

**Supplementary
Submission
No 125a**

**INQUIRY INTO REGULATION OF BUILDING
STANDARDS, BUILDING QUALITY AND BUILDING
DISPUTES**

Organisation: Engineers Australia

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Design and Practitioners Bill 2019

Response to the NSW public consultation draft

October 2019



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1. Introduction

Engineers Australia welcomes the opportunity to provide a submission in response to the draft Design and Building Practitioners Bill 2019.

This submission is made in the context of professional engineering services being a key component of the public having confidence in the delivery of a high-quality built environment.

The reforms as described in the bill should deliver some benefit to consumers of apartment buildings and, by extension, the community at large. Some important changes are required, however, to remove the risk of unintended consequences to these reforms. These are explored at Section 2.

The missing link is a Professional Engineers Registration bill. Commitment to such legislation in the very near term is essential if the reforms proposed in the bill are to be implemented easily and efficiently, and for critical loopholes in regulated professional standards to be eliminated. This is explored at Section 3.

1.1 About Engineers Australia

Engineers Australia is the peak member-based professional association for engineers. Established in 1919, Engineers Australia is in its centenary year and is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

The term ‘community’ is used in its widest sense, and the issues raised in this submission seek to improve the outcomes for everyone. Engineers Australia’s contribution is designed to help create a legislative framework to deliver a better-performing building sector with greater accountability of those involved—especially professional engineers.

Our work is supported by around 100,000 members, including about 25,000 in NSW.

Engineers Australia maintains national professional standards, benchmarked against international norms. As Australia’s signatory to the International Engineering Alliance, this includes accreditation of undergraduate university engineering programs. Furthermore, Engineers Australia manages Australia’s largest voluntary register for engineers, the National Engineering Register (NER).

2. Scope of the reform

2.1 Level of detail in the bill

The bill leaves a lot to regulations and it is recommended that it be amended to provide much more detail. Doing so would provide clarity to industry and the public as to what the reforms encompass. The reforms are important, so it is best to make the laws with the full scrutiny of Parliament, as opposed to leaving much of the changes to be defined by regulation. An Act of Parliament is the ultimate documentation for the application of a law, though other mechanisms are available to provide greater clarity on, and proper accountability for, the Government’s long-term intentions.

2.2 Classes of structure to which the reforms apply

The bill is silent on the scope of the reforms with regard to the classes of structure under the Building Code of Australia (BCA) to which it will apply. It is nonetheless understood that the Government’s intention is to begin with Class 2 (apartments) only, with other classes to be included at a later time via regulation.

However, as advised to Government in recent weeks and introduced above, Engineers Australia retains strong concerns that this approach does not go far enough and risks merely transferring the problems that Class 2 buildings have experienced to other buildings and other major structures which rely heavily on engineering services. The bill must include more detail to ensure industry and public confidence that the reforms will in fact extend to all parts of the building sector, or do so within a

prescribed timeframe. It would be a failure of the reform process if those engineers who are not suitable to practice are able to simply move to other parts of the building sector, or if the public did not have confidence in a longer-term goal to include all structures and all relevant professionals under the proposed new regime.

Related to the above, a very simple but critical clarification is needed for the applicability of the reforms to mixed use structures. This is for circumstances in which an apartment is part of a mixed-use structure such as offices or shops.

Case study: an engineering failure in a building that is not a Class 2 apartment¹

Tilt up panels are a standard form of construction for many factories and commercial properties. It involves lifting pre-cast concrete panels into place for a building. Temporary bracing is used during construction to support unfinished structures against wind and other construction loads. Failure of temporary bracing is not uncommon and prompted NSW Workcover to issue guidelines after the collapse of a 40-tonne panel.

- Temporary bracing needs to be designed by an engineer taking into account wind loading, site access, installation and dismantling
- The engineer must review and approve any modifications to the bracings’ design before any changes can be made
- An experienced engineer should design the temporary bracing before starting construction works
- Installation must be according to the engineer’s specification
- An engineer must review any proposed changes to the installation of the bracing
- Structural integrity of the bracing needs regular inspection



Bracing for tilt-up panels needs the input of engineers to ensure it is fit for the purpose and will perform safely without collapse and subsequent injury and damage. Without a compulsory registration scheme for engineers that applies beyond Class 2 structures, vital areas of engineering will remain at risk.

