

UNDERSTANDING THE BUILDING CERTIFICATION SYSTEM: A NEED FOR ACCREDITATION REFORM

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ABSTRACT

The building and construction industry makes a major contribution to the New South Wales (NSW) economy, with an annual input of 7.6% during 2010 that is projected to rise to 8.4% in 2020. Irrespective of the sector's growth potential, it is experiencing a severe skills shortage across a range of professions including building certification. Interestingly, the certification sector and the regulatory environment in which it operates is yet to receive rigorous attention in academia and industry. In the context of NSW, the role of the accredited certifier is multifaceted and involves confirming that building work complies with environmental planning controls and the National Construction Code. The Building Professionals Board (BPB) is the statutory body responsible for accrediting these professionals. The BPB is partnering with the University of Newcastle to ameliorate the current skills shortage through the development of an evaluation instrument regarding: certifiers seeking to upgrade to a higher level of accreditation but who do not have a recognised qualification and/or are unable to obtain the practical experience relevant to progression; and associated professionals who, although not accredited, wish to become a certifier but lack the recognised qualifications and/or experience.

The proposed evaluation instrument will incorporate a mix of current technologies and approaches to address the current and likely future demographics of certifiers, and their preparedness to engage with and access novel IT technologies. This paper introduces the current certification environment and the technologies proposed to structure the evaluation instrument.

Key Words: construction, building surveying, accreditation, education, assessment.

INTRODUCTION

Within New South Wales (NSW), the building and construction industry makes a major contribution towards the State economy, with an annual input of 7.6% during 2010 that is projected to rise to 8.4% in 2020 (NSW Fair Trading, 2012). Irrespective of the sector's growth potential, it is experiencing a severe skills shortage across a range of professions including building surveying and the functions these practitioners execute as certifiers. There is limited understanding about why this profession recruits so few applicants. This may be attributed to the age profile of existing incumbents, lack of awareness about the career as a profession, inconsistent certification schemes nationally and the increasing specialisation of the discipline.

In NSW the Building Professionals Board (BPB) is the State Government statutory body responsible for accrediting certifiers (NSW Government Building Professionals Board, 2012). The BPB is partnering with the University of Newcastle to ameliorate the current skills shortage through the development of an evaluation instrument that will assist with:

- certifiers seeking to upgrade to a higher level of accreditation but who do not have a recognised qualification and/or are unable to obtain the practical experience relevant to progression; and
- associated professionals who, although not accredited, wish to become a certifier but lack the recognised qualifications and/or experience.

This paper introduces the profession through a précis of its historical foundations. It then discusses the contemporary building surveyor: the certifier and the associated legislative system. This is followed by a discussion of the evaluation instrument and the initial pilot study.

HISTORY OF THE PROFESSION

Building Surveying is a profession that is steeped in antiquity. The origins are thought to have emanated from the reign of the Sixth King of Babylon: King Hammurabi (1792BC-1750BC) and the introduction of The Code of Hammurabi (Johns, 1904). Believed to be the first written codes of law, they endorsed punishment and contained a set specific to construction (Johns, 1904). They highlighted the responsibility of builders for their workmanship. For example:

- 'Rule 229: If a builder has built a house for a man, and has not made his work sound, and the house he built has fallen, and caused the death of its owner, that builder shall be put to death' (Johns, 1904).

These primary forms of legislative rule continued to be executed through time with many identified in the writings of Ancient Rome around 300BC. During this period Atkins explains that the 'construction' laws expanded focus to prevent the spread of fire from one building to another (as cited in Zillante, 2007). However, on September 2, 1666 a fire broke out in a small bakers shop, in the aptly named Pudding Lane, London. During that period, buildings were constructed of highly flammable materials like timber and thatch allowing rapid fire growth and spread. The effects of this fire were devastating with 80% of London being destroyed giving effect to the title 'The Great Fire of London' From this devastation arose a system of building regulation (Australian Institute of Building Surveying, 2013a). Regulatory controls at this time concentrated on provisions to protect life and property such as restrictions preventing the upper floors of buildings from overhanging adjacent streets(Zillante, 2007).

