

artibus INNOVATION

Developing industry skills.

IRC SKILLS FORECAST AND PROPOSED SCHEDULE OF WORK

IRC: CONSTRUCTION, PLUMBING AND SERVICES

APRIL 2017

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A. ADMINISTRATIVE INFORMATION

Name of IRC: Construction, Plumbing and Services

Name of SSO: Artibus Innovation

B. SECTOR OVERVIEW

The construction and plumbing sectors play an important role in the Australian economy. With an annual growth of 1.4%, the construction industry, for example, generates over \$300 billion.¹ The plumbing sector alone generates over \$12 billion in revenue and is expected to have an annual growth rate of 2.5% in the next five years.²

KEY INDUSTRY FACTS

- Most of the industry's businesses are sole traders and small businesses that employ up to twenty people.³
- The majority (>90%) of the workforce in the Construction, Plumbing and Services industry is employed in the private sector.⁴
- The industry is heavily regulated, with licensing and regulatory requirements at national, state and local level.
- Most businesses are Australian owned and their sales occur principally in the domestic market. There is, however, an increasing level of importation of foreign materials and labour.⁵
- The average age of the industry, though varying somewhat by sector is young—the workforce is younger than the national average, with the largest age group being 25–39 years.⁶

With an underlying commitment to evidence-based research, Artibus aims to address the current and emerging skill needs of the building and construction and plumbing services industries.

¹ IBISWorld: Industry at a Glance: <http://clients1.ibisworld.com.au/reports/au/industry/atagance.aspx?entid=306>.

² Ibid.

³ Ibid.

⁴ Australian Bureau of Statistics: 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly (Table 11. Employed Persons by Industry Division of Main Job (2015).

⁵ IBISWorld: Industry Reports on Institutional Building Construction in Australia (2016) and Commercial and Industrial Building Construction in Australia (2016), Land Division and Subdivision and Site Preparation in Australia (2015-16), Concreting, Bricklaying, Roofing and Structural Steel Erection Services in Australia (2015-16), Plastering and Ceiling, Carpentry, Tiling and Carpeting, Painting and Decorating, and Glazing Services in Australia (2015-16), Construction Machinery and Operator Hire, and Metal Cladding, Waterproofing and Scaffolding Services in Australia (2015-16), Architectural, Surveying and Mapping and Specialised Design Services in Australia (2015-16).

⁶ Australian Bureau of Statistics: 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly (Table 11. Employed Persons by Industry Division of Main Job (2015).

THE CPC/CPC08 TRAINING PACKAGE

CONSTRUCTION, PLUMBING, SERVICES TRAINING PACKAGE

- 2 Training Packages
- 103 Qualifications
 - CPC - 54
 - CPC08 - 49
- 4 Skills Set

INDUSTRY STAKEHOLDERS

INDUSTRY STAKEHOLDERS

- Employers
- Employees
- Enterprise
- Peak Bodies
- Unions
- Students/Learners

VET STAKEHOLDERS

VET STAKEHOLDERS

- Australian Industry and Skills Committee (AISC)
- Minister with portfolio responsibility for training packages
- State Training Authorities
- Industry Reference Committees (IRCs)
- State and Territory governments
- Industry Regulators
- Skills Service Organisations (SSOs)
- Registered Training Organisations (RTOs)

INDUSTRY ANALYSIS – CROSS-SECTOR TRENDS AND SKILLS

Industry Survey

Artibus has undertaken two national industry-focused surveys addressing the impact of technological disruption and environmental sustainable processes and products on the CPC Construction, Plumbing and Services Training Package.

The recent *2017 Skills Forecast Survey* addressed changes in current and emerging job roles, future labour supply skills demand and workforce development. More, specifically, it focused on the impact of technology and environmentally sustainable processes on skills required in the Construction and Plumbing Services sectors.

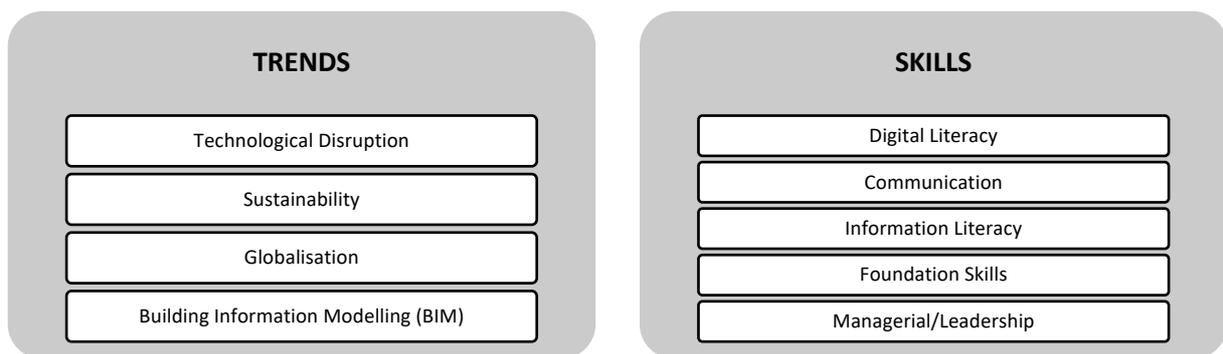
Sample Size

n = 223

Survey Results

The results from Artibus’s Skills Forecast Survey 2017 highlight the emerging importance of the following industry-specific workplace skills and knowledge.

Below is an overview of the identified trends and the specific skills highlighted by industry:



CPC CONSTRUCTION, PLUMBING AND SERVICES SECTORS

INDUSTRY SECTORS	
RESIDENTIAL BUILDING AND NON-RESIDENTIAL BUILDING CONSTRUCTION	
Description	<p><i>Residential Building Construction:</i></p> <p>The Residential Building Construction sector primarily involves the construction of houses or other residential buildings, carrying out alterations, additions or renovations to these buildings or organising or managing these tasks.</p> <p><i>Non-Residential Construction:</i></p> <p>The Non-Residential Building Construction sector involves the construction of non-residential buildings such as hotels, motels, hostels, hospitals, prisons, or other buildings, in carrying out alterations, additions, or renovation to such buildings, or in organising or managing these activities.</p>
Qualifications	<ul style="list-style-type: none"> • CPC10111 Certificate I in Construction • CPC20112 Certificate II in Construction • CPC20211 Certificate II in Construction Pathways • CPC40110 Certificate IV in Building and Construction (Building) • CPC40208 Certificate IV in Building and Construction (Contract Administration) • CPC40308 Certificate IV in Building and Construction (Estimating) • CPC40408 Certificate IV in Building and Construction (Sales) • CPC40508 Certificate IV in Building and Construction (Site Management) • CPC40611 Certificate IV in Building and Construction (Specialist Trades) • CPC40708 Certificate IV in Building and Construction (Trade Contracting)

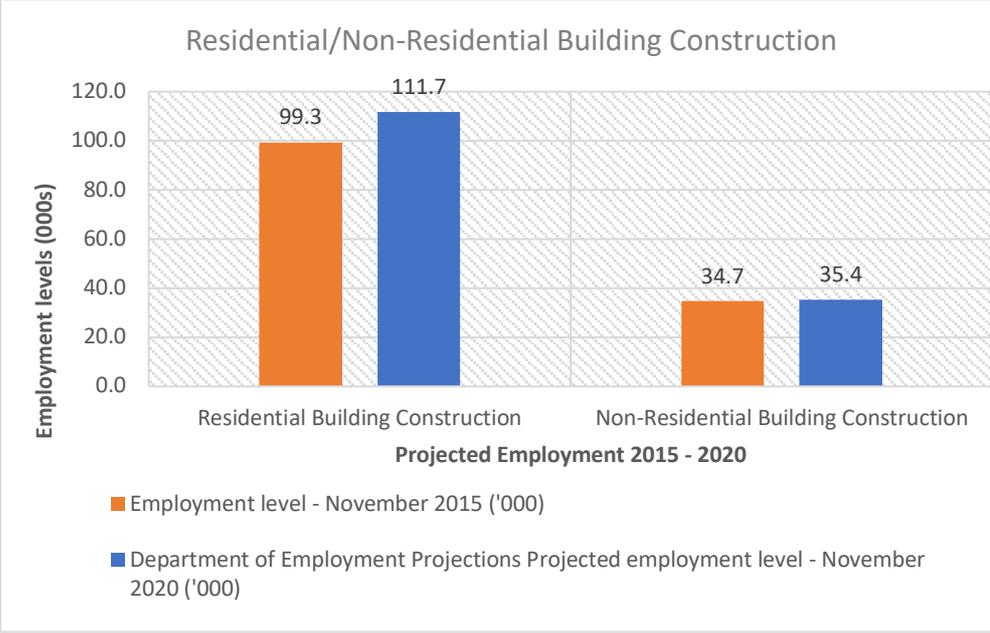
	<ul style="list-style-type: none"> • CPC50210 Diploma of Building and Construction (Building) • CPC50308 Diploma of Building and Construction (Management) • CPC60212 Advanced Diploma of Building and Construction (Management) • (Note: other trade qualifications also apply to this sector, but are listed below in other sectors)
Peak Bodies	<p>Peak bodies for this sector include CEPU, CFMEU, AWU, Air Conditioning and Mechanical Contractors Association, Association of Consultants in Access, Australian Industry Group, Australian Institute of Building, Australian Institute of Building Surveyors, Building Designers Australia, Elevating Work Platform of Australia, Housing Industry Association, Master Builders Association, Master Painters Association, Master Plumbers Association, Master Plumbers and Mechanical Services, National Fire Industry Association, Association of Consultants in Access, and Crane Industry Council of Australia.</p>
Licensing	<p>This sector operates in a highly-regulated environment, which includes state and local government building standards, approvals and zoning regulations, pollution controls and regulations about competing land usage, safety issues and disruption to existing businesses or residents.</p> <p>Builders must be licenced according to state and territory requirements. In the non-residential sector, key players in this regulatory framework include the Australian Building Codes Board, Standards Australia, the Australian Procurement and Construction Council, Australian Institute of Building, builders' licensing authorities and industry associations.</p> <p>In addition to this, those undertaking government contracts must hold international quality management accreditation (ISO 9001).</p>
Analysis of Businesses	<p>As of 2015, there were 59 426 businesses operating in the residential building construction sector. Between June 2014 and June 2015, 11 397 businesses entered the sector, and 7708 businesses exited. One-person operations make up 63% of all businesses, with a further 36% being microbusinesses (employing between one and nineteen people).⁷</p> <p>With market share spread across a significant number of operators, there are no dominating players in the industry. In housing construction, the great majority of companies are domestically owned, but there is a growing level of foreign ownership in other residential building construction (e.g. the Australian multi-unit market).⁸</p> <p>As of 2015, there were 13 618 businesses operating the in non-residential sector. Between June 2014 and June 2015, 2054 businesses entered the sector, and 1703 businesses exited.</p> <p>Businesses in this sector operate in areas such as institutional building construction and commercial and industrial building construction. One-person operations make up 62% of all businesses in this sector, and almost all are in the private sector (99% of all employees).⁹ The sector has a low level of globalisation, although this is slowly changing.¹⁰</p>

⁷ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

⁸ IBISWorld: Industry Reports on House Construction and Multi-Unit Apartment and Townhouse Construction in Australia (2015-16).

⁹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

¹⁰ IBISWorld: Industry Reports on Institutional Building Construction in Australia (2016) and Commercial and Industrial Building Construction in Australia (2016).

<p>Projected Employment Levels¹¹</p>	 <p style="text-align: center;">Residential/Non-Residential Building Construction</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Employment level - November 2015 ('000)</th> <th>Department of Employment Projections Projected employment level - November 2020 ('000)</th> </tr> </thead> <tbody> <tr> <td>Residential Building Construction</td> <td>99.3</td> <td>111.7</td> </tr> <tr> <td>Non-Residential Building Construction</td> <td>34.7</td> <td>35.4</td> </tr> </tbody> </table> <p style="text-align: center;">Projected Employment 2015 - 2020</p> <p>■ Employment level - November 2015 ('000) ■ Department of Employment Projections Projected employment level - November 2020 ('000)</p>	Category	Employment level - November 2015 ('000)	Department of Employment Projections Projected employment level - November 2020 ('000)	Residential Building Construction	99.3	111.7	Non-Residential Building Construction	34.7	35.4
Category	Employment level - November 2015 ('000)	Department of Employment Projections Projected employment level - November 2020 ('000)								
Residential Building Construction	99.3	111.7								
Non-Residential Building Construction	34.7	35.4								
<p>Automation, Globalisation, and Digitalisation</p>	<p>The following have been identified as having the potential to impact the job and skilling requirements for future workers:</p> <ul style="list-style-type: none"> • Cloud-based office • 3D printing • Cross-laminated timber products • Structural insulated panels • Water re-use technologies • BIM • Prefabrication • Automation • Sustainability regulations (NABERS, Greenstar, LEED etc.) • Virtual reality • Collaborative methodologies • Non-conforming products • Robotics • New materials such as Hebel and preform 									
<p>Supply-Side Challenges and Opportunities</p>	<p><i>Residential Building Construction:</i></p> <p>As of 2014, there were 13 310 students enrolled in CPC or CPC08 qualifications.¹²</p> <p>On average, 77% of students are employed following training.¹³</p> <p>Skills shortages have been reported in the following areas:¹⁴</p> <ul style="list-style-type: none"> • Construction estimator (for residential construction, requiring five to ten years' 									

¹¹ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

¹² National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

¹³ Ibid.

