

artibus INNOVATION

Developing industry skills

CPC Construction and Plumbing
Services

Industry Skills Forecast 2020



Submitted by Artibus Innovation
on behalf of the Construction, Plumbing and Services IRC
August 2020

Disclaimer

This report has been prepared by Artibus Innovation (Artibus) from primary and secondary sources and is intended to provide general guidance only. Artibus and its employees and other parties associated with the production of this report make no representations about the accuracy, veracity or completeness of the information within it and are not liable for any omissions, errors or inaccuracies. Artibus may update, amend or supplement this document at any time, but has no obligation to do so. Artibus disclaims all liability resulting from any decisions, opinions, assumptions and actions taken in response to, and resulting from, the information provided in this report.

Acknowledgement of Support

Artibus Innovation is funded by the Australian Government Department of Education, Skills and Employment through the Training Product Development Program.

© Artibus Innovation, 2020

Artibus Innovation

P O Box 547

North Hobart TAS 7002

enquiries@artibus.com.au

www.artibus.com.au

Construction, Plumbing and Service Industry Skills Forecast 2020

Contents

Executive summary	4
2019-2020 existing projects	5
Section A: Overview of changes, skills needs and barriers.....	6
Outline of approach	6
Forecast limitations	6
1. Industry workforce, skills developments and trends	8
2. Qualification utilisation	10
3. Use of non-training package products	12
4. Qualifications with low and no enrolments.....	14
5. Non-completion of qualifications and skill sets (including micro-credentials).....	16
6. Opportunities for use of cross-sector units developed by the AISC	17
7. Jobs that have experienced changes in skill requirements	18
8. Barriers to employers hiring apprentices and trainees.....	20
9. Other relevant activities.	22
Section B: Ongoing stakeholder consultation throughout 2019	23
Section C: Proposed training package projects.....	24
Project 1 – Hydrogen addition.....	25
Project 2 – Heritage skills	32
Project 3 – Construction hazards	38
Project 4 – Precast concrete installation.....	45
Project 5 – Water Efficiency Labelling and Standards.....	50
Project 6 – Work arising from previous activity	56
References	62
Appendices	65
Appendix 1 – Summary of projects.....	65
Appendix 2: Skills, trends, and workforce developments	70
Appendix 3: Letters of support	77
Attachment 1 : Section B: Ongoing Stakeholder Consultation throughout 2019	92

Executive summary

The 2020 Industry Skills Forecast for the CPC Construction and Plumbing Services Industry provides an annual report on industry developments and proposed skills responses identified in the period March 2019 through to March 2020.

The report is presented in three sections:

- Section A provides an overview of new industry workforce practices, skills developments and trends to emerge since the submission of the last full Industry Skills Forecast in 2019. This provides the broader context for training package product development and the standards against which industry led requests for the specific training package products were assessed.
- Section B describes the ongoing consultation with stakeholders throughout the year.
- Section C provides detailed accounts of proposed projects. These projects are presented with staged deliverables.

Overview of Changes, opportunities, and training needs

In 2019, there were four main drivers of change and opportunity in the Construction and Plumbing Services Industry:

1. Recognition of industry specific needs to employees, apprentices, trainees and students, and the associated implications for training and skills development to manage these.
2. Demand for new building technologies and integration of digital technologies in construction practices, such as Building Information Modelling (BIM), modern methods of construction (MMCs), and use of prefabricated components.
3. Heightened regulation in response to building failures and insurance requirements.
4. Identified demand for skills and occupations in response to climate changes and environmental disasters (e.g. fire, flood) is stimulating geographic demand for skilled occupations.

Training development in the Construction and Plumbing Services Industry needs to be responsive to, and strike a balance between, the maintenance of existing occupational skill needs, and meeting emerging skills gaps to remain productive and competitive. Key skill needs that emerged are:

- *Hydrogen skills*: reflecting rapidly emerging licensing and regulation.
- *Construction Hazards*: managing and addressing known and emerging occupational risks through appropriate training.
- *Heritage Skills*: meeting client demand (government and non-government) for maintenance of Australia's built heritage.
- *Precast Concrete Construction*: meeting emerging industry change and client demand for MMCs and developing training to cultivate the specialist skills required. Skills and training are needed in the use, installation and assembly of prefabricated components and non-traditional building materials. Precast Concrete Construction is envisaged as meeting a well-defined need in what will become a larger suite of qualification needs.

- *The Water Efficiency Labelling and Standards (WELS) scheme:* Australia's national urban water saving scheme. Under certain conditions, plumbers and builders are considered suppliers under the scheme, with legal obligations. Industry training is required as many installers are unaware of their legal obligations, despite heavy infringement penalties.
- *Cured in Place Pipe:* a unit of competency for Certificate III in Plumbing.
- *Certificate II in Plumbing:* a pathway qualification into plumbing to replace two expiring state accredited courses.
- *Steel Construction:* exploration of the inclusion of Steel Construction units of competency.
- *Certificate III in Swimming Pool and Spa Building:* Trade level qualification to compliment Certificate IV.
- *Rope Work:* units of competency and skill sets (or qualification) appropriate for industry and workers using ropes for high rise work.

The convergence of these trends is currently changing occupational practices and is projected to intensify over the next five years. The Construction and Plumbing Services Industry produces workers with broad competencies within their sector. These trends point to continued demand for construction workers with the following qualities:

- occupational competencies
- specialised technical capabilities
- competencies to work and meet reporting requirements in a highly regulated and technologically assisted reporting environment
- high awareness of physical and psychological workplace hazards that are likely to adversely affect individual workers and the security of the ongoing labour force.

2019-2020 existing projects

These activities have supported the Minister's priorities of reducing duplication and further streamlining training packages.

In 2019-2020 the Construction and Plumbing Services Industry Reference Committee (IRC):

- submitted and received full or partial Australian Industry Skills Council (AISC) approval for the following completed projects Bricklaying and Blocklaying; Stonemasonry; Demolition; Painting and Decorating; Building and Construction; High Risk Work; Rigging; Construction Crane Operations; Steel Fixing; Scaffolding; Roof Tiling; Solid Plastering; Wall and Ceiling Lining; Wall and Floor Lining; Construction Waterproofing; Swimming Pool and Spa Building; and Construction Pathways
- Carpentry and Joinery qualifications were not endorsed by the AISC and will be resubmitted once the AISC directives have been addressed
- Plumbing; Concreting; and Shopfitting Cases for Endorsement have been submitted.
- review of Building Surveying qualifications to update and future proof the qualifications, remove duplication, and delete low enrolment qualifications is well progressed.

Section A: Overview of changes, skills needs and barriers

Outline of approach

The annual update to the Industry Skills Forecast and proposed schedule for work in 2020 is informed by data from multiple sources, including:

- industry knowledge derived from ongoing consultation by the IRC and the Skills Services Organisation (SSO) with employers and key stakeholders
- reputable data from national statistical and survey data sets, such as VOCSTATS, Australian Bureau of Statistics (ABS) and the Labour Market Information Portal
- relevant research from academia, industry and forecasts
- primary industry knowledge about the construction industry has been developed by the SSO through an accessible online survey undertaken by 175 industry stakeholders, between 30 October 2019 and 17 February 2020¹
- specialist and ongoing consultations with employers, regulators, industry associations and training boards, particularly in the areas of Hydrogen Addition, Heritage Skills, Rope Work, Asbestos and Silicosis Hazards, Mental Health, and Precast Concrete Construction
- in-depth qualitative interviews with 14 members of the IRC, undertaken January and February 2020.²

Forecast limitations

All forecasts have limitations that must be acknowledged at the outset. There are two major limitations of this annual update.

We have sought to verify the claims made in primary research by industry and employer perspectives with statistical trends (e.g. ABS, Labour Market Information Portal), mixed method forecasts (e.g. National Centre for Vocational Education Research (NCVER), IBISWorld), and emerging quantitative and qualitative themes found in the wider research, where possible. However, as this forecast documents emerging trends, skills gaps and training needs, verification of industry and employer perspectives with statistical trends was not possible in every case. This forecast has sought to present an accurate summation of themes and trends identified by industry and employers, while also transparently stating where there is a lack of quantitative evidence to support industry claims. A lack of quantitative evidence does not nullify industry knowledge and these claims may, in due time, be supported by the wider literature. Documenting industry knowledge in this annual update to the skills forecast will permit comparative research and subsequent verification or disproving of industry claims.

Note on Australian Bushfires and COVID-19

The social and economic impacts of the Australian bushfires and COVID-19 virus are, as yet, unknown, but are expected to negatively impact the Australian population and economy. In February, the Australian Industry Group/Housing Industry Association Australian Performance Construction Index (Australian PCI®) increased by

¹ Note: percentages may exceed 100% where a question allowed **respondents** to select **multiple** answers.

² Note: percentages may exceed 100% where a question allowed **respondents** to select **multiple** answers.

1.4 points to 42.7.³ However, Australian economists have predicted the pandemic and bushfire events will result in an economic downturn and impact on international supply chains.⁴

The ABS is actively monitoring these rapidly emerging events and their implications on official statistics. The ABS Chief Economist recently stated that natural disasters tend to have relatively minor impacts on the broader labour market, and these are most commonly seen in changes to the number of hours worked.⁵ However, the outcomes are far from clear at the time of writing. The IRC and SSO will continue to monitor and analyse the impact of these events for the construction industry and their implications for skills and training.

3 Ai Group (2020), Australian PCI®: Construction decline eases in February, accessed 13/3/20 at Ai Group (2020),
<https://www.aigroup.com.au/policy-and-research/mediacentre/releases/PCI-Feb-2020/>

4 Koukoulas, S.; Quiggin, J.; Wood, D.; Foster, G.; Kirchner, S. & Auld, S. (2020), 'Experts on how coronavirus will wallop Australia's economy – and what the government must do,' The Guardian, 11/3/2020, accessed 12/3/2020 at
<https://www.theguardian.com/business/commentisfree/2020/mar/11/four-experts-on-how-coronavirus-will-wallop-australias-economy-and-what-the-government-must-do>

5 ABS (2020), 'Measuring natural disasters in the Australian Economy', ABS Chief Economist Series (3/3/2020), accessed 12/3/2020 at
<https://www.abs.gov.au/websitedbs/D3310114.nsf/home/ABS+Chief+Economist+-+Measuring+natural+disasters+in+the+Australian+economy>

1. Industry workforce, skills developments and trends

Construction is one of the four industries that will together contribute 62.1 per cent of estimated total employment growth in the five-year period to May 2024. New developments in existing and emerging specialisations within the sector require tailored training solutions, such as prefabrication and the shift towards hydrogen in our national gas supply. MMCs have increased our reliance on new technologies, which must be addressed as construction becomes increasingly digitised. Meanwhile, increased industry recognition of workplace hazards demands appropriate training and skills development.

The major new workforce skills and trends to emerge since the submission of the last full Industry Skills Forecast are:⁶

1. demand for occupational skills due to the addition of hydrogen to gas supply
2. greater awareness of construction workplace hazards
3. demand for heritage skills
4. demand for prefabricated concrete construction installation skills due to new modern methods of construction.

The IRC received direct requests for training products to address industry skills needs in the following areas:⁷

- Rope Work
- WELS Scheme
- Cured in Place Pipe - unit of competency
- Steel Construction - units of competency
- Swimming Pool and Spa Building Certificate III.

These trends emerge within an existing context of continuing and intensifying regulation and environmental changes. Climate changes and environmental disasters (e.g. fire, flood) are stimulating geographic demand for skills and occupations in the construction industry. These concerns are also changing insurance requirements⁸, and resulting in strengthened regulation in response to building failures.⁹ This is all against a backdrop of significant social shifts in the sector that see an ageing construction workforce, occupational skills shortages, and ongoing industry concerns that the number of new entrants into construction occupations may not meet workforce needs for replacement and future needs.

There is a fragmented broader industry perspective about current, incremental and imminent changes within the construction industry which was reflected in a survey undertaken by Artibus Innovation and answered by

⁶ See appendix 2, tables 2-7 for details

⁷ See appendix 3 for details

⁸ Whitbourn, M. 2019. Insurers refused cover to stone suppliers over lung disease risk. The Sydney Morning Herald, Dec 7. Available at <https://www.smh.com.au/national/insurers-refused-cover-to-stone-suppliers-over-lung-disease-risk-20191202-p53g1h.html> accessed 1/4/2020

⁹ Shergold, P. & Weir, B. (2018), *Building Confidence – Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*, accessed 24/3/2020 at https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf

175 respondents across the industry. Of the 175 responses received, 53 were from employers, with the majority (3 in 4) responses from small businesses. Industry was also represented through 25 responses from representative associations. A wide range of skills gaps were identified by employers, with a majority of employers (60%) saying the industry was poor at responding to emerging issues. Dissatisfaction with training was another theme among employer responses, with 62% dissatisfied with the skills provided through training. However, few dissatisfied employers pointed to problems with existing National Training Package products, despite most qualifications being almost a decade old. Most concerns were about quality of delivery, implementation, cost, and confidence in trainers and private Registered Training Organisations (RTOs).

2. Qualification utilisation

Circumstances in which employers employ people with vocational education and training (VET) qualifications

In their recent report *Employers' use and views of the VET System (2019)*, the NCVER¹⁰ found that over half of employers (50.9%) interviewed engaged with the VET system. Of these, employers used VET under three specific circumstances:

1. because they have jobs that require vocational qualifications (34.2%), including specialised job skills and to meet legislative, regulatory or licensing requirements
2. because VET training meets their need for skilled staff and improving staff skills when employing apprentices and trainees (23.3%)
3. because they use nationally recognised training (other than apprenticeship and traineeships) for their staff training (19.9%).

Unlike employers in general, VET is central to licensing requirements in the construction industry. This means that VET is an entry requirement for trades and employers who are likely to be familiar with VET training and skills outcomes. The reasons given by IRC members reflect this, as well as the value the construction industry places on a VET qualification as an indicator of an employee's skills:

- 50% identified licensing requirements for trades meant that employers had no choice but to employ VET trained workers
- 50% said that employers saw formal VET qualifications as meaning they could have confidence in the level of skills of employees. One IRC member said that VET qualifications provide consistency of work outcomes
- a small number said that employing workers with VET qualifications saved time and were good for business marketing
- 14% of IRC members said that employers do not employ people with existing VET qualifications, and this was due to non-VET reasons. For instance, some employers have RTO arms and prefer to train workers themselves (e.g. large construction companies, Defence), or use non-VET trained workers because demand is such that they will employ unqualified employees.

Circumstances in which employers do not employ people with VET qualifications

The following circumstances in which industry employers do not employ people with VET qualifications were identified:

- cost and uncertainty about having ongoing work in a short-term contract environment meant that employers did not employ people with VET qualifications or who are completing apprenticeships and traineeships

¹⁰ NCVER (2019), Employers' use and views of the VET System, accessed 10/03/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/employers-use-and-views-of-the-vet-system-2019>

In the 2019 study, 7007 employers were interviewed between February and June 2019. These employers included 1,193 drawn from the Construction industry

- unskilled labourers were used in the sector for a range of reasons, including because labourers do not require VET qualifications, and people start out in the industry untrained but are later employed (sometimes illegally) in skilled positions
- employers do not employ people with existing VET qualifications because they have RTO arms and prefer to train them themselves (e.g. large construction companies, Defence), or because demand is such that they will employ unqualified employees.

The nature of some construction tasks is changing due to changes in modern construction methods which require quasi-manufacturing skill sets. This change risks deskilling existing construction workers, but it also poses opportunities for existing workers to develop better project management skills earlier in their careers, and demand for more collaborative skills to work between trades.

3. Use of non-training package products

Construction industry employers do utilise the broad range of training that is available outside of the National Training Package. However, according to NCVER research, employer use of unaccredited training in the construction industry is the lowest of any industry sector at 39% versus the 48.5% average for all industries.¹¹ The reason it is lower in the construction industry is most likely because the occupational training needed for licensing purposes and entry to the industry is done through the National Training Package.

Construction employers and employees do draw on the wide range of training offered outside of this system by industry associations, industry training boards, and manufacturers to meet their skills needs and continuing professional development requirements. IRC members mentioned a range of similar training options used within the construction industry, including:

- accredited and non-accredited courses provided by industry associations
- manufacturer and vendor training
- in-house training and induction.

The main reasons identified as to why employers use training outside the national training system are niche or bespoke training needs, flexibility and speed of delivery.

Example: Employer use of bespoke training, Rope Work

An example of niche or bespoke training outside the national system is rope work training, which is a skill used in working at heights as a less expensive access approach than scaffolding. For example, rope work is commonly used by painters to access the outside of high-rise buildings. Currently, there is no national training product in this area and a small number of industry members have directly requested that this training be developed.¹² The industry's training needs are met through private training, including from the International Rope Access Trade Association (IRATA) which states it has trained over 100,000 rope access technicians worldwide.¹³ IRATA currently offers minimum 4-day training courses in Queensland and New South Wales.¹⁴ The Australian Rope Access Association also offers certificate training for technicians, at levels I, II, and III.¹⁵

Further reasons for construction industry using training outside the National Training Package were identified by the IRC members and are outlined in the table below. It should be noted that the construction industry's reasons for using unaccredited training are not exceptional and are consistent with the main reasons given by 48.8% of all employers:

- 57% to provide the skills needed for the job
- 36% to meet and maintain professional or industry standards

¹¹ NCVER (2019), Employers' use and views of the VET System, accessed 10/03/2020 at https://www.ncver.edu.au/research-and-statistics/publications/all-publications/employers-use-and-views-of-the-vet-system-2019_p.12.

¹² Daniel Wurm (National Painting and Decorating Institute, ongoing discussions 2019); David Dougherty (Total Height Safety, Forum discussion & email correspondence, 2019).

¹³ <https://irata.org/page/training-requirements>

¹⁴ Levels 1 to 3.

¹⁵ <https://sprat.org/cert/>

- 34.5% to meet highly specific training needs.

