Construction, Mining & Energy
Workforce Insights

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Workforce Insights has been developed to inform government skills planning and to support employers and individuals to make informed workforce and skill development decisions.
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About Workforce Insights

At the beginning of 2019, the South Australian government established eight Industry Skills Councils (ISCs) to strengthen industry’s voice in skills and workforce development, and to ensure that funding for skills and training is directly aligned to industry priorities.

Workforce Insights brings together advice from ISCs and their networks, labour market and training data and industry research to explore the latest trends in skills and workforce development. In developing these reports, the Training and Skills Commission has adopted an industry centred approach, so you can be sure the insights have been endorsed by industry leaders. The reports were developed prior to, and in the early stages of, the global outbreak of Coronavirus (COVID-19), and it is evident that significant disruption has since occurred – impacting both industry and the demand for a skilled workforce, as well as the ability of employers to commence and retain apprentices and trainees. The need for further consideration of the impacts relevant to each industry is noted, and work in this regard has commenced.

Workforce Insights has been developed to inform government skills planning and to support employers and individuals to make informed workforce and skill development decisions. Workforce Insights will continue to evolve and be updated as additional research is undertaken and new information becomes available.

Thank you to all those who supported the development of these industry-led, sector-driven documents. Individually and collectively your contribution to the skilling and development of South Australia’s current and future workforce has been immense.

For further information,
tasc.sa.gov.au/workforce-insights
Construction, mining and energy

The construction industry comprises several sub-sectors including building, civil engineering and construction services such as plumbing, electrical and air-conditioning.

The main sub-sectors of the mining industry in South Australia include oil and gas, metal ore and mineral mining, exploration and mining support services. The energy sector includes electricity, gas and water supply.

All combined, the construction, mining and energy sectors employ around 87,600 people in South Australia.

Key findings

- New technologies, such as renewable energy, are affecting the construction, mining and energy sectors and their workforce, generally by changing how work is done.
- Management and leadership skills will be of increasing demand in the future.
- Digitisation is impacting large sections of the workforce.
- Robotics is becoming increasingly prevalent in the construction sector. It is valued for its potential to increase capacity and can prevent workers having to undertake repetitive, physically intensive tasks, allowing them to prolong their working life.
- Micro-credentialing could help the sector respond to changing skill needs, enabling workers to keep their skills and knowledge relevant by learning to apply new technologies, or to move into other occupations.
- The construction and energy sector’s ageing workforce will increasingly place pressure on the industry to attract new workers and transition older workers into supervisory, managerial, mentoring or training roles that are less labour-intensive.
Industry outlook

The electricity, gas, water and waste services industry contributes approximately 9,000 jobs in South Australia, or 1.3 per cent of the state’s workforce, with nearly half of the industry employed in either water supply or electricity distribution.

The industry sub-sectors include electricity and gas supply; water, drainage, and sewage services; the collection, treatment and disposal of waste materials; and the remediation of contaminated materials.¹

The construction industry is the third largest employer in South Australia.² It includes activities such as residential and non-residential construction; construction services including air-conditioning, carpentry and plumbing; and civil engineering construction.³

Many of the traditional trades belong to the construction sector, as do newer roles such as those in renewable energy.

The energy and mining sector is a significant contributor to South Australia’s economy, contributing $8.7 billion or about eight per cent to the state’s gross state product (GSP) in 2018. The energy and mining sector employs more than 41,000 South Australians and plays a pivotal role in the economic development of regional South Australia.⁴

² | Australian Bureau of Statistics (2019)
⁴ | Government of South Australia, Sustainably Growing Energy and Mining in South Australia (2019)
New technologies, such as renewable energy, are affecting the construction, mining and energy sectors and their workforces, generally by changing how work is done. In 2000-2001, hydro power accounted for 95 per cent of renewable energy production; in recent years, due to the wider adoption of other renewable technologies, hydro power makes up 40 per cent of Australia’s renewable energy generation.5

In April 2019, AGL announced it had secured the right to develop, own and operate a 250-megawatt pumped hydro energy storage project at Hillgrove Resources Limited’s Kanmantoo copper mine in South Australia’s Adelaide Hills region. This project will contribute to the changing needs of the South Australian energy market, in which energy storage assets will be required to offer dispatchable capacity as renewable generation increases.6

The South Australian government expects the state will be net 100 per cent renewables by the 2030s.7

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### Skill shortages

Skill shortages includes occupations or skills that have been identified by Industry Skills Councils as currently experiencing a skills shortage.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Region</th>
<th>Industry</th>
<th>Type</th>
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<tbody>
<tr>
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<td>Building Construction</td>
<td>Occupation</td>
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<td>Occupation</td>
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<td>Occupation</td>
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<td>Carpenter</td>
<td>South Australia</td>
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<td>Concreter</td>
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<td>Heavy and Civil Engineering Construction</td>
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<td>Occupation</td>
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<td>Waste Water Sewage Operator</td>
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<td>Water Supply Sewerage and Drainage Service</td>
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<tr>
<td>Waste Water Treatment Operator</td>
<td>South Australia</td>
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<tr>
<td>Water Quality Analyst</td>
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<tr>
<td>Water Treatment Operator</td>
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<td>Water Supply Sewerage and Drainage Service</td>
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<td>Electrical Distribution Trades Worker</td>
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<td>Electrician</td>
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<td>Electricity Supply</td>
<td>Skill</td>
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<tr>
<td>Gas Fitter</td>
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<td>Gas Supply</td>
<td>Skill</td>
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<tr>
<td>Signal Electrician</td>
<td>South Australia</td>
<td>Electricity Supply</td>
<td>Skill</td>
</tr>
</tbody>
</table>
### Electrotechnology
- Educators, Trainers and Assessors
- Electricians
- Refrigeration/Air Conditioning Tech
- Engineers (various)
- Appliance Repair

**Reasons**
- Ageing workforce/current staff retiring
- Cost and time to achieve the required qualification
- Competition from other organisations
- Wages/salaries considered too low
- Geographic location of the vacancy

### Gas Supply Trans., Distribution & Gaseous Fuels
- Tanker Drivers (dangerous goods)
- Gas Main and Service Layers
- Engineers (various)
- Servicing/Maintenance Managers

**Reasons**
- Cost and time to achieve the required qualification
- Ageing workforce/current staff retiring
- Unattractive job/poor industry image
- Competition from other organisations
- Geographic location of the vacancy
- Currently no gas supply apprenticeships offered

### ESI Transmission and Distribution
- Educators, Trainers and Assessors
- Line Workers
- Electricians
- Cable Jointers
- Transmission (overhead/underground)

**Reasons**
- Ageing workforce/current staff retiring
- Cost/time to achieve the required qualification
- Competition from other organisations
- Wages/salaries considered too low
- Geographic location of the vacancy

### Water
- Water/wastewater treatment operators
- Maintenance
- Engineers (various)
- Water Quality Management
- Managers (various)

**Reasons**
- Wages/salaries considered too low
- Competition from other organisations
- Geographic location of the vacancy
- Ageing workforce/current staff retiring
- Unattractive job/poor industry image
Construction, Plumbing and Services

- Building Associate (site supervisor)
- Bricklayer and Stonemason
- Carpenters and Joiners
- Construction Managers
- Architectural, Building and Surveying Tech
- Machine Operators
- Painting Trades Workers
- Plumbers/Concreters/Plasterers
- Bricklayers and Stonemasons
- Wall and Floor Tilers/Floor Finishers
- Crane, Hoist and Lift Operators
- Roof Tilers/Signwriters

Reasons

- Cost and time to achieve the required qualification
- Ageing workforce/current staff retiring
- Unattractive job/poor industry image
- Competition from other industries

Critical occupations

Critical occupations includes occupations or skills that have been identified by Industry Skills Councils and include occupations that are deemed critical to achieving industry growth potential.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry</th>
<th>Type</th>
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<tr>
<td>Diesel Fitters</td>
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<td>Electrician</td>
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<tr>
<td>Mining Engineers</td>
<td>Mining</td>
<td>Occupation</td>
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<tr>
<td>Occupational Hygienists</td>
<td>Mining</td>
<td>Occupation</td>
</tr>
<tr>
<td>Surveyors</td>
<td>Mining</td>
<td>Occupation</td>
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<tr>
<td>Electrician</td>
<td>Electrotechnology</td>
<td>Skill—PV Skills</td>
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<tr>
<td>Electrical Instrumentation</td>
<td>Electrotechnology</td>
<td>Occupation</td>
</tr>
<tr>
<td>Plumber</td>
<td>Construction Services</td>
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<tr>
<td>Refrigeration and Air Conditioning Technician</td>
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<td>Occupation</td>
</tr>
<tr>
<td>Electrical Distribution Trades Worker</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
</tbody>
</table>
Skills demand

Most priority qualifications for the construction, mining and energy industry are at the certificate III level and are identified as basic requirements for jobs.8

At a national level, the Construction, Plumbing and Services Skills Forecast identifies management and leadership skills to be of increasing demand in the future. Lower-skilled occupations are at risk of being automated, while employment in business and management occupations that require high levels of social intelligence, technical ability and creative intelligence is forecast to grow.9

New technologies are having an impact on the construction sector. The increasing use of modular house building, offsite construction and advances in renewable energy technology are some examples. An increasing demand for IT skills is also being felt across the construction workforce.10

The Construction Industry Training Board (CITB) has introduced development and innovation programs to address new and emerging technologies and skill shortages. Support is provided where content is outside the scope of the national training package framework.

The CITB continues to promote Building Information Modelling (BIM), which provides potential productivity gains and savings and is transforming the way construction work is carried out, and discussions are taking place with the Industry Reference Committee to roll-out the program nationally.11

In July 2019, the CITB in collaboration with the South Australian Department for Innovation and Skills (DIS) launched the report, How ready is South Australia’s building and construction sector for technological change?12 The report found:

- despite a subdued uptake of new technologies in the industry to date, cost and consumer demand are likely to drive faster adoption
- technology uptake brings significant productivity, safety and efficiency improvements for most residential and civil construction projects
- government’s procurement practices are increasingly important in encouraging the use of design technologies that lead to timely and efficient project delivery.

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9  | Artibus Innovation, Construction, Plumbing and Services Skills Forecast (2019)
10 | Industry Priority Qualifications Report 2018
11 | Construction Industry Training Board, Annual Report 2017-18
12 | Construction Industry Training Board, How ready is South Australia’s building and construction sector for technological change? (2019)
The CITB report identified skills and training gaps and other risks during the life cycle of a construction worker that must be addressed to assist the industry:\(^\text{13}\)

- opportunities for upskilling and skills deepening are limited given the transient nature of the industry
- an older workforce that is retiring, limits opportunities for supervision and mentoring of younger workers entering the workforce
- digitisation is demanding new skills for traditional tasks such as operating plant and machinery
- workforce entrants need higher skills for traditionally ‘lower skilled’ occupations
- employers report that new entrants often do not have the technical and soft skills (for example, enterprise, creativity and collaboration skills) needed in modern, complex workplaces such as large building sites
- the absence of STEM skills is linked to a lack of employability.

