

February 2005

SKILL SHORTAGE ASSESSMENT OCCUPATION: ELECTRICIAN

Current: Skill shortage

Short Term Outlook: Skill shortage

Executive summary

1. Results of the Survey of

Employers who have Recently Advertised (SERA) indicate that there is a shortage of electricians in New Zealand. Only 54% of positions were filled within six weeks of advertising and there was an average of only 8 suitable applicants for every 10 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, 2004

	Fill rate	Average number of suitable applicants
Electricians	54%	0.8
All trades surveyed	41%	0.7

Source: Department of Labour, SERA

2. During the past three 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 2005 on the back of sustained activity in the construction sector.
3. There has been slow growth (1.1% per annum) in the overall supply of qualified, practicing electricians over the past four years. This slow growth in supply occurred during a period of rapid construction growth and indicates that supply has not kept pace with the increase in demand. However, new enrolments in training have risen strongly. Therefore an increase in the number of trainees achieving qualifications is likely from 2005 onward, which will boost the supply of qualified electricians.
4. The shortage of electricians may ease slightly through 2005 as the steady increase in enrolments for the National Certificate in Electrical Engineering (Electrician) since 2000 feed through to new registrations. There may also be a lagged effect from migration inflows in the past three years (given that it takes time for migrants to reach New Zealand registration standards).

Introduction

The purpose of this report is to investigate shortages of electricians in New Zealand. The report aims to give an assessment of whether there is a shortage of electricians and to provide an insight into demand and supply factors contributing to this situation. It also offers an outlook for shortages in this occupation.

Electricians install, maintain and repair electrical wiring and electrical/electronic equipment. Approximately one-third are self-employed. They are increasingly required to keep up-to-date with technological advances because the amount of work involving computer-based electronics, complex new lighting, telecommunications and security equipment is rising.

In order to work in New Zealand, all electricians need to be registered and hold a current practicing 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 2001, two-thirds (67%) of all electricians were employed in the construction industry while 15% were employed in manufacturing. The remaining 19% were thinly spread across a wide range of industries. The Department of Labour (DoL) estimates that there were approximately 13,200 electricians employed in New Zealand in 2003.

A background and technical note to this report is available from DoL. The note provides an overview of the broader Job Vacancy Monitoring Programme, of which this report is an output. It also provides a brief description of the employer survey conducted for this report and explanations of indicators and definitions used in the report.

Note on occupational classification

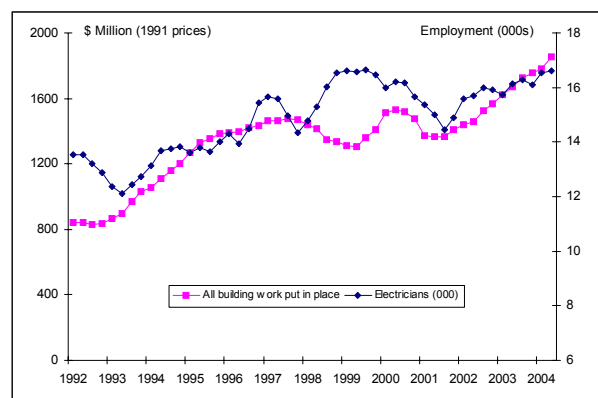
For the most part, this report presents information for the 5-digit occupational category of *electricians* (code 71311 of the New Zealand Standard Classification of Occupations). However, certain data sources, such as Household Labour Force Survey (HLFS) and External Migration, are only available at the broader 3-digit category. The 3-digit category has the same title as the 5-digit category i.e. *electricians* (code 713). The broader category also includes *transport electricians* and *appliance electricians*. However, in terms of employment numbers, the occupation of *electrician* is dominant. Therefore trends in the broad category are regarded as reflective of trends in *electricians*.

