

... design, plan, organise and oversee the construction of civil engineering projects such as dams, bridges, pipelines, gas and water supply schemes, sewerage systems, roads, airports and other structures; analyse the likely behaviour of soil and rock when placed under pressure by proposed structures and design structural foundations; analyse the statical properties of all types of structures and test the behaviour and durability of materials used in their construction; plan and develop transportation systems; and estimate and monitor the construction costs of projects.

### Indicative Skill Level

Most occupations in this unit group have a level of skill commensurate with a Bachelor degree or higher qualification. In some instances relevant experience and/or on-the-job training may be required in addition to the formal qualification (ANZSCO Skill Level 1).

### Skilled Occupation Criteria

#### Long-lead time

Civil Engineering Professionals meet the criteria for long lead time, as entry to this occupation requires a substantial training commitment.

- ▶ Employment as a Civil Engineer generally requires the completion of a university qualification of at least four years study (full-time equivalent), such as a Bachelor of Civil Engineering.

#### High use

Civil Engineering professionals meet the criteria for high use, showing that the skills which people have acquired through education and training are being deployed for the uses intended.

- ▶ Based on advice from Universities Australia, university courses in civil engineering have a strong degree of match with eventual employment as Civil Engineering Professionals.
- ▶ Of new graduates employed as Civil Engineering Professionals, 82% had studied in a related field, such as engineering and related technologies (*Australian Graduate Survey, 2009*).
- ▶ As professionals, Civil Engineers are expected to have a level of skill commensurate with a Bachelor degree or higher qualification. Of those employed as Civil Engineers, 87% were found to possess this level of skill (*ABS Survey of Education and Work, 2010*).<sup>1</sup>

#### High risk

Civil Engineering Professionals also meet the criteria for high risk/high disruption. This indicates that the occupation is important for the effective operation of an enterprise and/or the broader economy.

- ▶ Civil Engineering Professionals are required to be registered or licensed in some states and territories, such as Victoria, Queensland and Tasmania.
- ▶ Civil Engineering Professionals are important to meet government policy priorities at both the Commonwealth and state level. These include the Clean Energy Initiative, sustainable housing initiatives, and the National Solar Schools program.

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<sup>1</sup> Analysis for the Skilled Occupations List (SOL) was conducted using the latest available data, including the 2010 ABS Survey of Education and Work (SEW). Percentages may therefore differ from those cited in the 'Occupation Trends' analysis (over the page), which uses alternative sources in some instances (e.g. the 2008 ABS Survey of Education and Work). Small sample sizes for some occupations may also result in fluctuations in the SEW data between 2008 and 2010. The specific data sources used for the Occupation Trends analysis can be found on the Skills Australia website: <http://www.skillsaustralia.gov.au/SOLsummarysheets.shtml>.

## Occupation trends

### ANZSCO: 2332

### Civil Engineering Professionals

<b>Employment level</b>	47,100 A high proportion of workers (89.5%) are employed full-time.
<b>6 digit employment (2006 Census)</b>	233211 Civil Engineer 12,470 233212 Geotechnical Engineer 700 233213 Quantity Surveyor 1990 233214 Structural Engineer 3190 233215 Transport Engineer 2740
<b>Employment growth</b>	Over the five years to August 2010, employment increased by 28.4% (compared with growth of 12.1% for all occupations). Employment is expected to rise by 23.4% over the next five years (compared with projected growth of 9.5% for all occupations).
<b>Unemployment rate</b>	Average (around 3.1%) compared with all occupations.
<b>Educational profile</b>	Around 75.5% have a Bachelor degree or higher qualification.
<b>Vacancies</b>	The Internet Vacancy Index (IVI) rose by 18.4% over the 12 months to September 2010 to 138.4 (March 2006=100). Vacancies for all occupations increased by 19.4%.
<b>Gender</b>	Around 11.8% of workers are female (compared with 45.4% for all occupations).
<b>Labour turnover</b>	Around 5.3% of workers leave this occupation in a year compared with 13.1% for all occupations.
<b>Age profile</b>	The median age is 38 years and 38.9% are aged 45 years and over (compared with 38.5% for all occupations).
<b>Earnings</b>	Median full-time weekly earnings (before tax) are high (\$1500).
<b>Graduate outcomes</b>	Graduate Careers Australia data show 90% of Bachelor degree graduates in civil engineering seeking full-time work were working four months after graduation, almost 90% of whom were working as Engineering Professionals, Managers and Administrators and Building and Engineering Technicians.
<b>Skill shortages</b>	Shortages of Civil Engineering Professionals have been persistent since 2003.

