



ENGINEERS
AUSTRALIA

Registration of Engineers

THE CASE FOR STATUTORY REGISTRATION

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1 Introduction

1.1 ABOUT ENGINEERS AUSTRALIA

Engineers Australia is the peak member-based professional association for engineers with about 100,000 members. Established in 1919, Engineers Australia is a not-for-profit organisation, constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

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 much of the world we inhabit was created by engineers.

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

The great majority of engineers provide their services competently, ethically and with diligence. However, use of the title 'engineer' is unrestricted and is likely to remain so because it has become a generic term. In the absence of regulation for engineering, anyone could purport to be an engineer and provide engineering services without appropriate competencies and with disregard to standards.

Engineering services are vital to national economic prosperity and social well-being, yet there is no uniform regulatory regime covering engineering practitioners in Australia. Instead, it is ad hoc and largely voluntary.

This point was highlighted in NSW by that state's Minister for Better Regulation and Innovation, Hon Kevin Anderson MP, when he was reported as saying: ***"I can't believe that in this state engineers don't have to be registered."***¹

1.1.1 CONTACT DETAILS

Questions related to Engineers Australia's advocacy for statutory registration of engineers can be directed to registrationadvocacy@engineersaustralia.org.au.

¹ 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/7eafb904b49b1c2293a2bec6549f098>. Accessed 21 July 2019.



2 Comprehensive registration of engineers is good for the nation

Engineers Australia does not promote registration as a ‘silver bullet’ to all ills of industry. For example, in the building sector, Registration is the first recommendation of the Building Ministers Forum (BMF) Shergold & Weir report because it is the first step; it creates a system to recognise people likely to perform competently, and a mechanism to exclude those found to be unsuitable to work as an engineer.

Compulsory registration for anyone providing professional engineering services will enable significant enhancement of public safety and consumer protection. More broadly, there are five key benefits of a registration system for engineers:

2.1 INDUSTRY AND CONSUMER INFORMATION

Engineering services are purchased by governments, large and small business, and individual consumers. In the absence of a common standard for ordinary engineering practitioners, consumers are limited in terms of the extent they can measure the professionalism of an engineer they wish to engage.

A registration scheme will aid the market by providing advice to consumers on the competence and experience levels of engineering practitioners. This enables consumers to make more informed decisions and reduces the common tendency to choose services based on price alone.

By way of comparison, it should be noted that doctors, lawyers and architects all have to be licenced/registered to practice but, as things stand, engineers do not.

2.2 REDUCING RISKS TO PUBLIC HEALTH, SAFETY AND WELFARE

A significant risk to consumers of engineering services in the current registration environment—where there is little or no regulation of the engineering profession—comes when some people attempt to undertake work without adequate skills or competencies. Registration helps to ensure that only those with suitable baseline qualifications (that is, an appropriately recognised engineering degree), enough relevant experience, and a proven commitment to ongoing training and professional development can provide engineering services.

Risks to the public resulting from the provision of engineering services by unqualified or incompetent persons have three elements:

- **Health:** through such things as badly designed or ‘sick’ buildings (poor air-conditioning, rising damp, low natural light levels). Beyond the building sector, health effects can include things such as contaminated drinking water and other environmental incidents.
- **Safety:** through the collapse or other significant failure of buildings such as was seen in the Opal and Mascot Towers of Sydney in 2018-2019. Safety issues can also arise beyond the building sector with infrastructure failures (for example, bridges) or through the failure of hazardous services such as gas, electricity or mechanical works.
- **Economic:** involving financial costs such as design and construction costs, litigation expenses, lost production and rectification costs. The economic costs associated with the Opal and Mascot Towers offer relevant contemporary case studies.

Requiring engineering practitioners who offer services that place public safety, health and welfare at risk to be registered can minimise these risks. It does this by creating a system to recognise people likely to perform competently, and a mechanism to exclude those found to be unsuitable to work as an engineer.

2.3 PROFESSIONAL RECOGNITION

Businesses and the community expect a certain set of standards and skills from engineering practitioners. As with other professionals, engineering practitioners have a high degree of responsibility and liability imposed on them by courts and regulators. A statutory registration scheme would identify those persons whose academic qualifications, cumulative and current experience, competencies and commitment to ethical conduct and continuing professional development are the standard expected of the ordinary skilled person exercising and professing to have that skill.

