions to ensure they align with the National Construction Code.”

Marisa Muchow
General Council, Metricon

2.2.1 National Construction Code

To understand the nature of conformity assessment in Australia, it is necessary to understand the NCC. The NCC is a performance-based code. This means that the only mandatory requirements of the NCC are the performance requirements. As illustrated in Figure 2-2 compliance with the performance requirements can be demonstrated by following a *performance solution* path, a *deemed-to-satisfy (DTS)* solution path, or a combination of both.

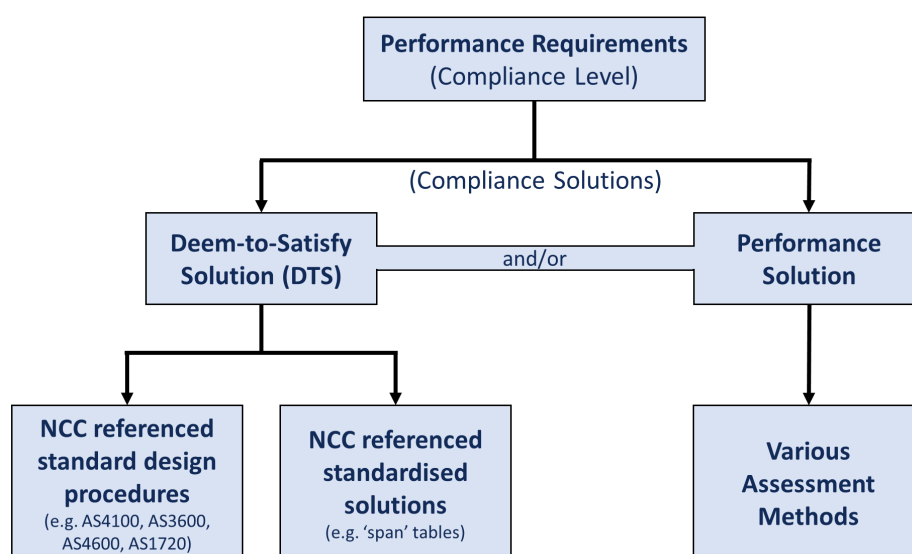


Figure 2-2: The NCC performance framework

The *DTS solution* path includes NCC specifications calling for use of standardised processes and products. Providing evidence of conformity to these referenced processes and products is acceptable as satisfying the NCC performance requirements.

Whether using the *performance solution* or *DTS solution* pathway, the NCC (Volume 1, Part A5.2) requires that *evidence of suitability* is provided using the following methods:

- Documentary *evidence of suitability* as described in NCC Volume 1 Part A5:
 - (i) CodeMark Certificate of Conformity
 - (ii) Certificate of Accreditation (from a State and Territory Accreditation Authority)

- (iii) Certificate issued by a certification body accredited by the Joint Accreditation scheme of Australia and New Zealand (JAS-ANZ)
 - (iv) Report issued by an Accredited Testing Laboratory
 - (v) Certificate/Report from a professional engineer or other appropriately qualified person
 - (vi) Other documentary evidence (e.g. product technical statement)
- Verification methods including:
 - (i) The verification methods provided in the NCC
 - (ii) Other verification methods accepted by the appropriate authority
 - Expert judgement
 - Comparison with the *deemed-to-satisfy* provisions

It should be noted that this system was set up before the introduction of the performance-based code, and it can be argued that the system works better for the *DTS solution* path than the *performance solution* path. The use of *performance solution* however is essential for future development.

The flowchart in Figure 2-3 is a simplistic representation of how the current product acceptance works. While steps in the system clarify the *determination* function, the *selection* function is not identified. At no stage in this system is the responsibility for establishing the scope of conformity/certification clearly identified.

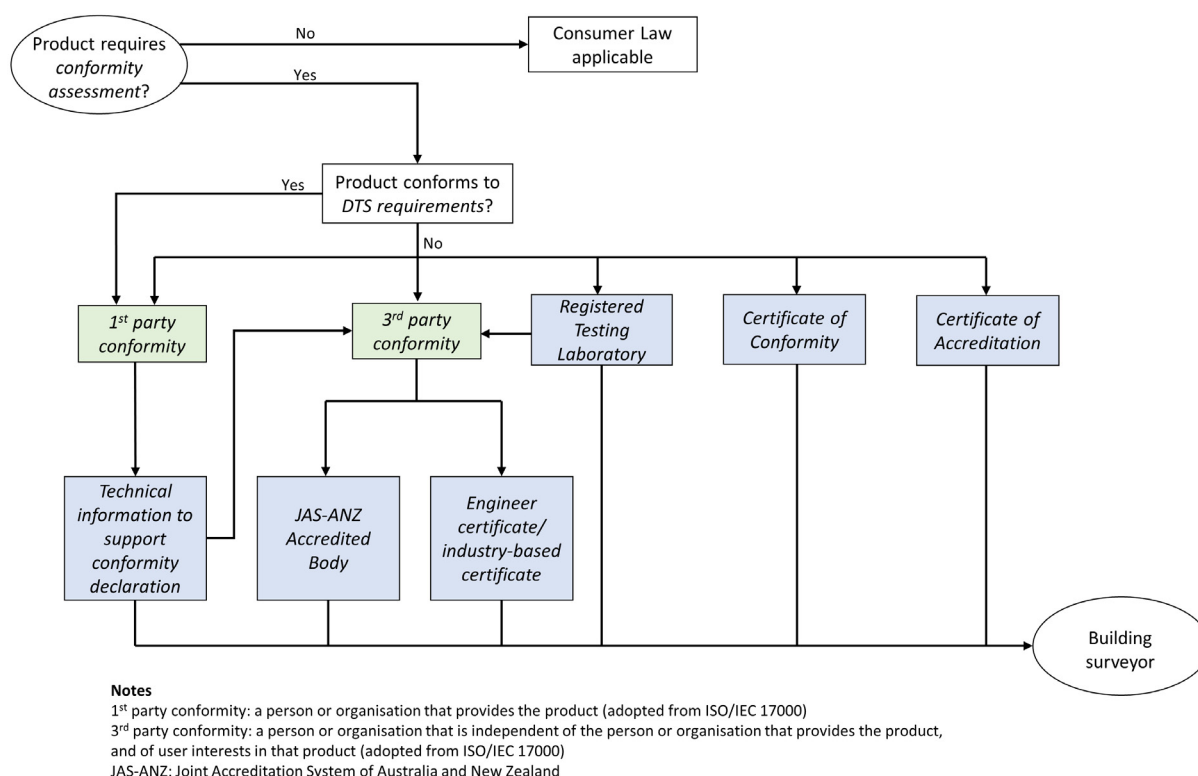


Figure 2-3: Flowchart for Australian NCC acceptance options (the green shaded boxes show the type of party involved in conducting the conformity assessment and the blue shaded boxes represent the six options for documentary evidence of suitability as described in NCC, Volume 1 Part A5)

2.2.2 Current system

The history of appraisal and certification of building products in Australia since 1978 is outlined in Appendix D. It is seen from the history that none of the efforts in Australia have been successful in being taken-up by industry by the same degree in comparison with developments in other countries (Section 2.3).

The current government schemes include CodeMark Australia and WaterMark¹⁶ which are the responsibility of the Australian Building Codes Board (ABCB) on behalf of the Commonwealth, States and Territories. The Building Regulations Advisory Committee (BRAC) is a Victorian Government statutory body. BRAC issues a *Certificate of Accreditation* – the only state scheme for the approval of a *performance solution*. CodeMark is a non-mandatory national scheme operating with a number of Conformity Assessment Bodies (CAB) accredited by JAS-ANZ. The CABs are responsible for assessing the product conformity against the performance requirements in the NCC and issue *Certificates of Conformity*. The CodeMark scheme has been revised four times since its inception in 2005. WaterMark is a mandatory certification scheme for plumbing products to ensure they are fit-for-purpose and appropriately authorised for use in plumbing and drainage installations.

JAS-ANZ conducts a review of CodeMark CABs every six months or as agreed by the JAS-ANZ Accreditation Review Panel, and as advised by ABCB¹⁷. In July 2019, CertMark International, one of the major CABs, has had its JAS-ANZ accreditation for issuing CodeMark Certificates of Conformity suspended as it did not meet scheme accreditation requirements¹⁸. This followed CertMark International's withdrawal of nine certificates for cladding systems, including aluminium composite panels (ACP) and expanded polystyrene (EPS) in February 2019¹⁹. CertMark International has been responsible for providing 57% of approximately 300 CodeMark Certificates of Conformity.

Further details about conformity assessment schemes in Australia, including various industry schemes, and the organisations responsible for implementing the schemes are provided in Appendix E. The industry schemes, such as the Australasian Certification Authority for Reinforcing and Structural Steels (ACRS), are designed to solve specific non-conformance problems for specific industries. Generally, certification of performance-based solutions is not within the scope of these schemes. Most of the industry schemes tend to have stringent and thoroughly defined post-initial assessment control measures.

2.2.3 Issues with current system

The fundamental objectives of conformity assessment of construction products²⁰ are:

- (i) to address the needs of consumers, users and, more generally, all interested parties by giving confidence regarding fulfillment of specified requirements (fitness-for-purpose),
- (ii) to allow suppliers to demonstrate to the market that their product has been attested to fulfil specified requirements by an impartial third-party body.

The Australian practice has tended to favour point (ii) sometimes at the expense of point (i). Recent incidents in Australian buildings, including flammable cladding, tainted roof panels, noise generated by movements, and cracking of elements, have undermined users' confidence in the building industry. The

¹⁶ ABCB. (2016). *The CodeMark Australia Certification Scheme Rules Version 2016.1*. Retrieved from <https://www.abcb.gov.au/>

¹⁷ ABCB and DBH. (2009). *The CodeMark Scheme Rules: Australia and New Zealand, Version 2009.1*. Retrieved from <https://www.abcb.gov.au/>

¹⁸ Australian Building Codes Board. (2019). Notice: CMI product certification body accreditation suspended in Australia (11 July 2019). Retrieved from <https://www.abcb.gov.au/News/Notice-CMI-product-certification-body-accreditation-suspended-in-Australia>

¹⁹ Victorian Building Authority, & Government of Victoria. (2019). CertMark International withdraws nine certificates for cladding systems, including ACP and EPS (February 2019). Retrieved from <https://www.vba.vic.gov.au/media/latest-news/article/2019/certmark-international-withdraws-nine-certificates-for-cladding-systems,-including-acp-and-eps>

²⁰ Standards Australia Limited and Standards New Zealand. (2015). *AS/NZS ISO/IEC 17067:2015 - Conformity assessment: Fundamentals of product certification and guidelines for product certification schemes*. SAI Global Limited, Standards Australia Limited, NSW and Standards New Zealand, Wellington

recent withdrawal of a number of CodeMark Certificates of Conformity has raised further concerns for building practitioners and consumers. While it is important to respond to these challenges, it is also important not to over-react with measures that stifle innovation or inflict unnecessary costs to the consumers (for example, having a list of pre-approved products which hinders future innovative products).

The following are issues and limitations in the current conformity assessment system that can be improved:

(a) General issues related to conformity assessment processes

(i) Underestimating the difficulties involved in demonstrating fitness-for-purpose and compliance of performance solutions in some critical cases

It is challenging to demonstrate that products are fit-for-purpose, especially for new and innovative products. Buildings are complex assemblies of interactive and interdependent products, where the design and installation of each feature potentially affects and/or relies on adjacent and related systems.

It is critical for all intended uses of the product to be identified. The NCC requires conformance to *all* relevant performance requirements to be considered. It is often very difficult for innovative products to:

- determine the relevant performance requirements, and
- how to demonstrate conformance when the requirements are qualitative.

There is no single entity in Australia which harnesses the required technical expertise and testing facilities to provide this support for the construction industry. Other countries have developed conformity assessment systems to cope with this problem (discussed in Section 2.3), for example the European Organisation for Technical Assessment (EOTA)²¹ in Europe.

(ii) The requirements for evidence of suitability in the NCC are too flexible

As discussed in Section 2.2.1, the NCC allows six forms of documentary *evidence of suitability* to demonstrate compliance. There is no guidance in the NCC on the suitability of the evidence for products that may impose different levels of risk if not fit-for-purpose based on their application.

(iii) Lack of support for building surveyors and other practitioners in providing independent, reliable information on the suitability of particular products for intended purposes

The current system is insufficient in providing consistent, transparent, and verified information on the fitness-for-purpose of building products which can be used as evidence of meeting all relevant performance requirements of the NCC and/or other relevant specifications. This issue was one of the contributing factors related to the flammable cladding in Australia.

(iv) Lack of transparency about how products are evaluated when the performance solution path is undertaken

The procedure for tests and analysis methods for products requiring *performance solutions* (i.e. when there is no standard or *DTS solution*) is not made public for future applications, unlike some other international conformity assessment systems (e.g. European system). Therefore, two similar products can be evaluated in different ways. Furthermore, learnings from product assessment does not evolve and develop to become national or international standards.

²¹ The EOTA scheme is described in detail in Appendix F.

(v) The requirements for surveillance is not clear

The extent and detail of surveillance checking measures is to the discretion of the manufacturer, supplier, CAB, evaluation body or testing laboratory. Indeed, many test reports indicate that evaluated performance is only applicable to the specific specimens tested with no reference to how production consistency can be assured. In some cases, there is no time limit on the validity of the test results while the products evolve overtime.

(vi) There appears to be no focus on reciprocal recognition for formal international acceptance of local evaluation

It is desirable to enhance trading opportunities of Australian building products through mutual recognition of Australian appraisals by relevant international bodies where possible. This would help to significantly reduce cost and time for Australian companies to access international markets as well as assisting with the importation of high-quality products in Australia.

(b) Specific issues related to the CodeMark scheme

(i) The applicant nominates the provisions of the NCC which are assessed for compliance

The NCC requirements for which the product is assessed for compliance are (as practiced) nominated by the applicant (e.g. manufacturer or supplier) and agreed by the CABs. Hence, the focus has been compliance with specific sections of the NCC, instead of ensuring the product is fit-for-purpose for the intended use which is the purpose of conformity assessment.

(ii) Variability in certificates of conformity

The varying level of detail between certificates has been identified as an issue for a number of years. The CABs have some flexibility to exercise their skill and judgement in evaluating products. This flexibility is good for commercial practice; however, it can lead to variability in how clearly each certificate communicates the critical conformity factors to users. The Certificates of Conformity available on the JAS-ANZ online database have been issued by seven different CABs. A review was undertaken to obtain an impression of consistency or variability in issued certificates (details provided in Appendix I, Section I.7.1). Two certificates were selected from each of the five CABs currently issuing CodeMark Certificates of Conformity (i.e. in total 10 certificates were reviewed). The certificates were issued between March 2018 and June 2019. It was observed that the clarity of the intended use and the evaluation coverage varied.

The Australian conformity assessment system of building products is a voluntary market-based system. It could be argued that this is a case of market failure since it fails to produce market confidence in the system.

“Owners and consumers demand surety of products. Industry needs surety of products. Surety comes from having transparent, verifiable fit-for-purpose building products.”

Joseph Genco
Building Surveyor, GGA Consultancy

2.3 Conformity assessment in other countries

A detailed survey of conformity assessment schemes in other countries is provided in Appendix F. The schemes and the responsible organisations which have been reviewed include:

- (i) Building Research Association of New Zealand, BRANZ (New Zealand),
- (ii) European Organisation for Technical Assessment, EOTA (European Union),
- (iii) Canadian Construction Materials Centre, CCMC (Canada),
- (iv) International Code Council Evaluation Service, ICC-ES (United States of America),
- (v) Japanese system, and
- (vi) FM Global, a property insurance company based in the United States.

A comparison of some of the key features of the different schemes (excluding FM Global) is shown in Table 2-1. Each country developed its own system to suit its needs, culture and legal framework. For example, in Europe EOTA functions as an international not-for-profit organisation consisting of numerous Technical Assessment Bodies, including DIBt (Germany) and ETA-DK (Denmark).

DIBt, in Germany with a population of approximately 80 million, also runs a national mandatory technical approval scheme. It employs more than 200 staff and is headquartered in Berlin. DIBt typically issues in the order of 3000 technical approvals annually.

ETA-DK, in Denmark with a population of approximately six million, operates as a not-for-profit private entity which is owned by Denmark Standards, runs a national voluntary approval scheme. It employs less than 10 people and is headquartered in Copenhagen. ETA-DK typically issues around 400 approvals per year.

In New Zealand which has a population of approximately five million, BRANZ operates as an independent organisation financially supported via the Building Research Levy and revenues created through commercial appraisal and research projects. Its total income for 2018/2019 was \$40.0 million; 54% from Building Research Levy, 21% from commercial services, 25% of other incomes²².

Conformity assessment is closely related to the international trading of construction products. The World Trade Organisation – Technical Barriers to Trade (WTO-TBT) Agreement states: “Whenever appropriate, members shall specify technical regulations based on product requirements in terms of performance, rather than design or prescriptive characteristics”. The ISO has created a comprehensive set of standards for conformity assessment to ensure that the procedures are fair and equitable in accordance with WTO-TBT Agreement. ISO procedures are adopted by JAS-ANZ and many of the ISO standards have become Australian Standards. Australia is committed to adopt ISO standards when it is appropriate to do so.

“The Deutsches Institut für Bautechnik (DIBt) is a national technical authority in Germany and is an institute of the German federal government and the German federal states. DIBt provide approvals and assessments of non-regulated construction products and construction techniques, providing confidence and ensuring the safety of construction works while fostering innovation in the construction sector. Such a model could be successfully adopted in Australia to provide similar benefits and safeguard the construction industry and community.”

Karsten Kathage

President of EOTA and Vice-President of DIBt

²² BRANZ Incorporated. (2019). Annual Review 2019. Retrieved from www.branz.co.nz

Table 2-1: Summary of comparison between conformity assessment schemes in different countries

	CODEMARK AUSTRALIA	EOTA EU	ICC-ES¹ USA	CCMC² CANADA	JAPAN	BRANZ NEW ZEALAND
ISO/IEC 17067 Criteria						
SELECTION (of product performance criteria)	Decided by client (in consultation with CAB)	Expert panel in TAB and client	Expert panel in ICC-ES	Expert panel in CCMC	Expert panel	On recommendation from BRANZ
DETERMINATION (of product characteristics via testing)	Confidential (by lab contracted by client to provide report to CAB)	EOTA designated labs	ICC-ES designated labs	CCMC recognised labs	MLITT ³ designated labs	by BRANZ lab
ATTESTATION (that product fulfils intended function)	by CAB	by EOTA	by ICC-ES	by CCMC	by MLITT	by BRANZ
SURVEILLANCE (ensure product supplied is same as product tested)	Mandatory surveillance, the nature and extent are decided by CABs	Mandatory surveillance by Notified Bodies	Mandatory surveillance by ICC-ES	Re-evaluation of product every 3 years, surveillance: plant inspections, periodic product testing, and/or field inspections	Inspection at source	Mandatory surveillance by BRANZ
Other criteria						
Voluntary/mandatory	Voluntary	Mandatory in some countries like Germany, voluntary in others	Voluntary	Voluntary	Mandatory	Voluntary
Governance	ABCB (government)	Not-for-profit organisation set up by regulators and comprises of all Technical Assessment Bodies designated by member states	Non-profit, limited liability company	Government (National Research Council of Canada)	Government	Independent research organisation partly funded through a government levy
Total no. of certificates/appraisals available on current database	Approximately 300	Approximately 5,400	NA	Approximately 500	NA	Approximately 400
Identification of conformity	CodeMark certificate of conformity	CE mark	ICC-ES mark of conformity	CCMC certification mark	Identification mark	Product certificates, listing, CodeMark certificates and BRANZ appraisal

NA: not available | ¹International Code Council Evaluation Service | ²Canadian Construction Materials Centre | ³Ministry of Land, Infrastructure, Transport and Tourism

The European Union has also developed a comprehensive system for conformity assessment that is in line with WTO-TBT Agreement and ISO for the purpose of facilitating trade within and outside the Union. It introduces the CE marking to products to ensure the free movement of goods within the European Union. CE marking indicates the product conforms to all European directives and standards. When no relevant EU standard exist, then a European Technical Assessment (ETA) must be obtained from EOTA by the manufacturer/supplier for the purpose of CE Marking. Similar marking practice as the EU has also been adopted in other countries, including USA, Canada, and Japan. It is noted that countries within the EU are operating on two systems:

- (i) an EU system for trade, and
- (ii) a national system for construction.

The European scheme also includes a multi-level assessment system, defined in the Construction Products Regulation (CPR, No. 305/2011), which states a system of assessment and verification of constancy of performance (AVCP). The system consists of five levels, with varying degrees of third-party surveillance and self-declaration and monitoring by the manufacturer as shown in Table 2-2.

Table 2-2: AVCP system used in the European conformity assessment system

Task	AVCP System				
	1+	1	2+	3	4
Factory production control					
Assessment of the performance of the construction product					
Initial inspection of the manufacturing plant and of factory production control					
Continuous surveillance, assessment and evaluation of factory production control					
Testing of samples, including collection of samples					
Document issued by the NB	Certificate of constancy of performance		Certificate of conformity of the factory production control	Test report	
NB	Product certification body		Factory production control	Notified laboratory	
Manufacturer	Drawing up the declaration of performance and affixing the CE marking				

Manufacturer
 NB: Notified body (an independent third-party inspection body)

2.4 Lessons for Australia

In the past, most construction products were made locally and there was little need for rigorous conformity assessment. Australian manufacturers usually employed their own technical experts and imposed their own stringent quality assurance (QA) systems. This was also a time when manufacturing policy-imposed costs on the Australian economy through barriers to import competition. Those policy settings needed to be changed as part of the internationalisation of the Australian economy.

Also, a major driver in the minds of policy makers during the time of major micro-economic reform in the 1980s and 1990s was concern about the burden of compliance costs on business.

Governments supported the view that conformance arrangements should be balanced against risk, that testing and certification should be undertaken by third parties where possible, options to demonstrate conformance should be available and conformity assessment should not restrict trade. The focus of policy was therefore to encourage a competitive certification market rather than to emphasise the need for risk mitigation.

The legacy of that changed operating environment, where local manufacturing has declined, and sources of product have diversified, has been the on-going absence of a more active hands-on government approach to the delivery of certification services and a too heavy reliance on the contestable market.

The building and construction industry, at all levels, is under constant pressure for cost savings. Moreover, the introduction of performance-based regulation facilitated international trade and encouraged innovation as a means of increasing productivity. This is putting more emphasis on the importance of fitness-for-purpose rather than compliance with limited clauses in standards or the NCC.

Recent incidences of non-conformance and non-compliance in building works have demonstrated that the current Australian conformity assessment system does not function as well as it should, nor does it have sufficient checks and balances for a global market.

There is a clear and demonstrable need for new ways to respond to the changed circumstances faced by industry. Compliance pathways need to be more relevant to the realities of contemporary market conditions, particularly for new products and technologies. Better harnessing of Australian expertise and testing capabilities can be a major contributor to this strategic objective.

A more robust conformity assessment system is an important component of the changes needed to improve the building control system to cope with the new reality of increasing imports and accelerating innovation.

The ATEN scheme (explained in Section 3) is one way to do this by supporting product innovation, enhancing product evaluation efficiency and lifting industry and community confidence in product appraisal.

3 Proposed Australian Technical Evaluation Network (ATEN)

3.1 General

The Australian Technical Evaluation Network (ATEN) scheme is presented in this section. It is proposed that ATEN comprises of a network of selected construction experts and testing facilities set up to provide appraisal reports for building construction products²³ (including materials, components and systems) in terms of fitness-for-purpose, using the NCC performance requirements and/or other relevant specifications. The vision for ATEN is to improve safety and confidence in the construction industry through robust and transparent technical evaluation of building products whilst supporting innovation. It is to act as a clear signpost to avoid the consequences of using a product which is not fit-for-purpose (Figure 3-1).

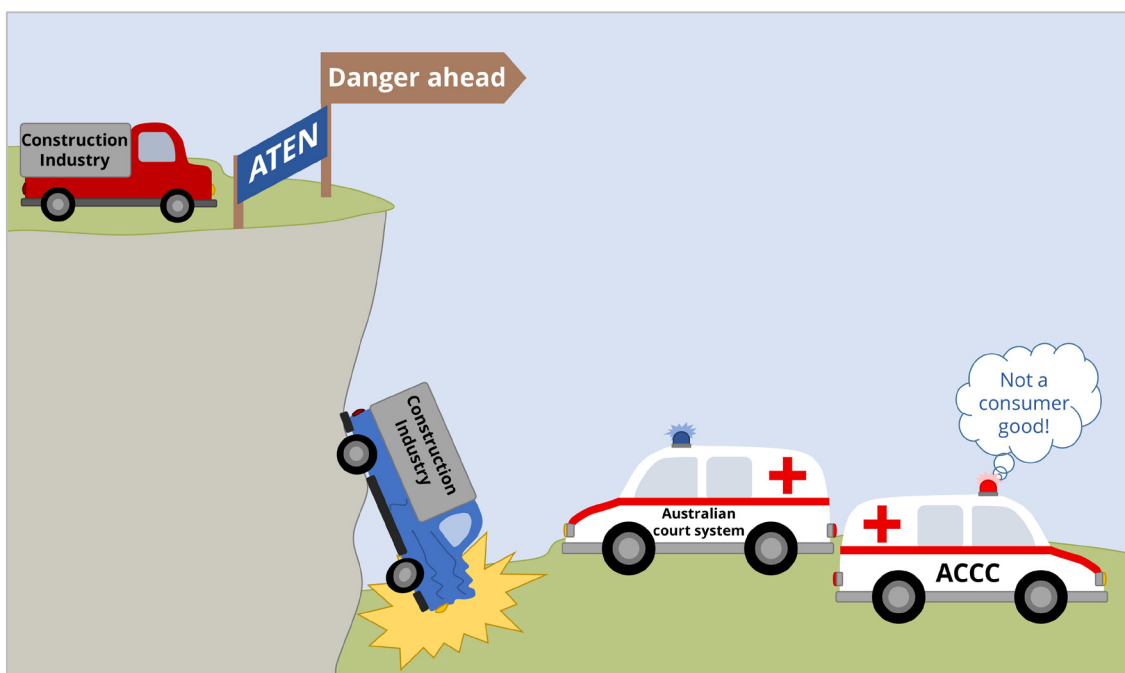


Figure 3-1: ATEN to provide guidance to avoid the consequences of using a product which is not fit-for-purpose

The proposed ATEN scheme is structured to fit in with the current Australian building regulatory landscape after a study of international best practice. Evaluating all relevant performance aspects of a building product in terms of fitness-for-purpose is a very complex problem. Currently, there is no single entity in Australia that is providing this support for the construction industry, hence ATEN is aimed at harnessing the expertise and testing capabilities across the country to provide this support for industry and consumers. It is intended to work co-operatively with existing mechanisms and/or bodies that already positively contribute to this task.

²³ The ATEN scheme applies to construction products, however, for the purpose of this report the scheme has been presented for building products.

3.2 What can ATEN offer?

The primary function of the proposed ATEN scheme is to reinforce and clarify the compliance pathways for construction products. It is to provide clear and consistent information on product fitness-for-purpose for its intended use. This will include:

- generating Appraisal Reports consisting of independent, consistent, verified information about where and how the product should be used based on risk-based assessment, made available to all,
- publicising test and evaluation methods for *performance solutions*, and
- defining clear and harmonised surveillance requirements based on risk-based assessment to be undertaken by required authorities.

An overview of the appraisal process is provided in Figure 3-2.

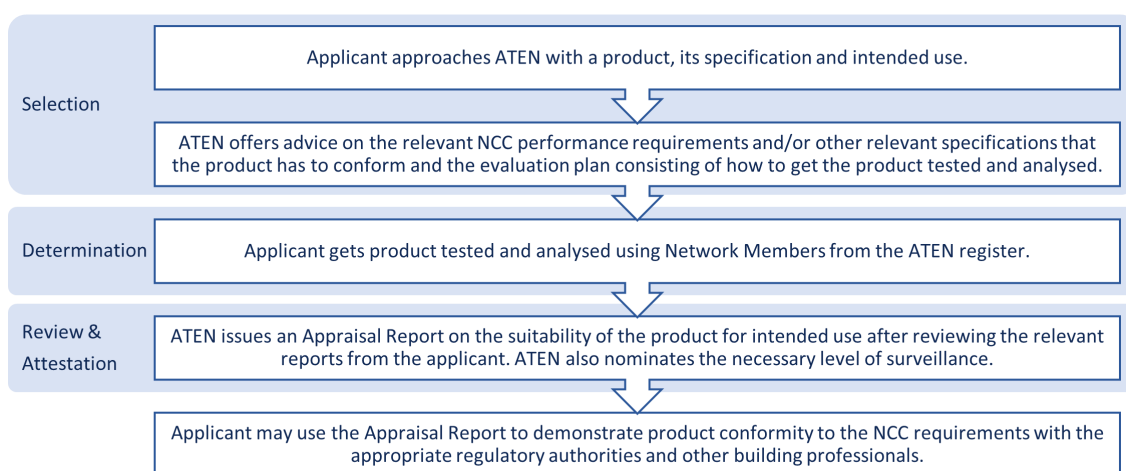


Figure 3-2: Overview of ATEN appraisal process

***“ATEN will answer the key questions across the entire supply chain:
(i) What do I need to do to sell my product in Australia?
(ii) Does this product comply?”***

Mark Burgess

Director of Testing and Technical Services, CSIRO

When requested, ATEN may also extend its function to:

- assist with new product development through its network members (potential contribution of ATEN is illustrated in Figure 3-3),
- review complex performance-based designs, and
- investigate non-conforming and non-complying incidences; a preliminary checklist for conducting these investigations is provided in Appendix G.

To assist with the implementation of ATEN it is proposed that it initially focuses on building products for high-risk applications (discussed in further detail in Appendix H). This includes structural and fire safety products where their failures can have catastrophic outcomes for human life and property. Such a start will also be in line with the Shergold and Weir Recommendation 21.

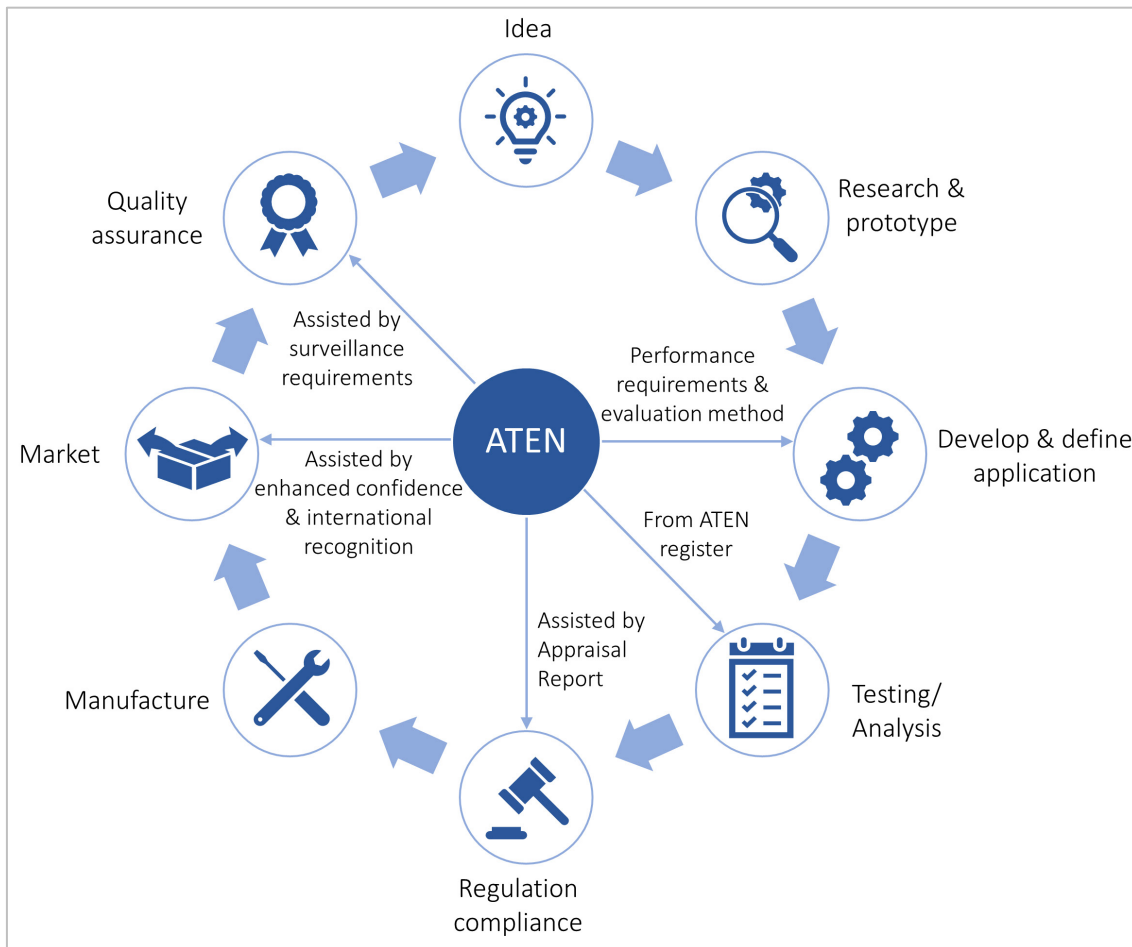


Figure 3-3: ATEN's potential contribution during building product development life cycle

“ATEN appraisals will reduce the risk to manufacturers in introducing new products and systems into the Australian market.”

Ken Watson

Executive Director of NASH

The ATEN scheme aims to shift the focus of conformity assessment from *code compliance* to *fitness-for-purpose*. *Code compliance* tends to make the product assessors focussed on identifying the code provisions to which the product can claim conformance, while *fitness-for-purpose* is aimed at identifying suitable uses for the product and using the code provisions as means for demonstrating compliance.

Generally, there are five ways a product may be not fit-for-purpose (see Figure 3-4):

- (i) The product may be not what it claims to be (a conforming failure).
- (ii) The product may be used inappropriately (a complying failure).
- (iii) The product may be installed incorrectly (an installation failure).
- (iv) The code specified solution is incorrect (a regulatory failure).
- (v) The product may not last as long as expected (this is outside the scope of the Australian building regulation at present).

ATEN would offer a technical solution for items (i) and (ii) items above and would provide contributions to assist with the other three items. ATEN would also specify the level of surveillance required to ensure the products in the market continue to have the same performance characteristics as the samples used for appraisal. This is a function of the conformity assessment system (described in Section 2.1) to cope with the continuous changes made to the product with time in order to ensure ongoing fitness-for-purpose.

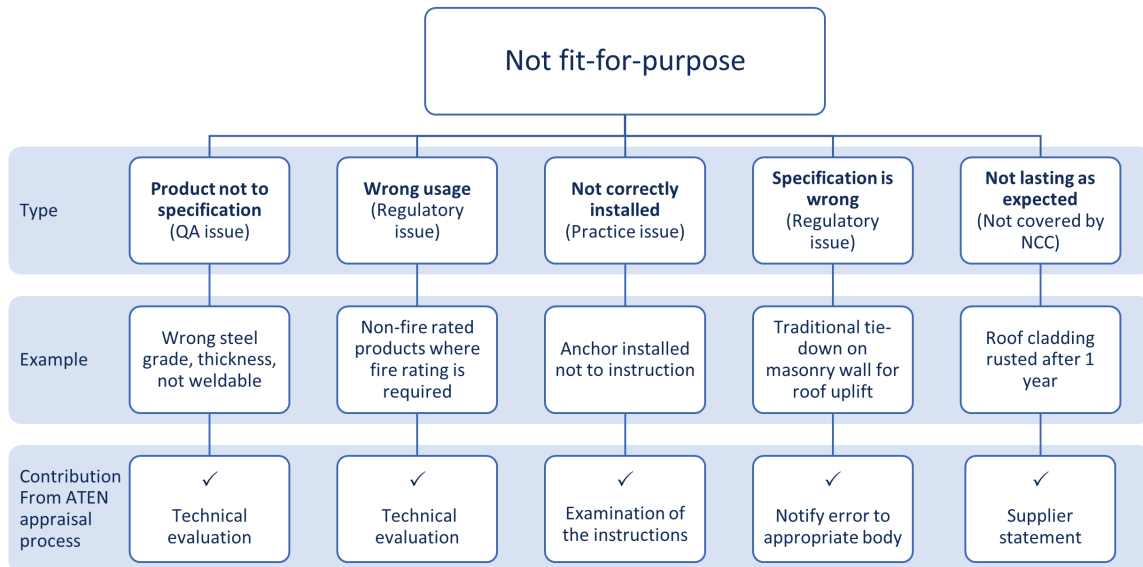


Figure 3-4: Contribution of ATEN appraisal process addressing the different ways a product is not fit-for-purpose

“Suppliers, developers, builders, architects, engineers and the whole construction industry will have peace of mind with the formation of ATEN whom they can rely upon for fit-for-purpose appraised products.”

Shan Kumar

Chief Engineer, Head of Engineering Innovations and R&D, Hickory Group

ATEN could be developed such that it contributes towards resolving some of the issues and limitations of the current conformity assessment system identified in Section 2.2.3. Some of the valuable features that ATEN would bring are listed below.

(i) Identify the relevant NCC performance requirements and/or other relevant specifications that a product has to conform to for its intended use and how to get the product tested and evaluated

The performance requirements would be identified by experts within the network, thus ensuring impartial, consistent, and comprehensive criteria for all products. The criteria would be determined based on the intended use of the product to ensure fitness-for-purpose, rather than selective NCC requirements.

(ii) Appraisal reports to be issued by ATEN (a single independent entity)

The assessment of the products would be based on pools of testing facilities and technical experts operating under ATEN guidelines. ATEN would act as a single independent entity that is responsible for the issuance of the Appraisal Reports. This would encourage consistency in the level of rigour and detail undertaken for the evaluation of all products and the content included in the Appraisal Reports.

(iii) Appraisal Reports to provide technical opinion for consideration by the appropriate authorities

Appraisal Reports provide an independent and reliable technical opinion on the suitability of products for intended use. Thus, they provide support and confidence to designers and building surveyors and other practitioners making decisions about the fitness-for-purpose of products, particularly for new and innovative products which require the *performance solution* path.

(iv) Evaluation methods for performance solutions to be made publicly available

This would ensure consistency of the evaluation method (including selection and testing and analysis) adopted for all similar products requiring *performance solutions*. It will also encourage learning and innovation from product evaluations and the development of national and international standards. It's noted that the evaluation method is performance-based and therefore it will not infringe on the associated intellectual property (IP). The purpose of evaluation methods is to establish the behaviour of the product to determine if it is fit-for-purpose. This approach is similar to that used in Europe by EOTA.

(v) Define clear and harmonised surveillance requirements based on risk-based assessment

The surveillance requirements are to be determined and defined by ATEN based on risk-based assessment of the product. Independent surveillance is to be undertaken by inspection bodies (also known in Europe as notified bodies).

It is noted that the practice of surveillance is common in Australia for other industries such as pharmaceutical and food industries. As discussed earlier, surveillance is also practised for building products, namely by industry schemes and CodeMark CABs.

“Development and use of new and innovative building products will only continue to evolve and prescriptive Building Codes and Standards cannot keep pace with innovation and are product specific so generic standards are not feasible.”

Simon Croft

Executive Director of Building Policy, HIA

A detailed comparison between the proposed ATEN and CodeMark scheme is provided in Appendix I including the key attributes of the ATEN scheme and its distinction from the CodeMark scheme. It is highlighted that the CodeMark scheme is a certification scheme, whereas the ATEN scheme is currently proposed to be an appraisal scheme.

A summary of the current issues with conformity assessment in Australia and how the ATEN scheme may assist is provided in Table 3-1.

Table 3-1: Summary of current problems with conformity assessment and the beneficial attributes of the proposed ATEN scheme

Current practice	How ATEN may assist	Attributes of ATEN
Underestimating the difficulties in demonstrating a product is fit-for-purpose.	ATEN is to harness the required expertise and testing facilities to provide verified information on the fitness-for-purpose of products.	Provides expert evaluation of every matter that affects the suitability of the product for the intended use.
Applicant nominates which NCC performance requirements to obtain compliance against.	ATEN is to identify all the performance requirements the product must satisfy to ensure fitness-for-purpose.	Fitness-for-purpose is the priority, considers all NCC performance requirements and/or other relevant specifications related to the intended use of the product.
The requirements for <i>evidence of suitability</i> in the NCC are too flexible and no guidance for selecting suitable method.	The level of rigour for the Appraisal Report and on-going surveillance is to be dependent on risk-based assessment of the intended use.	Appraisal Report and specified surveillance dependent on risk-based assessment.
Variability in certificates of conformity.	Appraisal Reports to be issued by ATEN in a consistent manner.	Consistent level of technical rigour and format for all Appraisal Reports.
Lack of support for building surveyors and other practitioners to determine if a product is fit-for-purpose.	ATEN Appraisal Reports may be used as evidence of meeting all relevant performance requirements of the NCC and/or other relevant specifications.	Provides independent, consistent, and verified information on the fitness-of-purpose.
Lack of transparency about how products are evaluated when the <i>performance solution</i> path is undertaken.	ATEN is to make evaluation methods for <i>performance solution</i> path publicly available.	Ensures consistency and transparency for evaluation of all products.
The requirement for surveillance is not clear.	Clear and harmonised surveillance requirements defined by ATEN and undertaken by the relevant authorities.	Surveillance requirements based on risk-based assessment.
No focus on reciprocal recognition for international acceptance of local certification.	ATEN is to provide independent, uniform, and verified information about building products consistent with international standards.	ATEN Appraisal Reports may gain mutual recognition with international markets.

3.3 ATEN Scheme Rules

This section discusses the proposed ATEN Scheme Rules in relation to the general aspects, the framework for the ATEN scheme, and the appraisal process, including:

- (i) application,
- (ii) process for issuance of Appraisal Report (including the protocols for risk assessment and technical evaluation, and templates for the laboratory report and Appraisal Report),
- (iii) prerequisites for an Appraisal Report, and
- (iv) further scheme rules to be developed for the implementation of ATEN.

3.3.1 General

3.3.1.1 Objective

The objective of the scheme is to inform the users of construction products on the suitability of the products for the intended use. This is to be achieved by generating independent, consistent, verified information on the fitness-for-purpose of products in the form of an Appraisal Report.

3.3.1.2 Scope

The Appraisal Reports will be issued for construction products. ATEN is to identify the performance required in accordance with the applicant's statement on intended use. Hence, the applicant will not be allowed to cherry pick limited aspects of performance to be evaluated.

It is noted that the ATEN scheme applies to construction products, however, for the purpose of this report the scheme has been presented for building products.

3.3.1.3 Definitions

Definitions in ISO/IEC 17000 are generally applicable. Specific terms used in the Scheme Rules include the followings:

- **Construction products:** physical component or system used in construction works – not processes or appliances.
- **Construction works:** everything that is constructed or results from construction operations.
- **Deemed-to satisfy (DTS) and performance solutions:** are alternative paths defined in the NCC for demonstration of compliance with its stated performance requirements.
- **Product quality plan:** a document specifying procedures and associated resources applied to a specific product (by whom and when), consistent with ISO10005:2018²⁴.
- **Initial type test:** testing of one (or a few) typical sample of the product to obtain information on its performance.

