



JUNE 2006

ELECTRICIAN: OCCUPATIONAL SKILL SHORTAGE ASSESSMENT

2004 Situation: Genuine skill shortage

Current Situation: Genuine skill shortage

Short-term Outlook: Genuine skill shortage

1 Executive Summary

1.1 Results from the 2005 Survey of Employers who have Recently Advertised suggest employers have had considerable difficulty in filling electrician positions in New Zealand. Only 30% of positions were filled within ten weeks of advertising and there was an average of only nine suitable applicants for every ten electrician vacancies. This report considers these survey results in the context of trends in the demand for and supply of electricians.

Table 1: Employer Survey Indicators, 2005

	Fill Rate	Average Number of Suitable Applicants
Electricians	30%	0.9
All Trades Surveyed	37%	1.0

Source: Survey of Employers who have Recently Advertised, Department of Labour.

1.2 During the past four years, employment of electricians has risen in response to the booming construction industry. However, employment growth was slower than the growth in construction activity because of constraints on the supply of electricians. The current high level of demand for electricians is expected to be maintained through 2006 on the back of sustained activity in the construction sector.

1.3 There were 406 newly qualified electricians in 2005, an increase of over 150 since 2002. The number of current practising licences issued for electricians has grown by 16% in the year to 2005 and it appears many non-practising registered electricians are returning to the workforce as wage growth is strong. Net migration inflows of electricians have more than doubled in the last year and new enrolments in training have risen strongly between 2002 and 2005. This indicates that the number of trainees achieving qualifications is likely to increase in the future, and thus boost the supply of qualified electricians.

- 1.4 Due to the on-going disparity between the levels of supply and demand, the Department of Labour has assessed the electrician occupation as experiencing a **genuine skill shortage**.
- 1.5 The demand for electricians is expected to remain high as the level of activity in the construction sector is maintained at a historically high level in 2006. While the supply situation will continue to improve as the number of trainees achieving the relevant National Certificate qualifications is expected to increase over the next few years, the increase in supply will struggle to eliminate the current shortfall of electricians. The Department therefore predicts shortages to persist in the short-term.

2 Introduction

- 2.1 The purpose of this report is to investigate skill shortages for electricians in New Zealand.
- 2.2 The following section presents key findings from the Department of Labour's (the Department's) *Survey of Employers who have Recently Advertised* (SERA). This survey provides an indication of employer's success in filling advertised vacancies for electricians as well as other information on their recruiting experiences. The next two sections investigate trends in the demand for, and supply of, electricians. The penultimate section presents some of the issues that arise from the matching of demand and supply in the labour market, such as wage rates. Finally, the 'Assessment' section considers all the information presented in the report and provides a view on whether the occupation is in shortage, and if so, the type of shortage being experienced. A short-term outlook for the shortage situation is also offered.



- 2.3 Further background to this occupational report, including a discussion of the methodology; a glossary of terms; and an overview of the Department's *Survey of Employers who have Recently Advertised*, including the survey questionnaire, can be found in the 'Background and technical note' at <http://www.dol.govt.nz/publications/jvm/trades/2005/background.asp>.
- 2.4 ***Electricians in New Zealand***
- 2.4.1 Electricians (coded 71311 in the New Zealand Standard Classification of Occupations) install, maintain and repair electrical wiring and electrical/electronic equipment.
- 2.4.2 The vast majority of electricians who work in New Zealand are registered and hold a current practising licence. This licence must be renewed annually to ensure the holder is aware of current electrical legislation, codes of practices and

safe working procedures. In 2005, there were 13,867 electricians active in the workforce in New Zealand, according to the Electrical Workers Registration Board (EWRB). Census figures indicate that almost the entire electrician workforce is male (99%) and is employed full time (95%).

3 Survey of Employers who have Recently Advertised

- 3.1 This section presents the key SERA findings of employers' experiences in recruiting electricians.
- 3.2 The SERA allows the Department to gain insights into skill shortages by investigating how difficult it is for employers to fill vacancies. A 'fill rate' is calculated for each occupation – this being the proportion of vacancies included in the SERA sample which were filled with an adequately qualified and experienced person within ten weeks of advertising. Occupations with fill rates lower than 80% are typically regarded as being in shortage, while fill rates lower than 40% usually indicate that the occupation is in acute shortage.