Some of these gaps will require training package reforms at the national level and are largely outside the influence of CITB and DIS.\(^\text{14}\)

Robotics is becoming increasingly prevalent in the construction sector. It is valued for its potential to increase capacity and can prevent workers having to undertake repetitive, physically intensive tasks, allowing them to prolong their working life.\(^\text{15}\)

Training must keep up with these and other emerging technological changes. Industry stakeholders voiced concern over the ability of the current training system to respond quickly enough. It was suggested that industry may need to look at skill sets and state-based approaches to accrediting courses to meet rapidly changing skills needs.\(^\text{16}\)

For example, it was suggested that micro-credentialing could support professional development and continued learning in the construction, mining and energy sectors. Micro-credentialing can be achieved through completing skills sets, which are linked to an industry skill or need. These industry skill sets could be used for workers to keep their skills and knowledge relevant, learn and apply technology changes and tools, or move into other occupations.\(^\text{17}\)

\(^{13}\) Ibid
\(^{14}\) Ibid
\(^{16}\) Ibid
\(^{17}\) Artibus Innovation, Construction, Plumbing and Services Skills Forecast (2019)
Future skill shortages

Future skill shortages include occupations or skills that have been identified by ISCs as being at risk of experiencing a skills shortage over the next five years.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry</th>
<th>Type</th>
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<td>Construction Manager</td>
<td>Building Construction</td>
<td>Skill</td>
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<tr>
<td>Construction Manager</td>
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<td>Skill</td>
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<td>Electrical Distribution Trade</td>
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<td>Systems Operator</td>
<td>Waste Collection, Treatment and Disposal Services</td>
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</tr>
</tbody>
</table>

There is demand for skills, currently available in Western Australia, that will become increasingly important as automation is integrated in operations, particularly:

- 52845WA Certificate II in Autonomous Workplace Operations
- 52844WA Course in Working Effectively in an Automation Workplace.
Recruitment

The construction industry has traditionally been male dominated, and this trend is increasing. In 2006, women accounted for 17 per cent of the construction industry workforce;¹⁸ in 2018, women only accounted for 11.6 per cent of the workforce.

The participation of females in the electrotechnology industry has been gradually decreasing over the past 30 years, from about 21 per cent in 1984 to about 17 per cent in 2018.¹⁹ In contrast, in the water sector, female participation has grown by about 2.1 per cent a year since 1988; the current workforce is about 25 per cent female. Encouraging diversity is now a strategic objective of the Water Services Association of Australia.²⁰

The construction sector is also proactively exploring initiatives to attract, retain and train women. In South Australia, programs to support women include:²¹

- Women in Construction Working Party
  (Construction Industry Training Board)
- Women in Civil Events
  (Civil Contractors Federation SA)
- Women in Male Dominated Occupations
  and Industries (CEPU)
- HiViz Women’s Network
  (Master Builders Association)
- Australian Brick and Blocklaying
  Training Foundation
- Building Women
  (Housing Industry Association).

The CITB’s Doorways to Construction Certificate I Program attracted 44 female students in 2018. Among CITB-eligible construction workers, 4.62 per cent are women, and 1.4 per cent of CITB supported apprentices are women.²²

Although females still account for a small proportion of employment in the national mining sector, the share has increased—from 12.3 per cent in May 2004 to 14.8 per cent in May 2014.²³

¹⁸ | Artibus Innovation, Construction, Plumbing and Services Skills Forecast (2019)
²¹ | Construction Industry Training Board, Annual Report 2017-18
²² | Ibid
²³ | Australian Government, Department for Employment, Industry Outlook Mining
The biggest challenge for the waste services sector is attracting workers to what is seen as an unappealing work environment.\textsuperscript{24}

The challenge of attracting workers to the construction industry from a limited pool of students and having to compete for talent with other highly promoted industries, such as defence, is a concern. Industry feedback suggests that to secure the workforce, construction employers must focus on giving students an understanding of pathways into and career opportunities within construction occupations.\textsuperscript{25}

Construction industry stakeholders have expressed concerns about the lack of a coordinated strategy to deal with its ageing workforce. They say the industry must find ways to both attract new workers and to transition older workers into supervisory, managerial, mentoring or training roles that are less labour-intensive. Given the age profile, it is no surprise that the construction industry is concerned about future labour supply.\textsuperscript{26}

Since 2013, the Resources and Engineering Skills Alliance (RESA) has monitored job advertisements for positions for South Australians in the resource and energy sector. This includes only jobs either located in South Australia or accessible from South Australia (fly in, fly out or FIFO).\textsuperscript{27}

Table 1 provides a breakdown of South Australia’s vacancy distribution across occupational subsectors in the 2018-19 financial year. The data is collected from a single source and so is an indicator of hiring intentions and industry activity rather than a comprehensive analysis.\textsuperscript{28}

\textsuperscript{25} Ibid
\textsuperscript{26} Training and Skills Commission, \textit{Industry Priority Qualifications Summary Report} (2018)
\textsuperscript{27} Resources and engineering skills alliance, \textit{job advertisement research} (2019)
\textsuperscript{28} Ibid
RESA reports 2,967 job ads for the sector in the 2018–19 financial year. This represents a four per cent increase on the previous year, following a 92 per cent increase from 2016–17 to 2017–18. The occupations in demand include engineers, mechanical and maintenance roles, equipment operators, electrotechnology (including auto electricians) and drilling and blasting roles. The construction, mining and energy sectors continue to face challenges in attracting and recruiting suitable trainers, resulting in compromised training quality. Some trainers have the required teaching skills but lack practical experience. The Gas Industry Reference Committee, through the Australian Industry and Skills Committee (AISC), intends to discuss this national concern further with the Australian Skills Quality Authority (ASQA).

### Table 1: South Australian Vacancy Distribution by Subsector Financial Year 2018-19

<table>
<thead>
<tr>
<th>Sub-sector</th>
<th>Vacancies 2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Development/Services</td>
<td>130</td>
</tr>
<tr>
<td>Drilling &amp; Blasting</td>
<td>177</td>
</tr>
<tr>
<td>Electrotechnology</td>
<td>255</td>
</tr>
<tr>
<td>Engineering/Engineering Mgt</td>
<td>556</td>
</tr>
<tr>
<td>Equipment Operator</td>
<td>398</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>142</td>
</tr>
<tr>
<td>Maintenance</td>
<td>678</td>
</tr>
<tr>
<td>Mechanical /Metal</td>
<td>280</td>
</tr>
<tr>
<td>Quality/Safety/Health</td>
<td>159</td>
</tr>
<tr>
<td>Transport &amp; Logistics</td>
<td>23</td>
</tr>
<tr>
<td>Chemical Processing</td>
<td>8</td>
</tr>
<tr>
<td>Finance/Accounting</td>
<td>19</td>
</tr>
<tr>
<td>Human Resources/Training</td>
<td>29</td>
</tr>
<tr>
<td>Environmental</td>
<td>22</td>
</tr>
<tr>
<td>Civil Construction</td>
<td>10</td>
</tr>
<tr>
<td>Exploration/Field Services</td>
<td>11</td>
</tr>
<tr>
<td>Camp Site Services</td>
<td>4</td>
</tr>
<tr>
<td>Geoscience/Surveying</td>
<td>66</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,967</strong></td>
</tr>
</tbody>
</table>

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29 | Ibid
30 | Resources and engineering skills alliance, job advertisement research (2019)
31 | Ibid
The table below summarises occupations with recruitment challenges and opportunities for the construction, mining and energy sectors.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Conditioning and Refrigeration</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Bricklayer</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Cabinet Maker</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Carpenters and Joiners</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Chemical, Gas, Petroleum and Power Generation Plant Operators</td>
<td>Oil and Gas Extraction</td>
<td>Occupation</td>
</tr>
<tr>
<td>Chemical, Gas, Petroleum and Power Generation Plant Operators</td>
<td>Gas Supply</td>
<td>Occupation</td>
</tr>
<tr>
<td>Civil Engineering Professionals</td>
<td>Heavy and Civil Engineering Construction</td>
<td>Occupation</td>
</tr>
<tr>
<td>Drilling and Civil Trades</td>
<td>Heavy and Civil Engineering Construction</td>
<td>Occupation</td>
</tr>
<tr>
<td>Drilling and Civil Trades</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Fibrous Plasterer</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Glazier</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Mechanical Fitters</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Mechanical Plumbers</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Painting Trades Worker</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Site Supervisors</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Stonemason</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Wall and Floor Tiler</td>
<td>Construction Services</td>
<td>Occupation</td>
</tr>
<tr>
<td>Plumbers</td>
<td>Construction Services</td>
<td>Occupation and gas fitting licence</td>
</tr>
<tr>
<td>Electrician</td>
<td>Electricity Supply</td>
<td>Occupation and PV skills</td>
</tr>
<tr>
<td>Electrician</td>
<td>Construction Services</td>
<td>Occupation and PV skills</td>
</tr>
<tr>
<td>Civil Engineering Draftsperson and Technician</td>
<td>Heavy and Civil Engineering Construction</td>
<td>Occupation and skills in 12D, MicroStation, CAD</td>
</tr>
</tbody>
</table>
The Australian Government’s Department of Jobs and Small Business provides the following information on skills shortages and recruitment difficulties.\(^\text{33}\)

### OCCUPATION: Civil Engineering Professionals

#### ANZSCO:
2332-11, 12, 14, 15

#### SHORTAGE: Recruitment Difficulty

#### DATE: April 2018

- There is a shortage of experienced civil engineering professionals in South Australia. There is a more than adequate supply of civil engineering graduates, however, most vacancies required experience.

- Most businesses surveyed were engineering consultancy companies providing services across industries including construction, electricity and renewable energy, mining, defence, water and waste services, and transport.

- Fewer vacancies were filled in 2018, than last year (50 per cent, compared with 55 per cent in 2017).

- Most vacancies required experience; some vacancies required 7-15 years of experience.

- Applicant numbers were higher than in 2017 (on average, 34 compared with 28 in 2017). However, there were significantly fewer suitable applicants this year (on average, 1.2 compared with 4.3 in 2017).
  - Applicant numbers for graduate positions were significantly higher than vacancies requiring experience.
  - Excluding graduate level vacancies from the survey data, there were, on average, 15.5 applicants and 0.7 suitable applicants per vacancy.

- The average number of qualified applicants per vacancy and the proportion of qualified applicants remained relatively steady this year (12.7, compared with 13.4 qualified applicants in 2017, and 44 per cent, compared with 47 per cent in 2017).

- Employers stated there is a shortage of experienced civil engineers, mainly due to the high volume of infrastructure projects presently underway in South Australia.

\(^{33}\) | Australian Government Department of Jobs and Small Business, Ratings Summary—Labour Market Analysis of Skilled Occupations 2019, viewed October 2019

Unsuitable applicants

- Approximately 44 per cent of applicants lacked a bachelor’s degree in engineering (civil).
- Many applicants lacked experience in the occupation, or lacked knowledge of local engineering standards and codes, and local experience.
- Some applicants lacked the specific experience employers required, for example, civil construction or aviation industry experience.
- Some applicants had unsatisfactory communication skills.
- Some applicants did not have the university specialisation employers required, for example, traffic engineering.