It is also noteworthy that NCVER found employer satisfaction with unaccredited training for all employers is higher (87.4%) than with accredited training (72.1–78.8%).

Table 1. IRC member reasons why the construction industry uses training outside the national system.

Reasons	Description
Niche or bespoke training need	<ul style="list-style-type: none"> • 93% said to meet a niche or bespoke training need, such as for a particular technology, product or knowledge that is not currently catered for in the national system.
Flexibility	<ul style="list-style-type: none"> • 71% said flexibility was the main reason, with one noting that the TAFE system is very structured and inflexible in its delivery.
Speed of delivery	<ul style="list-style-type: none"> • 50% identified speed as major driver in a context of just-in-time delivery of projects, demand for up-to-date training products, and slowness in the national system's speed to market of qualifications to meet current needs.
Access	<ul style="list-style-type: none"> • 21% said access to VET training was an issue.
Lower costs	<ul style="list-style-type: none"> • 21% said lower costs of training were also a consideration.
Other factors	<ul style="list-style-type: none"> • Other explanatory factors that received single mentions were unusual jobs; specific business needs; currency; use for individual competencies; lack of VET trainers; dissatisfaction with VET; and employers not understanding the VET system.

4. Qualifications with low and no enrolments

The IRC has undertaken to delete, where possible, qualifications and units of competency with low or no enrolments from its training package. This is in support of the Council of Australian Government's (COAG's) reforms to training packages to remove obsolete/superfluous training package components from the National Register.

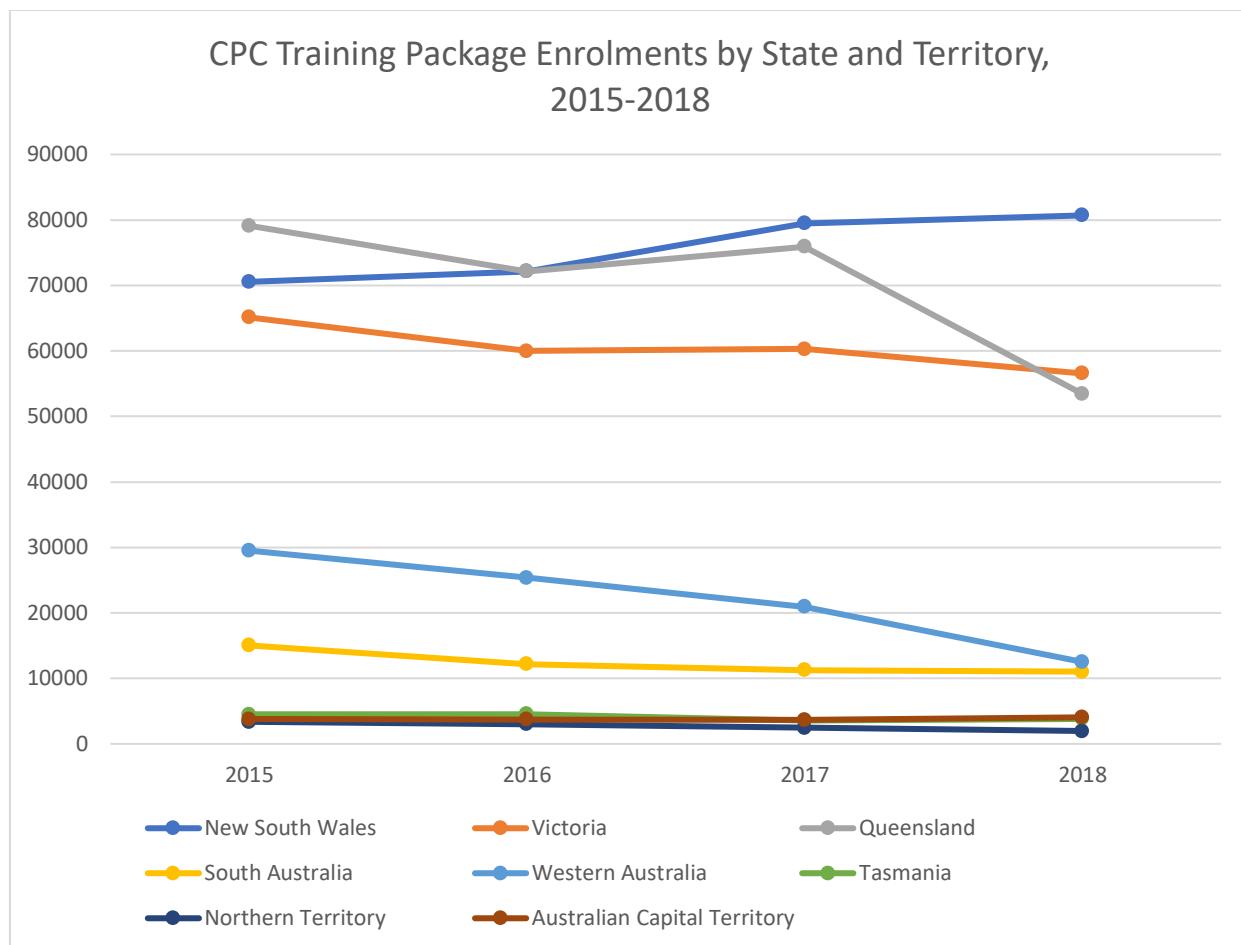
The following qualifications were reviewed in CPC Release 5.0 and were approved for deletion by the AISC in February 2020:

- CPC30511 Certificate III in Dogging
- CPC31611 Certificate III in Paving
- CPC31712 Certificate III in Post-tensioning
- CPC40408 Certificate IV in Building and Construction (Sales)
- CPC40611 Certificate IV in Building and Construction (Specialist Trades)
- CPC40708 Certificate IV in Building and Construction (Trade Contracting).

The following qualifications were reviewed in CPC Release 6.0 and are expected to be approved for deletion in August 2020:

- CPC20812 Certificate II in Metal Roofing and Cladding
- CPC20912 Certificate II in Urban Irrigation
- CPC32513 Certificate III in Plumbing (Mechanical Services)
- CPC50412 Diploma of Plumbing and Services
- CPC80115 Graduate Certificate in Fire Systems Design Management.

Training package enrolments by state and territory



Differences between states and territories

The demand for qualifications in the construction industry is largely driven by regulatory and compliance requirements within each state and territory. Where a state requires a licence (underpinned by a qualification or units of competency) then enrolment numbers are commensurate with occupational requirements.

The demand for the construction pathways qualifications (e.g. Certificates I and II in Construction) varies across jurisdictions due to differences in state and territory policy regarding school-based VET activity and industrial relations considerations, particularly on competency based wage progression. Western Australia and Victoria have developed accredited courses intended to control school-based activity and minimise issues relating to competency based wage progression for business and employers within their jurisdictions. Tasmania has adopted in large part the Victorian accredited course for the same reasons. In Queensland, the Certificate I is given preference, whereas the remaining states preference Certificate II outcomes.

5. Non-completion of qualifications and skill sets (including micro-credentials)

Direct data pertaining to non-completion is not available to answer this question and would likely yield highly individual and contextual responses. IRC members shared their impressions drawn from experience within the industry.

Industry knowledge

IRC members interviewed identified a number of key reasons for completion and non-completion of qualifications and skill sets in the construction industry.¹⁶ These were:

- *Personal reasons:* 50% said that students do not complete for personal reasons, such as realising the industry and job were unsuitable for them. Several commented that some young people had soft skill aptitudes that were less suited to construction industry work
- *Not needed:* 50% said that some employment roles do not require the completion of qualifications. In these cases, students will complete enough units within a qualification to obtain the competencies for a licence (e.g. Rigging and Dogging licences), or the base-level skills and knowledge required to get a job, then discontinue study
- *Lack of employer support and recognition:* 42% said that lack of support by employers, which may take the form of lack of investment, poor treatment or wages, and lack of mentoring, is a major reason for student non-completion of qualifications and skill sets
- External reasons which impact on the industry, such as economic downturns, were identified as resulting in there not being enough work for apprentices and trainees to complete their qualifications.

The majority of IRC members (86%) said that licensing was the main reason for student completion of qualifications. Other reasons were:

- 57% to start their own business
- 64% combined reasons including: wage progression, career advancement, confidence, achievement, and to be work-ready.

¹⁶ Note: percentages may exceed 100% if the question allowed **respondents** to select **multiple** answers.

6. Opportunities for use of cross-sector units developed by the AISC

Where available and relevant, the cross-sector units developed by the AISC are considered for all CPC training package projects.

The following endorsed cross-sector units may be suitable for future use in CPC qualifications and skill sets and will be considered on their merits by the IRC for inclusion where applicable.

- BSBXCM301 - Engage in workplace communication
- BSBXCM401 - Apply communication strategies in the workplace
- BSBXCM501 - Lead communication in the workplace
- BSBXDB401 - Develop and implement recruitment processes that are inclusive of people with disability
- BSBXDB501 - Support staff members with disability in the workplace
- BSBXDB502 - Adapt organisations to enhance accessibility for people with disability
- BSBXTW301 - Work in a team
- BSBXTW401 - Lead and facilitate a team
- TAEYDB401 - Plan and implement individual support plans for learners with disability
- TAEYDB501 - Develop and implement accessible training and assessment plans for learners with disability

7. Jobs that have experienced changes in skill requirements

Construction

There have been significant skills changes in construction around innovations in work practices, the evolving use of technologies, the shift from manual to digital practices, and advanced manufacturing practices in the construction industry (e.g. laser cutting, 3D printing). Key drivers are new technologies now spreading beyond Tier 1 companies to broader industry application (e.g. BIM, simulation and comparative modelling against a digital twin), new products (e.g. robotics, machinery), more 'high-tech' appliances to install (e.g. heating and roof-top systems), and the global demand for increased shelter and floorspace, which is estimated will need to double between 2015 and 2050. As a result, many future jobs in construction are likely to require higher levels of digital literacy and tailored, flexible training to adapt to specific new technologies.¹⁷ The resulting impact on training package development is:

- a need for units on emerging technologies and their applications in Australia and internationally
- a need to update qualifications to remove outdated technology and include new technology (e.g. vacuum drainage systems).

Construction supervisors and workers

Skills changes for construction supervisors and workers have been particularly noteworthy in the on-site assembly of prefabricated and modular components requiring construction supervisors to have competencies in these technologies. Skills in on-site installation in prefabricated and modular construction are also increasingly required, as are updated workplace health and safety in new construction environments. The changes are predominantly driven by MMCs from manufacturing now used in the construction industry, such as modular drop-ins, and smart work practices more generally. Supervisor and worker jobs in construction will require more precise training in MMCs.¹⁸ The resulting impact on training package development is a need for units on emerging technologies and their applications in Australia and internationally.

Plumbing

Plumbing skills are changing significantly in response to complex plumbing systems in commercial buildings and in domestic prefabricated buildings. This is largely in response to green technologies and products (e.g. green roofs and water saving systems). This shift is clearly evidenced across:

- consumer demand for green and new technologies¹⁹ and product availability from manufacturers
- green and waterwise plumbing accreditation and endorsement schemes²⁰
- government policies and programs to support individuals and households.²¹

¹⁷ CITB (2018). *Unlocking Construction's Digital Future: A skills plan for industry*. UK. Available at unlockingconstructionsdigitalfuture.citb.co.uk > [citb_constructions_digital_future_report_oct2018](#) accessed 1/4/2020

¹⁸ See, for instance, Jupp, J., and Awad, R. (2013). "Developing Digital Literacy in Construction Management Education: A Design Thinking Led Approach." *Journal of Pedagogic Development* 3(3).

¹⁹ Halliday-Wynes, S. & Stanwick, J. (2011). Plumbing, sustainability and training, NCVER, Adelaide.

²⁰ For example, see Master Plumbers & Gasfitters Association of Western Australia's Waterwise Plumber Program, accessed 24/3/2020 at <http://www.masterplumbers.asn.au/sustainability/default.aspx>

²¹ For example, see those listed by the Australian Government's Department of Agriculture, Water and the Environment at <http://www.environment.gov.au/climate-change/individuals-and-households>

Jobs in plumbing and related occupations are likely to see an increased demand for the skills associated with these new technologies and systems.

Construction industry fire systems compliance

Regulation is requiring new skills in compliance and documentation, driven both by the increased regulation of building materials and practices, and new fire rating products. The regulatory implications of the *Building Confidence* (2018) report by Shergold and Weir²² are relevant here, as are the regulatory capacities of digital building systems, such as BIM. Occupations relating to these areas will have increased requirements around compliance and documentation, which may require substantial upskilling in the current workforce. This is currently being considered by the IRC in the redevelopment of three fire systems qualifications.

Heritage skills

Heritage skills have seen significant impact from the introduction of new technologies. Incorporating technology into heritage projects requires skill sets in 'sympathetic' restoration and technology installation. This technological shift is driven largely through the widespread popularity and utilisation of technologies (e.g. solar, electronics). The impact of these technologies is clear in the Australian Heritage Strategy,²³ the Draft Australian Heritage Quality Framework,²⁴ and the relationship between the Heritage Quality Framework and Heritage Skills Development.²⁵ Jobs in this area will increasingly be required to integrate traditional methods and cutting edge technologies.

²² Shergold, P. & Weir, B. (2018), Building Confidence – Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia, accessed 24/3/2020 at https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf

²³ Commonwealth of Australia (2015), Australian Heritage Strategy, accessed 24/3/2020 at <https://www.environment.gov.au/system/files/resources/cb226e0d-ba51-4946-af5a-24b628958e79/files/australian-heritage-strategy-2015.pdf>

²⁴ International Council on Monuments and Sites (ICOMOS) (2020), Australian Heritage Quality Framework, <https://australia.icomos.org/about-us/australian-heritage-quality-framework/>

²⁵ See ICOMOS (2017), The Relationship between the Heritage Quality Framework and Heritage Skills Development, Discussion Paper, accessed 24/3/2020 at https://australia.icomos.org/wp-content/uploads/AHQF_Discussion-Paper-No-1_Relationship-between-AHQF-and-Heritage-Skills-Development_April-2017.pdf

8. Barriers to employers hiring apprentices and trainees

There were 19,720 construction trade apprentice and trainee commencements in the December quarter 2019, a decrease of 12.2% on the previous year.²⁶ The numbers have declined 19.7% between 2015-2019²⁷.

The main barriers to hiring apprentices and trainees in the construction industry have been identified and can be classified into three key groups. These are:

- Employer barriers: including the cost of employing an apprentice; lack or uncertainty of continuing work; inadequate subsidies and incentives; the company's ability to rotate apprentices to cover the scope of work required by the qualification; lack of understanding of requirements and red-tape; and the perceived lower cost of hiring contract workers from overseas.²⁸
- Apprentice issues: including lack of maturity due to age; insufficient base level language, literacy and numeracy (LLN) skills (particularly numeracy); applicant quality; and low interest in construction or physically demanding careers. A 2020 NCVER research report found apprentices struggle with the expectations of the workplace, managing their release from work for off-the-job training and managing their workplace relationships with superiors and supervisors.²⁹
- Training barriers: such as out-of-date training content; time that training takes apprentices off the job; competition with higher education; poor career advice; and occupational skills demand lists being out of date.³⁰

IRC members noted that several construction sub-sectors struggle to attract apprentices, namely plastering, painting and decorating, glazing, and brick and block laying.

A 2019 NCVER research report found that of apprentices and trainees that did not complete their training 11.9% cited having a poor relationship with their boss or co-workers as a reason for non-completion, while 11.7% were made redundant.³¹ 44.7% of females who did not complete their apprenticeship or traineeship said they observed bullying compared with 30.3% for males.³²

²⁶ NCVER (2020), Apprentices and Trainees 2019: December quarter – Australia, accessed 19/06/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/apprentices-and-trainees-2019-september-quarter-australia>

²⁷ NCVER (2020), Apprentices and Trainees 2019: June quarter – Australia, accessed 10/03/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/apprentices-and-trainees-2019-june-quarter-australia>

²⁸ Misko J & Wibrow B (2020), Traditional trade apprenticeships: learnings from the field, NCVER, accessed 19/06/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/traditional-trade-apprenticeships-learnings-from-the-field>

²⁹ Ibid

³⁰ Ibid

³¹ NCVER (2020), Apprentice and trainee experience and destinations 2019, accessed 19/06/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/apprentice-and-trainee-experience-and-destinations-2019>

³² Ibid

The IRC has suggested several pathways and strategies to address these barriers:

- the redeveloped CPC Certificate I and Certificate II qualifications provide the requisite skills and knowledge required by all Certificate III level construction qualifications.
- the crucial importance of Group Training Organisations (GTO) to overcoming employer issues and uncertainty of work continuity. In 2019, 89.6% of GTO apprentices and trainee's that completed their training were satisfied with their experience compared with 78.3% for those in direct employment.
- good support and mentoring from RTOs, GTOs and industry member associations can help students with LLN and personal issues to complete apprenticeships and traineeships.

9. Other relevant activities.

A meeting of IRC Chairs held in December 2019 identified additional activities that should form a feature of future training package development, including strategies to better incentivise and encourage RTOs to pick up training packages where there is industry and employer need.

Section B: Ongoing stakeholder consultation throughout 2019

This section identifies construction industry stakeholders that Artibus Innovation has engaged with over the last year to:

- gain industry sector feedback, advice and validation
- provide answers to queries regarding the CPC training package.

Available as Attachment 1.

Section C: Proposed training package projects

In section C, the proposed training package projects have:

- been identified and/or initiated by industry, employer, regulator and key stakeholder requests to the IRC for specific training products and their identification of gaps in the training package
- industry and employer knowledge verified through analysis of secondary research of industry forecasts, relevant research literature, national surveys, state and territory-based skills forecasts and analysis, and reputable national statistical data sets (e.g. ABS, NCVER, IBISWorld)
- considered the specific nature of the problem, prior to project proposals proceeding to issues of scope and subject-matter expertise.

What types of problem is the training package being asked to address?