Table 2: SERA Results for Electricians and All Trades Surveyed, August 2005

	Number of Employers	Number of Vacancies	Fill Rate ¹	Average Number of Suitable Applicants per Vacancy ¹
Electricians	54	92	30%	0.9
All Trades Surveyed	885	1480	37%	1.0

Source: Survey of Employers who have Recently Advertised, Department of Labour.

1 The 'All Trades Surveyed' fill rate and average number of suitable applicants per vacancy figures were both weighted to compensate for any under or over sampling of individual trade worker occupations in the 2005 survey.

- 3.3 Results from the 2005 SERA show that only 30% of electrician vacancies included in the survey were filled within ten weeks of being advertised, down from 54% in 2004. The fill rate for electricians was below the fill rate for all surveyed trade occupations (37%). There was an average of only nine suitable applicants for every ten electrician vacancies compared with an average of 1.0 for all trade occupations surveyed.

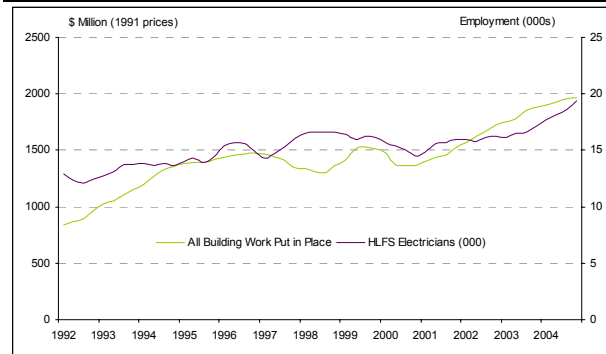
4 Demand for Electricians

- 4.1 This section investigates trends in the demand for electricians and the factors underlying these trends. Demand is measured by the number of electricians required by employers at current wage rates.

4.2 Historical Demand

4.2.1 There is a close relationship between the number of electricians employed and the value of building work put in place (see Figure 1). The number of *electricians*¹ employed grew by 34% in the four years to September 2005, compared with 42% growth in employment in the construction sector as a whole, and 44% growth in the value of work put in place. It is therefore likely

Figure 1: Value of Building Work Put in Place and Employment of Electricians



Source: Statistics New Zealand.

that demand for the services of electricians grew by more than the actual growth in employment over this period. This is probably due to supply constraints, which are influenced by restrictions on access into the electrician trade. In order to practise, electricians usually need to be registered and hold a current practising licence.

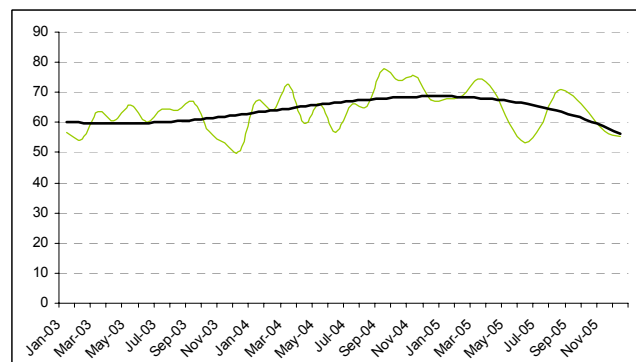
4.3 Future Demand

4.3.1 The Department's demand overview for the construction sector (see Appendix 1) suggests that while growth in construction activity is expected to slow in 2006, demand is still forecast to remain at a high level, driven mainly by growth in the non-residential sector. It follows that growth in the demand for electricians will slow in the next year or so but will still remain at a high level.

4.4 Changes in Market Conditions²

4.4.1 The Department's Job Vacancy Monitor shows that between October 2003 and October 2004, the three-monthly moving average for advertised vacancies for electricians grew by 30% (see Figure 2). However, since early 2005 the number of advertised vacancies began to show a downward trend. In the three months to December 2005 there were 18% fewer

Figure 2: Number of Advertised Vacancies for Electricians



Source: Job Vacancy Monitor, Department of Labour.

¹ Household Labour Force Survey data is only available at the 3-digit level of 'electricians' which also includes transport and appliance electricians. Electricians comprise most of this broader group (82% in the 2001 Census) and therefore trends at the 3-digit level are regarded as being reflective of trends for electricians.