Demand and supply trends

- Approximately 42 per cent of civil engineers are employed in the professional, scientific and technical services industry. Approximately 25 and 15 per cent, respectively, work in the construction and public administration and safety industries.
- Demand for civil engineering professionals is mainly driven by activity in the civil engineering and building construction industries. There is high demand for civil engineering professionals in South Australia.
- A number of major civil construction projects are presently underway, due to the state government’s 2016 and 2017 budgets, which mandated record spending on infrastructure ($12.1 and $9.5 billion, respectively, over 4 years).
- The value of engineering construction activity increased by approximately 33 per cent in 2017. Most of the increases related to electricity transmission, generation and pipelines, and roads, highways and subdivisions.
- The value of building work done increased by approximately 10 per cent in 2017.
- The value of building approvals, which provides an indication of future demand, increased by approximately four per cent in the year to March 2018.
- Consistent with the increase in engineering and construction activity, the number of South Australian internet advertised vacancies for civil engineering professionals increased by approximately 34 per cent in the year to March 2018, after trending upwards since March 2015.
- The vast majority of individuals employed as civil engineering professionals hold a bachelor’s degree or higher qualification in civil engineering. After trending upwards since 2013, course completions for civil engineers increased by approximately 14 per cent in 2016. However, course commencements decreased by approximately 15 per cent in 2015 and a further 22 per cent in 2016, which indicates supply may decrease in the next two years.
OCCUPATION: Civil Engineering Draftsperson and Technician  
ANZSCO: 3122-11, 12  
SHORTAGE: Shortage  
DATE: April 2017  

Labour market conditions have eased compared with the previous year. Employers attracted a sufficient number of applicants and suitable applicants to fill a large majority of advertised vacancies surveyed.

• Employer contacts included engineering consultancy practices and local government.

• A survey of employers who had recently advertised for civil engineering draftspersons and technicians showed that employers had little difficulty recruiting.

  - Survey results showed 71 per cent of vacancies were filled in 2017 up from around half in 2016 but similar to results recorded in 2014 and 2015.

  - On average, there were 23 applicants per vacancy of whom 14.1 were qualified and 8.7 were suitable. Applicant and suitable applicant numbers have been highly variable over recent years, with this year’s survey suggesting there has been a marked increase in the average number of suitable applicants compared with 2016.

• Last year’s survey occurred at the commencement of or anticipated commencement of a number of major redevelopment projects. Last year’s survey may have marked a period of peak demand for civil engineering drafters.

• Most contacts had little difficulty filling vacancies and were positive about the strength of the labour market for civil engineering draftspersons and technicians.

• Considering employers in general had multiple suitable candidates to select from and were able to consistently fill vacancies the occupation is rated as not in shortage.

  Unsuitable applicants

  • In general, unsuitable applicants lacked the required qualification, experience or technical skills.

  • Almost 40 per cent of applicants did not hold the relevant qualifications specified for the vacancy.

  • Some employers also favoured experience specific to their industry (e.g. local government, civil construction) or location due to regulation differences between jurisdictions.
• Technical skills relating to software use was important to employers. Employers required applicants to have knowledge and experience in operating CAD® software as the industry standard. Many applicants lacked these skills.

• Some employers required software and technical skills beyond the CAD® industry standard. For example, experience in 12D® and MicroStation® was heavily favoured in some vacancies and few applicants met this need.

Demand and supply trends

• Demand for civil engineering draftspersons and technicians is largely determined by engineering construction activity levels.

• ABS data shows the value of work done in South Australian engineering construction activity increased in the year to the September quarter 2016 by around three per cent. Around a quarter of the total value was attributed to work completed on bridges, railways and harbours with approximately a fifth each attributed to Telecommunications, Heavy industry and Roads, highways and subdivisions.

• ABS data shows Engineering Construction Activity value of work yet to be done for the year to December 2016 is at its highest level since 2014. Value of work yet to be done increased 21 per cent since 2015 and represents similar conditions to 2012 and 2013. Almost 60 per cent of the total value is represented by Roads, highways and subdivisions.

• The total value of SA building approvals increased by 14 per cent in 2016 compared with the previous calendar year.

• Consistent with the value indicators that suggest growth in engineering activity, advertised internet vacancies for civil engineering draftspersons and technicians in South Australia recorded an increase in 2016 to levels consistently higher than those experienced since 2013.

• Contacts surveyed were consistently positive about the outlook for the industry and many noted the multiple major civil works currently being undertaken in Adelaide.

• Occupational supply is dependent on a combination of on-the-job experience and formal training, usually at the Certificate IV or Diploma qualification level.

• The number of Certificate IV and Diploma level students in training courses classified to the occupations of civil engineering draftsperson and technician increased in 2015 compared with 2014 (the latest period available). Despite the 2015 increase, student numbers in 2015 remain well below any of the previous six years.

• Net overseas migration data for civil engineering draftspersons and technicians suggests there was a small net increase in South Australia in 2015. The number of Subclass 457 visas granted for this occupation is small.
Labour market conditions for carpenters and joiners have continued to tighten for employers seeking to fill vacancies with only 31 per cent of vacancies being filled. Results in 2018 showed a slight improvement with 1.3 applicants per vacancy deemed suitable compared to 0.7 suitable applicants per vacancy in 2017.

- The survey of employers who recently advertised for the occupation of carpenters and joiners were conducted in September quarter 2018.
- Employers surveyed indicated that there was an average of 11.3 applicants per vacancy with an average number of qualified applicants per vacancy of 3.3 applicants. Of those qualified, 1.3 were found to be suitable for employment.
- There was a variation in the results from 2017 where 52 per cent of vacancies were filled within four weeks. Employers received an average of 22.8 applicants with 0.7 suitable applicants per vacancy.
- In regional South Australia 50 per cent of vacancies were filled in comparison to 27 per cent of vacancies filled in metropolitan Adelaide. It is important to note that a very small sample of regional employers were surveyed.
- Employers in regional areas had 50 per cent of vacancies that remained unfilled in comparison to 75 per cent of vacancies that were left unfilled in metropolitan areas. Overall, the percentage of unfilled vacancies was 70 per cent in South Australia.
- A broad mixture of employers were surveyed across, construction, commercial, residential building and the industrial sector, requiring first and second fix carpenters.
  - Some employers ideally sought applicants with an Elevated Work Platform ticket and a White Card. SafeWork SA mandates that people who access operational work zones must hold a white card (or general construction card).
  - Some employers advised that they have taken on apprentices, as they were unable to fill positions with qualified applicants. They would continue to do so as long as they could attract new applicants that were willing to work and had the right attributes for the job.
  - Of the employers that were surveyed they identified qualified applicants who were not offered an interview were unsuitable as they lived interstate or lived too far from the location of the business.
• Some employers commented that, because of being unable to fill their vacancy, they are not able to take on available extra work.
• All employers surveyed required applicants to have completed a carpentry or joinery apprenticeship compared to 95 per cent in 2017.

Unsuitable applicants

• Out of the 147 qualified applicants, 72 per cent were qualified and were unsuitable for the role.
  - Applicants lacked basic qualifications; lacked experience in the occupation required or did not have communication skills necessary for the role.
  - Several applicants failed to present for trial and or interview and were therefore deemed unsuitable and unreliable.

Demand and supply trends

• Demand for carpenters and the level of activity in the construction industry generally influences joiners.
• Deterioration in the availability of trades in South Australia reflects a growth in the number of multi-story apartment projects in the market,
• HIA data determined that carpentry remains one of the trades in shortest supply.
• According to the 2016, ABS Census data there were 250 carpenters and joiners in South Australia. Of those 170 were employees and 80 were self-employed.
• Of those employed 49.2 per cent are employed in the construction industry in South Australia and 40.6 per cent in manufacturing. Data indicates that 210 are found in Adelaide and 40 in the rest of the state.
• ABS Census data in 2016 also identified that 78.2 per cent of carpenter and joiners held a Certificate III and IV.
• The value of building work done has improved and is at a five-year high, specifically March 2017 to March 2018 where there was a 19.2 per cent increase.
• The value of building work commenced in South Australia increased since the previous 12 months.
• Trade availability in Adelaide has continued to decrease since March 2016 with the biggest decrease from March to June quarter 2018 with a decline of approximately (-0.40).
• Regional South Australia also continued to see a decline in availability of trades.
Employers surveyed advised there were adequate numbers of suitable applicants to fill most plumber vacancies across the construction, commercial production and residential sectors.

- Of the employers surveyed, 73 per cent of vacancies were filled. Overall, there were 12.1 applicants per vacancy in comparison to 2017 where employers who advertised for plumbers filled 69 per cent of vacancies with an average of 15.4 applicants.
- There continued to be a decline in the number of suitable applicants per vacancy, with an average of one suitable applicant per vacancy. This result was below the 4-year average of 1.9 suitable applicants per vacancy.
- Of the employers surveyed, several required plumbers who held a gas fitting licences. Employers found it harder to fill these vacancies with applicants that had the required level of experience to do the role and the licence.
- In general, across a range of plumber’s vacancy type’s qualified and suitable applicants were available to employers advertising vacancies.

Unsuitable applicants

- There were sufficient suitable applicants to fill vacancies in South Australia, 78 per cent of qualified applicants were unsuitable in Metropolitan Adelaide and 93 per cent of qualified applicants were unsuitable in regional South Australia. Overall, 82 per cent of qualified applicants were unsuitable.
- Reasons for unsuitability included lack of basic qualifications, additional qualifications or specific experience. Some applicants were unsuitable due to remuneration expectations.
- Employers surveyed identified some applicants were unsuitable because they could not demonstrate sufficient work experience, or work experience in a specialised field of plumbing.
Demand and supply trends

- According to 2016 ABS Census, there were approximately 4500 Plumbers in South Australia of which 2800 were employed and 1600 were self-employed. The Census indicated that 86 per cent of plumbers were employed in the construction industry and therefore occupational demand was mainly influenced by developments in this sector.

- Overall, the construction sector in South Australia appeared strong despite some recent indicators of steady activity.
  - The total value of building work done in South Australia improved in the year to March 2018 compared with the previous 12-month period and was above the five-year average.
  - The value of building work commenced in South Australia was above the five-year average as at March 2018, this is a 19.2 per cent increase compared with the previous 12 months.
  - The value of South Australian residential building approvals increased slightly in the year to May 2018, which provided an indication of future demand, the number of building approvals remained well above the five-year average.

- The value of building work yet to be done had increased by 39 per cent from March 2017 to March 2018.

- The major source of supply to the trade was new apprenticeship graduates who had completed a contract of training in plumbing and gas fitting.
  - Apprenticeship commencement numbers increased since 2012 and in 2018 commencements were above the five-year average.