¹⁴ Department of Employment, Skill Shortage List, Australia 2015.

	<p>experience)</p> <ul style="list-style-type: none"> • Qualified stonemasons (a shortage for the past nine years out of ten). <p><i>Non-Residential Building Construction:</i></p> <p>As of 2014, there were 6212 students enrolled in CPC or CPC08 qualifications.¹⁵ On average, 77% of students are employed following training.¹⁶</p> <p>Skills shortages have been reported in the following areas:¹⁷</p> <ul style="list-style-type: none"> • Qualified stonemasons (a shortage for the past nine years out of ten). <p>The sector is dominated by non-employing businesses and microbusinesses, which has implications on the capacity to employ staff (particularly apprentices and trainees) and on training expenditure.</p> <p>Technological change is having an increasing impact on the operations of this sector, particularly in areas such as automation, use of new products and processes (e.g. prefabrication) and the use of software to manage the construction lifecycle.¹⁸</p> <p>Energy efficiency is also now a key consideration for the industry, supported by tightening minimum energy efficiency standards and the establishment of ratings schemes in this area.</p> <p>The requirement to qualify for state or territory registration or licensing can present a real barrier for new entrants.</p> <p>Businesses in this sector rely heavily on established reputations and existing relationships with networks of business contacts, which also represent a challenge for new entrants.¹⁹</p>
<p>Activities</p>	<p>The current Activity Orders relevant to this sector include:</p> <ul style="list-style-type: none"> • Case for Change for Construction and Construction Pathways Qualifications • Prepare to work safely in the construction industry unit of competency
<p>LAND DEVELOPMENT AND SITE PREPARATION</p>	
<p>Description</p>	<p>This sector primarily involves subdividing land into lots and servicing land, as well as demolition and earthmoving work such as levelling construction sites, excavation of foundations or removal of overburden.</p>
<p>Qualifications</p>	<ul style="list-style-type: none"> • CPC10111 Certificate I in Construction • CPC20112 Certificate II in Construction • CPC20211 Certificate II in Construction Pathways • CPC30413 Certificate III in Demolition • CPC41013 Certificate IV in Demolition

¹⁵ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

¹⁶ Ibid.

¹⁷ Department of Employment, Skill Shortage List, Australia 2015.

¹⁸ Artibus Innovation Industry Survey, June 2016.

¹⁹ IBISWorld: Industry Reports on Institutional Building Construction in Australia (2016) and Commercial and Industrial Building Construction in Australia (2016).

<p>Peak Bodies</p>	<p>AMWU, CEPU, CFMEU, Australian Workers Union, Australian Industry Group, Australian Institute of Building, Building Designers Australia, Elevating Work Platform, Master Builders Association, Housing Industry Association.</p>						
<p>Licensing</p>	<p>State and local governments currently oversee industry regulation, which relates to land use zoning, treatment of waste, permitted construction materials, population density, building design and minimum elevation of properties.</p> <p>Complying with these regulations necessitates a significant amount of time spent on the preparation and submission of legal paperwork and documentation.</p> <p>On-site preparation and use of each type of site machinery generally requires endorsed licenses for operators. State and territory authorities oversee occupational health and safety regulations.²⁰</p>						
<p>Analysis of Businesses</p>	<p>As of 2015, there were 28 083 businesses operating in this sector. Between June 2014 and June 2015, 3615 businesses entered the sector, and 3407 businesses exited. One-person operations make up 67% of all businesses.²¹</p> <p>Many of the operators working in land development and subdivision are small-scale residential property developers. In contrast, those operators working in site preparation tend to have their operations in other industries, such as equipment and material wholesaling or manufacturing, building construction, or road and mine construction.²²</p>						
<p>Projected Employment Levels²³</p>	<div style="text-align: center;"> <p>Land Development and Site Preparation</p> <table border="1"> <caption>Projected Employment Levels (000s)</caption> <thead> <tr> <th>Year</th> <th>Employment Level (000s)</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>39.4</td> </tr> <tr> <td>2020</td> <td>37.7</td> </tr> </tbody> </table> <p>Land Development and Site Preparation Services</p> <p>Projected Employment 2015 - 2020</p> </div>	Year	Employment Level (000s)	2015	39.4	2020	37.7
Year	Employment Level (000s)						
2015	39.4						
2020	37.7						

²⁰ Ibid.

²¹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

²² IBISWorld: Industry Reports on Land Division and Subdivision and Site Preparation in Australia (2015-16).

²³ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

Automation, Globalisation, and Digitalisation	<p>The following have been identified as having the potential to impact the job and skilling requirements for future workers in this industry sector:</p> <ul style="list-style-type: none"> • Cloud-based office • 3D printing • Cross-laminated timber products • BIM • Prefabrication (modular and off-site preparation) • Use of drones • Automation and robotics • Use of technology in all construction activity, including deconstruction
Supply-Side Challenges and Opportunities	<p>This sector has a low level of globalisation, and there is no significant international trade activity.</p> <p>There is a heavy reliance on technology and machinery, with the bigger businesses in a better position to win contracts over smaller operators due to the need to access or own the necessary equipment.</p> <p>Many of the employees in this sector—for example, earthmoving labourers or builder’s labourers—only have lower levels of skills or training. However, there is also a need for highly skilled and specialised staff due to the increasing use of technology and high level of regulation.</p> <p>This sector is highly transient and many businesses are only in the industry on a short-term basis, meaning workers need a broader skill base and the ability to adapt to work in other industries.²⁴</p> <p>As of 2014, there were 5057 students enrolled in CPC or CPC08 qualifications.²⁵ On average, 79% of students are employed following training.²⁶</p> <p>One-person operations or small businesses make up 98% of businesses in this industry, which has implications for their capacity to employ and train (particularly apprentices and trainees) and undertake professional development.</p> <p>This sector is highly transient, and many businesses are only in the industry on a short-term basis.</p> <p>The level of regulation means that there is a market for highly skilled and specialised staff such as surveyors and valuers, as well as building labourers and machinery operators.</p> <p>There is also a pathway issue, with the pathways available through the training system being unsuitable for industry’s needs.</p>
Activities	<p>The current Activity Orders relevant to this sector include:</p> <ul style="list-style-type: none"> • Case for Change for Construction and Construction Pathways Qualifications • Prepare to work safely in the construction industry unit of competency. • Update of Certificate III and IV in Demolition

²⁴ Ibid.

²⁵ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

²⁶ Ibid.

BUILDING STRUCTURE SERVICES	
Description	Relevant subsectors include concreting, bricklaying and blocklaying, roofing services and structural steel erection services.
Qualifications	<ul style="list-style-type: none"> • CPC10111 Certificate I in Construction • CPC20112 Certificate II in Construction • CPC20211 Certificate II in Construction Pathways • CPC20812 Certificate II in Metal Roofing and Cladding • CPC30111 Certificate III in Bricklaying/Blocklaying • CPC32313 Certificate III in Stonemasonry (Monumental/Installation) • CPC30313 Certificate III in Concreting • CPC30812 Certificate III in Roof Tiling • CPC31111 Certificate III in Steel Fixing • CPC31611 Certificate III in Paving
Peak Bodies	Relevant peak bodies include Australian Brick and Blocklaying Training Foundation, AMWU, CEPU, CFMEU, Australian Workers Union, Australian Institute of Building, Australian Industry Group, Elevating Work Platform, Housing Industry Association, Master Builders Association, Master Plumbers and Mechanical Services, and Metal Roofing and Cladding Association.
Licensing	The level of regulation and licensing varies according to the trade involved, with each type of building structure services (e.g. roofing, concreting, bricklaying and structural steel erection) subject to its own building codes, insurance requirements and operator certification.
Analysis of Businesses	<p>As of 2015, there were 27 024 businesses operating in this sector. Between June 2014 and June 2015, 4238 businesses entered the sector, and 4038 businesses exited. Of all businesses in this sector, 56% are one-person operations, a lower proportion of businesses compared to the industry overall. Small operators employing between one and nineteen employees make up 43% of businesses.²⁷</p> <p>The sector is characterised by many small-scale operators, many of which increase in size during growth phases in the housing cycle and contract accordingly. This sector also has relationships with labour-hire organisations that assist in meeting this changeable demand for labour.²⁸</p>

²⁷ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

²⁸ IBISWorld: Industry Reports on Concreting, Bricklaying, Roofing and Structural Steel Erection Services in Australia (2015-16).

<p>Projected Employment Levels²⁹</p>	<p style="text-align: center;">Building Structure Services</p> <table border="1"> <caption>Projected Employment 2015 - 2020</caption> <thead> <tr> <th>Year</th> <th>Employment Level ('000)</th> </tr> </thead> <tbody> <tr> <td>November 2015</td> <td>90.1</td> </tr> <tr> <td>November 2020 (Projected)</td> <td>96.8</td> </tr> </tbody> </table> <p style="text-align: center;">Projected Employment 2015 - 2020</p> <ul style="list-style-type: none"> ■ Employment level - November 2015 ('000) ■ Department of Employment Projections Projected employment level - November 2020 ('000) 	Year	Employment Level ('000)	November 2015	90.1	November 2020 (Projected)	96.8
Year	Employment Level ('000)						
November 2015	90.1						
November 2020 (Projected)	96.8						
<p>Automation, Globalisation, and Digitalisation</p>	<p>The following have been identified as having the potential to impact the job and skilling requirements for future workers in this industry sector:</p> <ul style="list-style-type: none"> • Concrete slabs replacing timber floors • Cross-laminated and engineered timber products • Energy use technologies (batteries and solar storage, water re-use technologies) • BIM • Prefabrication • Light-weight housing • Augmented reality devices to enhance industry training 						
<p>Supply-Side Challenges and Opportunities</p>	<p>This sector has limited formal qualifications and barriers to entry are generally low—new entrants can often enter easily from other construction trades.</p> <p>There are a high number of unskilled workers employed in this sector, with approximately one third having only completed Year 10 or 11 as their highest level of educational attainment.³⁰</p> <p>It is important to note that 99% of operators are employed by the private sector.³¹ This sector of the industry has a low level of globalisation, with little prospect for international expansion.³²</p> <p>As of 2014, there were 12 127 students enrolled in CPC or CPC08 qualifications.³³ On average, 84% of students are employed following training.³⁴</p>						

²⁹ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

³⁰ Commonwealth Department of Employment (Labour Market Information Portal): Educational Attainment by Industry Sector (2014).

³¹ Australian Bureau of Statistics: 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly (Table 11. Employed Persons by Industry Division of Main Job (2015).

³² IBISWorld: Industry Reports on Concreting, Bricklaying, Roofing and Structural Steel Erection Services in Australia (2015-16).

³³ Ibid.

	<p>Skills shortages have been reported in the following areas:³⁵</p> <ul style="list-style-type: none"> • Bricklayer (shortage in six out of the last ten years) • Roof tiler (shortage in nine out of the last ten years) • Sheet metal trades worker (shortage in nine out of the last ten years). <p>Current enrolments in relevant courses in the CPC are very low for roof tilers and structural steel workers.³⁶ There are low numbers enrolled in Bricklaying apprenticeships and high numbers of cancellations and withdrawals.³⁷</p> <p>A high number of unskilled workers are employed in this sector, with 30% having completed year 10 and 11 as their highest level of educational attainment.³⁸</p>
Activities	<p>The current Activity Orders relevant to this sector include updating the following qualifications:</p> <ul style="list-style-type: none"> • Certificate III in Concreting • Certificate III in Post-Tensioning • Bricklaying/Blocklaying: Stonemasonry and Paving components • Plumbing and Services qualifications
BUILDING INSTALLATION SERVICES	
Description	Subsectors include plumbing and services and fire and security alarm installation and maintenance.
Building Installation Services	<ul style="list-style-type: none"> • CPC20712 Certificate II in Drainage • CPC20912 Certificate II in Urban Irrigation • CPC32413 Certificate III in Plumbing • CPC32513 Certificate III in Plumbing (Mechanical Services) • CPC32612 Certificate III in Roof Plumbing • CPC32713 Certificate III in Gas Fitting • CPC40912 Certificate IV in Plumbing and Services • CPC50412 Diploma of Plumbing and Services • CPC50612 Diploma of Hydraulic Services Design • CPC32813 Certificate III in Fire Protection • CPC50509 Diploma of Fire Systems Design • CPC80115 Graduate Certificate in Fire Systems Design Management
Peak Bodies	Relevant peak bodies include AMWU, CEPU, CFMEU, Australian Workers Union, Air Conditioning and Mechanical Contractors Association, Australian Institute of Building, Australian Industry Group, Building Designers Australia, Elevating Work Platform, Housing Industry Association, Master Builders Association, Master Plumbers and Mechanical

³⁴ Ibid.