² Analysis of the Job Vacancy Monitor suggests that it is an indicator of change in labour market tightness, or change in the degree of difficulty of recruiting staff. An increase in vacancies typically indicates increasing difficulty in recruiting staff and vice versa. While changes in demand usually dictate changes in labour market tightness, it can also be affected by changes in supply conditions, such as a rise in net migration.

advertised vacancies for electricians compared to the three months to December 2004, indicating recruitment conditions for employers may have eased slightly since December 2004.

5 Supply of Electricians

5.1 This section investigates the various sources contributing to the supply of electricians. Supply is measured by the number of people willing and able to work as electricians at current wage rates.

5.2 *Training - National Certificate (Level 4) Qualifications and Equivalent*

5.2.1 This section investigates the growth in supply of *fully qualified* electricians through training. It considers two sources of supply:

1. The award of the National Certificate in Electrical Engineering (Electricians) Level 4 by the Electro-technology Industry Training Organisation (ETITO). This is the nationally recognised qualification for electricians which is designed by ETITO to meet the needs of employers of electricians in the electrical industry.
2. The award of the National Certificate in Electrical Engineering (Electricians) Level 4 or the award of qualifications which are deemed to be equivalent to the National Certificate in terms of level and number of credits by other providers such as polytechnics.

5.2.2 Table 4 shows that the vast majority of the National Certificate Level 4 qualifications are awarded by ETITO. In 2005, 406 trainees achieved the National Certificate or equivalent, an increase of 157 since 2001. New enrolments for this qualification have increased strongly from 830 in 2002 to 1,368 in 2005, while total enrolments have grown from 1,692 to 2,689 over the same period (see Table 3). This suggests an increase in future achievements of the National Certificate or other equivalent qualifications is likely.

Table 3: Number of Trainees Enrolled for the National Certificate in Electrical Engineering (Electricians) Level 4 and Other Equivalent Qualifications

	National Certificate in Electrical Engineering (Electricians) Level 4 (ETITO)		National Certificate in Electrical Engineering (Electricians) Level 4 and Other Equivalent Qualifications (Other Providers)		Total	
	Total Enrolled	New Enrolments	Total Enrolled	New Enrolments	Total Enrolled	New Enrolments
2002	1542	756	150	74	1692	830
2003	1856	843	284	129	2140	972
2004	2111	1048	336	167	2447	1215
2005	2325	1183	364	185	2689	1368

Source: Electro-Technology Industry Training Organisation, Tertiary Education Commission. Some figures were estimated by the Department.

Table 4: Number of Trainees Achieving the National Certificate in Electrical Engineering (Electricians) Level 4 and Other Equivalent Qualifications

	National Certificate in Electrical Engineering (Electricians) Level 4 (ETITO)	National Certificate in Electrical Engineering (Electricians) Level 4 and Other Equivalent Qualifications (Other Providers)	Total
2001	222	27	249
2002	197	25	222
2003	296	55	351
2004	365	50	415
2005	348	58	406

Source: Electro-Technology Industry Training Organisation, Tertiary Education Commission. Some figures were estimated by the Department.

5.2.3 The training rate for electricians is given in Table 5. This indicator provides an approximate measure of the rate at which the supply of fully qualified electricians can potentially grow through training. The training rate is calculated by expressing the number of trainees achieving the relevant qualification as a percentage of total employment in that occupation. The training rate for electricians was estimated to be 2.7% in 2005. The training rate for electricians is lower than the average training rate of 3.3% for all trades analysed by the Department. By way of comparison, the average training rate for electricians in New South Wales, Australia³ in the three years to June 2005 was 3.5% - higher than the training rate in New Zealand over the last three years.

Table 5: Training Rate for Electricians, 2001-2005

	Electricians	All Trades⁴
2001	2.1%	2.0%
2002	1.7%	2.2%
2003	2.6%	2.2%
2004	2.8%	2.7%
2005	2.7%	3.3%

Source: Department of Labour.

5.3 Migration

5.3.1 New Zealand has experienced a net migratory inflow of 329 *electricians* in the four years to December 2005, coinciding with the strengthening of the domestic economy. However, these inflows were offset by migratory losses in the previous four-year period from December 1997 to December 2001, when a net outflow of 265 electrical workers was recorded (see Table 6). The net increase in the past four years has been mainly driven by increases in arrivals. Departures generally

³ Australian national level estimates of training rates are not available.