- The number of trainees completing their contract of training as a plumber improved considerably. There was an average of 219 for completion numbers year ending March 2017-18 in comparison to the average of 175 March 2016-17.

- Although the number fluctuated from year to year, completion numbers were on par with the 5 and 10 year average for the plumbing trade.
The survey results showed a significant difference in the recruitment experience of metropolitan compared to regional employers. Employers in the metropolitan South Australia had a low fill rate of vacancies compared to employers in regional areas than last year.

• Most employers attracted suitable applicants and were able to fill their vacancies.
  - The survey results showed there were 8.1 applicants per vacancy of which, 5.5 of applicants were qualified and 1.8 were suitable applicants.
  - Approximately 52 per cent of vacancies were filled within four weeks and 38 per cent of employers had unfilled vacancies, with some attempting to fill multiple vacancies. The previous employer survey conducted in 2017 found that around 69 per cent of vacancies were filled within four weeks.
• Data showed a significant difference when comparing regional and metropolitan areas.
  - On average, metropolitan employers filled 44 per cent of vacancies and attracted an average of 8.1 applicants per vacancy and 1.8 suitable applicants per vacancy.
  - In regional areas, employers filled 80 per cent of vacancies, attracted an average of 12.0 applicants per vacancy and 4.0 suitable applicants received per vacancy. It is important to note that a small sample of regional employers were surveyed in comparison to the metro employers surveyed.
• Most of the employers surveyed were electrical services contractors who offer services to customers in the residential, commercial and industrial sectors. Some businesses specialised in solar panel installations and telecommunications.

Unsuitable applicants

• All vacancies surveyed required applicants to be trade qualified and licensed. Employers advised 68 per cent of applicants satisfied these criteria.
• In some instances, vacancies remained unfilled even though there were suitable applicants due to location and unrealistic remuneration expectations.
• The main reasons for unsuitability were lack of basic qualification, lack of experience in the occupation, lack of industry-specific experience, poor references and work history. A lack of additional qualifications/registrations was also a factor in applicants deemed unsuitable for the vacancy.
• Other reasons employers found applicants to be unsuitable were poor personal attributes such as attitude, character and presentation.
• Employers recruiting electricians to work on solar panel installations preferred candidates who were Clean Energy Council (CEC) accredited. Employers clarified in some instances they were willing to cover the costs involved in obtaining additional qualifications of a suitable applicant.

Demand and supply trends
• According to the 2016 ABS Census, there were 7600 employed electricians in South Australia; this represented an approximate 3.4 per cent decrease compared to 2011 census data where there were 7870 employed electricians. Approximately 76.5 per cent of employed electricians lived in metro areas while 23.5 per cent lived in regional areas.
• The 2016 Census also indicated that approximately 59.5 per cent of electricians were employed in the construction industry, 12.6 per cent were employed in the manufacturing industry and 6 per cent were employed in electricity, gas, water and waste services industry. Therefore, activity levels in the construction and manufacturing industries mainly influenced the demand for this trade.
• The Census also indicated approximately 78.9 per cent obtained Certificate III and IV qualification.
• In June 2018, HIA data indicated the availability of electrical trades continued to improve marginally.
• Overall, the construction sector in South Australia appeared strong despite some recent indicators of steady activity.
  - The total value of building work done in South Australia increased in the year to March 2018 compared with the previous 12-month period and is above the five-year average.
  - The value of building work commenced in South Australia as of March 2018 is above the five-year average, a 19.2 per cent increase compared with the previous 12 months.
  - The value of South Australian residential building approvals increased slightly in the year to May, which provided an indication of future demand, the number of building approvals remained well above the five-year average.
• The value of building work yet to be done increased by 39 per cent from March 2017 to March 2018.
• There was a steady decline in apprenticeship commencements over five consecutive years to March 2017, figures indicated there was a 38 per cent increase in 2018.
• In 2018, only 67 per cent of commenced trainees completed their training contracts. There were 386 completions in March 2018, which indicates they are below the five-year average of 443 completions. The number of trainees completing their contracts of training as an electrician has fluctuated over the last five years, reaching (501) in 2015.
Overall, employers of electrical engineers were unable to attract sufficient experienced and suitable applicants to fill their vacancies. There is a shortage of electrical engineers in South Australia.

- Businesses surveyed included engineering consultancy firms and private companies recruiting mechanical engineers for industries including electricity, construction, manufacturing, and mining.
- Substantially fewer vacancies were filled (50 per cent), compared with last year (100 per cent).
- Applicant numbers were significantly lower: on average 14.1 applicants per vacancy, compared with 45 applicants per vacancy in 2017.
- The vast majority of applicants were qualified (89 per cent, compared with 79 per cent in 2017).
- There were fewer suitable applicants per vacancy in 2018 compared with last year (on average, 2.3 compared with 3 per vacancy in 2017).
- Employers in the manufacturing, electricity and construction industries stated there was a sufficient supply of qualified electrical engineers, but applicants lacked the skills and experience they required.
- Alternately, mining industry employers stated they had no difficulty filling vacancies as several large oil and gas projects had ceased, which increased the number of suitable applicants.

Employer Requirements

- All employers required bachelor’s degree qualifications and experience in the occupation. Most employers required strong communication and interpersonal skills.

Unsuitable applicants

- Most unsuitable applicants lacked the skills and experience employers required. Examples of this included automation, transmission line, power generation, pump manufacturing or mining industry experience.
- Some employers stated a proportion of applicants were technically proficient electrical engineers, but they lacked business development and relationship building skills and experience.
- Other reasons for unsuitability were applicants lacking experience in the occupation (recent graduates) or lacking relevant experience.
- Employers rejected some applicants because they lived interstate or were not a good team fit.
Demand and supply trends

- South Australian electrical engineers are mainly employed in the professional, scientific and technical services, electricity, gas, water and waste services, or manufacturing industries. Demand is generally driven by electrical engineering infrastructure projects and activity levels in the construction, manufacturing and mining industries.
- The value of South Australian electricity transmission, generation and pipelines engineering construction increased by approximately 56 per cent in 2017, while engineering construction activity overall increased by around 33 per cent.
- A number of major civil construction projects are presently underway in South Australia, due to the South Australian state government’s 2016 and 2017 budgets, which mandated record spending on infrastructure ($12.1 and $9.5 billion, respectively, over 4 years).
- The value of building work done in South Australia increased by approximately 10 per cent in 2017.
- The value of building approvals, which provides an indication of future demand, increased by approximately four per cent in the year to March 2018.
- The number of manufacturing businesses in South Australia decreased from 6,238 at the end of the 2015-16 financial year to 6,207 at the end of 2016-17. Similarly, employment in South Australia's manufacturing industry decreased by around 16 per cent in the year to February 2018.
- However, despite a decrease in manufacturing businesses, the cessation of car manufacturing and a gap in defence shipbuilding in 2017, the South Australian economy grew by over two per cent in 2016-17, and a lower Australian dollar benefited non-mining exports. South Australian manufacturing exports increased by 20 per cent in the year to the September quarter 2017.
- Following increased mineral production activity in 2017-2018, South Australian mineral exports increased moderately in the year to March 2018.
- South Australian internet advertised vacancies for electrical engineers increased by 65 per cent in the year to March 2018. The numbers are the highest since 2013-14, however the increase was off a low base. Despite the increase, vacancy numbers remain subdued in comparison to the years 2006-2012.
- University education is the major source of supply to the occupation. The number of undergraduate completions in electrical engineering courses have trended downwards since 2012 and decreased in 2016 to the lowest number of completions in over 10 years.
- Following decreases in 2014 and 2015, commencement numbers increased in 2016, which may lead to an increase in supply in the next two years.
- South Australian internet advertised vacancies for electrical engineers increased by 65 per cent in the year to March 2018. The numbers are the highest since 2013-14, however the increase was off a low base. Despite the increase, vacancy numbers remain subdued in comparison to the years 2006-2012.
Overall, employers were unable to attract experienced and suitable mechanical engineers to fill their vacancies. Many applicants lacked the specific experience employers required. There is a shortage of mechanical engineers in South Australia (SA).

- Businesses surveyed included engineering consultancy firms, and private and public sector employers recruiting mechanical engineers for industries including construction, electricity, gas water and waste services, mining, defence and manufacturing.
- Substantially fewer vacancies were filled (25 per cent), compared with last year (86 per cent).
- Applicant numbers were significantly lower than in 2017; on average, 20.4 applicants per vacancy, compared with 50 applicants per vacancy in 2017.
- The average number of suitable applicants per vacancy decreased from 1.6 in 2017, to 1.1. Employers reported 94 per cent of applicants were unsuitable.
- There was a slight decrease in the proportion of qualified applicants; 87 per cent, compared with 91 per cent in 2017.
- Employers stated some applicants had unrealistic remuneration expectations.

- Some applicants expected salaries consistent with remuneration levels in Western Australia during periods of peak mining activity.
- Some public employers stated it was difficult to attract experienced applicants to the public sector, as private sector remuneration is generally higher.

Unsuitable applicants

- The main reason applicants were unsuitable was a lack of specialist industry experience, for example, manufacturing industry, power station construction, or building services experience.
- Some applicants lacked the technical skill and experience employers required, for example, reliability engineering and condition monitoring, manufacturing design, diesel generator or contract management experience.
- Some employers stated many applicants who did not complete their engineering degrees in Australia were technically proficient mechanical engineers, but they did not have the breadth of skills South Australian employers require, for example, project management, team co-ordination, relationship building and business development skills.
- Other applicants lacked experience in the occupation (recent graduates).
Demand and supply trends

- The main employing industries for this occupation are manufacturing (approximately 34 per cent) and professional, scientific and technical services (approximately 28 per cent). Mechanical engineers employed in professional, scientific and technical services generally provide consulting services to a range of industries, such as construction, oil and gas, and mining.

- Demand for mechanical engineers from the construction industry is strong, due to growth in engineering and building construction activity in SA.

  - Several major civil construction projects are presently underway in SA, due to the state government’s 2016 and 2017 budgets, which mandated record spending on infrastructure ($12.1 and $9.5 billion, respectively, over 4 years).

  - The value of SA engineering construction activity increased by approximately 33 per cent in 2017. Most of the increases related to electricity transmission, generation and pipelines, and roads, highways and subdivisions.

  - The value of building work done increased by approximately 10 per cent in 2017.

  - The value of building approvals, which provides an indication of future demand, increased by approximately four per cent in the year to March 2018.

- The number of manufacturing businesses in SA decreased marginally from 6,238 at the end of the 2015-16 financial year to 6,207 at the end of 2016-17. Similarly, employment in SA's manufacturing industry decreased by around 16 per cent in the year to February 2018.

- Despite the decrease in manufacturing businesses, the cessation of car manufacturing, and a gap in defence shipbuilding in 2017, the SA economy grew by over two per cent in 2016-17 and a lower Australian dollar benefited non-mining exports. SA manufacturing exports increased by 20 per cent in the year to the September quarter 2017.

- Following increased mineral production activity in 2017-2018, South Australian mineral exports increased moderately in the year to March 2018.