3.3.1.4 Applicant

The applicant, such as the product manufacturer/supplier, must be a legal Australian business with an Australian business number (ABN) and is responsible for ensuring the product continues to conform to the requirements to maintain the validity of the Appraisal Report.

²⁴ International Organisation for Standardisation (ISO). (2018). ISO 10005:2018, Quality management - Guidelines for quality plans. In: International Organisation for Standardisation.

3.3.2 Framework

It is proposed that ATEN is to comprise of ATEN (the entity), Network Members, and Reference Groups. The description of each is provided in the following subsections and a summary is provided in Figure 3-5. ATEN will review the qualification and capabilities of the selected experts and testing facilities. The selected experts may be engaged as individuals or representatives of specific organisations. Engagement with relevant industry associations and National Association of Testing Authorities (NATA) would be made as part of the implementation.

	Who they are	Responsibility
ATEN	Legal entity employing key staff with necessary skills	Responsible for conducting the Selection and Review and Attestation functions of conformity assessment, based on advice from the ATEN Reference Groups when necessary
Network Members	Selected construction experts and testing facilities	Responsible for conducting the Determination function of conformity assessment
Reference Groups	Selected experts from the Network Members and possibly others to advise on specific fields or projects	Responsible for providing advice for the Selection and Review functions of conformity assessment

Figure 3-5: Key ATEN constituents

3.3.2.1 ATEN

ATEN is the legal entity that employs staff with necessary skills. It is responsible for the:

- management of the scheme,
- liaison with the applicant,
- issuance of the Appraisal Report,
- web-based database for ATEN Appraisal Reports, and
- standardisation of information for test and analysis methods.

3.3.2.2 Network Members

The Network Members consist of construction experts and testing facilities selected by ATEN. They are engaged by the applicant to test and analyse the product. The Network Members are responsible for the part of the work that they carry out.

3.3.2.3 Reference Groups

The Reference Group are experts selected by ATEN to provide advice on specific fields or projects. In particular, they provide advice in relation to one or more of the tasks involved in the issuance of the Appraisal Report as defined in Section 3.3.3.2. The experts in the Reference Groups may be drawn from the Network Members, however for any given project, the experts in the Reference Groups would not consist of the same members selected from the Network Members to conduct the testing and analysis activities to avoid conflict of interest.

3.3.3 Appraisal process

3.3.3.1 Application

The applicant approaches ATEN for a request to obtain an ATEN Appraisal Report for a product. The product must satisfy the ATEN prerequisites defined in Section 3.3.3.3 to be considered for the issuance of an Appraisal Report. Once an agreement on the scope of work has been reached, ATEN would advise the applicant of the evaluation plan, the appropriate Network Members who could carry out the work, and the cost for its completion.

3.3.3.2 Process for issuance of Appraisal Report

The following key tasks are involved in the issuance of an Appraisal Report:

- ATEN reviews the information provided by the applicant, including intended use of the product, manufacturing specifications, product quality plan, and installation and maintenance guide.
- ATEN in consultation with Reference Groups if necessary, establishes the scope of the work, including identifying the appropriate and relevant aspects of performance to be evaluated to ensure the product is fit-for-purpose in accordance with the applicant statement on intended use. The NCC performance requirements and/or other relevant specifications will be used as criteria for acceptance.
- An agreement on the scope of the work is established with the applicant.
- ATEN in consultation with Reference Groups if necessary, develops the evaluation plan required for the product. Evaluation plan consist of test and analysis procedures to assess whether the product fulfils the selected performance requirements to ensure the product is fit-for-purpose. A preliminary ATEN protocol for technical evaluation is provided in Appendix J.
- Applicant contracts appropriate Network Members to undertake the product testing and analysis. A preliminary ATEN laboratory report template for the Network Members to use is provided in Appendix K.
- ATEN in consultation with Reference Groups if necessary, reviews all information including the test and analysis reports to determine that the selected performance requirements have been reliably demonstrated.
- ATEN in consultation with Reference Groups if necessary, determines and defines the surveillance requirements to maintain the validity of the Appraisal Report based on risk-based assessment. A preliminary ATEN protocol for risk assessment is provided in Appendix L.
- ATEN prepares Appraisal Report and is reviewed by Reference Groups if necessary. A preliminary ATEN Appraisal Report template is provided in Appendix M.
- ATEN issues the Appraisal Report.

A detailed overview of ATEN's appraisal process is provided in Figure 3-6.

3.3.3.3 Prerequisites for ATEN Appraisal Report

ATEN would only accept products with the following prerequisites:

- the applicant is a legally registered Australian business with an ABN and is responsible for ensuring the product continues to conform to the requirements to maintain the validity of its appraisal,
- the product is traceable to the product supplier/manufacturer after installation, and
- the applicant must provide the following documentations that will form part of the Appraisal Report:
 - statement on intended use and any limitations,
 - product manufacturing specification,
 - product quality plan, and
 - guide for installation (and maintenance if applicable).

3.3.3.4 Other scheme rules

Further scheme rules to be developed for the implementation of ATEN:

- Appraisal Report marking and report number,
- suspension and withdrawal of Appraisal Report,
- amendments to Appraisal Report,
- transfer of ownership of Appraisal Report, and
- complaints and appeals.

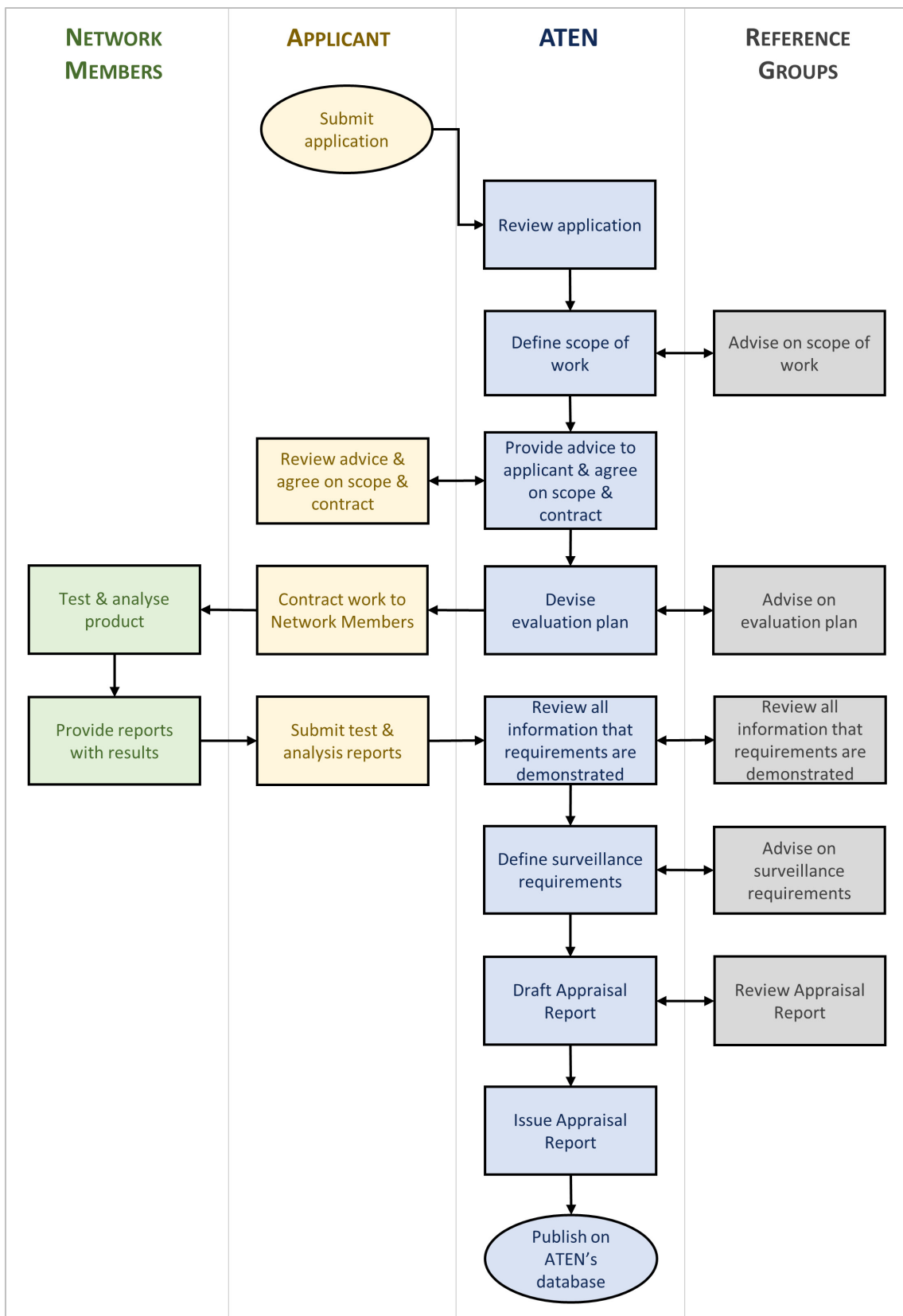


Figure 3-6: ATEN detailed appraisal process

3.4 Development of software support

3.4.1 Requirements for database of building products

A preliminary investigation has been undertaken to determine the requirements and desired features for a web-based database for ATEN Appraisal Reports. The databases for six conformity assessment systems were examined with attention given to search fields and categorisations of building products. The aim was to evaluate the user-friendliness and accessibility to critical information about the building products and certifications or appraisal reports. Based on the investigation a preliminary proposal about the features of the ATEN database are provided. A purpose-built database could be developed or an existing database such as by NATSPECT can be used with some modifications as presented in Appendix N.

The ATEN Appraisal Reports for products would be a source of information that can be included in statutory databases of high-risk building products, as proposed by Shergold and Weir Recommendation 21. Appraisal Reports for an individual building would form part of the record for that building in the building information database proposed in Shergold and Weir Recommendation 12.

3.4.2 Prototype app for a specific NCC section

The use of a web-based software to aid with the provisions of the NCC is a positive development for the industry in producing consistent interpretation of the provisions, especially since some sections can be quite complex and difficult to follow. Users, including architects, engineers, builders, and building surveyors may not necessarily come to the same conclusion for the same situation. To show a possible benefit of developing common understanding and consistency of application of the NCC a prototype software for Fire Resistance Level (FRL) for specific items of Classes 2, 3, and 9a buildings has been developed and discussed in Appendix O. Such a prototype software can be extended to other provisions of the NCC.

3.5 Beneficial impact of ATEN

The implementation of the ATEN scheme, to improve the current conformity assessment system and in particular to address the gap in ensuring fitness-for-purpose of products, is expected to generate societal, economic, and environmental beneficial impacts. The details of the expected impacts of ATEN at a national level are discussed in the following subsections and summarised in Figure 3-7.

While the national uptake of ATEN is envisioned, to assist with its implementation it may be instigated by a state or territory providing certain state-level benefits. Given that the Victorian Government has funded this scoping study, there is an opportunity for the Victorian Government to take the lead, and therefore the potential beneficial impact for Victoria is discussed in Section 3.5.4.

3.5.1 Societal beneficial impact

- **Increase safety in the use of buildings products, especially those requiring a performance solution**

As demonstrated in past incidents, the use of non-conforming and non-compliant building products may result in fatalities and serious injuries. ATEN would help to address the deficiencies with the current conformity assessment system, especially in

relation to ensuring products are fit-for-purpose, and therefore reduce the likelihood of major compliance failures. It would be particularly beneficial for building products which require a *performance solution* pathway in the NCC.

- **ATEN would assist with providing a robust and consistent enforcement of building regulation**

ATEN provides a mechanism which would enable determination that building products holistically comply with the NCC provisions and are fit-for-purpose, thus assisting with the enforcement of building regulation.

- **Enhance confidence in the construction industry**

ATEN would support in providing a solution to the growing lack of confidence and trust in the construction industry and addressing concerns and recommendations highlighted by recent reports in relation to conformance and compliance of building products. The enhanced confidence in the construction industry will impact all stakeholders, including product manufacturers/suppliers, designers and engineers, builders and contractors, building surveyors, and consumers.

At present the Australian Competition and Consumer Commission (ACCC) does not deal with building products because they are not considered as consumer products. ATEN cannot solve this issue; however, it would assist with identification and documentation of these issues for the appropriate regulatory authorities.

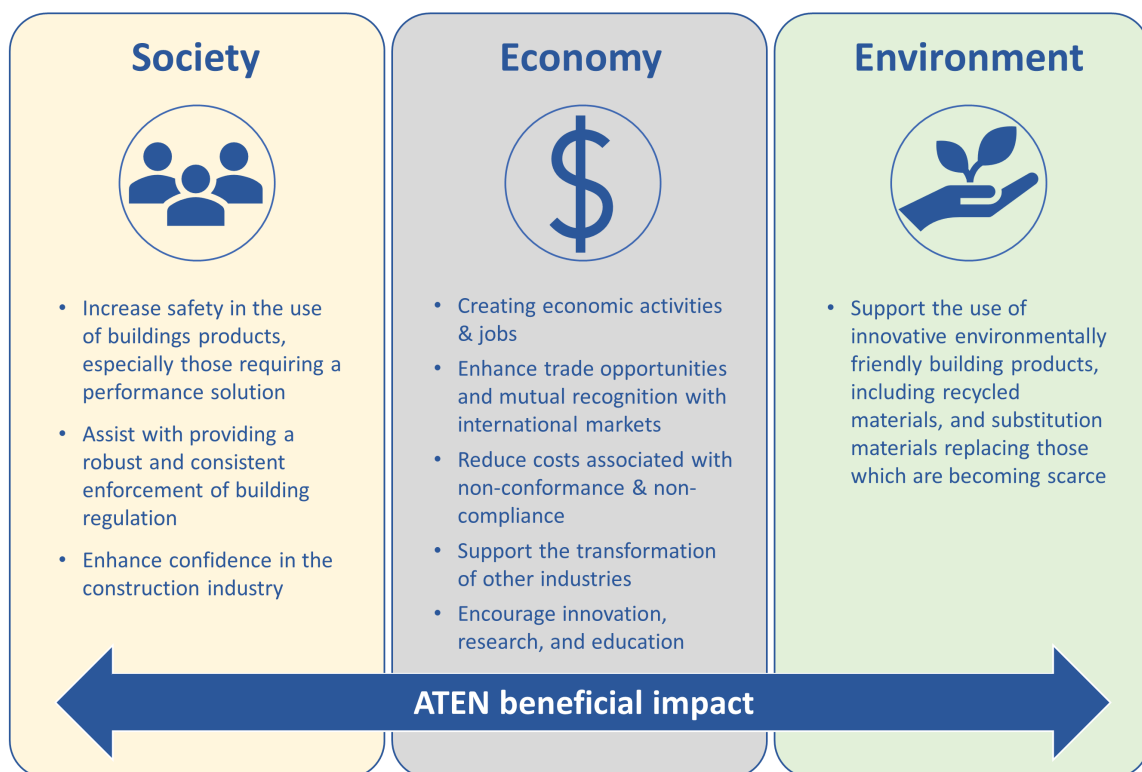


Figure 3-7: Expected beneficial impact of ATEN

3.5.2 Economic beneficial impact

- **Creating economic activities and jobs**

The uptake of ATEN, whether as a mandatory or voluntary scheme for *performance solutions*, would encourage economic activities and job growth in the building products assessment supply chain. The fields that would see growth will be high value and technical in nature, including validation/testing engineers, laboratory technicians, project planning managers, and risk management experts.

- **Enhance trade opportunities**

ATEN would enhance trade and facilitate mutual recognition in international markets by providing a uniform, consistent, and independent product evaluations. It would help to eliminate the duplication of evaluation procedures and therefore, significantly reduce cost and lead time for Australian companies to access international markets for locally developed, innovative and new products. It would also assist with importation of quality products in Australia as it will provide a level playing field for appraisal of products.

- **Reduce costs associated with non-conformance and non-compliance**

ATEN would assist with reducing the likelihood of non-conforming and non-compliant incidences and hence the associated extensive costs as demonstrated by recent incidences. A summary of three cases is provided in Table 3-2. For large scale issues there are often uncertainties about who is liable for costs and if the private sector cannot actually meet these costs there is an expectation for the Government to provide support. Government funding will ultimately be provided by taxpayers through taxes, increased fees, and/or one-time levies. The unbudgeted costs will cause pressure to the Government and likely to distract from the delivery of planned projects.

- **Support the transformation of other industries**

ATEN has the potential to support with the transformation of other industries such as:

- *Off-site construction*

With a stated focus on expediting innovation, ATEN may be instrumental in supporting the offsite construction sector, working closely with key stakeholders in this sector to develop appropriate validation programs. By prioritising evaluation of innovative products for this growth sector, ATEN may assist in improving its viability, encouraging the levels of market activity required for promoting jobs growth.

- *Victoria future industries transition plan to reskill automotive industry workers²⁵*

The automotive industry is driven through the skilled deployment of production, repetition, lean manufacturing, quality control and surveillance. These skills will be critical to driving the success of off-site construction; it being inherently a production environment. By optimising pathways for the uptake of innovative construction technologies, ATEN would also support the growth of this sector, a growing destination for re-skilled automotive workforce, capturing this significant intellectual capital for re-deployment into the construction industry.

²⁵ Victorian State Government. 2015. *Towards Future Industries: Victoria's Automotive Transition Plan*

- **Encourage innovation, research and education**

ATEN would support innovation and contributions to research and education in construction through collaborations with innovators, designers, and researchers. Its involvement in early stages of the product development cycle would assist to inform the evaluation requirements during the development process, this would in return assist with reducing the product evaluation timeline, mitigate the risk of (late in development) costly design iterations, and able to more accurately plan and budget for product evaluations.

ATEN would enable the identification of research needs which can be pursued by the university sector and identify key construction trends which would be useful for education and training of various construction professionals at different levels.

“Greater precision in setting performance standards and verifying compliance will give less variation in design proposals and lower costs. ATEN can help deliver this.”

Peter Gow

Former Western Australia Building Commissioner

3.5.3 Environmental beneficial impact

There is an increasing demand for the built environment to transition to a more sustainable carbon constrained future. ATEN would support the use of innovative environmentally friendly building products. These include recycled and reusable materials, and the use of substitution materials to replace those which are becoming scarce, for example the replacement of sand and cement with alternatives for the production of concrete. By their nature such products are most likely to be part of the *performance solution* in the NCC. Hence, ATEN's support of such a path would facilitate greater uptake. Indeed, it is estimated in general that support for such a pathway results in \$1 billion annual benefit²⁶.

3.5.4 Beneficial impact for Victoria

Instigation of the ATEN scheme by state or territory may provide certain state-level benefits. These are discussed in relation to Victoria since it has taken the initiative to fund this scoping study. Some of the beneficial impacts are discussed below and summarised in Figure 3-8.

- **Creating a centre of (construction) excellence in Victoria**

ATEN is to comprise a pool of expertise drawn from relevant parts of the construction industry to advise, inform and propose evaluation methods consistent with the desire to address fitness-for-purpose requirements for building products. A considerable part of this expertise is expected to reside within existing laboratories and testing facilities and experts in various fields experienced in conducting compliance programs. The establishment of an entity like ATEN would attract high value work and infrastructure around it to serve both the local and international markets.

²⁶ Centre for International Economics (CIE). (2012). *Benefits of building regulation reform: From fragmentation to harmonisation*. Prepared for Australian Building Codes Board. Retrieved from <https://www.abcb.gov.au/Resources/Publications/Corporate/The-CIE-Report-Benefits-of-building-regulatory-reform>

- **Capitalise on digital technologies**

ATEN would be able to leverage on the Victorian State Government’s intent to become the national hub for digital innovation in the construction industry²⁷ by creating a dynamic knowledge base for evaluation methods and fit-for-purpose criteria that helps to inform future programs. The constantly evolving nature of the knowledge base would establish it as the primary referenced resource for evaluation when introducing new products and materials into the construction sector. Such knowledge creation would support other digital strategies such as Building Information Modelling (BIM).

- **Enhance the position of the state as the Education State**

ATEN would enhance Victoria’s position as the Education State. The ATEN entity and its Network Members would be able to gather valuable information and develop knowledge which would be useful in enhancing industry practice for future professionals in construction. The broad skills developed through the ATEN activities would support education outcomes for various practitioners in the construction supply chain, including engineers, architects, building surveyors, project managers, and trade professionals.

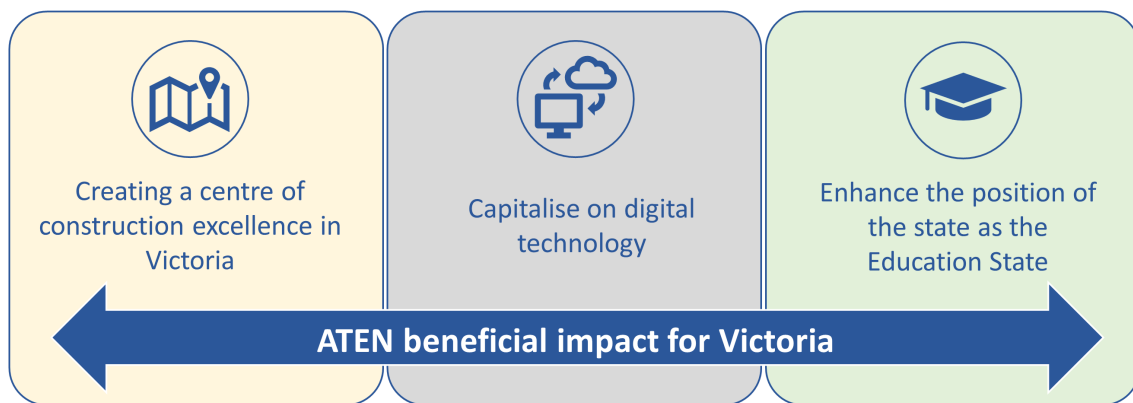


Figure 3-8: Expected beneficial impact of ATEN for Victoria

²⁷ Victorian Government, Department of Economic Development, Jobs, Transport, & Resources. (2016). *Construction Technologies - Sector Strategy, Victoria's Future Industries*. https://www.business.vic.gov.au/_data/assets/pdf_file/0006/1275495/Construction-Technologies-Strategy-web-version-20160310.pdf

Table 3-2: Repair and replacement cost of non-conformance and non-compliant incidences

Incident	Description	Cost
Combustible claddings in Victorian buildings	<p>Combustible claddings include aluminium composite panels (ACP) (with a polyethylene core of more than 30%) and expanded polystyrene (EPS) panels.</p> <p>By 2018 the Victorian Cladding Taskforce identified 275 high/extreme-risk buildings and 354 low/moderate-risk buildings²⁸. The risk has been calculated for buildings with likely presence of combustible cladding via considering the risk of fire spread and the ability for occupants to exit the building.</p>	<p>Based on the 629 buildings identified, Victorian owners may endure a rectification cost of \$250 million to \$1.6 billion²⁹. The final cost will depend on the cost-efficiency of the rectification program implemented, and the actual level of risk and the size of the affected buildings.</p> <p>The Victorian Government has announced a \$600 million plan to fix 500 private buildings which have been identified at the highest risk of fire³⁰.</p>
Magnesium oxide (MgO) boards in Danish façade structures	<p>MgO boards was widely used on facades in Denmark during 2010-2015. They were not originally tested for hygrothermal function before being used on exterior wall structures.</p> <p>The boards leak salty water as MgO salts absorb humidity from the surrounding air. This causes damage to adjacent construction members, including corrosion of fasteners and metal members, and moisture and mould problems in wooden members.</p>	<p>Sheathing with MgO boards are currently being replaced in Denmark and the expected cost of repair is approximately 2 billion DKK (0.4 billion AUD)³¹.</p>
Leaky building crisis in New Zealand	<p>Residential buildings constructed from the late 1980s to mid-2000s have been identified to have a high-risk of weather tightness problems³².</p> <p>The issue is mainly related to buildings with monolithic external cladding (e.g. coated polystyrene and fibre cement) installed over untreated timber framing without a drainage cavity system.</p>	<p>Reported repair and replacement cost of \$11.3 billion for 42,000 failures³³.</p>

²⁸ The State of Victoria Department of Environment, Land, & Water and Planning. (2018). *Victorian Cladding Taskforce: Taskforce Update*. Retrieved from <https://www.planning.vic.gov.au>

²⁹ Lockrey, S., & Moore, T. (2019). Flammable cladding costs could approach billions for building owners if authorities dither. *RMIT University*. Retrieved from <https://www.rmit.edu.au/news/all-news/2019/jun/flammable-cladding-costs-could-approach-billions>

³⁰ Premier of Victoria. (2019). Tackling High-Risk Cladding to Keep Victorians Safe [Press release]. Retrieved from <https://www.premier.vic.gov.au/tackling-high-risk-cladding-to-keep-victorians-safe/>

³¹ Rode, C., Bunch-Nielsen, T., Hansen, K. K., & Grelk, B. (2017). *Moisture damage with magnesium oxide boards in Danish facade structures*. Paper presented at the 11th Nordic Symposium on Building Physics (NSB2017), Trondheim, Norway.

³² Real Estate Authority - New Zealand Government. Learning about leaky buildings. Retrieved from <https://www.settled.govt.nz/>

³³ PricewaterhouseCoopers for the Department of Building and Housing. (2009). *Weather-tightness - Estimating the cost*. Retrieved from <https://www.interest.co.nz/sites/default/files/PWC-leaky%20homes%20report.pdf>

4 Implementation Considerations and Conclusions

4.1 General

This section provides an overview of some considerations important for the implementation of ATEN, including the register for Network Members, entity structure, national and state level implementation, connection with other related bodies, attributes and support for ATEN to operate successfully, and concluding remarks.

4.2 Network Members

ATEN is essentially to be the facilitator for bringing together the relevant parties, including construction experts and testing facilities, to evaluate building products in terms of fitness-for-purpose. A preliminary sample of experts who have agreed to be included in the ATEN register has been compiled. Furthermore, industry associations related to the construction industry that may interact with ATEN as part of its operation have also been identified. A register of laboratories and testing facilities with capabilities identified as suitable for conducting testing of various building products has also been compiled based on publicly available information found online.

The details of the registers are provided in Appendix P. The register for Network Members will be expanded and further details about the field of expertise will be developed for the implementation of ATEN.

4.3 Entity structure

4.3.1 Options for entity structure

There are a few options for ATEN to be formed as an entity, including:

- (i) as a company - company limited by guarantee,
- (ii) establishing an incorporated association, or
- (iii) establishing an unincorporated association.

Each of the above options have different risk profiles and will allow a variance of activities to be undertaken by ATEN. The detailed features of the mentioned options are covered in Appendix Q.

Out of the three options the unincorporated association is not preferred as it does not provide protection for its members and does not provide the ability to hold assets and enter into contracts as the structure is too informal. The company limited by guarantee or incorporated association are the recommended way forward for ATEN. Through these structures ATEN can establish a board of directors who set the scope of the work of the office and providing the framework for how and who may provide services that will form the appraisals.

A hybrid government structure is adopted by BRANZ, a New Zealand company which provides appraisals through a company limited by guarantee and uses incorporated associations as

subsidiary bodies to undertake related services such as research. This hybrid structure may also be utilised in a similar way within Australia.

Examples of other Australian entity structures, including hybrid structures, which may be considered as part of the implementation plan include:

- National Building Specification (NATSPEC); a national not-for-profit organisation, owned by government and industry,
- National Association of Testing Authorities (NATA); a government-endorsed, independent, not-for-profit company, operating as an association, and
- Australian Housing and Urban Research Institute (AHURI); a national independent research network with an expert not-for-profit research management company.

4.3.2 Limitation of liability

The limitation of liability of the directors and officers of ATEN (of the established company or incorporated association) can be achieved through:

- implementation of good governance,
- engaging of external experts through panelling arrangements to provide services to the entity which can leverage the experts' professional indemnity and further mitigate the risk of liability to the entity,
- auditing of appraisal activities undertaken to ensure that the scope of the appraisal is adequate, and compliance is being achieved as well as new learnings and updates incorporated into the documentation on use,
- auditing of laboratories recommended for testing to ensure ongoing compliance,
- insurance (directors and officers and professional indemnity), and
- establishing a risk and compliance function within the company or incorporated association.

The combination of these risk mitigation strategies will ensure the success of the established company or incorporated association and will minimise the risk of liability to its officers and employees.

4.4 National and state level implementation

The ATEN scheme may be implemented at national or state level. A national level application is the ideal solution and the potential governance of ATEN is discussed in Appendix R, however, this may take some time to establish.

A state or territory level application could provide a practical start that can be extended to national level at a later date. This would enable ATEN to be used immediately to assist with solving current issues.

4.5 Connection with other related bodies

If the ATEN scheme is to be established as part of the conformity assessment infrastructure, then the connection between the ATEN scheme with other key related bodies should be established and is discussed below.

4.5.1 Australian Building Codes Board (ABCB)

The ABCB is responsible for the NCC that includes provisions for *evidence of suitability*. The ABCB is also working on issues associated with high-risk applications as part of its new definition for *complex buildings*. Both of these issues are being reviewed and are of vital importance to ATEN.

Ideally, the ATEN Appraisal Reports should be recognised in the NCC through specific provisions and not as part of the generic any other form of documentary evidence. Support from each state or territory within its respective legislation or through representation within the established entity is also suggested to ensure consistency is achieved and supply chain participants do not have to go through additional evaluations to use a product in a particular state or territory.

As part of potential implementation of ATEN, close collaboration with the ABCB would be highly desired to realise the full benefits of ATEN in supporting the construction industry.

“The ATEN proposal is clearly aligned with the recommendations in the Building Confidence report and the implementation framework being developed by the Australian Building Codes Board.”

Peter Gow

Former Western Australia Building Commissioner

4.5.2 Joint Accreditation Scheme of Australia and New Zealand (JAS-ANZ)

JAS-ANZ has provided advice that appraisal work (as opposed to certification) does not necessarily require JAS-ANZ accreditation. However, accreditation may be done if deemed required for regulatory purposes.

4.5.3 National Association of Testing Authorities (NATA)

NATA accreditation provides a means of determining, formally recognising and promoting that an organisation is competent to perform specific types of activities such as testing, inspection, calibration in a reliable credible and accurate manner. The activities for which accreditation is granted, which may not be all activities the facility performs, are described in a scope of accreditation for the facility. For building products, NATA accreditation is applicable to tests which are performed in accordance with specific standard criteria. Hence, NATA accreditation of a testing facility is not generic in nature and would not typically apply to bespoke tests which may be required for innovative products with no applicable standards.

Collaboration between NATA and ATEN would be beneficial to support and improve the capabilities of the Network Members to undertake relevant testing and also to standardise procedures developed by ATEN for innovative products.

4.5.4 World Federation of Technical Assessment Organisation (WFTAO)

WFTAO is a worldwide network for coordinating and facilitating the technical assessment of innovation in the construction industry. It comprises of recognised national bodies in the field of technical assessment of construction products. ATEN may also establish relationship with WFTAO and technical assessment bodies in other countries with a view of mutual recognition to facilitate international trade.

4.6 Attributes for ATEN to operate successfully

The mission of ATEN is to provide independent, consistent, verified information on the fitness-for-purpose of construction building products. While this mission can be carried out under a number of possible governance models, three attributes are considered essential for its effective operation:

- ATEN should operate as an independent not-for-profit organisation with financial assistance for its initial establishment and operation. *Independent* and *not-for-profit* are important for its credibility.
- A connection should be established between ATEN and the building regulatory systems to reinforce and clarify the compliance pathway. The Appraisal Report will be a cost to the manufacturer. Its benefits therefore must be demonstrated to encourage its use. It could be argued that the problem of our current largely privatised conformity assessment system is a case of market failure to self-regulate so that regulatory action is necessary to remedy the situation.
- Given the size of the Australian market and limited number of experts and testing facilities, it is likely that only one network such as ATEN could be sustained. Further, in some similar economies there is usually one body operating the equivalence of ATEN typically with government support (e.g. Germany and New Zealand). If multiple organisations are to be created for market competition, careful attention needs to be given to issues related to variable assessments between competing bodies with the less stringent bodies preferred by the clients.

4.7 Support for ATEN to operate successfully

4.7.1 Financial support

In order to setup ATEN and to allow its initial growth, financial support is needed for:

- setting up appropriate governance, and
- cost of running the operation to produce Appraisal Reports. The cost of testing will be borne by the applicant.

After an initial period, it is expected that operational costs would be significantly covered by ATEN's commercial activities as a fee-for-service.

If ATEN is to do surveillance as well, then additional costs must also be included. However, these costs are not large when compared to the costs of a major compliance failure (as noted in Section 3.5).

4.7.2 Non-financial support

There are a number of ways that governments, regulators and industry associations can support ATEN, examples include:

- ABCB may consider specific inclusion of Appraisal Report as part of the *evidence of suitability* (Volume 1 Part A5.2) in the NCC. Further, limited types of *evidence of suitability* may be allowed for high-risk applications.
- regulatory authorities and building certifiers may refer to ATEN as an authoritative source of expertise for investigation of non-conforming, non-complying incidents or for a second opinion when faced with more complex performance proposals,

- guidelines for government procurement may give preference to products with ATEN appraisals, and
- industry associations may make their memberships aware of ATEN existence and encourage its use.

4.8 Concluding remarks

This scoping study for the Australian Technical Evaluation Network (ATEN) concluded that:

- The establishment of this scheme to form a network of selected construction experts and testing facilities to evaluate building products is technically feasible. ATEN would be able to produce consistent, verifiable and independent product Appraisal Reports on fitness-for-purpose to support the construction industry supply chain.
- The scheme would address specific deficiencies in the Australian conformity assessment system in line with recommendations of the Shergold and Weir report, the Senate Inquiry report and the Victorian Cladding Taskforce report. It would also meet the identified needs by the Victorian Government under its Future Industries Sector Strategy to “streamline compliance pathways for new construction materials and products”.
- The scheme is consistent with international best practice in conformity assessment and brings Australia in line with key trading partners.
- The scheme would deliver significant benefits to the society, economy, and environment, and enhancing the overall confidence in the construction industry.
- The scheme can fit in with the current Australian conformity assessment system. It is not intended that it would replace or interfere with any existing conformity assessment bodies but may well be helpful in facilitating the work of these bodies.

The following key considerations need to be further addressed as part of both policy settings and future funding arrangements:

- **Whether ATEN appraisal is mandatory, voluntary or a combination of both**

The ATEN scheme can work for all scenarios; however, the operational requirements will be different as the volume of work will change significantly depending on this choice. Given the expectation that ATEN would introduce more rigorous requirements than currently exist in the market, it is unlikely that the ATEN route to compliance will be adopted widely by industry if it is voluntary in nature, nor if it exists in combination with other alternatives that provide a lower barrier for compliance. It is therefore proposed that ATEN appraisals be a mandatory requirement for identified products in high-risk applications, or in cases where the regulator needs to act on market intelligence about suspect products or building design. Such mandatory application is to be at the discretion of participating jurisdictions.

- **How the Appraisal Report is to be used as part of a revised conformity assessment system**

ATEN can serve as an effective and efficient tool to support the relevant assessment criteria for the newly defined *building complexity* levels which are currently under public review through the Australian Building Codes Board (ABCB)³⁴. To assist with the

³⁴ Commonwealth of Australia and the States and Territories of Australia. (2019). National Construction Code: Governing Requirements and Common Schedules, 2019 Amendment 1 - Public Comment Draft. In. Canberra, Australia: Australian Building Codes Board.

implementation of the ATEN it is proposed that it focuses initially on building products for high-risk applications. This includes structural and fire safety products where their failures can have catastrophic outcomes for life safety.

The ATEN appraisal process is also in line with the recent proposed Amendment to NCC 2019 to include the Performance Based Design Brief (PBDB) to demonstrate a performance requirement is satisfied by a *performance solution*. The ATEN Appraisal Report may be considered as a form of PBDB.

- **Entity structure**

Feasible options have been put forward (including company limited by guarantee, and incorporated association) with the final decision being dependent on preference of the initial funding stakeholders to launch ATEN. The business plan would follow from this decision. Operational considerations in relation to insurance of the ATEN entity and its network members, handling of intellectual property and creation of non-disclosure agreements would require careful attention to offer appropriate protections.

- **Ongoing surveillance of appraised products**

This is important to maintain the validity of the ATEN Appraisal Reports. The surveillance can be undertaken by specified Inspection Bodies or alternatively undertaken by ATEN if it is decided that it is to have this additional function. If surveillance is to be undertaken by independent bodies, this can be part of a product certification that supplied products are meeting the relevant criteria set in the Appraisal Report.

It should be noted that the practice of surveillance is common in Australia for other industries such as pharmaceutical and food industries. Some existing industry-run product certification schemes also have surveillance built into them with the certification bodies acting as inspection bodies.

As part of the ATEN implementation process, there may be additional consideration given to its use to provide Appraisal Reports as part of existing schemes. For example, the ATEN Appraisal Reports could be part of the required documentation for state-based schemes such as the Victorian Building Product Accreditation system which is run by the Building Regulations Advisory Committee (BRAC).

Some of these items are related to policy settings, and thus ATEN would need to respond accordingly. Therefore, it is recommended that implementation work be undertaken in close consultation with the relevant participating state, territory and/or federal governments to facilitate an efficient and successful rollout.

The financial requirements to set up and operate the ATEN scheme will depend on the decisions related to the items mentioned above (e.g. mandatory or voluntary, scope of products covered, being sole provider or one of many, etc.). However, given the well documented deficiencies of the conformity assessment system in Australia and the consequences on safety and economy, and also the demonstrated successful operation of similar schemes in other countries the financial requirements can be estimated and justified.

Appendices

Appendix A

Review of contemporary reports and submissions on non-conforming building products to inform a scoping study on the Australian Technical Evaluation Network (ATEN)

Written by Ivan Donaldson
Former General Manager (Australian Building Codes Board, ABCB)

Foreword

At a time of national policy review prompted by serious building failures, there is a widespread community concerns about health and safety in buildings and contemporary efforts by government to find solutions. This Appendix provides a review of contemporary reports and submission on non-conforming building products the objective of this review is two-fold:

- to better understanding the role that a future ATEN could play in Australia's technical and conformance infrastructure to address impediments that do not support good community health and safety outcomes in buildings, and
- to inform a future ATEN role by drawing on recent public reviews and, what solutions have been identified by industry practitioners and others.

A.1 Methodology

To achieve this objective, it has been necessary to review three recent national reports on building regulation reform (2017-18)³⁵, as well as the NSW Lambert Report (2015)³⁶ on that jurisdiction's building regulatory system and the UK's Hackitt Report³⁷ which followed the disastrous Grenfell Tower fire. It was also important to take note of the Victorian Government's Construction

³⁵ Senior Officer's Group (SOG). (2017). *Implementation plan: Strategies to address risks related to non-conforming building products (September 2017)*. https://www.industry.gov.au/sites/default/files/strategies_to_address_risks_related_to_non-conforming_building_products_-_implementation_plan.pdf

Shergold, P., & Weir, B. (2018). *Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*. <https://www.industry.gov.au/data-and-publications/building-confidence-building-ministers-forum-expert-assessment>

Senate Economics References Committee. (2018). *Non-conforming building products: the need for a coherent and robust regulatory regime*. Commonwealth of Australia 2018. Retrieved from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming45th/Report

³⁶ Lambert, M. (2015). *Independent Review of the Building Professionals Act 2005: Final Report (October 2015)*.

³⁷ Hackitt, D. J. (2018). *Independent Review of Building Regulations and Fire Safety: final report. Presented to Parliament by the Secretary of State for Housing, Communities and Local Government by Command of Her Majesty*. UK: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707785/Building_a_Safer_Future_-_web.pdf

Technologies Sector Strategy (2016)³⁸ and its proposal to see developed a mandatory certification scheme for high-risk building products and for materials with safety implications.

These reports and the Senate Economics References Committee submissions to its inquiry into non-conforming building products were examined to identify relevant recommendations and/or findings that bear on the ATEN scheme. A Building Products Innovation Council (BPIC) submission to BMF, dated April 2018³⁹, was also examined because it is the latest and most comprehensive work on building regulation reform and has wide industry stakeholder support.

One hundred and fifty-four publicly available submissions⁴⁰ to the Senate Economics References Committee inquiry on Non-conforming building products 2015-2018 have been reviewed. Of those submissions, 23 were found to be of most relevance to ATEN. The details are provided in Section A.3.

A.2 Observations

A.2.1 Relevance of Victorian industry development policy to ATEN

The ATEN scoping study is supported by the Victorian Government. It is therefore relevant for the scoping study to have regard for the strategic focus of the Victorian Government's policy on the construction industry's future development.

Construction Technologies is a priority sector under the Victorian Future Industries Fund. The sector is defined as new approaches to managing construction activities and assets, including with the support of digital technologies and other services across the infrastructure supply chain, off-site and prefabricated construction products and services and construction and building materials, products and services.

Key government strategies⁴¹ to promote development in the sector are:

- streamlining compliance pathways for new construction materials and products,
- advocating for a national certification system for high-risk building products, starting with cladding,
- securing priority access to structural, fire and acoustic testing, and
- providing clear information on building standards and regulation of building work.

The ATEN scheme is a good fit with this policy framework. It aims to improve compliance pathways, particularly for new products and technologies, by harnessing expertise and testing capabilities across the country. This will support product innovation, enhance evaluation efficiency and increase confidence in product appraisal in construction.

³⁸ Victorian Government, Department of Economic Development, Jobs, Transport, & Resources. (2016). *Construction Technologies - Sector Strategy, Victoria's Future Industries*. https://www.business.vic.gov.au/_data/assets/pdf_file/0006/1275495/Construction-Technologies-Strategy-web-version-20160310.pdf

³⁹ *Rebuilding Confidence: an Action Plan for Building Regulation Reform*. BPIC submission to the Building Ministers' Forum-April 2018. The Building Products Innovation Council is the national body representing Australia's building products associations. Its mission is to promote the most efficient and innovative use of building products to Government and regulators.

⁴⁰ Parliament of Australia. Submissions (to the inquiry into non-conforming building products). Retrieved from https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming_products/Submissions

⁴¹ Victorian Government, Department of Economic Development, Jobs, Transport, & Resources. (2016). *Construction Technologies - Sector Strategy, Victoria's Future Industries*.

ATEN would be a rigorous and independent product and system evaluator and enabler of sound and sustainable technology and industry development

A.2.2 Shergold and Weir Building Confidence Report and initial government response

Shergold and Weir found that the nature and extent of problems raised in relation to the building and construction industry was significant and concerning. It was concluded that the current compliance and enforcement framework have been inadequate from preventing non-compliance of building products.

The report's goal was to enhance public trust through effective implementation of building and construction standards that protect the interests of those who own, work, live, or conduct their business in Australian buildings. Shergold and Weir made 24 recommendations to create a national best practice model, or framework, to strengthen the effective implementation of the NCC.