⁴ The training rates for 'all trades' were calculated for the 14 trade occupations that were examined in-depth using data from the SERA Intensive 2005. As the composition of occupations being examined changes from year-to-year, so will the training rates.

show a more consistent pattern, averaging about 270 per annum. Employers interviewed in the 2005 SERA mentioned that there were many electricians coming into the country but in their opinion some lacked experience relevant to New Zealand.

Table 6: Permanent and Long-term Arrivals, Departures and Net Migration of Electricians, 1998-2005 December Year End

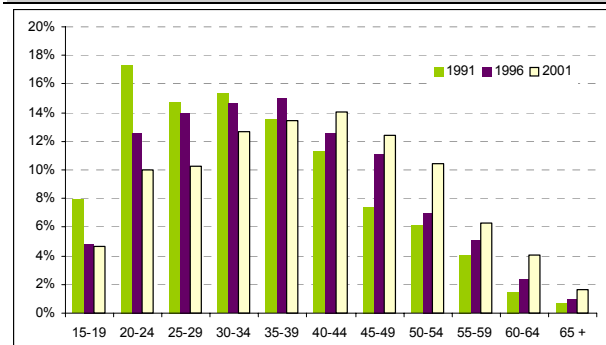
	1998	1999	2000	2001	2002	2003	2004	2005
Arrivals	172	238	185	276	283	346	317	409
Departures	273	309	280	274	230	255	267	274
Net Migration	-101	-71	-95	2	53	91	50	135

Source: External Migration, Statistics New Zealand. This data is only available at the 3-digit level of 'electricians' which also includes transport and appliance electricians. Electricians comprise the majority of this broader group (82% in the 2001 Census) and therefore trends at the 3-digit level are regarded as being reflective of trends for electricians.

5.4 Retirements

5.4.1 Based on 2001 Census data, it is estimated that approximately 1.1% of the electrician workforce retires each year (assuming a retirement age of 65). This equates to about 150 electricians per annum. This is lower than the average retirement rate for all trade occupations (1.3%). Census data shows an ageing of the electrician workforce occurred between 1991 and 2001 (see Figure 3). The percentage of electricians under 35 years of age decreased from 55% in 1991 to 38% in 2001, while the proportion in all age groups over 40 increased. By 2001 nearly half of all electricians were 40 years of age or older and the average age was 39, up from 34 in 1991. As the electrician workforce ages, the number of electricians retiring each year will increase.

Figure 3: Age Profile of Electricians, 1991-2001



Source: Census of Population and Dwellings, Statistics New Zealand.

5.5 Registration

5.5.1 The vast majority of electricians who work in New Zealand are registered with the EWRB. Once registered, those electricians seeking to practice must obtain a practising certificate on an annual basis from the EWRB. The registration data may slightly underestimate the total electrician workforce as some non-registered electricians are covered under the employer licence regime.

5.5.2 The number of electricians holding annual practising licences (including provisional licence holders⁵) provides an indication of the practising workforce in

⁵ The EWRB allows provisional licences to be issued to people such as qualified migrants to work while they are progressing towards meeting New Zealand electrical registration and licensing requirements. Provisional licences allow the holder to work under a qualified supervisor while working towards achieving

New Zealand. There were 13,867 practising electricians in 2005 according to the EWRB (see Table 7).

Table 7: Current Practising and Provisional Licences Issued, 1999–2005

Year	Annual Practising Licenses	Provisional Licenses	Total
1999	11,157	65	11,222
2000	10,984	78	11,062
2001	11,172	107	11,279
2002	12,064	109	12,173
2003	11,210	125	11,335
2004	11,762	199	11,961
2005	13,627	240	13,867

Source: Electrical Workers Registration Board.

5.5.3 Changes in the size of this practising workforce reflect all the factors influencing supply, including migratory flows, retirement and occupational change. The number of current practising licences issued for electricians grew by 16% in the year to 2005. This was after a period of low growth between 1999 and 2004. The strong growth in the number of current practising licences issued is supported by Household Labour Force Survey data which showed that employment of 'electricians' grew by 10.5% in 2005.

Table 8: Registration of Electricians, 1999–2005

Year	Total Number of Annual Practising Licenses Issued	Growth in Number of Practising Licenses Issued	Number of Registrations	New Registrations
1999	11,222	-	17,029	
2000	11,062	-160	17,436	407
2001	11,279	217	17,873	437
2002	12,173	894	18,311	438
2003	11,335	-838	18,730	419
2004	11,961	626	19,402	672
2005	13,867	1,906	20,099	697

Source: Electrical Workers Registration Board.