- Following a four-year decline, South Australian internet advertised vacancy numbers for the occupational group Industrial, Mechanical and Production Engineers increased by approximately 75 per cent in the year to March 2018 (disaggregated data for mechanical engineers only was unavailable), however, the increase was from a low base.

- University education is the major source of supply to the occupation. The number of course completions in mechanical engineering degree courses in SA remained relatively steady in 2016, compared with 2014 and 2015 completions. Course commencements reduced slightly in 2016 and are at the lowest levels since 2008. This suggests supply may be subdued in the next 2-3 years.
Employers surveyed continue to have difficulties in attracting sufficiently experienced bricklayers for their advertised vacancies. There continues to be a shortage of qualified applicants with no significant changes over the past 12 months.

- Surveyed employers were primarily small to medium businesses that worked in residential or commercial construction
- The proportion of vacancies filled in 2018 was 35 per cent. Overall, the percentage of vacancies filled within 4 to 6 weeks had improved slightly from 30 per cent in 2017. The average number of applicants per vacancy has increased from 3.8 applicants per vacancy in 2017 to 7.7 applicants per vacancy in 2018. This is above the five-year average from 2014 to 2018 of 5.3 applicants per vacancy.
- Of the qualified applicants per vacancy, the average remained on par as the previous year with 0.4 suitable applicants per vacancy.
- Employers had significant issues attracting qualified and experienced bricklayers to their vacancies. Employers received the highest number of applicant numbers per vacancy since 2015 with an average of 8 applicants per vacancy.
- Most employers surveyed commented it is very hard to find qualified and suitable bricklayers. Some employers stated this difficulty is due to the increased demand for tradespeople while others cited a lack of interest in apprenticeships from attracting apprentices.
- The occupation of bricklayer remains in shortage and vacancies remained unfilled, as applicants do not possess the correct qualifications or experience.

Unsuitable applicants

- Of the employers survey only 16 per cent of employers had qualified applicants and 68 per cent of those applicants were unsuitable.
- Applicants were found to be unsuitable as they were not trade qualified or had little or no experience within the field. In these instances, applicants were considered more suitable for a laboring role as they lack the technical skills of the trade.
- Several applicants screened and deemed appropriate for trial failed to present on the day or left the trial after a few hours.
- Overall, the proportion of employers who had unfilled vacancies was 60 per cent with 30 percent of employers receiving no suitable applicants.
• In addition, some unsuitable applicants lacked the relevant building and workplace safety licences, ABN or access to own transport required by employers.
• A high number of employers claimed some workers were unreliable and lacked a good work ethic.

Demand and supply trends

• According to the 2016, ABS Census there were 1200 employed bricklayers in South Australia, a decrease of 25 per cent from 2011 where there were 1600 employed bricklayers.
• Around 91 per cent of bricklayers are employed in the construction industry with most of these working on the residential construction sector.
• Some surveyed employers noted residential construction activity was stable, consistent with available data that shows overall, the construction activity in South Australia appears strong despite some indicators of steady activity.
  - The total value of building work done in South Australia increased in March 2018 compared with March 2017 and was above the five-year average.
  - The value of work building work commenced in South Australia has increased in March 2018 in comparison to March 2017, an approximate 6 per cent increase compared with the previous 12 months.
• South Australian residential building approvals increased slightly in the year to May 2018, which provides an indication of future demand, the number of building approvals remain well above the five-year average.
• Job advertisements for Bricklayers have increased slightly over the last 12 months and have remained steady if not the same with an average 6-7 since 2014 according to the Internet Vacancy index.
• A source of supply to the trade is new graduates who have completed a contract of training in bricklaying and block laying.
• Completions numbers have been in steady decline since 2013 and are at their lowest since 2007.
• In the last five years, in spite of a small increase in commencements numbers in 2015, the number of commencements have remained steady but well below the 10-year average.
• Only around half of those that commence a contract of training in bricklaying complete the qualification.
• In addition to formally recognised contracts of training, there is also a significant informal supply to the occupation. Census data from 2016 indicated that approximately 37 per cent of bricklayers do not hold qualifications at the Certificate III level or higher.
Labour market conditions for painting trades workers continued to be of concern and there appears to be shortages of qualified painters across several sectors. Most surveyed employers attracted low numbers of suitable applicants and many vacancy positions were unable to be filled within four weeks of advertising.

- A survey of employers who had recently advertised for painters found that 44 per cent of the vacancies were filled within four weeks. This proportion is lower than those employers surveyed in 2017 where 55 per cent of vacancies were filled within four weeks.
- Employers were surveyed across several sectors including commercial, residential building and construction companies.
- Employers attracted an average of 15.7 applicants per vacancy compared to 8.1 applicants per vacancy in 2017, however many of these applicants were not qualified or had little or no experience as a painter.
- The average of suitable applicants per vacancy have remained the same as last year’s results. Employers surveyed identified an average of 1.4 suitable applicants per vacancy in both 2017 and 2018.
- In regional areas, employers disclosed that they gained employees through personal contacts and did not advertise rather gained applicants through their networks or word of mouth. Several regional employers said that they were sole traders and only employed staff when the job required.
- Given the low ratio of suitable applicants per vacancy and low proportion of vacancies filled the labour market for painting trades workers is rated as being in shortage.

**Unsuitable applicants**

- Employers attracted an average of 6.4 qualified applicants per vacancy of which 41 per cent overall were qualified.
- The proportion of qualified applicants that were unsuitable was 59 per cent and an average of 36 per cent of employers had unfilled vacancies.
- All advertised vacancies required trade qualified applicants or applicants with experience commensurate with a trade qualification.
• Many applicants lacked basic skills in being able to do the role or lacked experience in the occupation. Some applicants lived interstate and relocation was a concern for the employer. Some applicants that were deemed qualified failed to present for the interview or trial. Others failed to finish the trial early or lacked the soft skills to do the role. Employers in the domestic sector valued painters with customer service and communication skills.

Demand and supply trends

• According to ABS 2016 Census data there are approximately 2700 Painting Trade Workers in South Australia, of those 90.2 per cent in the construction industry.

• Of those, 1200 are employees and 1500 are self-employed. Of those employed 81.5 per cent resided in metropolitan areas and 18.5 per cent in the rest of the state.

• Overall, the construction sector in South Australia appeared strong despite some recent indicators of steady activity.
  - The total value of building work done in South Australia improved in the year to March 2018 compared with the previous 12-month period and is above the five-year average.
  - The value of South Australian residential building approvals increased slightly in the year to May 2018, which provided an indication of future demand, the number of building approvals remain well above the five-year average.
  - The value of building work yet to be done has increased by 39 per cent from March 2017 to March 2018.
  - A major source of supply to the trade has been new graduates who have completed a contract of training in painting and decorating.
  - According to NCVER an average of 27 students completed a Certificate III in painting and decoration to year ending March 18 in comparison to 35 students who completed the certificate to year ending March 2016.
  - Over a longer term, completion numbers have fluctuated, making the 2018 completion numbers lower than the five-year average of 34 for painting trades.
  - Completion rates for apprentices in the painting trades have continued to decrease and remain below the 10-year average of 39.
The labour market for fibrous plasterers continues to be difficult and has followed the same trend as the previous 12 months. The vast majority of employers contacted were unable to attract a sufficient number of suitable applicants for their advertised vacancies.

- Of the businesses surveyed, all were specialist providers of plasterboard fixing services, mostly in the residential and commercial sectors.
- Employers surveyed who had recently advertised fibrous plasterers’ vacancies reported that only 17 per cent of vacancies were filled. This was a 10 per cent improvement from 2017 when only 7 per cent of vacancies were filled.
- In 2018 the average number of applicants who applied for positions was 6.5 which was much lower than 2017 (11.9). There were more qualified applicants with an average 15 per cent in 2018 in comparison to only 6 per cent in 2017.
- Employers reported receiving an average of 0.3 suitable applicants per vacancy in 2018 compared to 0.5 suitable applicants per vacancy in 2017.
- Employers surveyed in 2018 identified that 67 per cent of qualified applicants were unsuitable in comparison to 100 per cent of applicants being unsuitable in 2017. Several employers advised it was very hard to find qualified fibrous plasterers and gyprockers that have the required skill level and experience.
- Overall, employers reported substantial difficulties in finding tradespeople with the technical skills and experience to perform the fibrous plasterer role. The survey responses indicate there continues to be a shortage of fibrous plasterers in South Australia.

**Unsuitable applicants**

- Employers surveyed required applicants to hold a trade qualification in addition to experience within the occupation and were willing to take on labourers and teach them on the job if necessary.
- The main reasons for unsuitability were lack of appropriate experience and lack of quality technical skills. The majority of employers ran small plasterboard installation businesses and required staff to work autonomously and to have quality finishing skills. Employers reported that both qualified and unqualified applicants were unsuitable because they could not demonstrate these skills. Several applicants failed to present for trial.
Demand and supply trends

- According to 2016 ABS Census data there were 1400 fibrous plasterers employed in South Australia, of which 50.5 per cent were self-employed. The Census indicated that 87 per cent were in capital cities and 13 per cent were in the rest of the state. The highest level of education for Fibrous Plasterers was Certificate III and IV in Wall and Ceiling Lining at 42 per cent with 47.9 per cent having no post-school qualification.

- According to the HIA Trades Report in 2018, approximately 94 per cent of fibrous plasterers were employed in the Construction industry and therefore demand was driven by development in this sector. According to the HIA, South Australia has maintained a relatively balanced supply of trades in recent years, but the deterioration in the availability of trades in South Australia reflects a growth in the number of multi-story apartment projects in the market.

- Annually trade availability was down in both Adelaide and Regional South Australia by -0.22 in June 2017 and continues to decrease by -0.37 in June 2017.

- Overall, the construction sector in South Australia appears strong despite some recent indicators of steady activity.
  - The total value of building work done in South Australia improved in the year to March 2018 compared with the previous 12-month period and is above the five-year average.
  - The value of building work commenced in South Australia was above the five-year average as at March 2018, this was a 19.2 per cent increase compared with the previous 12 months.
  - The value of South Australian residential building approvals increased slightly in the year to May 2018, which provides an indication of future demand, the number of building approvals remain well above the five-year average.
  - The value of building work yet to be done has increased by 39 per cent from March 2017 compared to March 2018.
  - A source of supply to the trade is new graduates who have completed a Certificate III.
  - NCVER estimates indicate commencements into training were low for the year ending March 2018, however there has been improvements in with a result of 31 commencements, compared to 2016 when there were approximately 17 commencements.
  - An average of 14 fibrous plasterers completed training in a Certificate III in Wall and Ceiling Lining to four quarters to March 2018 compared to an average of 11 for the four quarters to March 2017.
OCCUPATION: Air-conditioning and Refrigeration Mechanic

ANZSCO: 3421-11

SHORTAGE: Shortage

DATE: September 2018

Employers reported attracting many applications for their advertised vacancies for air-conditioning and refrigeration mechanics, but they were unable to recruit sufficient suitable workers due to lack of specific experience. Consequently, a portion of vacancies were filled within four weeks (46 per cent).