This point was highlighted in the independent expert report into Opal Tower, commissioned by the NSW Government, which recommended, “[t]he creation of a government Registered Engineers database developed in partnership with an appropriate professional body.”¹

In addition, regulators can choose to create a register to signal that registrants, in the provision of engineering and engineering-related services, can maintain and have the benefit of appropriate insurance coverage in the event that a professional services provider fails to discharge his/her duties properly.


2.4 ENHANCED INTERNATIONAL MOBILITY AND TRADE IN ENGINEERING SERVICES

In many countries, engineering is seen as an essential profession whose practitioners should be recognised and registered. Standards of practice that are recognised by government have the potential to improve overseas trade and are essential for trading in accordance with the World Trade Organisation trade and services obligations, and under bilateral trade agreements.

A statutory compulsory registration scheme for all engineers in Australia can provide a competitive edge for a nation that is seeking to export services to the global market.

2.5 LEGISLATIVE EFFICIENCY

A statutory registration scheme with requirements that match those of other jurisdictions creates legislative efficiency. It is a means of ensuring that both a common standard for engineering practice is in place in all states and territories and that engineers do not have to comply with the different requirements in each jurisdiction.



In my work I have observed many people working in engineer roles that are not engineers. This has resulted in very poor outcomes for the community in terms of wasted money, increased exposure to risks, lower levels of service provided, etc.

– an Engineers Australia member

3 Essential elements of a statutory registration scheme

All registration systems have the same basic characteristics in that standards must be set, courses accredited, candidates examined or assessed, and a register maintained. Performance must be monitored and failures disciplined. A register has greater effect if supported by licensing arms of government.

Engineers Australia supports a co-regulatory model of registration, which involves statutory bodies and professional associations undertaking various roles. The co-regulatory model provides greater assurance of the competency of registered engineering practitioners and reduces the risk of physical and financial harm to consumers. This approach allows industry and assessment entities like Engineers Australia to control the qualifications and competency standard applied to a practitioner, and allows government to oversee the assessment and monitoring system and standards applied to practitioners through the approval process.

A guiding principle of the voluntary registration model introduced by Engineers Australia (the NER), is to increase the professionalism of the broadest possible cohort of practising engineers. Under a co-regulatory approach, Engineers Australia believes that legislation governing the delivery of engineering services in states and territories ought to:

- contain restrictions on who may deliver engineering services
- restrict the 'registered' title to those who are on an engineering register
- register engineers in the broadest possible areas of engineering practice aligned with the areas of practice and not by industry sector, with the onus on each registered engineering practitioner to only undertake work that he or she is competent to undertake
- base registration on a competency assessment by approved assessment entities
- include a mandatory continuing professional development regime for ongoing registration

“One could not practice in the law or medicine without being registered and it is a long-standing anomaly that this has not applied also to engineering.”

– an Engineers Australia member

3.1 APPLY REGISTRATION ACROSS ALL INDUSTRIES

Statutory registration of professional engineers should apply to anyone who provides professional engineering services, and in any area of engineering in any industry. The carve out for such registration is that it should only be for those performing professional engineering services under the supervision of an appropriately registered engineer, or if only applying prescriptive standards or designs.

Engineering services are often discussed in the context of the building sector—and often apartment buildings as a sub-set of that industry. However, engineers provide complex services in many industries, like public infrastructure, power generation, manufacturing and mining, where professional engineers provide critical services.

It would be a missed opportunity if a new registration schemes for engineers were not applied more broadly, and could indeed risk transferring risk to sectors in which engineering work is not subject to registration.



It has always horrified me that there is no real check on anybody calling themselves a consulting engineer without the requisite qualifications and experience

– an Engineers Australia member

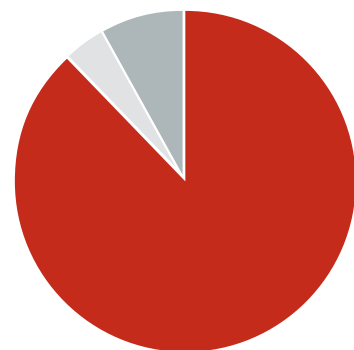
4 Public support for comprehensive registration

To test the level of public demand for action, Engineers Australia commissioned national polling. 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 2019.² 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.”

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 governments legislate 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.



■ Yes ■ No ■ Not sure

² 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.



The community deserve a better system.

– an engineer’s submission to the NSW Parliamentary inquiry into engineer registration.