5.6 Occupational Detachment⁶

5.6.1 Table 8 shows there was on average about 475 new registrations each year between 1999 and 2004. By registering, these individuals have presented themselves as potential additions to the supply of electricians in New Zealand.

full registration. However, in some respects their status is similar to that of apprentices rather than fully qualified electricians.

⁶ 'Occupational detachment' refers to individuals who choose not to continue practising in their occupation but retain a connection to the occupation (e.g. move into a management or supervisory role, or retain professional registration), or who leave the occupation entirely (e.g. by changing occupation or withdrawing from the labour market).

The sources of these new registrations include recent graduates and new migrants. However, the number of annual practising licences issued only grew, on average, by about 150 per annum between 1999 and 2004. The fact that growth in the total number of electricians with annual practising certificates increased at a slower rate than growth in the number of new registrations indicates a significant number of electricians left the occupation over this period.

- 5.6.2 In 2005, however, the growth in annual practising licences (an increase of 1,906 from 2004) has considerably outstripped the number of new registrations (an increase of 697 from 2004). This suggests that many electricians who had previously detached themselves from the New Zealand electrician labour market have returned to practise in the last year. The number of electricians who had registered at some point in time but did not apply for a practising licence in 2005 was down 16% to 6,232.

6 Matching of Supply and Demand

- 6.1 This section considers some of the issues that arise from the labour market matching of the supply of electricians with the demand for electricians.

6.2 *Salaries*

- 6.2.1 Electrician wages are relatively high compared with other trades. The Labour Cost Index (LCI) measured an average hourly wage of \$22.74 for electricians compared with an average wage for all trade workers of \$19.81 (see Table 9). According to the LCI, wages of electricians have increased by 5.1% in the twelve months to June 2005, compared with 4.8% in all trades. Many employers mentioned in the 2005 SERA that wage growth for electricians was strong.

Table 9: Average Hourly Wage Rates for Electricians⁷

	June 2004	June 2005
Electrician	\$21.86	\$22.74
All Trades	\$18.90	\$19.81

Source: Labour Cost Index, Statistics New Zealand.

7 Assessment

- 7.1 This section considers all the information presented in this report on employers' recruiting experiences, supply and demand trends, and matching issues, and offers a view on whether there is a shortage of electricians and the type of shortage. A short-term outlook for the shortage situation is also offered.

⁷ The data shown from the LCI are unadjusted mean hourly rates. Caution should be taken with interpreting this information due to the relatively small sample sizes, particularly at the occupational level. Furthermore, the LCI is designed to measure changes in, rather than the actual level of, wage and salary rates.

- 7.2 Demand for electricians has grown rapidly over the past few years on the back of a booming construction industry. The value of building work put in place has grown by just under 10% per annum during the past four years and the demand for electricians is likely to have grown by a similar rate. In contrast to the rapid growth in demand, the supply of electricians has grown slowly. In 2005 supply grew by 2.6% through training, which was complemented by some net inward migration. Growth through training was even lower in previous years and there is evidence occupational detachment resulted in a loss of supply. As demand growth has exceeded supply growth, an acute shortage of electricians has resulted. This is reflected in the low fill rate of 30%. This disparity that has developed as demand has outgrown supply indicates that the shortage of electricians is a **genuine skill shortage** (see Box 1 for definition).

Box 1: Skill Shortage Definitions

Genuine Skill Shortage

Occurs when employers have difficulties filling their job vacancies because there are not enough individuals with the required skills in the potential labour market to fill the positions on offer.

Recruitment and Retention Difficulty

Occurs when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment. Retention problems are often a major contributor to this condition.

- 7.3 The demand for electricians is expected to remain high as the level of activity in the construction sector is maintained at a historically high level in 2006. While the supply situation will continue to improve as the number of trainees achieving the relevant National Certificate qualifications is expected to increase over the next few years, this increase in supply will struggle to eliminate the current shortfall of electricians. The Department therefore predicts shortages to persist in the short-term.

