Civil, Structural & Transport Engineers	New South Wales (NSW)
ANZSCO Codes: 2332-11,14,15	April 2009
Labour market ratings:	Civil Engineer - No shortage Structural Engineer – Recruitment difficulty Transport Engineer – Recruitment difficulty (regional)
Comment: *Recruitment difficulties are evident for structural engineers with experience in dams and bridges and for structural and transport engineers for positions in inland councils.*	

Occupational demand

ABS Census data indicate that combined employment of civil, structural and transport engineers grew by a solid 3.5 per cent per annum from 2001 to 2006. Non-residential construction activity has been strong in recent years, with the Construction Forecasting Council (CFC) expecting the value of work done to grow by 16 per cent in 2008-09, following growth of 11 per cent the previous year. However, non-residential building approvals have fallen sharply since September 2008 which suggests that activity in this sector will weaken once work currently underway is completed.

Occupational supply

DEEWR estimates that supply to these occupations from university completions averaged 300 per annum in the three years to 2008, which was slightly above the average of 285 for the previous three years. The annual training rate (entry-level course completions as a percentage of employed civil engineering professionals) is 3.2 per cent. DEEWR estimates that the wastage rate for the occupation was 2.3 per cent per annum from 2001 to 2006, which suggests that supply from local training is sufficient to offset wastage and allow for modest employment growth. Net overseas immigration to NSW is also an important supply source, growing to 390 persons in 2007-08, compared with an average of 240 per annum for the previous five years.

Employer and industry comments/current labour market

A DEEWR survey of employers who had recently advertised for civil engineers, structural engineers or transport engineers was conducted for this report. The survey found that 78 per cent of vacancies were filled within six weeks of advertising, which was a significant improvement on the success rate of 47 per cent in 2008. Employers had most success in filling vacancies for civil engineers. About 88 per cent of such vacancies were filled, with advertisers experiencing few difficulties in recruiting suitable applicants across a range of sectors including construction, consulting and local government. While positions requiring extensive experience in specialised areas such as dams and those based in inland regional councils proved more difficult to fill, there was insufficient evidence to establish a shortage in any particular specialisation or region.

Positions for structural engineers with experience in building design or building project work were also filled fairly readily, although recruitment difficulties were evident for those with extensive experience in specialised areas such as dams and bridges. The recruitment experience of employers seeking transport engineers was mixed. Half of the vacancies surveyed were withdrawn by employers due to a lack of funding of relevant projects. Employers and recruitment agencies also reported that a number of consulting firms had recently cut back their employment of traffic engineers. While employers in Sydney were generally able to fill vacancies, a number of positions based in inland regional councils remained unfilled after repeated advertising.

Labour market outlook

The CFC expects non-residential construction activity to grow by 7 per cent (not adjusted for inflation) in 2009-10 which should further improve demand for civil engineering professionals. As a result, some recruitment difficulties are likely to persist, especially in sectors benefitting most from planned increases in Australian Government and NSW Government spending on infrastructure.

Civil, Structural, Transport Engineer	Victoria
ANZSCO Code: 2332-11, 14, 15	March 2009
Labour market rating:	Civil - Recruitment Difficulty Structural – Shortage, Transport – No Shortage
Comment: Recruitment difficulties experienced by employers in the water industry; Shortage of structural engineers with local experience and knowledge of Australian Standards	

Occupational demand

ABS 2006 census data indicate there are 2909 Civil Engineers employed in Victoria with approximately a third of these working in Architectural, Engineering and Technical Services. Approximately three quarters of the 653 Structural Engineers employed in Victoria also work in this industry. In 2006 there were 779 Transport Engineers employed in Victoria with over half working in State and Local Government. ABS State and Regional Indicators for Victoria (March quarter 2009) indicate the total value of engineering construction activity (work) done during the December quarter 2008 increased by 5.8 per cent from the September quarter 2008. The "Victorian Transport Plan", outlined in the 2009-10 Victorian Budget, will invest $3 billion for new rail lines and stations, as well as more than $990 million for new roads.

Occupational supply

Entry to these professions is generally through a four year Bachelor of Engineering (Civil), and studies in the speciality areas can be integrated in the mid to final years and enhanced with further postgraduate studies. Commencements in entry level Civil Engineering courses have risen steadily; from 299 in 2003 to 518 in 2007. Completions have remained steady with a slight increase in 2007 to 278 completions compared with 227 in 2003. Sixty eight per cent of employed Structural Engineers hold a Bachelor degree; 62 per cent for Civil Engineers and 59 per cent for Transport Engineers. On average 15 per cent of Civil, Structural and Transport engineers have postgraduate qualifications. Supply to the profession from net migration in 2007-08 was 173 Civil Engineers (including transport engineers) similar to that in 2006-07. No data were available for structural engineers.