Australia inherited British regulatory building controls (Zillante, 2007). It is thought that the first construction specific controls were introduced by Governor Philip in 1788. Given the high fire danger associated with certain construction techniques and materials he banned the use of thatched roofs if a house had a chimney (Cowan, 1998). However, it was centuries later that the profession of building surveying and strict building regulations as we know today were first founded. The profession became established with the introduction of building certification, Codes and Standards 'as a response to actual or perceived disasters' (Phillips, 2010) such as fires. Today, the profession faces many challenges such as complex building regulatory and accreditation systems that differ amongst the states and territories, new technologies and construction methods, and a lack of professional pathways and people entering the profession.

DEFINING BUILDING SURVEYING: CERTIFICATION

The Australian Institute of Building Surveying, NSW/ACT Chapter has identified that 'Building Surveyors have a detailed and expert knowledge of the Building Code of Australia (BCA), building legislation, standards, construction techniques and processes, allowing them to contribute their skills through all facets of the building's life, from design, development and construction approval, the construction process, usage and finally its demolition (Australian Institute of Building Surveying NSW/ACT Chapter, 2013).

Therefore, the 'fundamental role of Building Surveyors is the responsibility for making sure that buildings are safe, accessible and energy efficient. They have an impact on the design, planning and functionality of buildings and also detect and diagnose problems with design issues, construction techniques and materials and they manage the inspection process from foundations through to completion' (Australian Institute of Building Surveying, 2013b).

Over time, building disasters and the introduction of new materials and technologies have led to the introduction and revision of new standards and codes, building regulations and legislation. These changes have had a significant impact on the building surveying profession in Australia. The role of building surveyors, the discipline from which certifiers are drawn, has become highly specialised incorporating, *inter alia*, fire safety engineering, construction law, forensic inspection, building material science, dispute resolution, energy efficiency as well as disabled access (Australian Institute of Building Surveying, 2013b). In addition, building surveyors require an in-depth understanding of the statutes that underpin the environmental planning and development systems of their state and territory. This increase in specialty knowledge and skills is placing negative pressure upon those working within the building surveying discipline. Importantly, to practice, building surveyors need to meet the requirements of the scheme governing their state or territory. Nationally, each has a different system that sanctions building surveyors to practice.

THE NSW SYSTEM OF CERTIFICATION

Within NSW the majority of building work requires certification. This means that proposals will be assessed for compliance against relevant codes and standards, be subjected to construction inspections and require a final inspection before occupation. Building surveyors, accredited as certifiers, are the professionals responsible for administering these duties.

The NSW BPB accredits certifiers so they can issue a range of certificates such as construction certificates, occupation certificates and complying development certificates. In 2012 there were approximately 400 private certifiers and 800 council accredited certifiers (NSW Government Building Professionals Board, 2012). The accreditation system typically involves an applicant demonstrating they meet the accreditation scheme requirements which include: specialty knowledge, specialty skills, specialty underpinning knowledge, specialty qualifications and relevant experience. Specialty knowledge concerns a range of areas including legislation and policy relevant to the profession. In addition, certifiers must demonstrate their understanding and application of fire engineering practices. Specialty skills differ in that they are focused upon analysis, interpretation and assessment against legislation, codes and the like in a practical application. Speciality underpinning knowledge may be interpreted as knowledge of legislation associated with the profession including environmental and administrative policy. Specialty qualifications are those tertiary degrees identified by the scheme as meeting the objectives to practice within the profession.

There are four levels associated with building surveying functions:

- Accredited certifier – building surveying grade 1
- Accredited certifier – building surveying grade 2
- Accredited certifier – building surveying grade 3
- Accredited certifier – building surveying grade 4 (NSW Government Building Professionals Board, 2013).

Within industry these are known as A1, A2, A3 and A4. A1 is the highest level achievable and has no restriction. This means certifiers can work with any type or scale of building and structure, including those involving fire engineered alternative solutions (NSW Government Building Professionals Board, 2013). Given the four levels, demonstrating compliance against the requirements may be considered a complex and arduous process.

The accreditation scheme administered by the BPB covers both private certifiers and local authority certifiers. However, it may be considered an ineffective instrument for associated professionals wishing to enter the profession and existing certifiers proposing to upgrade to a higher level. These issues are discussed below.

THE PROBLEM ENVIRONMENT

Nationally, there is a severe shortage of building surveyors; the discipline from which certifiers are drawn. From a NSW perspective, this shortage has been acknowledged (Australian Centre of Excellence for Local Government, 2012); however, it has received minimal attention, both in industry and academia. The reasons for the shortage are not well understood. Demographically, the dilemma may be exacerbated by the aged profile of present incumbents. With an ageing population, existing practitioners leaving the profession are not being replaced (Australian Centre of Excellence for Local Government, 2012). Their invaluable strengths of knowledge and experience are being lost.