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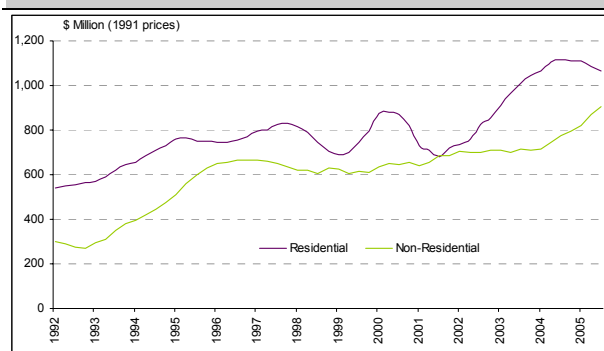
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Appendix 1: Construction Industry Demand Overview

New Zealand has experienced four years of strong growth in construction activity, and although the rate of growth has recently slowed, growth remains high. Figure A1 shows the rapid (44%) growth in building work put in place which occurred between late 2001 and late 2005. The boom has resulted in construction industry employment growth of 42% over the same period. While growth in total building work put in place still remains strong (4% in the year to September 2005), it has slowed from an average growth rate of 11% per annum in the previous three years.

The strong growth in the construction industry has been driven predominantly by activity in the residential sector, although in the last year the non-residential sector has begun to catch up. Until recently, growth in the residential sector has been driven by a range of factors. These include: low real interest rates from early 2001 to early 2004, high population growth caused by record net immigration, strong wage and job growth, a

Figure A1: Building Work Put in Place, Residential and Non-residential



Source: Statistics New Zealand.

previous lull in building activity, and falling household sizes. However, in the year to September 2005, there has been a 4% decrease in the value of residential building work put in place. In contrast, there has been a 17% increase in the value of non-residential building work put in place driven most strongly by growth in commercial buildings. It is likely that the slowdown in the residential sector has freed up resources for growth in the non-residential sector.

Table A1: Construction Activity and Employment, Years to September, 2001-2005

	Year to Sep 2001	Year to Sep 2002	Year to Sep 2003	Year to Sep 2004	Year to Sep 2005
Work Put in Place (1991 \$m)	5,461	6,088	6,898	7,544	7,869
% Change		11.5%	13.3%	9.4%	4.3%
Residential Building Consents (number)	19,533	24,408	30,139	31,864	27,092
% Change		25.0%	23.5%	5.7%	-15.0%
Non-residential Building Consents (number)	16,680	17,143	15,799	16,432	16,647
% Change		2.8%	-7.8%	4.0%	1.3%
Construction Employment (Four Quarter Moving Average)	113.0	119.1	135.8	150.1	160.3
% Change		5.4%	14.1%	10.5%	6.7%

Source: Statistics New Zealand.

Outlook for the Residential Sector

The residential sector has slowed down in the last year after a sustained period of high growth. This slowdown is likely to continue because all the key drivers of that growth have turned. Interest rates have risen⁸, lower levels of net inward migration⁹ have slowed population growth, the downturn in international students coming to New Zealand may negatively impact apartment building, and the high exchange rate may discourage offshore investors. Figure A2 shows there has been a downward trend in the number of residential consents issued since mid-2004. In the 12 months to September 2005 there was a 15% decrease in the number of consents issued for residential buildings, indicating that residential activity will continue to weaken. In addition, December 2005 Consensus Forecasts from the New Zealand Institute of Economic Research predict that residential investment will fall by 8.9% in the year to March 2007.

Figure A2: Quarterly Building Consents Issued, Residential and Non-residential (Number)



Source: Statistics New Zealand.

Outlook for the Non-residential Sector

Non-residential building activity grew strongly over 2005. This is reflected by a sharp increase in the number of non-residential building consents issued in 2004 (see Figure A2). Although the number of non-residential building consents issued began to slow over the second half of 2004, it has shown an upward trend in the first three quarters of 2005. The Department expects non-residential building activity to remain strong as construction resources are freed up from the downturn in the residential sector. An increase in the number of non-residential consents combined with increasing government and infrastructure expenditure indicates construction activity will increase in the sector over 2006.

Overall Outlook

The slowdown in the residential sector in 2006 is likely to be compensated by continued growth in the non-residential sector. Activity in the overall construction sector is consequently expected to remain at historically high levels. This will maintain the demand for labour at equally high levels.

⁸ The Reserve Bank of New Zealand increased its Official Cash Rate to 7.25 per cent in December 2005, a rise of 2.25 percentage points since the beginning of 2004.

⁹ Net inward migration (permanent and long-term arrivals less departures) fell to 7,000 in the year to December 2005 from a peak of 42,500 in the year to May 2003.