Table 2. Example response to Minister's priorities

Is it a qualification content gap?	There is no appropriate qualification that is fit for purpose for this industry.
Is it a qualification access/delivery gap?	There is a qualification (or skill set) but it is not being delivered in an accessible way to the students who want it.
Is it a skilled labour gap?	There are qualifications, but not enough skilled graduates in this geographic area.
Is it a skills gap?	There are graduates and workers in this industry, but they do not have proficiency in new and emerging areas of competency.

Project 1 – Hydrogen addition

Description

Green hydrogen is emerging as a key technology in Australia's energy future, with Australia's National Hydrogen Strategy (the National Strategy) published in November 2019 outlining a national commitment to, and process for, its uptake. Hydrogen is a low or no emissions alternative to natural gas that can assist in assuring liquid fuels security, provide energy grid support, and address the persistently high costs of natural gas for domestic use. The work proposed here is an initial review and the development of a skill set within the CPC training package for hydrogen uptake readiness. Beyond this initial project proposal, it is anticipated that there is significant scope for further unit and qualification development as national adaption to hydrogen progresses.

Current proposal

The IRC proposes that the gas sections of the CPC training package be reviewed and a skill set developed, reflecting Australian Standards, licensing and regulatory needs as they emerge. This review and skill set development is limited to assessing and addressing the addition of hydrogen in the domestic supply and will not reassess previous work undertaken. In order to assure a timely training response to the hydrogen addition, this project should begin now, as:

- the development, approval, and associated quality processes will take time before RTOs and trainers are ready to deliver training when required
- developing a hydrogen competent workforce will take several years through the completion of full qualifications and apprenticeships, and through the upskilling of the current plumbing labour force.

Rationale

The COAG Energy Council released the National Strategy in November 2019, which outlines the direction forward for Australia to develop a significant hydrogen market for both domestic and export purposes. To date, the Australian Government has invested \$146 million in research and exploratory programs in the area, and there are numerous pilots currently underway around the country.³³ Recent estimates suggest that global demand for hydrogen energy is likely to increase to 8 million tonne by 2030 and about 35 million tonnes by 2040.³⁴ Japan, China, Singapore, and South Korea have emerged as significant export markets. In the domestic context, hydrogen is intended to encompass both production and use, and will be utilised in a number of areas.

Changes to the domestic gas supply, while currently envisioned as incremental, will require new technical skills for domestic plumbers to continue to do their current work. Hydrogen is expected to be used domestically and commercially in three main ways: 1) combined heat and power fuel cells; 2) hydrogen burning appliances that have been developed and are currently undergoing testing; and 3) hot water and ventilation systems (combined electrolyser, fuel cell, hydrogen storage, and heat recovery).³⁵ Future gasfitters are likely to work on fuel cells and

³³ For example, Queensland have committed \$19 million to the development of a domestic green hydrogen Industry, and in 2019 the first export of green hydrogen was made to Japan. In South Australia, AGIG are developing the demonstration facility Hydrogen Park South Australia, costing \$11.4 million (\$4.9 million of which came from SA Government) and Hydrogen Utility have announced a 30MW water electrolysis plant. VIC, NSW, and WA all have various trial projects underway, and the Canberra Institute of Technology (ACT) has a test station for current infrastructure and is intending to train workers in these emerging skills.

³⁴ Medium hydrogen uptake scenario in: ACIL Allen for ARENA

³⁵ Edwards, R. (2020), Professional Communication from the Chair of H2 Networks to Artibus Innovation regarding the Hydrogen Project Proposal.

with hydrogen burning appliances, and will require those skills and competencies relevant to the risk levels associated with how hydrogen is produced and used.

It is crucial to begin the process of reviewing and updating the training package with sufficient lead time to ensure changes reach the market when required. The review and associated training product development must take into account the time it takes to complete a full apprenticeship and for current workers to complete the necessary upskilling to work safely with hydrogen. As the National Strategy makes clear, training and safety are areas that require immediate resourcing.³⁶

Industry stakeholders have emphasised that this change is coming, and that it important to be ready for it.³⁷ IRC members have also recognised the difficulty of ascertaining what exactly needs to be done, underlining the importance of undertaking this review.

Training demand: update and upskill plumbing qualifications

There are two key sources of demand for training:

- the National Strategy prioritises hydrogen-related reviews and updates to training packages
- a need to update the plumbing and other construction qualifications and upskill the 79,200³⁸ plumbers to ensure a continued supply of skilled labour who can safely work with blended hydrogen in the domestic gas supply, fuel cells, and hydrogen burning appliances.³⁹

The strategic action plan, the National Strategy, proposes to "ask the Australian Industry and Skills Committee to bring forward the hydrogen-related reviews and updates of training packages if Industry Reference Committees recognise an urgent need for this work be completed."⁴⁰ It should be noted that the National Strategy notes the potential for hydrogen education and training to be developed as an export product.

Impact on existing jobs and qualifications

A key aspect of the National Strategy is to use hydrogen as a substitute for, and blended with, natural gas in domestic supply. This has significant cross-sector implications and will impact the CPC skills and training needs, notably the current and future plumbing labour force.

The Artibus Innovation 2020 Industry Skills Forecast Survey registered existing labour shortages within the sector, with 31% of respondents (41 of 131 question responses) having recently experienced a labour shortage in plumbing, with a further 14% (19 of 131 question responses) shortage in gas fitting.⁴¹ Employment numbers for plumbers are sizable, and most states or territories currently experience an occupational skills shortage in the area (see Table 1 below).

³⁶ COAG Energy Council, Australia's National Hydrogen Strategy: Commonwealth of Australia, 2019. Pg 32

³⁷ Artibus Innovation (2020), *ISF2020 Consultations with CPC IRC Members*, Commercial in Confidence

³⁸ Labour Market Information Portal, Construction,
<http://lmip.gov.au/default.aspx?LMIP/GainInsights/IndustryInformation/Construction> accessed 13th Jan, 2020

³⁹ Edwards, R. (2020), Professional Communication from the Chair of H2 Networks to Artibus Innovation regarding the Hydrogen Project Proposal.

⁴⁰ COAG Energy Group, Council Hydrogen Working. Australia's National Hydrogen Strategy: Commonwealth of Australia, 2019. Pg. 83

⁴¹ Artibus Innovation (2020), *CPC ISF Survey Results: Round 2 Report*, Commercial in Confidence

Table 3. Plumbers in Australia: current and projected occupation data by ANZSCO code 3341

Plumbers Australia-Wide⁴²	
80,900 currently employed, May 2019	88,600 projected employment level, May 2024
State/Territory	2020 Occupational Skills Shortage⁴³
South Australia	No shortage
Victoria	Shortage
Australian Capital Territory	Shortage
New South Wales	Shortage
Northern Territory	Shortage
Queensland	Regional shortage
Tasmania	Shortage
Western Australia	No shortage

Existing hydrogen training projects

Work is already underway with the Gas Industry IRC and their SSO (Australian Industry Standards, AIS) to be undertaken in 2020/2021 to review and update current training packages to include hydrogen.⁴⁴ They are working with regulators to ensure that training updates will appropriately meet any emerging regulation or licensing requirements. Across the next 5 to 10 years, they further intend to develop new qualifications and units, establish pathways from training to employment, and provide clear information around hydrogen education and training.⁴⁵

The work of the Gas Industry IRC and AIS is likely to have some cross-sector relevance, which this project will seek to utilise. Amongst other things, this review will identify units for cross-sector use so as to ensure there is no duplication.

Risk levels and competencies are still being determined for domestic and commercial settings, and different skills and competencies will be required depending on how hydrogen is produced and used. Gasfitters using hydrogen technology are expected to be deemed low risk, and it is anticipated that their additional hydrogen training needs will be most appropriately met through an expansion of the gas competencies at Certificate III level, and as a skill

⁴² 2019 Occupational Projections – five years to May 2024 Labour Market Information Portal <http://lmip.gov.au/PortalFile.axd?FieldID=2787735&.xlsx> accessed 10 March, 2020

⁴³ Labour Economics Office South Australia Department of Jobs and Small Business,

Plumber Occupational Reports by State, <https://docs.employment.gov.au/collections/plumber-occupational-reports>, accessed 10th March, 2020

⁴⁴ Australian Industry Standards. Gas Skills Forecast 2019. Australian Industry Standards (2019).

https://www.australianindustrystandards.org.au/wp-content/uploads/2019/06/ueg_sf2019_final_pages_lowres.pdf.

⁴⁵ COAG Energy Council, Australia's National Hydrogen Strategy: Commonwealth of Australia, 2019. Pp 63

set for existing gasfitters.⁴⁶ It is anticipated that hydrogen competencies needed to undertake higher risk work will require the development of post trade qualifications.

The Australian Government has allocated \$16.1 million in funding to the Tasmanian Government for training development around hydrogen through the Energising Tasmania project to support the Battery of the Nation Initiative⁴⁷. The current funding round for Energising Tasmania is open for grant applications until 30 September 2020.

Summary of key evidence supporting the need for a hydrogen update

- Changes resulting from this new work will impact both current and incoming workers as it reflects broader changes already in motion across this, and many other, sectors.
- The introduction of hydrogen to the domestic gas supply means that all gas workers will require some form of upskilling and training to meet new environments and standards.
- Existing components do not currently incorporate a hydrogen addition and must be able to meet this need as it is introduced. There is a significant opportunity for cross sector development and potential to import units from other training packages, which will be articulated through the review process.
- It has been projected that the industry could provide 7,600 jobs in targeted global contexts by 2050.⁴⁸ Current employment for plumbing within the Construction Industry in Australia is 79,200.⁴⁹
- There are sizable enrolments across the three qualifications that cover gas within the CPC training package. Across these programs, CPC32413 - Certificate III in Plumbing, CPC32513 - Certificate III in Plumbing (Mechanical Services), and CPC32713 - Certificate III in Gas Fitting, there were 17,063 enrolments in 2018 alone.⁵⁰ (See table 2 below).
- Individual units also show sizable enrolments. For instance, CPCPGS3061A - Install and commission Type A gas appliances has had consistent growth in enrolments, with 5849 in 2018.⁵¹

Table 4. Plumbing qualifications: enrolments

⁴⁶ Edwards, R. (2020), Professional Communication from the Chair of H2 Networks to Artibus Innovation regarding the Hydrogen Project Proposal.

⁴⁷ http://www.federalfinancialrelations.gov.au/content/npa/skills/project-agreement/FPA_Energising_Tasmania.pdf

⁴⁸ COAG Energy Council, Australia's National Hydrogen Strategy: Commonwealth of Australia, 2019. Pp 63

⁴⁹ Labour Market Information Portal, Construction,
<http://lmip.gov.au/default.aspx?LMIP/GainInsights/IndustryInformation/Construction> accessed 13th Jan, 2020

⁵⁰ Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 16/01/2020
<http://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml>

⁵¹ 2015: 3887 enrolments; 2016: 4790 enrolments; 2017: 5309 enrolments; 2018: 5849 enrolments. Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 16/01/2020
<http://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml>

Years⁵²		2015	2016	2017	2018	Total
CPC32413 - Certificate III in Plumbing		11288	14373	16593	16754	59007
CPC32513 - Certificate III in Plumbing (Mechanical Services)		56	60	66	64	243
CPC32713 - Certificate III in Gas Fitting		192	225	305	250	979

Ministers' priorities addressed

Table 5. Ministers' priorities – hydrogen addition

Reform	Action to address reform
Obsolete and duplicate qualifications removed from the system.	This project does not propose to remove obsolete or duplicate qualifications from the system.
More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices.	This project will provide supporting advice on industry expectations for training delivery through the Companion Volume and Implementation Guide.
The training system better supports individuals to move more easily between related occupations.	This review and skill set development will better support plumbers moving into a blended, and eventual 100% hydrogen gas environment. This will allow greater mobility between related plumbing occupations.
Improved efficiency of the training system through units that can be owned and used by multiple industry sectors.	This project will locate units that can be of use across multiple industry sectors.
Foster greater recognition of skill sets.	This project may identify new skill sets needed for future development.

More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices. This project will provide supporting advice on industry expectations for training delivery through the Companion Volume and Implementation Guide.

Consultation plan

Consultation undertaken:

The consultation undertaken for this project proposal included:

⁵² Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 10/03/2020
<http://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml>

- 175 responses to the annual Industry Skills Forecast review, widely promoted by the SSO and industry to stakeholders through their networks
- individual consultations held with key industry stakeholders, including representatives from the Energising Tasmania project, the Master Plumbers and Mechanical Services Association of Australia, H2 Networks, and the Plumbing Industry Climate Action Centre
- one-on-one interviews with 14 members of the IRC.

Consultation plan:

The key engagement methods may include some or all of the following:

- Technical Advisory Groups (TAGs) to be established in accordance with internal policy and procedures to guide the subject matter expertise components of the work
- direct correspondence with regulators
- direct correspondence with State Training Authorities (STA)
- direct correspondence with IRC and key stakeholders
- industry associations and other stakeholders will be invited to capital city forums in all states and territories. A copy of forums material will be published on the web and an online forum will also be facilitated
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- industry survey on early and late draft material
- distribution of survey through TAG networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

This proposal is for the development of new components for the National Training Register so information regarding review history is not relevant.

The skill set would be housed within the Certificate III in Gas Fitting in the CPC training package.

It is anticipated that the following generic skills will be addressed in this proposed development work:

- Industry and Occupation Skills
- Adaptability and Learning Skills
- Analytical Skills
- Digital Skills
- Collaboration Skills
- Leadership and Management Skills
- Customer Service and Marketing Skills
- Stem Skills

- Business and Compliance Skills
- Sustainability and Natural Resource Management Skills.

Timeline and key dates:

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in October 2020 and:

- ensures the requirements set out across the training package policies are met
- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 6. Project timeline – hydrogen addition

Details	Date
Expected approval by the AISC of proposed work	October 2020
The Department of Education, Skills and Employment (DESE) commissioned activity order	November 2020
Engage Small and Medium Enterprises (SMEs) to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021
Review feedback and update training package components, as per TAG advice	March - May 2021
Validation draft put forward for consultation	June– July 2021
Finalise quality assurance	August 2021
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of project components

Training package(s) to be developed: - up to 8 new units of competency.

Project 2 – Heritage skills

Description

Heritage skills are needed to properly maintain and restore our built environment. There are numerous providers across the country offering various training to select markets, but a dedicated national training skill set is currently lacking. Developing a heritage trades skill set would provide essential skills to workers and make clear the area of specialisation.

Rationale

Australia needs a good supply of tradespeople skilled in heritage construction and the IRC has addressed this need in a number of recent projects. Developing a national training product in heritage skills will:

- provide a work-ready labour force to maintain and restore our built environment heritage
- protect the knowledge base of specialist skills needed to properly undertake heritage work
- support the growing interest in heritage tourism.⁵³

Concern has been expressed regarding the potential for skills loss in the area and the need to maintain the knowledge base.⁵⁴ While heritage skills are acknowledged as a niche area, the IRC agree with industry stakeholders that inclusion in the national training package is of benefit. Training needs should be met with, at minimum, the development of skill sets, with the possible development of a full qualification.

The Artibus Innovation 2020 Industry Skills Forecast Survey identified existing labour shortages within the construction sector, with 6% of respondents (8 of 131 question responses) having recently experienced a labour shortage in heritage restoration and maintenance.⁵⁵

Training demand

The IRC has received a number of requests to develop training around heritage skills, including the following:

- discussion with Centre for Heritage (March 2018) to develop a NSW heritage ‘white card’⁵⁶
- discussion about the development of a Heritage Induction unit with Fiona Buhler from NSW Government and Andrew Bryson from the NSW Apprentice Engagement Forum (November 2017)⁵⁷
- establishing the need for heritage preservation skills with the Tasmanian Construction and Industry Training Board (November 2019) and the potential of heritage-based tourism, and minimising the effect of the absence of regulation to compel heritage maintenance⁵⁸

⁵³ Purple Infinity. Heritage Construction Skills Update Report. TBCITB (2018), p. 5.

⁵⁴ Artibus Innovation, Construction IRC member interviews, Jan - Feb (2020).

⁵⁵ Artibus Innovation (2020), *CPC ISF Survey Results: Round 2 Report*, commercial in confidence

⁵⁶ Email Communication, David Morgan (CEO, Artibus Innovation) and Martin Farley (Centre for Heritage)

⁵⁷ Personal Communication, Artibus Innovation and Fiona Buhler (NSW Government) and Andrew Bryson (NSW Apprentice Engagement Forum), Nov 2017.

⁵⁸ Meeting, Artibus Research Team and Fred Lijauco (TBCITB), (2019).

- a request from the National Trust of South Australia to develop a national training product in Heritage Skills⁵⁹
- a request from the Victorian Painting and Decorating TAFE Teachers network to include Painting and Decorating into the proposed skill set.

Consultation with key stakeholders in the heritage sub-sector (all of who worked across regional, rural and remote areas) revealed unanimous support for the proposed project to develop national heritage skills training.

Stakeholders were asked if they would use the training to train or upskill staff and employ people with this training. All those who answered these questions affirmed that they would. Stakeholder responses to how the training should be packaged offered nuanced and considered views, identifying the importance of the relationship between specialist heritage skills training and existing trade qualifications. Skill sets were seen as potentially the best delivery mechanism. The Artibus Innovation Heritage Skills 2020: Stakeholder Consultation Report is available on request.

The identified need for the development of heritage skills has been further verified with a wide number of stakeholders through the 2018 survey of heritage skills in Australia. This study found that 87% of respondents saw current VET training in the area as insufficient.⁶⁰ Education and training was the overwhelming focus of respondents. A separate report has argued that the lack of post-trade training opportunities is a significant factor in shortages in heritage skills, as is the lack of a dedicated heritage qualification.⁶¹

Existing training

Heritage units have been updated or added in qualifications for roof plumbers, plasterers and carpenters. The Certificate III in Bricklaying and Blocklaying and the Certificate III in Stonemasonry each include a comprehensive stream encompassing heritage, conservation and restoration. Industry associations, heritage organisations, and governments have identified the need for additional heritage skills training. At present, the following units are available within the CPC and CPP training packages.