Employer and industry comments/current labour market

DEEWR's survey found that approximately 76 per cent of civil engineer vacancies were filled with an average of 6.5 applicants per vacancy. Vacancies for structural and transport engineers were difficult to source reflecting the smaller labour market in Victoria for these professions, so employers were cold canvassed. Three quarters of surveyed structural engineer vacancies and over half of transport engineer vacancies were filled, with an average of 16 and 7 applicants per vacancy respectively. On average there was less than one suitable applicant per vacancy across all three occupations. Most employers sought qualified engineers with a minimum of two years local experience, and knowledge of Australian Standards. Because of this requirement, many applicants from overseas were not considered suitable. Regional employers had greater difficulty attracting suitable applicants across all three engineering disciplines with the majority of positions remaining unfilled.

Contacts in the water industry seeking civil engineers had difficulty finding people with industry-specific experience. From the small number of surveyed contacts seeking structural engineers, most indicated they had few local applicants and a high level of interest from overseas. Few applicants met their selection criteria in regard to local experience, indicating a shortage for this profession.

A small number of employers seeking transport engineers received suitable applicants but could not complete the recruitment process within the survey timeframe or failed to come to agreement with the successful candidate. As such the filled rate did not accurately reflect employers' experiences. Employers indicated some redundancies in local consultancies had increased local supply, and that there are few transport engineering companies so competition is limited. Consequently, most vacancies for transport engineers were filled relatively easily, except for local government positions.

Labour market outlook

There is no evidence that there will be any changes to the labour market for the next 6 months.

Civil Engineer, Structural Engineer, Transport Engineer	Queensland
ANZSCO Code: 2332-11, 14, 15	March 2009
Labour market rating	Shortage
Comment: *In all three professions, demand is particularly high for senior level engineers. At this level of experience, State wide shortages are evident.*	

Occupational demand

Civil engineers may specialise in construction, municipal, structural, transport, or water supply distribution engineering. Structural engineers mostly work with architects, builders and other engineers to organise and supervise the construction of structures. Transport engineers design, test and improve systems and structures used to move people, including planning the future travel needs of metropolitan and regional areas. ABS Census data show workforce growth of civil engineers in Queensland was 32 per cent between 2001 and 2006. All three professions can be found in the government sector or in a variety of industries such as mining, manufacturing and construction. Demand for civil engineers continues to be generated by ongoing government investment in infrastructure projects. ABS figures show a 23.5 per cent increase in the trend volume of engineering construction work done in the year to December 2008.

Occupational supply

Formal entry to these professions in Queensland is via the completion of a four-year Bachelor of Engineering (Civil). Queensland universities offer a range of options including majors, dual and extended majors and minors or dual degrees. Data from the Department of Education, Employment and Workplace Relations indicate enrolments in civil engineering courses peaked at 352 in 2005 and have since fallen with a total of 144 students enrolling in 2007. Historically, around 30 per cent of students leave before completing their studies and, if completions stay commensurate with enrolments, around 170 newly qualified civil engineers will graduate at the end of 2009.

Department of Immigration and Citizenship data indicate 518 self-identified civil engineers migrated to Queensland in 2006-07. Labour Force Survey data suggest interstate migration may also be a major contributor, with Queensland's civil engineering workforce increasing by approximately 3500 persons over the year to February 2007, and numbers since remaining at this elevated level.

Employer and industry comments/current labour market

Surveyed employers who had advertised for civil, structural or transport engineers all reported difficulty filling their positions. Vacancy filled rates for the three professions were 29 per cent, 14 per cent and 20 per cent respectively and employers for all three professions sought applicants with extensive experience. Almost a third of employers seeking civil engineers received no response to their advertisement, and employers for all three professions reported more than 70 per cent of applicants were unsuitable because they lacked specialist design software knowledge, project management experience or other industry specific experience. In some cases they noted that applicants who possessed the requisite software knowledge were often recent graduates who lacked senior level experience. Respondents reported a high number of applicants from overseas, but that these applicants generally failed to demonstrate specific industry or Australian regulations experience. Employers and recruitment specialists reported the number of applicants has been steadily rising. Surveyed respondents who had advertised for transport engineers reported that despite a slight downturn in demand from most industries, demand from the government sector has continued to strengthen.

In all three professions, contacts reported their ability to fill regional vacancies has improved over recent months and suggested there has been an easing in the labour market for new graduates and for nonspecific vacancies.