2.3 Building elements

The draft bill does not appear to require certification of any part of building work that is not part of the structural fabric, fire safety system or waterproofing. That is, the draft bill does not appear to address services (apart from certain fire services) such as vertical transportation, electrical systems, communications, HVAC (heating, ventilation and air conditioning), geotechnics, or the many other parts of a building that are designed by engineers.

The bill will therefore improve some standards, but only to the fire safety, waterproofing, and external load-bearing components of a building that are essential to its stability. These are of course vital elements of a structure, but it ignores many others that are essential for a building to be fit for purpose. The most glaring example of where the draft legislation could fail to overcome major problems with apartment buildings is that while the apartments in a building might be structurally sound under the proposed new regime, the integrity of the entire building itself could still be compromised if it is sitting in/on unstable ground.

¹ OHS News, *NSW: WorkCover Issues Guidelines on Tilt Up Panels*, 29 January 2010. Available at: <http://content.safetyculture.com.au/news/index.php/01/nsw-workcover-issues-guidelines-on-tilt-up-panels/#.XaQ84egzaUI>. Accessed 14 October 2019. Additional details about the incident involving the 40-tonne panel may be available from SafeWork NSW.
Photo source: A photo of the NSW incident was not available, so one from a Queensland example is provided. Note that in the report of the QLD example, WorkCover QLD reiterated the need for “any system used for attaching pre-cast elements to building perimeters is to undergo a comprehensive design process by a competent professional engineer.” In QLD, all professional engineers must be registered to practice. WorkCover Queensland, *Precast wall panel failure*, 6 July 2018. Available at: <https://www.worksafe.qld.gov.au/injury-prevention-safety/alerts/whsq/2018/precast-wall-panel-failure>. Accessed 14 October 2019.

In addition, the lack of coverage of the proposed new regime means structurally sound apartments could have poor access, could flood as a result of a lack of engineering oversight of water services and be uninhabitable because of a malfunctioning HVAC system.

It is recommended that the bill instead specify that, as a minimum, any design under the BCA require sign-off by a registered building designer.

Case study: an engineering failure in a Class 2 apartment but related to something not currently considered a 'building element'²

Formwork collapse: Formwork is an integral element in construction and is applicable to many construction activities including high rise apartments. Formwork is a temporary (sometimes permanent) mould into which concrete is poured. It is often made of strong plywood but can be other materials.

Failure of formwork can have horrific results. A multi-story formwork collapse in May 2019 saw three workers escape injury by grabbing onto and climbing up the reinforcement mesh and debris. Formwork for high rise apartments and other high-rise buildings needs to:

- Be designed by a competent person, such as an engineer, taking into account various factors including static and dynamic loads, how the formwork is to be braced, rigidity, movement of people and environmental factors such as wind and rain
- Have variations to design checked by an engineer
- Have various components from different formwork systems authorised by an engineer
- Have an engineer inspect and certify completed formwork and its supporting structures meet the design specifications and are structurally sound



Formwork in complex construction should be designed by engineers with appropriate training and experience. Without a compulsory registration scheme for engineers that applies beyond the currently-defined "building elements", vital areas of engineering will remain at risk.

3. Registration of engineers

Engineers Australia supports the first recommendation in both the Shergold-Weir report and the Opal Tower report that there must be compulsory registration of engineers in NSW.

On several occasions, the Government has made commitments to implement Recommendation 1 from both reports as it applies to engineers:

- The Minister for Better Regulation and Innovation, Hon Kevin Anderson MP, has been reported as saying: "I can't believe that in this state engineers don't have to be registered... We will be fixing that problem very quickly..."³
- A media release issued by Minister Anderson stated: "The NSW Government is implementing four key reforms to deliver a more robust regulatory framework for the construction of buildings, including...a requirement that all

² SafeWork NSW, *Formwork collapse during concrete pour*, 25 May 2019. Available at: <https://www.safework.nsw.gov.au/compliance-and-prosecutions/incident-information-releases/2019-iir-accordions/formwork-collapse-during-concrete-pour-25-may-2019>. Accessed 14 October, 2019. Additional details about this incident may be available from SafeWork NSW.