Table 7. Enrolments in existing heritage units, 2015-2018

Year⁶²	2015	2016	2017	2018	total
CPCCBC4037A - Prepare drawings for heritage works	69	169	46	49	331
CPCCBC4039A - Undertake the heritage restoration process	12	0	0	0	12
CPPDSM5007A - Coordinate construction or renovation of facilities	72	73	33	45	218

The following units were approved for endorsement by the AISC at its February 2020 meeting:

- CPCCST4001 Prepare to undertake the heritage restoration process

⁵⁹ Personal Communication, David Morgan (CEO, Artibus Innovation) and Marie Paterson (CITB SA)

⁶⁰ Heritage Skills Initiative. Heritage Skills Sector Analysis Survey. International Specialised Skills Initiative (2018).

⁶¹ Havaliah, Tim. Building Solid Foundations: Career Pathways in Traditional Trades in Australia. International Specialised Skills Fellowship (2019).

⁶² Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 10/03/2020
<http://vocstats.ncver.edu.au/webapi/jsf/tableView/tableView.xhtml>

- CPCCST4002 Undertake the heritage restoration process
- CPCCST4004 Initiate the heritage works process
- CPCCST4005 Prepare drawings for heritage works
- CPCCST4006 Prepare report for heritage restoration work
- CPCCST3024 Apply conservation principles and practices to heritage stonework
- CPCCST3021 Restore stonework.

The Local Government Training Package offers the Unit LGAPLEM612B Protect heritage and cultural assets, which may be of use to construction workers in recognising and assessing heritage and cultural elements of the built environment. Likewise, the units MSFDG5003 Conserve heritage leadlight and stained glass, MSFDG5004 Install heritage leadlight and stained glass, and MSFDG5002 Remove heritage leadlight and stained glass may be of relevance to workers in heritage construction.

Ministers' priorities addressed

Table 8. Minister' priorities – heritage skills

Reform	Action to address reform
Obsolete and duplicate qualifications removed from the system.	This project does not propose to remove obsolete or duplicate qualifications from the system.
More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices.	This project will provide supporting advice on industry expectations for training delivery through the Companion Volume and Implementation Guide.
The training system better supports individuals to move more easily between related occupations.	This skill set will better support specialised training in heritage skills. This will allow greater mobility between different projects with heritage components and facilitate greater employer confidence of incoming workers.
Improved efficiency of the training system through units that can be owned and used by multiple industry sectors.	This project will locate units that can be of use across multiple industry sectors.
Foster greater recognition of skill sets.	In providing a specialist skill set in Heritage Skills where none currently exist, this project will foster a greater recognition of skill sets.

Consultation plan

Consultation undertaken:

The consultation undertaken for this project proposal included:

- 175 responses to the annual Industry Skills Forecast review, widely promoted by the SSO and industry to stakeholders through their networks
- Individual consultations held with six key industry stakeholders

- one-on-one interviews with 14 members of the IRC.

Table 9. SSO heritage industry consultations, 2020

Name	Entity Name	Sector	State	Rural/Regional/Remote (RRR)	Activity
Owen Smith	TasTAFE	RTO	TAS	All of Tasmania. Also deliver training to other parts of Aust, including remote areas (WA/NT) for mining companies, etc.	
Greg Owens	Longford Academy	Not for Profit specialist training outside the National Training Package	TAS	All of Tasmania	Ongoing engagement and validation with industry and stakeholders
Keith McAllister	Heritage Stone Restoration Australia	Industry	SA	All parts of Australia	Collection of industry intelligence
Andrew Bryson	NSW Construction Industry Training Advisory Board	Industry	NSW	All of NSW	Promotion of the VET system
Fred Lijauco	Tasmanian Building and Construction Industry Training Board	Industry	TAS	All of Tasmania	Cultivating and maintaining networks and partnerships with industry including engagement in rural and regional areas
Trisch Baff	Flexible Construction Training & Assessment	RTO	SA	All areas of SA	

Consultation plan:

The key engagement methods may include some or all of the following:

- TAGs to be established in accordance with internal policy and procedures to guide the subject matter expertise components of the work
- direct correspondence with regulators
- direct correspondence with STAs
- direct correspondence with IRC and key stakeholders

- industry associations and other stakeholders will be invited to capital city forums in all states and territories. A copy of forums material will be published on the web and an online forum will also be facilitated
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- industry survey on early and late draft material
- distribution of survey through TAG networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

The units of competency being proposed for inclusion in a newly developed skills set were submitted for endorsement within CPC Release 5.0. The implementation date is to be confirmed.

The relevant generic skills are embedded in the proposed units of competency.

The proposed units are within qualifications that are funded under the apprenticeship model and it is envisaged that this skill set would be employed under this model.

Timeline and key dates

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in June 2020 and:

- ensures the requirements set out across the training package policies are met
- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 10. Project timeline – heritage skills

Details	Date
Expected approval by the AISC of proposed work	October 2020
The DESE commissioned activity order	November 2020
Engage SMEs to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021
Review feedback and update training package components, as per TAG advice	March - May 2021
Validation draft put forward for consultation	June – July 2021
Finalise quality assurance	August 2021

Details	Date
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of components

- 1 new skill set to be developed
- Including 6 existing units of competency.



Project 3 – Construction hazards

Description

There are significant workplace hazards in the construction industry. Many of these are addressed in existing training and through workplace inductions. There are several hazards that require safety awareness training because they present acute, ongoing, and severe threats to the health and safety of current and future construction workers. The National Training Package requires suitable units to raise awareness of material and mental health hazards among both workers entering the industry and upskilling the existing workforce.

The IRC proposes a project to develop units of competency around hazard safety awareness units in these areas:

1. Asbestos safety awareness
2. Silicosis safety awareness
3. Mental health safety awareness.

Rationale

The rationale for the project is the protection of the health and safety of current and future construction workers from known, ongoing and severe threats to their life and livelihoods.

Employer and industry need

Exposure to hazardous materials continues to pose unacceptable health risks to workers in the construction industry. This is despite efforts by Safe Work regulators and industry representatives to raise awareness of exposure risks, and to ban, control and licence the handling and disposal of material hazards. Exposure to hazardous materials continues due to their continued presence in the built environment and because the workers are likely to encounter or disturb them in the course of their professional work. For example, asbestos is difficult to avoid even though it has been banned since 2003. This is because asbestos containing materials remain in many buildings and structures built before 1990, including in over 3,000 building products. There is insufficient awareness of other dust diseases, as evidenced by the recent trend of cases of accelerated silicosis.

There is similar increased recognition within the construction industry that poor mental health is one of the most significant, hidden hazards faced by workers, particularly for men. Suicide rates are elevated among construction workers compared to workers in other industries. Between 2011 and 2013, the suicide rate in construction was 1.7 times that of other male workers.⁶³ In some jurisdictions it can be much higher. For example, the 2005 suicide mortality rate in the Tasmanian building and construction industry was over 5 times that of men in the general population (129 per 100,000, versus 25 per 100,000). The outcome of several industry and training programs, such as MATES in Construction, Bluehats Suicide Prevention initiative and OzHelp, suggest the risks associated with poor mental health among workers and apprentices in the construction industry can be substantially reduced with training. For example, in 2010, OzHelp Tasmania began providing training to 80% of Tasmanian building and construction apprentices enrolled at TasTAFE through their Skills for Life program, contributing to a reduction in suicides, suicidal ideation and attempts among this cohort.

While there are existing workplace programs, with the exception of the OzHelp Tasmania pilot program described above, there are no mental health units offered to workers as they train to enter the industry. Existing units within other training packages are nursing or mental health sector setting specific and not suitable for importing into the

⁶³ Milner, A. and Law, P. (2017), Mental Health in the Construction Industry, MATES in Construction, accessed 29/10/19 at <http://micaus.bpndw46jvgfcmdu.maxcdn-edge.com/wp-content/uploads/2015/11/MIC-QLD-construction-industry-roundtable-report.pdf>

construction industry. It should be noted that this proposal has strong support from regulators. See Appendix 4 for letters of support.

Training demand: regulatory requirements

Safe Work Australia's (2019) recent guide on work-related psychological health and safety identifies that employers are responsible for protecting workers from mental health risks at work. It states that persons conducting a business or undertaking:

must ensure, so far as reasonably practicable, [that] workers are provided with information, training, instruction and supervision to protect them from risks to their psychological health and safety at work.⁶⁴

As noted previously, there is broad support for mental health and other training within the construction industry and safe work regulators. However, changing employment conditions, such as casual and labour hire practices,⁶⁵ mean that an employer cannot be assured that workers have received such training.

The Australian Government Dust Disease Taskforce was established in July 2019 and has released interim recommendations.⁶⁶ Prompted by a trend of new cases of accelerated silicosis, the Taskforce seeks to understand occupational dust disease across all jurisdictions. The early recommendations largely focus on ways to directly address the health implications, although it should be noted that an immediate targeted education (and communication) campaign has been flagged for immediate implementation. While this recommendation is aimed at general information, it supports the need for broader, more sustained education around material hazards within a workplace context.

The IRC through its SSO has also received direct requests to develop national training products for dust, silicosis and asbestos awareness and identification. The SSO met with the Asbestos Safety and Eradication Agency, who requested further training to improve asbestos awareness and effective and safe management, removal and disposal of asbestos and other preventable dust diseases. SafeWork NSW (October 2019) also requested advice on available silicosis training in this area and proposals to address this need through the CPC training package. SafeWork NSW has suggested the inclusion of silica training in the CPC training package, including recommending elements and performance criteria on:

- identifying products containing crystalline silica (CS)
- identifying CS in common building products
- identifying health hazards from exposure to respirable crystalline silica (RCS)
- identifying tasks generating airborne RCS on site
- knowledge and skills to use control methods on power tools and equipment
- knowledge use and maintenance of respirators for RCS.

Existing construction hazards training

National Training Package units:

⁶⁴ Safe Work Australia (2019), Work-related psychological health and safety: a systemic approach to meeting your duties, accessed 29/10/19 at https://www.safeworkaustralia.gov.au/system/files/documents/1901/work-related_psychological_health_and_safety_guide.pdf

⁶⁵ ABC News (2019), 'Suicide Prevention training push to help construction workers save lives', accessed 30/10/19 at <https://www.abc.net.au/news/2019-10-29/suicide-prevention-scheme-helping-construction-workers/11649328?pfmredir=sm>

⁶⁶ National Dust Disease Taskforce. Interim Advice to Minister for Health. (2019).

- five asbestos units
- one accredited silicosis unit of competency
- no construction-industry specific mental health units suitable to meet the industry need for:
 - mental health awareness for construction workers
 - mental health first aid training
 - mental health awareness for construction managers.

Existing units within other training packages are nursing or mental health sector setting specific and not suitable for importing into the construction industry.

Asbestos and silicosis: increasing enrolments and industry demand

Asbestos and silicosis enrolments and accredited courses suggest growing industry and learner demand for suitable skills. There was a 30.6% increase in total enrolments across all asbestos units between 2015 and 2018, and considerable unit enrolment increases in New South Wales and Victoria:

- in New South Wales, 2018 enrolments in the CPCCDE3014A - Remove non-friable asbestos unit were up 62.6% since 2015. 2018 enrolments in CPCCDE3015A - Remove friable asbestos were up 39%
- in Victoria, 2018 enrolments in the CPCCDE3014A - Remove non-friable asbestos unit were up 79% since 2015. 2018 enrolments in CPCCDE3015A - Remove friable asbestos were up 44.6%.

Overall enrolments in asbestos units are outlined in the following table.

Table 11. CPC asbestos unit enrolments, 2015-2018⁶⁷

Asbestos Unit Enrolment	2015	2016	2017	2018
CPCCBC5014A - Conduct asbestos assessment associated with removal	231	218	264	227
CPCCPD3031A - Implement safe lead paint and asbestos work practices in the painting industry	2090	2210	2183	2167
CPCCDE3015A - Remove friable asbestos	1556	1687	1452	2141
CPCCDE3014A - Remove non-friable asbestos	6912	6910	6899	9051
CPCCBC4051A - Supervise asbestos removal	1552	1909	1935	2525
Total	12339	12935	12732	16112

⁶⁷ Source: VOCSTATS <<http://www.ncver.edu.au/resources/vocstats.html>>, extracted on 10/03/2020

The source of the data is National VET Provider Collection, accessed through NCVER's VocStats, in the time series 2014-2017. The data were originally collected by registered training organisations and state training authorities around Australia. The National Centre for Vocational Education Research (NCVER) is not responsible for the correct extraction, analysis or interpretation of the data presented herein.⁶⁷ Please note, in this analysis the category 'state/territory' is defined according to Data Submitter Attributes.

Outside the National Training Package there are also four accredited asbestos courses and one silicosis course that are current and with RTOs approved to deliver them. These are:

1. 10675NAT Course in Asbestos Awareness – 13 RTOs are approved to deliver this course
2. 10279NAT Course in Identification and Awareness of Asbestos Containing Materials – a single RTO is approved to deliver this course
3. 10162NAT Course in Safe Access to Asbestos Affected Areas – a single RTO is approved to deliver this course
4. 10852NAT Course in Working Safely with Asbestos Containing Materials – no RTOs are approved to deliver this course.⁶⁸ However the ACT STA noted that this course recently replaced 10559NAT and is likely to soon have RTOs registering to deliver it. Canberra Institute of Technology will be one of those RTOs
5. NAT10830001 Prevent crystalline silica exposure – a single RTO is approved to deliver this course.



Impact on existing jobs and workers

It is expected that the introduction of construction hazards skill sets will not only upskill current and future workers, but also preventing premature exit from the industry by workers due to poor mental and physical health. This is important because the construction industry needs to ensure the continuity of its labour force, particularly in the context of an ageing workforce in multiple construction occupations.⁶⁹

⁶⁸ The currency period of this accredited course commenced on 3/03/2020.

⁶⁹ Training and Skills Commission (2018), [Construction: South Australia's Industry Priority Qualifications 2018](#), p.11

Ministers' priorities addressed

Table 12. Ministers' priorities – construction hazards

Reform	Action to address reform
Obsolete and duplicate qualifications removed from the system.	This project does not propose to remove obsolete or duplicate qualifications from the system.
More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices.	This project will provide supporting advice on industry expectations for training delivery through the Companion Volume Implementation Guide.
The training system better supports individuals to move more easily between related occupations.	These units of competency will provide workers with important training in construction hazards, and provide employers surety that workers are aware of, and can appropriately respond to, physical and mental hazards within the workplace. This will allow for greater mobility between related occupations.
Improved efficiency of the training system through units that can be owned and used by multiple industry sectors.	This project will develop units of competency that may be of use across multiple industry sectors.
Foster greater recognition of skill sets.	This project may result in skill sets regarding Construction Hazards. If this occurs this project will foster a greater recognition of skill sets.

Consultation plan

Consultation undertaken:

The consultation undertaken for this project proposal included:

- 175 responses to the annual Industry Skills Forecast review, widely promoted by the SSO and industry to stakeholders through their networks
- individual consultations held with key industry stakeholders
- regulators from all states and territories informed of proposal and invited to provide input. Support has been explicitly given from SafeWork NSW and WorkSafe VIC, as well as the Queensland Government's Office of Industrial Relations
- one-on-one interviews with 14 members of the IRC.

Consultation plan:

The key engagement methods may include some or all of the following:

- TAGs to be established in accordance with internal policy and procedures to guide the subject matter expertise components of the work
- direct correspondence with regulators

- direct correspondence with STAs
- direct correspondence with IRC and key stakeholders
- industry associations and other stakeholders will be invited to capital city forums in all states and territories. A copy of forums material will be published on the web and an online forum will also be facilitated
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- industry survey on early and late draft material
- distribution of survey through TAG networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

This proposal is for the development of new units of competency, so no review or funding information is applicable.

All generic skills would be considered in the context of developing the units of competency.

The units would likely be housed in the Certificate II in Construction qualification with the individual units available within the elective bank. The mental health unit(s) would, of course, be available for use as an elective across all trade qualifications, offering a focus on suicide prevention, accessing help, personal well-being and support of others.

Timelines and key dates

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in October 2020 and:

- ensures the requirements set out across the training package policies are met
- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 13. Project timeline – construction hazards

Details	Date
Expected approval by the AISC of proposed work	October 2020
The DESE commissioned activity order	November 2020
Engage SMEs to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021

Details	Date
Review feedback and update training package components, as per TAG advice	March- May 2021
Validation draft put forward for consultation	June – July 2021
Finalise quality assurance	August 2021
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of project components

- Develop between 3-6 new units of competency.

Project 4 – Precast concrete installation

Description

Precast concrete construction is an increasingly common aspect of construction in Australia, and this project proposes to develop a precast installation qualification so as to properly meet employer requirements, market needs, and national standards.

Rationale

Recent times have seen an increase in the use of precast concrete in construction, with demand globally predicted to increase at 6.5% per year, at an estimated \$185.35 billion by 2023.⁷⁰ However, this increase has been marked by a number of incidents of improper installation, such as concrete panels falling from heights in Canberra and Queensland, which in some cases has resulted in deaths.⁷¹ Due to its size and weight, precast concrete has particular concerns around proper technique in temporary support and lifting during installation, for instance.⁷² While precast concrete installation is a highly specialist form of prefabrication, it is anticipated that training developed here will lay the groundwork for future training developments for prefabrication installation more generally.