³⁵ Department of Employment, Skill Shortage List, Australia 2015.

³⁶ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

³⁷ Ibid.

³⁸ Commonwealth Department of Employment (Labour Market Information Portal): Educational Attainment by Industry Sector (2014).

	Services, Metal Roofing and Cladding Association, National Fire Industry Association.						
Licensing	The level of regulation is heavy across each area of the sector, with stringent registration and licensing controls governing the entry of new contractors and business operations, administered separately by each state and territory.						
Analysis of Businesses	<p>As of 2015, there were 76 101 businesses operating in this sector (25 193 in plumbing services, 6397 in air-conditioning and heating services, 3168 in fire and security alarm installation).</p> <p>Between June 2014 and June 2015, 10 238 businesses entered the sector, and 9256 businesses exited.³⁹ One-person operations make up 48% of all businesses, a lower proportion than the industry’s average. Over half (51%) of businesses are small operators, with one to nineteen employees.⁴⁰</p> <p>The plumbing services industry has the largest number of sole operators or partnerships in this sector, though in recent times, larger scale plumbing businesses have emerged, capturing larger scale contract work.</p>						
Projected Employment Levels⁴¹	<p style="text-align: center;">Building Installation Services</p> <table border="1"> <caption>Projected Employment Levels for Building Installation Services</caption> <thead> <tr> <th>Year</th> <th>Employment Level ('000)</th> </tr> </thead> <tbody> <tr> <td>November 2015</td> <td>~255.0</td> </tr> <tr> <td>November 2020 (Projected)</td> <td>287.2</td> </tr> </tbody> </table> <p style="text-align: center;">Projected Employment 2015 - 2020</p> <p>■ Employment level - November 2015 ('000)</p> <p>■ Department of Employment Projections Projected employment level - November 2020 ('000)</p>	Year	Employment Level ('000)	November 2015	~255.0	November 2020 (Projected)	287.2
Year	Employment Level ('000)						
November 2015	~255.0						
November 2020 (Projected)	287.2						
Automation, Globalisation, and Digitalisation	<p>The following have been identified as important in building skills capability in this industry sector:</p> <ul style="list-style-type: none"> • CO testing • Electronic processing of documents • Press-fit fittings for copper • Electronics in gas appliances • Electronic control of pumps 						

³⁹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

⁴⁰ Ibid.

⁴¹ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

	<ul style="list-style-type: none"> • Cloud-based scheduling • Sustainability and renewable energies, e.g. biogas plants, waste-to-energy projects, solar energy • Pipe-crimping technology and plastics • Electronic Certificates of Compliance • Push-fit drainage • BPress piping systems • Pipe locating technology • Smartphone apps that affect how plumbing work is communicated • Use of non-standard materials • Type B gas fitting
<p>Supply-Side Challenges and Opportunities</p>	<p>The degree of globalisation across this sector is low, and there is low exposure to international trade.⁴²</p> <p>Despite this, significant regulatory change is predicted in the domestic air-conditioning sector as a response to international agreements on the discontinuation of ozone-depleting refrigerants.⁴³</p> <p>Technological change is driving significant changes to job roles in some sectors (e.g. plumbing, where plumbers will need to develop skills in constructing airtight buildings and integrated plumbing systems).⁴⁴</p> <p>As of 2014, there were 34 276 students enrolled in CPC or CPC08 qualifications.⁴⁵ On average, 80% of students are employed following training.⁴⁶</p> <p>The Master Plumber's Association advises that current and emerging skills gaps exist in some specialised plumbing areas such as type B gas and gas servicing, as well as on some of the new technologies including blackwater and greywater treatment plants.⁴⁷</p>
<p>Activities</p>	<p>The current Activity Order relevant to this sector is to update Plumbing and Services qualifications.</p> <p>In addition, a Case for Change is being developed to review the following fire-related qualifications:</p> <ul style="list-style-type: none"> • CPC32813 Certificate III in Fire Protection • CPC50509 Diploma of Fire Systems Design • CPC80115 Graduate Certificate in Fire Systems Design Management <p>Note: As per an industry recommendation, a review of Certificate IV in Fire Systems Compliance (30903QLD) will be undertaken to evaluate its incorporation into the national training package.</p>
<p>BUILDING COMPLETION SERVICES</p>	

⁴² IBISWorld: Industry Reports on Concreting, Bricklaying, Roofing and Structural Steel Erection Services in Australia (2015-16).

⁴³ Energy Efficiency in HVACR, Australian Refrigeration Association (2016)

⁴⁴ Ibid.

⁴⁵ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁴⁶ Ibid.

⁴⁷ Construction and Property Services Industry Skills Council: CPSCIC Environmental Scan 2015-16, Appendices (Plumbing Sector – Snapshot)

Description	Relevant subsectors include carpentry and joinery, plastering and ceiling services, tiling and lining, and painting and decorating. This sector is also referred to as ‘finishing trades’.
Qualifications	<ul style="list-style-type: none"> • CPC10111 Certificate I in Construction • CPC20112 Certificate II in Construction • CPC20211 Certificate II in Construction Pathways • CPC30211 Certificate III in Carpentry • CPC30611 Certificate III in Painting and Decorating • CPC31011 Certificate III in Solid Plastering • CPC31211 Certificate III in Wall and Ceiling Lining • CPC31511 Certificate III in Formwork/Falsework • CPC31311 Certificate III in Wall and Floor Tiling • CPC31812 Certificate III in Shop fitting • CPC31912 Certificate III in Joinery • CPC32011 Certificate III in Carpentry and Joinery • CPC32211 Certificate III in Joinery (Stairs)
Peak Bodies	Relevant peak bodies include AMWU, CEPU, CFMEU, Australian Workers Union, Air Conditioning and Mechanical Contractors Association, Australian Institute of Building, Australian Industry Group, Building Designers Australia, Elevating Work Platform, Housing Industry Association, Master Builders Association, Master Painters Association, ICANZ.
Licensing	<p>There is a medium level of regulation across the plastering and ceiling services, carpentry, and glazing trades, with a similar regulatory environment to other building and construction trades—compliance with Australian Standards, health and safety regulations, environmental regulations (noise and waste). There are generally accepted pathways for entry to the industry via the traditional four-year apprenticeship model.</p> <p>In painting and decorating, the level of regulation is lighter, though there are still regulations governing health and safety and paint products. There is a voluntary certification program for painting contractors who can meet certain minimum performance standards.⁴⁸</p>
Analysis of Businesses	<p>As of 2015, there were 93 193 businesses operating in this sector. Between June 2014 and June 2015, 15 061 businesses entered the sector, and 14 287 businesses exited. One-person operations make up 66% of all businesses.⁴⁹</p> <p>Across the subsectors of plastering and ceiling services, carpentry, glazing, tiling and carpeting, smaller firms working in localised markets dominate the industry.</p> <p>Tiling and painting and decorating services have a few larger players that tend to work in the commercial and institutional building markets.⁵⁰</p>

⁴⁸ Ibid.

⁴⁹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

⁵⁰ IBISWorld: Industry Reports on Plastering and Ceiling, Carpentry, Tiling and Carpeting, Painting and Decorating, and Glazing Services in Australia (2015-16).

<p>Projected Employment Levels⁵¹</p>	<p style="text-align: center;">Building Completion Services</p> <table border="1"> <caption>Projected Employment 2015 - 2020</caption> <thead> <tr> <th>Year</th> <th>Employment Level ('000)</th> </tr> </thead> <tbody> <tr> <td>November 2015</td> <td>~201.0</td> </tr> <tr> <td>November 2020 (Projected)</td> <td>213.1</td> </tr> </tbody> </table> <p style="text-align: center;">Projected Employment 2015 - 2020</p> <ul style="list-style-type: none"> ■ Employment level - November 2015 ('000) ■ Department of Employment Projections Projected employment level - November 2020 ('000) 	Year	Employment Level ('000)	November 2015	~201.0	November 2020 (Projected)	213.1
Year	Employment Level ('000)						
November 2015	~201.0						
November 2020 (Projected)	213.1						
<p>Automation, Globalisation, and Digitalisation</p>	<p>To build skills for the future in this industry sector, the following need to be considered:</p> <ul style="list-style-type: none"> • Cross-laminated timber and massive timber buildings • Prefabrication • 3D printing • Lightweight building components and smart homes • Adhesives, CNC created components, fastenings • CLT and Cassette systems • Plastic wall and flooring components • Use of treated timber • 3D production • Wall cladding systems • Structural insulated panels • Wallpaper mural advancements • Spray technology in painting and decorating • New wall coverings • Low VOC materials and water-based paints • Use of apps and other digital technologies 						
<p>Supply-Side Challenges and Opportunities</p>	<p>This area of the industry has a low level of globalisation, with little to no international trade in services, though some subsectors such as painting and glazing do import a small proportion of materials.⁵²</p> <p>Apprenticeship training, supplemented by short courses, has been the formal entry pathway to most sectors; however, a significant proportion of workers in some areas, such as plastering and ceiling services, are trained on-the-job without formal qualifications.</p> <p>Increasingly, state-based licensing and insurance requirements are putting pressure on those without formal qualifications.⁵³</p>						

⁵¹ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

⁵² Ibid.

⁵³ Ibid.

	<p>As of 2014, there were 54 749 students enrolled in CPC or CPC08 qualifications.⁵⁴ On average, 86% of students are employed following training.⁵⁵</p> <p>Despite the high numbers of students in training, the industry has reported skills shortages in the following areas:⁵⁶</p> <ul style="list-style-type: none"> • Painting Trades Worker (shortage for four years over the last ten) • Solid Plasterer (shortage for six years over the last ten) • Fibrous plasterer (shortage for four years over the last ten) • Wall and floor tiler (shortage for five years out of the last ten) <p>Barriers to entry in the plastering and ceiling services industry are low, as indicated by the high levels of entry and exit of establishments. The dominance of gypsum plasterboard in the cladding of walls and ceilings, in conjunction with the steady reduction of solid wet plaster over recent decades, has resulted in the level of skilled input into construction steadily diminishing.</p> <p>The higher levels of qualification previously needed no longer pose a prohibitive barrier to entry.⁵⁷ Apprenticeship training, augmented by intensive short courses, has been the formal entrance qualification to the industry, but on-the-job training is estimated to account for about 60% of the industry's workforce. Experienced trade-qualified plasterers suggest that 18 months on the job is adequate training for plasterboard fixers.</p> <p>However, new entrants are better placed to compete on larger scale contracts or to subcontract to major building contractors if they hold formal qualifications.⁵⁸</p> <p>In New South Wales, government regulations require that plasterers (along with other building industry trades) be licensed to operate, but this is not the case in other jurisdictions.</p> <p>In carpentry, tradespeople trained on-the-job face increasing difficulty in contracting due to state-based licensing and insurance requirements. The National Building Professionals Register is expected to become the base prerequisite for tendering for contracts in the carpentry services industry and will form a barrier to new entrants without registration.⁵⁹</p> <p>In many areas of the industry, the main barrier faced by new entrants is their lack of proven reputation for reliability and quality in an industry where established contacts are so important.</p>
<p>Activities</p>	<p>At this stage, Activity Orders relevant to this sector include:</p> <ul style="list-style-type: none"> • Case for Change for Construction and Construction Pathways Qualifications • Prepare to work safely in the construction industry unit of competency
<p>OTHER CONSTRUCTION SERVICES</p>	
<p>Description</p>	<p>This sector mainly includes services not elsewhere classified, such as scaffolding, dogging, rigging, post-tensioning, waterproofing of buildings, and swimming pool and spa building.</p>

⁵⁴ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁵⁵ Ibid.

⁵⁶ Department of Employment, Skill Shortage List, Australia 2015.

⁵⁷ IBISWorld: Industry Reports on Plastering and Ceiling, Carpentry, Tiling and Carpeting, Painting and Decorating, and Glazing Services in Australia (2015-16).

⁵⁸ Ibid.

⁵⁹ Ibid.