Demand for electricians

Historical demand

There is a close relationship between the number of electricians employed and the value of building completions (see figure 1). That said, the number of electricians employed grew by 10.8% in the three years to June 2004, compared with 31% growth in employment in the construction sector as a whole, and 36% growth in the value of work put in place. It is therefore likely that demand for the services of electricians grew substantially more over this period than the actual growth in employment. This

Figure 1: value of building work put in place and employment of electricians



Source: Statistics New Zealand

is probably due to supply constraints, which are influenced by restrictions on access into the electrician trade. In order to practise, electricians need to be registered and hold a current practising licence.

Future demand

The Department of Labour's (DoL's) demand overview for the construction sector, (which is given in Appendix 1), suggests that the current high level of activity will be sustained through 2005. It follows that the current level of demand for electricians will continue for the next year or so.

Summary

During the past three 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 2005 on the back of sustained activity in the construction sector.

Supply of electricians

Training-National Certificate (Level 4) qualifications and equivalent

This section investigates the growth in supply of *fully qualified* electricians through training. It considers three 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 by other providers such as polytechnics.
3. The award of qualifications apart from national certificates which are deemed to be equivalent to the national certificate in terms of level and number of credits.

Table 2 shows that the vast majority of the National Certificate Level 4 qualifications are awarded by ETITO. New enrolments for this qualification have almost doubled from 544 in 2000 to 1,010 in 2004 while total enrolments have grown from 1442 to 2,324 over the same period. Due to the lag between enrolments and achievements (typically about three and a half years), this upturn has only recently begun to yield an increase in the number of national certificate level 4 qualifications achieved, which were about 55% higher in 2004 than in 2000 (table 3). There were no non-national certificate qualifications at the equivalent level of the national certificate awarded over this time period.

Training rate indicators are given in table 4. A comparison of the number of trainees achieving the national certificate in Electrical Engineering (level 4) and equivalent qualifications with the number of electricians employed yields a training rate of 2.3%. This indicator provides a crude measure of the rate at which the supply of fully qualified electricians can potentially grow through training¹. This training rate is slightly higher than the average training rate of 1.8% for all trades surveyed in New Zealand, but well below the 2003 training rate of 3.8% for electricians in New South Wales (NSW). The

¹ This assumes that there is full employment of electricians. This is a reasonable assumption in the current environment of low unemployment and skill shortages.

New Zealand electrician training rate of 2.3% needs to be considered against the growth in demand for the services of electricians. This is probably closer to the annual growth in the level of building work put in place, which has exceeded 10% per annum during the past three years. This suggests that training levels have been falling short of the growth in demand for electricians.

Table 2: enrolments for 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 (Other providers)	Other equivalent qualifications	Total
2000	Total enrolled	1442	Not available	None	
	New enrolments	544	Not available	None	
2001	Total enrolled	1544	Not available	None	
	New enrolments	590	Not available	None	
2002	Total enrolled	1869	Not available	None	
	New enrolments	767	Not available	None	
2003	Total enrolled	2126	98	None	2224
	New enrolments	849	Not available	None	
2004	Total enrolled	2324	Not available	None	
	New enrolments	1010	Not available	None	

Source: ETITO, Tertiary Education Commission (TEC)

Table 3: 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 (Other providers)	Other equivalent qualifications	Total
2000	239	Not available	None	
2001	242	Not available	None	
2002	189	Not available	None	
2003	291	13	None	304
2004	370	Not available	None	

Source: ETITO, Tertiary Education Commission (TEC)

An alternative measure of training levels is the training enrolment rate (NC level 4) which compares the total number of trainees enrolled for the national certificate with the number of electricians employed. The training enrolment rate for electricians was 16.8% in 2003.

Training – Other related qualifications and courses

While the level 4 national certificate and equivalent non-national certificates may be regarded as the qualification required to be a *fully qualified* electrician, there are other lower level qualifications available in electrical training (such as Certificate in Electrical

Technician, Level 3). These qualifications are of significance as they may staircase trainees towards the national certificate level 4 qualifications. Credits obtained in these qualifications may be recognised towards a national certificate level 4, should the trainee later wish to become a fully qualified electrician. A list of these qualifications and the proportion of trainees enrolled in courses leading to these qualifications is provided in Appendix 2.