Key points

- This project will provide units of competency in an area of construction installation where there is currently only limited coverage. It will support both new students and upskilling current workers.
- Employer need has been indicated through the industry association the National Precast Concrete Association of Australia (NPCAA), and a further survey of members needs is currently underway. The responses collected already indicate that all respondents (28) would like national training in the area.
- There is no current national training directly applicable to the area, so enrolment figures are not available.
- The Artibus survey of the NPCAA found 95% (21 of 22) of employers wanting to train or upskill current workers with a qualification like this, and 86% indicating a willingness to employ workers with this training. As at 4 March 2020, Seek.com shows 311 precast jobs available in Australia.
- Construction Training International offer a course in Precast Concrete Panel Erection,⁷³ Victoria offers the 22497VIC Course in Concrete Precast Rectification.⁷⁴

⁷⁰ Wadlow, Tom. "Precast Construction Industry Set to Pass \$185bn Value Mark by 2023." Construction Global (<https://www.constructionglobal.com/equipment-and-it/precast-construction-industry-set-pass-185bn-value-mark-2023>), 31 May 2018

⁷¹ Roberts, Lachlan. "Worksafe Investigating after Concrete Panel Falls from Braddon Building Site." RiotACT (<https://theriotact.com/worksafe-investigating-after-concrete-panel-falls-from-braddon-building-site/284764>), 30 January 2019. WorkCover Queensland. "Precast Panel Wall Failure." <https://www.worksafe.qld.gov.au/injury-prevention-safety/alerts/whsq/2018/precast-wall-panel-failure>, 6 June 2018. Bavas, Josh. "Eagle Farm Construction Deaths: Two Men Fatally Crushed in Concrete Panel Collapse." ABC News (<https://www.abc.net.au/news/2016-10-06/two-people-crushed-by-collapsed-concrete-panels/7910470>), 7 October 2016. "Huge Fine over Wa Concrete Panels Deaths." Fully Loaded (<https://www.fullyloaded.com.au/industry-news/1805/huge-fine-over-wa-concrete-panels-deaths>), 18 May 2018.

⁷² SafeWork Australia. Guide to Managing Risk in Construction: Prefabricated Concrete. (September 2019). 9.

⁷³ <https://constructiontraining.com.au/courses/precast.html>

⁷⁴<https://www.education.vic.gov.au/Documents/training/providers/rto/curr22497VICConcretePrecastRectification.pdf>

Training needs

While there is current training available in tilt up construction – where the concrete is cast on site adjacent to the destination point⁷⁵ and precast manufacture⁷⁶ – there is currently no national training available in precast concrete construction, where components are developed off site, then transported and installed on site.

Requests for qualification development

The National Precast Association of Australia (NPCAA) have communicated a desire for national training in precast installation, which is being further explored across the industry. 28 respondents to an Artibus innovation survey of the NPCAA would like to see a national qualification in precast installation developed. Respondents to this survey were predominantly comprised of employers (82%, 23 of 28), with RTOs (11%, 3 of 28), representative associations (4%, 1 of 28), and other (14%, 4 of 28) comprising the remainder.

The NPCAA distributed the opportunity to participate in the survey to over 1500 parties across the sector.

This survey noted a number of areas requiring training, with particular areas of need including: Unloading, Lifting, and Handling (89%, 25 of 28); Erection (86%, 24 of 28); Precast-specific Cranes and Rigging (82%, 23 of 28).

Ministers' priorities addressed

Table 14. Ministers' priorities – precast concrete installation

Reform	Action to address reform
Obsolete and duplicate qualifications removed from the system.	This project does not propose removal of obsolete and superfluous qualifications from the National Register.
More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices.	The project will ensure information is made available to training providers about training for working with precast concrete products.
The training system better supports individuals to move more easily between related occupations.	This training will support movement between occupations within the construction industry.
Improved efficiency of the training system through units that can be owned and used by multiple industry sectors.	It is anticipated that training package material developed as a part of this project will be relevant to multiple sectors within the construction industry and may also be of value to the manufacturing and civil construction sectors.
Foster greater recognition of skill sets.	The project may propose the development of one or more skill sets for the CPC training package.

⁷⁵ Current units on training.gov.au are CPCCCO3048- Construct tilt panels on site; CPCCCM1016- Identify requirements for safe tilt-up work; CPCCRI3015A- Perform advanced tilt-up slab erection; CPCCBC4022A- Supervise tilt-up work

⁷⁶ See the PMC training package for Precast Concrete Manufacture

Consultation plan

Consultation undertaken:

The consultation undertaken for this project included:

- individual consultations held with key industry stakeholders
- discussions with the NPCAA
- a survey distributed amongst members of the NPCAA, the results of which are available in the Artibus Innovation 2020 Industry Skills Forecast Survey Report
- agenda item at IRC meeting, February 2020.

Consultation plan:

The key engagement methods may include some or all of the following:

- TAGs will be established in accordance with internal policy and procedures to guide the subject matter expertise components of the work
- direct correspondence with regulators
- direct correspondence with STAs
- direct correspondence with IRC and key stakeholders
- industry associations and other stakeholders will be invited to capital city forums in all states and territories. A copy of forums material will be published on the web and an online forum will also be facilitated
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- industry survey on early and late draft material
- distribution of survey through TAG networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

This proposal is for new training material so review information does not apply.

All generic skills would be considered during CPC training package development.

At present there is no funding for training in this field.

The Forestry training package has units of competency for installation of prefabricated timber components.

Timeline and key dates

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in October 2020 and:

- ensures the requirements set out across the training package policies are met

- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 15. Project timeline – precast concrete installation

Details	Date
Expected approval by the AISC of proposed work	October 2020
The DESE commissioned activity order	November 2020
Engage SMEs to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021
Review feedback and update training package components, as per TAG advice	March - May 2021
Validation draft put forward for consultation	June – July 2021
Finalise quality assurance	August 2021
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of project components

This proposal is for one qualification at AQF Level 3 - Certificate III in Precast Concrete Installation.

The project to develop the new qualification will consider employing cross sector units, generic skills, existing units from the Construction, Manufacturing and Transport training packages as well as, indicatively, the development of eight new units of competency:

- CPCPRE3001 Brace and prop precast concrete components
- CPCPRE3002 Remove bracing and propping from precast concrete constructions
- CPCPRE3003 Level and secure precast concrete components
- CPCPRE3004 Grout load bearing precast concrete components
- CPCPRE3005 Grout non-load bearing precast concrete components
- CPCPRE3006 Caulk precast concrete components
- CPCPRE3007 Repair precast concrete components
- CPCPRE4001 Inspect precast concrete erections.



Project 5 – Water Efficiency Labelling and Standards

Description

The WELS scheme is Australia's national urban water saving scheme. WELS reduces demand for high quality potable water by informing consumers about water efficiency at the point of supply or sale. The WELS scheme has been shown to be highly successful in reducing potable water demand, and utility costs for consumers. Under certain conditions, plumbers and builders are considered suppliers under the scheme, with legal obligations. However, many are unaware of their legal obligations, despite heavy infringement penalties.⁷⁷

Current proposal

The Department of Agriculture, Water and the Environment is the regulator of the WELS scheme. The Department proposes that the:

- AISC approve the IRC establishing a working group to identify the implications of the WELS scheme for the CPC training package
- working group identify and update the relevant knowledge evidence within units across the CPC training package.

Rationale

Estimates show that using water efficient products could save Australians more than \$2 billion by 2030. That's an average saving of \$175 per household each year.⁷⁸

In 2018, savings from the WELS scheme had reached 122 gigalitres (122 billion litres) per year of potable water. This is enough water to fill over 47,000 Olympic swimming pools. Because less water is being heated and pumped, the scheme is reducing greenhouse gas emissions by over 11 million tonnes of carbon dioxide equivalent annually. Households are now saving around \$1.1 billion in utility bills (water, electricity and gas). By 2036, WELS is expected to reduce domestic water use by 230 billion litres each year and save households over \$2.6 billion in utility bills.

The WELS scheme has implications for the CPC training package. It requires specified products (e.g. taps, showers, flow controllers, toilets and urinals) to be registered and labelled with their water efficiency in accordance with the standard set under the [Water Efficiency Labelling and Standards Act 2005](#) (WELS Act). This obligation extends to all suppliers of WELS products.

Plumbers and builders are considered suppliers under the WELS Act if they:

- include regulated products as a fixture or fitting in a new building or unit offered for sale
- include sales of regulated products as part of tendering or quoting in building, construction, refurbishment or renovation projects
- sell regulated products as part of installation or repair work.

⁷⁷ Penalties for contraventions of the WELS Act can include infringement notices and/or prosecution. A body corporate may be liable to an infringement notice penalty amount of \$6,300 per contravention (product) and a court imposed penalty of up to \$63,000 for each contravention. For an individual, infringement notices are \$1,260 per contravention or a court imposed penalty of \$12,600 per contravention.

⁷⁸ 65% of these savings are from reduced electricity and gas costs from avoided water heating, 35% of these savings are from reduced water bills.

Before a product is supplied, suppliers are responsible for making sure they have met all [product label and display requirements](#). This includes checking the registration status of products. Day to day administration of the scheme is undertaken by the WELS Regulator on behalf of all Australian states and territories.

Peak plumbing industry groups and WELS industry stakeholders, including the Plumbing Products Industry Group, Australian Industry Group, Master Plumbers Association and the Plumbing Industry Climate Action Centre support the need for formal training for plumbers about their obligations under the WELS Act.

The proposed update to the knowledge evidence in related units of competency would set out how plumbers can meet their legal obligations under the WELS Act in practice. In addition, the knowledge evidence would also inform plumbers about where or how they can confirm that products are registered before supplying and installing.

Training demand: update and upskill plumbing qualifications

The demand for training is:

- to update the knowledge evidence across the plumbing and other construction qualifications meet workers' legislated obligations as suppliers
- to upskill the current plumbing labour force of 79,200⁷⁹ plumbers.

The Department of Agriculture, Water and the Environment has proposed that the National Training Package be updated to include knowledge on WELS Act obligations. This is considered a high priority and would equip the industry to meet their legal obligations and to achieve the objectives of the WELS scheme, as set out in section 3 of the WELS Act, below:

- conserve water supplies by reducing water consumption
- provide information for purchasers of water-use and water-saving products
- promote the adoption of efficient and effective water-use and water-saving technologies.

WELS achieves these objectives by ensuring common domestic water-using products are registered and labelled with accurate, easily understood water use information. The reduction in domestic water use reduces costs to consumers, leaves more water available for other uses such as agriculture or manufacturing, and allows communities to reduce or postpone investment in water infrastructure such as dams or desalination plants.

A submission by the Building Products Innovation Council to The Senate Inquiry into Non-Conforming Building Products⁸⁰ outlined the following:

The WELS Regulator has noted the increased supply of non-conforming showers into the Australian market from overseas manufacturers. These instances of non-conformance include showers supplied without flow controller, with substituted flow controller or flow controllers supplied separately. These products use more water than their WELS label indicates, therefore consumers are being provided with fraudulent information.

Non-conforming/non-compliant products and non-compliant installations represent a long-term risk to the objectives of the WELS Act. Mass scale installations of inefficient showerheads, taps or toilets, such as

⁷⁹ Labour Market Information Portal, Construction, <http://lmip.gov.au/default.aspx?LMIP/GainInsights/IndustryInformation/Construction> accessed 13th Jan, 2020

⁸⁰ The submission was subsequently referenced in the December 2018 report, The Senate Economics Reference Committee – Non-conforming products: the need for a coherent and robust regulatory regime (refer https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Non-conforming45th/Report)

in multi-unit developments could have significant impacts on urban water security. At the household or unit level, the additional water usage or electricity and gas usage required to heat water may not be able to be identified by the householder, meaning that the role of plumbers in ensuring that products comply is even more critical.

Impact on existing jobs and qualifications

Employment numbers for plumbers are sizable, and most states or territories currently experience an occupational skills shortage in the area (see Table 1 below).

Table 16. Plumbers in Australia: current and projected occupation data by ANZSCO code 3341

Plumbers Australia-Wide⁸¹	80,900 currently employed, May 2019	88,600 projected employment level, May 2024
	State/Territory	2020 Occupational Skills Shortage ⁸²
	South Australia	No shortage
	Victoria	Shortage
	Australian Capital Territory	Shortage
	New South Wales	Shortage
	Northern Territory	Shortage
	Queensland	Regional shortage
	Tasmania	Shortage
	Western Australia	No shortage

Summary of key evidence supporting the need for the WELS proposal

- The WELS scheme impacts both current and incoming workers, with plumbers and builders considered suppliers under the WELS Act under certain conditions. Before a product is supplied, suppliers are responsible for making sure they have met all product label and display requirements. This includes checking the registration status of products.
- All plumbers and builders require some form of training to meet the WELS standards.
- Existing training components require the updating of skills and knowledge to incorporate the WELS Act.

⁸¹ 2019 Occupational Projections – five years to May 2024 Labour Market Information Portal <http://lmip.gov.au/PortalFile.axd?FieldID=2787735&.xlsx> accessed 10 March, 2020

⁸² Labour Economics Office South Australia Department of Jobs and Small Business,

Plumber Occupational Reports by State, <https://docs.employment.gov.au/collections/plumber-occupational-reports>, accessed 10th March, 2020

- Upskilling may also be required for the 79,200 plumbers currently employed within the Construction Industry in Australia.⁸³

Ministers' priorities addressed

Table 17. Ministers' priorities – WELS

Reform	Action to address reform
Remove obsolete, superfluous and duplicative qualifications and units from the system.	This project does not propose to remove obsolete or duplicate qualifications or units from the system.
Include information about industry's expectations of training delivery (i.e. duration of training, mode of delivery and learner characteristics).	This project will provide supporting advice on industry expectations for training delivery through the Companion Volume and Implementation Guide.
Improve qualification design to enable individuals to upskill and move easily from one related occupation to another.	N/A
Improve the efficiency of the training system through the creation of units of competence that can be owned and used by multiple industry sectors.	<p>Updating the knowledge evidence of the relevant units of competency will better support plumbers and builders to meet the legislated requirements of the national urban water saving WELS scheme.</p> <p>The updated units of competency:</p> <ul style="list-style-type: none"> • can be used across multiple industry sectors (e.g. civil construction). • support compliance with the WELS scheme • will undergo a minor release, minimising the impact on training and assessment.
Foster greater recognition of skill sets.	This project may identify new skill sets needed for upskilling current workers in the construction industry.

Consultation plan

Consultation undertaken:

Peak plumbing industry groups and WELS industry stakeholders were consulted in the development of this proposal and provide their support to this proposal:

- WELS (Industry and co-regulator) Advisory Group
- Plumbing Products Industry Group
- Australian Industry Group

⁸³ Labour Market Information Portal, Construction, <http://lmip.gov.au/default.aspx?LMIP/GainInsights/IndustryInformation/Construction> accessed 13th Jan, 2020

- Master Plumbers Association
- Plumbing Industry Climate Action Centre.

Consultation plan

The key engagement methods may include some or all of the following:

- working group to be established in accordance with [IRC Operating Framework](#) and other relevant internal policy and procedures
- direct correspondence with regulators
- direct correspondence with STAs
- direct correspondence with IRC and key stakeholders
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- distribution of survey through working group networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

This proposal builds on the 3-year (2017-20) review of the Plumbing and Fire Services Project, which reviewed 13 qualifications and over 160 units of competency.

This project is expected to be considered for implementation by the AISC in August 2020.

The [Plumbing and Fire Services Case for Endorsement](#) provides further details on the review, including updated enrolment and completion data.

It is anticipated that the following generic skills will be addressed in this proposed development work:

- Industry and Occupation Skills
- Adaptability and Learning Skills
- Analytical Skills
- Digital Skills
- Collaboration Skills
- Leadership and Management Skills
- Customer Service and Marketing Skills
- STEM Skills
- Business and Compliance Skills
- Sustainability and Natural Resource Management Skills.

Timeline and key dates

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in October 2020 and:

- ensures the requirements set out across the training package policies are met
- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 18. Project timeline – WELS

Details	Date
Expected approval by the AISC of proposed work	October 2020
The DESE commissioned activity order	November 2020
Engage SMEs to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021
Review feedback and update training package components, as per TAG advice	–March - May 2021
Validation draft put forward for consultation	June - July 2021
Finalise quality assurance	August 2021
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of project components

Approval is sought to work with the IRC to establish a working group to update the knowledge and evidence required across existing units of competency in National Register. Updated units will be released as a Minor Release.

Units of competency to be reviewed and updated to be advised by the working group.

Project 6 – Work arising from previous activity

Description

Previous activities have identified changes needed that fall outside the scope of the approved activity orders. Industry participants have directly requested unit and skill development to meet industry needs. Projects in the following areas have been identified:

- Cured in Place Pipe, a unit of competency for Certificate III in Plumbing
- Certificate II in Plumbing – plumbing pathway qualification
- Construction: exploration of steel units of competency
- Certificate III in Swimming Pool and Spa Building
- Rope Work: units of competency appropriate for industry and workers.

Rationale

A common concern expressed by industry and employers is the need to make small or modular changes to the training package, such as updating units and technology. The IRC proposes to demonstrate its responsiveness to industry and stakeholder needs through small projects. This practice will facilitate and maintain a high standard training package:

1. Plumbing

Increasingly plumbers are required to repair damaged drainage systems without excavation. This is particularly prevalent in urban renewal projects where older pipe systems have deteriorated. The process for this work is known as 'cured in place'. During the redevelopment of the Certificate III in Plumbing this work was included in the elective bank through the inclusion of a unit of competency from the resource and infrastructure industry (RII) training package. This unit is not entirely applicable for the work of plumbers since its scope and scale is designed for civil construction. The development of a new unit, specifically for plumbers was noted as being out of scope of the activity order and so has been brought forward into the Industry Skills Forecast as an item requiring attention in the future.

Pathways into plumbing are provided in Victoria and Western Australia through state accredited courses – both of which expire this year. During the redeveloping of the plumbing qualifications advisory group members recommended the development of a national pathway qualification to replace the accredited courses and provide consistency across Australia.

