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A Critical Examination of Mandatory Building Inspections: Perspectives from Australian Contractors

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Abstract:
In Australia, the construction industry relies on building inspections conducted by statutory building surveyors and/or independent building inspectors to ensure regulatory compliance with the National Construction Code. Despite the essential role of these inspections, there is growing concern about the effectiveness and evidence of compliance. This issue is intensified by the complexities of modern construction practices and the pressures from the housing crisis, highlighting the need for a critical re-evaluation of inspection practices to reflect their impact on completed buildings better. This study explores the perspectives of contractors who closely interact with the regulatory inspection process to examine its influence on construction practices, the challenges in meeting standards, and its effects on project timelines and quality. Through qualitative interviews with five experienced contractors in the Victorian construction industry, a pilot study was undertaken, and the aim was to evaluate the feasibility of a holistic study. The findings reveal a consensus among contractors on the need for improved inspection processes, advocating for more comprehensive oversight and the integration of technology to bridge the compliance-quality gap. The study critically assesses the current mandatory inspection approach as inadequate for ensuring comprehensive regulatory compliance. It calls for a collective effort to enhance construction practices, aiming for regulatory mechanisms that better align with the complexities of modern construction, thereby ensuring safer, higher-quality building outcomes. With an emphasis on contractor experiences, this exploratory study sets the stage for more extensive research to refine inspection processes and improve construction quality and compliance.

Keywords:
Building Standards, Construction, Contractor Perspectives, Mandatory Inspections, Regulatory Compliance.

1 Introduction

The construction industry is crucial to Australia's economy, contributing significantly to infrastructure development, GDP, and employment (Law, 2021). However, there is a concerning trend of building defects due to poor workmanship and substandard quality control, which raises safety concerns, leads to financial losses, and erodes public trust (Sandanayake *et al.*, 2022; Shergold and Weir, 2018). These issues highlight the need for effective compliance with the National Construction Code (NCC) and a review of current construction practices. Mandatory building inspections, guided by the NCC and state legislation, aim to ensure compliance with safety and adequate design standards (ABCB, 2021), which is considered an

intervention to ensure basic building quality. However, their effectiveness in guaranteeing compliance has been questioned, revealing a gap between regulatory expectations and actual practice (Johnston and Teys, 2022).

The qualification of inspectors is a critical issue, given the increasing complexity of modern construction, evolving regulations, new materials, and advanced processes. As key participants in the construction process, registered builders are considered influential and actively engaged in each phase of construction, significantly impacting the building outcome. Understanding their perspectives on the current regulatory context is seen as a direct and efficient way to assess and improve regulatory effectiveness (Sharkey et al., 2014; Law, 2021). Thus, aiming to understand building contractors' perceptions of mandatory building inspections, this study explores the efficacy of inspection practices in the State of Victoria, where the local legislation prescribes a set of mandatory inspections to be carried out during the construction process and as a prerequisite for the release of a building permit. Qualitative interviews with experienced contractors are used to examine the real-world impacts of these inspections. It reveals insights into the challenges contractors face, their views on inspection processes, and their recommendations for improving regulatory practices.

2 Building Inspections – Victorian Regulatory System

Construction defects are a critical issue, often due to inadequate enforcement of the NCC (Shergold and Weir, 2018; Aibinu and Paton-Cole, 2023). Stringent oversight and detailed inspections are essential to ensure safety and compliance. The Victorian Building Authority (VBA) is responsible for ensuring effective inspections in alignment with the "Framework for Reform," which aims to modernise Victoria's building system (Better Regulations Victora, 2021). The complexity of Victoria's regulations is related to the building regulations framework (See Figure 1), which is complemented by other Acts: the Planning and Environment Act (1987), the Architects Act (1991) and Architects Regulations (2015), the Professional Engineers Registration Act (2019), the Energy Safe Victoria Act (2005), and others related to Health and Safety, Contracts, Consumers, the Sale of Land, and other local regulations.