5 How to regulate engineering

The most appropriate way to regulate professional engineers is with an Act of Parliament that applies a registration requirement to people who wish to provide professional engineering services.

To secure public confidence in the engineering profession, a government-run register of engineers should be implemented that is modelled on what is in operation in QLD and has recently been introduced for Victoria. Queensland has had statutory registration requirements since 1929, and Victoria passed its own **Professional Engineers Registration Act** in August 2019.

The majority of engineers apply their skills competently, but registration is necessary to reduce the risks presented by anyone who attempts to deliver engineering services without relevant qualifications, experience or currency, or is not sufficiently competent to deliver services without supervision. In the interests of community safety and consumer protection, registration should apply to anyone who provides professional engineering services.

The carve out for such registration should only be for those performing such services under the supervision of an appropriately registered engineer, or if only applying prescriptive standards or designs.

Professional bodies should be appointed to conduct assessments on individuals’ qualifications and experience to keep costs low. This is the system used in Queensland and will soon be applied in Victoria.

Engineers Australia supports a nationally coordinated system - we don’t want red tape from different standards in every state. The **Mutual Recognition (New South Wales) Act 1992** provides for mutual recognition which will eliminate any need for individuals to have their skills assessed more than once. More on the topic of mutual recognition is provided at Section 6.3.1, below.

5.1 ASSESSMENT ENTITIES

In QLD, the government recognises independent Assessment Entities to conduct the initial checks of applicants for registration (examples include Engineers Australia, Australasian Institute of Mining and Metallurgy, and the Civil Aviation Safety Authority).

Using assessing authorities can help simplify compliance requirements and avoid red tape. It offers a mechanism for assessing the qualifications and experience requirements of a statutory register, with a letter of assessment that is

issued once but can be used in all jurisdictions that require registration of engineers. The assessment provided by Engineers , for example, can nominate an individual's areas of engineering, which is especially useful for jurisdictions that require engineers to be registered for selected types of engineering work.

5.1.1 NATIONAL ENGINEERING REGISTER

The National Engineering Register (NER) was introduced by Engineers Australia in 2015 and is recommended as the benchmark for competence in a co-regulatory system of registration for engineers.

The NER is the largest publicly searchable register in the country with 21, 672 people registered, of which 92% are registered at the professional grade (February 2020). It delivers a uniform national benchmark of professionalism in the broadest areas of engineering practice, both general and special, in both the private and public sectors. It is possible for engineers to be registered on NER, whether or not they are members of Engineers Australia, and at the grades of Professional Engineer, Engineering Technologist or Engineering Associate.



It is important to note that while the NER has made important advancements towards achieving its objectives, it is not a substitute for statutory registration of engineers. Because it is not compulsory for an engineer to be registered on the NER, an engineer looking to avoid scrutiny/regulation can simply not sign up to it. Of the roughly 186,000 engineers working in Australia, only 21,672 are on the NER (about 12%).³ The bottom line is that someone can still call themselves an engineer without having to be registered on the NER.

The NER is a national engineering register—but it is not a means of excluding the unqualified or incompetent.

Engineers Australia believes that the NER provides an effective *model* for Governments, and that bodies like Engineers Australia are best-placed to assess the qualifications and experience of applicants to a statutory register. However, we do not ask for the NER to be called up in legislation as the sole means for recognising an engineer's competence. There are three reasons for this:

1. The role of regulator belongs to Government. Unlike professional bodies, governments have the resources and legal power to conduct comprehensive investigations of the kind outlined in the Bill, and to enforce sanctions. Also, if Engineers Australia (or other professional and industry associations) was to take on this role, we could be accused of having a conflict of interest.
2. Engineers Australia recognises that the government is unlikely to support monopoly control of a public registration system, albeit by a not-for-profit professional association.
3. Engineers Australia views registration of engineers as a fundamental priority for the profession and seeks to avoid any inference of a profit motive in its advocacy.

Driving our work is the fact that Engineers Australia is constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

³ The NER figure stated is accurate for February 2020. The 186,000 figure is based on Engineers Australia analysis of the 2016 census and includes all engineers (professional engineers plus far lesser numbers of engineering technologists and engineering associates) who were in the labour force and working in engineering occupations. Given the census data was collected in late 2015, it is assumed that this figure has now grown significantly. Consequently, the percentage of engineers who are on the NER is likely to be less than the 12% estimate provided in the body text.