2. Construction

Steel construction units of competency

During the update of the Certificate III in Carpentry the IRC was provided with significant input from BlueScope Steel – a major supplier to the construction industry. Many of the units of competency in carpentry were amended to provide for a choice of construction material – timber or steel. This catered for geographic differences in the trade (e.g. timber is not used in the north of Australia) and changes to construction methods where steel is increasingly used for framing in both commercial and residential construction. In South Australia, BlueScope Steel have been piloting a school-based pathway program in steel framing and have written to the IRC to request it considers the inclusion of steel construction units of competency. This request was received too

late in the process to incorporate in the activity order at the time. The IRC has sought advice on the industrial coverage of this area before committing to further work.

3. Swimming Pool Building

Certificate III in Swimming Pool and Spa Building

During the redevelopment of the Certificate IV in Swimming Pool and Spa Building feedback from employers noted the significant challenges in recruiting new entrants into this niche sector. The Certificate IV has dealt with the priority issue of increased construction supervision and project management skills but there remains a gap and strong desire from industry to develop an apprenticeship pathway for trade entry.

Recent correspondence from a pool builder stated:

"After fifty years in the trade, I continue to be very disappointed that I could not offer good employees, whom I considered would make good pool tradespeople, any formal training that would result in them gaining a trade certificate in pool construction. Instead, I have had to push them towards the building, plumbing and electrical trades where they can complete an apprenticeship/traineeship and gain a genuine tradesperson certificate (my three sons included). "

4. Rope Work

Units of competency, skill sets and qualifications

Rope work is a regular feature of working in the built environment in areas where scaffolding or access equipment is not required, with applications across building construction and maintenance. It refers to the use of rope systems to create reliable and safe access to heightened industrial areas in total or partial suspension above the ground. Rope access is regularly used in working at heights,⁸⁴ although most training is provided by private providers.

⁸⁴ <https://www.vertech.com.au/irata-training/>



This critical area of construction safety not currently addressed in the national training package. Industry members have directly requested national training be developed,⁸⁵ and it was raised twice by respondents in the 2020 Industry Skills Forecast Survey. SafeWork NSW is highly supportive of further work in this hazard area. It has identified falls from heights as the primary cause of death in the construction industry with "falls from ladders, roofs and scaffolds being the key mechanisms."⁸⁶

⁸⁵ Daniel Wurm (National Painting and Decorating Institute, ongoing discussions 2019); David Dougherty (Total Height Safety, Forum discussion & email correspondence, 2019),

⁸⁶ NSW SafeWork (2020), Letter of Support for Construction Hazards Proposal (24/3/20), professional communication, included as an appendix to this report.

The development of national training will ensure competency for new entrants to the construction industry and facilitate upskilling current workers.

Ministers' priorities addressed

Table 19. Ministers' priorities – work arising from previous activity

Reform	Action to address reform
Obsolete and duplicate qualifications removed from the system.	N/A
More information about industry's expectations of training delivery is available to training providers to improve their delivery and to consumers to enable more informed choices.	<p>Development of a cured in place unit of competency for the Plumbing sector would improve delivery of the Certificate III in Plumbing and provide a stand-alone unit of competency for tradesmen being increasingly called to this work. The equipment used by the plumbing and civil engineering sectors differs and the current RII unit calls for the assessor to hold a high level of RII training product knowledge, rather than plumbing knowledge.</p> <p>Development of a specific steel construction pathway would address regional differences in building methods and materials and enable training providers to tailor training to be more suitable to rural and regional participants.</p>
The training system better supports individuals to move more easily between related occupations.	A steel construction pathway would enable workers currently working with steel to transition to the construction sector.
Improved efficiency of the training system through units that can be owned and used by multiple industry sectors.	Like all units of competency, it is envisaged that any units developed could be imported into other training packages, where relevant.
Foster greater recognition of skill sets.	This proposal is to develop units of competency relating to steel construction.

Consultation plan

Consultation undertaken:

The consultation undertaken for this project proposal included:

- 175 responses to the annual Industry Skills Forecast review, widely promoted by the SSO and industry to stakeholders through their networks
- individual consultations held with key industry stakeholders
- one-on-one interviews with 14 members of the IRC.

Consultation plan:

The key engagement methods may include some or all of the following:

- TAGs, to be established in accordance with internal policy and procedures to guide the subject matter expertise components of the work
- direct correspondence with regulators
- direct correspondence with State STAs
- direct correspondence with IRC and key stakeholders
- industry associations and other stakeholders will be invited to capital city forums in all states and territories. A copy of forums material will be published on the web and an online forum will also be facilitated
- RTOs will be engaged through online survey and trainer networks
- public web project page updated fortnightly
- newsletter survey distribution to 4,200 stakeholders, including all RTOs, regulators, industry associations. Minimum of three newsletter profiles
- industry survey on early and late draft material
- distribution of survey through TAG networks and Artibus digital channels
- social media – Twitter and LinkedIn.

Other relevant information

1. Certificate III in Plumbing – CPC Release 6.0 latest review and major update due for consideration at the August 2020 AISC meeting.

Both the recommended additional unit of competency and development of a pathway qualification was outside the scope of the current review but was noted during consultation.

The generic skills likely to be addressed in the above proposed development work would be:

- industry and occupation skills
- adaptability and learning skills
- collaboration skills
- sustainability and natural resource management skills.

Certificate III in Plumbing is an apprenticeship and is funded by all states and territories.

2. Steel construction units of competency are designed to introduce learners to the recognised trade callings in the construction industry and provide meaningful credit in a construction industry Australian Apprenticeship. The addition of steel units of competency would widen the range of experience available to learners.
3. Swimming Pool and Spa Building Certificate IV: This project was endorsed at the April 2020 AISC meeting. It was through the development work of this project that it was noted that there is need for a trade level qualification in this field to provide a pathway to the Certificate IV.

Timelines and key dates

The following timelines and key dates are predicated on the basis that an Activity Order will be commissioned by the AISC in October 2020 and:

- ensures the requirements set out across the training package policies are met
- will accommodate any necessary adjustments as a result of the impact of COVID-19 to the training package development process.

Overall project duration: 13 months from execution of Activity Order.

Table 20. Project timeline – work arising from previous activity

Details	Date
Expected approval by the AISC of proposed work	October 2020
The DESE commissioned activity order	November 2020
Engage SMEs to develop training package components	February 2021
Draft 1 is put forward for consultation	March 2021
Review feedback and update training package components, as per TAG advice	March - May 2021
Validation draft put forward for consultation	June - July 2021
Finalise quality assurance	August 2021
Send project to STAs for sign off	September 2021
Lodge project to DESE	October 2021
AISC considers project for implementation	November 2021

Summary of project components

- Cure in Place Pipe – 1 new unit of competency
- Steel Construction – up to 4 new units of competency
- Certificate III Swimming Pool and Spa – 1 new qualification made up of existing units of competency
- Rope work – up to 3 new units of competency as elective units under Certificate III in Painting and Decorating.

References

- "Huge Fine over WA Concrete Panels Deaths." Fully Loaded <https://www.fullyloaded.com.au/industry-news/1805/huge-fine-over-wa-concrete-panels-deaths>, 18 May 2018.
- Ai Group (2020), *Australian PCI®: Construction decline eases in February*, accessed 13/3/20 at Ai Group (2020), <https://www.aigroup.com.au/policy-and-research/mediacentre/releases/PCI-Feb-2020/>
- Ai Group (2020), *Implementing mental health initiatives in Australian business: triggers, facilitators and barriers*, accessed 25/3/20 at https://cdn.aigroup.com.au/Reports/2020/Report_Mental_Health_in_Australian_Business_Jan2020.pdf
- Australian Industry Standards (2019) *Gas Skills Forecast 2019*. https://www.australianindustrystandards.org.au/wp-content/uploads/2019/06/ueg_sf2019_final_pages_lowres.pdf.
- ACIL Allen Consulting for ARENA (2018), Opportunities for Australia from Hydrogen Exports. <https://arena.gov.au/assets/2018/08/opportunities-for-australia-from-hydrogen-exports.pdf>.
- Artibus Innovation (2020), *CPC ISF Survey Results: Round 2 Report*, commercial in confidence.
- Artibus Innovation (2020), *Precast Concrete 2020: Industry Consultation Report*, commercial in confidence.
- International Council on Monuments and Sites (ICOMOS) (2020), *Australian Heritage Quality Framework*, <https://australia.icomos.org/about-us/australian-heritage-quality-framework/>
- Australian Bureau of Statistics (2020), 'Measuring natural disasters in the Australian Economy', ABS Chief Economist Series (3/3/2020), accessed 12/3/2020 at <https://www.abs.gov.au/websitedbs/D3310114.nsf/home/ABS+Chief+Economist+-+Measuring+natural+disasters+in+the+Australian+economy>
- Australian Government Department of Employment, Skills, Small and Family Business (2019), *Industry Employment Projections 2019 Report*, Release date 22/11/2019, accessed 12/3/2020 at <http://lmip.gov.au/default.aspx?LMIP/GainInsights/EmploymentProjections>
- Bavas, Josh. "Eagle Farm Construction Deaths: Two Men Fatally Crushed in Concrete Panel Collapse." ABC News <https://www.abc.net.au/news/2016-10-06/two-people-crushed-by-collapsed-concrete-panels/7910470>, 7 October 2016.
- Campbell, D. (2020), Professional communication: Northern Territory, Department of Trade, Business and Innovation (27/3/20).
- CITB (2018). Unlocking Construction's Digital Future: A skills plan for industry. UK. Available at unlocking construction's digital future - www.citb.co.uk › citb_constructions_digital_future_report_oct2018. accessed 1/4/2020
- COAG Energy Council Hydrogen Working Group (2019), *Australia's National Hydrogen Strategy*. Commonwealth of Australia.
- Commonwealth of Australia (2015), *Australian Heritage Strategy*, <https://www.environment.gov.au/system/files/resources/cb226e0d-ba51-4946-af5a-24b628958e79/files/australian-heritage-strategy-2015.pdf>
- Dougherty, D. (2019), PersComms (re: Total Height Safety, Forum discussion & email correspondence, 2019).
- Edwards, R. (2020), Professional Communication from the Chair of H2 Networks to Artibus Innovation regarding the Hydrogen Project Proposal.

Farmer, M. (2016), *Modernise or Die: The Farmer Review of the UK Construction Labour Model*, Construction Leadership Council, accessed 25/3/20 at <http://www.constructionleadershipcouncil.co.uk/wp-content/uploads/2016/10/Farmer-Review.pdf>

Halliday-Wynes, S. & Stanwick, J. (2011), *Plumbing, sustainability and training*, NCVER, Adelaide.

Havaliah, T. (2019) *Building Solid Foundations: Career pathways in traditional trades in Australia*. International Sepcialised Skills Fellowship.

Heritage Skills Initiative (2018), *Heritage Skills Sector Analysis Survey*. International Specialised Skills Initiatve.

International Council on Monuments and Sites (ICOMOS) (2020), *Australian Heritage Quality Framework*, <https://australia.icomos.org/about-us/australian-heritage-quality-framework/>

International Council on Monuments and Sites (ICOMOS), The Relationship between the Heritage Quality Framework and Heritage Skills Development, Discussion Paper, accessed 24/3/2020 at https://australia.icomos.org/wp-content/uploads/AHQF_Discussion-Paper-No-1_Relationship-between-AHQF-and-Heritage-Skills-Development_April-2017.pdf

Jongeneel, D. (2020), Email of Industry Training Proposal from Department of Agriculture, Water and Environment (27/3/20), professional communication.

Jupp, J., and Awad, R. (2013). "Developing Digital Literacy in Construction Management Education: A Design Thinking Led Approach." *Journal of Pedagogic Development* 3(3).

Koukoulas, S.; Quiggan, J.; Wood, D.; Foster, G.; Kirchner, S. & Auld, S. (2020), 'Experts on how coronavirus will wallop Australia's economy – and what the government must do,' The Guardian, 11/3/2020, accessed 12/3/2020 at <https://www.theguardian.com/business/commentisfree/2020/mar/11/four-experts-on-how-coronavirus-will-wallop-australias-economy-and-what-the-government-must-do>

Milner, A. and Law, P. (2017) *Summary report: Mental health in the construction industry*.

<http://micaus.bpndw46jvgfycmdxu.maxcdn-edge.com/wp-content/uploads/2015/11/MIC-QLD-construction-industry-roundtable-report.pdf>

National Dust Disease Taskforce. *Interim Advice to Minister for Health*. (2019).

NCVER (2019), *Employers' use and views of the VET System*, accessed 10/03/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/employers-use-and-views-of-the-vet-system-2019>

NCVER (2020), *Apprentices and Trainees 2019: September quarter – Australia*, accessed 23/03/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/apprentices-and-trainees-2019-september-quarter-australia>

NCVER (2020), *Apprentices and Trainees 2019: June quarter – Australia*, accessed 10/03/2020 at <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/apprentices-and-trainees-2019-june-quarter-australia>

NCVER (2020), *Apprentices & Trainees: Early Estimates – September quarter 2019*, accessed 10/03/2020 at https://www.ncver.edu.au/_data/assets/pdf_file/0043/8276848/Early-trend-estimates-September-quarter-2019.pdf

NHBC (2018), *Modern Methods of Construction: Who's doing what?*, accessed 25/3/20 at <https://www.nhbcfoundation.org/wp-content/uploads/2018/11/NF82.pdf>.

NHBC (2016), *Modern Methods of Construction: views from the industry*, accessed 25/3/20 at <https://www.nhbcfoundation.org/wp-content/uploads/2016/07/NF70-Modern-methods-of-construction.pdf>

National House Building Council (NHBC) (n.d.), *NHBC MMC Hub*, accessed 25/3/20 at <http://www.nhbc.co.uk/builders/productsandservices/TechZone/MMCHub/>

Purple Infinity (2018) *Heritage Construction Skills Update Report*. TBCITB.

RICS (2018), *Modern Methods of Construction: A forward thinking solution to the housing crisis*, Royal Institution of Chartered Surveyors (RICS), London, accessed 25/3/20 at <https://www.rics.org/globalassets/rics-website/media/news/news--opinion/modern-methods-of-construction-paper-rics.pdf>

Roberts, Lachlan. "Worksafe Investigating after Concrete Panel Falls from Braddon Building Site." RiotACT <https://the-riotact.com/worksafe-investigating-after-concrete-panel-falls-from-braddon-building-site/284764>, 30 January 2019

Safe Work Australia (2019), *Work-related psychological health and safety: a systemic approach to meeting your duties*, accessed 29/10/19 at https://www.safeworkaustralia.gov.au/system/files/documents/1901/work-related_psychological_health_and_safety_guide.pdf

SafeWork Australia, (2019) *Guide to Managing Risk in Construction: Prefabricated Concrete*. (September 2019).

Shergold, P. & Weir, B. (2018), *Building Confidence – Improving the effectiveness of compliance and enforcement systems for the building and construction industry across Australia*, accessed 24/3/2020 at https://www.industry.gov.au/sites/default/files/July%202018/document/pdf/building_ministers_forum_expert_assessment_-_building_confidence.pdf

South Australia Training and Skills Commission (2018), *Construction Industry Priority Qualifications* (2018). Industry priorities based on 247 survey responses (159 from employers).

Training and Skills Commission (2018), [*Construction: South Australia's Industry Priority Qualifications 2018*](#)

Victorian Skills Commission (2018), Annual Activity Report: Connecting industry with skills, Victorian Skills Commissioner.

Wadlow, Tom. "Precast Construction Industry Set to Pass \$185bn Value Mark by 2023." Construction Global <https://www.constructionglobal.com/equipment-and-it/prefabricated-construction-industry-set-pass-185bn-value-mark-2023>, accessed 31 May 2018

Whitbourn, M. 2019. Insurers refused cover to stone suppliers over lung disease risk. The Sydney Morning Herald, Dec 7. Available at <https://www.smh.com.au/national/insurers-refused-cover-to-stone-suppliers-over-lung-disease-risk-20191202-p53g1h.html> accessed 1/4/2020

WorkCover Queensland. "Precast Panel Wall Failure." <https://www.worksafe.qld.gov.au/injury-prevention-safety/alerts/whsq/2018/prefabricated-wall-panel-failure>, 6 June 2018.

Wurm, D. (2019), Personal Comms (Re National Painting and Decorating Institute, ongoing discussions, 2019).