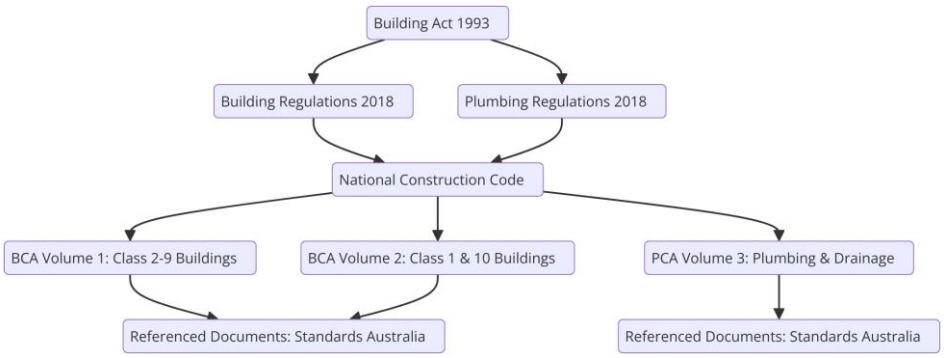

Figure 1: Building Regulations Framework (Authors)

One requirement of the Victorian building regulatory system is a minimum number of mandatory inspections at specific construction stages, which must be carried out by independent building inspectors and the relevant builder surveyor.

2.1 Mandatory Inspections and Inspector Qualifications

Mandatory inspections are crucial for maintaining building standards, requiring inspectors to have comprehensive knowledge and interpret complex regulations (Crommelin *et al.*, 2021;

Johnston and Reid, 2019). However, discrepancies in compliance and enforcement necessitate a re-evaluation of current protocols (Nwadike and Wilkinson, 2021; Johnston and Teys, 2022). The evolving construction landscape demands that inspectors continuously update their skills and knowledge to manage regulatory compliance pressures (Johnston and Teys, 2022; Shergold and Weir, 2018). Inspectors face challenges, especially when pressured to approve non-standard solutions without adequate expertise (Nwadike and Wilkinson, 2021). The professionals responsible for conducting building inspections must be highly qualified and registered with the appropriate authorities. In Victoria, building surveyors and inspectors must comply with the VBA's Code of Conduct (VBA, 2020). This code ensures that surveyors act independently and uphold the highest professional standards. They must possess a deep understanding of the Building Code of Australia (BCA) and the NCC, as their assessments have significant implications for public safety and the integrity of the construction process.