5.2 MUTUAL RECOGNITION

The *Mutual Recognition Act 1992* entitles an individual who is registered as an engineer in one state to be registered as an engineer in another. An engineer already registered in QLD (for example) would still need to apply for registration in Victoria and probably pay a registration fee. However, mutual recognition means that the initial assessment of a person's eligibility for registration as an engineer would only need to happen once, which helps to keep the cost of registration in more than one state for an individual down.

Administrative and financial costs for the profession could be minimised further if all states were to recognise registration in one jurisdiction as sufficient for practice in another. That is, adopt a model of 'register once, practice anywhere.'

5.3 APPLICATION TO ASSOCIATES AND TECHNOLOGISTS

There are three categories of engineer recognised as providing engineering services in Australia: Professional Engineer, Engineering Technologist, and Engineering Associate. There is merit in including all three on a new register for engineers, though at present only those who provide professional engineering services are required to be registered in Queensland and Victoria.

In the interests of streamlined regulation, Engineers Australia therefore supports proposals to begin by only applying registration to professional engineers.

However, it is important to ensure that those who provide engineering services to the level of Engineering Technologist and Engineering Associate are not unintentionally excluded from practice. The main thing is to ensure that "professional engineering services" are only provided by "professional engineers", but that the other levels of engineering service can continue to be provided by engineering technologists and associates.

Three members of the engineering family

1. Professional Engineer

Professional Engineers apply lifelong learning, critical perception and engineering judgement to the performance of engineering services. They challenge current thinking and conceptualise alternative approaches, often engaging in research and development of new engineering principles, technologies and materials.

Professional Engineers require at least the equivalent of the competencies in a four-year full-time honours bachelor degree in engineering.

2. Engineering Technologist

Engineering Technologists exercise ingenuity, originality and understanding in adapting and applying technologies, developing related new technologies or applying scientific knowledge within their specialised environment.

Engineering Technologists require at least the equivalent of the competencies in a three-year full-time bachelor degree in engineering.

3. Engineering Associate

Engineering Associates apply detailed knowledge of standards and codes of practice to selecting, specifying, installing, commissioning, monitoring, maintaining, repairing and modifying complex assets such as structures, plant, equipment, components and systems.

Engineering Associates require at least the equivalent of the competencies in a two-year full-time associate degree in engineering or a two-year full-time advanced diploma in engineering from a university or TAFE college.

6 Cost of a registration scheme

The potential cost of not applying registration to all professional engineering services is significant.

Governments around the country are striving to reduce the risk of buildings being evacuated or left uninhabitable, reduce the risk of infrastructure like bridges and roads being unsafe, and reducing the risk of 'everyday living' being disrupted by failures in utilities like power and water supply. A less visible risk to the economy is that, without a comprehensive scheme to register the services of engineers, there may be continued effects on confidence due to lingering uncertainty about the efficacy of reforms.

Registration can help reduce those risks and their costs.

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 median value Sydney homes.⁴
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 (noting that several assessment providers exist), 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 (New South Wales) Act 1992* which entitles an individual to have their registered status recognised across borders.
 - b. **Regular registration fee:** the registration fee to the government regulator may be payable at periods that can be determined by Government and could be annually or every three or five 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 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.

⁴ CoreLogic, *CoreLogic Hedonic Home Value Index, December 2019 Results*, Thursday, 2 January 2020. Available at: <https://www.corelogic.com.au/sites/default/files/2020-01/CoreLogic%20home%20value%20index%20Jan%202020%20FINAL.pdf>. Accessed 13 January 2020.

1

Registration of engineers around Australia and the world

1.1 A NATIONAL OR FEDERAL SCHEME?

A subtle difference is made between a “federal” and “national” system of registration. The term ‘national registration’ has a meaning that depends on the user but is usually used to describe a situation where the Commonwealth controls the legislation. However, Australia is a federation where the states have responsibility for certain areas of government, including registration of professions.

A federal system whereby registration is managed on a state-by-state basis, but with close alignment of standards and application of the Mutual Recognition Act, is achievable.

Over the past 50 years, I have witnessed too many examples of unprofessional behaviour by so-called ‘engineers’, to the detriment of the public.

– an Engineers Australia member

1.2 CURRENT STATUS ACROSS AUSTRALIAN JURISDICTIONS

Australia does not have a uniform registration system for engineers.