³ Elias Visontay, "Minister to reform building industry", *The Australian*, June 24, 2019. Available at: <https://www.theaustralian.com.au/nation/minister-to-reform-building-industry/news-story/7eafbf904b49b1c2293a2bec6549f098>. Accessed 21 July 2019.

building practitioners, including building designers, architects and engineers, be registered to ensure they have the appropriate skills and insurance, and can be held accountable for their actions.”⁴

The reality is the proposed legislation does not require all building practitioners to be registered. It is the submission of Engineers Australia that the Government should follow through on its commitments on compulsory registration of engineers in full.

It is unacceptable that at present virtually anyone in NSW can call themselves an engineer, even if they have no experience, no education, no credentials and no commitment to maintain competency.

Engineers Australia calls on the Government, as part of its legislative package, to also introduce a Professional Engineers Registration bill to ensure that community safety and consumer protection is restored. If it cannot be introduced in 2019, it is strongly recommended that the Government makes a formal commitment, to Parliament, to do so in 2020.

3.1 A registration Act to support the current bill

In terms of design and construction of buildings there are three major parties: engineers, architects, and builders

Architects are separately registered and regulated in NSW by the *Architects Act*. Builders are registered and regulated in NSW by the *Building Professionals Act* and, where it applies, the *Home Building Act*.

Only engineers are not presently registered and regulated within NSW by the government. Yet engineers of many disciplines have a major role to play in both the structural fabric of the building and the associated building services.

The reforms would be greatly improved if the Government also enacts a Professional Engineers Registration Act. There are several reasons for this:

- A Professional Engineers Registration Act could be very simply called up in regulations as the means by which someone can be deemed suitable as a “registered designer” for engineering work.
- The Design and Practitioners Bill 2019 specifically provides for mutual recognition of people who are registered under law in other jurisdictions as registered practitioners, and it is assumed that this is a reiteration of the provisions of the *Mutual Recognition Act 1992* (Cth). However, without a NSW scheme to register someone to practice as an engineer, it is hard to see how the benefits of mutual recognition laws can be easily achieved.
- The proposal is that “registered building practitioners” may alter the original designs without securing a declaration from a “registered design practitioner” if the work does not relate to a “building element” or a performance solution. Appropriately, they will however have to provide a list of such variations and attest to their meeting the Building Code of Australia. Without comprehensive registration for professional engineers, builders will be exposed to the risk of engaging people to do professional engineering work for which they are not appropriately trained or experienced.
- With Queensland having had compulsory registration of engineers in place since 1929 and the Parliament of Victoria recently passing laws to introduce compulsory registration of engineers, there is an increased risk that unqualified or substandard engineers will seek to provide engineering services in NSW, where the engineering profession is currently unregulated.

A Professional Engineers Registration Act is an established way to enhance regulatory efficiency.

3.2 Proposed operation of a registration scheme

Given the broad membership coverage and knowledge we have of the engineering profession, Engineers Australia is well placed to provide informed views to the Government on how a compulsory registration scheme could operate. For example, we developed the voluntary National Engineering Register (NER) in 2015, are an approved assessment entity for the QLD Government’s registration scheme and have been involved in the process of developing the Victorian Government’s Professional Engineers Registration Bill 2019, which passed Parliament in August 2019.

⁴ Minister for Better Regulation and Innovation, *Next Steps in Building Regulation Reforms*, 26 June 2019. Available at: <https://www.finance.nsw.gov.au/about-us/media-releases/next-steps-building-regulation-reforms>. Accessed 14 October 2019.

A Professional Engineers Registration Act in NSW would require anyone who provides professional engineering services (without supervision) to be registered.

A similar Act has been in operation in QLD since 1929. The current version of their legislation is the *Professional Engineers Act 2002* (QLD), and it defines an engineering service as follows:

“professional engineering service means an engineering service that requires, or is based on, the application of engineering principles and data to a design, or to a construction or production activity, relating to engineering, and does not include an engineering service that is provided only in accordance with a prescriptive standard.”

A *prescriptive standard* is further defined as a document that states procedures or criteria for carrying out the service, the application of which does not require advanced scientifically based calculations.