Shergold and Weir also said that Australia's product certification systems will need to include mandatory permanent product labelling and prohibitions against the installation of high-risk building products that are not certified. Once a common position is reached by the BMF, it called on governments to make it a priority to implement this through amendments to the NCC and/or through consistent reforms to each jurisdiction's legislation. In particular, Shergold and Weir called for:

- a statutory duty on design practitioners to prepare documentation that demonstrates that proposed buildings will comply with the NCC,
- a national best practice guide for documenting *performance solutions* that could be adopted by jurisdictions and given legislative force, and
- a more robust approach to third party review of designs and to the documentation and approval of *performance solutions* and variations.

Shergold and Weir also calls for each jurisdiction to:

- develop a building information database as a centralised source of building design and construction documentation,
- set out information which must be included in *performance solutions*, specifying in occupancy certificates the circumstances in which *performance solutions* have been used and for what purpose,
- provide a transparent and robust process for the approval of *performance solutions* for constructed building work,
- provide for a building compliance process which incorporates clear obligations for the approval of amended documentation by the appointed building surveyor throughout a project, and
- require genuine independent third-party review for specified components of designs and/or certain types of buildings.

Their report also recommended (Rec 21) that BMF agrees its position on the establishment of a compulsory product certification system for high-risk building products.

It is clear from BMF's handling of the Report that it supports, in principle, the implementation of all 24 Shergold and Weir recommendations, at least jurisdiction by jurisdiction. In February 2019, it announced that six of Shergold and Weir recommendations would be given priority. The one priority in this group of direct relevance to ATEN is Recommendations 13. BMF also foreshadowed that it would work closely with industry and/or ABCB on Recommendations 14-17 and noted that it

had directed SOG (Senior Officers' Group) to develop a strategic response to Recommendation 21 (i.e. on the establishment of a compulsory product certification scheme for high-risk building products).

In July 2019, BMF also announced that it was giving ABCB responsibility for a new implementation team that will develop a national framework for the consistent implementation of the recommendations of the Shergold and Weir report, as well as the design, construction and certification of complex buildings⁴².

A.2.3 Relevance of Senate Committee, Hackitt, Lambert Reports and BPIC Action Plan to ATEN

All of the approaches to reform advocated in these other reports also call for systemic national action, largely in the form of increased government intervention, either direct or indirect.

The Reports' findings on the need for change was reinforced from a reading of the 154 submissions lodged with the Senate Committee on Economics inquiry into NCBPs. Not one submission supported the status quo. Submissions to the other reviews were not available to the author.

Every report recommended change to the technical and conformance infrastructure as part of broader reform strategies both in Australia and the UK.

A common thread in the Australian reports was the extent to which they pointed the way to a need for a dramatic shift in long settled policy settings in place for over a quarter of a century⁴³.

A major driver in the minds of policy makers during the time of major micro-economic reform of the Australian economy in the 1980s and 1990s was concern about the burden of compliance costs on business.

Governments at the time supported the view that conformance arrangements should be balanced against risk, that testing and certification should be undertaken by third party houses where possible, options to demonstrate conformance should be available and conformity assessment should not restrict trade.

The focus of policy was therefore to encourage a competitive certification market rather than to emphasise the need for risk mitigation.

The shift now being contemplated is for a greater degree of government intervention through more checks and balances. This is likely to lead to a shift in the tension between the need to encourage competitiveness and risk mitigation in favour of the latter.

The ATEN scheme fits well into this paradigm shift, without introducing a new layer of heavy-handed bureaucracy or another layer of control. Its focus is on facilitation and the marshalling of sound technical expertise. Its goal is to build confidence and support in the community for the Australian building regulatory system and the construction industry.

A.2.4 Examples of interventions proposed in the contemporary reports

The following draws together examples of recommendations in the reports that call for intervention by Government as well as examples of calls for reform by industry.

⁴² BMF Communiqué of 18 July 2019

⁴³ Linking Industry Globally: Report of the Committee of Inquiry into Australia's Standards and Conformance Infrastructure. Pp 161-164 Canberra Australian Government Printing Service 1995

A.2.4.1 Shergold and Weir

- Broader powers for regulators and enhanced regulatory oversight.
- A more robust approach to third party review of designs and documentation and approval for alternative solutions.
- Consideration of a mandatory product certification system for high-risk building products (also supported by Senate Committee).

A.2.4.2 Senate Economics Committee

- Point of sale intervention.
- A national licensing system for all practitioners.
- Significant penalties for non-compliance.
- Mandatory recall insurance for suppliers of high-risk building products.

A.2.4.3 Lambert

- Peer Review Panels to evaluate alternative solutions.
- A national risk-based building certification scheme.
- More documentation to justify alternative solutions.

A.2.4.4 Hackitt (UK)

- Retesting of critical products and systems every three years.
- Test house to be more accountable for the results of their tests.
- Labelling and traceability of building products.

A.2.4.5 Building Products Innovation Council (BPIC) (Industry perspective)

- Effective field screening tests for particular products.
- Testing products in-situ.
- Conformity excise penalties for non-conformance.

A.2.5 Examples of industry calls for reform from the 23 Submissions to the Senate Economics Committee inquiry

(More details provided in Section A.3)

- Improved communications between government and industry.
- Cross-industry support is need for conformance reform and should be shaped by an engagement with government stakeholders.
- A national product compliance body, possibly within the Australian Competition and Consumer Commission (ACCC).
- Re-establish CSIRO Building, Construction and Engineering Division and its testing facilities
- Australian Technical Infrastructure Alliance be given a role to address weaknesses in the full range of conformance infrastructure services.
- AIB's call for a suite of initiatives that would mean more compulsion and less market-based approaches.
- Housing Industry Association (HIA) support for the EU's construction product regulation.
- Master Builders Australia (MBA) preference for better coordinated certification
- Government endorsement of existing third-party certification schemes that meet APCC Procurement requirements.
- Improved policing and enforcement.
- Expert panels under a national product compliance system to assess risk and decide if products can enter the market.

A.3 Identification of issues in 23 public submissions⁴⁴ that the proposed ATEN scheme will address

A.3.1 Peak National Bodies

A.3.1.1 Construction Product Alliance (CPA) issues (No. 33⁴⁵)

- Non-conforming products have been allowed into the market due to inadequate: surveillance, audit checks, testing, first party certification, and enforcement.
- Building certifiers bear a disproportionate share of the burden for product conformance - raising the question of whether more responsibility should rest with product suppliers and builders.

Action proposed by CPA

CPA proposed an Action Plan, supported by 40+ industry and related organisations:

- A taskforce of industry stakeholders, state and federal government agencies to develop a strategic plan on short, medium- and long-term responses to the issue of non-conforming products.
- ABCB review NCC *evidence of suitability* criteria; and develop and publish a guidance handbook on the use of risk-based assessments to determine the appropriate *evidence of suitability*. (This has been completed)
- A national portal to increase public and industry awareness of available information on NCBPs.
- Increase stakeholder awareness of third-party certification schemes as a tool for achieving product compliance.
- A pilot to determine feasibility of a single building product register for compliant product, based on industry and government certification schemes.
- Evaluate feasibility of building product legislation being enforced at point of sale. (This has been done but deferred for the time being by BMF.)
- State building authorities to review surveillance and audit activities and implement stronger penalties to improve compliance with the NCC.
- Assess feasibility of a confidential reporting system about NCBPs for industry.

This submission was made in 2015. Many of the participants that supported this submission were also identified as having supported a 2018 submission to the BMF on the Shergold and Weir report by Building Products Innovation Council (BPIC on the same or related issues, including product certification). The BPIC submission is dealt with separately in this Review.

The key point here is industry's wish to be part of the solution and to participate with government to negotiate a strategic plan that covers all the issues that need to be addressed. It is a theme that is repeated often.

⁴⁴ The text of the 23 submissions (available at https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming_products/Submissions) have been quoted or subject to minor editing in this document for reasons of brevity and to focus on the essence of their issues and recommendations as they appear to bear on ATEN.

⁴⁵ The unique number shown throughout this document is the reference assigned to the individual submissions by the Senate Economics Committee. There were 164 submissions made, 10 of which were confidential. Of the remaining, 23 were found to be relevant to ATEN

A.3.1.2 Australian Construction Industry Federation (ACIF) issues and action proposed (No. 81)

ACIF supports the approach of the Construction Product Alliance.

A.3.1.3 Building Products Innovation Council (BPIC 2015) issues (No. 72)

“Over the last decade there has been a shift in the building products supply chain to an increased use of offshore sources along with a decreased level of local manufacturing of these products. Further, the ease of purchasing online has brought into the market a plethora of less educated buyers (sourcing small quantities), who do not have the knowledge to ensure products are *fit-for-purpose*. There are also numerous examples of local manufacturers cheating the system. Once these products are in the supply chain, the provenance is often lost and seeking a remedy when a problem arises becomes extremely difficult.

The problem also has its roots in the closure of the CSIRO Building, Construction and Engineering Division and its associated testing capabilities (beyond just fire safety) 15 years ago. Without the independent facilities and expertise provided by that CSIRO division, manufacturers especially overseas suppliers and those local manufacturers with modest turnovers, have had to self-test their products (first- and second-party testing), which of course is not an independently verifiable process.”

BPIC position in 2015

BPIC supported the CPA approach, and recommended measures to strengthen independent verification and assessment systems by:

- Establishing an Independent Compliance Body within the ACCC to investigate documented and serious NCBP complaints and prosecute where appropriate.
- Government endorsement and common labelling of existing third-party product certification schemes that meet minimum Australasian Procurement and Construction Council (APCC) requirements.
- Re-establish the CSIRO Building, Construction and Engineering Division along with its associated testing facilities.
- Promote the ABCB to prepare guidance information on the types of *evidence of suitability* and the building products that should be aligned with each type of evidence based on their risk. (This has been completed)
- State and territory building regulators to revisit the benefits of national harmonisation of the administrative framework for building approvals. (This has been completed but outcome is only IGA 2017 that is, at best, a *best endeavours* approach to harmonisation.

A.3.1.4 Australian Industry Group (AiG) issues (No. 46)

“The operation of the conformance framework (that is comprised of all regulations, codes of practice, standards, certification or accreditation schemes that bring about product conformance in the building and construction sector) has gaps and weaknesses. The lack of independent verification and insufficiently visible regulatory authorities is making the conformance framework ineffective and unfair. The end result is undermining confidence in the regulatory system and an uneven playing field.”

Action proposed by AiG

Ai Group recommends that the Commonwealth, states and territories and industry:

- Consider strategies to increase stakeholder awareness of third-party certification schemes as a tool for achieving product conformance.
- Conduct a pilot to determine the feasibility of establishing a single national building product register for conforming product based on industry and Government certification schemes.
- Evaluate the feasibility of building product legislation placing responsibility for product conformance at point-of-sale. The evaluation should consider costs and benefits, and risks that arise with purchases made outside of Australian borders.
- Establish a taskforce to develop a strategic plan that incorporates short, medium- and long-term responses to the issue of NCBPs.
- Assess the feasibility of establishing a confidential reporting system to facilitate the reporting of instances of NCBPs.
- Promote awareness of the role of regulatory bodies in the building and construction sector and in particular how to report NCBPs.
- Establish a national portal to increase public and industry awareness of information available on NCBP.

States and territories:

- improve surveillance and audit activities and implement stronger penalty regimes to improve conformance with the NCC and other building regulations.
- expedite the development of the Inter-Governmental Agreement to underpin the Electrical Equipment Safety System (EESS).
- review their building certification arrangements to clarify the responsibilities of building certifiers and assess the adequacy of existing arrangements in preventing the installation of NCBPs.

The Commonwealth:

- Request ABCB to modify the NCC *evidence of suitability* criteria to stipulate that high-risk products to carry only third-party certification; and develop and publish guidance material in the form of a handbook regarding the use of risk-based assessments to determine the appropriate *evidence of suitability* under the NCC.
- Encourage the Australian Technical Infrastructure Alliance (ATIA) and members to work collectively and individually with industry to develop strategies to identify and address any weaknesses in the chain of infrastructure services including:
 - measurement science,
 - standards development,
 - testing and testing accreditation, and
 - certification and certification accreditation that may contribute to NCBP; and develop appropriate risk-based models for third party certification schemes that may be used by industry.

Australia Institute of Building (AIB) issues (No. 151)

AIB reported that as stated in *Procurement of Construction Products - A guide to achieving compliance*⁴⁶:

“At the end of June 2012, the building and construction industry generated \$305 billion in total income, incurred \$275.4 billion in total expenditure, and employed 950,000 persons. Construction products are estimated to comprise 30% of project costs; therefore, approximately \$82.62 billion dollars was spent on their procurement in 2011–12. One major builder estimated the average cost of rework due to non-conforming products was between 0.25% and 2.5% of the overall contract value.

This works out at up to \$2.06 billion immediate cost to builders of reworking due to faulty building products, and this does not include the costs of rework 5, 10 or 20 years later, or the costs to the economy of the effects on human health and safety due to nonconforming building products.”

Action proposed by AIB

AIB's view was, in part, that:

- Product conformity should shift from an *informative* to a *normative* approach, meaning that some form of testing would become compulsory.
- A National Register of Certified Construction Products would be valuable to inform the industry and building professionals.
- The testing of products should ideally be at the point of manufacture, with overseas standards thorough enough to have faith in their processes.
- There should be some level of identification of the source of product inputs (i.e. traceability).
- A national building compliance office, similar to CASA for aircraft is needed called the *Australian Building & Construction Compliance Office*. This would aim to ensure compliance of, and improve standards of, both workmanship and products, and possibly manage the National Register. AIB advocates that significant funding in the order of \$10 million of federal funding over three years would be required to establish it.

AIB also consider that there needs to better awareness of the role of the technical infrastructure in industry and the community.

A.3.1.5 Housing Industry Association (HIA) issues (No. 30)

“The responsibilities for supplying a product that is *fit-for-purpose* is shared across several players in the supply chain. This can make identifying who is ultimately responsible for the failure of a particular product and seeking a remedy a difficult process.

The other significant reason that makes quantifying the problem difficult is the range of regulatory bodies with both direct and indirect responsibility. This overlap and confusion has led to a situation where industry stakeholders do not know who to report problems to, where agencies refer complaints to other agencies, and where little or no action is taken, or perceived to be taken, by those agencies that do have responsibility and legislative capacity. This response leads industry to question the value in reporting problems.

Many product sectors such as plumbing and sanitary ware, electrical fittings, windows, engineered wood and steel reinforcing have numerous examples of fraudulent certification and product

⁴⁶ <https://www.acif.com.au/resources/strategic-forum-for-building-and-construction/procurement-of-construction-products-a-guide-to-achieving-compliance>

marking being used. In most instances, these products also fail the primary test to be *fit-for-purpose* and therefore safe to be used in building and construction work.

Action proposed by HIA

It is possible to identify a set of hallmarks that could be followed to create a reliable and transparent method of product certification that can be relied upon by the purchaser at the point of sale.

The hallmarks of a model product certification scheme should include:

- Identify the product category to be managed (e.g. in-scope products).
- Establish a technical standard for the design and manufacture of the product (or adopt existing standards where appropriate).
- Establish the method of product testing to be undertaken for in-scope products based on a risk assessment of the products (i.e. type testing (single sample), proof testing (ongoing samples) or production testing (all product)).
- Establish the type of testing bodies that can undertake testing of the products (e.g. independent third-party certification for products which affect structural safety, first party certification for non-structural, non-safety products)
- Establish the type of certification required for the tests undertaken (e.g. test certificates by testing authorities or product technical information provided by the manufacturer).
- Require the product supplier to be registered (and make a declaration that the products they produce conform).
- Require products to be tested and the relevant documents to be supplied to the scheme owner.
- Require products to be labelled by the supplier before offered for sale.
- List products in an online format to allow products to be easily checked.
- Create a process for surveillance, confidential reporting and auditing of the products covered by the scheme; and penalties for enforcement.

A.3.1.6 Master Builders Australia (MBA) issues (No. 35)

MBA identified five issues that are central to the use and existence of non-conforming building products (NCBPs):

- NCBPs are a major concern to the building and construction industry.
- Addressing NCBPs does not require more regulation. Instead, existing regulation requires better enforcement, improved industry awareness, greater clarity and more regulator enforcement.
- The 'front-end' of the chain (manufacturers & suppliers) must adopt more responsibility for ensuring NCBPs do not enter Australia and, where they have, the front-end must bear the onus of removing them from sale.
- Building contractors need better tools to ensure they use the right product in the right place to ensure they are fit-for-purpose - addressing both non-conformance and non-compliance.
- Governments must ensure they actively work with industry in coordinating and overseeing the existing array of information/certification tools in a transparent manner to enhance compliance and enforcement levels. This would also allow building contractors to access the necessary verification of complying products that can be used with ease and confidence.

Action proposed by MBA

MBA proposes the Federal Government in the first instance examine the veracity of existing product certification schemes, and of vesting in an established national agency (say the ACCC) to administer and, where found deficient consider the option of, a single, co-ordinated production certification scheme. Key elements of such a scheme would:

- define minimum standards of product conformity and testing,
- have broad product coverage,
- be simple and easy to navigate (especially for industry and consumer users), and
- include auditing and surveillance functions.

This proposal has arisen out of growing recognition within the building and construction industry of the essentially unwieldy nature of the current patchwork system of assessment schemes. In particular, there is a concern amongst industry practitioners at the disparate quality of assessment, level of auditing, and effectiveness of fraud mitigation measures amongst the various schemes.

Practitioners also indicate they have difficulties with the incomplete coverage of, and the lack of transparency in, the various schemes, which in turn diminishes user confidence and trust relations.

The challenge is to ensure the various individual schemes satisfy, at least, agreed minimum thresholds of performance, with sufficient transparency to allow users (actual and potential) to recognise when relevant performance benchmarks have been achieved (or surpassed).

As such, the role for government in this regard is to ensure the individual schemes operate within an overall product certification system, itself a sub-set of a broader regulatory framework which is better co-ordinated, risk-based and where compliance is proportional, simpler and more transparent. Hence, the first preference is for better co-ordination of the current schemes once regulatory mapping has been completed.

Consideration should be given towards how a federal agency can coordinate, monitor, survey and assist those agencies, as well as provide a consistent means by which consumers, industry and regulators can understand the system.

A.3.2 Building product sector bodies

A.3.2.1 Vinyl Council of Australia issues (No. 11)

Alternative solutions provide more choice of construction and product solutions; however, they also lead to greater complexity in verifying product performance in terms of critical aspects such as the fire resistance and smoke limitation requirements under the NCC's Volume 1 Section C

Given the range of pathways to demonstrate compliance, surveillance is clearly challenging and recent experience has shown that regulators are not adequately resourced to ensure product compliance is being met when the product is in situ in the building.

Because NCBPs 'cut corners' in terms of manufacturing and quality control, they are almost always cheaper than competing products

Action proposed by the Vinyl Council

- Review and strengthen *evidence of suitability* criteria in the NCC.
- Encourage the adoption of third-party certification schemes as the preferred pathway for NCC compliance for safety critical building elements.
- Explore solutions to facilitate verification of product certifications and document traceability.
- Consider a point of sale enforcement approach.
- Develop and implement more effective surveillance regimes.

A.3.2.2 Engineered Wood Products Association of Australasia (EWPAA) issues (No. 12)

“... mandatory certification has not proved to be effective in the electrical and plumbing sectors due to an increase in fraudulent certification, and the EWPAA does not advocate mandatory certification. Instead, it is recommended that an Independent Compliance Body be set up within the ACCC to investigate documented non-trivial complaints and prosecute where appropriate.”

Action proposed by EWPAA

Mandatory certification has not proved to be effective in the electrical and plumbing sectors due to an increase in fraudulent certification, but EWPAA does not advocate mandatory certification. Instead, it is recommended that an Independent Compliance Body be set up within the ACCC to investigate documented non-trivial complaints and prosecute where appropriate.

The legislative framework already exists for such action under the misleading information sector of the Competition and Consumer Act 2010.

Severe financial penalties need to be imposed where it is proved that an organisation is either selling non-compliant product, or where they are importing it directly for use in Australia.

An Independent Compliance body be self-funded directly from the significant infringement penalties for convictions.

A.3.2.3 Bureau of Steel Manufacturers of Australia (BOSMA) issues (No. 18)

Non-compliant steel being supplied into construction is part of an overall problem in establishing product conformity to the Australian Standards specified. There is evidence from a range of sources that some steels being supplied into projects are non-compliant with specifications and standards. There needs to be a better overall product conformity system and in the case of high-risk construction safety related products like steel, there needs to be Government support.

In BOSMA's opinion non-compliant steel being supplied into construction is part of an overall problem in establishing product conformity to the Australian Standards specified. There is evidence from a range of sources that some steels being supplied into projects are non-compliant with specifications and standards. There needs to be a better overall product conformity system and in the case of high-risk construction safety related products like steel, there needs to be Government support.

Action proposed by BOSMA

The BOSMA position is that regardless of source of product, members of the supply chain must ensure that the steel products used in risk critical structural applications have been supplied from steel mill manufacturers which have Third Party Certification of their manufacturing output, demonstrating compliance with the relevant Standards.

BOSMA is not calling for increased regulation but support from Government of the systems already in place driven by industry need and with a proven track record. Frameworks such as this are well understood and accepted by competent steel mills worldwide, as Third-Party Certificates of Product Compliance are already for them a low cost “reduced red tape” method of demonstrating compliance to Standards and correct test certificate data and identifying markings.

A.3.2.4 Australian Window Association (AWA) issues (No. 5)

“Compliance and its enforcement in Australia have not kept pace with the rapid changes to our economy, global supply chains, and how or where products are manufactured or sourced.

There are a growing number of fraudulent documents that are hard for surveyors to identify and many overseas laboratories are now testing to Australian Standards but their reports have identified major testing and reporting flaws in addition to misuse.

Compliant manufacturing companies are experiencing eroded margins and reduced revenues due to the increasing presence of non-conforming products.

Companies testing to standards and undergoing audits realise much higher costs to comply than those that don't, with non-compliant products not being picked up until an event occurs

Non-conforming product is most prevalent in the high rise residential and office market.”

Action proposed by AWA

Government endorsement and common labelling of existing third party product certification schemes that meet the following minimum requirements would offer a level of protection to purchasers and provide an industry driven mechanism: a) accredited through the JAS-ANZ; b) includes product conformity requirements for type or batch (ongoing) testing to Australian or International Standards as appropriate, as well as a process for ongoing, periodic auditing; and c) undertakes market surveillance to identify and weed out fraudulent activity.

An effective method to reduce both non-compliant product and product with fraudulent certification is to have large pecuniary penalties for the deliberate sale or procurement of non-compliant products, or first use of non-compliant products where the products are imported by the user.

The Competition and Consumer Act exists and may be able to be extended to provide the legislative framework to enforce action against non-compliance based on misrepresentation of product in the building and construction sector. If the ACCC is the appropriate body to enforce this, resources would need to be adequate for it to effectively act in response to numerous complaints.

Effective action against non-compliant product by the ACCC could be funded from penalties recovered from prosecutions.

An alternative option could be a program akin to the state-run options in the US where buildings are inspected for product conformity and those found deliberately procuring, installing and certifying offending products are charged with legal action. There is no provision for a phoenix company under these rules and penalties can incur jail time. This has reduced the problem significantly and improved the quality of building stock. Monies retrieved are used to educate and test and maintain best practice. Known examples are in New York and Ohio.

A.3.2.5 Australian Steel Institute issues (No. 19)

There is a “prevalence of steel product and materials not meeting relevant Australian standards (which) has increased significantly since the move to global sourcing and purchasing practice in recent years.

The ASI suggests that the main contributors to this are:

- A regulatory system that allows for easy passing off of fraudulent materials or supply of non-conforming building product (NCPBs).
- Ineffective surveillance for NCPBs.
- A lack of or lack of use of existing of third-party certification systems.
- A lack of effective reporting and enforcement of existing standards requirements.
- An uneven playing field for importers compared with local producers on non-compliant product requirements that substantially disadvantage local supply.”

Action proposed by ASI

- All state and federal government procurement guidelines fully support and stipulate the use of the 12 principles in the APCC guide for procurement.
- All Government contracts stipulate the use of industry backed third party compliance schemes for key structural product areas (e.g. structural steel) where available.
- The State-based Workplace Health and Safety Act be strengthened and clearly articulated to support the enforcement of penalties for unsafe supply of non-conforming product in the building industry and that the Act or guidance documents from the Act provide specific examples relating safety and non-conforming product.
- The liability for non-conformance for building products and certification of conformity be available at point of sale.

A.3.2.6 Furniture Alliance issues (No. 121)

“The lack of product surveillance (irrespective of source) together with the lack of financial disincentives for importing/selling non-compliant product generate an environment where non-compliance levels are significant and the public is put at risk.”

Action proposed by Furniture Alliance

To improve policing and enforcement of existing regulations:

- Extend scope of the definition of consumer goods to include building products, which are used in residential building work giving the ACCC (or a new Australian Building and Construction Commission) authority to act.
- Seek jurisdictions to mandate inspections of buildings by qualified building inspectors during construction.
- Establish a national register that documents issues that can be dealt with by a body with authority to act on NCBP issues.
- Map out and eliminate overlapping non-conformance responsibilities between the Commonwealth, state/territory and local governments.
- State and territory consumer affairs agencies to collect non-conforming products information as part of their dispute resolution processes.
- Strengthen independent verification and assessment systems.
- Establish an Independent Compliance Body within the ACCC (or the new Australian Building and Construction Commission) to investigate serious, well substantiated (i.e. evidence based) NCBP complaints and prosecute where appropriate.

- Government endorsement and common labelling of existing third-party product certification schemes that meet minimum Australasian Procurement and Construction Council (APCC) requirements.
- Re-establish an independent, credible national testing and certification authority, such as the former CSIRO Building, Construction and Engineering Division, to evaluate suspect building products.
- Promote the ABCB to prepare guidance information on the types of *evidence of suitability* and the building products that should be aligned with each type of evidence based on their risk.
- Commonwealth, state and territory building regulators to revisit the benefits of national harmonisation of the administrative framework for building approvals.

A.3.2.7 Fire Protection Association of Australia (FPAA) issues (No. 31)

In summary, FPA Australia assert that NCBPs are having a negative impact on the Australian market in terms of safety, costs, quality and uncertainty across the supply chain.

Action proposed by FPAA

FPAA proposed a significant change to the product certification system. They proposed to add another layer of control over building products driven by industry through existing third-party certification schemes.

Their system is called the National Building Product Compliance System. In short, it would involve the introduction of “expert panels” drawn from industry under the auspices of, and accountability to, the Commonwealth and the NCC. The role of these panels would be to assess risk against a pre-determined set of criteria set by local industry and administered by it at the local level. It assumes that existing voluntary certification schemes would become mandatory and effectively controlled by local industry.

It would utilise AS 4360-1995 Risk Management and ISO Guide 67 Conformity Assessment-Fundamentals of Product Certification to rank products individually for risk and so determine the level of surveillance that would apply case by case.

A.3.2.8 Insulation Council of Australia and NZ (ICANZ) issues (No. 36)

Non-compliance of products used in the building industry is a real and growing problem. The increasing use of these products not only undermines the quality of building stock for the future, it creates a major disincentive to invest in new production facilities or upgrade existing equipment. It also is a disincentive to employ more people and places some existing jobs at higher risk.

With regard to safety, there are numerous documented instances of product failure in glazing panels, facades, wiring and flammable building products that have been shown to be non-compliant and pose significant risks to site workers and to the safety of subsequent building occupants. The fact that these instances occur regularly demonstrates the current compliance framework is weak if not disconnected and broken.

ICANZ contends that there is inadequate product checking, auditing, surveillance and a lack of enforcement to meet compliance requirements. State regulators appear to lack the resources and skills the needed to step up to play a more effective role in these areas. Some states have vacated this responsibility completely.

Building certifiers are not trained experts on every building product or on energy assessments and to a large extent must rely heavily on the builder and product supplier to provide credible product testing and fit-for-purpose documentation.

Action proposed by ICANZ

As part of reducing the occurrence of non-compliance Industry needs to support overburdened building certifiers with a more robust certification process that comes into play before and during construction. This would involve builders and product suppliers being made more accountable for ensuring that non-compliant products are not supplied and used. A number of industry associations have already taken the initiative of developing comprehensive conformity assessment schemes for their members' products. These will be of great assistance to building certifiers.

A.3.3 Commonwealth and State Bodies

A.3.3.1 Commonwealth Department of Industry and Science (DIS) issues (No. 43)

The Department notes that standards and conformance activities play an essential role in facilitating international trade. It is important Australia actively participates in the development of international standards to ensure they are relevant for Australian conditions and needs.

Action proposed by DIS

The Australian Government's Industry Innovation and Competitiveness Agenda includes a principle that states:

"... where a trusted international standard or risk assessment already exists, and a system, service or product has been approved under that trusted standard or assessment, then regulators should not impose any additional requirements for approval in Australia, unless it can be demonstrated there is good reason to do so."

It is important to consider the wider scope of Australia's regulatory system, and approach to international standards, when reviewing specific issues such as non-conforming building products.

A.3.3.2 Commonwealth Scientific and Industrial Research Organisation (CSIRO) issues (No. 13)

- Reliance on overseas laboratories presents two challenges. Firstly, testing in other regulatory jurisdictions may not account for subtleties or specifics in Australian regulation and building environment. Secondly, reliance on international testing will not develop and support a knowledge base of Australian expertise, resulting in future regulatory development and standard setting operating in an information vacuum.
- Non-conformance presents a range of risk profiles depending on the type of building product. This may be the risk to occupants, such as structural and fire safety, or financial risk and costs of rectification. These risk profiles are unrelated to product cost, with low value building products potentially causing catastrophic outcomes.
- Many building products and materials can be difficult to identify once removed from their packaging and installed.

Action proposed by CSIRO

- A robust, independent, Australian based testing and certification environment is an important factor in addressing the issue of non-conforming products.
- A vibrant commercial laboratory infrastructure can successfully provide independent assessments and testing necessary to address product non-conformance.

A.3.3.3 Australian Competition and Consumer Council (ACCC) issues (No. 39)

Stakeholders in the building industry have told the ACCC that:

- Building regulations lack enforcement provisions which would deter the marketing of building products that do not meet the building standards they are claimed to meet.
- Non-conformance involves imported and locally made building products.
- Building regulators have insufficient recall and remediation powers that are not always readily suited to non-conforming building products, particularly when products have been installed.
- The building regulatory framework needs to provide nationally consistent recall, remediation and enforcement outcomes for building products.

Although the existing regulatory framework for building products is a good foundation, the claims of supply and use of non-conforming building products in Australia have reduced stakeholder confidence.

Development of the current building regulatory framework was part of the COAG National Partnership Agreement to Deliver a Seamless National Economy. COAG was instrumental in bringing building and plumbing regulation into the NCC Code.

Action proposed by ACCC

The building product regulatory framework could be improved to enhance building product conformity and increase confidence amongst those working in the building industry. Building regulatory powers need to be improved to equip building regulators with:

- Sufficient power so that they can take action against suppliers for making false and misleading claims about building products.
- Powers so that they can compel suppliers of unsafe non-conforming building products to recall products and undertake remediation action.

These powers should be consistent across jurisdictions so that building regulators can take a nationally consistent action against non-conforming building products.

The features of an enhanced regulatory framework should enable building regulators to:

- Conduct market surveillance, test products and take enforcement action when false and misleading claims about building products are detected.
- Institute risk-based remediation and/or recall building products, including when they have been installed into completed buildings.
- Readily institute complementary recalls put in place in other jurisdictions and deliver nationally consistent enforcement outcomes across jurisdictions.

Providing building regulators with improved nationally consistent powers could be achieved in a number of ways. This could include national regulation, mirror legislation, adoption of a model law or implementing a complementary applied law scheme.

A.3.3.4 Victorian Government issues in ministerial submission dated 6 August 2015 (No. 57)

The ABCB CodeMark building product certification scheme is a voluntary system and is therefore only able to capture a limited number of products and does not provide the level of necessary assurance that products have been appropriately tested for the purpose for which they are to be used. Of the estimated 100,000 plus building products in the Australian marketplace, only some 130 are CodeMark assessed.

Action proposed by Victorian Government

- **Mandate CodeMark**

The CodeMark Certificate of Conformity is issued by a CAB and specifies that the properties and performance of a building material or method of construction or design fulfil specific requirements of the Building Code of Australia (BCA). Reviewing the CodeMark Scheme Rules to require explicit, clear and unambiguous reference to provisions of the NCC to which the certificate relates would improve clarity around what the Certificate of Conformity is certifying compliance with.

Making CodeMark certification mandatory for high-risk building products with a life safety consideration would further reinforce the integrity of the product compliance process. Endorsing a mandatory assessment and certification for all products that have a life safety consideration similar to WaterMark where the evidence to demonstrate suitability may be from the current pathways listed in the BCA would improve certainty and reliability around the use of such products.

- **Adopt a mandatory National Building Products Accreditation scheme for all building products**

It is important that there are explicit restrictions on the use of certain building products in inappropriate circumstances. Further, to ensure that building work includes only appropriate building products, there is a need for a mechanism for product suppliers, builders and building surveyors to be readily able to determine whether products are compliant for use in the relevant circumstances. A mandatory scheme could be adopted at a national level, building on the existing voluntary CodeMark scheme, and modelled on radio communications compliance labelling requirements or a similar scheme to WaterMark which is based around the licensing of a trademark by approved certifiers.

A national scheme embedded within Commonwealth legislation could empower an appropriate body to issue a notice to declare building products or classes of building products to be subject to the mandatory scheme and required to bear a compliance label.

This could commence with setting criteria to define high-risk life safety products. Some building products involving life safety could be subject to more rigorous testing and evidentiary requirements, while other products that are less risky could have less burdensome requirements.

A national body could accredit testing bodies (for example NATA or JAS-ANZ). Testing bodies could also be located overseas if a mutual recognition agreement was in place (similar to the Australia-EU Mutual Recognition Agreement on Conformity Assessment).

By strengthening the approach to certification, provisions could also be established to make it an offence for the manufacturer or importer to import or supply building products that are subject to the mandatory scheme without the compliance label, or with a compliance label but without having made a declaration of conformity. The ACCC (or another appropriate federal regulator) could have primary responsibility for prosecuting contraventions, reflecting the leading role that federal agencies have in regulating international trade, corporations and interstate commerce.

Rather than relying on end-users to determine product compliance, the regulatory framework should be improved by placing responsibility on importers and distributors to ensure that NCBPs are not available for purchase in the first place.

While cheap and inferior quality building NCBPs are the major concern, the wider compliance context also includes the improper installation and inappropriate use of otherwise quality products. Improper installation can pose the same safety and economic risks as NCBPs and should be understood and considered as part of a regulatory would better protect Australian householders.

To protect Australian households' primary enforcement must move from post-installation, which places the compliance burden on end-users, to the point of manufacture, importation and distribution. This will increase the effectiveness of the regulatory regime given product distribution at these points is more centralised and stakeholders have a greater opportunity to ensure compliance

Simply put, rather than builders and consumers having to determine whether or not a product is compliant, based on often incomplete information and a lack of technical knowledge in the latter's case, NCBPs should not be on shelves in the first place.

The alternative would be to place a greater degree of responsibility of compliance on importers and distributors. Auditing and surveillance at this point is more efficient as the distribution of products is more centralised, while stakeholders at this level have a greater access to product information from manufacturers. Ultimately, this would serve to improve the enforcement of the regulatory framework without increasing compliance burdens for small-business and consumer end-users.

The Construction Product Alliance points to the examples of the Greenhouse and Energy Minimum Standards (GEMS) and Water Efficiency Labelling Standards (WELS) schemes as regulatory frameworks that reduce NCBP availability and strengthen consumer and industry confidence by placing the responsibility of compliance on importers and distributors.

Furthermore, the issues associated with a lack of documentation that accompanies products can be addressed through increased requirements to provide documentation at the point of sale. The government should explore the possibility of implementing a product register that would allow builders and consumers to identify correct installation methods and limits for products.

A.3.4 Trade unions

A.3.4.1 CFMEU issues (No. 74)

CFMEU has been concerned about "the importation to Australia of goods that do not comply with Australian standards (posing a risk to consumers) and the lack of inspection and compliance enforcement of imported products. "

Action proposed by CFMEU

The union was a member of the (former {Gillard}) Prime Minister's Manufacturing Taskforce which found in 2012 that:

"Australian manufacturers are increasingly finding that they are competing against products that do not conform to regulatory requirements and do not meet standards to which domestic businesses adhere. This places complying and conforming businesses at a cost and competitive disadvantage".

And recommended: "That that the Commonwealth Government develop an approach to conformity marking along the lines of Europe's CE Marking; that it evaluate, in consultation with industry, the effectiveness of existing regulators with responsibilities for product assessment with a view to improving the effectiveness of conformity assessment; and that it enters a dialogue with the ACCC and, through the state and territory governments' Offices of Fair Trading, to increase the priority given to addressing misleading claims of conformity with regulation and voluntary standards."

A.3.4.2 Electrical Trades Union (ETU) issues (No. 14)

- “the (negative) impact that the China-Australia Free Trade Agreement will have upon the building products that will flood the building and construction industry
- (Australia’s) standards are not rigorously enforced and checked, and that in turn is due to a lack of resourcing and policy priority.”
- All products used in regulated building work are assessed against Australian Standards (or equivalent), to be undertaken by Customs or similar, ensuring that any non-conforming items are kept from being distributed prior to their acquisition by suppliers.

Action proposed by ETU

All products to be assessed against Australian Standards (or equivalent), to be undertaken by Customs or similar, ensuring that any non-conforming items are kept from being distributed prior to their acquisition by suppliers.

All products found to meet the standard are marked in a clear and concise way.

Product assessments are verified and are audited by independent regulators on a minimum annual basis and the results be publicly available. Ideally, the system is monitored and enforced by a single government agency that is working in concert with other agencies as required. Penalties for importers and vendors who fail assessments ultimately allows for criminal prosecutions.

Consideration be given to the establishment of an industry-wide levy to provide a stable funding base for standards enforcement regulatory activities.

A.3.5 Other

A.3.5.1 SAI Global issues (No. 6)

SAI Global believe the management and suitability of the current standards for building products are addressed and adequate paths exist for these to be modified by the stakeholders – building industry bodies, regulators, standards bodies, manufacturers and end users.

The enforcement of the standards and data collection across the supply chain however is not managed well and where registers are kept of certification, they are isolated and difficult for consumers to find and use.

Action proposed by SAI global

A real time auditing platform with a centralised product database must be implemented to:

- Manage the registration of manufacturers, importers and distributors.
- Conduct criteria-based assessments for benchmarking.
- Compare product certifications and test results along the supply chain.

Manufacturers, importers and distributors must be registered in a central data base and certified before being able to supply product. b. Identify and draw upon existing effective conformance models currently used within the automotive and aerospace industries.

3rd Party certifiers must place their product certifications into the centralised database.

Critical control points be established from the supply chain at which sampling or assessment takes place.

Manufacturing location assessments – Unannounced audits & frequency increases for previous non-compliances

Non-Australian manufacturers would be regulated by a commercial contract between Australian importers or distributors

The centralised data base must be self-funding by the user. Economic benefits to the suppliers result from finding non-conforming product earlier in the supply chain, preferably prior to shipment from the manufacturing point thus lowering economic risk and product release.

A.3.5.2 Insurance Council of Australia (ICA) issues (No. 152)

“Aside from the risk to the safety of occupants and emergency services, the installation of NCBP has the potential to increase insurance premiums and other associated costs due to the increased risk associated with their use.”

Action proposed by ICA

The current Australian regulatory regime in relation to certification and identification of NCBP needs to be reviewed and adjusted to ensure that only properly tested and compliant materials are used in all buildings

There should be consideration of a national approach to policing and enforcement of existing regulations, including a national audit of buildings to detect and quantify the current level of exposure to NCBPs.

It is important to ensure building material testing procedures are stringent enough to provide confidence that certification is a reasonable measure of quality and compliance. Building material testing should also reflect how the building product would behave in-situ and not in an artificial or isolated environment.

Appendix B

ATEN Workshops

Foreword

During the scoping study for the ATEN scheme two workshops were held; one in February and the other in September 2019. In this Appendix the workshop details are provided, including the programs and the participating organisations.

B.1 Workshop 1 program

Workshop 1 consisted of the following presentations and a discussion and question and answer session.

- **Australian Technical Evaluation Network – a scoping project**
Presented by Emad Gad (Swinburne University of Technology)
- **Victoria Future Industries**
Presented by Athena Andriotis (Department of Jobs, Precincts and Regions)
- **Australian practice**
Presented by Joseph Genco (ACSEV)
- **Technical assessment of non-standardised construction products in Europe**
Presented by Karsten Kathage (DIBt)
- **Proposed ATEN technical framework**
Presented by Lam Pham (Swinburne University of Technology)
- **ATEN governance and management**
Presented by Ivan Donaldson (former General Manager of ABCB)

B.2 Workshop 2 program

Workshop 2 consisted of the following presentations and a discussion and question and answer session.

- **Australian Technical Evaluation Network – a scoping project**
Presented by Emad Gad (Swinburne University of Technology)
- **Summary of ATEN and how it would work**
Presented by Mark Burgess (CSIRO)
- **The need for streamlined approach to product appraisal to support industry**
Presented by Athena Andriotis (Department of Jobs, Precincts and Regions)
- **How ATEN would relate to regulations and design engineers**
Presented by Peter Gow (Engineers Australia, former Western Australia Building Commissioner)
- **Issues faced by builders, how can ATEN help?**
Presented by Marisa Muchow (Metricon)
- **Product appraisals required to support building surveyors**
Presented by Jeremy Turner (AIBS)

- **How fit-for-purpose product appraisals would benefit manufacturers**
Presented by Ken Watson (NASH)
- **Importance of product appraisal for the housing industry**
Prepared by Simon Croft (HIA) and presented by Mr. Joseph Genco (ACSEV)

B.3 Participating organisations

Participants from the following organisations attended the workshops:

- AECOM
- Association of Consulting Structural Engineers Victoria, ACSEV
- Australasian Certification Authority for Reinforcing and Structural Steels, ACRS
- Australasian Fire and Emergency Service Authorities Council, AFAC
- Australian Institute of Building Surveyors, AIBS
- Australian Steel Institute, ASI
- Australian Glass and Window Association, AGWA (previously Australian Window Association, AWA)
- Boral
- Cladding Safety Victoria, CSV
- Commonwealth Scientific and Industrial Research Organisation, CSIRO
- Concrete Institute of Australia, CIA
- Deakin University
- Department of Housing and Public Works (Queensland)
- Department of Jobs, Precincts and Regions
- Engineered Wood Products Association of Australasia, EWPA
- Engineers Australia, EA
- Fire Protection Association Australia, FPAA
- Housing Industry Association, HIA
- ITW Buildex
- Masters Builders Australia, MBA
- Melbourne Testing Services, MTS
- Metricon
- MiTek
- Monash University
- National Association of Steel-framed Housing, NASH
- National Association of Testing Authorities, NATA
- National Building Specification, NATSPEC
- RMIT University
- Rondo
- Swinburne University of Technology
- The University of Melbourne
- Victorian Building Authority, VBA
- Warringtonfire

Appendix C

Standards and conformance contribution to Australia's regulatory regime for building products

Written by Ivan Donaldson
Former General Manager (Australian Building Codes Board, ABCB)

Foreword

This Appendix is a brief overview of the Australian system of building regulations with a focus on conformance and where it fits into Australia's regulatory regime for building products. It is not exhaustive or focussed on detail but, rather, is an introduction to what conformance's purpose is and how it relates to the regulation of building design and construction.