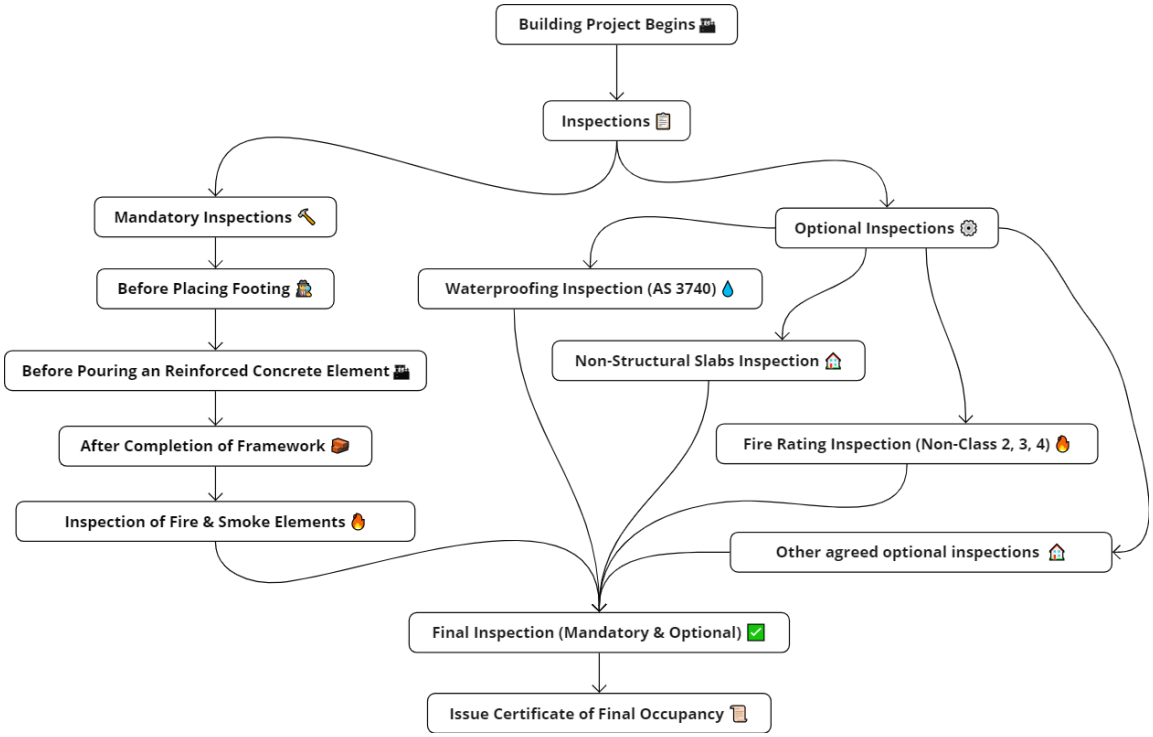

Figure 2: Example of mandatory inspections in Victoria and other additional inspections if requested and agreed upon with the client (Authors)

Building surveyors are central to the inspection process, with key responsibilities that include:

- Ensuring mandatory inspections are carried out at designated stages of construction.
- Determining the need for additional (optional) inspections based on the project's complexity and associated risks.
- Maintaining comprehensive documentation of all inspections, including identifying non-compliance issues and detailing corrective actions taken and accepted alternatives based on performance-based requests.

The stringent competencies required for these roles ensure that only highly qualified and experienced professionals are entrusted with these critical duties.

Knowing that the Australian National Construction Code (NCC) allows two alternative compliance solutions, one based on "deemed-to-satisfy" and another based on "performance", the experience of the builder surveyor is critical (See Figure 3). It is sometimes up to the discretion of the building surveyor to accept or reject any solution, or a tendency to apply

performance-based solutions if deemed to satisfy cannot be achieved in some instances/buildings if a lack of proper provisions on the NCC is identified (ABCC). Performance-based building regulations have been adopted by more than a dozen countries around the world with current challenges in their effectiveness, objectivity and embrace emerging issues (Meacham *et al.*, 2005, May 2003; Mumford, 2010)

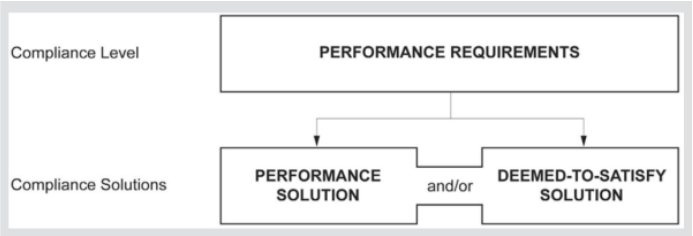

Figure 3: Performance Requirements (BCA)

Furthermore, building surveyors must be on top of an 'encyclopaedia of building compliance' knowledge and constantly up on changes in legislation, codes, and standards that directly or indirectly impact buildings (Law, 2021).

These factors place added pressure on building surveyors and inspectors, who must demonstrate compliance with the mandatory inspections required by the Act and the contractual obligations they assumed when issuing the building permit. Additionally, they face pressure from contractors to consider performance-based solutions that may bypass strict regulatory compliance.

2.2 The role of contractors in Inspections

Contractors and building surveyors significantly influence regulatory processes, affecting the quality and safety of construction projects. While inspections aim to enforce standards, contractors often struggle to balance compliance with operational realities (Sharkey *et al.*, 2014; Law, 2021).

2.3 Research Methodology

This study employs a qualitative research approach, specifically utilising grounded theory, to investigate the complex landscape of mandatory building inspections in Victoria. At the heart of our methodology are in-depth interviews with five experienced building contractors selected through purposive sampling based on their extensive knowledge and practical insights. The cornerstone of the participant selection process was the requirement of at least eight years of local experience in Victoria, with expertise including quality assurance, project management, and regulatory compliance (See Table 1).