It is recommended that NSW follow the example of QLD and institute a co-regulatory model with recognised organisations to assess the suitability of practitioners for registration, and a statutory authority to manage the register and conduct compliance activities.

If the Government continues with its desire to only address issues in the building sector or for the restricted set of designed features as defined in the draft bill, it would be possible to structure the legislation so that the rules only apply in that way. Such a move would however be a missed opportunity to raise professional standards and lower risks across the full spectrum of structures, and other industries like public infrastructure, power generation, manufacturing and mining, where professional engineers provide critical services. See Section 3.4 for more information on this matter.

3.3 Cost of a registration scheme

The potential cost of not applying registration to all professional engineering services is significant. The Government is striving to reduce the risk of buildings being evacuated or left uninhabitable, reduce the risk of infrastructure like bridges being unsafe, and reducing the risk of ‘everyday living’ being disrupted by failures in utilities like power and water supply.

Conversely, the cost of instituting a comprehensive registration scheme is very low. The three main cost components are as follows:

1. **Cost to government of setting up a scheme:** Victoria is the latest state to develop a process to set up a comprehensive compulsory registration scheme for professional engineers and passed a bill to do this in August 2019. In that state’s 2018-19 budget, \$5.9m was allocated to fund the creation of a scheme, spread across two years. This equates to less than the cost of seven average Sydney homes.⁵
2. **Cost to government of managing the scheme:** In QLD, a comprehensive registration scheme has been in place since 1929. It is administered by the Board of Professional Engineers Queensland (BPEQ). The BPEQ’s annual report for 2018/19 notes that it operated on a surplus of \$0.9m.
3. **Cost to the profession of attaining and retaining registered status:** Individual engineers will incur costs associated with:
 - a. **One-off assessment fee:** Using the QLD model as an example, and the fees applied by Engineers Australia if it is used as the assessment provider, the *once-only assessment* fee is less than \$600. For anyone who is already registered in QLD or Victoria, this cost is not relevant due to the provisions of the *Mutual Recognition Act* which entitles an individual to have their registered status recognised across borders.
 - b. **Regular registration fee:** the registration fee may be payable at periods that can be determined by Government but could be annually or every 3 or 5 years. Using QLD as the example, the current annual registration fee is \$232.74.
 - c. **Continuing Professional Development (CPD):** responsible engineers already undertake CPD, so costs associated with CPD will only be a new cost for anyone who is not already doing the right thing (that is, not already completing CPD). Engineers Australia estimates that the cost of doing 50 hours of CPD per

⁵ CoreLogic, *CoreLogic Hedonic Home Value Index, August 2019 Results*, Monday 2 September 2019. Available at: <https://www.corelogic.com.au/sites/default/files/2019-09/CoreLogic%20home%20value%20index%20Sep%202019%20FINAL.pdf>. Accessed 14 October 2019.

year is about \$500. The cost is relatively low because CPD can be achieved in a wide variety of ways, most of which are either free, very cheap, or provided on-the-job. Simple examples include reading technical journals, work-based training, attending presentations and private study. Engineers Australia is just one of very many providers of CPD and our offerings are open to anyone—not just members—and a very large number of these cost just \$30 for non-members.

3.4 The need for registration to apply to all professional engineers, across all industries

The community trusts engineering without realising it. The buildings we live in. The cars we drive. The devices we use every day. We trust that they are safe and will work as they are designed to. Rarely do we realise that the world we inhabit was created by engineers.

When trust is unconscious, it's even more important to protect the integrity of engineering practice.

A Professional Engineers Registration Act should therefore apply to all professional engineers working across any area of engineering, other than those working under supervision.

The building industry reform process is necessarily focused on engineers in that sector, and the introduction of a Professional Engineers Registration Act would be the most efficient mechanism for improving standards. It would be a missed opportunity to not apply it more broadly. Engineers provide complex services in many industries, like public infrastructure, power generation, manufacturing and mining, where professional engineers provide critical services.

Case study: an engineering failure but not in the building sector⁶

Tunnelling Failures: Sydney has a history of flawed tunnelling projects as evidenced by Northside Stormwater Storage Tunnel, Airport Rail Link, Cross City Tunnel and the Lane Cove highway tunnel collapse.