A familiarity with the roles of the key bodies to deliver measurement, standards and conformance is essential to an understanding of how they underpin the codes and standards behind the joint governments' intent to address issues of safety, health, access, amenity and sustainability in the design, construction and performance of buildings.

The regulatory regime to manage building products, in reality, reflects the level of risk governments are prepared to take with the design and construction of buildings, and the products and components involved; namely, public health and safety and environmental risks.

It is these risks that conformance processes aim to mitigate. It should also be noted that while conformance processes play an important role, *performance solution* compliance under the NCC can be demonstrated by a number of *assessment methods*, of which conformance is one.

C.1 The standards and conformance infrastructure defined

Conformance is one part of the whole system, but it is a foundation element that goes to the heart of the integrity of the design and building process.

The 1995 Kean Inquiry⁴⁷ defined this system as follows:

"The standards and conformance infrastructure is a crucial element of the commercial and scientific fabric of a modern community. An efficient and effective system will encourage innovation and underpin competitive advantage. It is vital to the integration of Australian industries into the world economy. It helps to ensure that Australian products comply with international specifications and gives buyers confidence that the products will perform as claimed and are fit-for-purpose".

The infrastructure has three components: measurement, standards and conformance.

Measurement is the foundation of commercial and scientific activities. A Commonwealth body, the National Measurement Institute, is the peak Australian measurement body responsible for biological, chemical, legal, physical and trade measurement.

⁴⁷ Linking Industry Globally: Report of the Committee of Inquiry into Australia's Standards and Conformance Infrastructure. Page xi Canberra Australian Government Printing Service 1995

Australian Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and consistently perform the way they are intended to. They establish a minimum set of requirements which define quality and safety criteria. Australian Standards are voluntary documents that are developed by consensus. Many Australian Standards, because of their rigour, are adopted into legislation to become mandatory or referenced in contracts⁴⁸. Standards Australia is the primary standards writing body, but in the case of the building industry other standards may apply, including those from international sources.

Conformance provides confidence in performance and certainty that products meet the relevant standards and/or regulatory requirements necessary to be fit-for-purpose.

The key conformance bodies are the Joint Accreditation System of Australia and New Zealand (JAS-ANZ), National Association of Testing Authorities (NATA), and the private sector certifying and testing bodies, universities, laboratories plus CSIRO. Their respective roles involve accreditation, certification and testing.

Accreditation is a procedure by which an independent authoritative body (accreditation body) gives formal recognition that a conformity assessment organisation is competent to carry out specific tasks. Accreditation involves the onsite assessment of conformity assessment bodies for competence to carry out specified calibrations, tests, inspections and/or certifications of products, systems or personnel, to determine if they meet a (minimum) required standard⁴⁹.

Certification is an assessment and approval process based on test results that are carried out by an approved body such as an accredited test house or laboratory. Certification involves assessing test results and issuing a certificate or similar approval document, or, for example, the affixing of a mark to a conforming product.⁵⁰

The National Association of Testing and the Joint Accreditation System of Australia and New Zealand are Australia's accreditation bodies for testing laboratories, inspection bodies and certification bodies.

C.1.1 JAS-ANZ

JAS-ANZ is a bi-national Government owned entity. Accreditation by JAS-ANZ indicates that a body has been approved by an independent third-party as a professional body that acts with integrity when certifying or inspecting for conformity assessment.

C.1.2 National Association of Testing Authorities (NATA)

NATA is a private company but is recognised by the Commonwealth for its accreditation role. NATA's role is to ensure that organisations comply with relevant international and Australian standards and are competent to provide consistently reliable testing, calibration, measurement and inspection data to government, industry and the wider community.

⁴⁸ Standards Australia. *Developing Australian Standards*. <https://www.standards.org.au/StandardAU/Media/SA-Archive/OurOrganisation/Documents/Developing-Australian-Standards.pdf>

⁴⁹ Commonwealth Department of Industry, Innovation and Science July 2016 www.industry.gov.au/data-and-publications/australias-standard-and-conformance-infrastructure

⁵⁰ Linking Industry Globally: Report of the Committee of Inquiry into Australia's Standards and Conformance Infrastructure. Page157

C.1.3 Conformity Assessment Bodies (CABs)

They are responsible for evaluating products to approved specifications and must be accredited for this purpose.

C.2 National Construction Code (NCC)

The performance based NCC's goal is to enable the achievement of nationally consistent, minimum necessary standards of relevant safety, health, access, amenity and sustainability objectives efficiently.

The *evidence of suitability* provisions in the NCC are part of a supply chain process to ensure that products, materials, design and construction are fit for their intended purpose, which in turn is tied to the building control and administrative systems of the states and territories. The ABCB does not manage any of these subsequent processes and under the Commonwealth, states and territories Inter Government Agreement (IGA)⁵¹ has no conformance, compliance or other statutory powers.

C.3 State Regulations

States and territories are responsible for the compliance and enforcement of building practices and products, including the NCC. While the Australia-wide NCC must be adopted, the states/territories retain power to administer the application of the NCC and regulate for local variations.

C.4 Surveillance and Enforcement

Provisions exist through the product supply chain at government level to deal with conformance and compliance. However, there remain questions about the adequacy of the existing regimes that are the subject of review nationally and in individual jurisdictions.

C.5 Consumer Protection

The Australian Consumer Law (ACL) operates in all states and territories and applies to all Australian businesses to deliver consumer protection. It is illegal for any business to make statements that are incorrect or mislead. Anti-competitive behaviour is also illegal. ACL is enforced and administered by the Australian Competition and Consumer Commission (ACCC). In practice, ACCC relies largely on complaints to initiate investigations. Also, ACCC legislation on safety issues applies only to consumer goods. ACCC is not responsible for regulating the safety of building materials, which are deemed producer goods not consumer goods.

In some circumstances, state and territory consumer dispute mechanisms also operate.

⁵¹ An Agreement between the Governments of Commonwealth of Australia, the States and the Territories to continue in existence and provide for the operation of the Australian Building Codes Board 2017

C.6 Contract and Common Law

Parties to building contracts may have recourse to dispute resolution, arbitration or court action including on products that are defective or are non-conformant with product specifications. The manufacture, supply and use of building products in Australia are also covered by common law, including redress for negligence.

C.7 Product importation

Building products imported into Australia are administered through Commonwealth legislation and regulations primarily through Australian Border Force (Customs), the Department of Immigration and Border Protection, Austrade and the Department of Foreign Affairs and Trade (DFAT).

While Customs has wide powers, its focus on building products is mostly limited to labelling and country of origin, with the notable exception of asbestos and asbestos containing materials which are prohibited imports.

Importers must make an import declaration to attest to the nature, source and commercial details involved but there is no requirement to positively attest that the products are *fit-for-purpose* or meet Australian Standards.

Because of Customs' limited authority to monitor or investigate non-conformance, a product must enter the market before any action can be taken by the ACCC or state authorities with consumer protection responsibilities.

C.8 International Relevance

It is also important to consider the wider scope of Australia's regulatory system, and approach to international standards, when reviewing specific issues such as non-conforming building products.

Standards and conformance activities facilitate international trade. Australia needs to actively participate in the development of international standards to ensure they are relevant for Australian conditions and needs.

Appendix D

Australian history of appraisal and certification

Foreword

This Appendix outlines the history of Australia's appraisal and certification schemes for building products.

D.1 1978 – CSIRO Established ABSAC

- The Australian Building Systems Appraisal Council (ABSAC) was formed in 1978 (CSIRO, MBA, HIA, AIBS and ICA). Its role was to provide *independent appraisals of innovative systems or products*, to ease the acceptance of innovative products/systems into the industry. In the first 15 years of operation, it produced *Technical Opinions* for this purpose.
- In 1993, ABSAC increased the scope of its appraisals to include not only innovative products but any product for which the manufacturer/promoter felt there was a need for an independent assessment of the *product's ability to fulfil its intended purpose*.
- ABSAC became CSIRO Appraisals in March 1999:
 - Giving manufacturers the independent evidence needed for regulatory approval.
 - Evaluations provide assurance for designers, builders and owners that functionality will be met.
 - CSIRO Appraisal is a founding member of World Federation of Technical Assessment Organizations – providing international recognition.
- The Australian Building Regulations Coordinating Council (AUBRCC) established a *national accreditation process* to facilitate the introduction and use of new and innovative building products at about 1990. CSIRO is to manage the process on behalf of AUBRCC.
- For 25 years of its operation ABSAC and CSIRO Appraisals processed 521 applications and issued 305 Technical Assessments. These included 5 complete building systems, 14 slabs on ground, 24 floor systems or coverings, 68 roofing membranes, 25 termite barriers, 29 structural members (half are lintels), 30 wall systems, 46 wall claddings, 7 walls for wet areas and 5 fire resisting wall systems.

D.2 1996 – ABCB Building Products and System Certification

- National Accreditation Review Committee – extensive criticism of the AUBRCC system.
- Establishment of the National Certification Committee to run alongside Building Codes Committee by ABCB – with the introduction of the new *performance-based* building code (BCA 1996).
- ABCB National Building Products and Systems Certification scheme – issued *Certificate of Compliance* which *certifies that the properties and performance of a building product or system comply with the provisions of the BCA and HCA*.
- *Certificate of Compliance* then became *Certificate of Conformity* but still based on CSIRO Appraisals according to some of the issued certificates.
- During its nine years of operation, 20 Certificates of Conformity were issued – half of the certificates were for termite resisting systems.

D.3 2000 – Laver Review

- ABCB to cease to undertake product certification but instead establish certification criteria and recognise appropriate product accrediting bodies to perform the task.

D.4 2005 – CodeMark Launch

- Trans-Tasman scheme with JAS-ANZ as the accreditation body operates with ISO Guide 61/65.
- Certificates to be issued as *Certificate of Conformity* by third-party certification bodies accredited by JAS-ANZ.
- ABCB and NZ Department of Housing are joint managers of the scheme.
- The scheme received mandatory acceptance under state and territory building control legislation.
- CodeMark scheme has undergone a number of reviews and changes to the Scheme Rules:
 - Version 2005.1 (18 August 2005) – highlighting the fact that CodeMark certificate is the only way that will have mandatory acceptance throughout Australia.
 - Version 2007.2 (30 November 2007) – this version introduced specific additions and variations that apply to the scheme in New Zealand.
 - Version 2009.1 (27 March 2009) – this version introduced the use of the *Unrestricted Building Surveyor* to review and approve the Evaluation Methodology, Evaluation Plan and the Evaluation report.
 - Version 2016.1 – the Australian scheme is separated from the NZ scheme.
- CodeMark has issued about 300 Certificates of Conformity of varying quality with 7 CABs, including (with the portion of certification provided by each CAB in brackets): CertMark International (57%), Global-Mark (21%), AsureQuality (9%), SAI Global Certification Services (8%), Bureau Veritas Australia (3%), BEAL Certification Service (1%), and BRANZ (1%).

Appendix E

Conformity assessment schemes in Australia

Foreword

This Appendix describes some of the Australian conformity assessment schemes in relation to the structure, formation, and type of services provided by the organisations responsible for implementing the schemes, the general details of the conformity assessment schemes (for building products), and the post-initial assessment control measures. The conformity assessment schemes and the responsible organisations which are described include:

- (i) CodeMark scheme which acts at a national level,
- (ii) CertMark International which is a Conformity Assessment Body for CodeMark and it has provided majority of the CodeMark Certificates of Conformity, and
- (iii) Victorian Building Regulations Advisory Committee (BRAC) which is a state level accreditation system.

Furthermore, four industry-based schemes and the responsible organisations are discussed:

- (i) Engineered Wood Production Association Australia (EWPAA),
- (ii) Australian Glass and Window Association (AGWA),
- (iii) Australasian Certification Authority for Reinforcing and Structural Steel (ACRS), and
- (iv) ActivFire (operated by CSIRO).

A summary of the key aspects of each of each scheme and organisation is also provided. It is noted that the information provided is based on publicly available information which has been obtained predominantly on the website of the conformity assessment organisations. The information provided is valid at the time the data was collected (May 2019).

E.1 CodeMark scheme

E.1.1 Organisation structure

The CodeMark scheme⁵² is managed by the ABCB in Australia and DBH in New Zealand. A flowchart of the responsibilities in the CodeMark Australia scheme is illustrated in Figure E-1. The Joint Accreditation System of Australia and New Zealand (JAS-ANZ) is the scheme administrator and it is responsible for accrediting and monitoring third-party Conformity Assessment Bodies (CABs), also known as Certification Bodies (CBs), who are able to issue CodeMark Certificate of Conformity.

⁵² ABCB. (2016). *The CodeMark Australia Certification Scheme Rules Version 2016.1*. Retrieved from https://www.abcb.gov.au/-/.../Certification/The_CodeMark_Australia_Scheme_Rules.pdf

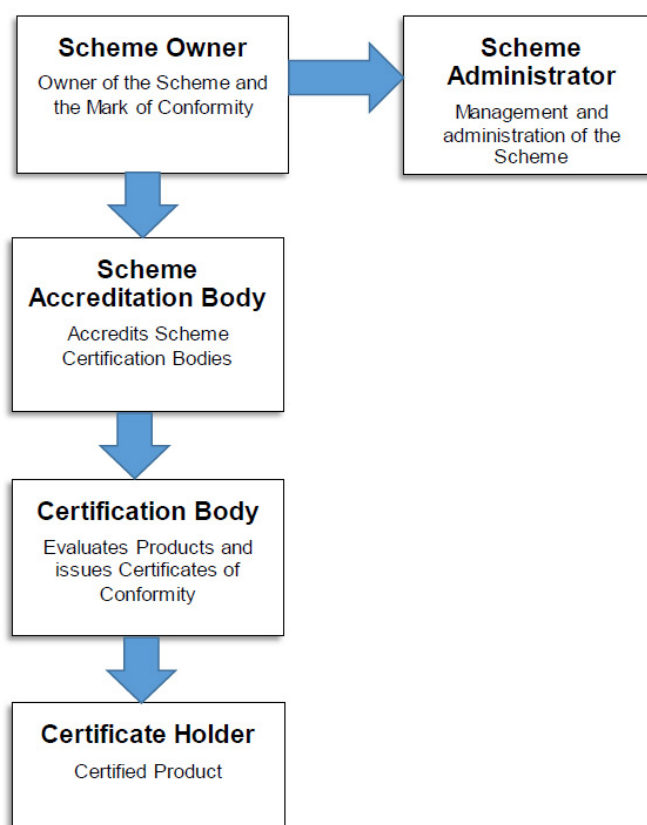


Figure E-1: Flowchart of responsibilities in the CodeMark scheme (2016)

E.1.2 Formation

CodeMark scheme was initially developed in 2005 for both Australia and New Zealand. In 2016 separate schemes were developed for the two countries; CodeMark Australia and CodeMark New Zealand.

E.1.3 Services

CodeMark scheme is a voluntary third-party scheme for the certification of building products and systems. The scheme is based on the relevant international guidance documents produced by the International Organisation for Standardisation (ISO) and mandatory documents produced by the International Accreditation Forum (IAF).

CABs are responsible for assessing the product conformity against the performance requirements in BCA under the CodeMark Australia Scheme Rules and NZBC under the CodeMark New Zealand Scheme Rules. The Certificates of Conformity which are currently available on the JAS-ANZ online database⁵³ have been provided by seven CABs:

- ASUREQuality Limited
- BEAL Certification Service Ltd
- BRANZ Ltd
- Bureau Veritas Australia Pty Ltd

⁵³ JAS-ANZ. "Our Directory: CodeMark Register of Certificates of Conformity." Retrieved 16-05-2019, 2019, from <http://www.jas-anz.org/our-directory/codemark-certified-organisations>.

- CertMark International Pty Ltd
- Global-Mark Pty Ltd
- SAI Global Certification Services Pty Ltd Trading as SAI Global

JAS-ANZ conducts a review of the CABs every 6 months or as agreed by the JAS-ANZ Accreditation Review Panel, and as advised by ABCB (stated in CodeMark Scheme Rules, 2009⁵⁴).

E.1.4 Conformity assessment scheme

Certificate of Conformity are issued under the CodeMark scheme. The scheme has been specifically developed to authorise the use of new and innovative products by assessing for conformity with the performance requirements in the Building Codes. The certification of a product involves evaluating the product compliance with the relevant performance requirements in the Building Code of Australia (BCA), that is Volume One and Two of the National Construction Code, the *deemed-to-satisfy* provisions, or a combination of both *performance* and *deemed-to-satisfy solution* provisions. In accordance with the CodeMark scheme, the identification of the relevant requirements and provisions should be dependent on the intended use of the product. In practice, the applicant may select the relevant BCA requirements for which the product claims compliance against.

The total number and proportion of the certifications (for Australia and New Zealand) provided by the different certification bodies is provided in Table E-1 and Figure E-2, respectively.

Table E-1: Number of certifications provided by different CodeMark CABs

Certified accredited bodies	No. of certifications
AsureQuality Ltd.	27
BEAL Certification Service Ltd.	2
BRANZ Ltd.	2
Bureau Veritas Australia Pty. Ltd.	9
CertMark International Pty. Ltd.	174
Global-Mark Pty. Ltd.	66
SAI Global Certification Services Pty. Ltd.	26

⁵⁴ ABCB and DBH. (2009). The CodeMark Scheme Rules: Australia and New Zealand, Version 2009.1. Retrieved from <https://www.abcb.gov.au/-/media/Files/Resources/.../CodemarkSchemeRules.pdf>

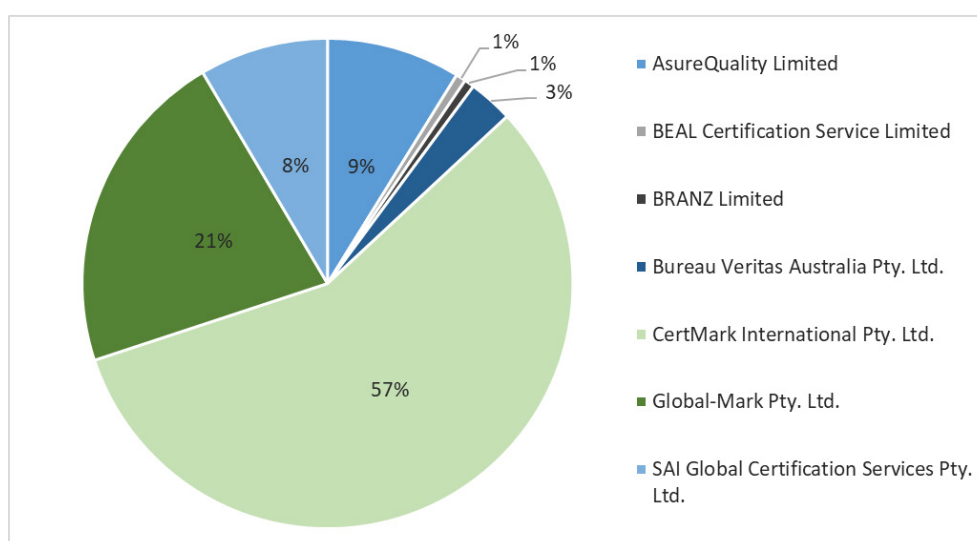


Figure E-2: Proportion of certifications provided by different CodeMark CABs

E.1.5 Post-initial assessment control measures

In accordance with the 2016 CodeMark Australian scheme, the CAB is required to conduct initial and annual routine surveillance of certificate holders during the period of time for which the Certificate of Conformity is valid. The annual surveillance must at least include: (i) a review of the product quality plan for the certified product, (ii) assessment of any changes to the Building Code that may affect the product certification, (iii) assessment of the content of the certificate to ensure ongoing validity (i.e. accuracy and completeness), and (iv) accurate representation of the certificate on the register. Furthermore, post-manufacture and supply chain surveillance must be conducted at least once in three-year cycles for each certified product. The nature and extent of the post-manufacture or supply chain surveillance (e.g. re-testing, re-assessment, factory and/or construction site audits) is decided by the CAB and is dependent on results of the initial certification and previous surveillance of the certified product.

The Certificates of Conformity are valid for 3 years; after this period renewal of the certificate is required. This involves a full review of the evaluation plan under which the Certificate of Conformity was granted and a review of other suitable references and information.

E.2 CertMark International

E.2.1 Organisation structure

CertMark International (CMI)⁵⁵ is a private organisation, which is accredited by JAS-ANZ to act as a CAB for the CodeMark scheme. CMI also functions independently.

E.2.2 Services

CMI offers certification against the Australian and New Zealand building code and standards by independently verifying compliance based on the evidence provided by the applicant. In addition to

⁵⁵ CertMark International (2019). "CertMark International." from <https://certmark.org/>.

providing certificates which meet the requirements of various schemes (including CodeMark), it also creates custom-made requirements and develops specific acceptance criteria for a particular product. Furthermore, CMI provides the following services:

- *Scope of testing:* CMI identifies the testing requirements for a testing laboratory to perform for a required test in accordance with a standard.
- *Supplier assessment:* CMI conducts a general assessment to ensure that products show conformity to Safety Regulations and Standards (the details of the assessment are not provided).
- *Pre-shipment inspection:* CMI can independently inspect products before shipment.

E.2.3 Conformity assessment scheme

CMI provides the following types of product certifications:

- *CertMark Product Certification:* This is a voluntary system of accreditation that can be applied to any product in any country. The certification is utilised to show product compliance to a specific standard (e.g. ASTM, ISO, AS/NZS). Certification is provided based on test reports from recognised testing laboratories (e.g. Australian National Association of Testing Authorities (NATA) and International Laboratory Accreditation Cooperation (ILAC)), manufacturing site audits, technical documentation, product quality plan (PQP) and on-going annual audits. The CertMark Product Certification service meets the requirements of third-party product accreditation consistent with ISO/IEC 17065⁵⁶.
- *CodeMark Australia:* CMI is a third-party accredited CAB for CodeMark Australia scheme. The certification shows conformity in accordance with the Australian Building Code. CodeMark certification is granted based on the following documents provided by the applicant: test reports (from NATA or ILAC approved laboratories and testing facilities), manufacturing site audits, technical documentation, quality plan, installation site audit and on-going annual audits. The applicant selects the relevant BCA requirements for which the product claims compliance against.
- *CodeMark New Zealand:* CMI is also a third-party certification accredited body for CodeMark New Zealand scheme. The certification shows conformity in accordance with the New Zealand Building Code. The requirements are similar to CodeMark Australia.
- *WaterMark:* The certification shows conformity in accordance with the Australian Plumbing Code.
- *FireMark:* The certification shows conformity in accordance with the Australian Fire Code, it incorporates aspects from CodeMark and Watermark. There are currently no FireMark certifications on the CertMark online register.

E.2.4 Post-initial assessment control measures

CMI conducts annual site audits for CodeMark Product Certifications. The onsite audit includes:

⁵⁶ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2012). ISO/IEC 17065: 2012, Conformity assessment - Requirements for bodies certifying products, processes and services. In: International Organisation for Standardisation.

- Post-manufacturer supply chain surveillance, which involves inspecting the product as installed in the market.
- A review of the product quality plan.
- An assessment of the Certificate of Conformity to ensure its content is complete and accurate over time. In addition, any changes to BCA or NZBC which may affect the product conformity are assessed.
- Consideration of proposed changes to the product. However, it is noted that the certificate holder is expected to notify CMI if any changes are made to the product since the product certification was granted.
- Consideration of complaints, feedback, and any past non-conformances.
- Furthermore, it is noted that test results and reports require validation or re-testing every five years.

E.3 Victorian Building Regulations Advisory Committee (BRAC)

E.3.1 Organisation structure

The Victorian Building Regulations Advisory Committee (BRAC)⁵⁷ is an independent statutory body. It is a committee of building industry representatives and the members are appointed by the Minister. The Victorian Building Authority (VBA) provides administrative and technical resources to support the functions of BRAC.

E.3.2 Formation

The BRAC was established under the *Building Act 1993*. The first accreditation of a building product was provided in 1999.

E.3.3 Services

The BRAC has two key functions as stated in the *Building Act 1993*:

- (i) to provide advice to the Minister of Planning on draft building regulations, and
- (ii) to accredit building products, construction methods and component/systems related to building work.

The product accreditation scheme provided by BRAC operates alongside the national product certification scheme, CodeMark. The Victorian accreditation scheme is suitable for products which are only to be used in Victoria. If the product is to be used in other states and territories, then the CodeMark certification scheme is more appropriate.

E.3.4 Conformity assessment scheme

A building product accreditation granted by BRAC is proof that the product satisfies the requirements of the *Building Regulations 2018* and the Building Code of Australia now incorporated in the NCC. The BRAC provides accreditation of a building product by assessing test reports, appraisals, and/or opinions provided by the applicant against the performance requirements in accordance with the Building Code. The applicant needs to provide the evidence that the product is

⁵⁷ Victorian Building Authority (VBA). (2019). Victorian Building Regulations Advisory Committee Retrieved from <https://www.vba.vic.gov.au/building/building-regulations-advisory-committee>

fit-for-purpose for its intended use. The appraisal reports provided by the applicant must be from a suitable qualified registered building practitioner, NATA registered testing authority, or a suitable qualified person/body.

The accreditation is for innovative products and it does not apply to building products that comply with the deemed-to-satisfy provisions of the Building Code. Furthermore, the applicant chooses the performance requirements to be evaluated. Once a product is granted accreditation, it is mandatory for the building surveyor to accept the building product (or system/method/design) where use of the product complies with the accreditation.

BRAC team meets on a monthly basis to make decisions about the accreditation of applications after reviewing all the documents provided by the applicant.

E.3.5 Post-initial assessment control measures

Currently, there is no form of surveillance requirement once accreditation of a product has been granted, nor an end date or renewal date.

E.4 Engineered Wood Production Association Australasia (EWPAA)

E.4.1 Organisation structure

The Engineered Wood Products Association of Australasia (EWPAA)⁵⁸ is a member association for manufacturers of engineered wood products, including plywood (used for formwork, residential and commercial flooring), wind and earthquake bracing, cladding; laminated veneer lumber (LVL), particleboard and medium density fibreboard (MDF), hardboard, and I-beam products for both commercial and residential structures. It is independent of government funding and it is supported on a voluntary basis by wood manufacturers in Australia, New Zealand, Fiji and Papua New Guinea and supported by affiliated members. It has 18 manufacturing members and 9 supplier members.

The EWPAA team consist of nine people; CEO, technical manager, compliance manager, communication officer, financial officer, civil engineer, laboratory supervisor, manufacturing engineer, IT consultant.

E.4.2 Formation

EWPAA was established in 1934 as the Queensland Veneer and Plywood Board which focused on administrative issues related to the veneer and plywood industry. By 1939 it grew into a national board and became to be known as the Australian Plywood Board. In 1966 it changes its name to Plywood Association of Australia (PAA) as it became more involved in market development activities. Since then the association has grown to include manufacturers outside of Australia and to include products other than plywood, hence the name has now changed to Engineered Wood Products Association of Australasia (EWPAA).

⁵⁸ Engineered Wood Products Association of Australasia. (2018). EWPAA. Retrieved from <http://ewp.asn.au/>

E.4.3 Services

The following services are provided by EWPAA:

- product certification and testing,
- standard development,
- education and training,
- research and development,
- market maintenance, and
- technical promotion.

E.4.4 Conformity assessment scheme

EWPAA offers certification to manufacturers in Australia, New Zealand, Fiji, and Papua New Guinea. The following types of certifications are provided:

- Product Certification,
- Chain of Custody Certification,
- Japanese Agriculture Standards (JAS) or Japanese Industrial Standard (JIS) Certification, and
- Australian Wood Packaging Products Certification scheme (AWPCS).

Every certified product is tested by an independent laboratory; typically, it is performed by EWPAA's NATA accredited laboratories. EWPAA conducts at least one qualification audit for certification which includes; an onsite inspection of the manufacturing process, a review of the documented management system, and a review of internal testing facilities.

E.4.5 Post-initial assessment control measures

The following are the key quality control and surveillance activities in relation to Product Certification:

- Applicant must implement quality control systems in accordance with EWPAA rules (includes process control, internal testing, management systems, product qualification, documentation and record keeping).
- The Product Certifications do not expire; however the manufacturers are subject to following ongoing surveillance activities:
 - *Surveillance audits*: every 6 months EWPAA conducts onsite audits on manufacturing processes.
 - *Surveillance testing*: manufacturers are required to select samples of their products every day and provide to EWPAA laboratory for testing.
 - *Market place surveillance*: EWPAA periodically inspects certified products in the market.

E.5 Australian Glass and Window Association (AGWA)

E.5.1 Organisation structure

The Australian Glass and Window Association (AGWA)⁵⁹ is run as a co-operative organisation with over 600 members, majority of which are small to medium sized companies. All members have one vote regardless of their size or financial contribution. All states and territories have representation on the association's board of directors. A full-time executive director and CEO manage the Association's 14 staff.

Below are the various types of AGWA memberships:

- Manufacturer (need to abide with the AGWA code of conduct).
- Supplier (need to abide with the AGWA code of conduct).
- Service providers (not entitled to vote or hold office within the Association).
- Professional (not entitled to vote or hold office within the Association).
- Student/interest memberships (not entitled to vote or hold office within the Association).

E.5.2 Services

The following are the main services and actions undertaken by AGWA:

- Provides guidance on technical issues related to windows (AGWA is involved in Australian Standards committees, residential and commercial building code committees, committees for mandatory energy requirements and the Housing Industry Association (HIA)).
- Owns and manages the Window Energy Rating Scheme (WERS).
- Manages accreditation programs for manufacturers that independently verify product energy, structural and water performance claims to regulators builders and homeowners.
- Provides dispute resolution services for consumers.
- Provides training for members, through the Australian Fenestration Training Institute (AFTI).
- Keeps the industry informed about window related issues, and promotes the window industry to builders, designers, and consumers.
- Provides support at the federal, state and territory levels on regulations and issues affecting the industry.

E.5.3 Conformity assessment scheme

The following are the criteria (or the code of conduct) that AGWA members (i.e. certified members) are required to follow:

- Provide products and services that comply with or exceed the minimum performance requirements of all relevant Australian Standards (including AS 2047: Windows and external glazed doors in buildings standard) and the National Construction Code. Members need to verify their window design performance using a NATA third-party accredited testing laboratory and register the tests results with AGWA. The test results are only valid for the range of products tested and in the form the products have been tested (AGWA needs to be notified about any changes made to the products by 1st of July each year).
- Provide a minimum 6-year guarantee against faulty workmanship and materials.

⁵⁹ Australian Glass and Window Association. (2019). Australian Glass and Window Association. Retrieved from <https://www.agwa.com.au/>

- Need to be inspected by accredited auditors (members' products are subject to annual NATA audits).
- Provide customers access to a complaint handling procedure.
- Maintain a high standard of integrity and ensure fairness in all aspects of their operations.
- Commit to the AGWA code of conduct.

The following information must be provided on the certificate and the product assembly label:

- The manufacturer's identification mark.
- The serviceability limit state wind pressure.
- The ultimate limit state wind pressure.
- The water penetration resistance.

E.5.4 Post-initial assessment control measures

The following are the key quality control and surveillance activities undertaken by AGWA.

- *Market surveillance:*
 - Since 2015 AGWA conducts market surveillance of products for both members and non-members.
 - Market surveillance involves the purchasing of products from member and non-member companies and physically testing products to the requirements of AS 2047. The results are only disclosed to members.
- *Audits:*
 - Audits are conducted at the member's factories (for manufacturing members in Australia and overseas) based on the member's accreditation status. Members are given different rankings based on their history of auditing schemes and members with higher rankings do not necessarily need to be audited every year.
 - All audit personnel are NATA accredited.

Furthermore, it is stated that the code of conduct is not audited, however, any breach of the Code may lead to investigations undertaken by AGWA and disciplinary action.

E.6 Australasian Certification Authority for Reinforcing and Structural Steel (ACRS)

E.6.1 Organisation structure

The Australasian Certification Authority for Reinforcing and Structural Steels (ACRS)⁶⁰ is a not-for-profit, third-party product certification and technical approvals scheme. It is supported and endorsed by member companies from various fields, including engineering, inspection, manufacture, government, and customer bodies. It has 19 members.

⁶⁰ Australasian Certification Authority for Reinforcing and Structural. (2018). ACRS. Retrieved from <https://www.steelcertification.com/acrshome.html>

E.6.2 Formation

ACRS was established in 2000 by industry, based on internationally recognised model for steel certification which was established in the UK 30 years ago. ACRS is based on the requirements of the international standard for bodies operating product certification systems, ISO/IEC 17065 (the international standard on Conformity assessment; requirements for bodies certifying products, processes and services). It was accredited by JAZ-ANZ in 2014 to confirm that the functionality of ACRS is in accordance with ISO/IEC17065:2012.

E.6.3 Services

ACRS aims to ensure confidence in steel materials supply in the provided by manufacturers and suppliers worldwide for the construction industry. It emphasises process control, product testing, and materials traceability. It owns and administers three consumer-oriented, independent, expert, not-for-profit, third-party steel certification schemes:

Product Conformity: The Product Certification Scheme certifies manufacturers, processors, and fabricators (i.e. producers) of reinforcement and prestressing steel, structural steel, and ancillary products conform to ACRS Product Requirements.

Product Traceability: The Traceability Certification scheme certifies suppliers of reinforcement and prestressing steel, structural steel, and ancillary products are manufactured, processed, or fabricated in accordance with ACRS Product Requirements under the ACRS Product Certification Scheme.

Quality Systems: Allows companies to have their quality management systems to be certified by ACRS, or to transfer their ISO 9001⁶¹ certification to ACRS.

It assesses and certifies manufacturing and processing at over 160 locations in around 20 countries. It has provided 190 certifications and it has certified 75 firms.

E.6.4 Conformity assessment scheme

ACRS aims to ensure that steel construction products are manufactured to Australian and New Zealand Standards through its Product Certification Scheme. The product certification covers processing of raw materials, the manufacture of steel and construction products, and the transformation of the incoming steel into the finished form (for steel reinforcing materials and welded steel beams). The products are evaluated against the Australian and New Zealand standards, international standards, and publicly available company standards.

E.6.5 Post-initial assessment control measures

The following are the main post-certification surveillance activities in relation to product certification.

- *Evaluation:*
 - ACRS sends a representative to visit firms at least once a year to verify that the firm meets the obligations under the scheme.
 - The scheme operates on a 3-year cycle of assessment and the evaluation is dependent on the stage of the cycle, it involves: data evaluation, full evaluation

⁶¹ International Organisation for Standardisation (ISO). ISO 9001:2015, Quality Management Systems In. Geneva, Switzerland.

(every 3 years), surveillance evaluation (annual evaluation or as directed by ACRS), additional evaluation (as required by ACRS), forensic audit (as required by ACRS), unscheduled evaluation, verification testing (additional material testing as required during evaluation period), exemption evaluation, and exit evaluation (ACRS needs to verify the firm's adequate separation from the scheme).

- *Surveillance:*
 - The minimum surveillance includes a review of quarterly test data provided by certified firms.
 - Samples are taken from the market to conduct independent verification testing (as required by ACRS).
 - Other surveillance methods may also take place as decided by ACRS.

E.7 ActivFire (CSIRO)

E.7.1 Organisation structure

The ActivFire scheme⁶² is a nationally recognised product certification program for the registration, certification, and listing of active fire protection equipment (i.e. detection and suppression equipment). ActivFire registers a list of products (known as the Register of Fire Protection Equipment) which have been tested and evaluated to conform to relevant standards and specifications (including Australian standards, international standards and technical specifications).

CSIRO is responsible for the maintenance and administration of the ActivFire scheme and the Register of Fire Protection Equipment. CSIRO is an independent statutory authority. It is constituted and operates under the provisions of the *Science and Industry Research Act 1949* and the *Commonwealth Authorities and Companies Act 1997*.

E.7.2 Formation

The ActivFire scheme was established in 1989 by the Scientific Services Laboratory (SSL) as a joint government agency and industry initiative, and in consultation with Fire Protection Association (FPA) Australia. It was developed as a response to issues which had been identified by a review process conducted by Committee of Review of Standards Accreditation and Quality Control Assurance (known as the Foley Report). SSL services and facilities were assigned to CSIRO in 2004, and now the ActivFire scheme is a program which operates under CSIRO Verification Services (CSIRO-VS).

E.7.3 Services

The following are the key objectives and services conducted under the ActivFire scheme:

- To verify the conformity (and compliance) of active fire protects through physical testing and appraisal in accordance with relevant standards and specifications (i.e. reference criteria).
- To verify approvals and certifications by other national and international bodies.
- To provide an effective and transparent mechanism for appraisal, testing, certification and listing of new active fire protection technologies.

⁶² CSIRO. (2019). ActivFire: Active fire protection - product certification: Home. Retrieved from <https://www.activfire.gov.au/>

- To provide reference documentation and information which supports the various building regulation and authority requirements for *evidence of suitability* for fire protection equipment used in the building industry.
- To maintain a process which allows changes to the conformity of products to be verified and updated.
- To maintain a Register of Fire Protection Equipment (meeting reference criteria) which is publicly available online.

It is noted that the applicant selects the reference criteria (standards and technical specifications) against which the attestation of conformity for the product is assessed.

E.7.4 Conformity assessment scheme

Three forms of certification classes are considered, the definitions as described on the ActivFire website are provided below:

Certified Product Approval (CPA): "certification and registration of products, verified by the conformity assessment scheme, as meeting specified requirements included within the current scope of JAS-ANZ accreditation."

Listed Product Approval (LPA): "listing and registration of products, verified by the conformity assessment scheme, as meeting specified requirements which are not included within the current scope of JAS-ANZ accreditation or which are in the process to being migrated to product certification standards which are included within the current scope of JAS-ANZ accreditation."

Recognised Product Approval (RPA): "listing and registration of products, verified by the conformity assessment scheme, as meeting specified requirements based upon recognition and evidence of verification of conformity issued by a recognised conformity assessment body."

E.7.5 Post-initial assessment control measures

There are no strict surveillance procedures, although it may be a requirement for some products (dependent on the product type) and CSIRO-VS is responsible for preparing a surveillance plan and maintaining a surveillance management system and schedule. Furthermore, all product certifications, validation document and on-line content related to the Register of Fire Protection Equipment require annual validation. The revalidation process requires review and verification of the following, as stated in *Rules Governing ActivFire Scheme* (2010):

- The currency or relevance of the reference criteria against which a product is certified.
- The designation/authenticity/eligibility of business entities attached to certified product.
- Evaluations, investigations and/or inspections of a product and/or product type/category.
- Any other matters deemed appropriate to determine the *fit-for-purpose* and/or conformity of a certified product with reference criteria.

E.8 Summary of Australian conformity assessment schemes

A summary of the key details about the Australian conformity assessment schemes and organisations described in the previous sections is provided in Table E-2.

Table E-2: Summary of key details about conformity assessment schemes and organisations in Australia

Scheme/ Organisation	Type	Formation	Conformity assessment type	Total no. of certificates or appraisals	No. of certificates or appraisals per year	Type of products	Post-initial assessment control measures
CodeMark	A voluntary third-party scheme, it is managed by the ABCB in Australia and DBH in New Zealand.	It was established in 2005 as CodeMark, and in 2016 separate schemes were developed for Australia and New Zealand.	Certificate of Conformity	306 for Australia and New Zealand (199 for Australia, and 107 for New Zealand)	NA	New and innovative building products.	Annual routine surveillance is required which involves reviewing the validity of the certificate and supporting documentations. Post-manufacture or supply chain surveillance must also be conducted at least once in three-year cycles for each certified product. However, the nature and extent of the surveillance is decided by the CAB. The certificates also need to be renewed every 3 years.
CertMark International (CMI)	Private organisation.	NA	Provides the following different product certifications: <ul style="list-style-type: none"> • CertMark Product Certification • CodeMark Australia • CodeMark New Zealand • WaterMark • FireMark (not available on the online register) 	322 (251 are registered under CodeMark scheme)	NA	Any building products, it also assesses plumbing products.	CMI conducts annual site audits for CodeMark Product Certifications. Furthermore, test results and reports require validation or re-testing every five years.
Victorian Building Regulations Advisory Committee (BRAC)	An independent statutory body established under the <i>Building Act 1993</i> .	The first accreditation of a building product was provided in 1999.	The product accreditation is suitable for building products intended to be used in Victoria or the marketing strategy is initially for Victoria only.	42	~ 2 (average over the last 20 years)	The accreditation is for innovative products and it does not apply to building products that comply with the deemed-to-satisfy provisions of the Building Code.	None

Scheme/ Organisation	Type	Formation	Conformity assessment type	Total no. of certificates or appraisals	No. of certificates or appraisals per year	Type of products	Post-initial assessment control measures
Engineered Wood Products Association of Australasia (EWPAA)	Independent of government funding and it is supported on a voluntary basis by wood manufacturers in Australia, New Zealand, Fiji and Papua New Guinea and supported by affiliated members	Established in 1934 as the Queensland Veneer and Plywood Board, since then the organisation has grown to an international board including manufacturers outside of Australia and includes wood products other than plywood.	<ul style="list-style-type: none"> • Product Certification • Chain of Custody Certification, • Japanese Agriculture Standards (JAS) or Japanese Industrial Standard (JIS) Certification • Australian Wood Packaging Products Certification scheme (AWPCS). Every certified product is tested by an independent laboratory, (typically EWPAA's NATA accredited laboratories).	Have provided certifications to approximately 65 manufacturers.	NA	Engineered wood products, including plywood (used for formwork, residential and commercial flooring), wind and earthquake bracing, cladding; laminated veneer lumber (LVL), particleboard and medium density fibreboard (MDF), hardboard, and I-beam products for both commercial and residential structures.	Applicant must implement quality control systems in accordance with EWPAA rules. Manufacturers are subject to the following ongoing surveillance activities for Product Certifications: <ul style="list-style-type: none"> • Surveillance audits: every 6 months EWPAA conducts onsite audit of manufacturing processes. • Surveillance testing: manufacturers are required to select samples of their products every day and provide to EWPAA laboratory for testing. • Market place surveillance: EWPAA periodically inspects certified products in the market.
Australian Glass and Window Association (AGWA)	A co-operative organisation with over 600 members, majority of which are small to medium sized companies.	NA	Manages accreditation programs for manufacturers that independently verify product energy, structural, and water performance claims to regulators, builders, and homeowners. Members need to verify their window design performance using a NATA third-party accredited testing laboratory.	No. of members: approximately 600	NA	Glass and window products	AGWA conducts market surveillance for both members and non-members. This involves the purchasing of products and conducting tests to the requirements of Australian Standards. Audits are conducted at manufacture's factories and based on the manufacturer's audit history, the frequency of the audits may be extended (for regular manufacturers, audits are conducted annually).