### Labour market

Shortages of Civil Engineers have been persistent. Separate assessments of individual occupations which comprise this unit group commenced in 2009 (except for Quantity Surveyor which was a separate unit group in ASCO and is separately assessed) so it is difficult to provide a historical perspective of demand by 6 digit occupation.

233211 Civil Engineer: DEEWR research in early 2010 shows shortages of Civil Engineers are evident across all states. Employers reported both the proportion of vacancies filled (44%) and the average number of suitable applicants (less than one) were low. Shortages were evident in both metropolitan and regional areas. Vacancies for highly experienced and specialised Civil Engineers, in areas such as construction, road and water supply, were particularly difficult to fill.

233212 Geotechnical Engineer: Not assessed

233213 Quantity Surveyor: Shortages have been persistent since 2006. In that time there has consistently been less than one suitable applicant per surveyed vacancy and the proportion of vacancies filled has continuously been lower than 50%.

Employers do, however, attract relatively large numbers of applicants (an average of 12 per vacancy in 2010) but on average less than one was considered by employers to be suitable. The main reasons applicants are considered by employers to be unsuitable are lack of specific or extensive experience (five years plus) and lack of local building code knowledge. There appears to be considerable overlap between Quantity Surveyor and Construction Estimator.

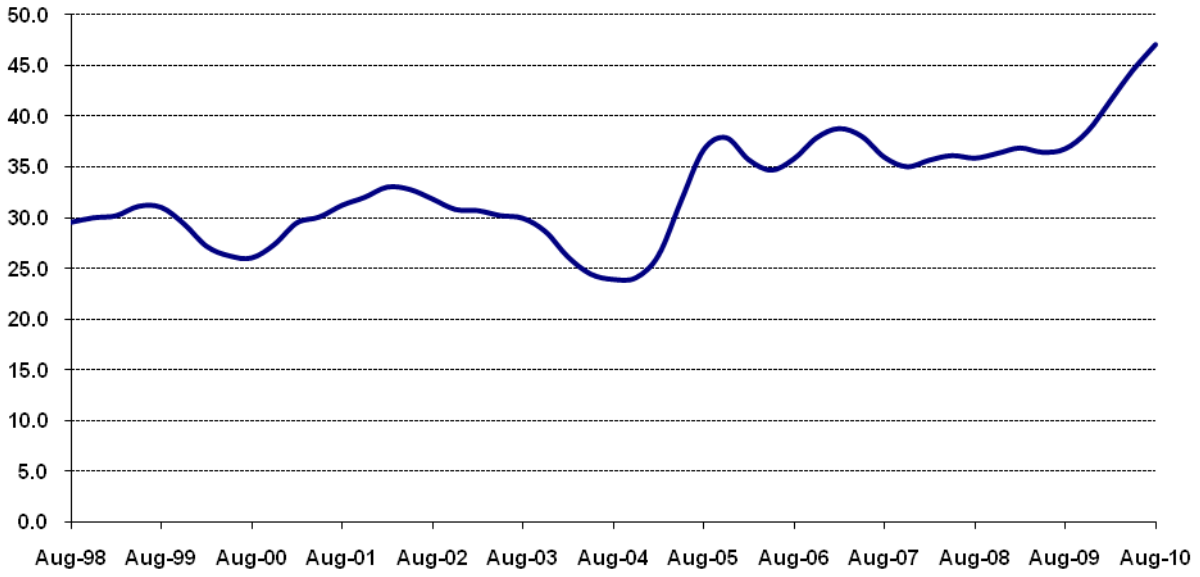
233214 Structural Engineer: Employers experienced difficulty filling their advertised vacancies in early 2010. DEEWR research shows a low proportion of vacancies filled (25%) and less than one suitable application per vacancy. Employers experienced particular difficulty recruiting specialised and senior structural engineers.

233215 Transport Engineer: Shortages of Transport Engineers were identified through DEEWR research undertaken in 2010. Around 40% of vacancies were filled and employers considered an average of one applicant per vacancy suitable.

### **Summary**

Demand is strong for these professions, with employment growth projected to continue to be strong over the next five years. Although levels of advertised vacancies remain relatively low, employers continue to experience significant difficulty recruiting.

Civil Engineering Professionals  
Employed Persons ('000s) Aug 1998 to Aug 2010



Internet Vacancy Index (IVI) - 3 Monthly Average - Nov 2006 - Sept 2010  
Civil Engineering Professionals (March 2006 = 100)