Media representation may have compounded the problem. Media accounts of negative building development issues often place responsibility upon certifiers, discouraging entrance into the profession. Most medium and large-scale developments are approved by government through a development consent and certifiers are responsible for building compliance. The media sometimes portrays certifiers as being responsible for sanctioning these developments.

Attaining an approved qualification to practice may be difficult as only a small number of tertiary institutions are accredited to provide building surveying degrees. Low enrolments may be attributed to professional anonymity: certification is not a well-publicised profession. Students also face difficulties as there are no direct pathways for them to enter the profession.

Accreditation of the profession is complex and sometimes administered inconsistently. The lack of uniformity is characterised by problematic accreditation schemes existing for each state and territory within Australia, compounded by different rules and regulations across tiers of government and associated agencies.

In NSW the introduction of private certification introduced an additional standard of accreditation requirements: initially there were separate standards and accreditation requirements for government and non-government certifiers. On the one hand government building surveyors struggled with change as their role opened up to the private sector. Yet their accreditation was solely reliant upon the General Manager endorsing their application to the BPB regardless of their qualifications (or lack thereof). They also remain sheltered from public liability due to their association with a government agency: local authorities indemnify local council certifiers from personal liability. Private accreditation is considered strict with mandatory tertiary qualifications, extensive experience requirements, continuing professional development standards and accreditation processes combined with 10 year liability periods. Notably, a government certifier is unable to move into the public realm to practice unless they meet all appropriate accreditation requirements including specialty qualifications, skills and experience.

Up-skilling to achieve higher levels of accreditation is difficult. There are few high level certifiers in the profession and this offers minimal opportunity for mandatory peer guidance to achieve practical experience requirements. High level certifiers occupy a niche market and it may be challenging to progress, as a trained and accredited certifier will be a market competitor.

Professionals such as engineers and builders may wish to become certifiers. Although they may have a wealth of experience and an associated educational qualification it is unlikely they will meet certifier accreditation standards. Under the current scheme, practical experience and education requirements, the ability for associated professionals is limited with no identifiable pathway on how to become a certifier.

Specialisation itself may be a hindrance to the profession with the National Construction Code covering a host of specialised areas from fire safety, accessible standards and energy efficiency (Australian Building Codes Board, 2013). The expansion of the profession into the private

sector has meant that a range of regulatory roles has been transferred to private professionals. Therefore, they also require expert knowledge and experience of the development planning discipline where each state and territory maintains its own governing legislation. Lower level agencies within states and territories generally have the ability to implement additional rules for their region rendering it difficult to undertake developments across geographical boundaries. Certifiers must contend with a mass of technical building regulations as well as environmental planning regulations that change with each locality.

RESOLVING THE PROBLEM

Acknowledging the aforementioned issues, the University of Newcastle has partnered with the NSW BPB to develop processes that will facilitate the accreditation of professional certifiers. This has involved the development of an evaluation tool that will assist certifiers seeking to upgrade to a higher level of accreditation where they do not have a recognised tertiary qualification and/or are unable to obtain the practical experience relevant for progression to a higher category; and associated professionals who wish to become a certifier but lack the recognised qualifications and/or experience.

ASSESSMENT INSTRUMENT

Research has identified a number of areas that an assessment instrument should cater for. The current NSW scheme has specific requirements related to speciality knowledge, specialty skill, speciality underpinning knowledge, specialty qualifications and experience. Following an examination of the scheme the following are considered the principal areas in need of assessment:

- technical building knowledge of codes, standards and associated documentation;
- technical building application (knowledge to practice); and
- State specific regulatory and policy knowledge: development planning, environmental requirements, through to building and accreditation related legislation and policy.

The BPB requires an instrument that enabled an objective assessment. This meant eliminating the need for subjective marking. It was also acknowledged that certifier's backgrounds would impact upon the success of the project and consideration would need to be given to their age, computer literacy, geographic location and willingness to adopt technology.

The pilot instrument we have developed has two primary phases: an online computer assessment tool and a 3D virtual gaming programme.