- The survey found that 46 per cent of vacancies were filled within four weeks. This was a slight improvement in comparison to the September 2017 survey where 40 per cent of vacancies were filled within four weeks.
- On average, there were 6.7 applicants per vacancy compared to an average of 7.6 applicants per vacancy reported in the 2017 survey.
- There was a slight increase in the number of suitable applicants per vacancy, with 1.4 suitable applicants per vacancy compared to an average of 1.0 suitable applicants recorded in 2017.

- Due to ongoing difficulty, some employers reported finding it easier to recruit apprentices to train and offer employment upon completion of their apprenticeship.
- In addition to qualifications and experience, employers required applicants to have appropriate licences (such as the ARC tick refrigerant handling license, White Card and restricted electrical licence.)

Unsuitable applicants

- Although employers required applicants to be trade qualified, only 56 per cent of applicants were qualified and 76 per cent of qualified applicants were found unsuitable.
- The main reason for unsuitability were due to applicants not having sector-specific experience.
- Employers commonly sought applicants with at least two to five years sector-specific experience (e.g. industrial, commercial or residential).
Demand and supply trends

- According to the 2016 ABS Census there were 1,500 employed air-conditioning and refrigeration mechanics in South Australia and approximately 25.4 per cent were self-employed. Approximately 75 per cent obtained Certificate III and IV qualification.
- Census 2016 data also indicated 39.9 per cent were employed in the “construction industry” and 35.7 per cent were employed in an “other services” industry.
- Census 2016 data indicated 84.3 per cent of air-conditioning, refrigeration mechanics in South Australia lived in metro areas, and 15.7 per cent lived in rural areas.
- The Australian Refrigeration Council indicated in 2017, there were 2,807 licensed air-conditioning and refrigeration technicians (including apprentice technicians) in South Australia.
- The Internet Vacancy Index online vacancies have trended up over the previous five years.

- Overall, the construction sector in South Australia appears strong with some recent indicators of steady activity.
  - The total value of building work done in South Australia increased in the year to March 2018 compared with the previous 12-month period and is above the five-year average.
  - The value of building work commenced in South Australia as of March 2018 is above the five-year average, a 19.2 per cent increase compared with the previous 12 months.
  - The value of SA residential building approvals increased slightly in the year to May, which provides an indication of future demand, the number of building approvals remain well above the five-year average.
  - The value of building work yet to be done has increased by 39 per cent from March 2017 to March 2018
  - Financial commitments for the construction of new dwellings in South Australia increased by around 4 per cent in the year to July 2018 compared with the previous year.

In the last two years however, there has been a slight improvement in completion rates. Completions 4 quarters to March 2018 were 76 and 72 respectively to 4 quarters to March 2017. The number of trainees who completed their contracts of training reached its highest point in 2013 and showed a decline.
Employers surveyed have indicated a continued decline in the past 12 months with approximately a third of cabinetmaker vacancies being filled within four weeks. Most employer reported difficulties in attracting applicants that were qualified and had the skills and experience for the vacancy.

- A survey of employers across cabinet making, joinery and shop fitting business who had recently advertised have been contacted across residential and commercial sectors.
- On average there were 9.5 applicants per vacancy and an average of 0.4 applicants were suitable for the role. This is a further decline from 2017 where there were 0.6 suitable applicants per vacancy. This year’s average is the lowest number recorded in ten years.
- Only 35 percent of vacancies were filled in 2018 and this represented a further decline from 2017. It is also considerably lower than the previous employer survey conducted in September 2016 when the proportion of vacancies filled was 100 per cent.
- Employers surveyed reported significant difficulties in attracting applicants that were qualified and had the skills and experience to do the role.

The occupation of cabinetmakers has been rated as having a shortage in 2018 and this has been the case for four out of the last five years. The lack of suitable applicants continues to be of concern for employers. Several have said that they have had to decline work due to not having enough qualified staff to do the work. Some employers have stated that they are considering closing the business due to being unable to attract applicants that can work to high standards.

Unsuitable applicants

- The average number of applicants per vacancy had risen by an average of 2 since 2017; however, 87 per cent of applicants were not qualified and therefore were not suitable for the vacancy. All employers surveyed required trade qualified cabinetmakers.
- The main reason for applicants being unsuitable was due to lacking the qualification or the skills and experience to do the role.
- Approximately 52 per cent of qualified applicants were considered unsuitable for the role and 60 per cent of employers had unfilled vacancies, which is a further decrease on 2017 where 50 per cent of vacancies were not filled.
• Other reasons for unsuitability included lack of sufficient technical skills and competency in the role. There were also applicants that lived too far from the place of work or were not happy to take the job due to the remuneration offered.

Demand and supply trends

• At the ABS 2016 Census there were 1700 employed cabinetmakers in South Australia.

• Approximately 73 per cent of cabinetmakers were employed in the manufacturing industry and are a further 15.7 per cent are in the construction industry. Demand for cabinetmaking products and services has been closely linked to building activity in the construction industry.

• Over 31 per cent of the workforce were self-employed; many of these work as installers.

• Overall, the construction sector in South Australia appears strong despite some recent indicators of steady activity.
  - The total value of building work done in South Australia improved in the year to March 2018 compared with the previous 12-month period and is above the five-year average.

- The value of South Australian residential building approvals increased slightly in the year to May 2018, which provides an indication of future demand, the number of building approvals remain well above the five-year average.

- The value of building work yet to be done has increased by 39 per cent from March 2017 in comparison to March 2018.

• According to ABS 2016 Census, around 69 per cent of cabinetmakers hold a Certificate III qualification or higher, indicating a high reliance on formal training as a source of occupational supply.

• South Australian apprenticeship completions in cabinetmaking fell in 2016 (50) and decreased again in 2017 (43). There were minimal improvements in 2018 at 48 completions.

• The HIA Trades Report indicates that South Australia has maintained a relatively balanced supply of trades in recent years, but the deterioration in the availability of trades in South Australia reflects a growth in the number of multi-story apartment projects in the market.
• The South Australian labour market for construction trade workers has tightened for the third consecutive year.
• Of the six occupations surveyed at a state level five were rated in shortage, with carpenters and joiners declining from being rated in recruitment difficulty in 2017 to being in shortage in 2018.
• All nationally assessed occupations remained in shortage in 2018, continuing the trend from the 2017 results.
• Construction activity appeared steady, as did the value of building work yet to be done.
• In general, supply to the workforce has declined over the past few years, as indicated by a reduction in the number of construction trades apprenticeship completions.
• The 2018 survey of employers who had recently advertised for construction tradespersons found that 38 per cent of vacancies were filled within four weeks, compared to 40 per cent in 2017. This is well below the five-year average of 60 per cent.
• The amount of vacancies being filled have continued to decline dramatically since 2013 where the proportion of vacancies filled were at a high of 87 per cent of vacancies filled.
• Suitable applicants per vacancy have remained on par in the last two years with figures at (0.9) in 2018 and (0.8) in 2017.
• It is important to note that although the average number of suitable applicants was low (0.9) in 2018 there was an average of 11.6 applicants per vacancy. There had also been an increase in the number of suitable applicants since 2017, with 3.0 in 2018 in comparison to 2.6 in 2017.
• The proportion of vacancies filled in the metropolitan area was at 36 per cent with an average number of 0.7 suitable applicants per vacancy.
• In regional areas, 57 per cent of vacancies were filled with an average number of 3.1 suitable applicants per vacancy.
• The average number of applicants per vacancy is on par with 11.7 in metropolitan areas and 10.6 in regional areas.
Unsuitable applicants

- Employers reported attracting 11.6 applicants per vacancy; however, 67 per cent of qualified applicants were considered unsuitable.
- The main reason for unsuitability included:
  - Lack of basic and additional qualifications or specific experience. Some applicants were unsuitable due to remuneration expectations.
  - Applicants were unsuitable because they could not demonstrate sufficient work experience, or work experience in a specialised field.
  - Other reasons for unsuitability included lack of sufficient technical skills and competency in the role. There were also applicants that lived too far from the place of work or were not happy to take the job due to the remuneration offered.
  - Several applicants failed to present for trial and or interview and were therefore deemed unreliable.
  - In addition, some unsuitable applicants lacked the relevant building and workplace safety licenses, ABN or access to own transport required by employers.
- A high number of employers claimed applicants were unreliable and lacked a good work ethic.

Demand and supply trends

- Some surveyed employers noted residential construction activity was stable, consistent with available data that shows overall, the construction activity in South Australia appears strong despite some indicators of steady activity. Employment of bricklayers, carpenters and joiners, painting trade workers, fibrous plasterers and plumbing trades is predominant in the construction industry.
  - The total value of building work done in South Australia increased in March 2018 compared with March 2017 and was above the five-year average.
  - The value of work building work commenced in South Australia has increased in March 2018 in comparison to March 2017, a 5.7 per cent increase compared with the previous 12 months.
  - South Australian residential building approvals increased slightly in the year to May 2018, which provides an indication of future demand, the number of building approvals remain well above the five-year average.
- Trade availability in Adelaide has continued to decrease since March 2016 with the biggest decrease from March to June quarter 2018 with a decline of (-0.39).
- A HIA Trades Report has indicated that South Australia has maintained a relatively balanced supply of trades in recent years, but the deterioration in the availability of trades in South Australia reflects a growth in the number of multi-story apartment projects in the market.
  - HIA data determined that carpentry remains one of the trades in shortest supply.
Retention

In 2017–18 workers over 50 years of age comprised 25.6 per cent of Construction Industry Training Board eligible construction workers. A small percentage of this cohort (0.71 per cent) were undertaking apprenticeships. The construction industry faces a massive challenge with an ageing workforce in occupations such as air-conditioning and refrigeration, bricklaying, gas fitting, painting and decorating, and electrical. The 2016 census suggests that approximately 40 per cent of the construction workforce in South Australia is 45 years of age or older, which compares to the state average of 44 per cent.

Nationally, the average age of electrotechnology workers is 39 years, with 24 per cent aged over 50 years. The loss of key skills and industry knowledge caused by workers retiring will contribute to the already evident skills replacement gap, put a significant strain on the workforce, and further increase competition with other industries for skilled workers.

The gas and water sectors are facing similar workforce challenges, with more than nine per cent of the gas workforce needing to be replaced to account for workers who are over 60 years. The sector recognises the immediate need to invest in apprentices in preparation for the loss of workers during the next four to five years. The water sector also has a large proportion of its workforce aged over 50, with many likely to retire in the next 10 to 15 years.

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Skilled migration

In February 2019, the state government confirmed its commitment to increasing South Australia’s population through strategic skilled migration.