This stringent criterion ensured that interviewees possessed a comprehensive understanding of the building inspection ecosystem, including its challenges, effectiveness, and potential areas for improvement. To structure an effective inquiry, the following three-pronged approach was adopted to undertake semi-structured interviews: 1) The role of building contractors in building inspection; 2) The role of mandatory inspections in ensuring building regulation compliance and their further influential role in building quality assurance; and 3) the qualifications and competencies of inspectors. This strategic framework enabled us to explore the multifaceted nature of building inspections systematically while ensuring comprehensive coverage of te research topic. For data analysis, this study employed a robust qualitative thematic coding framework (Vaismoradi *et al.*, 2016; Hay, 2010).

Table 1. Profiles of interviewees

Label	Experience	Role
CB1	Over fifteen years in the construction industry with a focus on quality assurance and regulatory compliance	Oversees the implementation of inspection protocols and compliance with building codes
CB2	Senior project manager with ten years specialising in regulatory compliance and risk management	Focuses on ensuring that construction projects adhere to legal and safety standards
CB3	Twenty years as a builder with extensive experience in managing large-scale residential projects.	Directly involved in on-site management and coordination of mandatory inspections.
CB4	Twelve years in construction project management, with expertise in overseeing project completion and occupancy.	Manages project workflows and ensures that final inspections are conducted for occupancy permits.
CB5	Eight years in construction, specialising in the coordination of inspection activities.	Liaises between building surveyors and construction teams to facilitate inspections

The analytical process began with an initial round of coding based on the three primary themes aligned with our interview structure. Subsequently, this coding was refined by developing more granular 'Child Nodes' from the primary 'Tree Nodes'. This hierarchical approach enabled to discern subtle patterns and nuances within the data, facilitating a deeper understanding of the subject matter. It is crucial to acknowledge that while the sample of building contractors may not be statistically representative of the entire industry in Victoria, this was a deliberate methodological choice. The aim was not to produce a broad survey of diverse practices but rather to conduct an in-depth exploration of the most significant, urgent, and typical issues in building inspection. This focused approach allowed to drill down into critical aspects of the field, potentially uncovering insights that might be overlooked in a more generalised study.

3 Findings and Discussion

All interviewees highlight their involvement in inspection processes to ensure compliance and manage risks. They stress the importance of strict enforcement to prevent long-term liabilities, noting gaps in current inspection focuses, such as structural integrity, waterproofing, and acoustics. They advocate for better-defined inspection expectations and emphasise that regulations standardise safety practices but require more rigorous enforcement. These insights from experienced building contractors provide a foundation for understanding the complex interplay between regulations, contractor responsibilities, and quality assurance challenges in the building industry. The following sections delve deeper into these themes, exploring the role of regulations and mandatory inspections, the qualification of building inspectors and the role of building contractors in building inspections.

3.1 Role of Regulations and Mandatory Inspections

The interviewees demonstrated varied levels of involvement in the inspection process. One interviewee mentioned being heavily involved due to their role in ensuring compliance and managing risks, stating that close engagement in the process is critical rather than relying solely on basic mandatory inspections. They discussed attending final walk-throughs and being responsible for signing off on occupancy. The interviewees described the objective of mandatory inspections as primarily protecting consumers and ensuring a minimum level of building quality and safety. These inspections focus on structural elements and fire safety aspects of buildings. CB1 stated that regulations are crucial for ensuring buildings meet minimum safety standards. According to CB2 and CB5, the benefits of mandatory inspections

include establishing a consistent approach across the industry, standardising construction practices, and providing a basic level of consumer protection. They serve as a checkpoint to ensure that critical aspects of construction meet regulatory standards (i.e., safety). “Well, legislations, they just define what quality required minimum from, ... [and] make sure all the parties are on the same page.” (CB2).