Labour market outlook

Shortages of civil, structural and transport engineers are expected to persist over 2009 due to steady demand generated by high levels of public investment and planned infrastructure development.

Civil Engineer, Structural Engineer & Transport Engineer	South Australia
ANZSCO Codes: 2332-11, 2332-14, 2332-15	March 2009
Labour market rating	Civil Engineer: Shortage. Structural Engineer: No Shortage. Transport Engineer: No Shortage.
Comment	

Occupational demand

Demand for this group of professionals is influenced by the level of engineering construction activity. ABS data show that the total value of South Australian engineering construction work completed in the December quarter 2008 was around 26 per cent higher than the corresponding quarter a year earlier. However, industry contacts indicated that demand conditions weakened in late 2008, with this trend continuing into early 2009. DEEWR's Skilled Vacancy Index data show a sharp decline in the number of advertised vacancies for civil engineering professionals in the first three months of 2009, although in year-to-date terms vacancy levels were relatively stable.

Occupational supply

Entrants to these professions have usually completed a four year degree in a related engineering course at either the University of South Australia or the University of Adelaide. Combined student completions from both universities have been stable over the past decade at around 70 persons per annum (including single and mixed degrees in civil, structural, water and environmental engineering). Recently, there has been an increase in the aggregate number of related engineering degree course commencements relative to earlier years. As a consequence, DEEWR projections suggest that student completions will be slightly higher in 2009, at around 77 persons. Immigration is an additional source of supply for civil engineering professionals, averaging around 30 persons per annum (in net terms) in both 2006-07 and 2007-08.

Employer and industry comments/current labour market

A survey of employers who had recently advertised for civil engineering professionals indicated that 31 per cent of total vacancies were filled within six weeks, which was only slightly higher than the 27 per cent fill rate recorded in early 2008. Both the number and percentage of suitable applicants declined in the most recent survey period. Most applicants were rejected due to lack of appropriate qualifications and/or relevant industry experience. Employers had the greatest difficulty recruiting civil engineers with significant levels of experience in piping, water and road construction work. A small number of vacancies for new graduate civil engineers also proved hard to fill. Vacancies for experienced structural engineers were fewer in number and recruitment difficulties were less apparent for these professionals. Recruitment and hiring intentions had clearly weakened as a result of the current economic downturn, although a number of firms remained committed to filling vacancies for civil engineers and shortages for this occupation were still in evidence relative to a year earlier. Only one unfilled vacancy for a structural engineer was identified, although the employer later decided to suspend filling action due to lack of work. No information was available to suggest that transport engineers are currently in shortage.

Labour market outlook

Demand conditions for civil engineering professionals have deteriorated in recent months due to the worsening global financial crisis and its related effect on the Australian economy. Engineering construction activity is therefore expected to slow over the next year as projects are deferred or possibly cancelled altogether. At the same time, formal supply of civil engineering professionals is projected to increase. Current shortages should therefore ease over the short-term.

Civil Engineer, Structural Engineer, Transport Engineer	Western Australia
ANZSCO Codes: 2332-11, 2332-14, 2332-15	March 2009
Labour market rating:	Recruitment Difficulty
Comment: Employers report difficulty attracting experienced engineers in highly specialised roles.	

Occupational demand

ABS census data show the number of civil engineers in WA has increased by 39 per cent between 2001 and 2006 with civil engineers mainly working in Engineering Design and Engineering Consultancy Services and Water Supply. More recent ABS Labour Force Survey data show that in the year to November 2008 the level of employment of this occupation has been steady. A deep water port at Oakajee in the mid west is expected to go ahead in the near future, creating the need for infrastructure spending on roads, schools, and medical and community facilities and increasing the need for civil, transport and structural engineers in late 2009 and 2010.

Occupational supply

A four-year Bachelor of Engineering degree majoring in Civil Engineering is available at both Curtin University and the University of Western Australia (UWA) with structural and transport engineering available as specialisations. Recent combined Curtin and UWA domestic graduate numbers of Civil Engineers have been 2007 (63), 2006 (64) and 2005 (64). Some students undertake double degrees, often in engineering and commerce, allowing them to obtaining employment in alternative fields. University information indicates many students within graduate programs are employed up to nine months before they complete their degrees. The net gain in overseas migration of civil engineers to WA was recorded as 405 persons in 2007-08 which was more than the net gain of 327 in 2006-07.