Scheme/ Organisation	Type	Formation	Conformity assessment type	Total no. of certificates or appraisals	No. of certificates or appraisals per year	Type of products	Post-initial assessment control measures
Australasian Certification Authority for Reinforcing and Structural Steels (ACRS)	A non-for-profit organisation supported and endorsed by member companies from various fields; engineering, inspection, manufacture, government, and customer bodies.	Established in 2000 by industry, based on internationally recognised model for steel certification which was established in the UK 30 years ago.	Provides 3 certification schemes: <ul style="list-style-type: none"> • Product Conformity • Product Traceability • Quality Management Systems 	No. of certifications: 190 No. of certified firms: 75	NA	Reinforcement and prestressing steel and structural steel.	The Product Certification scheme operates on a 3-year cycle of assessment and the evaluation procedures are dependent on the stage of the cycle. At minimum, ACRS visits the firm annually to ensure the firm meets the obligations under the scheme. Surveillance includes: <ul style="list-style-type: none"> • Review of quarterly test data provided by certified firms • Samples taken from the market to conduct independent verification testing (as required by ACRS) • Other surveillance methods may also take place as decided by ACRS.
ActivFire (CSIRO)	ActivFire scheme is a program which operates under CSIRO. CSIRO is an independent statutory authority. It operates under the provisions of the Science and Industry Research Act 1949 and the Commonwealth Authorities and Companies Act 1997.	The ActivFire scheme was established in 1989 by the Scientific Services Laboratory (SSL) as a joint government agency and industry initiative. SSL services and facilities were assigned to CSIRO in 2004, and now the ActivFire scheme is a program which operates under CSIRO Verification Services.	Product certification is provided for active fire equipment. It is noted that the applicant selects the reference criteria (standards and technical specifications) for which the attestation of conformity for the product is assessed.	1766	~ 1,400 in 2019, however includes renewed versions	Active fire protection products (detection systems, smoke alarms, sprinklers, and associated peripherals).	No strict surveillance (although it may be a requirement for some products). However, all product certifications, validation document, and on-line content related to the Register of Fire Protection Equipment require annual validation.

Note: the information has been obtained from publicly available domain and is valid at the time the data was collected (on May 2019) | NA: not available

Appendix F

Conformity assessment schemes in other countries

Foreword

This Appendix reviews the conformity assessment schemes and the responsible organisations in other countries as a benchmark for Australia. This review includes:

- (i) Building Research Association of New Zealand (BRANZ),
- (ii) European Organisation for Technical Assessment (EOTA),
- (iii) Canadian Construction Materials Centre (CCMC),
- (iv) International Code Council Evaluation Service (ICC-ES),
- (v) Japanese system, and
- (vi) FM Global.

In particular, the organisation structure, formation, type of services is discussed as well as the general details of the conformity assessment schemes (for building products) and post-initial assessment control measures. A summary of the key aspects of each of the schemes and organisations is also provided. It is noted that the information provided is based on publicly available information which has been obtained predominantly on the website of the conformity assessment organisations. The information provided is valid at the time the data was collected (May 2019). Furthermore, a brief overview of the publications by International Organisation for Standardisation (ISO) in relation to conformity assessment are provided.

F.1 Building Research Association of New Zealand

F.1.1 Organisation structure

BRANZ⁶³ is an independent research organisation acting as a third-party to provide evidence-based advice about building and construction issues to the industry and government in New Zealand. It is financially supported by industry funding via the Building Research Levy, and revenues created through commercial research projects. According to the Building Research Levy Act 1969, 0.1 % of the contract value of every construction project above \$20,000 is paid towards the Building Research Association of New Zealand Inc. In practice, the levy is charged and collected by Building Consent Authorities and is then paid to BRANZ.

F.1.2 Formation

In the 1950s the industry-owned information services were provided by the Building Research Bureau. BRANZ was established in the late 1960s as the Parliament passed the Building Research Levy Act in 1969. Building Research Association of New Zealand Inc. functioned as an industry partnership with the Government and it was awarded the assets of the Bureau and received the levy for the development and dissemination of knowledge to the sector. The government also provided annual financial support to the Association; however, this was terminated in the late 1980s. In the 2000s it was identified by the Board that there was a potential for misunderstanding

⁶³ BRANZ. "BRANZ." Retrieved 15-05-2019, 2019, from https://www.branz.co.nz/cms_display.php.

between the services carried out for *industry goods* (i.e. *public goods*) and commercial services for specific companies within the sector. Hence, in 2002 a separate company BRANZ Ltd. was established to provide research, advice, testing, and education services. The Association and BRANZ Ltd went through a couple of reforms, however since 2008 both entities have been reunified and have specific and well-defined roles within the BRANZ Group. It is noted that the BRANZ Appraisal service has been functioning since 1974.

F.1.3 Services

BRANZ provides testing and consultancy services to provide impartial evidence-based advice about critical building and construction issues to the industry and government in New Zealand. The following services are provided by BRANZ:

- Compliance and evaluation services (including product certifications).
- Testing, including (i) fire testing and safety engineering, (ii) material testing, and (iii) structural testing. (Its fire resistance and reaction-to-fire testing laboratory is accredited by International Accreditation New Zealand (IANZ), and it is registered as a testing authority for the Building Code of Australia).
- Research services focus on improving building performance; including their safety, health, warmth, and resilience.

F.1.4 Conformity assessment scheme

BRANZ provides the following types of assessments:

- *Appraisals*: provide an in-depth evaluation of building products and systems showing that they are deemed for purpose and Building Code (New Zealand and Australia) compliant.
- *CodeMark Certifications*: provide a simple and robust way of showing that a product meets the requirements of the New Zealand and Australian Building Code in accordance with the voluntary CodeMark scheme.
- *NZS 3604 Nail Listing*: provides a list of nails which have been tested to be suitable for use of fixing timber framing in accordance with NZS 3604.
- *Technical Opinions*: this is provided for low-risk products which are expected to have a long history of use in service. It is for products which do not require the same level of rigour as an Appraisal and it usually involves assessing the product against single NZBC clauses.
- *Type Tests*: this is provided for low-to-medium risk products and systems. It is for products which do not require the same level of rigour as an Appraisal and it usually involves assessing the product against single NZBC clauses or other robust criteria.

The appraisals, certificates, technical opinions, and listings are available on the BRANZ website. Currently, there are 422 Appraisals and 8 CodeMark certifications on the register, this indicates that the more rigorous conformity assessment scheme has been undertaken to conduct product evaluations. The criteria (referred to as the *evaluation plan*) for the Appraisal is developed based on the requirements of the NZBC or BCA, and other user expectations. Expert technical opinions, testing, inspections, product technical literature, and other required information are assessed against these criteria. The time taken to complete an Appraisal process varies significantly depending on the product. If all the information is available, an Appraisal may be produced in 3 months, however, if there are complications and supporting information is not available the process may take up to 6 to 12 months.

F.1.5 Post-initial assessment control measures

BRANZ monitors all aspects of the product (or system) for which an Appraisal has been issued, including quality control, specifications, field performance, installation practicality, technical literature, and any changes to codes and standards. The monitoring (or audit) is typically conducted annually, however, depending on the complexity of the product more frequent audits may be necessary.

F.2 European Organisation for Technical Assessment

Organisation structure

The European Organisation for Technical Assessment (EOTA)⁶⁴ is an international non-profit organisation which conducts technical assessments of building products. It is based in Brussels, Belgium. It has been established under the EU Construction Products Regulation (CPR) No. 305/2011 and it includes all Technical Assessment Bodies (TABs) assigned by member states of the European Union and the European Economic Area. Furthermore, countries subject to a Mutual Recognition Arrangement (MRA) with the European Union are also considered for memberships. It works closely with the European Commission (EC), the European Union (EU) Member and European Free Trade Association (EFTA) States, the European Standardisation Organisations, and other stakeholders and construction.

EOTA has four officers: a President, a Treasurer, a Chair of the Technical Board, and a Secretary General and it consists of three organs:

- *The General Assembly*; consists of members, and it is also responsible for, based on written demand to EOTA, accepting (as Members) all TABs which meet the CPR and EOTA requirements. If there are multiple TABs for a Member State, then the Member State must select a single spokesperson.
- *The Executive Board*; consists of the four EOTA officers and at least three other representatives from TABs (appointed by the General Assembly)
- *The Technical Board*; consists of a nominated representative from each TAB.

F.2.1 Formation

EOTA was initially established in 1998 in Belgium, as the *European Organisation for Technical Approvals*, under the provisions of the EC Council Directive in relation to construction products, Construction Products Directive (CPD) 89/106/EEC. Since 2013, EOTA was re-registered under the EU CPR No. 305/2011 as the *European Organisation for Technical Assessments*.

F.2.2 Services

EOTA is primarily responsible; (i) for developing and adopting European Assessment Documents (EADs) by using scientific and technological expertise, and (ii) for supporting and coordinating its members with the preparation and issuing of European Technical Assessments (ETAs). EOTA also assists with matters related to making innovative products available in the construction industry. Furthermore, it informs the European Commission and the Standing Committee on Construction about any questions and issues about the development EADs.

⁶⁴ EOTA (2019). "European Organisation for Technical Assessment: Home." Retrieved 17-06-2019, 2019, from <http://www.jas-anz.org/>.

The Technical Assessment Bodies are responsible for conducting the assessments of products and issuing the ETA based on an EAD developed within EOTA. TABs are designated and monitored by member states in accordance with the CPR (No. 305/2011). The frequency at which TABs are evaluated may vary, however, member states are advised to at least evaluate the TABs once in every 5 years. The member states are responsible for informing the Commission about the TAB monitoring activities and results. Currently, EOTA has approximately 50 TABs.

F.2.3 Conformity assessment scheme

EOTA is responsible for the management of issuing ETAs. An ETA involves assessing and determining the performance of the essential characteristics of product (as it has been manufactured). The characteristics to be evaluated for the intended use of the product are determined by the manufacturer and the TAB.

The total number of ETAs provided by EOTA by all of the issuing assessment bodies, and the breakdown of ETAs provided by DIBt and ETA-DK Technical Assessment Bodies, since 2012 are provided in Figure F-1.

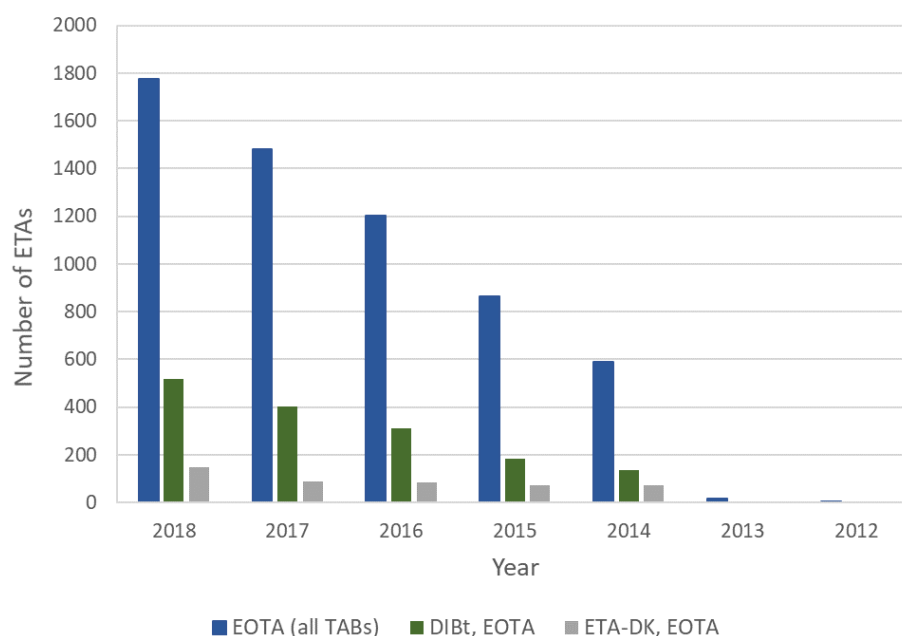


Figure F-1: Number of assessments conducted by EOTA for all issuing assessment bodies, and EOTA by DIBt and ETA-DK

F.2.4 Post-initial assessment control measures

The assessment and verification of constancy of performance (AVCP) system defines the method for which the products are to be assessed and the method implemented to ensure quality of the product post assessment. The AVCP system varies depending on the complexity of the product (or system) and the level of importance and risk associated with the product (safety-relevant products). Information about the AVCP system is stated in harmonised product standards and European Assessment Documents. The AVCP system consists of five levels which involves varying degrees of third-party (notified bodies) involvement and self-declaration and monitoring by the manufacturer. The Member State and the European Commission decide which AVCP system is suitable. A

summary of the five levels for the AVCP system is provided below (based on the description provided in the CPR Guidance Note⁶⁵):

- System 1+: product certification granted based on the issuing of a certificate of constancy with determination of the product type and continuous surveillance and audit testing by a notified product certification body.
- System 1: product certification granted based on the issuing of a certificate of constancy with determination of the product type and continuous surveillance by a notified product certification body.
- System 2+: factory product control certification granted with continuous surveillance by a notified factory production control certification body.
- System 3: determination of a product type by a notified testing laboratory.
- System 4: manufacturer's tasks only.

F.3 Canadian Construction Materials Centre

F.3.1 Organisation structure

The Canadian Construction Materials Centre (CCMC)⁶⁶ operates within the National Research Council (NRC) of Canada. It runs under the general policy and technical advice of the Canadian Commission on Construction Materials Evaluation (CCCME) whose aim is to support innovation and technology transfer in the building industry.

The CCCME consists of members from the regulatory bodies, the industry, and the general public. In addition to advising the NRC on the administration of the CCMC, it is responsible for: (i) providing policy guidelines for the operation of the CCMC, (ii) ensuring the reliability and quality of technical decisions and reporting made by CCMC, (iii) providing a means to deal with the needs of the provinces and territories of Canada (as identified in the memorandum of the understanding on the CCMC between NRC and the provinces and territories), and (iv) to deal with disputes in relation to any matters under the responsibility of CCCME. CCCME develops standing/sub-committees and task groups to assist with discharging some of the responsibilities, as necessary.

F.3.2 Formation

NCR established the CCCME in 1988. This was in response to the recommendation made by the joint collaboration of NCR, the provincial regulatory authorities, and the construction industry investigating the means for assisting building officials to make decisions about the acceptability of innovative building products.

F.3.3 Services

CCMC provides a national evaluation service for innovative non-standardised building construction products (including materials, systems, and services) for commercial and residential buildings. Furthermore, it may evaluate products that are covered in recognised standards. For products for which no specific standard exists, CCMC evaluations only applies to the specific product; that has

⁶⁵ Construction Products Association. (2012). *Guidance Note on the Construction Products Regulation, Version I*. Retrieved from: www.constructionproducts.org.uk

⁶⁶ National Research Council (NRC) Canada (2019). "Construction materials certification." from <https://nrc.canada.ca/en/certifications-evaluations-standards/construction-materials-certification>.

been manufactured, assembled, or processed at a particular site or manufacturing facility. For products for which standards exist, CCMC evaluations demonstrate conformity, and the opinions about these products are made available as Evaluation Listings.

The product evaluations are made available as a searchable index to the public and they are accessible for free to qualified subscribers. The CCMC services are utilised and benefited by manufacturers, specifiers, and regulators.

CCMC is recognised by all provincial and territorial building regulatory bodies in Canada, however, the approval of a product and acceptance of CCMC evaluations is determined by the authority having jurisdiction.

F.3.4 Conformity assessment scheme

CCMC provides an opinion about the product's compliance with the National Building Code of Canada or Provincial/Territorial Building Codes, either as an acceptable solution, or an alternative solution, or a combination of both. The opinion is based on evidence obtained by assessing the product through testing, analysis, engineering review, and/or other scientific means. The Evaluation Reports and Evaluation Listings both specify how the products are used for the evaluation to be valid.

The information required to be supplied by applicants requesting a CCMC evaluation, includes:

- legal company information,
- a competent technical contact, knowledgeable about the product,
- detailed description of the product,
- desired intended use of the product,
- a documented quality system,
- detailed installation instructions, and
- a desktop-sized sample of the product.

There are currently 509 product evaluations (which includes Evaluation Reports and Listings) on the online register.

F.3.5 Post-initial assessment control measures

The CCMC is undergoing changes to ensure that the evaluation process is compliant with the ISO/IEC 17065⁶⁷ standard. Re-evaluation of the reports is conducted every three years. Surveillance includes plant inspection, periodic product testing, and/or field inspections.

F.4 International Code Council Evaluation Service (United States)

F.4.1 Organisation structure

International Code Council Evaluation Service (ICC-ES)⁶⁸ is a not-for-profit, limited liability organisation that provides technical evaluations of building products, components, methods, and materials. It is a subsidiary of the international Code Council (ICC), however, it is a separate company and has its management, staff, and procedures. ICC-ES is accredited by the American National Standards Institute and by the Standards of Council of Canada under ISO/IEC Guide 17065. ICC-ES has a Board of

⁶⁷ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC) (2012). ISO/IEC 17065: 2012, Conformity assessment - Requirements for bodies certifying products, processes and services, International Organisation for Standardisation.

⁶⁸ ICC Evaluation Service (2019). "ICC Evaluation Service." Retrieved 10-05-2019, 2019, from <https://icc-es.org/>.

Managers (currently consisting of ten members) consisting of code officials, architects, and engineers who advise on business matters. Primarily, their focus is to ensure public safety through the evaluation of construction products. ICC-ES also has an Evaluation Committee which consists of 10 code officials who are responsible for providing independent consideration and approval of acceptance criteria which are developed for new and innovative products. The committee meets three times a year and all meetings are open to the public. Attendees have the opportunity to discuss the acceptance criteria and provide information to committee members. Furthermore, ICC-ES employs experienced evaluation specialists, architects, and professional engineers with expertise in various fields; civil, structural, fire protection, and mechanical engineering.

F.4.2 Formation

ICC-ES was developed in 2003 as four American building product evaluation services joined their operations, including the National Evaluation Service, BOCAI Evaluation Services, ICBO Evaluation Service, and SBCCI Public Service Testing and Evaluation Services. Based on the original evaluation service organisations, ICC-ES has a history which dates back to more than 80 years.

F.4.3 Services

ICC-ES provides technical evaluations of building products, components, methods, and materials. The evaluation reports assist building industry professionals in determining the code compliance of products, especially for new and innovative products. ICC-ES is expanding its evaluation services for plumbing, mechanical, fuel gas products, and *green* building products.

F.4.4 Conformity assessment scheme

Companies requiring an evaluation report for a product must submit an application to ICC-ES with supporting data including product information and test reports. In general, the laboratory test reports and inspection reports must be conducted by bodies that have accredited (to do the related work) by a party that is signatory to the Mutual Recognition Arrangement of the International Laboratory Accreditation Cooperation. An ICC-ES technical staff then evaluates the data provided and works with the applicant to ensure that sufficient evidence of compliance with either the building code or an ICC-ES acceptance criterion (which is approved by the ICC-ES Evaluation Committee) is provided. It is noted that, the ICC-ES reports must include reviews under the International Codes. Reviews in accordance with the National Codes, the Standard Codes, and Uniform Codes are optional. Once all the required information is collected and evaluated, an evaluation report is issued and made available on the ICC-ES website.

F.4.5 Post-initial assessment control measures

New evaluation reports are valid for one year, afterwards they can be renewed at one or two-year cycles based on the applicant's preference. The level of ongoing follow-up inspection varies depending on the product. The details of the ongoing inspection requirements are provided in the approved quality documentation. As a minimum, a qualifying inspection of the manufacturing facility is required prior to the issuance of an evaluation report, and annually afterwards.

F.5 Japanese system

F.5.1 Organisation structure

The Ministry of Land, Infrastructure and Transport (MLIT)⁶⁹ is responsible for providing approvals building products which do not comply with the Japanese Building Standard Law (BSL) prescriptive provisions. The Ministerial approvals are based on evaluation reports which are issued by performance evaluation organisations recognised by the MLIT.

F.5.2 Services

The requirements for building products, including building materials and construction methods, are stated in building codes (including Building Standard Law, BSL Enforcement Order and MLIT notifications) and related standards (such as Japan Industrial Standards (JIS) and Japan Agricultural Standards (JAS)). Conventional building products may follow a 'deemed-to-comply' prescriptive solution outlined in the standards, however, additional requirements provided in BSL notifications shall also be considered.

New building products or products which do not comply with prescriptive provisions require approvals from the MLIT. The approval is granted based on evaluations conducted by MLIT designated performance evaluation organisations or bodies. Each evaluation organisation is assigned to conduct certain type of work with a list of services and items that it can evaluate, however the list may vary in time. According to the Building Performance Standardisation Association, there are 26 Japanese evaluation organisations and three overseas evaluation organisations⁷⁰.

Furthermore, certification bodies also exist to ensure conformity with prescriptive provisions. For example, certification bodies accredited by the Ministry of Economy, Trade and Industry (METI) conduct tests to verify that products comply with JIS and audit the quality management systems of manufacturers. Successful applicants are allowed to use the JIS mark.

F.5.3 Conformity assessment scheme

There are several categories of assessment and recognition for undertaking evaluation works stipulated in the BSL. Typical categories are material quality, fire resistance and non-combustibility. An example of the typical documentation required by BSL for evaluation is given below:

- (1) Performance Evaluation Work Application Form (English)
- (2) Description of product/material (English and Japanese translation)
- (3) Product/material characteristics explanation (English and Japanese translation)
- (4) Quality data (English and Japanese translation)
 - (a) When the product/material has been produced by different methods from the prescribed test/examination methods in the Minister Notification No.1446⁷¹ (hereinafter referred to as MN1446), the applicant shall submit the comparative data where the product has been tested/examined by the said prescribed methods. In that case, the test, etc., following the prescribed methods for comparison, shall be conducted an appropriate number of times.

⁶⁹ Ministry of Land, Infrastructure and Transport (MLIT). (2008). Retrieved from <http://www.mlit.go.jp/en/index.html>

⁷⁰ INGÉROSEC Corporation. (2015). *Sustainable building and construction sector in Japan and analysis of opportunities for European firms*. EU-Japan Centre for Industrial Cooperation Retrieved from https://www.eu-japan.eu/sites/default/files/publications/docs/sustainableconstruction_final.pdf.

⁷¹ Ministry of Land, Infrastructure and Transport (2000). Notification No. 1446-2000; Technical Standard for Specifications and Quality of Structural Materials (in Japanese).

- (5) Testing methods (English and Japanese translation)
 - (a) When the product/material has been produced by different methods from the prescribed test/examination methods in MN1446, the applicant shall submit documents that compare the applied method with the prescribed method.
- (6) Quality control methods (English and Japanese translation)
 - (a) Information of manufacturer's factory, etc.
 - (i) Manufacturer's management policy, including quality control policy (unless the evaluation work is based on MN1446 III (2))
 - (ii) Organisation chart (including company-wide chart and placement of quality manager)
 - (iii) Outline of education and training to the employees (unless the evaluation work is based on MN1446 III (2))
 - (b) Information on production process
 - (i) Manufacturer's written internal process/manual
 - (ii) Product qualities and quality control methods (including storekeeping methods)
 - (iii) Name of product and manufacturer
 - (iv) Manufacturing process
 - (v) Management methods
 - (vi) Manufacturing facilities and those management methods
 - (vii) Testing facilities and those management methods
 - (viii) Outsourcing work and those management methods
 - (ix) Complaint procedure
 - (c) Quality manager
 - (i) Name and job title
 - (ii) CV
 - (iii) Education on quality control
 - (d) Manufacturer's written process/manual and quality control record
 - (i) Internal process of inspection stipulated in MN1446, Table3 (b), manufacturing, transportation and storekeeping, etc.
 - (ii) Quality control, organisation management, nomination and role of quality manager, etc.
 - (iii) Inspection record and data.
 - (iv) Record of (i) to (iii)
 - (e) Certification of ISO 9000.2⁷² (in the case that the evaluation work is based on MN1446 III (2) only)

F.5.4 Post-initial assessment control measures

Inspection of all products required at source.

⁷² International Organization for Standardization (ISO) (1994). ISO 9000.2: 1994, Quality management and quality assurance Standards - Generic guidelines for the application of ISO 9001, ISO 9002 and ISO 9003.

F.6 FM Global

F.6.1 Organisation structure

FM Global⁷³ is a mutual property insurance company. Its aim is to provide property risk management and ensure resilience of its client-owners. It forms part of the FM Global group, which consists of affiliates and business units, including:

- *AFM*: provides property insurance for the middle market.
- *FM Approvals*: sets standards and certifies products and services for companies worldwide.
- *FM Global Cargo*: provides cargo coverage and risk engineering services.
- *Mutual Boiler Re*: provides breakdown treaty reinsurance and other support services for mechanical, electrical, and pressure systems.
- *Emergency Response Consultants*: provides hand-on emergency response training to fire brigades, hazardous material emergency responders, technical and confined-space rescue teams, emergency medical services and local fire departments.

FM Global has 67 offices worldwide, more than 5,400 employees from 1,860 are loss prevention engineers.

F.6.2 Formation

FM Global was founded in 1835 by a textile mill owner, Zachariah Allen. It was initially established as a mutual fire insurance company, called Factory Mutuals. By 1987, 42 mutual companies had joined together to form three companies, which provided comprehensive coverage and loss prevention resources. In 1999, FM Global was formed which provided even greater insurance capacity. Its clients include the world's largest organisations. In 2014, it was reported that its clients included one of every three Fortune 500 companies.

F.6.3 Services

FM Global conducts risk management to improve a company's ability to withstand loss in the future. The services which are provided are summarised below.

- *Cyber risk assessment*: involves three risk assessment components; physical security, information security, and industrial control and building management systems.
- *Hot work*; risk management and fire safety guidelines for conducting hot work
- *Boiler and machinery services*: engineers assist with evaluating and reducing the risk associated with boiler and machinery products and services. The evaluation is completed in accordance with United States and Canada regulations.
- *Predictive analytics*: used to predict severity of the risk and the where loss is likely to occur.
- *Claims services*: assist businesses before, during, and after a loss occurs.
- Supply chain risk management
- *Project services*: insurance coverages for during construction and renovation
- *Business risk consulting*: risk management approach for quantifying the effect of business disruptions.
- *Site evaluations*: engineers conduct site evaluations to determine the company's risks
- *Appraisal services*; determine the worth of a company's physical assets
- *Cargo claims services*

⁷³ FM Global (2019). "FM Global." from <https://www.fmglobal.com/>.

- *Brokerage services*
- *Cargo risk engineering services*
- *Research – product testing and certification*: set standards (for contractors, builders, and manufacturers) to ensure that high levels of safety and resilience is achieved. It provides a product testing service, FM Approvals, to ensure that a product has undergone certification testing to verify its suitability for its intended use. Furthermore, it provides: Property Loss Prevention Data Sheets which provide guidelines to better understanding loss prevention engineering, and Technical Reports Supporting Code Change.

F.6.4 Conformity assessment scheme

FM Global is responsible for running FM Approvals, which is a third-party product testing and certification program. The FM Approved certification mark for a product or service ensures that a high level of property loss prevention product testing and certification standards have been conducted. The certification can be applied to an entire product or system, or a single performance characteristic. It is claimed to be recognised by the world's leading regulatory authorities. In fact, products can be simultaneously tested to global standards and FM Approvals standards through the FM Approval's global certification program. The FM Approvals may be obtained for the following product types: fire protection equipment, electrical equipment, building materials, roofing assemblies, hazardous location equipment, fire detection and signalling materials, wall assemblies, and smoke detection materials. More than 50,000 products and services have been FM Approved.

F.6.5 Post-initial assessment control measures

There is no form of quality control or surveillance associated with FM Approvals.

F.7 Summary of international conformity assessment schemes

Table F-1 provides a summary of the key aspects of each of the conformity assessment schemes and organisations described above.

Table F-1: Summary of key details about conformity assessment schemes and organisations in other countries

Region/ Country	Organisation/ scheme	Type	Formation	Conformity assessment type	Total no. of certificates or appraisals	No. of certificates or appraisals per year	Post-initial assessment control measures
New Zealand	BRANZ	Independent research organisation. It is financially supported by industry funding via the Building Research Levy, and revenues created through commercial research projects.	Initially it existed as the Building Research Bureau in the 1950s. In the late 1960s BRANZ was developed, although it went through a few reforms until 2008.	<ul style="list-style-type: none"> • Appraisals • CodeMark Certificate of Conformity • NZS 3604 nail listing • Technical opinions • Type tests 	422 Appraisals	NA	For the Appraisals, at minimum annual monitoring is required. The monitoring involves reviewing all aspects of the product (or system), including quality control, specifications, field performance, installation practicality, technical literature, and any changes to codes and standards.
Europe	EOTA (all TABs)	An international non-profit organisation.	It was initially established in 1998 as <i>European Organisation for Technical Approvals</i> . From 2013 it was re-registered as <i>European Organisation for Technical Assessments</i> .	European Technical Assessment (ETA)	5,424	~ 1,800 in 2018 ~ 1500 average over the last 3 years	The method implemented to ensure quality of the product post assessment is described in the AVCP system; which is stated in the harmonised product standards and EADs. The AVCP system varies depending on the complexity of the product and the level of importance and risk associated with the product
Germany	DIBt, EOTA TAB			European Technical Assessment (ETA)	1,411 (DIBt also provides national approvals, approximately 2,000 to 3,000 per year)	~ 500 in 2018 ~ 400 average over the last 3 years	

Region/ Country	Organisation/ scheme	Type	Formation	Conformity assessment type	Total no. of certificates or appraisals	No. of certificates or appraisals per year	Post-initial assessment control measures
Denmark	ETA-DK, EOTA TAB			European Technical Assessment (ETA)	483 (ETA-DK also provides national approvals, approximately 400 approvals per year)	~ 150 in 2018 ~ 100 average over the last 3 years	
Canada	CCMC	Operates under the National Research Council and administration of CCCME.	Established in 1988.	<ul style="list-style-type: none"> Evaluation Reports Evaluation Listings 	509 product evaluations	NA	Re-evaluation of the reports is conducted every 3 years. Surveillance includes plant inspection, periodic product testing, and/or field inspections.
America (and Canada)	ICC-ES	Non-profit, limited liability organisation.	Four evaluation service companies joined officially as ICC-ES in 2003.	Evaluation report	NA	NA	As a minimum, annual qualifying inspection of the manufacturing facility is required.
Japan	Ministry of Land, Infrastructure and Transport	Government.	NA	Approvals based on evaluation reports	NA	NA	Inspection of products conducted at source.
International, established in the United States of America	FM Global	Insurance company (private)	Initially as Factory Mutuals in 1935, and as FM Global in 1999.	FM Approvals	50,000	NA	None

Note: the information has been obtained from publicly available domain and is valid at the time the data was collected (on May 2019) | NA: not available

F.8 International Organisation for Standardisation (ISO)

The following are key publications provided by the International Organisation for Standardisation (ISO) in relation to conformity assessment:

- ISO/IEC 17000: 2004, *Conformity assessment – Vocabulary and general principles*⁷⁴
 - Adopted in Australia: AS ISO/IEC 17000: 2005, Reconfirmed 2016⁷⁵
 - It specifies general terms and definitions related to conformity assessment, including the accreditation of conformity assessment bodies, and the use of conformity assessment to aid trade. The functional approach to conformity assessment is described to assist users of conformity assessment, conformity assessment bodies and their accreditation bodies, for both voluntary and regulatory systems.

- ISO/IEC 17067:2013 *Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes*⁷⁶
 - Adopted in Australia, AS/NZS ISO/IEC 17067: 2015⁷⁷
 - Describes the fundamentals of product certification and provides guidelines for understanding, developing, operating or maintaining certification schemes for products, processes and services. It is intended to be used by all parties interested in product certification (especially for certification scheme owners).

- ISO/IEC 17065 *Conformity assessment - Requirements for bodies certifying products, processes and services*⁷⁸
 - Adopted in Australia, AS/NZS ISO/IEC 17065: 2013⁷⁹
 - Provides requirements for the competence, consistent operation, and impartiality of third-party conformity assessment bodies which are involved in product certification.

- ISO/IEC Guide 28: 2004, *Conformity assessment – Guidance on a third-party certification system for products*⁸⁰
 - Revised by ISO/IEC TR 17026: 2015, *Conformity assessment - Example of a certification scheme for tangible products*⁸¹
 - Provides guidance for third-party product certification systems for determining the conformity of a product with specific requirements by conducting initial testing of samples of the product, assessment and surveillance of the involved quality system, and surveillance by testing of product samples obtained from the factory and/or the open

⁷⁴ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2014). *ISO/IEC 17000:2004, Conformity assessment - Vocabulary and general principles*. International Organisation for Standardisation

⁷⁵ Australian Standards. (2016). *AS ISO/IEC 17000: 2005, Reconfirmed 2016, Conformity assessment - Vocabulary and general principles*. NSW, Australia: Standards Australia

⁷⁶ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2013). *ISO/IEC 17067: 2013, Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes*. International Organisation for Standardisation

⁷⁷ Australian/New Zealand Standard. (2015). *AS/NZS ISO/IEC 17067: 2015, Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes*. NSW, Australia and Wellington, New Zealand: Standards Australia/Standards New Zealand

⁷⁸ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2012). *ISO/IEC 17065: 2012, Conformity assessment - Requirements for bodies certifying products, processes and services*. International Organisation for Standardisation

⁷⁹ Australian/New Zealand Standard. (2013). *AS/NZS ISO/IEC 17065: 2013, Conformity assessment - Requirements for bodies certifying products, processes and services*. NSW, Australia and Wellington, New Zealand: Standards Australia/Standards New Zealand

⁸⁰ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2004). *ISO/IEC Guide 28: 2004, Conformity assessment - Guidance on a third-party certification system for products*. International Organisation for Standardisation

⁸¹ International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2015). *ISO/IEC TR 17026: 2015, Conformity assessment - Example of a certification scheme for tangible products*. International Organisation for Standardisation

market. It also discusses the conditions for the use of a mark of conformity and granting a certificate of conformity.

- ISO/IEC Guide 67: 2004, *Conformity assessment – Fundamentals of product certification*
 - Revised by ISO/IEC 17067: 2013⁸²
 - Provides guidance on product certification systems for product certification bodies and other interested parties who want to understand, develop, establish, or compare third-party product certification systems.

⁸² International Organisation for Standardisation (ISO) and International Electrotechnical Commission (IEC). (2004). *ISO/IEC Guide 67: 2004, Conformity assessment – Fundamentals of product certification* International Organisation for Standardisation

Appendix G

Recommended checklist for non-conforming and non-compliant investigations

Foreword

This Appendix provides a recommended checklist for investigation of non-conforming and non-compliant building products as one of the deliverables from this scoping study.

Checklist

1. ENQUIRY- Triage initial enquiry into:
 - (i) Information request or
 - (ii) Investigation

2. SCOPING the investigation (in consultation with Authority)
 - a) Identify type of product to be investigated – component or assembly?
 - b) Where has the product or assembly been used and what is the role of product (if component) and/or intended use (if assembly), as defined by the manufacturer?
 - c) Discuss and determine
 - (i) Potential non-conforming and non-compliant issues
 - (ii) Identify the non-conforming and non-compliant issues that need to be investigated
 - (iii) Consequences of non-conforming and non-compliant? – are they safety/health-related?
 - (iv) Are the issues durability related?
 - d) Determine applicable relevant codes and standards
 - e) Determine relevant investigation method based upon:
 - (i) Information available to authority or agency
 - (ii) Relevant established test procedures or feasibility of testing.
 - (iii) Labs able to undertake testing.
 - (iv) Is product supplied by authority
 - (v) Is product to be obtained from supplier (off the shelf scenario)
 - (vi) Is product installed on site
 - f) Reporting requirements

3. RESEARCH
 - a) Information from authority or supplier
 - b) Technical research of available data, fact sheets and manuals
 - c) Validation of technical information received
 - d) Marketing/Labelling
 - (i) How the product is sold in the market? Separately or in combination with other products?
 - (ii) How it is labelled? Does it claim to be in conformity with stated standards?

(iii) How far can it be traced back on the supply chain?

4. INVESTIGATION

- a) Inspection of product/system (if already installed) or product supply
- b) Comparative assessment to data and research scope
- c) Testing of building products and the various subsystems
- d) Collation of data

5. REPORT

- a) Assessment and Appraisal
- b) Conclusion

Appendix H

ATEN and building products for high-risk applications – Discussion

Foreword

Due to recent incidents of non-conforming building products in the industry, it is generally agreed that the treatment of products in high-risk applications needs to improve. This Appendix discusses various strategies to identify high-risk applications, contributions that the ATEN scheme can make towards improving the management of products in high-risk applications, and longer-term issues that require more fundamental changes.

H.1 Identify high-risk applications

The first step is to identify high-risk applications where additional measures need to be taken. High-risk is not an inherent property of a product but of the application of the product (situation where the product is used). The following options are possible:

- (i) Assign the responsibility to the designers: They are in the best position to decide when an application has high-risk implications. The product appraisal or certification must be in cognizant of the high-risk applications and provides appropriate measures to mitigate the risks. These measures should be made mandatory in accordance with Shergold and Weir (2018) recommendations.
- (ii) Define non-high-risk activities: Activities associated with, for example, painting, cleaning etc. are not high-risk to the building occupants. This can be used in conjunction with (i). The practical way of implementing this is to have a list issued by the regulators to remove any ambiguity.
- (iii) Define high-risk application categories: products associated with structural safety, fire safety and safety in use, and the level of importance of buildings (as defined in the NCC) can be used for this purpose. The practical way of implementing this is to have a list issued by the regulators to remove any ambiguity.

H.2 ATEN contribution

The ATEN scheme could contribute towards improving the management of products in high-risk applications by the following:

- (i) More extensive use of risk assessment in the appraisal: Risk assessment is currently used in product certification schemes to identify risk issues in product manufacturing. ATEN evaluation of fitness-for-purpose could also use risk assessment to: (a) identify high-risk applications, (b) to decide what measures to take when there are issues with non-conformance. These measures could be introduced as part of the Scheme Rules.
- (ii) Introduce a multi-level appraisal scheme for low, medium and high-risk applications where different activities are assigned to different actors in the scheme. This can be implemented in conjunction with (i). However, to be effective the scheme must have some linkage with the regulation.

H.3 Longer-term issues

Longer-term issues that may require more fundamental changes are listed below.

- (i) High-risk issues associated with durability: The current NCC does not list durability performance as a performance requirement. High-risk issues are most difficult to assess when they are connected with durability issues. The assessment cannot be carried out on the product in isolation, instead a holistic approach is necessary which considers the components that the product is connected to and the environment in which it operates. None of these factors are required to be considered at present.
- (ii) Time limit on the validity of assessment: All building products are continuously changing with changing manufacturing process, material supplies etc. There may be also changes to the assessment methodology and testing. All these changes may render a conforming product into a non-conforming one. A time limit must therefore be placed on the validity of an assessment. Many existing products still rely on very old assessments – if tested again they may become non-conforming. The issue associated with the non-conformance of existing products is out of the scope of ATEN, however, mandatory regulatory provisions may need to be implemented to address this concerning issue.

Appendix I

Comparison of CodeMark Australia scheme and proposed ATEN scheme

Written by Michael Kelly

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Foreword

This Appendix provides a comparison of the proposed ATEN scheme with the current CodeMark Australia scheme and outlines the point of differentiation between the two schemes.

1.1 CodeMark Australia scheme and Proposed ATEN scheme documents

The following CodeMark Australia documents were examined for this report:

- CodeMark Australia Certification scheme brochure (Version 2.1, May 2018, verified 9-June-2019),
- The CodeMark Australia Certification Scheme Rules (Version 2016.1, undated, verified 9-June-2019),
- CodeMark Protocol for the Assessment of Products against BCA Performance Requirements (Version 1.01, undated, verified 9-June-2019), and
- CodeMark Australia - Information Required on a Certificate of Conformity (Version 1.02, May 2019).

The following ATEN documents were examined for this report:

- Draft explanatory leaflet (undated), and
- Draft ATEN Scheme Rules (May 2019).

1.2 Methodology

In comparing the current CodeMark Australia third-party product accreditation scheme, as practised, with the proposed ATEN scheme, the following general steps have been followed:

- Review the CodeMark Australia Scheme Rules and all referenced protocols, directives and guidance documents;
- Summarise key requirements of the CodeMark Australia scheme that bear directly on product suitability and evaluation consistency;
- Examine a sample of recent CodeMark Australia Certificates of Conformity (CofCs) for alignment with the key scheme requirements;
- Review the proposed ATEN Scheme Rules and available presentation material describing the scheme;
- Prepare a summary of key requirements of the ATEN scheme that bear directly on product suitability and evaluation consistency;
- Identify and summarise common and unique factors in both schemes, including relevant observations.

1.3 CodeMark Australia scheme Overview

The CodeMark Australia scheme provides a voluntary evaluation, reporting and certification procedure for specific conformity claims made by an applicant in relation to a product or system proposed for use on an

Australian building. The specific claims made by the applicant may be against performance requirements or *DTS* provisions and may be broad or narrow. The scheme provides for assessment of those claims, by an accredited body, in a systematic, structured manner related to the Assessment Methods and *evidence of suitability* provisions in the Governing Requirements of the NCC (BCA). It results in a Certificate of Conformity in relation to the product or system and BCA provisions that will, in all but limited cases, be automatically accepted by the certifying authority in every jurisdiction, provided the product is used in accordance with the certificate conditions and limitations.

JAS-ANZ, as the CodeMark Australia scheme Administrator, is final arbiter of correctness of Certificates of Conformity. JAS-ANZ, as the CodeMark Australia scheme Accreditation Body, is responsible for regular monitoring, surveillance and reporting on the competence and compliance of accredited Certification Bodies. Each accredited Certification Body is responsible for annual surveillance of its Certificate Holders and their products including quality plans, BCA change impacts and ongoing accuracy of Certificates.

1.4 Evaluating Complex, Interdependent Products

It is not possible for a CodeMark Australia certificate to say whether all performance requirements relevant to a particular building have been satisfied. That is the job of the designer (at design stage) and later the certifier (at pre-occupancy stage) for that particular building. The only thing a CodeMark certificate can say is that “if BCA provision XXX is relevant to a particular building, this product satisfies provision XXX in the following circumstances . . .”. The obligation to also consider “provisions YYY and ZZZ” does not arise, even if those provisions are absolutely essential to the building. It is up to the designer or certifier to confirm the certificate coverage and to be satisfied that anything a product cannot do is done by something else. This task is complex but vital.

High-risk products and systems – those of particular interest to regulators and owners – rarely involve only one performance requirement, or one aspect of a performance requirement. Buildings are not assembled, feature by feature, from isolated independent elements. Buildings are complex assemblies of interactive and interdependent components and systems, where the design and installation of each feature potentially affects and/or relies on adjacent and related systems. Certification scheme rules, directives and guidance on the evaluation of product claims appear to make an assumption that simple binary choices can be made in preparing the evaluation plan – as if there is always a one-to-one correspondence between a product feature and a performance requirement or *DTS* provision.