- Queensland is the only jurisdiction with mandatory and comprehensive registration.
- South Australia and Western Australia have no registration or licensing provisions of any kind.
- In NSW, the ACT, Tasmania and Northern Territory, the registration or licensing regimes are for engineers involved in the building sector only. The regimes do not cover other areas of engineering like mechanical, electrical, aeronautical.
- Victoria passed the Professional Engineers Registration Act in 2019, which will come into force in July 2021.

1.2.1 QUEENSLAND***Professional Engineers Act 2002***

Professional engineers engaged in a professional engineering service in Queensland must be registered under the *Professional Engineers Act 2002* (QLD), unless they work under the direct supervision of a Registered Professional Engineer Queensland (RPEQ). The Act is restricted to registration of professional engineers and does not include engineering technologists or engineering associates.

The main objects of the Act are to protect the public by ensuring professional engineering services are provided by a registered professional engineer in a professional and competent manner; to maintain public confidence in the standards of service; and to uphold the standards of service of registered professional engineers.

The Act provides that a person who is not a registered professional engineer must not use that title or hold themselves out to be registered. The Act also provides that only registered professional engineers may carry out professional engineering services.

The exception to this is where the person is carrying out the service under the supervision of a registered professional engineer. The registered professional engineer must only carry out engineering services within their registered area of engineering. The area of engineering is prescribed by regulation.

Engineers must apply for assessment under an approved assessment scheme. The assessment pathways to registration on the NER are approved pathways for registration purposes in Queensland.

The organisations approved to assess competencies include Engineers Australia, Australasian Institute of Mining and Metallurgy (AusIMM), Civil Aviation Safety Authority (CASA), Institution of Chemical Engineering (IChemE), Institute of Public Works Engineering Australasia Queensland Division (IPWEAQ), Professionals Australia, and Royal Institute of Naval Architects (RINA).

The CPD requirements for registration on the RPEQ are aligned with those of those of the Approved Assessment Entities and vary.

For example, Engineers Australia requires 150 hours of CPD over three years, and the AusIMM requires 50 hours each year over a three-year period.

Professional indemnity insurance is not a condition of registration as an RPEQ.

1.2.2 NEW SOUTH WALES



Building and Development Certifiers Act 2018

Engineers who work as building sector certifiers are regulated under the *Building and Development Certifiers Act*. The Building and Development Certifiers Regulation 2020 sets out the requirements for the registration of registered certifiers including classes, qualifications, experience and knowledge, to provide Code of Conduct standards, to establish contract requirements for certification work and to create a new accreditation framework. (The Act and Regulation commence on 1 July 2020 and replace the *Building Professionals Act 2005* and the Building Professionals Regulation 2007.)

Engineers registered on the NER in the relevant registration field automatically meet the speciality qualifications and experience requirements for accreditation.

NSW regulates its mining engineers separately with registration overseen by relevant competency boards.

In 2020, the NSW Government is considering introduction of legislation for a more comprehensive registration scheme for professional engineers.

1.2.3 AUSTRALIAN CAPITAL TERRITORY



Construction Occupation (Licensing) Act 2004

Under the ACT's *Construction Occupation (Licensing) Act 2004*, building certifiers must be registered with the Australian Capital Territory Construction Occupations Registrar. Persons who certify building work or plumbing and drainage plans must be licensed. The Construction Occupation (Licensing) Regulations 2004 prescribe the conditions that must be satisfied for a person or company to be licensed as a building assessor or building surveyor.

In 2016, the incoming Government made a commitment to introduce a comprehensive registration scheme in its 2016-2020 term. That commitment has been reiterated several times and, in 2020, work to conduct formal public consultation and develop legislation commenced. There is a territory election in late 2020 and, if the new Government continues to support registration of engineers, legislation could be passed in 2021, for commencement in 2022.

1.2.4 VICTORIA



Professional Engineers Registration Act 2019

The *Professional Engineers Registration Act 2019* (the Act) was passed in the Victorian Parliament in August 2019. The Act introduces a co-regulatory scheme where, initially, five categories of engineer will be registered:

- civil
- structural
- mechanical
- electrical
- fire safety.

Registration will commence from 1 July 2021 and the scheme has been designed to be extended to other areas over time.

This model of co-regulation will include assessment entities approved by the Business Licensing Authority (BLA). The BLA will be supported by Consumer Affairs Victoria (CAV) and the Victorian Building Authority (VBA).