Qualifications	<ul style="list-style-type: none"> • CPC30511 Certificate III in Dogging • CPC30711 Certificate III in Rigging • CPC30911 Certificate III in Scaffolding • CPC31411 Certificate III in Construction Waterproofing • CPC31712 Certificate III in Post-Tensioning • CPC32912 Certificate III in Construction Crane Operations • CPC40808 Certificate IV in Swimming Pool and Spa Building
Peak Bodies	<p>Relevant peak bodies include AMWU, CEPU, CFMEU, Australian Workers Union, Australian Institute of Building, Australian Industry Group, Building Designers Australia, Elevating Work Platform, Housing Industry Association, Master Builders Association, Australian Institute of Waterproofing, Swimming Pool and Spa Association, and Crane Industry Council of Australia.</p>
Licensing	<p>Across this sector, licensing requirements range from medium to heavy, given the regular use of machinery and the involvement of high-risk construction work.</p> <p>Contractors are required to hold formal certification in some areas, most notably for scaffolding services and for equipment operators; in addition, businesses must comply with a range of Australian and international standards and occupational health and safety regulations.</p> <p>Relevant licences for this sector are offered as individual units of competency by Registered Training Organisations.⁶⁰</p>
Analysis of Businesses	<p>As of 2015, there were 33 648 businesses operating in this sector. Between June 2014 and June 2015, 5271 businesses entered the sector, and 4929 businesses exited. Of all businesses, 60% are one-person operations.⁶¹</p> <p>This sector contains a diverse range of businesses, ranging from machinery and operator hire to metal cladding, waterproofing and scaffolding.</p> <p>There is some level of foreign ownership in areas such as machinery operation and hire (e.g. crane operation companies); however, the majority of firms are still small to medium scale businesses, operating in narrow geographic and niche markets. Over 99% of the industry is employed in the private sector.⁶²</p>

⁶⁰ Ibid.

⁶¹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

⁶² IBISWorld: Industry Reports on Construction Machinery and Operator Hire, and Metal Cladding, Waterproofing and Scaffolding Services in Australia (2015-16).

<p>Projected Employment Levels⁶³</p>	<p style="text-align: center;">Other Construction Services</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Employment Level ('000)</th> </tr> </thead> <tbody> <tr> <td>November 2015</td> <td>105.2</td> </tr> <tr> <td>November 2020 (Projected)</td> <td>121.0</td> </tr> </tbody> </table> <p style="text-align: center;">Other Construction Services Projected Employment 2015 - 2020</p> <p>■ Employment level - November 2015 ('000)</p> <p>■ Department of Employment Projections Projected employment level - November 2020 ('000)</p>	Year	Employment Level ('000)	November 2015	105.2	November 2020 (Projected)	121.0
Year	Employment Level ('000)						
November 2015	105.2						
November 2020 (Projected)	121.0						
<p>Automation, Globalisation, and Digitalisation</p>	<p>The following need to be taken into consideration when developing knowledge and skills for future work in this industry sector:</p> <ul style="list-style-type: none"> • Robotics and remote operation • Energy saving and water saving equipment • New construction materials 						
<p>Supply-Side Challenges and Opportunities</p>	<p>As of 2014, there were 5128 students enrolled in CPC or CPC08 qualifications.⁶⁴</p> <p>On average, 81% of students are employed following training.⁶⁵ There is a higher proportion of part-time workers in this sector than other construction services sectors, partially due to the transient nature of the work.</p> <p>There are low numbers of students in training in many of the relevant trades in this sector, and high numbers of apprenticeship withdrawals.⁶⁶ Higher-level courses in management are not being utilised.</p> <p>The main challenges in this industry relate to equipment cost, maintenance and operation and work safety regulations. There are a higher proportion of part-time workers in this sector than other construction services sectors, partially due to the transient nature of the work.</p> <p>This sector is divided in the challenges it presents to new entrants—in some areas such as construction machinery and operator hire, there are high barriers to entry due to the high cost of purchasing and maintaining the capital equipment required and the sector’s tight regulatory environment.</p> <p>In others, such as scaffolding, metal cladding and waterproofing, businesses enter and exit the industry according to fluctuations in revenue and demand for services.⁶⁷</p>						

⁶³ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

⁶⁴ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

	Weather conditions, terrain and access issues, availability of equipment and delays in project commencements and time frames all present challenges to businesses operating in this space.
Activities	Currently the Activity Order for this sector only includes updating the High-Risk Work Qualification including dogging, rigging, scaffolding, steel fixing and construction, crane operations and post-tensioning.
ARCHITECTURAL, ENGINEERING AND TECHNICAL SERVICES	
Description	This sector includes building design, building surveying and signage.
Qualifications	<ul style="list-style-type: none"> • CPC30216 Certificate III in Signs and Graphics • CPC60115 Advanced Diploma of Building Surveying • CPC80215 Graduate Diploma of Building Surveying
Peak Bodies	Relevant peak bodies include AMWU, CEPU, CFMEU, Australian Workers Union, Australian Institute of Building, Australian Industry Group, Building Designers Australia, Australian Institute of Building Surveyors, Australian Sign and Graphics Association.
Licensing	<p>The Institute of Surveyors regulate the surveying industry, and under the <i>Mutual Recognition Act 1992</i>, licensed surveyors may apply for registration in other states or territories. The industry operates under a broadly consistent legislation across Australia, based on the Model Building Code from the early 1990s.</p> <p>In 2000, the National Building and Surveying Alliance was formed to share information between builders and surveyors.⁶⁸</p> <p>The signage industry is not regulated, though industry workers can apply for membership of the Australian Graphic Design Association, an organisation that also represents those working in specialised design services.</p>
Analysis of Businesses	<p>As of 2015, there were 63 024 businesses operating in this sector. Between June 2014 and June 2015, there was a slight net decline in the number of businesses (<1%). As of 2015, 53% of businesses were non-employed, and 45% employed between one and nineteen people.⁶⁹</p> <p>This sector has low levels of foreign ownership and globalisation; however, these levels are increasing. The requirement for registration and accreditation limits import competition. Some local surveying firms also operate in international markets.⁷⁰</p>

⁶⁸ Ibid.

⁶⁹ Australian Bureau of Statistics: 81650 Counts of Australian Businesses, including Entries and Exits, June 2011- June 2015.

⁷⁰ IBISWorld: Industry Reports on Architectural, Surveying and Mapping and Specialised Design Services in Australia (2015-16).

<p>Projected Employment Levels⁷¹</p>	<p style="text-align: center;">Architectural, Engineering, and Technical Services</p> <table border="1"> <caption>Projected Employment 2015 - 2020</caption> <thead> <tr> <th>Year</th> <th>Employment Level (000s)</th> </tr> </thead> <tbody> <tr> <td>November 2015</td> <td>308.1</td> </tr> <tr> <td>November 2020 (Projected)</td> <td>368.2</td> </tr> </tbody> </table> <p style="text-align: center;">Projected Employment 2015 - 2020</p> <p>■ Employment level - November 2015 ('000) ■ Department of Employment Projections Projected employment level - November 2020 ('000)</p>	Year	Employment Level (000s)	November 2015	308.1	November 2020 (Projected)	368.2
Year	Employment Level (000s)						
November 2015	308.1						
November 2020 (Projected)	368.2						
<p>Automation, Globalisation, and Digitalisation</p>	<p>Skills and knowledge in the following will be required for this industry sector:</p> <ul style="list-style-type: none"> • Unmanned Aerial Vehicles (UAVs) and aerial photography • Handheld global navigation satellite systems (GNSS) and web-based GIS • Precision machine control systems • Advanced total stations, scanners, database management • BIM • LiDAR • Energy efficiency requirements • NABERS, Greenstar, LEED 						
<p>Supply-Side Challenges and Opportunities</p>	<p>It is predicted that this sector will face a 7% decline in employment numbers in the next five years.⁷²</p> <p>The importance of technology and the high cost of equipment is a barrier to entry for the many sole traders and microbusinesses bidding for contracts.⁷³</p> <p>The use of technology has also led to a reduction and separation between the industry occupations.</p> <p>While the knowledge bases remain discrete, the range of technological tools used at task level have led to skill sets that can be used across the range of occupations.</p> <p>There are currently several qualifications from the CPC training package that fall within this sector, though there is some functional overlap between the work outcomes of these and the surveying and spatial design and surveying qualifications in the CPP (Property Services) training package.</p>						

⁷¹ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

⁷² Commonwealth Department of Employment (Labour Market Information Portal): *Industry Employment Growth and Projections by Industry Sector* (2015).

⁷³ IBISWorld: *Industry Reports on Architectural, Surveying and Mapping and Specialised Design Services in Australia* (2015-16).

	<p>The CPC training package contains a Certificate III in Signage and an Advanced Diploma in Building Surveying. As of 2014, there were 696 people enrolled in the Certificate III in Signage.⁷⁴ In this sector employees are most likely to hold a bachelor degree (38%).⁷⁵</p> <p>According to the Department of Employment, shortages are currently being experienced in the following occupations:⁷⁶</p> <ul style="list-style-type: none"> • surveyors (shortage in four years out of the last five) • quantity surveyors (shortage experienced in three years out of the last five).
Activities	Currently there are no Activity Orders for this industry sector.

⁷⁴ Ibid.

⁷⁵ Commonwealth Department of Employment (Labour Market Information Portal): Educational Attainment by Industry Sector (2014).

⁷⁶ Department of Employment, Skill Shortage List, Australia 2015.

C. EMPLOYMENT

EMPLOYMENT OUTLOOK

This section evaluates the employment growth of the Construction, Plumbing and Services industry in Australia, including the aggregate growth of the industry over a period time and the sectors and occupations which are experiencing higher than average growth rates.

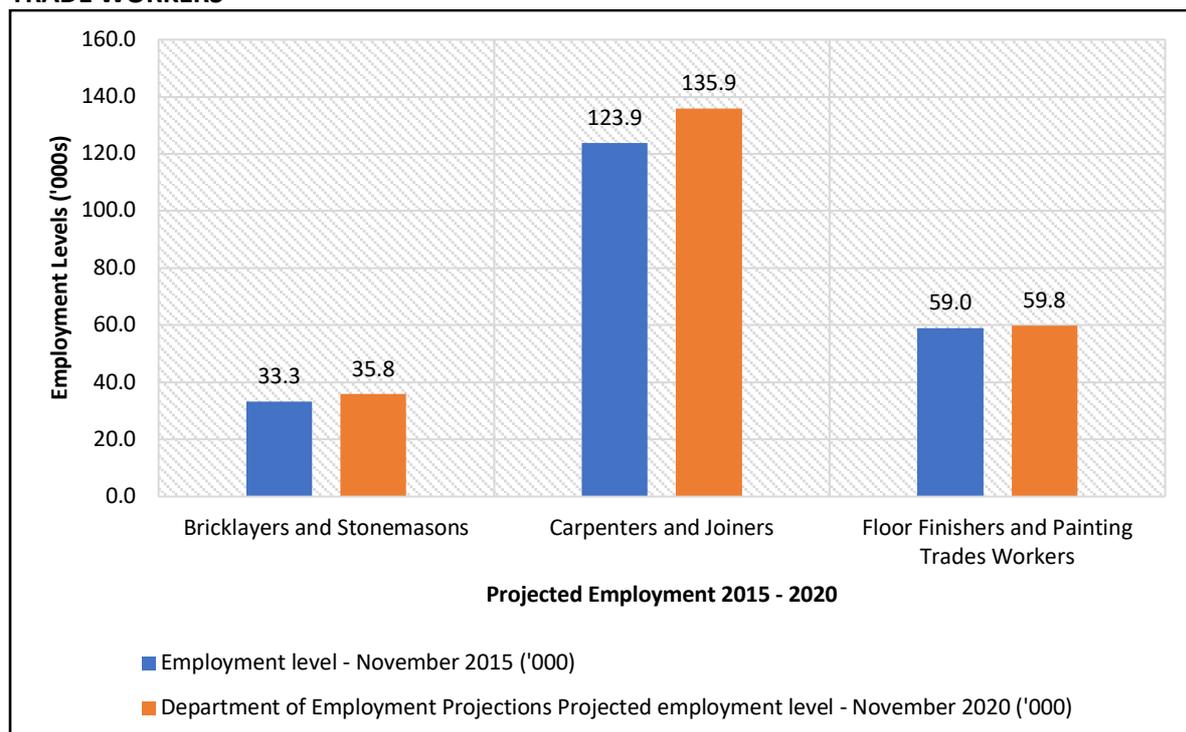
OCCUPATION AND LEVEL OF EMPLOYMENT DATA (ANZSIC)

The construction industry is Australia's biggest by number of operating businesses, with more than 330 000 (or 16%) of all businesses nationally. The industry currently employs over one million people, which accounts for 9% of the national workforce.⁷⁷

Overall, the industry has experienced a slight but steady increase in employment levels since 2012, and is expected to continue at this level of growth to 2020, by which time the industry will employ an estimated 1 200 000 people across the country.