Appendices

Appendix 1 – Summary of projects

Appendix 1 Table 1. Summary of project units/skill sets

Project Number	Qualification / unit / skill set	Code	Previous change (endorsement date)	Previous work (transition / update / establishment)	Work (new / update / deletion)	Entry level / trade / post-trade qualification	Expected date for endorsement
Project 1 Hydrogen	Skill set	CPCSS00004 Carry out hydrogen work					
	Unit	CPCHYD3001 Install and commission Type A appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3002 Maintain and service Type A appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3003 Disconnect and reconnect Type A appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3004 Calculate and install ventilation for Type A appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3001 Install and commission Type B appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3002 Maintain and service Type B appliances	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCHYD3003 Disconnect and reconnect Type B appliances	N/A	N/A	New	Trade	Nov 2021

Project Number	Qualification / unit / skill set	Code	Previous change (endorsement date)	Previous work (transition / update / establishment)	Work (new / update / deletion)	Entry level / trade / post-trade qualification	Expected date for endorsement
	Unit	CPCHYD3004 Calculate and install ventilation for Type B appliances	N/A	N/A	New	Trade	Nov 2021
Project 2 Heritage skills	Skill set	CPCSS0005 Undertake heritage restoration	N/A	N/A	New	Post-trade	Nov 2021
	Unit	CPCCST4001 Prepare to undertake heritage restoration process	25/2/20	Transition	N/A	Post-trade	Nov 2021
	Unit	CPCCST4002 Undertake the heritage restoration process	25/2/20	Transition	N/A	Post-trade	Nov 2021
	Unit	CPCCST4004 Initiate the heritage works	25/2/20	Transition	N/A	Post-trade	Nov 2021
	Unit	CPCCST4005 Prepare drawings for heritage work	25/2/20	Transition	N/A	Post-trade	Nov 2021
	Unit	CPCCST4006 Prepare report for heritage restoration work	25/2/20	Transition	N/A	Post-trade	Nov 2021
Project 3 Construction Hazards	Skill set	CPCSS0006 Construction hazardous materials	N/A	N/A	New	Post-trade	Nov 2021
	Unit	CPCCDE3014 Remove non-friable asbestos	5/6/15	Transition	Delete	Trade	Nov 2021
	Unit	CPCCDE3015 Remove friable asbestos	5/6/15	Transition	Update	Trade	Nov 2021

Project Number	Qualification / unit / skill set	Code	Previous change (endorsement date)	Previous work (transition / update / establishment)	Work (new / update / deletion)	Entry level / trade / post-trade qualification	Expected date for endorsement
Project 4 Precast Concrete Constructions	Unit	CPCCDE4008 Supervise asbestos removal	5/6/15	Transition	Update	Post-trade	Nov 2021
	Unit	CPCCDE5001 Conduct air monitoring and clearance inspections for asbestos removal work	5/6/15	Transition	Update	Post-trade	Nov 2021
	Unit	CPCCPD3031 Work safely with lead-paint surfaces in the painting industry	25/2/20	Transition	N/A	Trade	Nov 2021
	Unit	CPCCPD3036 Work safely to encapsulate non-friable asbestos in the paint industry	25/2/20	Transition	N/A	Trade	Nov 2021
	Unit	CPCMHEH3001 Mental health and awareness in the construction industry	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3001 Brace and prop precast concrete components	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3002 Remove bracing and propping from precast concrete constructions	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3003 Level and secure precast concrete components	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3004 Grout load bearing precast concrete components	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3005 Grout non-load bearing precast concrete components	N/A	N/A	New	Trade	Nov 2021

Project Number	Qualification / unit / skill set	Code	Previous change (endorsement date)	Previous work (transition / update / establishment)	Work (new / update / deletion)	Entry level / trade / post-trade qualification	Expected date for endorsement
	Unit	CPCPRE3006 Caulk precast concrete components	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE3007 Repair precast concrete components	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCPRE4001Inspect precast concrete erections	N/A	N/A	New	Trade	Nov 2021
Project 5 WELS	Unit(s)	TBA	N/A	N/A	New	Trade	Nov 2021
Project 6 Work Arising							
Cure in Place Pipe	Unit	CPCPMS300x	N/A	N/A	New	Trade	Nov 2021
Steel Stream	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021
Cert III Swimming Pool & Spa	Qualification	CPC3xx21	N/A	N/A	New	Trade	Nov 2021

Project Number	Qualification / unit / skill set	Code	Previous change (endorsement date)	Previous work (transition / update / establishment)	Work (new / update / deletion)	Entry level / trade / post-trade qualification	Expected date for endorsement
Rope Work	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021
	Unit	CPCCOM2000x	N/A	N/A	New	Trade	Nov 2021

Appendix 2: Skills, trends, and workforce developments

Appendix 2 Table 1. Skills and trends impacting the construction industry, as identified by IRC members

Skills and Trends	IRC Description
Specialisations are emerging and increasing	<ul style="list-style-type: none"> • Mental health and workplace health and safety as both emerging and enduring concerns that 'never go away' • Hydrogen skills needs are emerging and will ramp up • BIM use picking up • Technology changes and skills needed for project planning and BIMs • Increases in veneer cladding • Increase in non-construction industries putting products in packages (e.g. BlueScope Steel) • Increased 'in-build' infrastructure • Increase in medium and high-density builds, rather than urban sprawl • Fire design, installation and maintenance • Business skills • View that there is a subset of trades that will be irrelevant in 5 years and how to identify these • Future proofing the industry through units and skill sets that are future relevant
Regulations have stronger compliance and performance criteria	<ul style="list-style-type: none"> • National Construction Code emphasis on performance as opposed to compliance, with apprentices needing skills to identify and distinguish between compliance and performance requirements
MMCs are emerging and requiring skilled workers ⁸⁷	<ul style="list-style-type: none"> • Drafting skills needed in response to emerging MMCs in prefabricated construction and modular work • The IRC member for the Defence sector said that Defence had reviewed and revised their delivery of construction trades training to reflect new changes, such as construction to house new technologies
Economic downturns: what this would mean for the workforce?	<ul style="list-style-type: none"> • It was noted by one IRC member that any downturn in the commercial construction market would mean more painters competing for domestic work

⁸⁷ Also termed 'Pre-Manufacture' as a "generic term to embrace all processes which reduce the level of on-site labour intensity and delivery risk" (Farmer, 2016: p. 12).

Appendix 2 Table 2. Industry change – demand for occupational skills due to hydrogen addition

Workforce and Skills Development	Factors and Trends
<p>Skills identified by IRCs</p> <p>Needs to be incorporated into the National Training Package because:</p> <ul style="list-style-type: none"> • there will be occupational workplace health and safety issues as hydrogen is widely adapted • a broad approach to improve awareness and training is required • occupation-specific knowledge of materials and safe working practices (e.g. higher pressures, flammability) for plumbers and plant operators requires training package development. 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • national policy: National Hydrogen Taskforce • hydrogen is to be added to the Queensland domestic gas supply • state governments projects moving into hydrogen development and export economy (e.g. Victoria green hydrogen, South Australia, Tasmania, Queensland).

Appendix 2 Table 3. Industry change – greater awareness of construction workplace hazards

Workforce and Skills Development	Factors and Trends
<p>Skills identified by IRCs</p> <p>Needs to be incorporated into the National Training Package because:</p> <ul style="list-style-type: none"> • a broader approach is required to improve awareness and training, even if some accredited and unit training options exist for asbestos and silicosis • current training emphasis is on identification, not hazard mitigation • there is a requirement for industry occupation-specific awareness and safe handling of asbestos, particular demand in Defence sector where military bases have large amounts of asbestos • there is a requirement for occupation-specific awareness of dust-borne and other material disease risks, including lead paint on heritage sites, jet fuels in 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • changing work and career values • worker vulnerability • workforce continuity vulnerable to early exit • regulator identified need by National Asbestos Eradication Agency • expectation of increased government regulation from Dust Disease Taskforce • insurance barriers for construction subsectors, particularly stone masonry and kitchen employers • successful pilot mental health programs for construction apprentices and trainees reducing suicide and suicidal ideation • Safe Work regulators have expressed support for the development of training • Northern Territory Department of Trade, Business and Innovation identified need for

Workforce and Skills Development	Factors and Trends
<p>Defence, and lead and asbestos piping in plumbing</p> <ul style="list-style-type: none"> • there is a requirement for occupation-specific awareness and training in mental health, from risks that need to be self-managed by individuals through to supervisor awareness and knowledge • existing mental health programs should be made comprehensive to ensure skills gaps in this area are identified and met. 	<p>"immediate skill sets to support very broad workplace mental well-being".⁸⁸</p> <ul style="list-style-type: none"> • industry awareness and research on mental health initiatives and workplace mental health training.⁸⁹

Appendix 2 Table 4. Industry change – demand for heritage skills

Workforce and Skills Development	Factors and Trends
<p>Skills identified by IRCs</p> <p>Needs to be incorporated into the National Training Package because:</p> <ul style="list-style-type: none"> • traditional skills should be maintained • heritage skills are being lost, e.g. heritage roofing and colour-matching • heritage skills are niche skills, but are essential • of the relationship between heritage work and modern technology, e.g. stonemasonry. 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • heritage skills shortages in some geographic areas leads to delays • increase in heritage tourism • increased value placed on heritage features.

⁸⁸ Campbell, D. (2020), Professional communication: Northern Territory, Department of Trade, Business and Innovation (27/3/20).

⁸⁹ For example, see Ai Group (2020), Implementing mental health initiatives in Australian business: triggers, facilitators and barriers, accessed 25/3/20 at https://cdn.aigroup.com.au/Reports/2020/Report_Mental_Health_in_Australian_Business_Jan2020.pdf

Appendix 2 Table 5. Industry change – modern methods of construction

Workforce and Skills Development	Factors and Trends
<p>Skills identified by IRCs</p> <p>Needs to be incorporated into the National Training Package because:</p> <ul style="list-style-type: none"> • modular units are being built off-site, but specialist skills are needed to install them on-site and ensure installation complies with AS3500 • prefabrication training in waterproofing exists as a skill set in WA and this needs to be made national • prefabricated manufacture occurs in a factory setting which is distinct from on-site installation • skills are needed to read prefabricated construction plans and other quasi-manufacturing workplace technologies, such as BIM plans • on-site assembly requires greater use of safe installation practices • on-site assembly will impact how and when occupations enter, lock down and connect services • there is increased demand for specialist skills suited to the prefabricated and modular construction environment. 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • AS3500 series compliant installation • quality control for installation • demand and use of off-site manufactured products by Tier 1 companies, such as Lendlease • UK industry research with construction developers found that 69% were using MMCs (mostly volumetric or panelised systems) and 92% planned to expand or commence its use in the future⁹⁰ • emerging industry demand for specialist skills in prefabricating and installing components • cost considerations • ease and speed of assembly.

Appendix 2 Table 6. Employer changes – workforce and skills needs identified by employers

Workforce and Skills Development	Factors and Trends
<p>Skills needs identified by employers</p> <ul style="list-style-type: none"> • modern methods of construction • eco-construction techniques 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • Prefabricated building systems: the Victorian Skills Commissioner's Sector Advisory Groups

⁹⁰ NHBC (2018), Modern Methods of Construction: Who's doing what?, accessed 25/3/20 at <https://www.nhbcfoundation.org/wp-content/uploads/2018/11/NF82.pdf>. See p.5.

Workforce and Skills Development	Factors and Trends
<ul style="list-style-type: none"> • renewable technologies • shed building 	<ul style="list-style-type: none"> (in 2017-18) identified and developed new training products⁹¹ • Modular house building, off-site construction, robotics, and renewable technology advances identified as key issues by South Australian construction employers and stakeholders⁹² • International trends for extending pre-manufacture and off-site construction in the traditionally on-site construction sector⁹³ • UK house building industry have positive attitudes towards MMCs, with 2016 research finding that 98% of organisations have used or considered the use of MMCs in the last three years⁹⁴
<ul style="list-style-type: none"> • specialist construction skills • a hybrid training solution of concreting • roof plumbing • engineering and building qualifications • fire protection qualifications • railway construction experience • Revit training (building information modeling software). 	<ul style="list-style-type: none"> • Training exists or is under development in many of these areas, including specialist heritage skills, roof plumbing, engineering and building qualifications, fire protection and Revit • Railway construction is in the transport and logistics training package, supported by the Rail IRC • Other issues were identified by a low number of employer respondents and are not supported by the existing literature at this time.
<ul style="list-style-type: none"> • Business and communication skills • social media and communications training 	<ul style="list-style-type: none"> • Skills acknowledged by the AISC's cross-sector projects.

⁹¹ Victorian Skills Commission, Annual Activity Report: Connecting industry with skills, Victorian Skills Commissioner (2018).

⁹² South Australia Training and Skills Commission, Construction Industry Priority Qualifications (2018). Industry priorities based on 247 survey responses (159 from employers).

⁹³ See: Farmer (2016); RICS (2018), Modern Methods of Construction: A forward thinking solution to the housing crisis, Royal Institution of Chartered Surveyors (RICS), London, accessed 25/3/20 at <https://www.rics.org/globalassets/rics-website/media/news/news--opinion/modern-methods-of-construction-paper-rics.pdf>; National House Building Council (NHBC) (n.d.), NHBC MMC Hub, accessed 25/3/20 at <http://www.nhbc.co.uk/builders/productsandservices/TechZone/MMCHub/>

⁹⁴ NHBC (2016), Modern Methods of Construction: views from the industry, accessed 25/3/20 at <https://www.nhbcfoundation.org/wp-content/uploads/2016/07/NF70-Modern-methods-of-construction.pdf>

Workforce and Skills Development	Factors and Trends
<ul style="list-style-type: none"> • graduate diploma in construction and project management • IR/HR/legal training. 	

Appendix 2 Table 7. Industry change – precast concrete installation

Workforce and Skills Development	Factors and Trends
<p>Skills identified by industry and employer stakeholders</p> <p>Needs to be incorporated into the National Training Package because:</p> <ul style="list-style-type: none"> • industry has identified training required for occupations, particularly: Erection Supervisors; Post-installation Works Supervisors; Contractors; Project Supervisors and Builders; Building Designers; Draftsman; Precast Plant Manufacturer • industry stakeholders consulted said they would upskill and train staff with a qualification (96%), if available, and also employ people with this training (88%)⁹⁵ • industry identified training needs for skills, including: Unloading, Lifting and Handling; Erection; Precast-specific Cranes and Rigging; Grouting (load bearing and non-load bearing); 	<p>Driving demand for skills:</p> <ul style="list-style-type: none"> • increase in the use of precast concrete in construction • precast construction global demand is predicted to increase at 6.5% per year by 2023, or \$185.35 billion⁹⁶ • improper installation leading to concrete panels falling from heights in Canberra and Queensland due to improper installation⁹⁷ • workplace deaths⁹⁸ • specialist skills gaps for proper techniques for support and lifting during installation • an industry-identified lack of national training.

⁹⁵ Ibid. (Note: percentages may exceed 100% if the question allowed **respondents** to select **multiple** answers.)

⁹⁶ Wadlow, Tom (31 May 2018), 'Precast Construction Industry Set to Pass \$185bn Value Mark by 2023', Construction Global, accessed at <https://www.constructionglobal.com/equipment-and-it/precast-construction-industry-set-pass-185bn-value-mark-2023>)

⁹⁷ Roberts, Lachlan (30 January 2019), 'Worksafe Investigating after Concrete Panel Falls from Braddon Building Site,' RiotACT, accessed at <https://the-riotact.com/worksafe-investigating-after-concrete-panel-falls-from-braddon-building-site/284764>

WorkCover Queensland 6 June 2018), 'Precast Panel Wall Failure,' accessed at <https://www.worksafe.qld.gov.au/injury-prevention-safety/alerts/whsq/2018/precast-wall-panel-failure>

⁹⁸ SafeWork Australia (September 2019), Guide to Managing Risk in Construction: Prefabricated Concrete.

Workforce and Skills Development	Factors and Trends
<p>Precast-specific Transport; Damage and Repair; Caulking</p> <ul style="list-style-type: none">• industry strongly supports the development of training for addition to the national training register.	

Appendix 3: Letters of support

Appendix 4 Table 1. Project support

Project	Author	Role
Construction Hazards	Craig Allen Deputy Director-General Office of Industrial Relations Qld	Regulator
Construction Hazards	Lisa Willis Compliance Manager Safety Ad Service	RTO
Construction Hazards	Jason Wall Assistant State Inspector Asbestos and Demolition Services SafeWork NSW	Regulator
Construction Hazards	Daniel Adler Project Manager Asbestos Policy Local Government NSW	Regulator
Construction Hazards	Peter Dunphy Executive Director Compliance and Dispute Resolution SafeWork NSW	Regulator
Construction Hazards	Brian Chamberlin Construction Industry Education Officer WorkSafe Vic	Regulator
Precast Concrete Constructions	Travis Stephens HSE Manager Pindan Construction	Industry Employer
Precast Concrete Constructions	Alan Mascord Operations Manager Akura Pty Ltd	Industry Employer
Precast Concrete Constructions	Barry McCormick NSW State Manager Actech Advanced Concrete Technologies	Industry Employer
Precast Concrete Constructions	Jeff Pellerin Product Manager Precast Lifting ANZ Ramset Reid	Industry Employer
Precast Concrete Constructions	Brendan Mulherin Trainer/Assessor Construction Training College	RTO

5 March 2020

We agree that there is definitely a need for these hazard awareness and mental health units. We'd be happy to be an involved RTO re development/review etc. if you are looking for industry input.

Kind regards

Lisa Willis

Compliance Manager

Mobile: 0407 662 187

lisa@safetyadserv.com

6 March 2020

Thanks for the opportunity to contribute. I am very much interested in the development and implementation of the asbestos awareness training discussed here.

Kind Regards

Daniel Adler

Project Manager – Asbestos Policy

T 02 9242 4128

daniel.adler@lgnsw.org.au

lgnsw.org.au/policy/asbestos

6 March 2020

I support the development of units of competency relating to workplace hazards, in particular nationally uniformed asbestos awareness training that includes, identification, safe handling and suitable control measures for asbestos containing materials. This training would be specific for all workers who may be required as part of their job description that may come across potential asbestos containing materials.

The training would be conducted at school and/or post school in an apprenticeship/traineeship and would require re-training/assessment on a regular basis. (5 yearly).

Regards,

Jason Wall

Assistant State Inspector | Asbestos and Demolition Services Chemicals, Explosives & Safety Systems

SafeWork NSW

Better Regulation Division | Department of Customer Service p 02 4321 5272 | m 0402 966 972

e jason.wall@safework.nsw.gov.au | www.safework.nsw.gov.au Address: Level 3, 92 – 100 Donnison Street, Gosford NSW 2250

13 March 2020

From a Worksafe Victoria perspective these issues are extremely prevalent in our industry and from the work I have been doing in Victoria's Tafe sector the need for training and or updated training on these topics has been highlighted to me. The Construction program at Worksafe Victoria would be extremely supportive of the proposals for the development of training in regards to:

- Asbestos awareness
- Silicosis awareness
- Mental Health

Worksafe Victoria's Construction program would also be appreciative of being involved in the development of such training if possible.

I will look forward to hopefully catching up with you at some stage to discuss further. Regards Brian

Brian Chamberlin
Construction Industry Education
Officer / Inspector (F1)
Hazardous Industries & Industry
Practice

brian_chamberlin@worksafe.vic.gov.au 567 Collins St
Tel/ 99641 1555 Melbourne VIC 3000
Mob/ 0435 323 495 www.worksafe.vic.gov.au



Customer Service

McKell Building – 2-24 Rawson Place, Sydney NSW 2000 Tel 02 9372 8877 | Fax 02 9372 7070 | TTY 1300 301 181

ABN 81 913 830 179 | www.customerservice.nsw.gov.au

Our reference: BN-00787-2020

Ms Wendy McLeod
Operations Manager Artibus
Innovation

By email: wendy@artibus.com.au

Dear Ms McLeod

I refer to your email correspondence dated 5 March 2020 concerning the development of units of competency relating to workplace hazards.