CodeMark Australia rules allows a product to be evaluated and certified on a narrow range of BCA provisions nominated by the applicant and agreed by the Certification Body (CB). This means that the scope of evaluation is determined by the applicant, with the CB unable to broaden the scope to discover any performance attributes lacking in the product. In this situation, it is important that the CB specify the limitations of product application and conditions on its use – including functions essential to the building that it cannot perform - so as to avoid the possibility of the certificate being inappropriately used. Such inappropriate use, through confusion or inattention, could lead to *performance gaps* in the total solution for a building without any apparent gap in the certification paperwork.

To deal with this, the CodeMark Australia scheme uses a system of conditions and limitations to constrain the application of certified products to just those situations where unfavourable interactions or performance will not occur. This requires skill, diligence and transparency in evaluation and reporting, so that Certificate Holders and especially users are made completely aware of what the product can and cannot do, where it can and cannot be used. The ABCB directive on Certificates of Conformity provides unambiguous confirmation that a high level of rigour is required in the assessment process.

An examination of a sample of 10 current CodeMark Australia certificates throws some light on the practical significance of these matters. See Section I.7.1. Several of the sample certificates make narrow claims for

products that obviously require other performance attributes, either alone or in conjunction with other products and systems. Assembling evidence of the total solution – for assessment by the Certifying Authority - falls to the designer (at the design stage of a project) and to the builder or project manager (at the post-construction or occupation stage). The designer, builder or project manager must know, from the CodeMark Australia certificate alone, whether the product is being used as intended and will perform its required function.

1.5 Examination of Certificates

Certification Bodies are required to use the CodeMark Australia scheme template for certificates and to complete it in accordance with the directions in the scheme document *Information Required on a Certificate of Conformity* published and maintained by the ABCB (as scheme owner). The current version is 1.02 published May 2019 and the previous version is 1.01 published October 2017. The differences between versions are largely editorial, such as specific references to NCC governing requirements or practical examples clauses.

Whilst the CodeMark scheme in its original form has been operating for many years, this report confines its assessment to the CodeMark Australia scheme and to Certificates issued under its current rules.

I.6 Assessment Processes

A step by step explanation of the assessment procedures for each of the schemes appears in the tables below.

Table I-1: Current CodeMark Australia scheme certification procedure (based on current rules)

STEP	TITLE	DESCRIPTION	COMMENTS
1	Application	Formal application including full details, manufacturing and quality plan, intended use and BCA compliance claims.	Follow Certification Body requirements.
2	Review	Examine sufficiency of information, product, uses and installation, consider compliance claims, verify that specification and claims can be evaluated, determine appropriate method of evaluation, agree on scope and resolve any differences with applicant.	Reviewer must be competent in scheme rules and BCA.
3	Evaluation Plan	Include defined scope of use and limitations, compliance claims, CodeMark Protocol (performance), means of compliance demonstration, assess quality plan and follow surveillance protocols.	All Evaluation Plan personnel must be competent in scheme rules & BCA and be licensed UBCs.
4	Evaluation process	Ensure sufficient evidence is available in various forms, that a quality plan exists and is maintained, and that product samples are representative. Validate prior evaluation(s) and test results relied on.	No personnel requirements apply for the evaluation, only for the Review and Plan.
5	Evaluate non-conformities	Identify and classify any nonconformities and direct appropriate response by applicant to critical or major nonconformities. Repeat evaluation tasks to resolve non-conformities.	This is an ongoing activity throughout the evaluation process.
6	Evaluation documentation	Document all evaluation activities, summarise in an evaluation report and conduct final review. Include all evaluation plan activities, product improvement recommendations and BCA compliance conclusions.	This is an ongoing activity throughout the evaluation process.
7	Evaluation report review	Review by person not involved in evaluation process. Document recommendations for certification decision.	May be concurrent with decision (8).
8	Certification decision	Decision by person(s) not involved in evaluation process. Prepare and issue Certificate using scheme template and ABCB directions.	May be concurrent with review (7).
9	Surveillance	Conduct annual surveillance of Certificate Holder including review of quality plan, BCA changes and Certificate accuracy and completeness. Conduct supply chain surveillance once in 3-year cycle or if directed by Administrator.	Driven by complaints or adverse experience.
Additional procedures apply where non-conformities are detected during surveillance, when the BCA or Scheme Rules are subject to change and when certificate termination is required.			

Table I-2: ATEN scheme appraisal procedure (based on proposed rules)

STEP	TITLE	DESCRIPTION	COMMENTS
1	Application	A registered Australian entity presents to ATEN with a traceable construction product including statement of intended use, specifications, manufacturing plan (including quality assurance), installation and maintenance instructions.	ATEN standard protocol/prerequisites.
2	Review	Review information provided by the applicant.	
3	Selection of performance requirements	Determine the aspects of performance to be formally evaluated to ensure the product is fit-for-purpose.	With consultation with Reference Groups if necessary.
4	Scope of work	Agree on scope of work, including indicative timeframe and cost.	
5	Evaluation plan	Develop the evaluation plan.	With consultation with Reference Groups if necessary.
6	Testing & analysis	Applicant contracts Network Members to test and analyse the product in accordance with evaluation plan.	ATEN standard protocol.
7	Surveillance requirements	Determines and define the surveillance requirements to maintain the validity of the Appraisal Report based on risk-based assessment.	With consultation with Reference Groups if necessary. ATEN standard protocol.
8	Appraisal Report	Technical review of fitness-for-purpose including performance requirements and scope/level, methods of evaluation, product test and analysis reports, manufacturing procedures, installation procedures, and maintenance requirements, before issuance of Appraisal Report	With consultation with Reference Groups if necessary. ATEN standard protocol.
Additional procedures may be developed for certification (if required), marking, recording, complaints, suspension, NCC updates, amendments etc.			

1.6.1.1 Comprehensive evaluation

A comprehensive product appraisal is required to consider every relevant performance requirement of a product in every intended application and to assess the fitness-for-purpose of the proposed product. Such an appraisal is required by the ABCB Certificate of Conformity directive but is not explicitly provided for in the rules.

One of the differences between the CodeMark Australia scheme, as currently practised and described above, and the proposed ATEN scheme, is that ATEN will be obliged to conduct a comprehensive product appraisal for every application. The applicant will present and describe the product or system, together with its scope of intended use, and the ATEN evaluation process will identify the performance requirements the product or system must satisfy, and the form of evidence required. The scope of evaluation cannot be influenced by the applicant. It will be up to the ATEN process to determine how the product demonstrates fitness-for-purpose and how this is described in the Appraisal Report.

A narrow evaluation may be satisfactory if the suitabilities and unsuitabilities of the product are carefully and consistently documented. A comprehensive evaluation has the advantage of being more reliable and more consistent. For the ATEN process to be effective, a procedure or protocol may be required to address *performance gaps* so that the in-service fitness-for-purpose is assured.

I.6.1.2 Comparison between CodeMark and Proposed ATEN scheme

Table I-3 provides a comparison between CodeMark and proposed ATEN scheme. The key attributes of the ATEN evaluation and its distinction from CodeMark includes:

- Brings thoroughness and consistency to the product appraisal process;
- Always starts with fitness for purpose;
- Considers every performance requirement related to the intended use;
- Considers the possibility of gaps in the performance requirements;
- Can be narrowed in relation to intended use but cannot be narrowed in scope;
- Does not respond purely to the scope requested by the applicant;
- Selects the most appropriate path to meet every performance requirement, and
- Provides expert assessment of every matter that affects the suitability of the product to be used in any application in any building for which its supplier claims it to be suitable.
- When fully developed, will include product quality monitoring and market surveillance mechanisms weighted according to the public risk involved in under-performance.

Table I-3: Comparison of CodeMark and ATEN schemes

ISSUE	CODEMARK (AS PRACTISED)	COMPARISON	ATEN (AS PROPOSED)	REMARKS
Objective	To provide confidence to regulatory authorities and the market about the conformance of Certified Products with the requirements of the BCA.	Schemes have similar objectives.	To provide a comprehensive, holistic technical evaluation service in relation to generic building solutions falling within the NCC.	
Scope	A voluntary third-party certification scheme that authorises the use of Products in specified circumstances in order to facilitate compliance with specified provisions of the BCA.	CodeMark Australia focus on BCA compliance vs ATEN focus on fitness for purpose.	A voluntary product evaluation service examining all product or system attributes that influence fitness-for-purpose in an Australian building.	Key distinction
Functional role	Generates Certificates of Conformity that facilitate certifier approval of products and systems in defined circumstances.	CodeMark Australia produces certificate while ATEN produces appraisal/evaluation report.	Generates Appraisal Reports that may be used within an assessment method under NCC Part A2.2 or A2.3.	
Acceptability	Automatic (subject to state/territory legislative discretion).	CodeMark Australia has legislative support.	Optional <i>evidence of suitability</i> under NCC Part A5.2.	
Legal status	CofC referred to in state regulations – mandatory acceptance.		Technical opinion for consideration by the appropriate authorities, or via a certifying intermediary.	CodeMark CB may certify using ATEN appraisal report
Claims to be evaluated	To be decided by applicants.	CodeMark Australia limited to applicant's claim while ATEN cannot be limited.	To be decided by ATEN based on intended use proposed by applicants and verified by ATEN.	Key distinction
Evidence to be considered	To be decided by applicants.	CodeMark Australia limited to applicant's evidence while ATEN cannot be limited.	To be determined by ATEN.	Key distinction
Outcome – published	Certificate of Conformity – one to ten-page summary, with supporting reference material disclosed at the discretion of the applicant.	CodeMark Australia certificate in standard format vs more detailed ATEN report.	Appraisal Report – full report with evaluation details (e.g. all testing and analysis findings).	
Outcome - restricted	Evaluation report and supporting evidence examined. (Supporting evidence may be available at discretion of applicant).	CodeMark Australia supporting evidence is less visible at discretion of applicant.	Minimal. Some material may be permitted to be confidential.	

ISSUE	CODEMARK (AS PRACTISED)	COMPARISON	ATEN (AS PROPOSED)	REMARKS
Risk assessment	Use to assess the chance of problems in manufacturing and installation (Version 2009.1 – omitted in version 2016.1).	CodeMark Australia evaluations not risk assessed at all vs ATEN with risk focus	Use to assess: (i) chance of high-risk application to increase the level of market surveillance, (ii) assess the situation when non-compliance occurs.	Risk-based approach is more efficient and reliable
Assessment methodology	Single level assessment.		Multiple level assessment (in line with international practice).	Single level means not risk based (i.e. same process and rigour for a letterbox as for an ACP)
Scheme structure	scheme owner (ABCB) Accreditation Body (JAS-ANZ) Administrator (JAS-ANZ) Accredited Certification Bodies (currently 5)	Significantly different structures, each fit-for-purpose.	Scheme rules ATEN structure and governance TBA.	
Scheme operation	ACBs operate autonomously within specified rules, directives, protocols and guidelines, subject to audit and penalties.	Too early to assess.	Expected that ATEN manages all projects.	ATEN structure and governance TBA
Scheme owner	Government (COAG)	Government vs private.	TBA. May be a consortium of not-for-profit bodies operating under a partnership agreement.	Role of commercial testing organisations to be considered
Scheme administrator	Government-appointed body (JASANZ)	Government vs private.	ATEN	ATEN legal structure TBA
Scheme accreditation body	Government-appointed body (JASANZ)	Government vs private.	N/A	Government oversight is considered valuable in CodeMark Australia.
Certification bodies	As accredited by scheme accreditation body. Unlimited number, currently 5 CBs potentially operating at different levels of stringency.	Multiple CodeMark Australia CBs vs single ATEN.	ATEN – single entity with assessment based on pools of testing organisations and technical experts operated on ATEN guidelines.	
Relationships with testing entities and service providers	None, but evidence favours entities defined in Part A5.		ATEN registered Network Members operating under published listing protocol.	
<i>Evidence of suitability</i> (in accordance with current NCC)	Tightly bound to NCC Part A5.		NCC Part A5 plus expert judgement.	

TBA: To be advised

I.7 Supporting Documents

I.7.1 Brief assessment of a sample of CodeMark Australia Certificates

I.7.1.1 Purpose

The assessment was carried out to gain an impression of consistency or variability in the conformity certification process. The CodeMark Australia Scheme Rules of necessity allow Certification Bodies some flexibility to exercise their skill and judgement in evaluating products. This flexibility is good for professional practice but may lead to variability in how clearly each certificate communicates the critical conformity factors to the user.

I.7.1.2 Sampling

Two certificates were selected from each of the Certification Bodies currently accredited (as at June 2019) by JAS-ANZ under the CodeMark Australia scheme.

The certificates were selected as ones evaluating significant building elements and systems in a range of building classes.

The certificates were reviewed and summarised having regard to the CodeMark Australia Scheme Rules and directions contained in the scheme document *Information Required on a Certificate of Conformity* published and maintained by the ABCB (as scheme owner).

The focus of review of each certificate was on those factors stated, in CodeMark Australia Scheme Rules and directions, to be critical or important to certification quality and clarity. See Section I.7.3.

Manufacturers' literature referenced in the Certificate was *not* examined as part of the review.

The sampled certificates are listed in Table I-1 below. A brief description of the scope and detail of each certificate follows the table. To avoid identifying particular certificates, a coding system has been used for CodeMark Certificates (CC), Certification Bodies (CB) and Certificate Holders (CH).

Table I-4: Sample of CodeMark Australia Certificates

Cert Number	Date Issued	Cert Body	Cert Holder	Product Type	BCA Version ¹	BCA Vols	Application Risk	Clarity of Intended Use ²	Evaluation Quality ³	Reports ⁴ Referenced	Reports Confidential? ⁵
CC1	08/2018	CB1	CH1	Waterproofing panels	BCA 2016 Amdt 1	One & Two	High	Medium	Low	4	No
CC2	09/2018	CB1	CH2	Fire-rated boundary wall	BCA 2016 Amdt 1	Two	High	High	Medium	6	No
CC3	11/2018	CB2	CH3	External wall panel	BCA 2016 Amdt 1	One & Two	High	High	Medium	14	Yes
CC4	07/2018	CB2	CH4	Bulk insulation	BCA 2016 Amdt 1	One & Two	Low	Medium	Low	11	No
CC5	04/2019	CB3	CH5	Wall panels	BCA 2016 Amdt 1	One & Two	High	Medium	Low	4	Yes
CC6	07/2018	CB3	CH6	Wall panel	BCA 2016 Amdt 1	One & Two	High	Low	Medium	2	Yes
CC7	12/2018	CB4	CH7	Termite resistant framing	BCA 2016	One & Two	Medium	High	Medium	7	Yes
CC8	06/2019	CB4	CH8	External wall cladding (non-cavity)	BCA 2019	Two	High	High	High	16	No
CC9	03/2018	CB5	CH9	Wall sarking	BCA 2016	One & Two	Medium	High	High	1	No
CC10	03/2019	CB5	CH8	External wall cladding (cavity)	BCA 2016	Two	High	High	Medium	1	Yes

Notes

1. BCA 2016 Amendment 1 came into force on 12/03/2018.
2. Assessed by reference only to the Certificate itself, including the stated limitations and conditions.
3. Assessment, evidence and reporting in relation to product performance claims and scheme rules.
4. Excludes reports authored by the Certificate Holder.
5. If not stated, assumed not to be confidential.

CC1

- The certificate describes a panel system intended to be used as a waterproofing and tile substrate system in wet areas.
- The system may, or may not, be a complete *waterproofing system* without the installation of a conforming waterproofing membrane to AS 3740, as noted in Condition 2.
- The referenced evaluation reports describe the waterproofing tests, but it is not clear whether the certified product or the AS 3740 system provides the waterproofing attributes.
- Further structural tests are noted under items A3 and A6 but did not form part of the evaluation.
- The evaluation methods state that assessment is against the performance requirements, but no performance requirements (only *DTS* provisions) are listed on the certificate.
- The listed reports include a one-line summary of the context of each report.
- The reports listed do not mention confidentiality.

CC2

- The certificate describes a residential boundary wall system intended for use where an external FRL of 60/60/60 is required.
- The scope is limited to fire, bushfire and thermal performance and does not consider structural or weatherproofing aspects. However, AS 1684 construction is stated as a condition.
- The certificate references multiple CSIRO FRL tests and opinions but does not list the actual test report in which the FRL 60/60/60 was achieved. It does refer to this report under the engineering report.
- The evaluation methods state that assessment is against the performance requirements, but no performance requirements (only *DTS* provisions) are listed on the certificate.
- The listed reports include a one-line summary of the context of each report.
- The reports listed do not mention confidentiality.

CC3

- The certificate describes a laminated panel system 60 mm thick comprising composite layers.
- It is intended for use as a non-load bearing external wall system in Class 2-9 buildings and as a load-bearing system in Class 1 and 10 buildings.
- BCA provisions covered are structural, weatherproofing, rising damp and spread of fire.
- The certificate is quite systematic in its evaluation path and contains detailed application conditions, limitations and exclusions.
- The limitations and conditions section include evaluation results (e.g. FRLs) which belong elsewhere in the certificate (i.e. in the BCA claims on page 1).
- The listed provisions are comprehensively cross-referenced to the supporting reports, but the supporting reports do not have brief statements of relevance, as required by the directive.
- The reports are confidential.

CC4

- The certificate describes non-combustible thermal insulation for roofs, ceilings, external walls, internal walls and floors of residential and commercial construction.
- In addition to thermal insulation, the certificate makes very broad conformity claims in weatherproofing, rising damp, bushfire construction and non-combustibility. These broad claims are not narrowed by the conditions and limitations.

- It is unclear why the product needs a CodeMark certificate. The listing of a complete catalogue of dimensions and specifications in Table A1 suggests a marketing purpose, as the CodeMark certificate acts like a ready reference for builders and specifiers.
- The references cited are reports of fire and thermal performance tests, and it is reasonably clear from the summary what was actually tested.
- There are anomalies in the assessment methods and associated evidence, eg AS/NZS 4859.1 and AS 3999 are listed as evidence of conformity with weatherproofing (P2.2.2) and dampness provisions (P2.2.3); fire test reports are listed as evidence of compliance with bushfire provisions (P2.3.4).
- The reports listed do not mention confidentiality.

CC5

- The certificate describes wall and floor panels for application in all building types.
- It covers structural, weatherproofing and fire resistance provisions of the BCA.
- The Description of Product (A2) includes cold formed steel support framing only. However, the Product Specification (A3) relates only to timber framing and notes that any variations to the specification are outside the scope of the Certificate.
- There is no clear linkage between BCA compliance claims and the reports list, and the reports do not include explanatory statements as required by the directive.
- The reports list (B2) includes entries on wind load testing and façade testing. The wind load test entry (dated 2017) refers to AS 4040:1992 which relates to tests on sheeting materials, specifically metal, fibre-cement and plastics.
- The building façade testing entry (dated 2013) contains no clue as to what was tested or whether it passed. The referenced reports are confidential.
- The Certificate contains (on page 2) an expanded warning and disclaimer regarding possible partial coverage of the certificate. This expanded wording does not appear on the other certificates sampled.

CC6

- The certificate describes a structural insulated panel system with no specified finishing system.
- It appears to be intended for use in roofs, floors and walls in all building classes, excluding weatherproofing and openings. However, the structural claims are limited to BCA Volume Two and fire properties have not been assessed.
- Limitation 1 is a garbled sentence and Limitation 5 contains a (now prohibited) disclaimer.
- It claims assessment of structural performance under dead, live, wind (non-cyclonic) and earthquake (housing) loads, relying on a single engineering report.
- It also claims thermal efficiency values for a range of product thicknesses.
- There is no clear linkage between the compliance claims and reports and no explanatory statement for each report.
- The referenced reports are confidential.

CC7

- The certificate describes framing for internal above ground use in all building classes.
- It is limited to use on sites south of the Tropic of Capricorn and within 50 km of Rockhampton.
- The actual material is described on the certificate, but its properties are not assessed.
- Its scope is tightly limited to the termite resistance component of P2.1.1 and does not extend to structural performance claims.
- The evaluation methods and associated confidential reports are restricted to termite resistance.

CC8

- The certificate describes a wall cladding system for Class 1 and 10 buildings up to wind class N3 (or, possibly, N4).

- Its scope encompasses structural properties, weatherproofing, bushfire resistance and thermal insulation. The limitations and conditions are clearly articulated.
- It includes detailed product specifications, installation conditions and precautions, in the manner of a product brochure.
- The extensive supporting reports appear comprehensive, including a one-line summary of the report, but a clear linkage to claims is not made. The reports are not indicated to be confidential.

CC9

- The certificate describes a wall sarking material for intended use on all building classes with steel or timber framing, brick or clad construction, up to wind class N3.
- Its scope covers weatherproofing (water penetration) and bushfire construction suitability. It is basically a certification of an AS/NZS 4200.1 membrane material.
- It includes detailed product specifications, installation conditions and precautions, in the manner of a product brochure.
- The assessment is comprehensive and includes fitness-for-purpose factors such as installation practicality and durability for which no performance is sought.
- It is supported by a single appraisal report including a detailed list of specific factors evaluated and there is no indication of confidentiality.

CC10

- The certificate describes a cladding system installed over battens to form a drained cavity external wall cladding on Class 1 and 10 buildings up to 3 storeys and wind class N3.
- The scope appears to cover structural and weatherproofing properties on buildings constructed from timber or steel framing with aluminium window and doors. No fire or bushfire claims are made.
- (Note that this scope is narrower than assessed by CB4 for the non-cavity form of this product – CC8)
- It includes detailed product specifications, installation conditions and precautions, in the manner of a product brochure. Part A6 greatly expands the *apparent* claims to include fire and bushfire.
- The assessment appears comprehensive and includes numerous fitness-for-purpose factors such as installation practicality, fire properties and thermal characteristics for which no conformity certification is sought.
- Weatherproofing assessment is rather vague and does not specify the method of assessment e.g. BCA verification method. Structural claims appear to be limited to wind resistance.
- It is supported by a single confidential appraisal report including a list of specific factors evaluated but without clear connection to the broad claims.

I.7.2 Summary of CodeMark Australia scheme process & reporting requirements

I.7.2.1 CodeMark Australia Scheme Rules – Section 4 (Version 2016.1, undated)

Based on a review of this Section, a Certification Body must:

- Evaluate applications in accordance with:
 - Section 4 rules
 - BCA requirements
 - State/Territory legislation
 - scheme Administrator directions.
- Verify ongoing compliance of Certificate Holders with the rules
- Act in accordance with ISO 17065:2012 and additional rules in Section 4
- Establish requirements for and receive applications that include:
 - Product details
 - Manufacturing details

- Product Quality Plan
- Product intended use
- Specific BCA provisions product complies with
- Examine product, uses and installation to determine:
 - the application of the product
 - that its claims can be evaluated, and
 - the appropriate method of evaluation
- Agree with applicant on scope of application
- Prepare evaluation plan (with timeframe and cost) including:
 - Defined scope of use of product
 - BCA provisions against which compliance is claimed [*BY THE APPLICANT*]
 - Evaluation of any performance requirements using the CodeMark Protocol
 - Means for demonstrating conformance
 - Assessment of Product Quality Plan
 - Surveillance Protocols
- Follow the evaluation plan using:
 - Appropriate determination activities
 - Representative samples of the product as used or installed
- Determine whether the relevant requirements of the BCA have been met, taking into account the nature and significance of identified product non-conformities
- Not issue a Certificate until critical or major non-conformities have been corrected.
- Document evaluation activities and prepare a report including:
 - All evaluation aspects and non-conformities
 - Recommendations for improvement identified during evaluation
 - The product's compliance with the requirements of the BCA

I.7.2.2 CodeMark Australia - Information Required on a Certificate of Conformity (V 1.02, May 2019)

This document is a formal directive to Certification Bodies as to the completion of Certificates of Conformity, as stated in Rule C7.7.6. It appears to be updated when required editorially (eg when referenced BCA clauses change with the amendment cycle) and occasionally to address corrective matters. It has an administrative focus, guiding CBs as to what should and should not appear in specific fields of the CofC Template. It does not modify the Scheme Rules but interprets and clarifies their meaning for the purposes of this Certificate.

Based on a review of this document, the following items bear directly on how consistently assessments are carried out by CBs and how clearly they are reported in the required certification format (page numbers refer to the ABCB document, not to the CofC template):

Page 4: Evaluation approach

- **What the product is or is not** - *establish purposes, uses and limitations of the product*
- **What claims of BCA compliance are being made** - *identify all applicable BCA requirements for the product.*
- **What documentation is presented to support claims of BCA compliance** – *evidence of suitability, including Protocol where assessment is against PRs.*

Pages 6-8: BCA compliance claims

- Critical field - purpose is to identify the BCA provisions the product does or does not comply with
- Obscure, general claims not to be made

- Must nominate BCA Performance Requirements or specific *DTS* provisions plus a descriptor for each claim
- Where product meets only a proportion of a requirement (eg an R-value), this must be noted in this section against the partial claim
- Where product meets PR other than via *DTS* claim, list only the PR
- Where product meets only one part or sub-clause of a requirement, that part must be specifically identified and, if *DTS*, the associated PR must not be listed.
- State Variations must be considered and listed if product meets them.

Page 9: Limitations and conditions

- Critical field - used to describe in what situations the product can and cannot be used
- Important to consider consequences if product is used under conditions or in situations for which it is not fit-for-purpose
- Must not include CB disclaimers [this direction was added in the May 2019 version]

Page 9: Building classification(s)

- Must nominate specific classes/subclasses, as appropriate
- Types of Construction must not be listed here

Page 10: Appendix A1 Type and intended use of product

- Expanded field for additional material, where required, but not for promotional material

Page 10: Appendix A2 Description of product

- Expanded field for additional description such as figures & illustrations to assist in describing products
- Not to contain unnecessary or irrelevant information

Page 11: Appendix A3 Product specification

- Can include some information unrelated to BCA claims, but not so as to mislead reader

Page 11: Appendix A5 Installation requirements

- Where reference is to published manuals or guides, they are not to conflict with information on the certificate, including limitations and conditions

Page 11-12: Appendix B1 Evaluation methods

- Claims against any PR must be evaluated using the CodeMark Protocol

Page 12: Appendix B2 Reports

- Must be clear connection between reports and BCA claims
- Each reference must fully identify the report and reporting body, and must include a brief statement on its relevance to the BCA claim
- For NATA reports, must include NATA laboratory accreditation number

Comments

There is potential inconsistency between the process requirements stated in the following CodeMark Australia scheme clauses:

C7.4.1.1: The evaluation must include ... all requirements or provisions of the BCA ... against which compliance is claimed.

This Clause supports the interpretation that the applicant's claims, not the views of the Certification Body, are central to the evaluation scope.

C7.4.4.1: In determining whether the relevant requirements of the BCA have been met, the person undertaking the evaluation...

This Clause hinges on the meaning of “relevant requirements”. If it means “relevant to the claim” there is no inconsistency. If it means “relevant to fitness for purpose”, there is an inconsistency.

C7.4.9.1: The evaluation report must include ... the Product's compliance with the requirements of the BCA.

This Clause is more specific, and harder to narrow just to the agreed compliance claims. However, it could still mean “... requirements of the BCA relevant to the evaluation scope”.

Taking into account the Scheme Rules and CofC Required Information, it seems clear that the intention of the scheme is to:

- Leave the control of the evaluation scope in the hands of the applicant;
- Require Certificates of Conformity to be clear and not misleading, and
- Regardless of the evaluation scope, require the Certification Body to:
 - Identify and describe the purpose(s) for which the product/system is and is not fit, and
 - Consider the consequences of product/system use in situations for which it is unfit.

The last of these points appears to be a significant source of variability in the content of a sample of Certificates of Conformity issued under the CodeMark Australia scheme. See Section I.7.1.

I.7.3 BCA 2019 Performance requirements, assessment methods and evidence of suitability

Meeting Performance Requirements [A2.1]

To meet each Performance Requirement requires:

- A Performance Solution (PS), or
- A Deemed-to-Satisfy (DTS) Solution, or
- A combination of PS and DTS.

Assessment Methods

For PS:

- Evidence of suitability to Part A5 [A2.2(2)(a)], or
- A Verification Method (VM) [A2.2(2)(b)], or
- Expert judgement [A2.2(2)(c)], or
- Comparison with DTS provisions [A2.2(2)(d)].

For DTS, NCC Volume One buildings:

- Evidence of suitability to Part A5 [A2.3(2)(a)], or
- Expert judgement [A2.3(2)(b)]

For DTS, NCC Volume Two buildings:

- An Acceptable Construction Manual [A2.3(3)(a)], or
- An Acceptable Construction Practice [A2.3(3)(a)], and
- Evidence of suitability to Part A5 [A2.3(2)(a)], or
- Expert judgement [A2.3(2)(b)].

Suitability [A5.0]

- Materials/products/forms of construction/designs fit for their intended purpose, and
 - Supported by evidence (A5.1, A5.2 below), and

- Constructed or installed in an appropriate manner.

Evidence of Suitability [A5.1, A5.2]:

- Evidence must be appropriate to material/product/form of construction, and
- Documentary evidence must be complete copy of original

Forms of evidence for PS or DTS - any of the following:

- CodeMark Australia or CodeMark certificate [*noting that recipient must check coverage and conditions*]
- Certificate of Accreditation [*by state or territory accreditation authority*]
- Certificate issued by Certification Body [*JAS-ANZ -accredited, non-CodeMark*]
- Report by Accredited Testing Laboratory [*NATA accredited or recognised*]
- Certificate from Engineer or appropriate person [*recognised by state/territory*]
- Product Technical Statement or similar [*typically manufacturer or supplier*]

Appendix J

Preliminary ATEN protocol for technical evaluation

Foreword

This Appendix outlines the proposed preliminary protocol for the technical evaluation of the ATEN scheme. The purpose of this protocol for technical evaluation is to demonstrate that the product under evaluation is fit-for-purpose based on the NCC provisions and/or other relevant specifications. The procedure for certain performance aspects of a product that can be evaluated using the NCC *DTS* path is outlined in Section 3. This involves the use of NCC referenced documents for calculation or testing or a combination of both. The procedure for certain performance aspects of a product that cannot be evaluated using the NCC *DTS* path is outlined in Section 4. This may involve newly established procedures for calculation and testing or a combination of both. The use of *DTS* or *performance solution* paths are not mutually exclusive. For some situations, it is necessary to combine both in an evaluation. Regardless of the path taken, it is important to verify that the samples submitted for evaluation are conforming to the manufacturing specification of the product.

J.1 Scope

This protocol describes procedures to be used in the evaluation of building products.

Building products, for the purpose of this document, are defined as material, components, sub-assemblies or building systems that have been accepted for evaluation under Australian Technical Evaluation Network (ATEN) Scheme Rules.

The purpose of the evaluation is to confirm that the products are fit-for-purpose using the National Construction Code provisions and/or other relevant specifications as the criteria for acceptance.

J.2 General procedure

The following general procedure should be followed:

1. Identify what are the intended uses of the product from information provided by the applicant.
2. Identify where products may be dependent on other products/systems in order to meet their intended use (specifically where they form sub-assemblies or components in a building system).
3. Identify the relevant performance requirements for the intended uses.
4. If aspects of relevant performance requirements are to be excluded from the evaluation, the reasons and justification for their exclusion must be explicitly stated in the evaluation report with justifications.
5. Aspects of performance to be evaluated using the *deemed-to-satisfy* path (i.e. where NCC referenced documents will be used), shall be evaluated in accordance with Section 3 of this Protocol.

6. Aspects of performance to be evaluated using the *performance* path shall be evaluated in accordance with Section 4 of this Protocol.
7. The outcomes from the evaluation shall be included in the Appraisal Report. The Appraisal Report shall be provided in accordance with the ATEN Appraisal Report template. Elements from the evaluation to be included in the Appraisal Report include:
 - (i) description of the intended use,
 - (ii) the relevant performance requirements,
 - (iii) the evaluation method and the outcomes of the evaluation.

J.3 Procedure for DTS path

The following is the procedure for *DTS* path:

1. Verify that the relevant NCC referenced documents are appropriate for the evaluation of the products.
2. Identify required key product properties with reference to their fitness in relation to the underlying performance requirements.
3. Verify that the product samples submitted for evaluation conform to the manufacturing specification with reference to key product properties.
4. Any testing shall be reported in accordance with the testing protocol.

J.4 Procedure for performance path

The following is the procedure for *performance* path:

1. Establish evaluation procedure/s for each performance requirement.
2. Evidence to support the *assessment method* shall be provided by individual(s) recognised by ATEN as competent in the particular subject matter.
3. NCC *verification methods* shall be used in the evaluation if appropriate.
4. If there is no appropriate NCC *verification method*, one of the following options shall be used (in order of preference):
 - a. Establish an appropriate *verification method* with the following steps:
 - (i) Establish the intended use of the product.
 - (ii) Identify the performance characteristics required to satisfy the intended use
 - (iii) Identify the parameters that can be used to describe the required performance characteristics.
 - (iv) Establish means for evaluation of the parameters which could be by testing, calculation or a combination of both.
 - (v) Establish criteria for acceptance.
 - b. Comparison with *DTS* provision with the following steps:
 - (i) Identify the parameters that describe the required performance from the *DTS* solutions.
 - (ii) Establish the means for evaluation of the parameters (which may include testing, calculation or a combination of both).

- (iii) Establish the values of the parameters from the *DTS* solutions.
 - (iv) Establish the values of the parameters for the corresponding *performance solution*.
 - (v) Establish criteria for acceptance.
- c. Expert Judgement
- (i) ATEN shall assign an expert relevant to the information developed in Section 2 (step 1).
 - (ii) Expert Judgement shall be used only when the performance parameters cannot be identified or evaluated.
 - (iii) The expert shall set out the basis for their judgement.

Note:

1. Parameters should be physical properties that can be evaluated for traditional engineering issues (e.g. mechanical or chemical properties of materials etc.), or indicators for sustainability issues (e.g. greenhouse gas emission, ozone depletion properties etc.)

2. Means for evaluation of the parameters should be described: established means (e.g. standard testing or calculation methods) by appropriate referencing, if new then it should be reported as part of the evidence for the Evaluation Method

5. Verify that the samples submitted for evaluation conforms to the manufacturing specification by performing Step 3.2, 3.3 and 3.4.

Note:

Testing procedures required for this step may be different from those adopted for performance evaluation.

Appendix K

Preliminary ATEN laboratory report template

Foreword

This Appendix provides a preliminary template for an ATEN laboratory report. The objective of the template is to have a consistent format across all laboratory reports conducted from recognised laboratories from the ATEN network. Independent third-party testing from ATEN network which supports transparency of test procedures and results and repeatability of testing procedures for similar type of products for reliability and consistency.

Title of Test Report (Report Number)

Name of testing facility	
Details of testing facility	Insert address, telephone, email and website
Tests were conducted by:	Insert names, positions, qualifications and signatures
Report Authorisation:	<p>Author: Insert name, position, qualification, signature and date</p> <p>Reviewed by: Insert name, position, qualification, signature and date</p> <p>Authorised by: Insert name, position, qualification, signature and date</p>
Date(s) of tests conducted:	DD/MM/YYYY
Date of report:	<p>Insert date of issue</p> <p>Insert date of expiry (for e.g. 3 years)</p>
This report was prepared for:	Insert name and address of client
Report status and revision history:	

K.1 Introduction

K.1.1 Aims of test

Describe the purpose and aims of test.

K.1.2 Identification of specimen

A detailed description of the component or system being tested, providing identification of the specific type of component or system and including, the name of supplier or the manufacturer (or both), the date of manufacture, the batch number etc.

K.1.3 Rules of engagement for testing

Outline rules of engagement, for example:

- Testing facility to be involved in the sampling process.
- Results of every test conducted shall be included, if they are excluded, a clear explanation/ justification shall be provided.

K.2 Test description

K.2.1 Test samples

A description of sample selection process and where relevant, orientation and conditioning for test. A detailed description of the geometry and material characteristics of the component or system being tested, including, where appropriate the dimensions, the materials, the coating and strength values.

Include reference to *Appendix 1*

K.2.2 Test Setup

A detailed description of the test arrangement, including instrumentation layout and where relevant fixture geometry, the geometric positioning of the component or assembly in the test specimens, as illustrated by sketches or photographs.

Include reference to *Appendix 2*

K.2.3 Test procedure

A detailed description of the test procedure

Include reference to *Appendix 3*

K.3 Test Results

Summarise the test outcomes as given in *Appendix 3*

State the number of tests performed, state whether the results of every test conducted have been included.

The results of the test, covering the following, where relevant:

- The rate and direction of loading.
- The load at failure in the case of destructive testing.
- The mode of failure for each test.
- Any specific observations concerning the application of load.
- A description of the progress of the test, including the mode of failure and any permanent deformations.
- The details of the load deformation curves, so proportioned that if there has been any discontinuity or considerable departure from linearity during the progress of increasing the loads then this will be clearly evident.
- Any other relevant information such as signs of distress prior to failure.
- Properties of materials at the time of test.

Appendix 1 – test samples

Information to be provided in this Appendix must include the following as a minimum:

- Number of samples to be tested, identification of samples.
- Selection method, e.g. specially fabricated for the test or random selection from production line for prototype testing.
- Physical characteristics and dimensions of samples, including drawings, fabrication details and any special modifications for the purpose of testing.
- A statement indicating that the test samples represent the intended construction and any exceptions noted.

Appendix 2 – Test set-up

Information to be provided in this Appendix must include the following as a minimum:

- Design of test set-up: explain the reasons for the design of the test set-up including the construction and operation of the equipment, the installation of the test samples - a description of the tools employed for the component or assembly installation (where applicable), restraint devices. Photographs and drawings of the test set-up shall be included.
- Instrumentation: description of instrumentation and location of performance measuring devices for loads, reactions, deformations etc. including accuracy of the instruments.
- A statement indicating that the test set-up represents the condition of intended use and any exceptions noted.

Appendix 3 - Test procedure

Information to be provided in this Appendix must include the following as a minimum:

- Referenced test method – list relevant standards.
- Method of loading including loading rate, pre-loading condition.
- Method of obtaining test results and graphs, for e.g. load-displacement, temperature-time.

Appendix 4 - Test results

Information to be provided in this Appendix must include the following as a minimum:

- Critical observations, photographs included.

- Where relevant:
 - serviceability load and deformation at serviceability load,
 - failure load and description at failure including mode of failure, deformation at failure etc. for each specimen including observations on ductile or brittle failure mode, yielding, excessive deformation and other distortions, and
 - complete load- deformation graphs for each specimen.
- Field of application for test results -limitations on the use of the outcomes of the test results.

Appendix L

Preliminary ATEN protocol for risk assessment

Foreword

This Appendix outlines the proposed preliminary protocol for risk assessment of products. Risk assessment can be used as a tool at various stages of the conformity assessment process.

Section 1 focuses on protocol scope and application. Section 2 outlines the general risk assessment process. Section 3 outlines the use of risk assessment in determining the required appraisal level, i.e. the stringency of the conformity assessment process to be appropriate for the risk level that the community may be exposed to if the product (component or system) is non-conforming. Section 4 outlines the use of the risk assessment process when a product has been found as not fit-for-purpose.

The aim here is to decide what actions are to be taken appropriate to the level of risk associated with the product.

Editorial note: An example taken from DIBT is given here to illustrate the use of the protocol. An extract from BRANZ's risk assessment guideline is also provided for comparison.

L.1 Scope and Application

This protocol describes procedures to be used in the risk assessment of building products.

Risk assessment shall be used to determine what action to be taken when a product is found not fit-for-purpose.

L.2 General risk assessment procedure

Risk assessment shall be carried out in accordance with AS/NZS 4360: 2004 Risk management.

L.2.1 Establish the context

- The context of the assessment shall be established in accordance with the intended use of the product.
- The product only performs its function as part of the construction work/system.
- Different aspects of performance may need to be assessed separately.
- This risk assessment shall be made with reference to the requirements of the National Construction Code with objective for health, safety, amenity and sustainability. It shall not address general issues of consumer protection.

L.2.2 Identify risks

Identify the following:

- product,
- hazard, and
- interests at risk.

L.2.3 Analyse risks

Describe the likelihood of the relevant hazardous event and describe the consequences of the event.

L.2.4 Evaluate risks

The objective of the evaluation is a declaration *low*, *medium* or *high* risk in accordance with Table L-1.

Table L-1: Risk matrix

		Likelihood		
		Low	Medium	High
Consequence	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High

L.3 Risk assessment for the determination of surveillance level

The risk assessment can be carried out for a product, using qualitative analysis for the purpose of determining the appropriate surveillance level in accordance with ISO 17065.

Table L-2 shows an example of how the surveillance level can be adjusted to correspond to the risk level.

Table L-2: Example of adjusting surveillance level to correspond to risk level.

Risk level	Surveillance level
Low	Factory production control
Medium	Factory product control and post- and field surveillance
High	Factory product control, field surveillance, and audit

This will need to be further adjusted to suit ABCB's current development of requirements for high-risk applications.

L.4 Risk assessment when the product is not fit-for-purpose

This risk assessment shall be carried out only when there is evidence from market surveillance that the product is not fit-for-purpose.

The risk assessment shall be carried out using quantitative analysis.

The objective of the assessment is to provide the regulatory authority with a basis for determining and justifying appropriate measures.

L.5 Examples of risk assessment

L.5.1 Example 1: DIBt process when a product is found non-conforming.



A Identification of the risk

1. Identification of the construction product

Product type – batches if applicable	RWM 0815, batches 1555 – 1570	Unique identification code	RWM0815
Number of the declaration of performance	ABC-RWM0815/12.5.15	Manufacturer	Joe Bloggs GmbH Any Street 13 12345 Anytown
Technical specification	Smoke alarm device in accordance with EN 14604:2005/AC:2008		
Intended use	Fire safety		

2. Identification of the hazard

BWR	BWR 2 – Safety in case of fire
Essential characteristic	Nominal activation conditions/sensitivity response delay (response time) and performance under fire condition
(Sub)property	5.17 – Sound output
Description of the deviation	After 1 minute the measured sound emission was 3.3 dB, i.e. 8.1 dB below the limit; after 4 minutes it was 1.4 dB below the limit, i.e. 5 dB
Description of the failure mode	The sound output of the smoke alarm device is too low.