OCCUPATIONAL PROJECTED EMPLOYMENT LEVELS

BRICKLAYERS AND STONEMASONS, CARPENTERS AND JOINERS, FLOOR FINISHERS AND PAINTING TRADE WORKERS⁷⁸

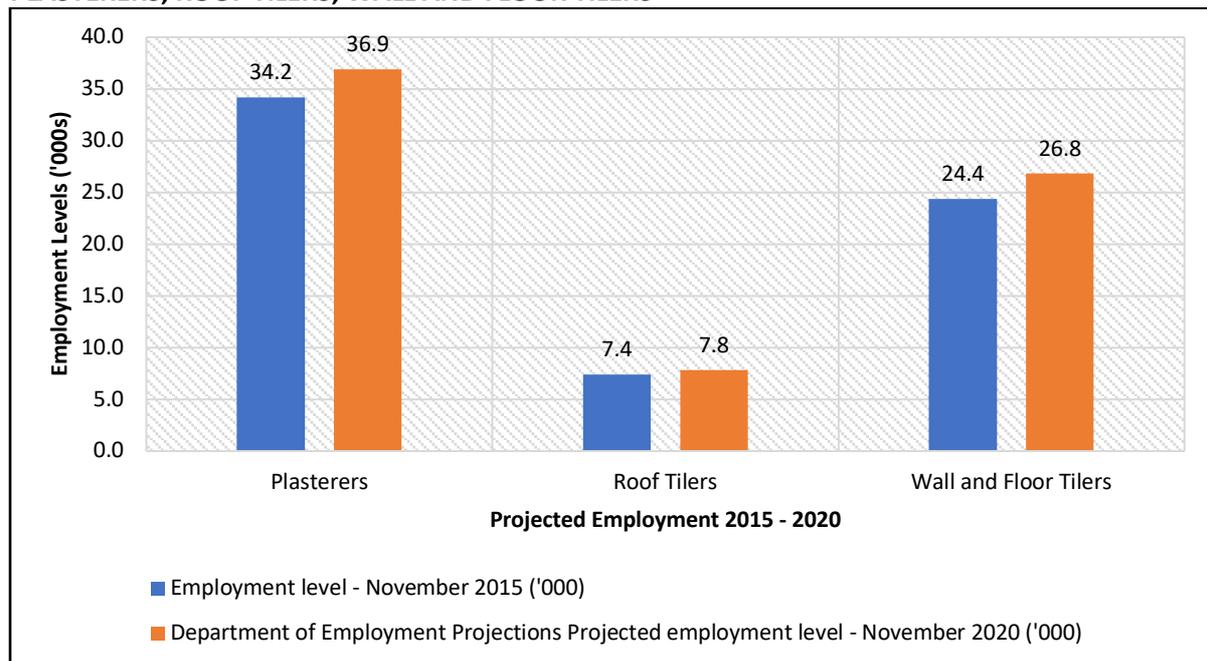


Overall, the projected employments levels for the occupation listed above will incur minor changes in the next four years. Employment levels for carpentry and joinery, however, are expected to increase by 12% by 2020.

⁷⁷ Australian Bureau of Statistics, 2015.

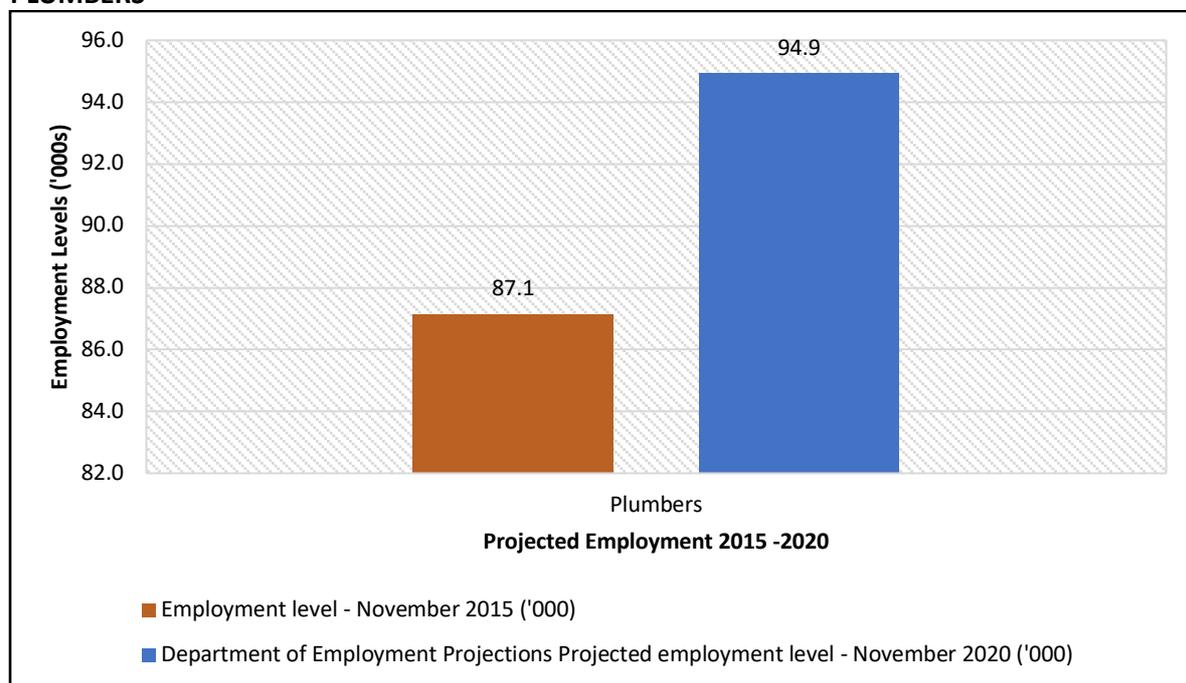
⁷⁸ Australian Department of Employment, Labour Market Information Portal, *Industry Projection – Five Years to November 2020*, 2016.

PLASTERERS, ROOF TILERS, WALL AND FLOOR TILERS⁷⁹



Overall, employment rates for the occupations listed above are on average expected to grow 1.83% by 2020.

PLUMBERS⁸⁰

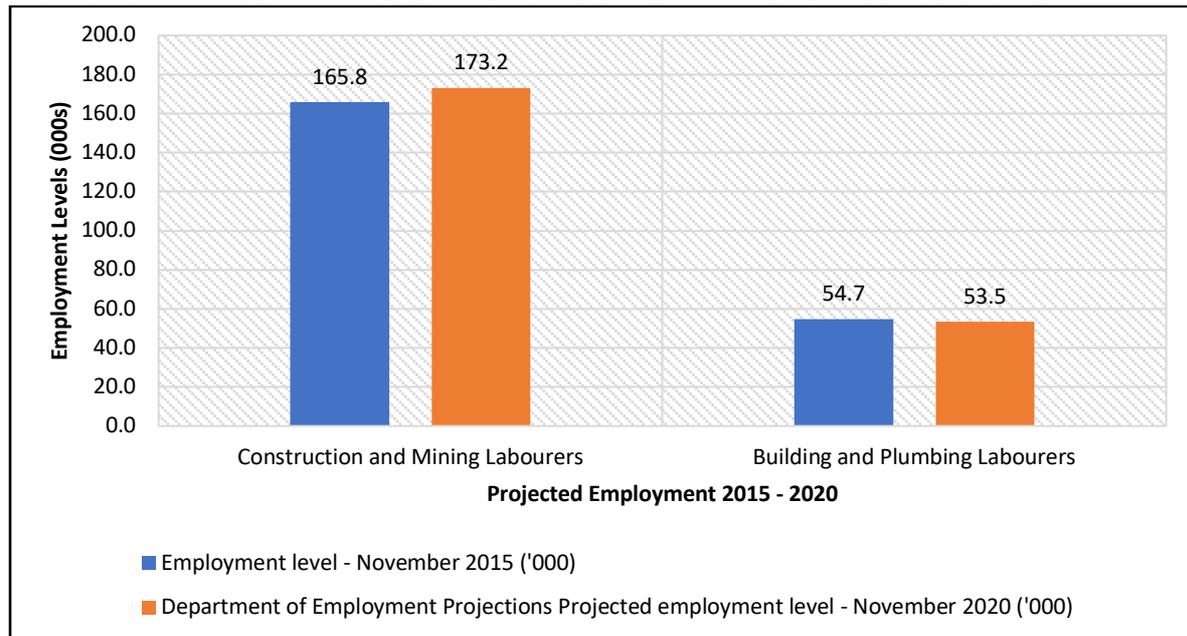


Employment levels for plumbing are expected to rise by 7.8% by 2020.

⁷⁹ Ibid.

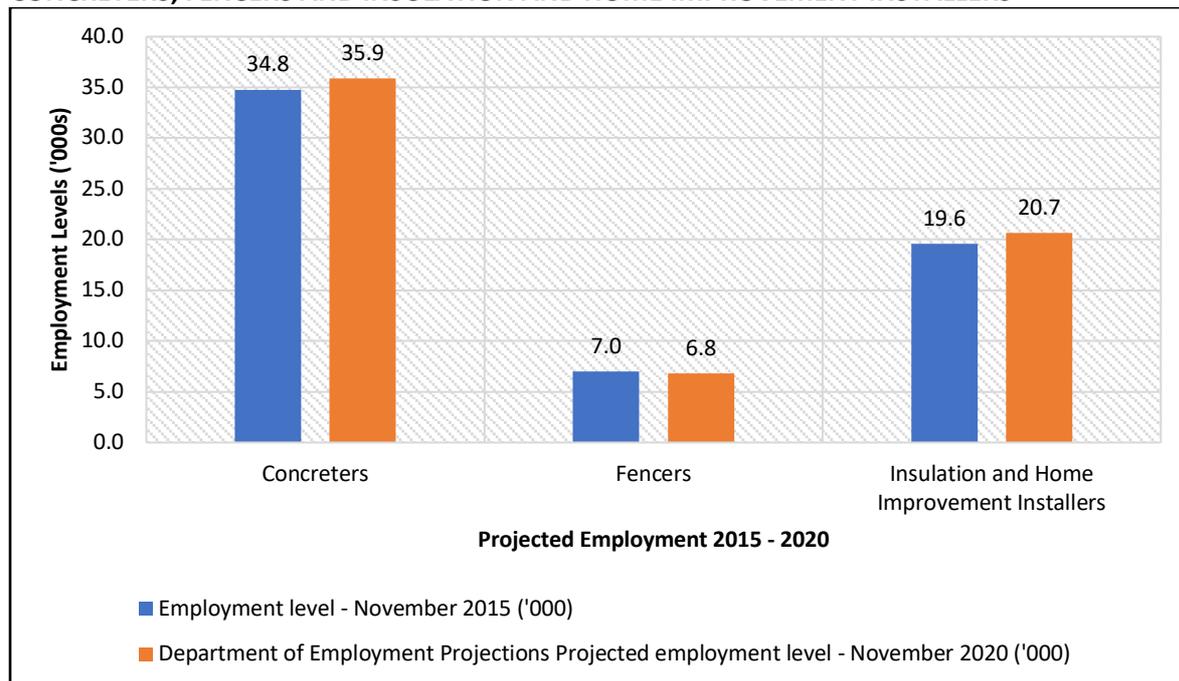
⁸⁰ Ibid.

CONSTRUCTION AND MINING LABOURERS AND BUILDING AND PLUMBERS LABOURERS⁸¹



Employment levels for construction and mining labourers are expected to increase 7.4% by 2020. By contrast, employment levels for building and plumbing labourers are expected to decrease by 1.2%.