SafeWork NSW provides its full support for the development of a bank of construction hazard awareness units in the areas of silica awareness, asbestos awareness and mental health.

Artibus Innovations' training proposal aligns with the Work Health and Safety Roadmap for NSW 2022 in terms of awareness and education objectives within the:

- *Building and Construction Sector Plan*
- *Hazardous Chemicals and Materials Exposures Baseline and Reduction Strategy*
- *Mentally Healthy Workplaces Strategy*
- *At Risk Workers Strategy (young workers, CALD workers, migrant workers and labour hire).*

The training proposal also supports the following NSW Manufactured Stone Industry Taskforce recommendations that were sent to Artibus Innovation for consideration in April 2019, and the suggested elements and performance criteria for silica that SafeWork NSW provided to Artibus Innovation in October 2019 (as referenced in your enclosed 'regulator briefing' document).

- *A mandatory unit of competency to be introduced by the relevant Industry Skills Council in all relevant training packages and trade courses that involve working with natural manufactured stone, and construction materials such as concrete, brick and tile based building products that contain silica. Currently there are inconsistent levels of training and understanding of silica in the multiple industries in which it is a risk and no mandatory training is required.*
- *The development of a general awareness course for workers that are not seeking a formal trade qualification or who wish to refresh their skills and knowledge. Many workers at risk of exposure to silica already have their trade qualifications or are working in jobs that do not require trade qualifications.*
- *Elements and performance criteria that includes identifying products containing silica, silica in common building products, health hazards from exposure to silica and tasks generating airborne*

silica on site; as well as knowledge and skills to use control measures on power tools and equipment and use and maintenance of respirators for silica.

In relation to asbestos awareness training, the course should cover asbestos identification, safe handling of asbestos and suitable control measures to manage asbestos.

Training should be specific for all workers who may be required as part of their job description to come across potential asbestos containing materials, with training to be conducted at school and/or post school in an apprenticeship/traineeship and re-training/assessment on a regular basis. SafeWork NSW welcomes the focus on mental health in the construction sector. Any training for workers and managers should focus on mental health literacy, stigma reduction, identification and control of psychological hazards in the workplace, early intervention and how to provide supportive recovery following mental ill health.

SafeWork NSW would also like to draw your attention to one critical area of construction safety that is not currently identified. Falls from heights continues to be the number one cause of death in the construction sector with falls from ladders, roofs and scaffolds being key mechanisms. Whilst appreciating the limitation in scope and resources, SafeWork NSW would be highly supportive of work being done in this hazard area.

Please advise if SafeWork NSW can be of assistance in the review of any materials from a subject matter and regulator perspective.

Should you require further information in relation to this matter, please contact Meagan McCool, Director - Chemicals, Explosives and Safety Auditing at SafeWork NSW on (02) 4321 5565 or via meagan.mccool@safework.nsw.gov.au.

Yours sincerely



**Peter Dunphy Executive
Director
Compliance and Dispute Resolution**

23/03/20



Office of
Industrial Relations
Department of Education

Our reference: FILE35169, REC35382

20 March 2020

Ms Wendy McLeod
Operations Manager
Artibus Innovation

Email: wendy@artibus.com.au

Dear Ms McLeod

Thank you for your email dated 5 March 2020 regarding the inclusion of construction hazards training in the construction, plumbing and services industry (CPC) 2020 skills forecast.

The Office of Industrial Relations (OIR) strongly supports any efforts to raise awareness in the construction industry of hazards, risks and appropriate controls to ensure the health and safety of workers in the industry. It is our preference that health and safety competencies are embedded in the CPC training package in all relevant units of competency to reinforce the message that health and safety is integral to good work practices rather than an add on.

As you have identified, there are several existing courses and units of competency on asbestos. We suggest that further research be undertaken to determine what gaps, if any, there are in the existing material before a decision is made on developing additional units.

The Health and Safety Executive in the United Kingdom has released a report on the effectiveness of [mental health first aid training in the workplace](#) that you may wish to consider. The WHSO training package includes material on psychosocial hazards such as bullying, fatigue, violence and psychological health that may be suitable for the CPC training package. Fatigue in the construction industry impacts on both the physical and psychological health of workers. There are several existing courses that address fatigue that align with the Australian Qualification units of competency.

It is our preference that managers and workers are trained in psychosocial risk management more broadly. There is guidance material on our [website](#) that you may find useful.

Any training on silicosis must include the development of safe systems of work for working with materials containing crystalline silica, for example cutting, drilling or grinding.

We support your proposal in principle but would welcome more detail on the approach and implementation.

If you require further information or assistance, please contact Ms Helen Burgess, Director, Construction Compliance and Field Services, OIR, on (07) 3406 9949.

Yours sincerely



Craig Allen

**Deputy Director-General
Office of Industrial**

1 William Street Brisbane Queensland 4000 Australia GPO Box 69 Brisbane Queensland 4001 Australia

Telephone 13 QGOV (13 74 68)

WorkSafe +61 7 3247 4711

Website www.worksafe.qld.gov.au www.business.qld.gov.au

ABN 94 496 188 983



ABN 63 004 235 063

1 Ramset Drive Chirnside Park
Victoria, 3116, Australia

tel: (03) 9727 6222

fax: (03) 9726 8215

info@ramsetreid.com
ramsetreid.com

To Whom it may concern,

It has been documented that the use of precast has been ever increasing as a method of construction. It is beneficial to many stakeholders in any given project. It crosses many industries from commercial, industrial and residential. In all areas the use of precast concrete can increase the speed of construction and this is advantageous to all.

With all advantages come inherent risk and precast concrete is not something that is any different. What is concerning as a member of the industry is the lack of formal training for the skills required to complete a build accurately and safely. Many current roles involve on the job training. This is something which should and could be improved with proper training. There is no formal training for builders, installers or contractors when it comes to the manufacture, handling or installation of precast concrete. The lack of regulatory body has equated to a fragmented system which overviews the process. Lastly, many codes and standards make reference to a 'competent person'; yet do not nominate who or what makes up this person. Without having this outlined, someone who may not be qualified may be in position to make a decision regarding how a safety critical activity may be performed. They may think they are performing an act correctly, unbeknownst to them. A formal qualification would assist in mitigating this.

Safety incidents, whether it be injuries or near misses are on the rise, something which could be mitigated through education. Furthermore, this would allow employers to determine if an employee or potential employee (if employing new staff) would be suitable to perform a given task prior to taking the risk by handing over the reigns and trusting the person is as capable as they say they are.

As a supplier to the precast market, I frequently answer questions from the greater industry and can confirm there are those whom I have spoken to who would benefit greatly from participating in a formal training around the safe practices of precast concrete. Furthering this, there are many workers who participate in a build who do not fall under the scope of 'concreter' or 'rigger' as outlined in the national trade register; but would have just as much influence on how a precast product is manufactured, handled or installed. In all these instances a failure can result in the build having roll on effects (e.g. causing delays) as well as a potential safety event should something go wrong.

I support the need for formalised training around the precast concrete industry and would have staff within my company participate in it, should it ever become available. At the moment, all new staff within our company participate in house training to gain skills from those whom have been in the industry as well as reviewing current standards from around the globe.

Jeff Pellerin | Product Manager – Precast Lifting ANZ





Actech International Pty Ltd
 ABN: 66 578 680 856 / ACN: 053 771 225
 PO Box 345, Pascoe Vale South, Vic 3044
 Ph: +61 (0)3 9357 3366 Fax: +61 (0)3 9357 3766

1300 ACTECH (228 324)
email: info@actech.com.au
website: www.actech.com.au

9-3-2020

Re: Precast Concrete Construction Qualification Development.

Actech is a supplier of a number of products to the precast industry which include but are not limited to concrete lifting systems.

Recently I have seen an increase in the number of new tradespeople conducting precast for builders that clearly have no idea about what precast is all about and I would like to share with you a recent example.

We received an order from a distributor for the client to collect. The nature of the items made me ask the customer when they collected what they were doing and he explained they were making concrete precast slabs for a builder. I explained they had the wrong product, had over specified the lifters and subsequently found they did not have a lift design prepared.

The customer came back with a new order which was duly collected but they then contacted me about changing the design without referral to the engineer. I again explained the problems with what they planned to do and again insisted they refer back to the engineer.

This is a clear example of a tradesperson undertaking a dangerous task in that they were lifting a ten tonne slab in the workplace and had no idea of what they were doing.

The main issues were

- Not understanding how different lifters work and their application.
- Required engineering support for lifting and installation.
- Not understanding that there are many factors that reduce a lifters performance including but not limited to;
- Edge distance.
- Concrete strength.
- Sling angle when lifting.
- Flexural strength of element to stop cracking.
- The role of embedment.

9-3-2020

Re; Precast Concrete Construction Qualification Development. Page two.

In short precast elements are not just slabs of concrete anybody can make and the NPCAA's pursuit of a stand alone "Installation Engineer" does not appear to be gaining traction within the industry.

The industry needs its own qualification and CPD if it is to be a safe workplace.

Yours truly

Barry McCormick NSW State Manager

Melbourne

P: 03 9357 3366
F: 03 9357 3766

Sydney

P: 02 9622 8222
F: 02 9622 8555

Brisbane

P: 07 3267 7770
F: 07 3267 8880

Perth

P: 08 9452 3337
F: 08 9452 3338



CONSTRUCTION

TRAINING COLLEGE

RTO 32512

To whom it may concern,

As a member of the Construction Industry for the past 30 years, I would like to offer my opinion regarding instigating formalized training for Precast concrete panels.

I started out in the industry pushing a broom and progressed to patching concrete from swinging stages, and trailing decks of form work shutters. I graduated to dogging duties (HRWL) and then rigging, both basic and intermediate. (I hold Advanced Riggers but that is for another work application).

I am currently employed with the above Registered Training Organization. Prior to this, I was the Operations Manager for Mulherin Rigging & Cranes Aust Pty Ltd, 48 Union Circuit Yatala. My duties included but were not limited to the installation of precast concrete panels.

Over the years I have worked with some very skilled installers and some very poorly skilled installers. I have seen extremely dangerous installations where the installer thought it was in order to support the end of three levels of a precast panel using a standard push/pull prop and a limited number of angle brackets to tie the panels in at each level. When we arrived on site, the prop had a 50-80mm bow in it so it was working very hard. The builder was not qualified to call the job unsafe and asked Mulherin Rigging to inspect the panel installation and provide a report.

The end result, MRCA removed approximately 26 previously installed panels, re-installed them in the correct manner and tied in as per Engineers' instructions. That particular installation Company is no longer operating. What concerns me is that the actual guys who installed these panels are still out there in the industry.

I believe by regulating the installation process, these unsafe practices have a better chance of being removed from the industry thus improving the safety process for installation of precast concrete elements and panels. By regulating, I mean the inclusion of both informal (RTO) and onsite training (formal training). The training should not be limited to installers but should be include the entire chain of precast handlers, manufacturers, transport, installers and most especially, the Head Contractor. I believe this can be aligned with basic rigging training.

In conclusion, I believe this has been a long time coming and with the current level of experience in some areas of the construction industry this matter needs to be addressed urgently and with the highest priority.

If you need to contact me, please do not hesitate to use any of the contacts details below.

Brendan Mulherin Trainer/Assessor
Regards,



HRWL Accredited Assessor - 31318 M obile: 0498 289 299

Office: 07 3807 3742 E-mail: brendan@constructiontc.net

Construction Training College (RTO Provider No. 32512) PO
Box 5226 Eagleby Qld 4207

B: 07 3807 3742 E: info@constructiontc.net W: www.constructiontc.net



Akura Pty Limited
ABN 33 602 244 628

4 Lombard Drive
Robin Hill NSW 2795
PO Box 9067
Bathurst NSW 2795

T: 02 6324 5335
F: 02 6331 8448
admin@akura.com.au
www.akura.com.au

To whom it may concern

I am writing to offer support for the development of a National Qualification in Precast Manufacturing and Erection.

Akura are a commercial builder and manufacturer of commercial building products based in Regional NSW and Sydney. Our manufacturing facility encompasses 2 factories focused on Precast Panels and Structural Steel elements. The Precast facility employs 14 staff and operates 5-6 days a week.

Due to rapid growth we have been looking to employ new team members with experience primarily in Concrete & Carpentry, ideally with precast knowledge and experience. This has been a very difficult exercise mostly as there is not a lot of experienced people available. The process of validating an applicant's experience is made more difficult by not having a National Qualification to reference or rely upon.

I strongly support the development of a Precast Qualification. The key areas I suggest are

- Quality systems and importance of quality
- Measuring accuracy and techniques
- Fundamentals of set out – squareness, basic geometry, volume & weight calculations
- Concrete characteristics – strengths, admixtures, components
- Steel in concrete – types, basic functions
- Accessories and fitments
- Class system and determining the requirement, measuring the outcome
- Bed Lifting methods and hardware
- Basic panel engineering
- Precast panel element design and how they used in buildings
- Placement of panels
- Connections and Propping
- Erection and transport
- In-situ elements and how they work with precast

If I can assist further with this initiative, please let me know

Kind Regards,

Alan Mascord

Operations Manager

alan@akura.com.au

To Whom it may concern,

This letter is intended to provide support for the National Precast association of Australia and the Department of Employment, Skills, Small and Family Business to create nationally recognised training to allow the development of a national precast concrete construction qualification.

I have been heavily involved in the precast/tilt up aspect of the construction industry for many years now in both 'hands on' and site management roles and am a strong advocate for any improvement.

Being based in WA our current legislation already has mandatory training requirements for tilt up work, being legislatively defined as the manufacture, transport, craneage, temporary storage, erection or temporary bracing of a concrete panel; the fixing of a concrete panel for the incorporation of the panel as a wall; the removal of temporary bracing of a concrete panel.

The legislation states that people in control of the workplace at which they are being installed must ensure that both persons supervising the installation on a construction site, and persons involved in tilt up work, have completed an approved course for the aspect of tilt up work they are involved in.

The WorkSafe Western Australia Commissioner has approved the course 'CPCCBC4022A Supervise tilt-up work' to satisfy the requirement that people who directly supervise tilt-up work at a construction site, and 'CPCCCM1016A Identify requirements for safe tilt-up work' for workers involved in tilt up work.

Further to the above, workers who have previously completed '51203 Course to Contribute to Safe Tilt-up Construction', '51629 Course in Contribute to Safe Tilt-Up Construction', 'CPCCCM1007A Carry out tilt-up work safely' or 'CPCCCM2011A Carry out tilt up work safely' may continue to undertake tilt-up work without completing the current course as they were the approved course at the time of completion.

This has been a long standing legislative requirement in Western Australia and one which my current organisation maintains as mandatory for projects in all jurisdictions, this results in great difficulty training persons to meet the WA legislated requirements if they are from other jurisdictions as the RTOs based in those states do not provide the option for training in these particular units, to have these as a National requirement would be very beneficial.

I have noted that tilt-up/precast work in Australia is largely unregulated, the WHS Regulations proposed in Western Australia based on the Harmonised Model were recently made available for comment and the requirements for precast were sadly lacking compared to what is currently legislated in WA, our organisation in our return submission strongly advised that our current requirements should be retained including, but not limited to, the training requirements detailed above.

On many occasions I have been criticised for voicing my opinion that precast is one of the quickest and safest methods of construction, I am criticised for this as a result of (well documented) incidents that most often result in death.

However my opinion is formed on the basis that when the processes outlined primarily in the AS3850 suite of Standards, and the National Code of Practice for Precast, Tilt-up and Concrete Elements in Building Construction are carried out by trained, competent persons, then the likelihood of an incident is limited to extremely low and is safer than most 'lifts' on a construction site due to the detailed knowledge of the 'load' and other associated requirements that do not require the use of judgement that is subject to fault due to the fallible nature of humans.

The most notable incident in Western Australia resulted in the death of two persons not involved in the installation process on November 25th 2015 at a Jaxon construction site in East Perth, there were a number of factors involved that were not adhered to and any one of them could potentially have prevented the incident occurring at all, or at the very least mitigated the severity.

I am not at liberty to discuss my knowledge of this incident any further than what is available on public record, but I have had personal discussions with some of the people involved in various aspects of the installation.

While this incident, as do most, required an element of failure or non-compliance to eventuate as it did, formal training of prerequisite processes certainly would have assisted all persons involved in the identification of shortcomings that, if acted upon, would have ensured the required controls were in place to prevent injury or harm.

The response to this incident in Western Australia was an industry wide review of organisational processes and procedures and a spike in training numbers for the aforementioned approved training courses.

To my knowledge since 2015 there has only been one other incident involving precast in Western Australia, May 19th 2018 at a Hanssen construction site in East Perth, following which Hanssen was found guilty of failing to ensure that work was directly supervised by a person who had completed an approved course for managers and supervisors on a site where tilt-up work was being done.

The limited number of recorded incidents in WA in the 2015-2020 period, and the one incident resulting in a prosecution and subsequent conviction for failing to comply with mandatory training and supervision requirements is clearly indicative that precast can be a safe method of construction when persons involved are adequately trained, and in itself supports the intent to create nationally recognised training to allow the development of a national precast concrete construction qualification.

Regards,

Travis Stephens

HSE Manager
Pindan Construction

PINDAN

191 Great Eastern Hwy, Belmont WA 6104

PO Box 93, Belmont WA 6984

travis.stephens@pindan.com.au

T +618

9471

5300

M 0434

331 816

**FUND
BUILD
MANAGE**

Building on Partnerships

Attachment 1 : Section B: Ongoing Stakeholder Consultation throughout 2019

Please note that Attachment 1 is attached as a separate document.