Public consultation on the Regulations and supporting Regulatory Impact Statement (RIS) is being conducted in 2020 and includes consultation on:

- Matters relating to assessment scheme's qualifications and competencies
- Requirements in relation to continuing professional development of registered professional engineers
- Prescribing conditions on registration or endorsement of registration
- Regulations with respect to fees or refunds of fees such as registration renewal or endorsement.

1.2.5 TASMANIA



Building Act 2016

The *Building Act 2016* ensures that "building services providers" comply with the requirements of the Act and the National Construction Code.

The definition of a "building services providers" is determined by the *Occupational Licensing Act 2005* and Occupational Licensing (Building Services Work) Regulations 2016. A "building services provider" is someone who holds a "building services licence", and such a licence must be held if performing "building services work", which includes engineering analysis, design and documentation, and assessment and certification of architectural or engineering designs (there are some exclusions for low risk and low value work).

A person must not do any "building services work" unless they hold a building services licence of the occupation and class relevant to the work. The Department of Justice, as the regulating authority, lists three categories of engineers under the "Design Class": Fire Safety Engineers, Building Services Engineers and Civil Engineers.

Under the administrative requirements, engineers who are registered on the NER need only provide evidence of their registration to obtain a license. Note that other requirements may exist.

1.2.6 SOUTH AUSTRALIA



Development Act 1993

There is currently no registration or accreditation system for engineers in South Australia. The *Development Act 1993* requires certain types of building practitioners be registered with a State Board. The Board used the former NPER as the benchmark for the criteria for qualifications and experience required of professional engineers.

In 2020, the South Australian Government indicated that it is liaising with the Australian Building Codes Board in its work to develop a coordinated approach to registration of engineers in the building sector. That is part of national efforts to reform the building sector that are driven by the Building Ministers Forum. Engagement by the South Australian Government with professional groups such as Engineers Australia is expected in 2021.

1.2.7 WESTERN AUSTRALIA



In August 2011, the Western Australian Government established a Building Commission to administer building practice registration, building controls (i.e. acts and standards) and complaints processes. The Commission also provides advice to government. The new arrangements do not specifically cover engineers.

In 2020, the WA Government is conducting public consultation on proposals to introduce registration for engineers in the building sector. This is in response to national efforts to reform the building sector, driven by the Building Ministers Forum. There is potential for this work to, over time, be extended beyond the building sector in order to fulfil the current Government's 2017 election campaign statements in support of a statutory registration scheme for engineers more broadly.

1.2.8 NORTHERN TERRITORY



Building Act 1993

The *Building Act 1993* (NT) requires registration of building practitioners, including certifying engineers. Registration is managed by the Building Practitioners Board. The Building Practitioners Board's principle role is the registration of Building Practitioners, which includes Mechanical, Hydraulic and Structural Engineers as well as Plumbers, Builders, Certifying Architects and Building Certifiers.

Trades persons and certifying engineers carrying out prescribed residential building work in the Northern Territory (as specified in Part 4A of the Building Act) must be registered. Companies undertaking prescribed residential building work must also be registered with the Board. Registration can be made for Certifying Engineer (Hydraulic), Certifying Engineer (Mechanical) and Certifying Engineer (Structural).

A qualification required for membership of Engineers Australia as a professional engineer eligible to use the post nominals MIEAust or a certificate of registration in the relevant category (structural engineer, building services engineer or mechanical engineer) on the NER is accepted for registration.

Three years' practical experience, including 12 months' practical experience in design and 12 months' practical experience in supervision, relevant to the sub-category applied for is also required but NER registrants are exempt from this requirement.