Training in these courses is reflected in the training enrolment rate (all related training) which compares the number of trainees enrolled in all electrician-related training with the number of employed electricians. The training enrolment rate (all related training) is measured at 29.4% for 2003 (table 4).

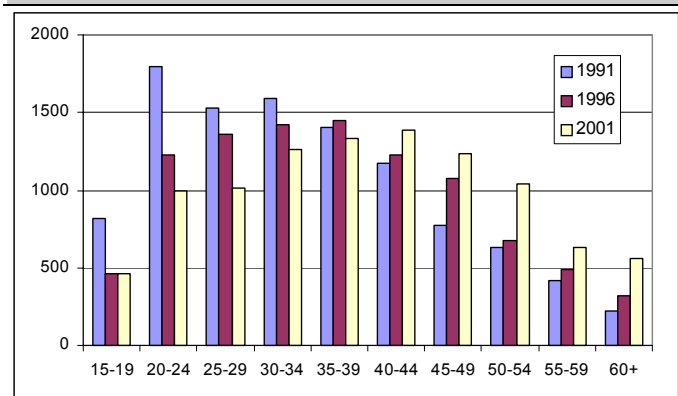
Table 4: training rates for electricians

Indicator	Explanation	Electrician (NZ)	All SERA trades surveyed (NZ)	Electrician (NSW, Australia)	All trades (NSW, Australia)
Training rate (national certificate L4 and equivalent)	Number of trainees achieving relevant national certificates (level 4) and equivalent non-national certificate qualifications expressed as a percentage of employment in that occupation.	2.3%	1.8%	3.8%	2.8%
Training enrolment rate (national certificate L4 and equivalent)	Number of trainees enrolled for relevant national certificates (level 4) and equivalent non-national certificate qualifications expressed as a percentage of employment in that occupation.	16.8%	16.3%		
Training enrolment rate (all related training)	Number of trainees enrolled in all relevant courses expressed as a percentage of employment in that occupation.	29.4%	30.5%		

Source: Department of Labour (New Zealand), Department of Employment and Workplace Relations (Australia)

Numerous employers interviewed in the Survey of Employers who have Recently Advertised identified the fall in training in the 1990s as a contributor to current supply problems. This is supported by data from the population censuses. Figure 2 shows a sharp decrease in the number of young people employed as electricians between 1991 and 2001. The percentage of electricians aged 15 to 24 years fell from 25% to 15% over the ten-year intercensal period.

Figure 2: age profile of electricians, 1991-2001



Source: Statistics New Zealand, Census

Migration

A moderate net migratory inflow of 208 electrical workers has occurred over the past three years, coinciding with the strengthening of the domestic economy. However, these inflows did not outweigh migratory losses in the previous four-year period from June 1997 to June 2001, when a net outflow of 351 electrical workers was recorded (table 5).

The net increase in the past three years has been mainly driven by increases in arrivals. Departures generally show a more consistent pattern, averaging about 270 per annum.

Table 5: permanent and long-term (PLT) arrivals, departures and net migration of electricians, 1997-2004 June years²

	1998	1999	2000	2001	2002	2003	2004
PLT annual arrivals	175	187	235	209	293	316	327
PLT annual departures	248	331	287	291	247	229	252
PLT annual net migration	-73	-144	-52	-82	46	87	75

Source: Statistics New Zealand, External Migration

Employers report that immigrant electricians often experience difficulties gaining full registration, and that without registration they were unable to practise as electricians. Many have to retrain while some of those from non-English speaking backgrounds have problems passing the exam because their command of English is inadequate.

Retirements

Using census data it is estimated that approximately 150 electricians retire each year. This is equivalent to an annual retirement rate of 1.1% i.e. this proportion of the workforce retires each year. A comparison of the annual number of retirees with the average number of training achievements (approximately 260 per annum over the past five years) suggests that retirements have had a considerable impact on the supply of electricians.

Occupational wastage

Employers felt that most electricians tend to stick with their trade once trained, although some move on to management positions when they get older.