Employer and industry comments/current labour market

A DEEWR survey of employers who had recently advertised for civil, structural and transport engineers was conducted for this report, with vacancy fill rates of 29 per cent, 14 per cent and 20 per cent respectively. Advertisements for each of the occupations attracted between 7 and 9 applicants per vacancy, but employers found only one to two applicants per vacancy to be suitable, mainly because many applicants lacked the specialised skills required for the projects being undertaken. Several employers indicated they were not willing to employ recent graduates and wanted people with a few years on-site experience, adding that they were willing to wait till they found someone possessing all the skills they required. They said there are many specialisations within the discipline, adding that a four year engineering degree was really only the starting point and it was experience followed by further study that qualified a person to work on specialist engineering projects.

The labour market for civil engineers has changed significantly from last year, with employers who were reporting that skill shortages were affecting their profitability now finding little difficulty recruiting other than in highly specialised areas. Employers reported receiving many applicants for any position advertised, with several indicating they receive applications from overseas but are unwilling to go through the processes required by immigration to consider these as viable candidates.

Several employers and recruitment agencies reported that there is a good supply of recent graduates and highly qualified people with over 15 years experience but a lack of people with five to ten years experience. This trend is reflected in the university enrolments of the last few years. Employers commented that almost all infrastructure development is being reviewed but they need to be ready for when the go ahead is given. Companies working in the development of infrastructure for the oil, gas and iron ore industry reported they were finding it difficult to fill certain specialised positions but overall they had limited recruitment difficulties.

Labour market outlook

Recruitment difficulties of civil engineers are expected to continue in the medium term, reflecting the specialist needs of the industry. Infrastructure projects may further increase levels of demand.

Civil, Structural and Transport Engineers	Tasmania
ANZSCO Code: 2332-11; 14; 15	March 2009
Labour market rating	Shortage
Comment: *Industry sources suggest that specialisations such as transport and structural engineers are especially hard to recruit.*	

Occupational demand

ABS 2006 Census data show there were 301 civil, structural and transport engineers employed in Tasmania. This was a 27.5% increase on the number recorded in the 2001 Census. Engineers Australia (Tasmania Division) advise that they have over 500 civil engineer members, however, they estimate this number only accounts for about 60 per cent of all qualified civil engineers in Tasmania. Demand for civil engineers is driven by factors such as general economic growth, construction activity, infrastructure development and regulatory changes such as safety and risk management. Increasingly, changes to environmental regulations such as those surrounding building codes, and potentially, issues surrounding emissions controls and carbon trading are likely to create new areas of demand according to industry sources. In addition, a number of sources identified that ageing of the engineering workforce is an issue, with replacement of retiring engineers another creator of demand.

Occupational supply

The main source of supply of civil engineers in Tasmania is through the Bachelor of Engineering degree at the University of Tasmania. Students undertake a common set of units for the first two years and then two years in one of the specialised engineering fields such as civil, electrical power, electronics & communications, mechanical, computer systems and mechatronics engineering. Completions of the Bachelor of Engineering (all disciplines) course have averaged over 88 per year over the last five years. However, a variable proportion of these each year would be overseas students who would not necessarily enter the labour market in Australia.

Employer and industry comments/current labour market

A survey of employers who had recently advertised for civil, structural or transport engineers was conducted for this report, with none of the contacted employers successfully filling their vacancies. One had withdrawn the vacancy due to an organisational restructure, and expected to re-advertise in the near future while in the remaining cases employers were looking for experienced engineers and/or a highly specialised set of skills.

Other industry sources indicated that they felt it was still difficult to recruit skilled and experienced civil engineers, although demand was starting to vary from sector to sector. Industry sources reported that large scale commercial and industrial construction projects are likely to be delayed, at least temporarily, and that this would reduce demand for a range of engineering occupations. However, government sponsored infrastructure projects are likely to off-set this lessening of demand to some extent at least. Other industry sources indicated that regional areas outside of Hobart will also continue to find it hard to attract skilled and experienced civil engineers.

Labour market outlook

Government infrastructure projects are expected to offset reductions in demand resulting from the global recession and it is expected shortages of civil, structural and transport engineers will persist in the medium term.

Civil Engineer	Northern Territory
ANZSCO Code: 2332-11	March 2009
Labour market rating	Shortage
Comment Senior Engineering positions are particularly difficult to fill	

Occupational demand

Australian Bureau of Statistics (ABS) Census data show there were 156 civil engineers employed in the Northern Territory (NT) in 2006, a marginal decline on the 2001 count of 162. The value of engineering construction work done in the NT increased throughout 2008 (ABS 8762.0), after declining during 2007, to surpass 2006 levels. The NT Government spending on infrastructure programs has grown each year since 2001 and over the last two years increased by 62 per cent to $887 million, with a further increase budgeted for 2009-10. The NT has, at least initially, been somewhat shielded from the global economic crisis and its impact on engineering demand. DEEWR's Skilled Vacancy Index shows there have been frequent advertised vacancies for civil engineers over the past four years (2005 to 2008), an indication of recruitment problems for an occupation of this size.