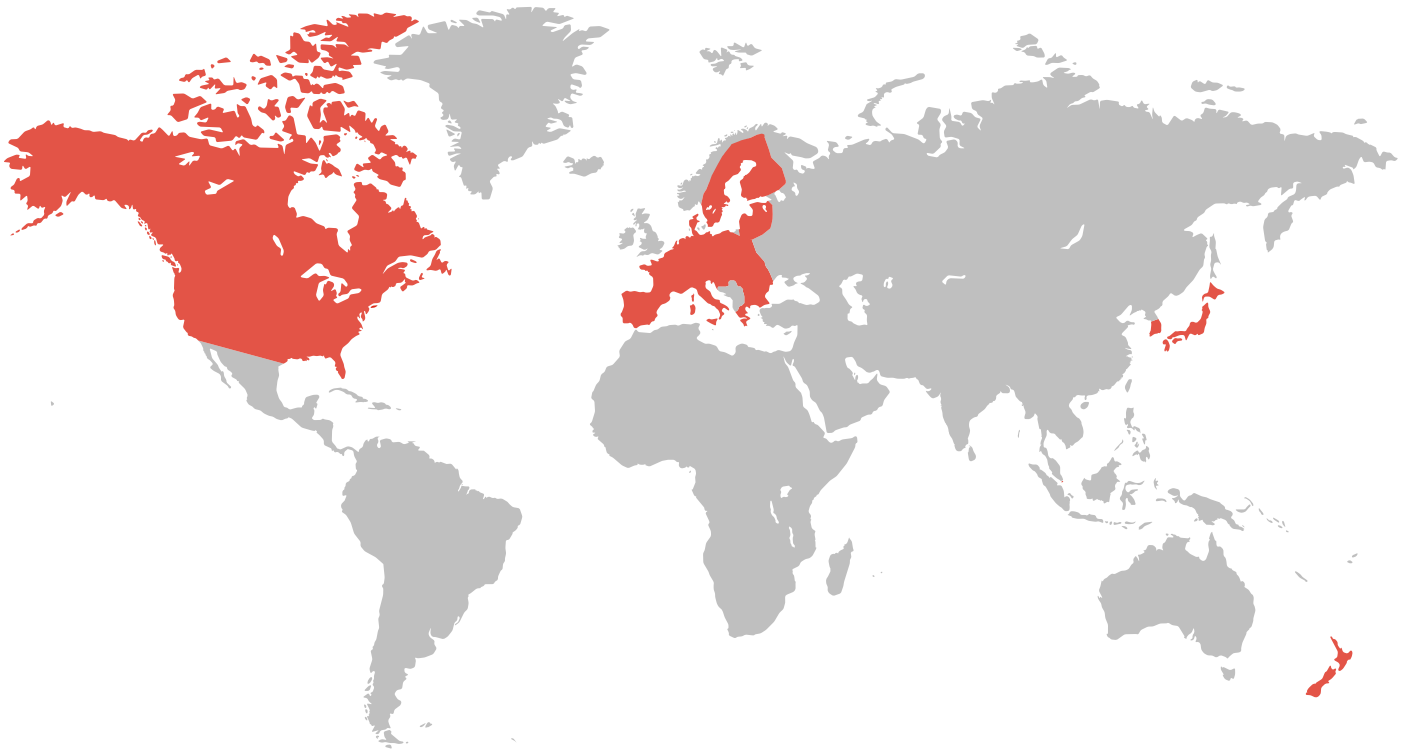
At present, no continuing development requirements have been determined by the Minister. The Board, however, encourages all registered practitioners to embark on a program of activity that continues to maintain and develop their personal skills and knowledge of the building industry.

On 22 March, in a letter to Engineers Australia, the NT Attorney General agreed to consider a registration scheme for a broader range of engineering disciplines.

1.3 REGISTRATION OF ENGINEERS AROUND THE WORLD

Countries that require registration of engineers:

- Canada
- United States of America
- New Zealand
- Singapore
- Japan
- Korea
- European Union.



It is illegal in Canada to use the title “Professional Engineer” or to practice as an engineer without a license. The profession is self-regulating under a mandate from each of Canada’s provinces. Licensing bodies ensure that standards of practice, education, admission are established and maintained and will discipline any engineer who fails to uphold professional practice or ethical standards. They can also take action against a person who illegally uses the term “professional engineer” or who practices engineering without a license.

Frequently asked questions

The following is a list of frequently asked questions or frequently posed challenges in the public debate about registration of engineers, and associated responses.

Registration is not a silver bullet

Engineers Australia does not promote registration as a 'silver bullet' but it is a first step to creating a system to recognise competence and exclude those found not suitable to work as an engineer.

Why can't we just use the National Engineering Register?

The role of the regulator belongs to Government, which has the resources and legal power to conduct comprehensive investigations of registered engineers and their work in response to complaints, and has the power to act as required. Engineers Australia is of the view that its National Engineering Register (NER) provides a good model for governments to adopt.

We need a national system; we don't want red tape from a different scheme in every state

It is agreed that new registration schemes should operate nationally and align with what is already in place in QLD and Victoria. A professional body should be appointed to conduct assessments on individuals' qualifications and experience to further avoid red tape. With each new state or territory that introduces registration, the Mutual Recognition Act 1992 kicks in to ensure recognition of registered status across borders.