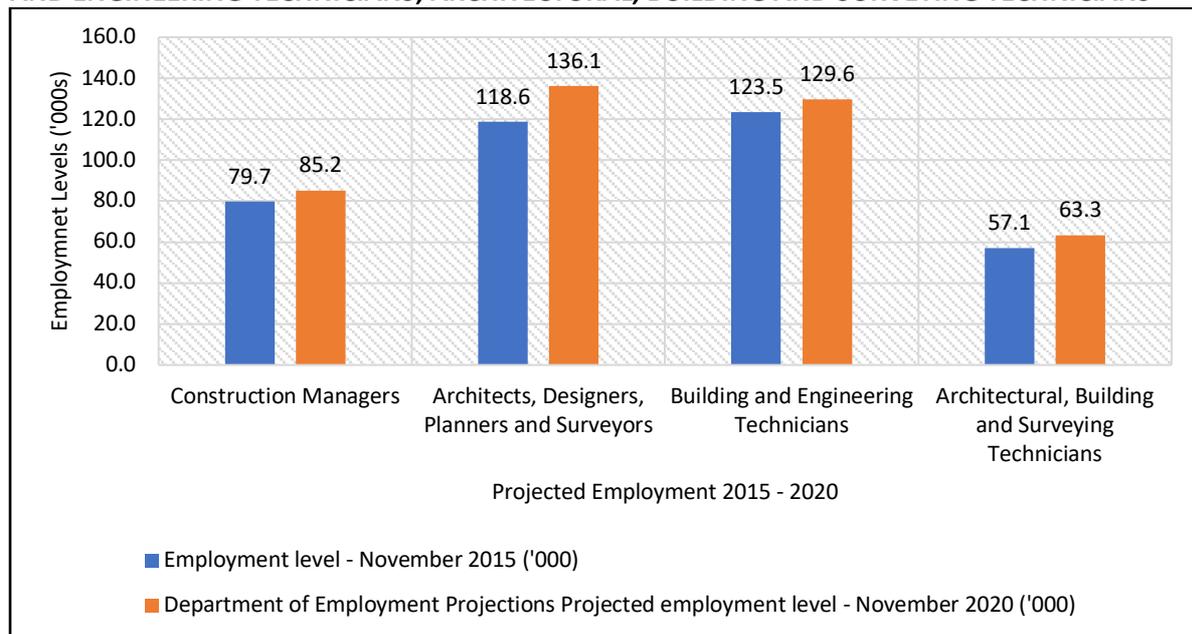
CONCRETERS, FENCERS AND INSULATION AND HOME IMPROVEMENT INSTALLERS



On average, employment levels for the occupations listed above are expected to increase by 0.06% by 2020. Employment levels for fencing will decrease by 0.2%. By contrast, employment levels for concreters and for insulation and home improvement installers will increase by 1.1% by 2020.

⁸¹ Ibid.

CONSTRUCTION MANAGERS; ARCHITECTS, DESIGNERS, PLANNERS AND SURVEYORS; BUILDING AND ENGINEERING TECHNICIANS; ARCHITECTURAL, BUILDING AND SURVEYING TECHNICIANS⁸²



An overall average of the occupations listed above suggest that employment levels are expected to increase by 30% by 2020. Employment levels for architects, designers, planners, and surveyors are expected to increase by 17.5% by 2020.

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES	
INDUSTRY SECTOR	CHALLENGES AND OPPORTUNITIES
Residential Building Construction	<p>As of 2014, there were 13 310 students enrolled in CPC or CPC08 qualifications.⁸³</p> <p>On average, 77% of students are employed following training.⁸⁴ Skills shortages have been reported in the following areas:⁸⁵</p> <ul style="list-style-type: none"> • Construction estimator (for residential construction, requiring five to ten years’ experience) • Qualified stonemasons (a shortage for the past nine years out of ten).
Non-Residential Building Construction	<p>As of 2014, there were 6212 students enrolled in CPC or CPC08 qualifications.⁸⁶ On average, 77% of students are employed following training.⁸⁷</p>

⁸² Ibid.

⁸³ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁸⁴ Ibid.

⁸⁵ Department of Employment, Skill Shortage List, Australia 2015.

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES	
	<p>Skills shortages have been reported in the following areas:⁸⁸</p> <ul style="list-style-type: none"> • Qualified stonemasons (a shortage for the past nine years out of ten).
Land Development and Site Preparation Services	<p>As of 2014, there were 5057 students enrolled in CPC or CPC08 qualifications.⁸⁹ On average, 79% of students are employed following training.⁹⁰</p> <p>In this industry, 98% of businesses are either one-person operations or small businesses, which has implications for capacity to employ (particularly apprentices and trainees) and train/undertake professional development.</p> <p>This sector is highly transient, and many businesses are only in the industry on a short-term basis.</p> <p>The level of regulation means that there is a market for highly skilled and specialised staff such as surveyors and valuers, as well as building labourers and machinery operators.</p> <p>There is also a pathway issue, with the pathways available through the training system being unsuitable for industry's needs.</p>
Building Structure Services	<p>As of 2014, there were 12 127 students enrolled in CPC or CPC08 qualifications.⁹¹ On average, 84% of students are employed following training.⁹²</p> <p>Skills shortages have been reported in the following areas:⁹³</p> <ul style="list-style-type: none"> • Bricklayer (shortage in six out of the last ten years) • Roof tiler (shortage in nine out of the last ten years) • Sheet metal trades worker ((shortage in nine out of the last ten years). <p>Current enrolments in relevant courses in the CPC are very low for roof tilers and structural steel workers.⁹⁴ There are low numbers enrolled in</p>

⁸⁶ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁸⁷ Ibid.

⁸⁸ Department of Employment, Skill Shortage List, Australia 2015.

⁸⁹ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² Ibid.

⁹³ Department of Employment, Skill Shortage List, Australia 2015.

⁹⁴ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES	
	<p>bricklaying apprenticeships and high numbers of cancellations and withdrawals.⁹⁵</p> <p>A high number of unskilled workers are employed in this sector, with 30% having completed year 10 and 11 as their highest level of educational attainment.⁹⁶</p>
Building Installation Services	<p>As of 2014, there were 34 276 students enrolled in CPC or CPC08 qualifications.⁹⁷ On average, 80% of students are employed following training.⁹⁸</p> <p>The Master Plumber's Association advises that current and emerging skills gaps exist in some specialised plumbing areas such as type B gas and gas servicing, as well as on some of the new technologies, including blackwater and greywater treatment plants.⁹⁹</p>
Building Completion Services	<p>As of 2014, there were 54 749 students enrolled in CPC or CPC08 qualifications.¹⁰⁰ On average, 86% of students are employed following training.¹⁰¹</p> <p>Despite the high numbers of students in training, the industry has reported skills shortages in the following areas:¹⁰²</p> <ul style="list-style-type: none"> • Painting Trades Worker (shortage for four years over the last ten) • Solid Plasterer (shortage for six years over the last ten) • Fibrous plasterer (shortage for four years over the last ten) • Wall and floor tiler (shortage for five years out of the last ten). <p>Barriers to entry in the plastering and ceiling services industry are low, as indicated by the high levels of entry and exit of establishments. The dominance of gypsum plasterboard in the cladding of walls and ceilings, in conjunction with the steady reduction of solid wet plaster over recent decades, has resulted in the level of skilled input into construction steadily diminishing.</p> <p>The higher levels of qualification previously needed no longer pose a prohibitive barrier to entry.¹⁰³ Apprenticeship training, augmented by</p>

⁹⁵ Ibid.

⁹⁶ Commonwealth Department of Employment (Labour Market Information Portal): Educational Attainment by Industry Sector (2014).

⁹⁷ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

⁹⁸ Ibid.

⁹⁹ Construction and Property Services Industry Skills Council: CPSCIC Environmental Scan 2015-16, Appendices (Plumbing Sector – Snapshot)

¹⁰⁰ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

¹⁰¹ Ibid.

¹⁰² Department of Employment, Skill Shortage List, Australia 2015.

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES	
	<p>intensive short courses, has been the formal entrance qualification to the industry, but on-the-job training is estimated to account for about 60% of the industry's workforce. Experienced trade-qualified plasterers suggest that eighteen months on the job is adequate training for plasterboard fixers.</p> <p>However, new entrants are better placed to compete on larger scale contracts or subcontracting to major building contractors if they hold formal qualifications.¹⁰⁴</p> <p>In New South Wales, government regulations require that plasterers (along with other building industry trades) be licensed to operate, but this is not the case in other jurisdictions.</p> <p>In carpentry, tradespeople trained on-the-job face increasing difficulty in contracting due to state-based licensing and insurance requirements. The National Building Professionals Register is expected to become the base prerequisite for tendering for contracts in the carpentry services industry and will form a barrier to new entrants without registration.¹⁰⁵</p> <p>In many areas of the industry, the main barrier faced by new entrants is their lack of proven reputation for reliability and quality in an industry where established contacts are so important.</p>
Other Construction Services	<p>As of 2014, there were 5128 students enrolled in CPC or CPC08 qualifications.¹⁰⁶</p> <p>On average, 81% of students are employed following training.¹⁰⁷ There is a higher proportion of part-time workers in this sector than other construction services sectors, partially due to the transient nature of the work.</p> <p>There are low numbers of students in training in many of the relevant trades in this sector, and high numbers of apprenticeship withdrawals.¹⁰⁸ Higher level courses in management are not being utilised.</p>
Architectural, Engineering and Technical Services	<p>There are currently several qualifications from the CPC training package that fall within this sector, though there is some functional overlap between the work outcomes of these and the surveying and spatial design and surveying qualifications in the CPP (Property Services) training package.</p>

¹⁰³ IBISWorld: Industry Reports on Plastering and Ceiling, Carpentry, Tiling and Carpeting, Painting and Decorating, and Glazing Services in Australia (2015-16).

¹⁰⁴ Ibid.

¹⁰⁵ Ibid.

¹⁰⁶ National Centre for Vocational Education Research: Data Collection on VET Students by Industry (2014-15).

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

SUPPLY-SIDE CHALLENGES AND OPPORTUNITIES

The CPC training package contains a Certificate III in Signage and an Advanced Diploma in Building Surveying. As of 2014, there were 696 people enrolled in the Certificate III in Signage.¹⁰⁹ In this sector employees are most likely to hold a bachelor degree (38%).¹¹⁰

According to the Department of Employment's Skills Shortage List, shortages are currently being experienced in the following occupations:¹¹¹

- surveyors (shortage in four years out of the last five)
- quantity surveyors (shortage experienced in three years out of the last five).

¹⁰⁹ Ibid.

¹¹⁰ Commonwealth Department of Employment (Labour Market Information Portal): Educational Attainment by Industry Sector (2014).

¹¹¹ Department of Employment, Skill Shortage List, Australia 2015.

D. SKILLS OUTLOOK

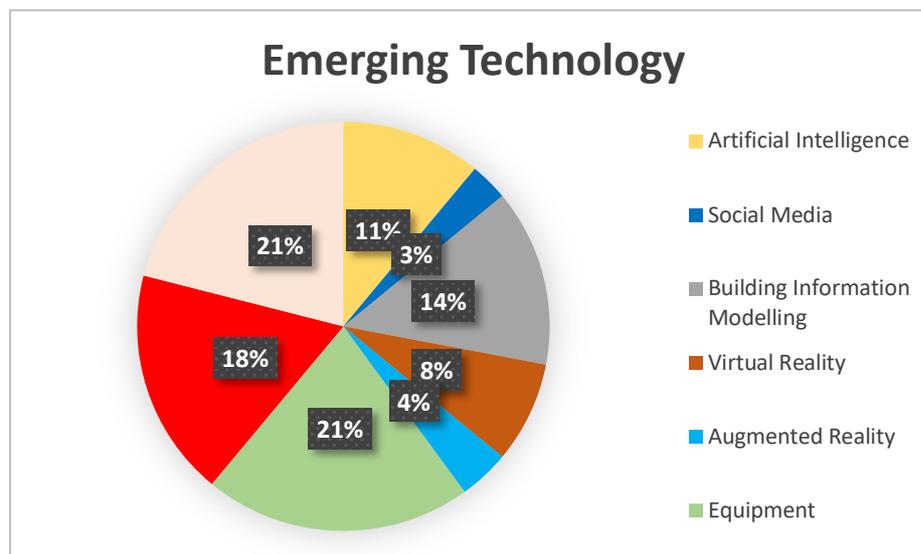
OVERVIEW

2017 SKILLS FORECAST SURVEY RESULTS - EMERGING TRENDS OVERVIEW

With a national industry sample size of 223, findings from the *2017 Skills Forecast Survey* confirmed the impact of technological disruption and environmentally friendly materials and processes on the industry.

Emerging Trends – Technology

The 2017 Artibus Innovation Industry Survey (2017 Survey) aimed to gauge the effect of technology as an emerging trend on four key stakeholder groups identified in the 2016 Artibus Innovation Skills Forecast.

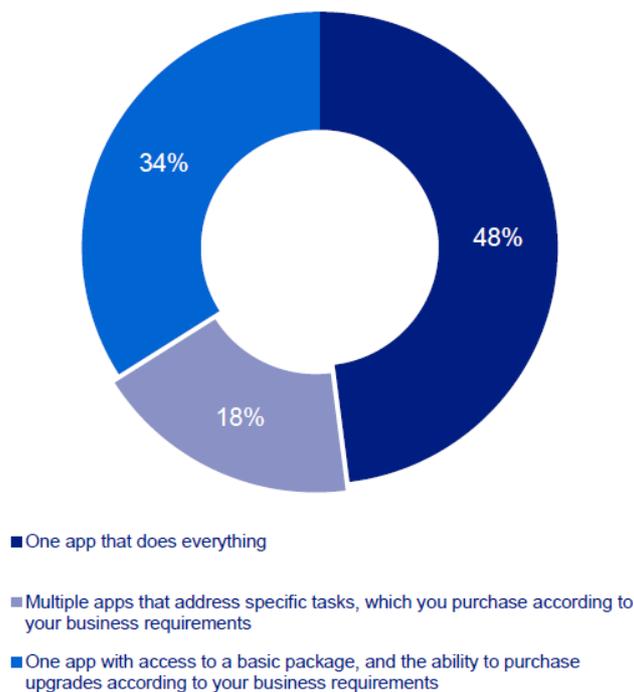


2017 Survey responses were categorised into eight key groups within emerging technology: Applications, Equipment, Materials, Building Information Modelling, Artificial Intelligence, Virtual Reality, Augmented Reality and Social Media.