Occupational supply

Charles Darwin University offers a Bachelor and Master of Engineering with civil, electrical, electronic, and mechanical engineering streams. Enrolments have historically been low; however, the number of enrolments has increased significantly since 2004 and in 2008 there were 130 engineers in training. Increased enrolments have yet to translate into increased completions which have remained below 10 per year. Some employers reported the lack of graduates has caused them to decrease graduate intake numbers although others have cut back graduate recruitment in response to the current economic conditions.

Employer and industry comments/current labour market

The majority of employers contacted had difficulty filling civil engineering positions with only 46 per cent of vacancies filled. However, this was an improvement over the 2008 fill rate of 27 per cent. Typically, there were multiple applicants per vacancy but few (7 per cent) were considered suitable. Mostly, unsuitable applicants lacked the specific work experience required for particular roles. Many international candidates were also considered unsuitable because they lacked knowledge of Australian standards and regulations.

Employers commonly said demand for civil engineers had either slowed down (but not to the level of their interstate offices) or remained the same, with a shift from mining and minerals to government, education and main roads work. The effect of government economic stimulus measures on demand for engineers may be limited as projects often need to avoid detailed design stages to meet strict time deadlines. Most of the positions advertised were for existing roles to replace turnover of staff.

Employers consistently said supply issues were a major problem, particularly for senior civil engineering roles. Most said they had trouble attracting candidates to the NT which is commonly considered a less desirable location because of its small size and remoteness. Wage pressures did remain a significant issue for some employers. However, others were offering reduced rates of pay due to the current economic conditions. A high staff turnover was not considered a problem with employers commenting that current engineering employees tended to be stable in their roles.

Labour market outlook

The global economic crisis has affected demand for civil engineering roles across Australia, particularly in the mining and construction sectors, freeing extra supply for vacancies that do arise. Less demand interstate for these roles creates more potential to attract suitable people to the NT. Demand for civil engineers in the NT is expected to hold, and attracting people to relocate to the NT remain difficult, however, while the global economic conditions remain weak, shortages of civil engineers in the NT are expected to ease.

Civil, Structural, Transport Engineer	Australian Capital Territory (ACT)
ANZSCO Code: 2332-11, 14, 15	February 2009
Labour market rating	Shortage
Comment	

Occupational demand

ABS Census data indicate the majority of civil engineering professionals in the ACT are employed in Engineering Design and Engineering Consulting Services. Demand for civil engineering professionals in the ACT appears to be strong with 60 per cent of employers commenting they have many civil infrastructure projects commencing in 2009. ABS Engineering Construction Activity data for the ACT show infrastructure activity in the year leading up to December 2008 has been strong with a rise of five per cent in the value of work done and a considerable rise in the value of work yet to be done for same period.

Census data show employment growth for this occupation of 28 per cent between 2001 and 2006, more recent Labour Force Survey (LFS) data show employment may have fallen slightly over the year to 2009.

Occupational supply

Entry to this occupation is through completion of a bachelor degree or higher qualification. Training for civil engineers is not available in the ACT which suggests supply is reliant on interstate and overseas migration.

Department of Immigration and Citizenship net migration figures show there was a minimal gain of civil, structural and transport engineers from overseas.

Employer and industry comments/current labour market.

A survey of employers who had recently advertised for civil, structural and transport engineers was conducted for this report with a number of employers cold canvassed due to limited vacancies being identified over the survey period. One third of the surveyed vacancies were filled, significantly lower than the 57 per cent fill rate recorded in 2008. Employers generally indicated they were recruiting due to business growth.

Employers received slightly less than five applications per vacancy with less than one applicant per vacancy considered by employers to be suitable. Most applicants were qualified engineers but were regarded as unsuitable by employers as they had insufficient experience or lacked knowledge of Australian infrastructure.

The majority of employers noted the current economic downturn has yet to affect them with around 80 per cent of employers expecting to recruit in the next six months. Some employers stated the global recession is most likely to affect recent graduates and engineers who have less than five years experience as this group is generally the first to feel the impact of job cuts. It was noted there is little movement at present among employed engineers who have five or more years' experience.

Labour market outlook

Demand for civil engineers in the ACT is expected to remain strong over the next six months and there is no evidence to suggest that skill shortages for this occupation will ease. Recent proposed Government budget initiatives to bolster infrastructure projects may see demand for this occupation increase.