3. Identification of the public interests at risk

Life/health	at risk
Environment	at risk
Economy	at risk

B Analysis of the risk

4. Description of the relevant damage scenario (failure effect)	5. Description of the potential damage
<p>When it is triggered, the smoke alarm might not be heard in some circumstances (especially by persons with hearing impairment or in deep sleep).</p> <p>Scenario for life/health¹: Escape or rescue comes too late or is not possible.</p> <p>Scenario for environment: With prompt warning, it might still have been possible to contain the fire. Building burns down.</p> <p>Scenario for economy: With prompt warning, it might still have been possible to contain the fire. Building burns down.</p>	<p>Potential damage for life/health: Smoke inhalation/asphyxiation resulting in death.</p> <p>Potential damage for the environment: High CO2 emission, temporary air and groundwater contamination, creation of waste.</p> <p>Potential damage to economy: High one-time costs for demolition and reconstruction.</p>

C Assessment of the risk									
6. Assessment of the effect in the damage scenario			7. Assessment of the severity of the damage						
Sound output is a decisive property. A deviation in it can entail unfavourable effects alone . A difference of 10 dB is perceived as a reduction of the volume by half. Thus a difference of 8.1 dB below the <i>minimum</i> sound pressure is a significant difference. Persons with hearing impairment or in deep sleep may not hear the alarm.			can result in death						
Classification of effect:	4		Degree of severity of the damage:	E					
8. Determination of the degree of risk									
Degree of the failure effect					Degree of severity of the damage	<table border="1"> <tr><td>Low risk</td></tr> <tr><td>Medium risk</td></tr> <tr><td>Serious risk</td></tr> </table>	Low risk	Medium risk	Serious risk
Low risk									
Medium risk									
Serious risk									
1	2	3	4	5					
			X				E		
					D				
					C				
					B				
					A				
Result:									
The construction product presents a			serious		risk.				

L.5.2 Example 2: BRANZ CodeMark Risk Assessment Process (not part of Australian CodeMark scheme)





RISK ASSESSMENT

PURPOSE

The purpose of the risk analysis is to assess the chance of a problem occurring that will have an impact on the performance of the Product in terms of the specific requirements of the NZBC/BCA including any relevant State and Territory variations and additions.

FACTORS CONSIDERED IN THE RISK ANALYSIS WILL INCLUDE:

- Nature of product: i.e. history of use, innovation, type, function (Building Code performances), history of quality, complexity, variability, location, exposure and in-service conditions, hazardous material;
- Nature of Certificate Holder: i.e. manufacturer, importer, marketer, supplier;
- Nature of manufacture: i.e. Variability of raw materials; Complexity of manufacture; number of employees involved with production and quality control; Supply of materials for manufacture; Number of sites involved in manufacture;
- Manufacturing Quality Plan;
- Extent and nature of sampling and testing;
- The need for BRANZ sampling and testing;
- Assembly quality;
- Supply of materials and components not by supplier;
- Building Code – claimed performances (considering all relevant clauses);
- Quality of building or building parts, to which the product is incorporated, assembled, applied or installed;
- Issues of public safety;
- Design process and skills;
- Handling and storage sensitivity;
- Packaging and distribution;
- Sequence of construction and importance;
- Interfaces;
- Construction site installation complexity and skill levels;
- Site finishing;
- Commissioning;
- The importance of aesthetics to the owner;
- Consumer protection;
- Detrimental conditions for installation;
- Effect of exposure to elements or physical damage before, during and after installation;
- Susceptibility to deterioration, damage and misuse;
- The degree of, and the dependence on, maintenance.
- Ease or difficulty for repair or replacement, (rectification).

Level of Risk

The level of risk is assessed in terms of the magnitude of the consequence and the likelihood of a problem occurring. This will be considered as the product as a whole in the building, components and materials that make the product, manufacturing and installation process.

A BRANZ Risk Assessment Matrix will be used to assist in determining the level of risk.

RISK ASSESSMENT PROCESS

The risk identification, risk assessment analysis, risk treatment and management will be recorded in the Evaluation Plan.

A justification of the risk assessment will form part of the documented Evaluation Plan development process and Annual Review.

Australian Technical Evaluation Network (ATEN)

Add:
Tel:
Email:
Website:

ATEN

Appendix M

Preliminary ATEN Appraisal Report template

Foreword

This Appendix provides a preliminary template for an ATEN Appraisal Report. The objective of the template is to have a consistent format across all Appraisal Reports and transparency in information presented which promotes greater robustness in decision making by engineers, building surveyors and regulators.

Australian Technical Appraisal – ATA (Report No.)

Trade name of product	Insert trade name of product
Name of product supplier	Insert name and contact details of product supplier
Generic type and use of product	Insert brief description of type and use of product
Validity From To	Insert date of issue Insert date of expiry (for e.g. 3 years)
Manufacturing plant(s)	Insert name(s) and address(es) of manufacturing plant(s) of the product
This appraisal report contains	Insert number of pages including number of Appendices that are an integral part of the document.
Revision history	List revision number and history if applicable

M.1 General conditions

M.1.1 Basis of appraisal

This Appraisal Report provides a technical evaluation of a product in terms of its fitness-for-purpose for its intended use.

The appraisal has been carried out in accordance with the relevant performance requirements of the National Construction Code 2019 with Part A2 Acceptance of design and construction and/or other relevant specifications as listed below.

Other relevant specifications: (list other relevant specifications if applicable)

This Appraisal Report is based on the product having:

- (i) Quality assurance plan and an installation guide as described in Section 3,
- (ii) product technical specification described in Section 4, and
- (iii) test/calculation data described in Section 5.

The approval of this product for a specific use remains with the appropriate authorised approval body.

This Appraisal Report is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this appraisal report.

Reproduction of this Appraisal Report including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of ATEN. In this case, partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the appraisal report.

M.1.2 Scope

Outline scope of appraisal and limitations.

M.2 Specific conditions

M.2.1 Definition of product and intended use

M.2.1.1 Definition of product

Insert an essential (enough for identification) description of the product or range of products that are to be appraised. Make reference to Section 4 for a more complete description, including illustration of product and intended use.

M.2.1.2 Intended use and relevant performance requirements

NCC performance requirements relevant to the product are listed in Column A of Table M-1 and Table M-2 of Section 6. For the purpose of this Appraisal Report, only the performance requirements listed in Column C of the tables are assessed. Therefore, the intended use of this product is limited to (insert Building Classification/Type etc. and any other limitations or exclusions). Other relevant specifications beyond the NCC are also listed if they exist.

M.2.2 Characteristics of product and methods of verification

M.2.2.1 Characteristics of product

Insert a description of technical characteristics of product that are required to be appraised (for example mechanical resistance, stability and safety for use in fire) and whether demonstration of conformance can be carried out under *DTS* or *performance* provisions of the NCC. Characteristic material values, dimensions and tolerances must correspond to drawings and provisions given in Section 4 of this appraisal report.

M.2.2.2 Methods of verification

For aspects of performance that can be assessed under *DTS* provisions, provide the relevant Clause Number and/or NCC referenced documents.

For aspects of performance that must be assessed under *performance* provisions, describe the proposed method for verification or relevant references.

Some product may require both types of examination for different performance aspects.

M.2.3 Product Evaluation

M.2.3.1 Responsibilities of applicant

The applicant is responsible for providing information relating to the manufacturing of the product. These include factory production control, frequency of tests conducted during production for: (i) dimensions of component parts, (ii) material properties and (iii) assembly.

The applicant shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the applicant shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this Appraisal Report. The applicant may only use initial/raw/constituent materials stated in the technical documentation of this Appraisal Report.

The factory production control shall be in accordance with the control plan which is part of the technical documentation of this Appraisal Report. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

The control plan for the above shall be prepared by the applicant and handed to ATEN.

The applicant is also responsible to inform ATEN of any change's fabrication, factory control etc. so that ATEN can assess whether these changes affect the validity of the Appraisal report.

M.2.3.2 Responsibilities of testing facilities

Insert an outline of the responsibilities of the testing facilities.

This may include sampling, preparation of test approach, data analysis, computations, etc...

These activities are to be carried out in accordance with the provisions laid down in the control plan.

M.3 Appraisal conditions

Provide the conditions under which the appraisal is conducted.

M.3.1 Manufacturing

Insert the manufacturing conditions and the quality plan as documented and given to ATEN. Any changes to the product or to the manufacturing process are to be notified to ATEN before the changes are introduced. The ATEN will then decide whether such changes will affect the validity of the appraisal and/or whether further assessment is necessary.

M.3.2 Installation

Correct installation is essential to ensure that the product will function properly. Insert a reference to the installation specification as provided by the manufacturer/supplier plus any other instructions deemed necessary – Refer to Section 4 for details

M.3.3 Relevant NCC Clauses and/or other relevant specifications

The relevant NCC Clauses that have been examined are:

(provide a list)

The relevant NCC Clauses that have NOT been examined are:

(provide a list)

Other relevant specifications:

(provide list)

M.4 Product technical data

M.4.1 Product Specification

Insert specifications and illustrations of product including materials, dimensions, sizes, intended use, limitations etc.

M.4.2 Installation Requirements

Insert installation parameters and instructions as per manufacturer's specification.

M.4.3 Technical Literature

Insert any other technical data that is relevant for users for e.g. characteristic resistance to loads

M.5 Evaluation data

Provide a summary of activities (test, measurement etc.) that are used as the basis for this appraisal with reference to the relevant test report from a recognised ATEN lab.

M.6 NCC Performance Requirements and/or other relevant specifications

Select appropriate Tables and tick the appropriate boxes.

Table M-1: NCC PERFORMANCE REQUIREMENTS – VOLUME ONE

NCC PERFORMANCE REQUIREMENTS – VOLUME ONE	RELEVANCE		ASSESSMENT	
	A	B	C	D
	YES	NO	YES	NO
STRUCTURAL PROVISIONS				
BP1.1				
BP1.2				
BP1.3				
BP1.4				
FIRE RESISTANCE				
CP1				
CP2				
CP3				
CP4				
CP5				
CP6				
CP7				
CP8				
CP9				
ACCESS AND EGRESS				
DP1				
DP2				
DP3				
DP4				
DP5				
DP6				
DP7				
DP8				
DP9				
FIRE FIGHTING EQUIPMENT				
EP1.1				
EP1.2				
EP1.3				
EP1.4				
EP1.5				
EP1.6				
SMOKE HAZARD MANAGEMENT				
EP2.1				
EP2.2				
LIFT INSTALLATIONS				
EP3.1				
EP3.2				
EP3.3				
EP3.4				
EMERGENCY LIGHTING, EXIT SIGNS ...				
EP4.1				
EP4.2				
EP4.3				

NCC PERFORMANCE REQUIREMENTS – VOLUME ONE (CONT.)	RELEVANCE		ASSESSMENT	
	A	B	C	D
	YES	NO	YES	NO
DAMP AND WEATHERPROOFING				
FP1.1				
FP1.2				
FP1.3				
FP1.4				
FP1.5				
FP1.6				
FP1.7				
SANITARY AND OTHER FACILITIES				
FP2.1				
FP2.2				
FP2.3				
FP2.4				
FP2.5				
FP2.6				
ROOM SIZES				
FP3.1				
LIGHT AND VENTILATION				
FP4.1				
FP4.2				
FP4.3				
FP4.4				
FP4.5				
SOUND TRANSMISSION AND INSULATION				
FP5.1				
FP5.2				
FP5.3				
FP5.4				
FP5.5				
FP5.6				
MINOR STRUCTURES AND COMPONENTS				
GP1.1				
GP1.2				
GP1.3				
GP1.4				
GP1.5				
HEATING APPLIANCES, FIREPLACES ETC.				
GP2.1				
GP2.2				
CONSTRUCTION IN ALPINE AREAS				
GP4.1				
GP4.2				
GP4.3				
GP4.4				
CONSTRUCTION IN BUSHFIRE PRONE AREAS				
GP5.1				
ENERGY EFFICIENCY				
JP1				
JP3				

Table M-2: NCC PERFORMANCE REQUIREMENTS – VOLUME TWO

NCC PERFORMANCE REQUIREMENTS – VOLUME TWO	RELEVANCE		ASSESSMENT	
	A	B	C	D
	YES	NO	YES	NO
STRUCTURE				
P2.1.1				
P2.1.2				
DAMP AND WEATHERPROOFING				
P2.2.1				
P2.2.2				
P2.2.3				
P2.2.4				
FIRE SAFETY				
P2.3.1				
P2.3.2				
P2.3.3				
P2.3.4				
P2.3.5				
P2.3.6				
HEALTH AND AMENITY				
P2.4.1				
P2.4.2				
P2.4.3				
P2.4.4				
P2.4.5				
P2.4.6				
SAFE MOVEMENT AND ACCESS				
P2.5.1				
P2.5.2				
P2.5.3				
P2.5.4				
ENERGY EFFICIENCY				
P2.6.1				
P2.6.2				

Provide other specifications as applicable.

Appendix N

Requirements for ATEN database of building products

Foreword

This Appendix covers one of the deliverables for the scoping study; namely, the development of requirements for a database of building products.

The purpose of the ATEN database is to provide critical information about building products and their intended use.

The databases for six conformity assessment systems are investigated with particular attention given to search fields and categorisations of building products. The aim has been to evaluate the user-friendliness and accessibility to critical information about the building products and certification or appraisal reports. A comparison of the features of the various databases is provided. Based on the investigation, a preliminary proposal about the ideal features of the ATEN database are presented.

It is envisaged that the categories and structure of the proposed ATEN database will be further developed through liaison with industry during the implementation phase of ATEN.

N.1 Overview of existing databases

The database for building products for six conformity assessment systems are investigated:

- (i) CodeMark,
- (ii) National Construction Product Register (NCPR, NATSPEC),
- (iii) ActivFire (CSIRO),
- (iv) Building Research Association of New Zealand (BRANZ),
- (v) European Organisation for Technical Assessment (EOTA), and
- (vi) International Code Council Evaluation Service (ICC-ES).

In particular, attention is given to the search fields which are provided on the online systems and the categorisations of the products.

N.1.1 CodeMark

The CodeMark Certificates of Conformity are available on the JAS-ANZ website. The following search fields are provided to look up an item on the online database (see Figure N-1):

- Organisation name
- Certificate number
- Certification BCA version (i.e. the associated building code)
- Certification scope (key word search)
- Accredited body

Additional information is also provided once a certain product is selected. Furthermore, a link is provided to download the certificate.

OUR DIRECTORY
CodeMark Register of Certificates of Conformity

Filters

Organisation

Organisation name
Choose some options ▼

Trading name or legal entity

Certificate Number
Choose some options

Certification

BCA version
Choose some options ▼

Certification Scope
Key Word

Certified by who

Accredited Body
Choose some options ▼

Apply Reset

Figure N-1: CodeMark register of Certificates of Conformity⁸³

N.1.2 National Construction Product Register (NATSPEC)

The National Construction Product Register (NCPR) is an online searchable database of construction products which have evidence of conformity to relevant Australian and international standards. It is developed and maintained by Construction Information Systems Limited (NATSPEC). The following search fields are provided to look up an item on the database (see Figure N-2):

- Product name
- Manufacturer
- Standard
- Search by product type:
 - general,
 - site, urban & open spaces,
 - structure,
 - enclosure,
 - interior,
 - finish,
 - mechanical,
 - hydraulic,
 - electrical,
 - conveying.

Additional information is also provided once a certain product is selected.

⁸³ JAS-ANZ. Our Directory: CodeMark Register of Certificates of Conformity. Retrieved from <http://www.jas-anz.org/our-directory/codemark-certified-organisation>

Search by

Product Name	Manufacturer	Standard	Search
--------------	--------------	----------	--

OR

Search by Product Type

01 General	02 Site, Urban & Open spaces	03 Structure	04 Enclosure
011 Documentation 012 Tendering 013 Generic preliminaries 014 Contract preliminaries 015 Schedule of rates (AUS-SPEC) 016 Quality assurance 017 General requirements 018 Common requirements 019 Sundry Installations	020 Demolition 022 Preparation and groundwork 024 Landscape structures 025 Landscape cultivation 026 Landscape finishes 027 Pavements 028 Pathways (AUS-SPEC) 029 Retaining walls (AUS-SPEC)	030 Foundations 031 Concrete 032 Earth 033 Masonry 034 Steel 038 Timber	041 Tanking and damp-proofing 042 Roofing 043 Cladding 045 Doors and windows 046 Glass 047 Insulation
05 Interior	06 Finish	07 Mechanical	08 Hydraulic
051 Linings 052 Partitions 053 Ceilings 054 Access floors 055 Fixtures 057 Furniture and furnishings 058 Signs and features	061 Trowelled and sprayed coatings 062 Wet areas 063 Tiling 064 Wall Surfacing 065 Floor surfacing 067 Painting	070 Mechanical general 071 Water plant 072 Air plant 073 Air handling components 074 Ductwork and components 075 Piping 076 Refrigeration 077 Control 078 Mechanical electrical 079 Mechanical commissioning and maintenance	080 Hydraulic general 081 Hydraulic System 082 Hydraulic systems 083 Fire systems 088 Hydraulic electrical 089 Hydraulic commissioning and maintenance
09 Electrical	10 Conveying		
090 Electrical general 091 Electrical equipment 092 Power systems 093 Power supply equipment 094 Power distribution equipment 095 Lighting systems 096 Communication systems 097 Safety systems 098 Security systems 099 Electrical commissioning and maintenance	100 Conveying general 101 Conveying equipment 102 Other conveying equipment		

Figure N-2: NCPR database for construction products⁸⁴

N.1.3 ActivFire (CSIRO)

ActivFire (managed by CSIRO) offers a public searchable database, allowing access to detailed certificates for each product. It offers quick access with searches by product type and/or supplier name, which can be further refined by the date of certification. A search engine also allows dynamic searches by product name or certificate numbers (providing an easy method for purchases to verify certificates online). Figure N-3 illustrates the information provided about a product on the online database.

⁸⁴ NATSPEC. National Construction Product Register (NCPR) - Raising awareness of product conformity. Retrieved from <http://www.ncpr.com.au/>

The screenshot shows a web browser window with the URL <https://www.activfire.gov.au/html/certDetailsView/afp1692.htm?nc=1>. The page displays the following information:

Certification designation [Go to details](#)
Brooks, Model EiB3105TYCH, 9 Vdc non-user replaceable lithium battery, silencing/hush facility, interconnectable, photoelectric smoke alarm

Certification id:	afp - 1692	Registered: 22-Jul-2004	Version: 15 (26-Apr-2019)
		Valid until: 30-Apr-2020	
Product type(s):	0005: Smoke Alarms		
Reference criteria:	1. Australian Standard AS 3786-1993, 'Smoke alarms' incl. Amdt 1 (April 1995) / Amdt 2 (December 1995) / Amdt 3 (9 November 2001).		
Agent/distributor:	Brooks Australia Pty Ltd 4 Pike Street, RYDALMERE, NSW, AUSTRALIA, 2116 Ph.: 02 9684 1466 Web site: http://www.brooks.com.au Fax: 02 9638 4146 Email/web addr.: salesnsw@brooks.com.au		
Registrant:	Brooks Australia Pty Ltd 4 Pike Street, RYDALMERE, NSW, AUSTRALIA, 2116		

Certificate of Conformity: [View certificate for afp - 1692](#) (PDF: 345 KB)

Figure N-3: Example of product information provided on the ActivFire online database⁸⁵

N.1.4 Building Research Association of New Zealand

BRANZ database provides a search platform for product certificates, listings, and appraisals. The following search fields are provided (see also Figure N-4):

- Certificate type:
 - CodeMark,
 - Appraisals,
 - Type Tests,
 - Technical Opinions,
 - Nail Scheme.
- Product ID/name or system number
- Company name
- Category:
 - adhesives, sealants and air seals,
 - wall and roof underlays,
 - building systems,
 - concrete additives,
 - DPM and tanking membranes,
 - damp-proof courses and flashings,
 - plumbing and drainage
 - fire rated systems,
 - flooring and underlays,
 - foundations and concrete floors,
 - heating and ventilation,
 - insulation,
 - insulating sheathing and substrates,
 - miscellaneous,
 - roofing,
 - roof and deck membranes,
 - sound control systems,
 - steel coil products,
 - stucco reinforcing, wire netting and plaster reinforcement,
 - timber framing, fixing and components,
 - wall bracing,
 - wall claddings and finishes,
 - wall, ceiling, soffit and interior finishing,
 - wet area membranes and systems,
 - window systems, doors and glazing,
 - concrete hold-down fasteners,
 - stairs,
 - rigid air barriers,
 - decking,

⁸⁵ CSIRO. (2019). ActivFire: Active fire protection - product certification: Home. Retrieved from <https://www.activfire.gov.au/>

- intertenancy wall systems,
 - fire tested products,
- materials tested products,
- structure tested products.
- Country:
 - Australia,
 - New Zealand,
 - Other.
- Order by (sort data option)

Additional information is also provided once a certain product is selected. Furthermore, a link is provided to download the certificate.

The screenshot shows a search interface titled "SEARCH BRANZ PRODUCT CERTIFICATES, LISTINGS, CODEMARK AND APPRAISALS". It features several search criteria with dropdown menus and a text input field:

- Certification Type:** All Certificates
- Product ID/Name or System No.:** (Text input field)
- Company Name:** All Companies
- Category:** All Categories
- Country:** All Countries
- Order by:** Product Title, Descending

At the bottom of the form are two buttons: "» SEARCH" and "» RESET".

Figure N-4: BRANZ database for product certificates, listings, and appraisals⁸⁶

N.1.5 European Organisation for Technical Assessment

EOTA provides an online database for which the European Assessment Documents (EADs) are made available and a search database for European Technical Assessments (ETAs) (however the assessment reports are not made available on the database). The database allows to search for a particular item by defining three criteria from 14 different search fields, including (Figure N-5):

- ETA number
- Issuing assessment body
- Trade name
- Holder of assessment
- Holder country
- Generic type and use
- AVCP decision (document number)
- AVCP system (Assessment and Verification of Constancy of Performance, AVCP) is a harmonised system which defines how to assess products and control the constancy of the assessment results and hence ensures the reliability and accuracy of the Declaration of Performance)
- Number EAD
- Title EAD
- Edition EAD
- Product area:
 - precast concrete products,

⁸⁶ BRANZ. BRANZ. Retrieved from https://www.branz.co.nz/cms_display.php

- doors, windows, shutters, gates and ancillaries,
 - membranes, including liquid applied and kits,
 - thermal insulation products, composite insulation systems,
 - structural bearings, pins for structural joints,
 - chimneys, flues and related products,
 - gypsum products,
 - geotextiles, geo-membranes and related products,
 - curtain walling, cladding, structural sealant glazing
 - fixed firefighting equipment,
 - sanitary appliances,
 - road equipment: circulation fixtures,
 - structural timber products, elements and ancillaries,
 - wood based panels and elements,
 - cement, building limes, other hydraulic binders,
 - reinforcing and prestressing steel for concrete and ancillaries, post tensioning kits,
 - masonry and related products, including units, mortars and ancillaries,
 - wastewater engineering products,
 - floorings,
 - structural metallic products and ancillaries,
 - wall and ceiling finishes (external and internal), internal partition kits,
 - roof coverings, lights, windows, related kits and ancillaries,
 - road construction products,
 - aggregates,
 - construction adhesives,
 - products related to concrete, mortar and grout,
 - space heating appliances,
 - pipes, tanks and ancillaries,
 - construction products in contact with water for human consumption,
 - glass products,
 - Power, control and communication cables,
 - sealants for joints,
 - building kits, units, prefabricated elements,
 - fire stopping, fire sealing, fire protective or retardant products,
 - other.
- Issuing date (specific)
 - Issuing date (range)

ETAssessments

Please fill in a word to search on!

Criteria

<ul style="list-style-type: none"> <li style="background-color: #0070C0; color: white; padding: 2px;">ETA Number (as nn/nnnn) Issuing Assessment Body (Acronym) Trade Name Holder of Assessment Holder Country Generic type and use AVCP Decision (nnnn/nnnn/EC/EU) AVCP System (1+1/2+3/4) Number EAD (nnnnnn-nn-nnnn) Title EAD Edition EAD (nnnn) Product area (PAC) Issuing date (dd/mm/yyyy) Issuing date (range) 	<input style="width: 90%; border: 1px solid gray;" type="text"/>
<ul style="list-style-type: none"> Holder of Assessment Holder Country Generic type and use AVCP Decision (nnnn/nnnn/EC/EU) AVCP System (1+1/2+3/4) Number EAD (nnnnnn-nn-nnnn) Title EAD Edition EAD (nnnn) Product area (PAC) Issuing date (dd/mm/yyyy) Issuing date (range) 	<input style="width: 90%; border: 1px solid gray;" type="text"/>
<ul style="list-style-type: none"> Generic type and use AVCP Decision (nnnn/nnnn/EC/EU) AVCP System (1+1/2+3/4) Number EAD (nnnnnn-nn-nnnn) Title EAD Edition EAD (nnnn) Product area (PAC) Issuing date (dd/mm/yyyy) Issuing date (range) 	<input style="width: 90%; border: 1px solid gray;" type="text"/>

You need to fill in at least one and maximum 3 criteria.
 The word you fill in above can also be a part of a word you are looking for. No extra signs are necessary to indicate this.

Do not use any spaces.
 To search on, divide them with a + sign. (e.g.

You need to fill in at least one and maximum 3 criteria.
 The word you fill in above can also be a part of a word you are looking for. No extra signs are necessary to indicate this.

[Show all Issued ETA's](#)

Figure N-5: EOTA database for ETAs⁸⁷

N.1.6 International Code Council Evaluation Service

The International Code Council – Evaluation Service (ICC-ES) is a nonprofit (limited liability) organisation that conducts technical evaluations of building products, components, methods, and materials. The search fields for directly finding an evaluation report includes (Figure N-6):

- Product number
- Manufacturer
- Product
- Code edition

The evaluation reports are also organised into broad categories (Figure N-7) with sub-categorise within each group:

- | | |
|--|--|
| <ul style="list-style-type: none"> • General requirements • Concrete • Masonry • Metals • Wood, plastics and composites • Openings • Finishes • Special ties • Equipment • Furnishings | <ul style="list-style-type: none"> • Special construction • Conveying equipment • Fire suppression • Plumbing • Heating, ventilation and air conditioning (HVAC) • Integrated automation • Electrical • Communications • Electric safety and security |
|--|--|

⁸⁷ EOTA. (2019). European Organisation for Technical Assessment: Home. Retrieved from <http://www.jas-anz.org/>

- Earthwork
- Exterior improvements
- Utilities
- Process integration

Figure N-6: ICC-ES database for evaluation reports, direct search⁸⁸

CSI Division Number	CSI Division Name	Collapse All
^ DIVISION 01 00 00	GENERAL REQUIREMENTS	
01 33 00	Submittal Procedures	
01 43 26	Testing and Inspecting Agency Qualifications	
01 45 00	Quality Control	
01 80 00	Performance Requirements	
∨ DIVISION 03 00 00	CONCRETE	
∨ DIVISION 04 00 00	MASONRY	
∨ DIVISION 05 00 00	METALS	
∨ DIVISION 06 00 00	WOOD, PLASTICS AND COMPOSITES	
∨ DIVISION 07 00 00	THERMAL AND MOISTURE PROTECTION	
∨ DIVISION 08 00 00	OPENINGS	
∨ DIVISION 09 00 00	FINISHES	

Figure N-7: ICC-ES database for evaluation reports, categorised search⁸⁸

N.2 Comparison between existing databases and ATEN

The review of the databases for building products for the conformity assessments systems illustrates that different information is provided by the various systems. All of the databases, except for the one provided by CodeMark, attempt to organise the products using some form of categorisation. However, some of the existing databases do not have a clear or concise categorisation method (for example BRANZ and EOTA). The categorisation of NCPR and ICC-ES are more effective (or user friendly) as they have broad categories and specific sub-categories. Furthermore, it is identified that some of the critical information about the certifications, evaluations, or appraisal reports are not provided on the databases (as search items or fields),

⁸⁸ ICC Evaluation Service. (2019). ICC Evaluation Service. Retrieved from <https://icc-es.org/>

instead, a link is usually provided to open a new window with more detailed information or to access the report or certification.

ATEN intends to have a database for Appraisal Reports for which the buildings products are effectively categorised, the performance requirements for which the product complies with is clearly stated, and other critical information about the appraisal report is concisely provided within the database. This will allow easy access to critical information about building products and their suitability for the intended use. Table N-1 provides a comparison of the items provided by the CodeMark (on the JAS-ANZ website), BRANZ, EOTA, ICC-ES, and the items which are intended to be included in the ATEN database.

Table N-1: Comparison between existing databases and proposed ATEN database

Item		CodeMark	BRANZ	EOTA	ICC-ES	ATEN
Identification number		✓	✓	✓	✓	✓
Product	Product name	✓ ¹	✓	✓	✓	✓
	Product category	✗	✓	✓	✓	✓
	Product description	✓ ¹	✓ ¹	✓	✗	✓
	Product intended use	✗	✗	✗	✗	✓
	Manufacturing plant details	✓ ³	✓ ³	✓	✓ ³	✓
Supplier	Product supplier name	✓	✓	✓	✓	✓
	Product supplier contact details	✓ ³	✓ ³	✓	✓ ³	✓
	Product supplier ABN number	✗	NA	NA	NA	✓
Assessment	Date of issue	✓ ¹	✓ ¹	✓	✗	✓
	Date of expiry	✓ ¹	NA	✓	✗	✓
	Surveillance requirement	✓	✗	✗	✗	✓
	Evaluation method	✗	✗	✓	✗	✓
	Performance requirements and relevant Code Clauses	✗	✗	✗	✗	✓ ¹
	Access to report	✓	✓	✗ ²	✓	✓

NA: Not applicable | ¹ Information is provided but not as a searchable item | ² Available from supplier |

³ Detailed information not provided and/or website link is provided

N.3 Preliminary proposal for ATEN database for appraisal of building products

The overview of the preliminary proposal for the ATEN database for appraisal of building products is provided in Figure N-8. It is envisaged that the detailed categories and structure this will be further developed through liaison with industry through the implementation phase of ATEN.

The preliminary database will consist of three components:

- (i) product information,
- (ii) supplier information, and
- (iii) assessment information.

Further details about each component is provided in the following sub-sections.

Product					Supplier			Assessment						
Product name and ID	Product category	Product description	Product intended use	Manufacturing plant details	Product supplier name	Product supplier contact details	Product supplier ABN number	Appraisal Report ID	Appraisal Report date of issue	Appraisal Report date of expiry	Evaluation method	Surveillance requirements	Performance requirements	Appraisal Report
	Need to select (construction) product type from given options			Name and address of manufacturing plant(s)							Deemed-to-satisfy path, and/or performance path		Relevant NCC Clauses and/or other relevant specifications	Link provided to Appraisal Report

Figure N-8: Preliminary proposal for ATEN database for appraisal of construction products

N.3.1 Product information

The product information consists of (shown in Figure N-9):

- Product name and product ID (if applicable)
- Product type; each product will be assigned a product type based on a product categorisation system. An example of a method of effectively categorising the construction products is provided below, which involves first categorising the product as: (a) structural type, (b) enclosure type, or (c) interior type. It is noted that the proposed categorisation of the products is based on the NATSPEC classification system, however, some modifications have been made.

Structural type:

- foundations,
- concrete,
- steel,
- timber,
- masonry,
- plastics,
- composites,
- earth,
- fastenings (anchors, screws, structural bolts),
- modular.

Enclosure type:

- tanking and damp-proofing,
- roofing (e.g. profiled sheet metal),
- cladding,
- doors and windows,
- glass,
- insulation,
- grates and covers.

Interior type:

- linings (e.g. plasterboards, cement board),
 - partitions,
 - ceilings,
 - access floors,
 - fixtures,
 - furniture and furnishings (e.g. workstations, window coverings),
 - signs and feature.
- Product description
 - Product intended use: the intended use of the product needs to be stated so that the suitable performance requirements in accordance with NCC and/or other relevant specifications are evaluated.
 - Manufacturing plant details: name and address of manufacturing plant(s).

Product				
Product name and ID	Product category	Product description	Product intended use	Manufacturing plant details
	Need to select (construction) product type from given options			Name and address of manufacturing plant(s)

Figure N-9: Preliminary proposal for ATEN database - product information component

N.3.2 Supplier information

The supplier information consists of (Figure N-10):

- Product supplier name
- Product supplier contact details
- Product supplier ABN number

Supplier		
Product supplier name	Product supplier contact details	Product supplier ABN number

Figure N-10: Preliminary proposal for ATEN database - supplier information component

N.3.3 Assessment information

The assessment information includes:

- Appraisal Report ID: each Appraisal Report would be provided with a unique identification number
- Appraisal Report date of issue

- Appraisal Report date of expiry
- Evaluation method: the method adopted to conduct the evaluation, i.e. *deemed-to-satisfy path*, and/or *performance path*.
- Surveillance requirements
- Performance requirements: the performance requirements would be stated including the relevant NCC Clauses and/or other relevant specifications. The performance requirements would be categorised according to the NCC and other relevant specifications, for example:
 - structure (Section B),
 - fire resistance (Section C),
 - access & egress (Section D),
 - services & equipment (Section E),
 - ancillary provisions (Section G),
 - special use buildings (Section H),
 - energy efficiency (Section J),
 - health and amenity (Section F),
- Appraisal Report: the reports would be accessible from the database.

Assessment						
Appraisal Report ID	Appraisal Report date of issue	Appraisal Report date of expiry	Evaluation method	Surveillance requirements	Performance requirements	Appraisal Report
			Deemed-to-satisfy path, and/or performance path		Relevant NCC Clauses and/or other relevant specifications	Link provided to Appraisal Report

Figure N-11: Preliminary proposal for ATEN database - assessment information component

Appendix O

Software for the determination of Fire Resistance Level (FRL)

Written by:

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Foreword

This Appendix outlines a deliverable for the scoping study; namely, prototype web-based software for a complex section of the National Construction Code (NCC). The intention is to demonstrate an example benefit of ATEN in reinforcing and clarifying complex NCC Clauses that can be managed by a software to produce consistent interpretation and also to serve as an educational tool.

A demo prototype software has been developed and can be accessed via:

<http://mercury.swin.edu.au/cchua/frl/>

Username: guest@nash.asn.au

Password: guest

O.1 Introduction

In developing software to interpret the provisions of the NCC, it is important to identify needs from the users' perspective.

There are essentially two groups of users: designers and building surveyors/certifiers. Designers need information for design, including options to achieve the most cost-effective solution. Certifiers need information for checking conformance of a given design.

For experienced users of both groups, the need is to arrive at a conclusion as quickly as possible for the more complex sections of the NCC. The conclusion should be consistent for both groups of users.

For non-experienced users, there are additional needs to explain the key terms and how conclusions are reached.

The fire resistance provisions of the NCC⁸⁹ are the most complex in the document. Users need to understand not only the required type of construction and fire resistance level but also the many *concessions* granted with special conditions. Different users will not necessarily come to the same conclusion in the same situation. The use of web-based software for this determination is a positive development for industry because it can produce consistent interpretations of the provisions. The software can also be used as an educational tool for practitioners.

This Appendix reviews past and current efforts in this direction then describes small piece of web-based software for the determination of Fire Resistance Level (FRL) in accordance with the NCC. At this stage, the software is only a prototype limited to Class 2, 3 and 9c buildings.

⁸⁹ ABCB National Construction Codes Series 2015 VOLUME ONE Building Code of Australia Class 2-9 Buildings, *Australian Building Codes Board*, Canberra, Australia, 2015.

O.2 Development Efforts

O.2.1 Review of Past Effort

The use of software to interpret provisions of the NCC was first developed by the CSIRO⁹⁰ [1]. Its Division of Building, Construction and Engineering (DBCE) produced a software named BCAider to provide a comprehensive interpretation of the Building Code of Australia 1990 (BCA 1990 – Amendment 8). The BCAider project began in 1989 with a planned budget of \$1.5 million and 15-person years of effort from 1989-93. CSIRO decided not to pursue further product support and licencing around 2005. Lessons to be learnt from this effort will be valuable for the future development of this type of software.

The following reasons have been forwarded as the causes for the lack of popularity.

- Need for constant update: financial reason for ceasing product support.
- Small Australian market: about 150 users (in 1990) for any particular specialised software.
- Scope of BCAider too large – users and developers.
- Only a small section of the package proved to be useful for each group of specialised practitioners.

It is interesting to note that although the software is still available, the machine that can run the software is difficult to find.

O.2.2 Current Efforts

There are two major research projects whose outcomes have not reached the industry users in Australia.

- **CSIRO Data61**⁹¹ includes regulation as a platform based on digital logic to support future regulation tools and services. The aim is to reduce the compliance burden, manage the complexity to save users time and money. At this stage, it is not known whether building regulation is to be included in the development.
- **BIM application:** Regulation compliance through BIM is a feasible option. However, a recent BRE study indicated that regulation would need to have to be rewritten in a fashion that enables machine-reading. The IFC schema at present does not have the required property set data specific to regulatory need⁹².

O.3 Motivating Scenario

O.3.1 NCC Requirements for FRL

FRL is a set of three figures in minutes measuring (a) *structural adequacy* (i.e. maintaining its load carrying capacity) (b) *integrity* (i.e. not disintegrating) and (c) *insulation* (i.e. maintaining acceptable temperature on non-exposed surface) when subjected to a standard fire test. (a) and (c) can be observed externally in a fire test.

The main variables for determining the FRL – *DTS solutions* for Class 2, 3 and 9c are:

- (i) Distance from *fire source feature*

⁹⁰ Sharpe, R. BCAider – PC Software to help building code users and developers, *Innovation and Economicin Building Conference*, Brisbane, Australia, September, 1991.

⁹¹ Data61 Website <https://research.csiro.au/data61>

⁹² BIMTODAY Website <https://www.pbctoday.co.uk> BIM news July 7 2016

- (ii) Building element: *internal and external, load bearing and non-load bearing walls and columns, floors, roofs, shafts etc.*
- (iii) *Rise in storeys (RIS)* 1, 2, 3, 4 or more

The outcomes are the required type of construction at various stringency levels A to C and a number of concessions meaning that the stringency level can be reduced subject to certain condition.

Type of construction A, B and C is determined from class of building, no of storey, floor area. Type A imposes higher requirements than B and C.

All the *terms in italic* from the previous paragraph are technical terms that are defined and explained in the NCC. The provisions are complex because many combinations and permutations are possible. Table O-1 presents a sample of FRL requirements for Class 2 and 3 buildings. The following example illustrates the complexities involved in determining the FRL for a single structural element – load bearing external wall.

O.3.2 Example

According to Table O-1, FRL for a load bearing external wall with RIS=2 is 90/90/90 for type B construction if the distance to the boundary is less than 1.5 metre but it can be reduced to 90/60/30 if the distance to the boundary is more than 1.5 metres but less than 3.0 metres. On the other hand, if the building has 2 exits or access to open space then it will require only type C construction with FRL = 90/90/90 if the distance is less than 1.5 metre to the boundary and no FRL requirement if the distance is more than 1.5 metres.

O.4 Software for FRL

O.4.1 Framework

This software addresses only for issues concerning FRL, concessions provided in Part C or requirements for non-combustibility etc. or other factors such as exit requirements, smoke control, sprinkler etc. still have to be considered as part of the design process. The software only considers factors affecting FRL.

In developing the FRL software, we propose a web-based framework with two components, namely inquiry and fetch as shown in Figure O-1. The inquiry component handles the user inquiry interaction for the users, while the fetch component analyses the input and generates the FRL recommendation in accordance with the Australian National Construction Code.

The software developers for the inquiry component work with the user to create a suitable interface inputting the building specification information. The inquiry component is designed to obtain necessary building specification input to determine the appropriate FRL recommendation. The current implementation consists of four frames namely classes of building, rise in storey, specification and FRL recommendation. The user interacts with the inquiry component to formulate and refine the inquiry. The component presents the user with a series of step-by-step guided frame containing applicable option selection to determine the building class, rise in storey, and specifications. Once the input specifications are complete, the FRL is then presented in the FRL recommendation frame.

For the fetch component, the software developers work closely with the FRL domain experts to construct the FRL database to store the specification requirements in accordance with the NCC. The FRL database is implemented to contain a list of FRL recommendations with its corresponding building class, rise in storey, and specification values. It also captures the list of options to be presented depending on what information is to be requested. This enables the inquiry component to make a fetch request to present only the relevant options as the user progresses through the inquiry refinement process.

With the proposed framework, the database can be updated if the NCC is updated without the need to update the software. As this is web-based, any update on the database allows users to receive the most up to date FRL recommendation. In addition, the software maintenance on each component can also be done independently without affecting each other.

O.4.2 Operation – software walk-through

This section describes how a user requests FRL information. It presents a test case on how it works and how a user interacts with the software.

The software works by accepting inputs from the users to determine the type of construction. The inputs are arranged in a sequence frames starting from the classes of buildings, followed by the rise of storeys, and finally the required specifications. Each frame presents a specific number of options for the user to select. The FRL recommendation is given only if enough input specification data are provided. The users can navigate backward or forward from frame to frame, adjusting the specifications as needed. In addition to the input options, definition and explanations to technical terms in each frame are accessible through a pop-up window if needed. Input specifications are derived from the use of the building, its height and location on the allotment from the NCC.

The software starts with presenting the building class (Figure O-2) followed by the rise in storeys (Figure O-3) for user selection. Users click on the *Next* button to confirm the selection and progress through the input sequence. The *Previous* button provides users with an option to go back to the previous input and allow the user to modify their selection.

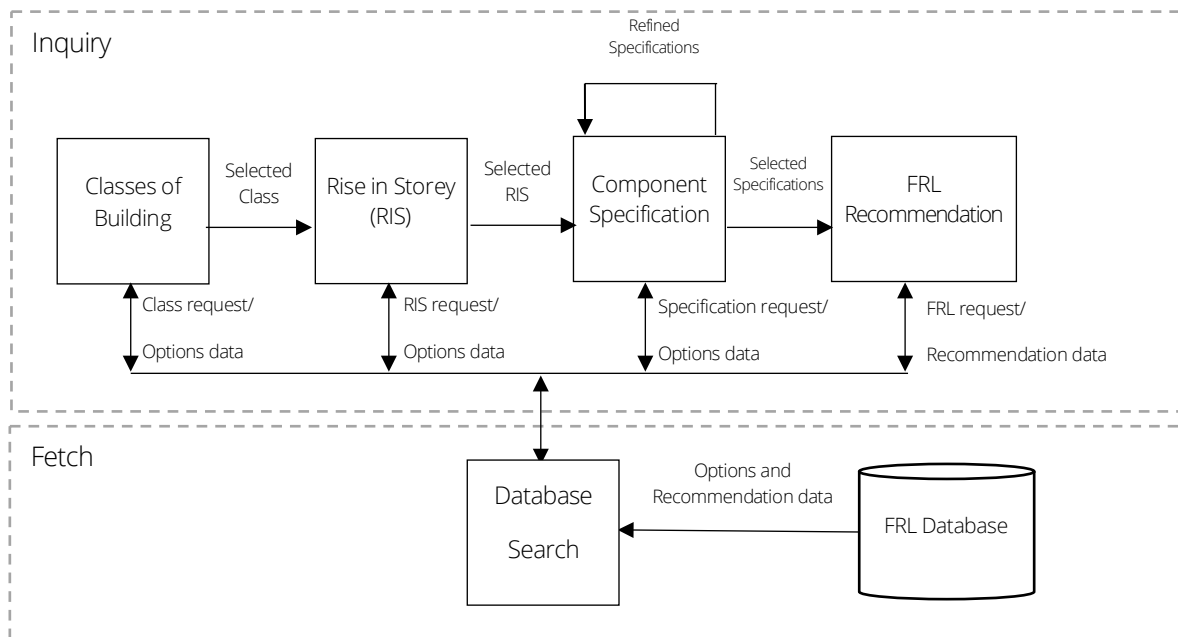


Figure O-1: FRL Software Framework

FRL App Class RIS Specifications Log Out

What building class is being considered?