State Nominated Occupations List

The State Nominated Occupations List is available to all applicants, including international graduates of South Australia. State nomination does not guarantee employment in South Australia and applicants must compete in the local job market. Below are the occupations on the State Nominated Occupations List that relate to the construction, mining and energy sectors. The full list of occupations can be found at https://www.migration.sa.gov.au/

<table>
<thead>
<tr>
<th>Occupation</th>
<th>ANZSCO Code</th>
<th>Industry sector</th>
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</thead>
<tbody>
<tr>
<td>Surveyor</td>
<td>232212</td>
<td>Construction Services</td>
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### Occupation ANZSCO Code Industry sector

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**Supplementary Skilled List (321)**

The Supplementary Skilled List reflects occupations available on the Short-Term Skilled Occupation List (STSOL) that are not available on South Australia’s State Occupation List. These occupations are only available if you meet the additional requirements: [https://www.migration.sa.gov.au/skilled-migrants/nomination-process/skilled-nomination-requirements/supplementary-skilled-list-and-special-conditions-apply](https://www.migration.sa.gov.au/skilled-migrants/nomination-process/skilled-nomination-requirements/supplementary-skilled-list-and-special-conditions-apply)

This list of occupations has not been identified as being in shortage; they are available to a limited number of applicants who can demonstrate employment outcomes or family links to support human capital and economic objectives of South Australia’s participation in the skilled migrant program. The application requirements and full list of the Supplementary Skilled List can be found here: [https://www.migration.sa.gov.au/skilled-migrants/lists-of-state-nominated-occupations](https://www.migration.sa.gov.au/skilled-migrants/lists-of-state-nominated-occupations)
Designated Area Migration Agreement

The South Australian Designated Area Migration Agreement (DAMA) between the Commonwealth Government and the South Australian Government enables employers to sponsor skilled overseas workers for positions they are unable to fill locally.

The two South Australian DAMA agreements are:

- The Adelaide City Technology and Innovation Advancement Agreement—the DAMA for the Adelaide metropolitan region. Of the 60 occupations, 18 are related to the construction, mining and energy industry sectors.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>ANZSCO Code</th>
<th>Industry sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Project Manager</td>
<td>133111</td>
<td>Building Construction, Construction Services</td>
</tr>
<tr>
<td>Electrical Engineer</td>
<td>233311</td>
<td>Electricity Supply, Construction Services</td>
</tr>
<tr>
<td>Electronics Engineer</td>
<td>233411</td>
<td>Construction Services</td>
</tr>
<tr>
<td>Engineering Manager</td>
<td>133211</td>
<td>Construction Services, Oil and Gas</td>
</tr>
<tr>
<td>Engineering Technologist</td>
<td>233914</td>
<td>Coal Mining, Oil and Gas Extraction, Metal Ore Mining, Non-Metallic Mining and Quarrying, Exploration and Other Mining Support Services</td>
</tr>
<tr>
<td>Hydrogeologist</td>
<td>234413</td>
<td>Coal Mining, Oil and Gas Extraction, Metal Ore Mining, Non-Metallic Mining and Quarrying, Exploration and Other Mining Support Services</td>
</tr>
<tr>
<td>Industrial Engineer</td>
<td>233511</td>
<td>Electricity Supply, Construction Services</td>
</tr>
<tr>
<td>Mechanical Engineer</td>
<td>233512</td>
<td>Electricity Supply, Construction Services</td>
</tr>
<tr>
<td>Production or Plant Engineer</td>
<td>233513</td>
<td>Electricity Supply, Coal Mining, Oil and Gas Extraction, Metal Ore Mining, Non-Metallic Mining and Quarrying, Exploration and Other Mining Support Services</td>
</tr>
</tbody>
</table>
The South Australian Regional Workforce Agreement is the DAMA covering the entire state of South Australia. There are 114 occupations listed in regional growth industries including agribusiness, health and aged care, hospitality and tourism, and mining and construction; 13 are related to construction, mining and energy.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>ANZSCO Code</th>
<th>Industry sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backhoe Operator</td>
<td>721212</td>
<td>Construction Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Bulldozer Operator</td>
<td>721213</td>
<td>Construction Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Construction Rigger</td>
<td>821711</td>
<td>Construction Services, Civil Engineering Construction, Building Construction</td>
</tr>
<tr>
<td>Crane, Hoist or Lift Operator</td>
<td>712111</td>
<td>Construction Services, Building Construction</td>
</tr>
<tr>
<td>Driller</td>
<td>712211</td>
<td>Metal Ore Mining, Exploration and Other Mining Support Services, Non-Metallic Mineral Mining and Quarrying</td>
</tr>
<tr>
<td>Earthmoving Plant Operator (General)</td>
<td>721211</td>
<td>Construction Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Excavator Operator</td>
<td>721214</td>
<td>Construction Services, Building Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Grader Operator</td>
<td>721215</td>
<td>Construction Services, Building Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Loader Operator</td>
<td>721216</td>
<td>Construction Services, Building Services, Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>Miner</td>
<td>712212</td>
<td>Metal Ore Mining, Exploration and Other Mining Support Services, Non-Metallic Mineral Mining and Quarrying</td>
</tr>
<tr>
<td>Scaffolder</td>
<td>821712</td>
<td>Construction Services, Building Construction</td>
</tr>
<tr>
<td>Steel Fixer</td>
<td>821713</td>
<td>Construction Services, Building Construction</td>
</tr>
<tr>
<td>Structural Steel Erector</td>
<td>821714</td>
<td>Construction Services, Building Construction</td>
</tr>
</tbody>
</table>
Regional issues

The South Australian Chamber of Mines and Energy (SACOME) Blueprint for Mental Health highlights the resources sector’s commitment to supporting the mental health and wellbeing of its employees.

The South Australian Chamber of Mines and Energy (SACOME) Blueprint for Mental Health highlights the resources sector’s commitment to supporting the mental health and wellbeing of its employees. The Blueprint describes effective mental health programs and actions that the industry and sites can adopt to improve the mental health and wellbeing of their workers. The programs are largely relevant to all industries and are of particular concern to those who work in regional and remote locations.39

The Blueprint for Mental Health and Wellbeing provides direction to:
- promote mental health
- prevent mental ill-health
- build capacity and culture to address mental health and mental ill-health in the workplace
- respond effectively and early to reduce the impact of mental ill-health on employees and their families
- through research, address gaps in knowledge of mental health and mental ill-health in the industry.

39 South Australian Chamber of Mines and Energy, ‘Blueprint for Mental Health and Wellbeing’
## Plans and major projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Status</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Stimulus package</td>
<td>In progress</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Health Infrastructure</td>
<td>In progress</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Health Infrastructure</td>
<td>In progress</td>
<td>Heavy and Civil Engineering Construction</td>
</tr>
<tr>
<td>School Infrastructure</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Innovation, Arts and Tourism</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Innovation, Arts and Tourism</td>
<td>Planning</td>
<td>Electricity Supply</td>
</tr>
<tr>
<td>North-South Corridor</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Regional Roads and Infrastructure</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Metropolitan Infrastructure Projects</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Metropolitan Infrastructure Projects</td>
<td>Planning</td>
<td>Construction Services</td>
</tr>
<tr>
<td>Infrastructure SA</td>
<td>Planning</td>
<td>Building and Construction</td>
</tr>
<tr>
<td>Electricity and Renewables</td>
<td>Planning</td>
<td>Building Construction</td>
</tr>
<tr>
<td>Electricity and Renewables</td>
<td>Planning</td>
<td>Electricity Supply</td>
</tr>
<tr>
<td>CellCube</td>
<td>Planning</td>
<td>Building Construction</td>
</tr>
<tr>
<td>CellCube</td>
<td>Planning</td>
<td>Electricity Supply</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>Planning</td>
<td>Building Construction</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>Planning</td>
<td>Electricity Supply</td>
</tr>
<tr>
<td>TAPS Plumbing Pathways*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Increasing Apprenticeship numbers in the Building and Construction Industry*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Monarto Zoo Project*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Born to Build*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Introduction to Landscaping*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Skilling Construction in the Fleurieu and Hills*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>New Demolition Workers*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Supporting our Apprentices through capability development for supervisors*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
</tbody>
</table>
The South Australian 2019-20 State Budget, released on 18 June 2019, included initiatives associated with the state’s building and construction industry.40

<table>
<thead>
<tr>
<th>Project</th>
<th>Status</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-apprenticeship Employment Ready Pathway*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Women in Trades Pre-apprenticeship &amp; Industry Education*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Mature-age Pre-apprenticeship Program*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Business Administration Pre-Traineeship*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Tradesperson to Trainer Program*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Steel Frame Careers*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
<tr>
<td>Platinum Solar and Storage*</td>
<td>In progress</td>
<td>Electricity, Gas, Water and Waste Services</td>
</tr>
<tr>
<td>Increasing Apprenticeships in the Electrotechnology Sector*</td>
<td>In progress</td>
<td>Electricity, Gas, Water and Waste Services</td>
</tr>
<tr>
<td>Allwater SA Leadership &amp; Management Framework*</td>
<td>In progress</td>
<td>Electricity, Gas, Water and Waste Services</td>
</tr>
<tr>
<td>Iluka JA Technical Frameworks*</td>
<td>In progress</td>
<td>Mining</td>
</tr>
<tr>
<td>Upskilling Demolition Workers*</td>
<td>In progress</td>
<td>Construction</td>
</tr>
</tbody>
</table>

*Skilling South Australia project

40 Government of South Australia, State Budget 2019-20, viewed October 2019
<https://statebudget.sa.gov.au/#Budget_Papers>
Housing Stimulus Package

In recognition of the softer outlook for housing construction the state government developed a $104.5 million housing sector stimulus package that includes $42.5 million in direct government expenditure and the provision of interest-free deposit gap loans from HomeStart. The package includes:

- creating an interest-free deposit gap loan of up to $10,000 funded through an Affordable Housing Fund of $2 million to be administered by HomeStart, starting on 1 September 2019
- a housing construction program in 2019–20 and 2020–21, undertaken by the South Australian Housing Authority, to include building about 90 homes, with most sold as affordable housing
- a preventative maintenance and upgrade program in 2019–20, undertaken by the South Australian Housing Authority, to maintain pre-1968 homes and upgrade several walk-up flats, and maintain and upgrade other public housing with repairs to roofing, gutters and downpipes; flooring; hot water units; kitchens, bathrooms and laundries; and painting.

It is estimated that the support package will result in around 170 new housing contracts and about 120 housing outcomes for those struggling to buy an established property.

Health infrastructure

- A new Women’s and Children’s Hospital co-located with the new Royal Adelaide Hospital within the Adelaide BioMed City.
- Reactivating the Repat and ongoing major upgrades at the Modbury Hospital and the Queen Elizabeth Hospital for Stage 3 of its redevelopment, including a new emergency department and operating theatres.

School infrastructure

- Capital projects to improve school facilities across the state, support enrolment growth in government schools and transition Year 7 into high school.

- Glossop High School to bring together its two campuses and accommodate all year levels on the Berri campus, creating capacity for 800 Year 7 to 12 students.

- $361 million will be spent on building three new government schools\(^{43}\), including a Year 7 to 12 secondary school in Whyalla, and birth to Year 12 schools in the Munno Para and Sellicks Beach/Aldinga regions, to be completed as Public Private Partnerships.