Would engineers working on-site for delivery of construction projects require registration?

If someone is providing a professional engineering service, they need to be registered. This covers all aspects of engineering, unless if: working under supervision of a registered engineer or, if only following a prescriptive standard or design. Working on site often draws on professional engineering judgement so it would be prudent to be registered.

Will registration affect my personal liability for engineering work?

Exposure to potential liability for an engineer is unaffected by registration. What registration does mean is that, if someone is found to have provided engineering services to an unacceptable standard, they may be removed from the register and therefore be unable to continue practicing as an engineer.

Also, a registered engineer is better able to resist pressures from clients to sign-off on sub-standard work because it would place their ability to practice at risk. Registration brings the engineering profession into line with other professions, namely the medical and legal professions.

How will registration apply in a world where engineering projects are increasingly multi-disciplined?

Engineering is an increasingly diverse profession and there is a need to create a system that captures all disciplines, without becoming too narrow. The areas of practice within the National Engineering Register and Registered Professional Engineer of Queensland systems is indicative of how this has been managed to-date.

We need to create a system whereby engineering services are always overseen by an engineer with relevant experience. It should be noted that part of being a professional is recognising one's own limitations. For example, a civil engineer with a career in building bridges may not be the right person to sign-off on the design of an airport runway.

When you consider that engineers sit at the apex of the building and construction process – scoping, designing and overseeing the work of other trades and professionals, it underlines how absurd the current situation is. Introducing engineer registration is simply a matter of public-interest and closes a long-time regulatory gap which makes no sense and exposes the public to risks.

- an engineer's submission to the NSW Parliamentary inquiry into engineer registration



3.1 CASE STUDY 1

Case study of an engineering failure in a building that is not a Class 2 apartment⁵

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.

3.2 CASE STUDY 2

Case study of an engineering failure in a Class 2 apartment, but related to something not usually considered when thinking of what goes into erecting a building⁶

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 in NSW saw three workers escape injury by grabbing onto 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



5 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/#.XaQ84egzaUl>. Accessed 14 October 2019. Additional details about the incident involving the 40-tonne panel may be available from SafeWork NSW.

6 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.

- 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 to ensure it meets the design specifications and is structurally sound

Formwork in complex construction should be designed by engineers with appropriate training and experience. Without a comprehensive compulsory registration scheme for engineers vital areas of engineering will remain at risk.

3.3 CASE STUDY 3

Case Study of engineering failure in civil construction (bridge)

In 2010, the eastern duplication bridge of the Gungahlin Drive Extension (GDE), over the Barton Highway in the ACT, partially collapsed sending debris crashing onto the highway. The new bridge was under construction when it collapsed. One man was trapped under the rubble and nine taken to hospital for treatment. All those affected were working on the new span of the bridge.

An engineer's report on the collapse of the bridge found the project's formwork was not properly braced to stop the girders moving sideways when the concrete was poured, creating excessive stress.

The engineer responsible has also been accused of breaching building standards on eight projects in the ACT including the Barton Highway bridge, Empire Apartments in Forrest and Pulse Apartments in Gungahlin.



3.4 CASE STUDY 4

Case Study of engineering failures in the agriculture sector

A number of silo collapses have taken place in regional Australia, some of which have resulted in fatalities. Recent examples of silo collapses include:

- In May 2010, a man was crushed to death by a metal grain silo near Kyabram in northern Victoria;
- In October 2014, a farm worker near Ouyen in western Victoria died when a grain silo collapsed on him;
- In June 2015, a 3000-tonne silo, which was about three-quarters full of cement dust, collapsed in the Adelaide suburb of Osborne, despite the silo being brand new, although thankfully, no-one was injured.
- In January 2017, a 3500-tonne grain silo on poultry company, Ingham's property in Cardiff, near Newcastle in NSW, collapsed without warning, with witnesses saying it was lucky that no-one was hurt; and
- In June 2018, a full grain silo collapsed near Mallala, to the north of Adelaide, and although workers were in the vicinity at the time, no-one was injured;

Compulsory registration of engineers would make it much less likely for similar design flaws and silo collapses to happen in the future, significantly enhancing community safety and consumer protection.

Registration of Engineers is a simple, sensible and logical step to mitigate risks.

- an Engineers Australia member



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