- Class 2 ⁱ - A building containing 2 or more sole-occupancy units each being a separate dwelling
- Class 3 ⁱ - A residential building, other than a building of Class 1 or 2
- Class 9c ⁱ - An aged care building.

Next

Figure O-2: Building Class Selection

Aside from the option selection, and the previous and next buttons, each frame also presents the user an option to click on the technical terms to look at its definition and explanation. Technical terms are indicated using the ⁱ icon that the user can click on. Upon clicking on the technical term, a window will pop up showing its definition and explanation (Figure O-4).

FRL App Class RIS Specifications Log Out

What is the Rise in Storey ⁱ(RIS)?

- 1
- 2
- 3
- 4 or more

Previous Next

Figure O-3: Rise in Storey Selection

What is Class 2? x

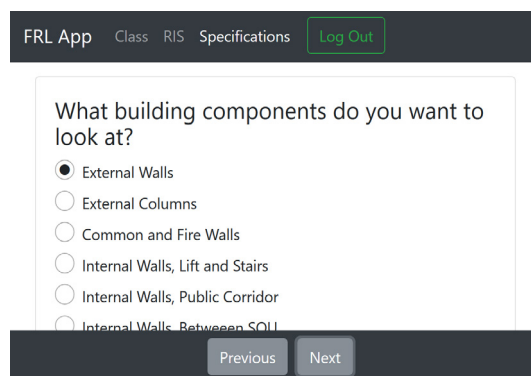
A building containing 2 or more sole-occupancy units each being a separate dwelling.

Close

Next

Figure O-4: Definition and Explanation Window

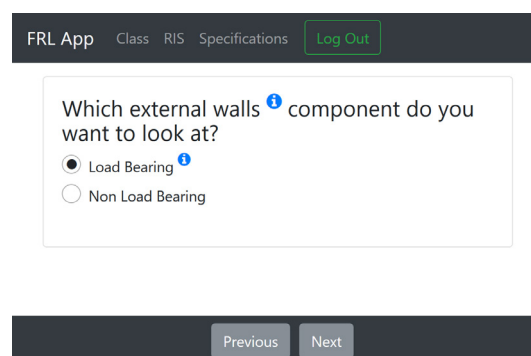
After the user completes the rise in storey frame selection (Figure O-3), the software proceeds to prompt the user for the specifications (Figure O-5 and Figure O-12).



The screenshot shows the FRL App interface with a navigation bar at the top containing 'FRL App', 'Class', 'RIS', 'Specifications', and a 'Log Out' button. The main content area displays the question 'What building components do you want to look at?' followed by a list of radio button options: 'External Walls' (selected), 'External Columns', 'Common and Fire Walls', 'Internal Walls, Lift and Stairs', 'Internal Walls, Public Corridor', and 'Internal Walls - Between SQU'. At the bottom, there are 'Previous' and 'Next' navigation buttons.

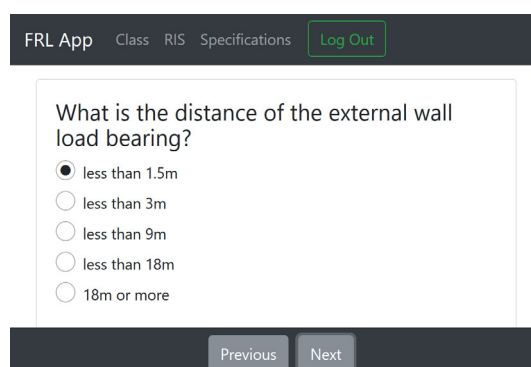
Figure O-5: Specification Selection (External Wall)

The number of specifications frames varies depending the option selected. The software checks the FRL databases and generates the appropriate option frame for the user. For instance, selecting the *External Wall* option, as shown in Figure O-5, will generate the component selection frame show in Figure O-6. The user has the option to select *Load Bearing* (Figure O-6) or *Non-load Bearing* (Figure O-9). The software will continue to analyse the user input and generate only the required options in the subsequent frame. This is shown in Figure O-7 and Figure O-10, respectively which present different distance options based on the user selecting *Load Bearing* or *Non-load Bearing*. Finally, once the user confirms the distance, the corresponding FRL recommendation is displayed as shown in Figure O-8 and Figure O-11.



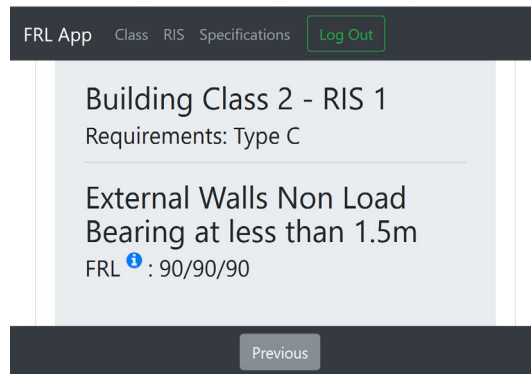
The screenshot shows the FRL App interface with a navigation bar at the top containing 'FRL App', 'Class', 'RIS', 'Specifications', and a 'Log Out' button. The main content area displays the question 'Which external walls component do you want to look at?' followed by a list of radio button options: 'Load Bearing' (selected) and 'Non Load Bearing'. At the bottom, there are 'Previous' and 'Next' navigation buttons.

Figure O-6: Specification (Load Bearing)



The screenshot shows the FRL App interface with a navigation bar at the top containing 'FRL App', 'Class', 'RIS', 'Specifications', and a 'Log Out' button. The main content area displays the question 'What is the distance of the external wall load bearing?' followed by a list of radio button options: 'less than 1.5m' (selected), 'less than 3m', 'less than 9m', 'less than 18m', and '18m or more'. At the bottom, there are 'Previous' and 'Next' navigation buttons.

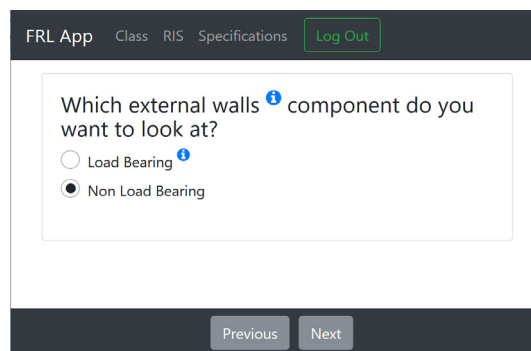
Figure O-7: Distance (Load Bearing)



The screenshot shows a dark header bar with the text "FRL App" and navigation links for "Class", "RIS", "Specifications", and a "Log Out" button. Below the header, a light grey box contains the following text: "Building Class 2 - RIS 1", "Requirements: Type C", "External Walls Non Load Bearing at less than 1.5m", and "FRL ⓘ : 90/90/90". At the bottom of the screen, a dark bar contains a "Previous" button.

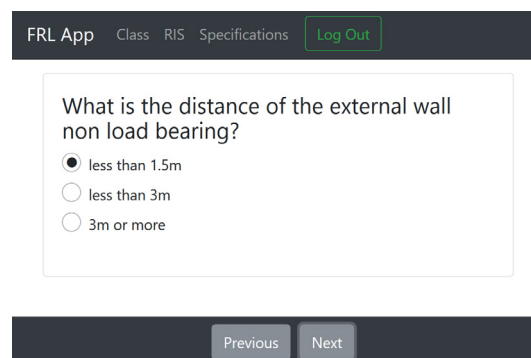
Figure O-8: FRL for Load Bearing External Wall

The user confirms each selection by clicking on the *Next* button, which the system will process to generate the next frame. The FRL recommendation frame will present the fire resistance level, including the summary of the selected building class and rise in storey (Figure O-8 and Figure O-11).



The screenshot shows the same dark header bar as Figure O-8. The main content area contains a question: "Which external walls ⓘ component do you want to look at?". Below the question are two radio button options: "Load Bearing ⓘ" and "Non Load Bearing". The "Non Load Bearing" option is selected. At the bottom, a dark bar contains "Previous" and "Next" buttons.

Figure O-9: Specification (Non-load Bearing)



The screenshot shows the same dark header bar. The main content area contains a question: "What is the distance of the external wall non load bearing?". Below the question are three radio button options: "less than 1.5m", "less than 3m", and "3m or more". The "less than 1.5m" option is selected. At the bottom, a dark bar contains "Previous" and "Next" buttons.

Figure O-10: Distance (Non-load Bearing)

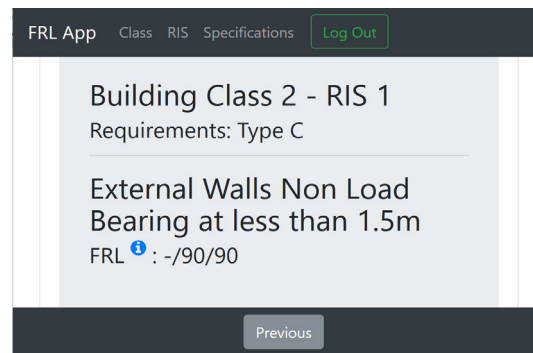


Figure O-11: FRL for Non-load Bearing External Wall

For example, if the user selects *Roof* (Figure O-12) instead of *External Wall* (Figure O-5), the software will generate the FRL recommendation (Figure O-13) once the user confirms by clicking *Next*. This is because no further specification information is required from the user.

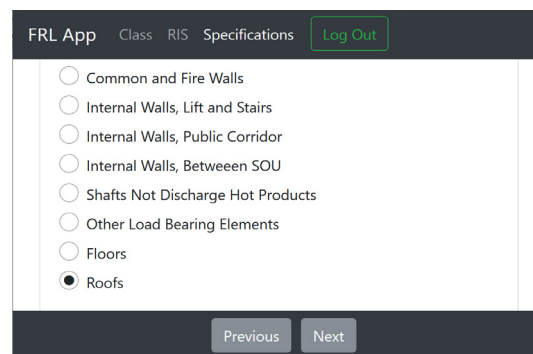


Figure O-12: Specification Selection (Roof)

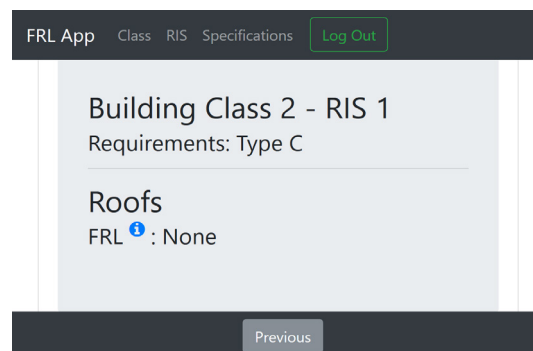


Figure O-13: FRL for Roof

O.5 Conclusion

O.5.1 Conclusion

A simple web-based software was developed for the determination of Fire Resistance Level (FRL) only, for Class 2 and 3 for the National Construction Code of Australia. As noted due to the complexity of Part C with its other requirements and or concessions it is not an easy path. This is only a proof-of-concept work

with the intention of demonstrating how a software may be used to produce consistent interpretation of the NCC and also to serve as an educational tool.

O.5.2 Proposed Future Work

The software will be extended to cover FRL requirements for all classes of NCC buildings. It can also be extended to cover NCC acoustic requirements that are under similar format.

Table O-1: A sample of FRL requirements for Class 2 and 3 buildings

BUILDING ELEMENT		RISE IN STOREYS (RIS)			
		1	2	3	4 or more
Basic requirements		Type C	Type B	Type A	Type A
EXTERNAL WALL LOAD BEARING	<1.5m <3m <9m <18m >18m	90/90/90 -/-/ -/-/ -/-/ -/-/	90/90/90 90/60/30 90/30/30 90/30/- -/-/ Use RIS=1 with 2 exits or have access to open space	90/90/90 90/60/60 90/60/30 90/60/30 90/60/30 Non-combustible (not required for top two storeys)	90/90/90 90/60/60 90/60/30 90/60/30 90/60/30 Non-combustible (not required for top three storeys)
EXTERNAL WALL NON LOAD BEARING	<1.5m <3m >3m	-/90/90 -/-/ -/-/	-/90/90 -/60/30 -/-/ Use RIS=1 with 2 exits or have access to open space	-/90/90 -/60/60 -/-/ Non-combustible (not required for top two storeys)	-/90/90 -/60/60 -/-/ Non-combustible (not required for top three storeys)
EXTERNAL COLUMN LOAD BEARING	<1.5m <3m <18m >18m	90/-/ -/-/ -/-/ -/-/	90/-/ 90/-/ 90/-/ -/-/ Use RIS=1 with 2 exits or have access to open space	90/-/ 90/-/ 90/-/ 90/-/	90/-/ 90/-/ 90/-/ 90/-/
COMMON WALLS AND FIRE WALLS		90/90/90	90/90/90 Use RIS=1 with 2 exits or have access to open space	90/90/90 Reduce to 60 if sprinkled	90/90/90 Reduce to 60 if sprinkled
INTERNAL WALLS LIFT AND STAIRS LOAD BEARING			90/90/90 Use RIS=1 with 2 exits or have access to open space	90/90/90 Reduce to 60 if sprinkled	90/90/90 Reduce to 60 if sprinkled
INTERNAL WALLS LIFT AND STAIRS NONLOAD BEARING			-/90/90 Use RIS=1 with 2 exits or have access to open space	-/90/90 FRL not required if sprinkled	-/90/90 FRL not required if sprinkled
INTERNAL WALLS PUBLIC CORRIDOR LOAD BEARING		60/60/60	60/60/60 Use RIS=1 with 2 exits or have access to open space	90/90/90 Reduce to 60 if sprinkled	90/90/90 Reduce to 60 if sprinkled
INTERNAL WALLS PUBLIC CORRIDOR NONLOAD BEARING		60/60/60	-/60/60 Use RIS=1 with 2 exits or have access to open space	-/60/60 FRL not required if sprinkled	-/60/60 FRL not required if sprinkled
INTERNAL WALLS BETWEEN SOU LOAD BEARING		60/60/60	60/60/60 Use RIS=1 with 2 exits or have access to open space	90/90/90 Reduce to 60 if sprinkled	90/90/90 Reduce to 60 if sprinkled
INTERNAL WALLS BETWEEN SOU NONLOAD BEARING		60/60/60	-/60/60 Use RIS=1 with 2 exits or have access to open space	-/60/60 FRL not required if sprinkled	-/60/60 FRL not required if sprinkled
SHAFTS NOT DISCHARGE HOT PRODUCTS LOAD BEARING				90/90/90 Reduce to 60 if sprinkled	90/90/90 Reduce to 60 if sprinkled
SHAFTS NOT DISCHARGE HOT PRODUCTS NONLOAD BEARING				-/90/90 FRL not required if sprinkled	-/90/90 FRL not required if sprinkled
OTHER LOAD BEARING ELEMENTS				90/-/ Reduce to 60 if sprinkled	90/-/ Reduce to 60 if sprinkled
FLOORS (suspended with a storey below)				90/90/90 Reduce to 60 if sprinkled Not required if within a SOU	90/90/90 Reduce to 60 if sprinkled Not required if within a SOU
ROOFS				90/60/30 Not required for non-combustible covering	90/60/30 Not required for non-combustible covering

Appendix P

Preliminary register of experts and testing facilities

Foreword

ATEN is to bring together the relevant parties, including construction experts and testing facilities, to evaluate building products in terms of fitness-for-purpose. This appendix discusses the preliminary register of experts (including organisations that may interact with ATEN) and testing facilities that have been compiled. For the purpose of confidentiality, the details of the experts have not been provided.

P.1 Register of experts

A preliminary investigation was undertaken to compile a register of experts demonstrating interest in the ATEN scheme and potential future involvement. The sample of experts consists of more than seventy practitioners from Australian universities, testing facilities, commercial organisations and industry bodies. The practitioners have expertise in various fields in the construction industry, they include:

- system developers,
- structural engineers,
- services engineers,
- fire engineers,
- material specialists (e.g. steel, concrete, timber, masonry, plastics, composites, and earth materials),
- construction professionals (e.g. contractors and engineering project managers),
- building surveyors,
- manufacturers, and
- academics and researchers.

Further classification of experts can be made in accordance with the specific requirements of the NCC.

Ninety-Four industry associations related to the construction industry (at a national and state level) that may interact with ATEN as part of its operation have also been identified, including:

- professional bodies (e.g. Engineers Australia - EA, Consult Australia, Building Products Industry Council - BPIC),
- materials based associations (e.g. Concrete Institute of Australia – CIA, Forest and Wood Products Australia – FWPA, Australian Steel Institute – ASI, Steel Reinforcement Institute of Australia – SRIA),
- discipline based associations (e.g. Australasian Fire and Emergency Service Authorities Council – FPAA, Institution of Structural Engineers – IstructE, Australian Institute of Building Surveyors – AIBS, Australasian Wind Engineering Society – AWES, Australian Earthquake Engineering Society – AEES), and
- construction based associations (e.g. Master Builders Australia – MBA, Housing Industry Association – HIA).

P.2 Register of testing facilities

A preliminary register of laboratories and testing facilities with capabilities identified as suitable for conducting testing of building products has also been compiled (based on publicly available information found online). In total, 23 facilities have been identified for Victoria and 26 facilities in other states and territories. The facilities cover a wide range of testing capabilities, including those listed below, and the distribution is provided in Figure P-1.

- **Acoustic tests:** includes tests associated with sound, noise, and vibration (e.g. tests to determine the acoustical performance of windows, doors, and walls).
- **Air and water penetration tests:** include tests to determine the products resistance to air and water penetration (e.g. determining the resistance of windows and doors to water penetration).
- **Chemical:** includes tests to determine various aspects and chemical behaviour of products (e.g. the reaction of a chemical with a specific material, and corrosion resistance testing; the ability of a product to withstand different types of environmental conditions without disintegration or degradation).
- **Durability and weathering tests:** includes tests to determine degrading effect of heat, light, moisture, and stress on a product over time.
- **Flammability and fire tests:** includes tests to determine how easily products combust and burn when exposed or are near a fire/heat source and the rate at which products burn when ignited.
- **Impact and ballistic tests:** includes tests to determine the response of products under impact and ballistic loads (e.g. impact resistance testing of glass)
- **Mechanical tests:** includes testing to determine material's mechanical properties (e.g. hardness, tensile, creep, fatigues, and non-destructive testing) and to determine the response of a structure (e.g. shear and bending tests).
- **Seismic tests:** include tests to determine the response of products under earthquake load (e.g. shake table tests).
- **Thermal tests:** includes tests to determine the thermal properties of a product (e.g. thermal transmission, thermal resistance, thermal conductivity of glass/glazing, walls, and roofs)
- **Wind:** include tests to determine the response of products under wind load (e.g. windborne debris testing, and wind tunnel tests).

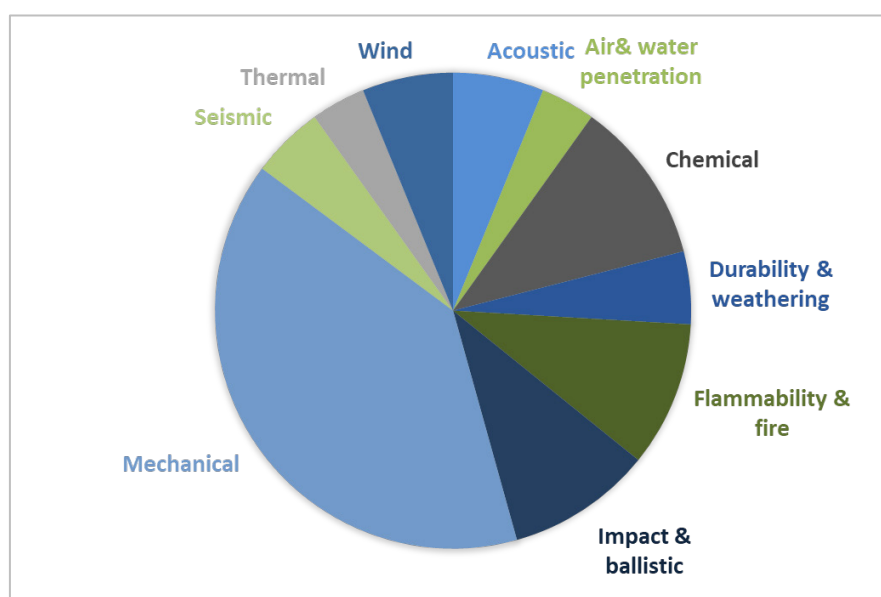


Figure P-1: Distribution of testing capabilities of the identified laboratories and testing facilities

Appendix Q

Potential entity structure for ATEN

Written by Marisa Muchow

General Counsel (Metricon)

Foreword

This Appendix provides an overview of how the ATEN entity may be structured. It discusses in the three potential entity structures:

- as a company - company limited by guarantee,
- establishing an incorporated association, and
- establishing an unincorporated association⁹³.

Q.1 Background

A state-based legislation has been introduced in order to ban the use of unsafe building products. The legislation provides regulators with extensive powers to issue orders for rectification of buildings affected by unsafe building products. It is clear from the introduction of this legislation and the recommendations arising from recent reports into building in Australia, that a robust means to provide confidence to all parties in the supply chain to demonstrate that building products conform to the requirements of the National Construction Code (NCC) ensuring the safety of occupants is long overdue.

The purpose of ATEN is to establish an appraisal for construction products, to build confidence and support for the Australian building regulatory system. This paper will provide an overview of the regulatory framework relating to non-conforming and non-compliant building products and provide recommendations for how ATEN may be structured to achieve their objective of establishing a network to support product innovation, enhance evaluation efficiency and increase confidence in product appraisal in building.

Q.2 Regulatory Overview

The Australian Building Codes Board (ABCB) is responsible for publishing, maintaining and updating the NCC which details the minimum necessary requirements for safety, health, amenity and sustainability in the design and construction of new buildings throughout Australia. Each state and territory give effect to the NCC through their acts of Parliament and subordinate legislation⁹⁴.

The provisions for Acceptance of Design and Construction are found in Part A2 of Volumes One and Three and Part 1.2 of Volume Two of the NCC⁹⁵. Essentially, there are six different types of evidence that can be used to verify that a product conforms or complies with Volume 1 and 2 of the NCC. To comply with Volume 3 of the NCC all products must have a Watermark Certificate of Conformity.

⁹³ This Appendix has not considered a Co-operative as it is not an appropriate structure or an Organisation formed by Royal Charter or by Special Act of Parliament as these forms of entities are now rarely formed.

⁹⁴ See eg, *Building Act 1993* (Vic), *Home Building Act* (NSW), *Environment Planning and Assessment Act 1979* (NSW) and *Queensland Building and Construction Commission Act 1991* (Qld).

⁹⁵ NCC is available at www.abcb.gov.au.

Following the Lacrosse fire in Melbourne and the Grenfell Tower fire in London, the Queensland and New South Wales Government introduced specific laws relating to building products that provide building authorities with broad powers⁹⁶.

In Queensland the *Building and Construction Legislation (Non-conforming Building Products- Chain of Responsibility and other Matters) Amendment Act 2017* (Queensland Act) amended the *Queensland Building and Construction Commission Act 1991* to establish a chain of responsibility, placing duties on all supply chain participants to ensure that building products used in Queensland are safe and fit-for-purpose.

The supply chain extends to those that are responsible for design, manufacture, import, or supply of a building product and know or should reasonably know, that a product will or is likely to be associated with a building, as well as if they install the building product into the building in connection with relevant work.

The Queensland Act established the Building Products Advisory Committee, and allows for a warning statement about a product and ability for a recall order to be issued where deemed necessary.

In New South Wales the *Building Products (Safety) Act 2017* (NSW Act) allows the Fair Trading Secretary to:

- Prohibit the use of a specified building product in a building;
- Issue an affected building notice for a particular building;
- Issue general warnings about a class of buildings that may be affected buildings.

The NSW Act makes it clear that the Act will prevail over the NCC, so that a building product may be banned even though the product or certain uses of the product complies with the requirements of the NCC⁹⁷.

The regulatory framework concerning non-conforming and non-complying products continues to evolve with the Building Confidence Report recommending “the Building Ministers’ Forum agrees its position on the establishment of a compulsory product certification system for high-risk building products”⁹⁸. The recommendation states that such reforms be implemented through amendments to the NCC and/or through consistent reforms to each jurisdiction’s legislation. It follows then that the appraisal provided by ATEN should also be implemented through the NCC and be consistent with each jurisdiction’s legislation.

Without consistency in approach and evidence that can be relied upon by those in the supply chain, the resulting cost to parties to undertake rectification will be extensive as has been seen with the widespread use of combustible cladding.

Q.3 ATEN’s Structure

It is ATEN’s mission to establish a network to harness collaboration of relevant testing authorities and professionals to provide services to manufacturers, designers, architects and builders who form the supply chain for construction works, to provide an appraisal of Construction Products.

Essentially, ATEN will be the facilitator bringing together the relevant parties required to appropriately define the use of a construction product, outline the relevant testing required and qualify a Construction Product. ATEN will achieve this through the provision of guidelines for laboratories who can undertake testing, co-ordinate the required testing with the laboratory, provide access to experts and engage their

⁹⁶ *Building and Construction Legislation (Non-conforming Building Products- Chain of Responsibility and other Matters) Amendment Act 2017* (QLD) and *Building Product (Safety) Act 2017* (NSW). In Queensland the relevant building authority is the Queensland Building and Construction Commission. In New South Wales the Act is administered by NSW Fair Trading.

⁹⁷ See s 9 and 17 *Building Product (Safety) Act 2017*.

⁹⁸ Shergold, P., & Weir, B. (2018). *Building Confidence: Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*, p. 36-37.

services to undertake scoping and use of a construction product, with collation of testing materials and risk assessments resulting in an appraisal, to be retained in a public register that can be used to provide confidence to all parties whom form part of the supply chain. ATEN may also engage in auditing of appraised products and may engage in related services. These services may include:

- education,
- research in related areas,
- bring together leading experts and manufactures from around the world to collaborate on best practice, and
- conferences and tradeshow.

ATEN can achieve these objectives by forming an entity in one of the following ways:

- as a company - public company limited by guarantee,
- establishing an incorporated association, or
- establishing an unincorporated association⁹⁹

Each of the above structures have different risk profiles and will allow a variance of activities to be undertaken by ATEN (or the company/organisation established by ATEN).

Q.3.1 Public Company Limited by Guarantee

A company limited by guarantee is a specialised form of public company designed for non- profit organisations. Companies limited by guarantee are subject to the *Corporations Act 2001* (Cth) which is administered by the Australian Securities and Investment Commission (ASIC). A company limited by guarantee is:

- a separate legal entity and can sue and be sued,
- lease and own property in its own name,
- enter into contracts, and
- hold assets in its name.

The term company limited by guarantee refers to what occurs in the winding up of this type of company. The members of the company specify an amount (which is usually minimal) they are willing to contribute to the property of the company on its winding up. This determination limits the liability of the company's members.

An important exception to the limited liability is that it will not apply to protect individuals if a director or officer of a company limited by guarantee, breaches their directors' duties. These duties are prescribed within the *Corporation Act 2001* (Cth) and case law and include:

- always acting in the best interest of the Company.
- being honest and careful in dealing both with the company and on behalf of the company.
- knowing what the company is doing, including how the company is faring financially,
- ensuring proper financial records are kept,
- make sure that the company can pay its debts on time.

A company limited by guarantee has legal restrictions and requirements that it must meet. As a minimum, a company limited by guarantee must:

- have at least three directors (at least two of the directors must live in Australia and one secretary,
- have a least one member,

⁹⁹ This paper has not considered a Co-operative as it is not an appropriate structure or an Organisation formed by Royal Charter or by Special Act of Parliament as these forms of entities are now rarely formed.

- be internally managed by a constitution,
- maintain a register of its members,
- keep a record of all directors' and members; meetings and resolutions,
- appoint a registered auditor within one month of its registration,
- keep proper financial records,
- prepare, have audited and lodge financial statements and reports after the end of every financial year,
- send to its members a copy of its financial statements and reports, unless the member has a standing arrangement with the company not to receive them,
- hold an annual general meeting once every calendar year within five months after the end of its financial year,
- receive and review an annual company statement and pay an annual review fee,
- lodge notices whenever changes to its officeholders, office addresses, constitution and its name occurs.

A company limited by guarantee can operate nationwide. The legal framework of a company limited by guarantee provides Government, and other stakeholders with confidence that the organisation is compliant with stringent principles and acknowledged standards. Legal reporting obligations as set out above will be further determined by the annual turnover of the company.

While the reporting obligations of this type of entity are strict, the structure provides a number of benefits to ATEN including limitation of liability of its members as well as good governance structures by way of reporting obligations and a constitution that sets out the objectives of ATEN.

Q.3.2 Incorporated Association

Incorporated associations are registered within a specific state. Incorporation of an association provides the following benefits:

The group will have a separate legal identity and as such it can:

- enter into contracts,
- hold assets in its own right,
- borrow money,
- sue and be sued in its own right, and
- enjoy perpetual succession.

Incorporation allows for limited liability to its individual members as incorporation creates a corporate veil that enables members to be protected from personal liability. An important exception to this however is that limited liability will not apply to protect individuals if a director or officer of an incorporated association breaches their director duties. These duties are prescribed by legislation and case law and are largely the same as those set out above for a company.

Each piece of state and territory legislation that sets up an incorporated association requires the following:

- have a name which has the words *incorporated* or *Inc*,
- have a constitution or a set of written rules with purposes that the Incorporated Association agrees to operate in accordance with,
- pay an initial registration fee to the relevant state or territory,
- have a certain number of members and people who are willing to hold certain positions in the Incorporated Association,
- hold certain meetings and keep certain records,
- provide the government with financial information about the organisation, and
- pay an annual fee to government.

Associations are only state based and can only conduct business in their home state or territory. To conduct business outside of an Incorporated Association's home state they are required to register as a registrable Australian body.

An incorporated association provides protection to its members and is a separate legal entity. Due to the work that ATEN will undertake through the facilitation of professionals and the provision of an appraisal, an incorporate association may provide a broad enough structure to undertake the relevant activities. As ATEN's activities however will not be confined to one State it will need to be registered as a registrable Australian body and as such a company limited by guarantee may be a better structure to an incorporated association as it can operate nationally and will have one framework for compliance and reporting to ASIC.

Q.3.3 Unincorporated Association

This structure is suitable for small groups or organisation with minimal assets who do work that requires minimal assets and minimal risk. An unincorporated association is not a legal entity in its own right and as such it cannot enter into Contracts or hold assets in the name of the unincorporated association. If the unincorporated association cannot meet its debts, the members of the unincorporated association will be required to make up the difference from their personal assets.

It is not recommended that an Unincorporated Association be used for ATEN's activities going forward. This is so as it does not provide protection for its members and does not provide the ability to hold assets and enter into contracts as the structure is too informal.

Q.3.4 Recommendation

Through establishment of a company limited by guarantee or an incorporated association ATEN can establish a board of directors who sets the scope of the work of the office, providing the framework for how and who may provide services that will form the appraisals.

BRANZ the New Zealand company which provides appraisals undertakes their appraisals through a company limited by guarantee and uses incorporated associations as subsidiary bodies to undertake related services such as research. This hybrid structure may also be utilised in a similar way within Australia.

Q.4 Limitation of Liability

Limitation of liability of the directors and officers of ATEN (or the establish company or incorporated association) can be achieved through:

- implementation of good governance,
- engaging of external experts through panelling arrangements to provide services to the entity which can leverage the expert's professional indemnity and further mitigate the risk of liability to the entity,
- auditing of appraisal activities undertaken to ensure that the scope of the appraisal is adequate and compliance is being achieved as well as new learnings and updates incorporated into the documentation on use,
- auditing of laboratories recommended for testing to ensure ongoing compliance,
- insurance (directors and officers and professional indemnity), and
- establishing a risk and compliance function within the company or incorporated association.

The combination of these risk mitigation strategies will ensure the success of the established company or incorporated association and will minimise the risk of liability to its officers and employees.

Q.5 Conclusion

If ATEN is to be the facilitator that brings together the required professionals, testing laboratories to provide a service of appraisals to the supply chain as evidence of meeting the NCC, it is important that appraisals be recognised by the NCC. Ideally, this recognition should be through specific provisions and not as part of the generic any other form of evidence provision. Support from each state within their respective legislation or through representation within the established entity is also recommended to ensure consistency is achieved and supply chain participants do not have to go through additional testing to use a product in a particular State or Territory.

If ATEN is to be successful in the facilitation of the parties required to provide appraisals it should be set up as a company limited by guarantee or an incorporated association with good governance and risk mitigation strategies.

Appendix R

Potential ATEN governance for a national approach

Written by Ivan Donaldson

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Foreword

This Appendix discusses in detail ATEN's potential governance if it is to operate nationally. The role of government is discussed, and different forms of governance are presented. The principles to drive ATEN's governance are identified and different forms of public-private governance are presented.

The three entity structures for ATEN outlined in Appendix Q could be adopted under each of the governance models identified in this Appendix.

The role of government

As the National Commission of Audit reported in 1996¹⁰⁰, governments should be focused on social or equity goals for the benefit of the community and on areas of market failure where, without government, private actions in the market would result in inefficiencies and sub-optimal outcomes for the community.

We now have a situation in the building and construction sector of demonstrable market failure.

The building and construction industry is already subject to a diverse range of regulations at all levels of government. The National Construction Code, oversighted by the joint Commonwealth, state and territory Governments' Australian Building Codes Board, contains the building standards aimed at achieving health, safety, amenity and sustainability objectives. Code enforcement rests with the states and territories either directly or through private entities.

Certification, which is a critical part of the system, is "... the assessment and certification of a building design and work under construction for which a building permit, an occupancy permit or approval in accordance with a state or territory legislation is needed. Within the system, building professionals, public and private building surveyors, architects and engineers are all addressed as certifiers."¹⁰¹

Accredited testing houses, laboratories and the like, as well as the proposed ATEN, are also involved through their product conformance function.

Conformance is a foundation element that goes to the heart of the integrity of the design and building process.

The 1995 Kean Inquiry¹⁰² defined this system as follows:

"The standards and conformance infrastructure is a crucial element of the commercial and scientific fabric of a modern community. An efficient and effective system will encourage innovation and underpin competitive advantage. It is vital to the integration of Australian industries into the world economy. It

¹⁰⁰ *National Commission of Audit: Report to the Commonwealth Government p. vii June 1996 AGPS Canberra*

¹⁰¹ *Competitive enforcement: Comparative analysis of Australian building regulatory enforcement regimes. P. 77 Jeroen van der Heijden, Delft University of Technology IOS Press 2008*

¹⁰² *Linking Industry Globally: Report of the Committee of Inquiry into Australia's Standards and Conformance Infrastructure. Page xi*

helps to ensure that Australian products comply with international specifications and gives buyers confidence that the products will perform as claimed and are fit-for-purpose”.

What is now needed in the certification area, in light of an operating environment that has not always delivered positive building outcomes, is a re-balancing of the role of government with the activities of the private sector.

ATEN governance in a changed operating environment

The key driver of ATEN's governance design is the extent to which government is to participate in ATEN's activities. To deliver a new service to the building and construction sector the choice is therefore between:

- a commercial collaboration between evaluation bodies with only minimal government involvement (Option 1),
- a new government-funded body with oversight, coordination and final sign-off power on holistic alternative solutions (Option 2), or
- a cooperative arrangement between government and participating evaluation testing bodies, with a clear separation between policy and operational matters (Option 3).

Irrespective of which broad option is chosen, ATEN may be accredited by JAS-ANZ to be recognised as a means by which conformance with the Building Code of Australia can be demonstrated.

Proposal supporting Option 3 - *a public/private partnership model*

Ideally for the ATEN scheme to add value to the conformity assessment system and deliver on trust, it would need to be underpinned by Commonwealth, state and territory policy and regulations so that it has adjudication authority.

The expertise for technical evaluation in Australia is carried out wholly in a contestable commercial market. Governments are responsible for setting and enforcing the rules but they do not, by in large, approve building solutions.

In this operating environment of market-driven certification and the demonstrated loss of the community's trust, more of the same is unlikely to be sufficient.

This would question a purely commercial model (Option 1) as a tool for regulatory conformance. However, this may still be of benefit to provide a streamline process for suppliers and manufacturers to gain understanding and advice to gain acceptance using existing infrastructure.

Also, it is unlikely that a wholly owned and operated national regulatory body would receive whole-hearted support from industry or be favoured by the States and Territories. It would be likely seen as adding another layer of costs and bureaucracy that could also, over time, challenge the constitutional authority of the States through bureaucratic creep. Option 2 is therefore also questionable at this time.

The preferred model therefore would be a public private partnership governed by well-established best practice principles, including, in this case, public indemnification for ATEN activities and having ATEN embedded into the existing regulatory framework in the most efficient and effective way.

R.1 Principles to drive ATEN Governance

The Commonwealth Department of Finance explains¹⁰³ that good public sector governance is underpinned by five core principles. An organisation that uses good governance is one that always, in word and action, demonstrates: accountability; leadership; integrity; stewardship; and transparency

The core principles that underpin considerations and decisions that influence the design of a governance structure for an activity or body are:

- clarity of purpose,
- accountability to the Parliament,
- transparency to the public, and
- optimisation of efficiency and performance.

With these principles in mind, it is noted that Option 3 involves the outsourcing of certain regulatory delivery responsibilities of government on alternative solutions and related matters. Out-sourcing does not have to, nor should it, absolve government of its accountability obligations or responsibility for the regulatory system it administers.

Government can address the accountability question of out-sourced activities. As noted by Richard Mulgan, Emeritus Professor, Crawford School of Public Policy, ANU “Transparency and the Performance of Outsourced Government Services” Occasional Paper No. 5 March 2015¹⁰⁴.

“contracts can include stipulations intended to compensate for some aspects of a transparency gap by requiring that the private contractor makes certain information available to government or the public or that certain aspects of the contractor’s operations be open to scrutiny from government accountability officers or parliamentary committees”

The ATEN scheme also needs to be informed by the Building Ministers’ Forum’s response to Shergold and Weir report. It is noted that Shergold and Weir said that Australia’s product certification systems will need significant reform, including mandatory permanent product labelling and prohibitions against the installation of high-risk building products that are not certified.

ATEN will contribute to the solution because it will deliver comprehensive Building Code fit for use appraisals drawing on expertise across the spectrum. It aims to provide a reliable robust service to the market that has the formal recognition of government, is transparent, available to industry and capable of being drawn on by regulators to support their enforcement activities. It could also underpin product labelling for greater market transparency.

R.2 Possible vehicles for public-private partnership

There will be a need for a vehicle to guide the partnership. This vehicle could be:

- an MoU between ATEN and BMF (or Commonwealth on behalf of BMF following joint Government agreement) drawing on the Commonwealth/NATA MoU model¹⁰⁵,

¹⁰³ Australian Government, Department of Finance. (2018). Core governance principles Retrieved from <https://www.finance.gov.au/resource-management/governance/policy/principles/>

¹⁰⁴ Mulgan, R. (2015). *Transparency and the performance of outsourced government service*. Commissioned by the Queensland Office of the Information Commissioner and prepared for the Australia and New Zealand School of Government Retrieved from https://www.oic.qld.gov.au/_data/assets/pdf_file/0003/27444/paper-transparency-and-outsourced-government-services.pdf

¹⁰⁵ Australian Government, Department of Industry, Innovation and Science. (2018). *Memorandum of Understanding between the Commonwealth of Australia as represented by the Department of Industry, Innovation and Science and National Association of Testing Authorities, Australia*. https://www.nata.com.au/phocadownload/government/MOU_Commonwealth_of_Australia_and_NATA.pdf

- a Variation to the 2017 Agreement between the Governments of the Commonwealth, the States and Territories to continue in existence and provide for the operation of the ABCB consistent with Clause 22.1 that states “This Agreement may be varied with the written consent of all Parties”¹⁰⁶,
- a model based on the Minimum Energy Performance Standards (MEPS) under a number of existing statutes including the Commonwealth’s *Greenhouse and Minimum Energy Standards Act 2012*¹⁰⁷.

Critical to the adoption of the ATEN scheme will be the need for policy and operational design to be fully developed and agreed by the Building Ministers’ Forum on advice from Senior Officers’ Group and the ABCB in consultation with proposed ATEN participants, JAS-ANZ and NATA. The scheme needs to be national, to be available as an additional tool for conformance and compliance by all nine jurisdictions and to work in harmony with the existing entities in the conformance infrastructure.

There will be a need to consider issues such as indemnity and accreditation for ATEN, scheme rules and amendment to Clause A2.2 *evidence of suitability* of Volume One of the Building Code of Australia so that ATEN is recognised.

R.2.1 ATEN MoU

The MoU between the Commonwealth and NATA may be worth exploring.

The National Association of Testing Authorities (NATA) is a private company but is recognised by the Commonwealth for its accreditation role through an MoU.

NATA’s MoU with the Commonwealth of 29 August 2018, also acknowledges that, on public interest grounds, the Commonwealth may provide grant funding to NATA.

R.2.2 IGA 2017

The Agreement dated 31 January 2018 sets out the governance of Australia’s strategic, policy and operational framework not only for the ABCB but also for the conduct of national building regulation reform. Additionally, it encompasses annual government funding commitments to the ABCB out to 2022-23 as well as separate agreements on intellectual property and indemnification of ABCB staff and industry Board members.

As ATEN would be carrying out its functions in the public interest and of direct relevance to conformance with the Building Code of Australia and State and Territory compliance and enforcement, it would be appropriate that it be part-funded by the nine governments and part-cost recovered in the market

R.2.3 MEPS model

A model based on the Minimum Energy Performance Standards (MEPS) under the Commonwealth’s *Greenhouse and Minimum Energy Standards Act 2012* could provide another solution.

In brief, MEPS fits into a wider national climate change mitigation policy framework oversighted by the COAG Energy Council of Ministers plus New Zealand. The policy is given effect by Commonwealth

¹⁰⁶ Australian Building Codes Board. (2017). Inter-Government Agreement. Retrieved from <https://www.abcb.gov.au/Resources/Publications/Corporate/2017-Inter-Governmental-Agreement>

¹⁰⁷ Australian Government, Federal Register of Legislation. (2012). Greenhouse and Energy Minimum Standards Act 2012. No. 132. Retrieved from <https://www.legislation.gov.au/Details/C2012A00132>

legislation that aims to meet international climate change obligations and promote the development and sale of products that use less energy and less greenhouse gases.

The MEPS model has a number of positive features. It could:

- provide a national approach to a national challenge;
- bring conformance, compliance and enforcement into line with the *Regulatory Powers Act 2014* to create greater clarity and consistency for regulators and make it easier for industry to understand and comply with the law; and deliver better public safety outcomes.

R.2.4 Conclusion

The simple approach would be to rely on the MoU option. The most complex model to develop would be the MEPS model.

An MoU lacks formality and gravitas. The MEPS model would be complex to set up.

Incorporation of the ATEN scheme either into a revised IGA, or under the auspices of the IGA, is preferred. It has the advantage of integrating ATEN into the existing system and at the same time adding to it in a seamless way.