Not only do issues with major infrastructure projects cause huge cost blow outs and time delays, at times there are direct consequences such as property damage that was incurred with the Lane Cove tunnel collapse and fatalities (Cross City Tunnel).

Pictured is the result of a collapsed exit ramp on the Lane Cove highway tunnel in November 2005.

The complexity of these projects is enormous and the engineers involved cross many disciplines. All engineers should be registered to mitigate failures.

A compulsory registration scheme for engineers is a risk mitigation and professional quality control tool that should apply beyond the building sector. If it does not, other vital industries and areas of engineering will remain at a higher-than-necessary risk.



⁶ TunnelTalk, *Lane Cove collapse investigations*, February 2007. Available at: <https://www.tunneltalk.com/Lane-Cove-collapse.php>. Accessed 14 October 2019.

Photo source: MTECC, *Lane cove tunnel collapse and sinkhole a forensic review*. Available at: <https://mtecc.com.au/lane-cove-tunnel-collapse-and-sinkhole-a-forensic-review-1-the-collapse/>. Accessed 14 October 2019.

3.5 Support for comprehensive registration

3.5.1 Engineers

Registration is a long-standing and high priority issue for Engineers Australia. It is often raised with members through e-Newsletters, social media, our monthly magazine “create”, and many engagements in mainstream media. It is therefore a topic of which Engineers Australia members are well-aware and on which they regularly engage with the organisation.

To prepare the first submission to the NSW Government in July 2019, as part of its building sector reform process, Engineers Australia sent an email to all 25,000 NSW-based members, alerting them to the NSW Government process and inviting them to either provide a response directly to the government, or to submit views for consideration by Engineers Australia.

Of those who responded, 91.5% expressed specific support for the introduction of a registration scheme for professional engineers. Just 3.4% expressed opposition. A further 5.1% were silent on the matter.

3.5.2 The general public

In addition to this process of consultation with our general membership, views were also sought from several specialist groups or committees within the membership: the leadership committees of our NSW-related divisions, the Structural College, Mechanical College and the Society for Fire Safety. All provided strong support for the introduction of compulsory registration of engineers.

To test the level of public demand for action, Engineers Australia commissioned polling nationally and in NSW. This showed that broad-based registration of engineers has very high levels of public support across all demographics. The poll of 1,222 people aged 18 years and older was conducted on 18-23 July 2019.⁷ It asked:

“Now a question about engineers in Australia. Engineers are involved in a range of things such as designing and building residential towers, making public infrastructure like bridges and roads, or delivering manufacturing and high-tech innovation. Do you think engineers in Australia should, or should not have to be registered in order to practice, in the same way as other professions such as architects, doctors and lawyers?”

Nationally, 88% of respondents answered that, “Yes, engineers should have to be registered.” Just 4% answered “No, should not have to be registered” and 8% answered “No opinion / can’t say.”

NSW respondents showed even higher levels of support: 91% support, 3% oppose and 6% can’t say.

Public support for broad-based and compulsory registration of engineers is incredibly high. When the results are broken down to various demographics, support never drops below 82%. If the NSW government legislates for a broad-based statutory register for engineers, it will have the support of city and rural voters, those on high and low incomes, men and women, and people of all age groups.

4. Concluding comments

Thank you for the opportunity to provide feedback in response to the draft Design and Practitioners Bill 2019. As a final note, while the industry engagement to this point has been useful, visibility of the draft bill is an important stage in the consultation process. It is therefore noted that nine business days is an incredibly short period in which to provide feedback.

It is recommended that the Government, as it moves forward with its reform program, allows more time for open, public, discussion. Doing so enables more considered feedback and ensures the public can have confidence in the probity of a reform process that is of great significance to community safety and consumer protection.

⁷ The poll was conducted for Engineers Australia by OmniPoll. The poll was conducted nationally among 1,222 people aged 18 years and over. Respondents were drawn from the online consumer panel managed by Lightspeed Research, OmniPoll's online partner. Sample quotas were set for each state, city and regional area, along with sex and age. To help reflect the overall population distribution, results were post-weighted to Australian Bureau of Statistics data on age, sex, area and highest schooling.

4.1 Contact details

To discuss the contents of this submission further, please contact _____, National Manager for Public Affairs, at _____.



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