The two categories with the joint highest response rate of 42% were Applications and Equipment, suggesting a continued uptake of applications by businesses in order to increase productivity and accuracy. Of particular value were applications that were able to offer a complete business management tool, meaning one application can be used throughout the business. This was backed up by the *Telstra Loop Self Employed Tradies Summary Report*¹¹², which stated that while 56% of tradespeople are using old fashioned quoting methods, such as paper notes, four out of five tradespeople would prefer a single app.

¹¹² Vision Critical, Telstra Loop; Self Employed Tradies Summary Report, June 2016

Telstra Report – Application Preference of Tradespeople¹¹³



- 4/5 of tradespeople prefer a single app
- first and foremost want simplicity
- Suggests a single app that delivers different functionality based on subscription
- Subscriptions should be simple

Equipment (including everything from tablets to cranes) has the potential to improve training and workplace performance. The rapid development of hardware such as handheld devices and computer numerical control (CNC) routers has the potential for improvements such as remote operation and greater safety, mobility and precision.

Of those surveyed, 18% acknowledged the importance of technology in the engineering of new materials, such as cross-laminated timber (CLT), that provide superior durability, efficiency, sustainability and affordability.

Building Information modelling (BIM) was acknowledged by 14% of respondents as an emerging technology that would play a role in their area. At its highest level (Level 3 or 'Open BIM'), BIM allows complete collaboration between different sectors, preventing the potential of conflicting information. Survey respondents showed a basic understanding of BIM and its potential uses, with the suggestion that level 1 would be appropriate for current sector requirements.

Artificial Intelligence (AI) was recorded by 11% of respondents as an emerging trend, with the two main examples cited being drones and robotics.

Virtual Reality (VR) and Augmented Reality (AR) were recognised as emerging trends by respondents (8% and 4% respectively). VR was highlighted as having potential for training delivery, such as using simulators to train plant and equipment operators. Survey results suggest that AR is a lesser known emerging technology and the scope for its potential uses within the sector have not been fully realised. Respondents offered AR as a tentative suggestion of an emerging technology but did not elaborate on its specific applications in the sector.

¹¹³ Vision Critical, D3_If Telstra were to offer a management / operating solution for tradies, which of the following would you prefer? Total sample= 176, Telstra Loop; Self Employed Tradies Summary Report, June 2016.

Social Media was identified as an emerging technology by 3% of respondents; the main purpose being to use the platform's search functions to collate information.

BUILDING INFORMATION MODELLING (BIM) IN THE INDUSTRY

In March 2017, Artibus proposed an interdisciplinary project to the Australian Government Department of Education and Training relating to building information modelling (BIM).

Given that the landscape of occupations in the built environment is changing and this change is expected to accelerate and be re-shape the with the adoption of BIM, our strategic approach aim to promote a collaborative cross-sectoral research network and between industries, IRCs and SSOs

The support of the Commonwealth Department of Education and Training is key in facilitating the research on, and adoption and implementation of BIM across the VET sector and Australians industries.

IMPACT OF AUTOMATION, GLOBALISATION, AND DIGITALISATION

The table below outlines and describes the impacts of automation, globalisation, and digitalisation by sector.

SECTOR ANALYSIS	
SECTOR	TECHNOLOGICAL CATEGORY
Residential and Non-Residential Building Construction	<ul style="list-style-type: none"> • Cloud-based office • 3D printing • Cross-laminated timber products • Structural insulated panels • Water re-use technologies • BIM • Prefabrication • Automation • Sustainability regulations (NABERS, Greenstar, LEED etc.) • Virtual reality • Collaborative methodologies • Non-conforming products • Robotics • New materials such as Hebel and preform
Land Development and Site Preparation Services	<ul style="list-style-type: none"> • Cloud-based office • 3D printing • Cross-laminated timber products • BIM • Prefabrication (modular and off-site preparation) • Use of drones • Automation and robotics • Use of technology in all construction activity, including deconstruction
Building Structure Services	<ul style="list-style-type: none"> • Concrete slabs replacing timber floors • Cross-laminated and engineered timber products • Energy use technologies (batteries and solar storage, water reuse technologies)

SECTOR ANALYSIS	
	<ul style="list-style-type: none"> • BIM • Prefabrication • Light-weight housing • Augmented reality devices to enhance industry training
Building Installation Services	<ul style="list-style-type: none"> • CO testing • Electronic processing of documents • Press fit fittings for copper • Electronics in gas appliances • Electronic control of pumps • Cloud based scheduling • Sustainability and renewable energies, e.g. bio gas plants, waste to energy projects, solar energy • Pipe crimping technology and plastics • Electronic Certificates of Compliance • Push fit drainage • BPress piping systems • Pipe locating technology • Smartphone apps that affect how plumbing work is communicated • Use of non-standard materials • Type B gas fitting
Building Completion Services	<ul style="list-style-type: none"> • Cross-laminated timber and massive timber buildings • Prefabrication • 3D printing • Lightweight building components and smart homes • Adhesives, CNC created components, fastenings • CLT and Cassette systems • Plastic wall and flooring components • Use of treated timber • 3D production • Wall cladding systems • Structural insulated panels • Wallpaper mural advancements • Spray technology in painting and decorating • New wall coverings • Low VOC materials and water based paints • Use of apps and other digital technologies
Other Construction Services	<ul style="list-style-type: none"> • Robotics and remote operation • Energy saving and water saving equipment • New construction materials
Architectural, Engineering and Technical Services	<ul style="list-style-type: none"> • Unmanned Aerial Vehicles (UAVs) and aerial photography • Handheld global navigation satellite systems (GNSS) and web-based GIS • Precision machine control systems • Advanced total stations, scanners, database management • BIM • LiDAR • Energy efficiency requirements • NABERS, Greenstar, LEED

KEY SKILLS IN THE CONSTRUCTION, PLUMBING, AND SERVICES INDUSTRY

The following section of this four-year work plan outlines the five most important skills needs for the next 3-5 years. Several of these skills relate to the industry.



A key highlight from the 2017 Skills Forecast Survey is that foundation skills were identified as the most important skills by industry. In 2016, industry viewed the ‘application of new materials and processes (e.g. prefabrication)’ as the most important skill.

The primary source of information used in the compilation of this list includes the whole-of-industry survey undertaken by Artibus Innovation: 2017 Skills Forecast Survey.

Secondary sources of intelligence were gathered from the Construction, Plumbing and Services Industry Skills Committee (IRC) and current industry reports for relevant sectors.

RANKING OF 12 MOST GENERIC WORKFORCE SKILLS

The table below provides a comparative analysis of the importance of the workforce skills in the industry based on two industry surveys.¹¹⁴

*Most important skill =1; least important generic skill for your industry =12.

12 GENERIC WORKFORCE SKILLS			
2016	Skill	2017	
1	Financial	9	↓ 8
2	Entrepreneurial	10	↓ 8
3	Technology	4	↓ 1
4	Managerial / Leadership	2	↑ 2
5	Design mindset / Thinking critically / System thinking / Solving problems	3	↑ 2
6	LLN	1	↑ 5
7	Customer service / Marketing	6	↑ 1
8	STEM	12	↓ 4

¹¹⁴ The numbering column on the left refers to the results from the Artibus Training Package Survey 2016. The numbering column on the right refers to the results from Artibus IRC Skills Forecast Survey 2017.

12 GENERIC WORKFORCE SKILLS			
9	Data analysis	11	↓ 2
10	Environmental and Sustainability	8	↑ 2
11	Communication / Virtual collaboration / Social intelligence	7	↑ 4
12	Learning agility / Information literacy / Intellectual autonomy and self-management	5	↑ 7

E. OTHER RELEVANT SKILLS-RELATED INSIGHTS FOR THIS SECTOR

Skills enabling the workforce to conform with regulatory framework

As mentioned above, advances in technology (e.g. building information modelling, prefabrication, new materials) are causing the construction industry to change—rapidly. Wider adoption of energy efficient and sustainable practices by the industry means further changes. The changes to manufacturing processes and business operations ultimately have implications for the regulatory framework as well.

Aligning with industrial practices, relevant standards and regulations will be implemented in relation to areas such as environmental protection and workplace health and safety. Therefore, from the perspective of skills and workforce needs, training will have to reflect these regulatory standards and regulations.

Recent Artibus Innovation survey results indicate that the CPC training package requires improvement on aspects relating to the regulatory framework. There was consensus among employers, RTOs and regulators that the training package needs improvement in areas relating to licensing. Figure 1 illustrates levels of satisfaction with the utility of the training package.

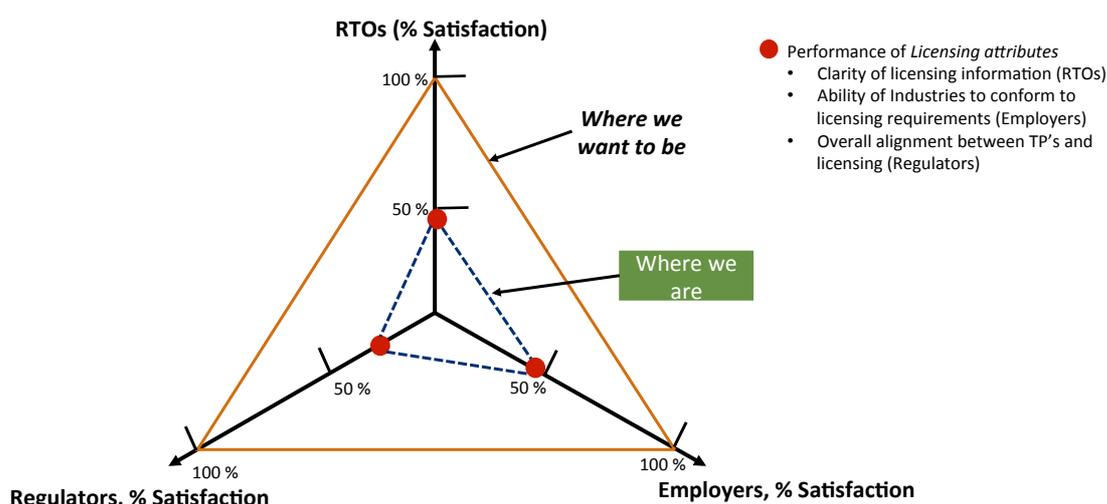


Figure 1: Utility of the Training Package: Support Towards Regulatory Framework

Recommendation:

The training needs to provide learners with a sound understanding of the regulatory framework and its implications for the industry and for their occupations.

Value Addition: Artibus Innovation Model for Quality, Utility, and Relevance of Training Packages

Artibus Innovation have developed a working framework to provide consistency in research, operational processes, and effective stakeholder participation.

Four main stakeholder groups were identified as having a direct relationship with the training packages (TPs). These groups have differing expectations of the TPs.

- Employers—for workforce development
- Learners (Employees, Students)—for learning and career aspirations

- RTOs—for training and assessment
- Regulators—for enabling users to conform with regulatory framework

TPs can be assessed in terms of quality, utility, and relevance.

Quality refers to the TP's success in delivering the intended function(s) and is determined by assessment across the stakeholder groups as measured through the parameter of customer satisfaction.

Utility refers to the effectiveness of the TP as assessed by the different stakeholder groups and measured through factors that are common across the groups, and can be represented by *Utility Maps*. For example, ability to conform to regulatory framework is a common aspiration among employers, RTOs and regulators, and therefore is an indicator for utility of the TP. Figure 1 is an illustration of the current utility of the CPC TP.