- Other school initiatives include:
  - Package to improve facilities and meet projected enrolment at Roma Mitchell Secondary College, Port Augusta Secondary School, Nuriootpa High School, Mark Oliphant College, Eastern Fleurieu R-12 School, Playford International College, Seaview High School, Golden Grove High School, Heathfield High School and Mount Compass Area School
  - Norwood Morialta High School to co-locate on the Parade Campus and expand to 1,700 places
  - Unley High School to expand to 1,700 places while delivering its pre-existing master plan
  - $29.2 million for Glenunga International High School to expand to 2,200 places\(^{44}\)
  - $22 million in new funding to deliver priority projects at Blackwood High School, Craigmore High School, Golden Grove High School, Heathfield High School, Henley High School, Kapunda High School, Mount Compass Area School, Seaview High School and Wirreanda High School
  - $18 million for Adelaide High School to expand to 1,800 places\(^{45}\)
  - $13.8 million for Brighton Secondary School to expand to 1,800 places\(^{46}\)
  - $10 million for capital works to upgrade and modernise the Gawler and District College B-12\(^{47}\)
  - $10 million for capital works to upgrade and modernise the John Pirie Secondary School\(^{48}\)
  - Fleet of flexible learning spaces that can be deployed across schools experiencing short-term enrolment spikes, increasing capacity across the system by 650 students. This includes classrooms and specialist learning areas such as science labs and art rooms.

\(^{43}\) Government of South Australia, *Budget Paper 1: Budget Overview*, 7, viewed October 2019
<https://statebudget.sa.gov.au/#Budget_Papers>

\(^{44}\) Government of South Australia, *Budget Paper 4: Agency Statements*, 169, viewed October 2019
<https://statebudget.sa.gov.au/#Budget_Papers>

\(^{45}\) Ibid

\(^{46}\) Ibid

\(^{47}\) Ibid

\(^{48}\) Ibid
Innovation, arts and tourism

- A 10-year Adelaide City Deal for infrastructure projects at Lot Fourteen, such as the Innovation Hub, the Aboriginal Art and Cultures Gallery, an International Centre for Food, Hospitality and Tourism Studies and Indigenous Business Hub.
- Additional investment into the Heysens at Hahndorf, Carrick Hill House, Mitcham Hills Trail and Glenthorne Trail.
- $182 million for the redevelopment of the Adelaide Festival Plaza precinct\(^49\)
- $155 million to construct the Northern Adelaide Irrigation Scheme to supply treated water from the Bolivar Wastewater Treatment Plant to the Northern Adelaide Plains, and $390 million for solar PV generation and storage solutions on SA Water assets.\(^50\)
- Funding for sporting infrastructure, including $10 million for a new roof at Memorial Drive, and to develop a State Sport and Recreation Infrastructure Plan ($500 000 over two years).\(^51\)

North-South Corridor

- The state and commonwealth governments have committed to the final section of the North-South Corridor, making it the biggest infrastructure project in South Australia’s history.
- The remaining 10.5 kilometre stretch is the most complex; $252 million has been allocated in the forward estimates to begin planning and early works, with the final cost to be determined after the business case has been concluded.\(^52\)
- By the end of 2019 all other sections will be complete or under construction, with major construction on the Regency Road to Pym Street project set to begin.

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\(^{49}\) Government of South Australia, Budget Paper 1: Budget Overview, 7, viewed October 2019
<https://statebudget.sa.gov.au/#Budget_Papers>

\(^{50}\) Ibid

\(^{51}\) Ibid, 10.

\(^{52}\) Government of South Australia, Budget Paper 3: Budget Statement, 7, viewed October 2019
<https://statebudget.sa.gov.au/#Budget_Papers>
Regional roads and infrastructure

- The State Budget includes $1.1 billion for regional road projects and infrastructure upgrades across the state over eight years. This includes $878 million in new funding for regional roads and infrastructure. The projects include:
  - road upgrades, including additional overtaking lanes and shoulder sealing ($143 million)
  - $125 million to upgrade South Australia’s section of Eyre Highway from Port Augusta to Perth, including $32 million to upgrade Eyre Peninsula roads following the closure of the rail line
  - Sturt Highway from Renmark to Gawler ($87.5 million)
  - Barrier Highway from Cockburn to Burra ($62.5 million)
  - Princes Highway upgrade ($250 million)
  - Horrocks Highway Corridor ($55 million)
  - duplication of Victor Harbor Road between Main South Road and McLaren Vale ($92 million)
  - Granite Island causeway refurbishment ($20 million)
  - $14 million to support the construction of the new Thomas Foods Facility
  - $14 million towards the Naracoorte and Kroemers Crossing roundabouts
  - $11 million for increased Dublin Saleyards access
  - regional and remote airstrips ($1.8 million)
  - Kangaroo Island roads ($1 million)
  - $1 million to open Bratten Bridge to road trains
  - $334,000 to upgrade Kingston SE’s three main streets.

These projects build on other projects announced in the 2018–19 State Budget including:
  - duplication of the Joy Baluch AM Bridge
  - Port Wakefield Overpass and Highway duplication
  - Penola Bypass
  - upgrade the 100-year-old Dog Fence
  - 10-year project for country health facilities
  - address critical housing needs for people in remote communities, in partnership with the Commonwealth Government.

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Metropolitan infrastructure

- Key metropolitan infrastructure projects outlined in the 2019–20 State Budget, apart from the North-South Corridor, include:
  - Torrens Road, Ovingham level crossing
  - Brighton Road, Hove level crossing
  - Portrush and Magill Roads intersection upgrade
  - Metropolitan road projects – other intersection upgrades
    - upgrade the Main North, Kings and McIntyre roads intersection
    - upgrade the Main North Road and Nottage Terrace intersection
    - upgrade the Glen Osmond and Fullarton roads intersection
    - upgrade the Grand Junction, Hampstead and Briens roads intersection
    - Fullarton and Cross roads intersection upgrade
  - Goodwood, Springbank, Daws roads intersection upgrade
  - Widen Flagstaff Road (including $6.4 million in the 2018-19 Budget)
  - protect and secure the coastline, save West Beach through sand recycling pipeline, as well as sand dune restoration and revegetation to be undertaken in partnership with local councils and coastal community groups.

Infrastructure SA

The State Budget delivers $3 million of additional funding over four years for Infrastructure SA to develop a 20-year State Infrastructure Strategy and five-year rolling annual infrastructure plan.

Electricity and renewables

A state-wide power blackout in South Australia in October 2016 prompted an investigation into energy reliability that recommended the adoption of battery storage for renewables.

The Australian Electricity Market Operator (AEMO) has joined forces with the Australian Renewable Energy Agency (ARENA) to fund 10 pilots aiming to manage electricity supplies during extreme peaks. This $35.7 million initiative will deliver 200 megawatts of capacity by 2020.

Over three years, pilot projects are being introduced in Victoria, South Australia and New South Wales.

CellCube to build huge grid scale vanadium battery in South Australia

Renewables firm Pangea Energy and vanadium battery producer CellCube have signed an agreement to build a 50MW/200MWh battery storage system alongside a solar farm in South Australia.

The grid-scale battery is expected to be operational in 2020. Developed across 79 hectares near Port Augusta, the $290 million project is the latest among several solar and wind farms proposed for South Australia’s mid north.
AGL Energy, the owner of the biggest gas generation fleet in South Australia, has announced plans to build a massive 250MW/2000MWh pumped hydro energy storage project in the disused Kanmantoo copper mine about 55km southeast of Adelaide. AGL has agreed to pay $31 million for the rights to develop the pumped hydro project, using the existing open mine pit and building an upper pond on nearby land. The move is an example of projects that aim to shift South Australia to a state grid that will be nearly all renewable energy within 10 years.

South Australia is already sourcing more than half its energy needs from wind and solar, and this proportion is expected to increase to more than 70 per cent by 2021 and reach almost 100 per cent by as early as 2026–27.

**ISC priorities**

<table>
<thead>
<tr>
<th>ISC Priority</th>
<th>Status</th>
<th>Responsibility</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual and higher apprenticeships</td>
<td>In progress</td>
<td>Government, industry</td>
<td>Construction, Mining and Energy</td>
</tr>
<tr>
<td>Career pathways, entry level opportunities and STEM</td>
<td>Complete</td>
<td>Government, industry</td>
<td>Construction, Mining and Energy</td>
</tr>
<tr>
<td>Recruitment insight data</td>
<td>In progress</td>
<td>Government, industry</td>
<td>Construction, Mining and Energy</td>
</tr>
<tr>
<td>Recognition of Prior Learning</td>
<td>Not yet commenced</td>
<td>Government, industry</td>
<td>Construction, Mining and Energy</td>
</tr>
</tbody>
</table>
Dual and Higher Apprenticeships

The Construction, Mining and Energy Industry Skills Council will further investigate the viability of dual and higher trades in South Australia. A dual apprentice trade model in Electrical and Refrigeration will be explored in 2020 in collaboration with direct employers, industry associations and registered training organisations.

Recognition of Prior Learning

The Construction, Mining and Energy Industry Skills Council has called for a review of South Australia’s Recognition of Prior Learning model. Industry feedback suggests that the process is unclear, extensive and lacks consistency.

Career pathways, entry level opportunities and STEM

To meet the current and future workforce needs of the Construction, Mining and Energy industry sectors, communicating clear career pathways and entry level opportunities into the industry is paramount. The ongoing demand for apprentices and trainees to attain STEM skills remains essential to attracting the right calibre of entrants to the industry’s workforce.

Recruitment insight data

Around 50 per cent of the employers surveyed by the Department of Jobs and Small Business reported that recruitment was more difficult than in previous years, due to reasons such as:

- there were fewer applicants than in previous years (for some employers)
- fewer workers were entering the industry
- increased competition for workers due to growth in the industry or region
- lower quality applicants than previous years.

The Construction, Mining and Energy Industry Skills Council intend to utilise and build on these insights with local recruitment intelligence and monitor occupations and regions facing significant difficulty in recruiting.
### Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>Status</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISC consideration/framework to support industry programs in thin markets and new training demand</td>
<td>Planning</td>
<td>ISC</td>
</tr>
<tr>
<td>Explore mechanisms to provide training providers with industry feedback on new training/recruitment insights in real time</td>
<td>Planning</td>
<td>ISC</td>
</tr>
<tr>
<td>Review approved Skilling South Australia projects</td>
<td>Planning</td>
<td>ISC</td>
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Disclaimer: The material contained in this document has been developed by the Training and Skills Commission with support and data provided by the Department for Innovation and Skills and others. The views and recommendations do not necessarily reflect the views of the Government of South Australia or the Department for Innovation and Skills, or indicate any commitment to a particular course of action.

The information contained in this document is provided in good faith and all reasonable care has been taken in its preparation. The Training and Skills Commission recommends users exercise care in interpreting this document and carefully evaluate the relevance of the material for their purpose and where necessary obtain appropriate advice specific to their particular circumstances.

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