The online computer assessment tool involves applicants answering a series of questions: technical building and legislative questions. The format of the questions is predominantly multiple choice, yes and no answers combined with drag and drop scenarios. Given the four levels of certifier accreditation, the tool has a pool of questions to address the knowledge and skills of each level. For example, where an applicant applies for the highest level of accreditation (A1), they will be subjected to questions from each of the underpinning level (A2, A3 and A4). Someone applying for A4 will only be presented with an A4 series of questions.

Examining the practical application of skills, knowledge and experience is not an easy task given variables such as geographical limitations and building accessibility. Therefore, a 3D application has been incorporated to provide immersive involvement in a hypothetical building. It allows an applicant to walk through a building and where necessary take measurements to determine compliance. Proponents are presented with a series of 2D compliant drawings relating to a 3D virtual model. Using the 2D drawings the applicant may navigate the 3D virtual model and identify non-compliant issues. The following figures illustrate a warehouse model where applicants can assess areas including distances to fire source features, exit door widths, fire service installations and travel distances.



Figure 1 External View of the Industrial Warehouse Model

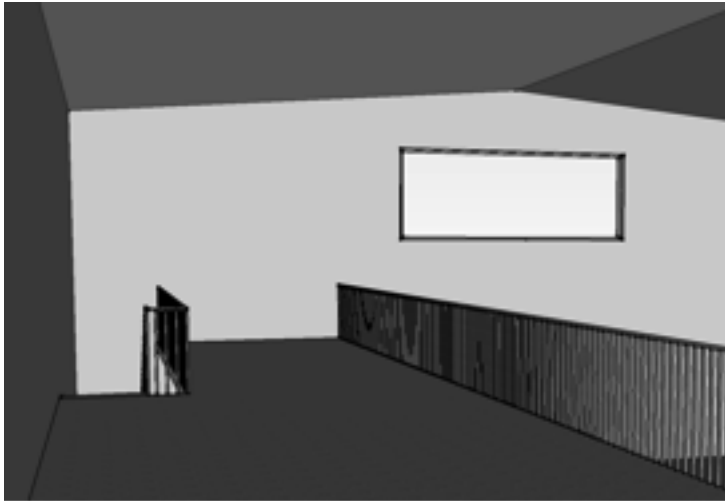


Figure 2 Warehouse Mezzanine View

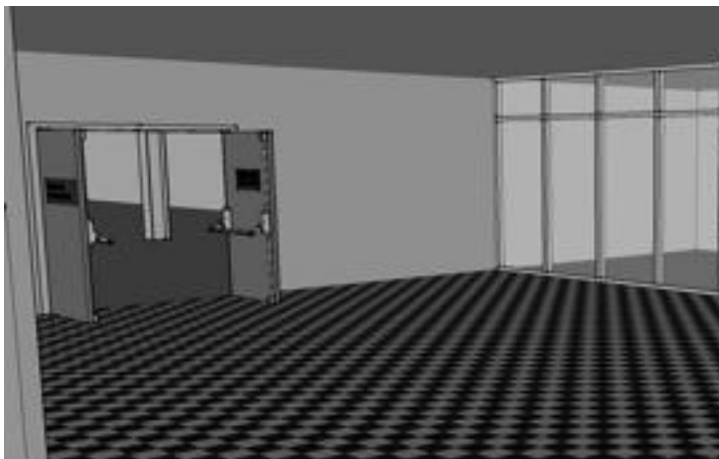


Figure 3 Warehouse Offices

The next phase will involve the pilot instrument being trialled with a representative sample of certifiers. These processes will be scrutinised from multiple perspectives to identify alternate approaches and improvements. This will involve representation from all stakeholder groups. On completion of the prototype implementations, workshops will be held to review the processes involved and to identify anomalies.

CONCLUSION

Given the multifaceted nature of the challenge, we have sought to develop and introduce technologies and methodologies that will have the ability to revolutionise the certification protocols of the building industry. In this respect, there is the potential to create a benchmark for building certifier accreditation processes in NSW. This will provide the ability to up-skill existing certifiers where they wish to achieve a higher level of accreditation and assist in the facilitation of pathways for professionals from associated disciplines.

This proposal has the potential to make a significant contribution to alleviating the skills shortage currently being experienced in this sector. Essentially, in the context of building certification this project will deliver a much needed transparent pathway for existing practitioners and associated professionals to access and progress in this profession.

This paper has focused on NSW building surveyors as the proposed evaluation instrument will be closely aligned with their roles and responsibilities. However, these findings and the instrument have widespread implications.

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