Several suggestions were made by the interviewees to improve the scope and frequency of mandatory inspections, especially for critical stages like waterproofing and services installation. “I think the scope and the frequency of inspections could increase. You could include waterproofing, acoustics, services, and roofing. We can include a whole range of different things that aren't in the current mandatory list.” (CB 3). Also, CB 4 suggested that building surveyors should be required to spend a certain percentage of project time on site beyond just the mandatory inspection points.

Furthermore, some participants reported that project delays are common when issues arise. One participant noted, “you've got to continually involve them in the process” (CB4), which extends timelines. This is particularly evident in situations where uncertainty and inconsistency occur, such as when “a new building surveyor disagrees with previous approvals,” leading to unexpected late-stage issues (CB5). Resource strain is also a major concern; CB2 identified ‘*insufficient resources*’ as a key risk factor in quality control, as inspections require considerable staff time and effort. Simultaneously, costs have risen significantly, with CB5 stating that “surveyor fees for large projects now range from $250,000 to $300,000.” Thus, while acknowledging the importance of inspections, contractors emphasise the need for a more efficient and flexible approach to minimise project disruptions.

To address these impacts, there was a recommendation for better documentation and transparency in the inspection process, leveraging digital technologies for more comprehensive record-keeping and visualisation of compliance. “I think my experience with this current company in digital engineering is helping us a lot in all different phases, particularly in quality perspective. We'll be able to see materials going to be used and how they'll look like in terms of coordination, different trades like services, structural.” *(CB 2).*

The following sections discuss the limited qualifications and expertise of building inspectors, which all interviewees highlighted.

3.2 Qualifications Needed for Inspectors

The current qualifications and expertise of building inspectors, particularly building surveyors, are a subject of concern in the industry. Building inspectors are required to be qualified and registered as building practitioners. They are expected to have extensive practical building experience, design knowledge, and a thorough understanding of the National Construction Code. The ideal inspector, according to CB3, should have “lots of experience, so practical building experience and design experience as well. Construction and design experience is very important.”

However, the interviewees highlight the limited expertise of individual inspectors as a key challenge of effective inspection, especially when dealing with complex projects such as high-rise buildings. This suggests that the complexity of modern construction requires a team of specialists rather than relying on a single inspector. The interviewee stated, “I don't think one person's experience is limited. We need to get all the different areas of expertise to reinforce that this is what they've done, this is compliant, and this meets our contract or the standards or our specifications.” (CB5)

Additionally, the inspector's capacity limitation is emphasised. CB3's observation that inspectors are 'spread too thin' points to a systemic problem in the industry. This lack of capacity isn't just about the number of inspectors but also about the time and attention each project receives. As buildings become more complex, the demand for thorough inspections increases, yet the capacity doesn't seem to be keeping pace. The interviewee further elaborates on this issue, stating: "If I go back to my house that I built in 2021, there are so many things that I did in that construction that I know I did correctly, but no one looked over my shoulder to make sure that I was doing it correctly" (CB3). This quote illustrates how capacity constraints lead to a focus on only the most basic elements, potentially missing critical aspects of construction quality.

The challenge of limited capacity is exacerbated by the rapid evolution of building technologies and materials. CB5's comment about the need for building surveyors to update their knowledge and experience highlights the ongoing struggle to stay current in a fast-changing industry. This isn't just about learning new techniques; it's about understanding how new materials and technologies interact with existing building codes and standards. "We're getting very complex nowadays. A build -- system complexity... If you take this building here. We handed over this building and there was a defect to do with the tri-gen plant here. And that plant had a hot water circulation system that our client had to keep at a certain pH, and you need to have it inspected every month and water tested and all that sort of stuff." (CB4) This example demonstrates how new technologies introduce complexities that require specialised knowledge and dedicated people to inspect properly.

3.3 Role of Contractors/Builders in Inspection Process

The interviewees, representing various senior positions in major construction companies, play crucial roles in the building inspection process. They often act as intermediaries between regulatory requirements and on-site implementation. Their responsibilities span from internal quality control to coordinating with external inspectors and/or building surveyors.