F. TRAINING PACKAGE REVIEW PLAN

Advice on the most appropriate timing for the review of relevant Training Package components

Contact details: Artibus Innovation, 373 Elizabeth Street, Hobart TAS 7000. Ph: (03) 6218 2841

Date submitted to Australian Government Department of Education and Training: 19th April, 2017

Project Activity Key:

A – Case for Change

B – Develop new Training Package, Qualification, or Units

C – Update a Training Package, Qualification, or Units

D – Preparation of Training Product or Materials to Support the implementation of Training Packages

CONSTRUCTION, PLUMBING AND SERVICES

CONTRACTED ACTIVITIES

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
2016	<ul style="list-style-type: none"> Certificate III in Shopfitting 	<p>A Case for Endorsement was pending for the Certificate III in Shopfitting.</p> <p>Concerns were raised by the AISC about the equivalency of units, lack of industry support for the proposed changes, articulation of progression from lower-level qualifications and whether there is a sufficient case for fundamental change of the qualification.</p>	<p>Completed.</p> <p>Project has been completed and submitted and approved by the AISC.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
		This has now been approved by the AISC.	
2016	<ul style="list-style-type: none"> • Certificate III in Signs and Graphics 	<p>A Case for Endorsement was pending for the Certificate III in Signs and Graphics.</p> <p>Concerns were raised by the AISC about the equivalency of units, lack of industry support for the proposed changes, articulation of progression from lower-level qualifications, and whether there is a sufficient case for fundamental change of the qualification.</p> <p>This has now been approved by the AISC</p>	<p>Completed.</p> <p>Project has been completed and submitted and approved by the AISC.</p>
2016-17	<p>Unit of Competency Review of:</p> <ul style="list-style-type: none"> • <i>CPCCPB3014 Install bulk insulation and pliable membrane products</i> • <i>CPCCPB3027 Install ceiling insulation</i> 	<p>The AISC Committee agreed to commission the Construction IRC, through Artibus Innovation, to:</p> <ul style="list-style-type: none"> • ensure <i>CPCCPB3027A Install ceiling insulation</i> meets the requirements of the Royal Commission in to the Home Insulation Program • ensure that <i>CPCCPB3014A Install batt insulation products</i> reflects the requirements of the Royal Commission into the Home Insulation Program • ensure that the units allow for effective and safe methods of instalment of insulation in accordance with Australian Standards. 	<p>Completed.</p> <p>Project has been completed and submitted and approved by the AISC.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
2017	<p>Transition units of competency for high-risk work licensing (HRWL) to the 2012 Training Package Standards (11 units of competency identified).</p>	<p>Concerns have been raised regarding the transition of units of competency for high-risk work licensing (HWRL) to the 2012 Standards for Training Packages by Safe Work Australia</p> <p>The units play a significant role in many industries such as transport and mining and civil construction.</p> <p>Update units to 2012 Standards and prepare a Case for Endorsement for submission to the Department/AISC.</p>	<p>Activity Type: C and D</p> <p>A Technical Advisory Group has been developed, and the project will be completed by July 2017.</p>
2017	<ul style="list-style-type: none"> • Certificate III in Concreting • CPC30413 Certificate III in Demolition • CPC41013 Certificate IV in Demolition • Certificate III in Post-Tensioning <p>High Risk Qualifications.</p> <ul style="list-style-type: none"> • CPC30511 Certificate III Dogging • CPC30711 Certificate III in Rigging • CPC30911 Certificate III in 	<p>The Case for Endorsement project aims to transition CPC08 units of competency to the 2012 Standards for Training Packages. This includes:</p> <ul style="list-style-type: none"> • reviewing the content of the units for relevance, usability and quality • removing duplication • complying with policy and standards for training packages <p>The components that are in scope for this project will be developed in the context of:</p> <ul style="list-style-type: none"> • the high-risk work licence units of competencies and the high-risk work qualifications; • the concreting, demolition and post-tensioning units of competency; 	<p>Activity Type: B, C, and D</p> <p>A Technical Advisory Group for High Risk Work has been developed and industry consultation is ongoing to validate the changes in the endorsed components.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
	<p>Scaffolding</p> <ul style="list-style-type: none"> • CPC31111 Certificate III in Steelfixing • CPC32912 Certificate III in Crane Operations 	<ul style="list-style-type: none"> • the dogging, rigging, scaffold, steel fixing and crane operations units of competency; • feedback from industry about inconsistencies in the use of units of competency across these components • the CPC and CPC08 training packages and other qualifications which share these components <p>The Case for Endorsement and revised companion volumes are scheduled to be submitted to the Department on or before 1 December 2017.</p>	
<p>2017</p>	<ul style="list-style-type: none"> • CPC30111 Certificate III in Bricklaying/Blocklaying • CPC32313 Certificate III in Stonemasonry (Monumental/Installation) • CPC31611 Certificate III in Paving 	<p>The Case for Endorsement project will perform the activities described in the Case for Change approved by the AISC.</p> <p>The components that are in scope for this project will be developed in context of transitioning to the 2012 Standards for Training Packages and developed in context of:</p> <ul style="list-style-type: none"> • previous activities and consultation already undertaken in relation to the components the CPC and CPC08 training packages and other qualifications which 	<p>Activity Type: B, C, and D</p> <p>A Technical Advisory Group has been developed and industry consultation is ongoing to validated the changes in the endorsed components.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
		<p>share these components.</p> <p>Completion date is scheduled for 1 December 2017.</p>	
2017	<ul style="list-style-type: none"> • CPC10111 Certificate I in Construction • CPC20112 Certificate II in Construction • CPC20211 Certificate II in Construction Pathways 	<p>Research and stakeholder consultation to be undertaken to develop a Case for Change for Construction and Construction Pathways Qualifications.</p> <p>The focus will be on, but is not limited to, a review of Certificate I and II in Construction in order to examine the effectiveness of pathways and entry into the traditional trade streams of the construction industry and provide advice about the changes required to update the CPC08 Construction, Plumbing and Services Training Package.</p> <p>The Case for Change will consider industry concerns on the disruption to training in the construction industry across jurisdictions in light of proposed changes to the carpentry and joinery qualifications.</p> <p>Provide IRC advice, as part of the Case for Change, as to how the recommended work will support implementation of the November 2015 COAG Industry and Skills Council Training Package Reforms summarised at: www.education.gov.au/vocational-education-and-training-reform.</p>	<p>Activity Type: A</p> <p>Industry consultation and research is ongoing to establish the skills needs of industry.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
		<p>This Case for Change is scheduled for submission to the Department on or before 1 December 2017.</p>	
<p>2017</p>	<ul style="list-style-type: none"> • Certificate III in Carpentry and Joinery • Certificate III in Carpentry • Certificate III in Joinery 	<p>The industry strongly suggested that this work needs to be undertaken in conjunction with the review of the Certificate I and Certificate II in Construction and Certificate II in Construction Pathways. These qualifications require further work to be undertaken, leading to the development of additional business cases.</p> <p>The following systemic issues have been identified:</p> <ul style="list-style-type: none"> • Qualifications need a full content review. • Qualifications are outdated and contain obsolete skills and knowledge. • Qualifications do not align with current legislation and environmental and safety regulations. • Qualifications do not reflect new technological and sustainable practices. 	<p>Activity Type: A Case for Change</p>
<p>2017</p>	<p>CPCCWHS1001 Prepare to Work Safely in the Construction Industry</p>	<p>The Case for Change is required to detail the following:</p> <ul style="list-style-type: none"> • delivery issues observed by industry • options for addressing the delivery issues that would lead to safety in the industry and the level of industry support for the options identified. 	<p>Activity Type: A Case for Change</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
		<p>AISC has noted that where the case is made for strategies to be put in place outside the existing standards then this could form the basis for advice to Ministers seeking exceptional circumstance exemption re delivery requirements in endorsed components of training packages.</p> <p>Scheduled to be completed by 1 December 2017.</p>	
<p>2017</p>	<ul style="list-style-type: none"> • CPC20712 Certificate II in Drainage • CPC20912 Certificate in Urban Irrigation • CPC20812 Certificate in Metal Roofing and Cladding • CPC32612 Certificate III in Roofing Plumbing • CPC32413 Certificate III in Plumbing • CPC32513 Certificate III in Plumbing (Mechanical Services) • CPC40912 Certificate IV in Plumbing and Services • CPC32713 Certificate III in Gas Fitting 	<p>A Case for Endorsement and associated work will consider the activities described in the 2015 <i>Scoping Study for the CPC08 Plumbing and Services Qualifications...</i></p> <p>The components that are native to CPC08 Construction, Plumbing and Services Training Package are to be transitioned to the 2012 Standards for Training Packages.</p> <p>Work to be undertaken to include:</p> <ul style="list-style-type: none"> • recommendations from industry consultations following the scoping study in relation to the revision of unit's content and deletion of qualifications; and • to consider the CPC and CPC08 training packages including other qualifications which share these components. <p>The work is to be completed by March 2018.</p>	<p>Activity Type: B, C, and D</p> <p>A Technical Advisory is being developed, research and consultation are ongoing.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
	<ul style="list-style-type: none"> • CPC50412 Diploma of Plumbing and Services • CPC50612 Diploma of Hydraulic Services Design • CPC50509 Diploma of Fire Systems Designs • CPC32813 Certificate III in Fire Protection • CPC80115 Graduate Certificate in Fire Systems Designs Management • 30903QLD Certificate IV in Fire Systems Compliance 		
2017-2018	Building Information Modelling Project (BIM) in the Construction, Plumbing and Services Industry.	A review of Building Information Modelling (BIM) across all sectors of the construction, plumbing and services industry, considering the impact it is having on service delivery, skills needs and job design. This will be completed alongside a review of BIM in the property services industry.	

PROPOSED ACTIVITIES

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
2017-18	Certificate III in Roof Tiling	<p>This qualification requires further work to be undertaken.</p> <p>The following systemic issues have been identified:</p> <ul style="list-style-type: none"> • Qualifications need a FULL content review. • Qualifications are outdated and obsolete skills and knowledge. • Qualifications do not align with current legislative, environmental and safety regulations; and • Qualifications do not reflect new technological and sustainable practices. 	<p>Activity Type: C and D</p> <p>Research and industry consultation is ongoing to validate scope of the project.</p>
2017-18	<ul style="list-style-type: none"> • CPC30611 Certificate III in Painting and Decorating • CPC31011 Certificate III in Solid Plastering • CPC31211 Certificate III in Wall and Ceiling Lining • CPC31311 Certificate III in Wall and Floor Tiling 	<p>These 5 qualifications in the finishing trades will be due for review in 2017 as part of the 4-yearly review cycle.</p> <p>Transitioning the units within these qualifications to the 2012 Standards for Training Packages would also form part of the review project.</p>	<p>Development of Case for Change</p> <p>Review of qualifications in painting and decorating, solid plastering, wall and ceiling lining, wall and floor tiling and construction waterproofing.</p> <p>Development of a Case for Endorsement for submission to the Department/AISC.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
2018-19	<ul style="list-style-type: none"> • CPC31411 Certificate III in Construction Waterproofing • CPC40208 Certificate IV in Building and Construction (Contract Administration) • CPC40308 Certificate IV in Building and Construction (Estimating) • 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) • CPC50308 Diploma of Building and Construction (Management) • CPC60212 Advanced Diploma of Building and Construction (Management) • CPC40110 Certificate IV in Building and Construction (Building) • CPC40508 Certificate IV in Building and Construction (Site Management) 	<p>Business and management skills remain important to the industry, and grouping all relevant qualifications to ensure that they are part of the same review cycle for industry consultation will ensure efficiencies. These qualifications will be due for review between 2017 and 2018.</p> <p>Transitioning the units within these qualifications to the 2012 Standards for Training Packages would also form part of the review project.</p>	<p>Development of a Case for Change leading to the submission of a Case for Endorsement to the Department/AISC.</p>

PLANNED REVIEW START (YEAR)	TRAINING PACKAGE QUALIFICATIONS	RATIONALE	ACTIVITY
	<ul style="list-style-type: none"> CPC50210 Diploma of Building and Construction (Building) 		
2018-19	Prefabrication Research Project	Industry surveys and published industry reports have consistently highlighted the growing trend towards prefabrication in the construction industry, and pointed to the impact this will have on job design and relevance of qualifications.	Development of a Business Case examining prefabrication processes and their impact on the content of units and qualifications across the different sectors of the construction, plumbing and services training package.
2018-19	Robotics and Automation Research Project	As above, further research is required to investigate the impact of automation and robotics on industry trades and skills needs.	Development of a Case for Change resulting in the need to examining robotics and use of automation in the construction industry and their impact on the content of units and qualifications across the different sectors of the construction, plumbing and services training package.
2019-20	<ul style="list-style-type: none"> CPC60115 Advanced Diploma of Building Surveying 	These qualifications will be due for review in 2019.	Develop a Case for Change to undertake a full review

Notes on the table:

1. This advice should reflect the industry imperative identified in the IRC Skills Forecast and Proposed Schedule of Work.

2. The AISC will use the recommendations made by all IRCs, together with an analysis of the relevant IRC Skills Forecast and Proposed Schedule of Work, to develop the National Review Schedule. In developing the National Review Schedule, the AISC will assess relative priority across IRC Skills Forecasts and Proposed Schedules of Work, taking account of risk, regulatory need, strategic industry and government priorities, economic impact, current levels of VET activity, and available budget. The AISC will also take account of any relevant industry proposals received. Work to review/update/develop training products will be commissioned in accordance with the National Review Schedule.

G. IRC SIGN-OFF

This IRC Skills Forecast and Proposed Schedule of Work was agreed to by:

(Name of Chair)

Signature of Chair

Date

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