On the one hand, contractors play a proactive and integral role in building quality assurance, directly associating inspections with quality standards. This approach is evident in the statements of CB2 and CB4, who detailed their companies' internal processes designed to meet and exceed regulatory requirements. CB2, in his role as a quality advisor, described his involvement: "I work in the Victorian section as a quality advisor, which just provides constant audits to the various projects, and I carry out various inspections in all faces, so the projects throughout our job." This hands-on approach to quality assurance demonstrates how contractors take the initiative to ensure compliance and quality throughout the construction process. CB3 and CB5 further elaborated on the proactive stance contractors take in the inspection process.

They emphasised the importance of close collaboration with inspectors to ensure compliance and facilitate mandatory inspections. CB5 highlighted the use of accountability systems, stating, "We've had instances where we've got away with something that, and we know an inspection hasn't occurred, especially on a big building, and we know that potentially someone may not ever pick it up. But because we saw the paperwork is not there, we push upon our teams that they have to rip it up and do it again."

This commitment to accountability, even when it results in additional work and cost, underscores the contractor's role in maintaining quality standards. CB1 and CB2 emphasised the contractor's responsibility to maintain internal quality control and prepare for external inspections. CB1 noted, "We're systematic. So we'd be safe, like if we weren't happy with it,

and even if it's, I guess, in the past, consultants or building surveyor was -- and if we weren't happy, we would probably redo the work."

This proactive approach to quality control demonstrates how contractors take ownership of the quality assurance process, often going beyond minimum requirements to ensure project success. On the other hand, the building contractors significantly influence the inspection process and its outcomes. Their roles allow them to potentially shape the inspection experience and results in several ways. Firstly, they have control over scheduling and preparing for inspections. As the interviewee mentions: "In the past, it was actually once we get a list of inspection requirements, making sure that we undertake them, and we used to break that down in a matrix to say -- and link that to our program to say when would we need to do all the mandatory inspections" (CB5). This ability to schedule inspections gives them the power to ensure that sites are prepared and potentially present the best possible image to inspectors. CB4 alludes to the role of guiding inspections, "I would attend final walk-throughs for occupancy and stuff like that, but a lot of my engineers do a lot of the running around and preparing for all of that stuff." This suggests that these professionals or their delegates often lead inspectors through the site, potentially influencing what gets seen and how it's presented. Moreover, their oversight of internal quality control processes gives them intimate knowledge of any issues on site. CB2 describes his role, *"*I work in the Victorian section as a quality advisor, which just provides constant audits to the various projects and I carry out various inspections in all faces, so the projects throughout our job."

This deep involvement in quality control puts them in a position to potentially highlight or downplay certain aspects of the project during official inspections. It's important to note that while the interviews don't explicitly mention concealing issues from inspectors, the interviewees' positions would theoretically allow for such influence. For instance, CB3 mentioned, "I have teams on every project that carry out their own inspections and work with the building surveyors." (CB3). This coordination with building surveyors could potentially be used to manage what information is presented during inspections.

4 Conclusion and Further Research

This study concludes that the effectiveness of building inspections relies on both the regulations' framework and the competencies of inspectors and contractors (See Figure 4). Based on the identified challenges, three dimensions were identified, and potential solutions were suggested for each, respectively: 1) Regulatory Scope and Limitations, 2) Evolving industrial context, and 3) Practitioners' Role and Capacity.

In terms of regulations, the current minimum standards and limited inspection scope have been widely criticised for their ineffectiveness as a comprehensive instrument for ensuring building quality and safety compliance. To address these challenges, this study recommends a fundamental rethink of the current inspection regime. It suggests expanding mandatory inspections to cover areas that are currently underrepresented, such as waterproofing and acoustics, as highlighted by industry professionals. Regarding the evolving industry context, increasingly complex building designs and rapidly changing construction technologies pose significant challenges for building inspectors and other practitioners. In response, the findings suggest increasing the frequency of inspections, enforcing the requirement for qualified on-site inspections, and leveraging digital technology to enhance record-keeping and transparency in construction documentation. For example, Building Information Modelling (BIM) can help various trades stay aligned with project progress and improve communication efficiency,

accuracy, and transparency among stakeholders. However, these new technologies also present challenges for building surveyors, underscoring the need for adaptive inspection practices. Professional training and upskilling are essential for inspectors to keep pace with industry advancements and ensure thorough oversight throughout the construction process.

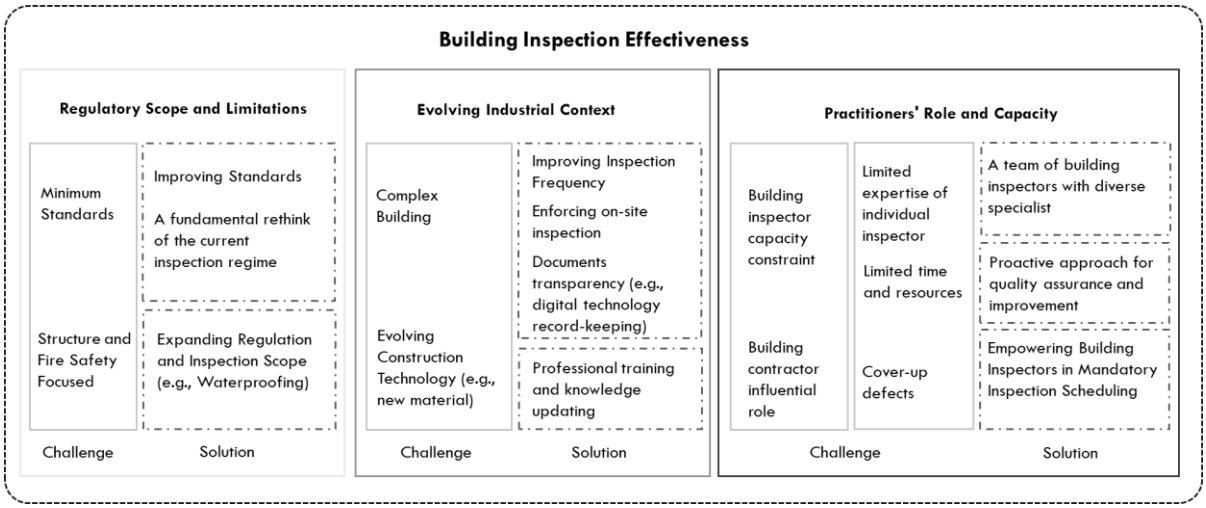

Figure 4 - The challenges and proposed solutions for building inspection effectiveness.

In terms of practitioners, this study recognises the crucial roles played by both building inspectors and contractors in the inspection process. Given the limited qualifications required of inspectors by current regulations, as well as constraints on their time and resources, coupled with the potential for contractors to conceal issues during inspections, the findings recommend establishing inspection teams with diverse expertise rather than relying on individual inspectors. Additionally, contractors should be encouraged to adopt more proactive and stringent approaches to compliance and quality improvement. For example, one interviewee's company has developed its own comprehensive quality assurance system. Furthermore, empowering building inspectors to schedule unscheduled mandatory on-site inspections is crucial. Providing inspectors with more autonomy in this regard reduces the likelihood that contractors will only prepare for scheduled inspections, allowing for a more accurate assessment of ongoing construction quality.

According to the research findings, contractors' perceptions of inspections, the challenges they face, and the adjustments they make in response to mandatory inspections provide a foundation for understanding how building practices and outcomes are affected by these inspections. Future studies should explore how other stakeholders view the regulatory environment and how contractors navigate their relationships with inspectors and regulatory bodies. This includes examining the dynamics between contractors and inspectors during the inspection process, as well as how contractors manage compliance with authorities such as the Victorian Building Authority (VBA), Safe Energy Victoria, and local councils. This may shed light on potential conflicts of interest, challenges in maintaining consistent standards across different regulatory bodies, and opportunities to improve the effectiveness of inspections.

5 Acknowledgement

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