Current practising licences

All registered electricians are required to renew their practising licence each year. The number of practising licences issued each year is therefore a good measure of the 'stock' or 'supply' of qualified electricians (including provisional licence holders³). Changes in the number of electricians with current practising licences reflect the net effect of all supply factors such as training, migration, retirement and occupational wastage. Data from the Electrical Workers Registration Board (EWRB) show a slow increase in the number of practising electricians, from 11,756 in the year to June 2000 to 12,263 in the year to June 2004. This amounts to a growth of 1.1% per annum. This growth in the stock of practising electricians contrasts starkly with the rapid growth (greater than 10% per annum) in the volume of work put in place in the construction sector, which should act as a crude measure of growth in demand for the services of electricians. The difference in growth rates reflects the extent to which the demand for electricians has outstripped growth in supply.

² These estimates could underestimate the migrant flows of electricians because the occupations of approximately 40% of persons entering and leaving New Zealand are not recorded or are not identifiable.

³ The Electrical Workers Registration Board (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 full registration. However, in some respects their status is similar to that of apprentices rather than fully qualified electricians.

Table 6: current practising and provisional licences issued, 2000-2004

	2000	2001	2002	2003	2004
Current practising licenses	11,677	11,900	11,875	11,874	12,094
Provisional licences	79	107	111	142	169
Total	11,756	12,007	11,986	12,016	12,263

Source: EWRB

Summary

There has been slow growth (1.1% per annum) in the overall supply of qualified, practising electricians over the past four years. This slow growth in supply occurred during a period of rapid construction growth and indicates that supply has not kept pace with the increase in demand. However, new enrolments in training have risen strongly so there is likely to be an increase in the number of trainees achieving national certificate level 4 from 2005 onwards, which will boost the supply of qualified electricians.

Employer recruiting experiences

Overall shortage of electricians

The SERA results suggest that there is a shortage of electricians in New Zealand with 54% of positions filled in the six weeks after advertising. This is slightly more than the overall fill rate for all trades surveyed which was 41%. There was an average of 0.8 suitable applicants for each electrician vacancy, compared with 0.7 for all trade occupations surveyed.

Table 7: SERA results for electricians and all trades surveyed, July 2004

	Number of employers	Number of vacancies	Vacancies filled	Fill rate	Suitable applicants	Average number of suitable applicants per vacancy
Electrician	18	24	13	54%	18	0.8
All trades surveyed	240	453	186	41%	337	0.7

Source: Department of Labour, SERA

Most employers surveyed thought that there was a national shortage of competent, qualified electricians holding New Zealand registration. Electricians with industrial electrics experience and experience with electrical and mechanical controls were in especially short supply.

What are employers paying?

Electrician wages are relatively high compared with other trades. The Labour Cost Index (LCI) measured an average hourly wage of \$21.90 for electricians compared with an average wage of all trade workers of \$19.54 (table 8). Average wages offered by employers included in the SERA are also relatively high at \$21.83. According to the LCI, wages of electricians have risen by 4.9% in the twelve months to June 2004, compared with 4.3% in all trades.

Table 8: average hourly wage rates for electricians and other trades

	Hourly rate
SERA – electrician	\$21.83
LCI – electrician	\$21.90
LCI – all trades	\$19.54

Source: Department of Labour (SERA), Statistics New Zealand (LCI)

Changes in market conditions

A net 28% of employers included in the SERA said that it was harder to recruit staff compared with 12 months ago, which was slightly lower than the average of all trades surveyed.

Outlook

Demand for electricians has grown rapidly over the past few years on the back of a booming construction industry. This high level of demand for electricians is expected to continue with construction activity being sustained at high levels. In contrast to the rapid growth in demand, the supply of electricians has grown slowly since 2000 resulting in a critical shortage of electricians. While the number of trainees achieving the relevant National Certificate qualifications is expected to increase over the next few years, these will not be sufficient to eliminate the current shortfall of electricians. DoL therefore foresees shortages, at best, easing only slightly in the short term.

For further information, contact:

Robert Haig, ph 915 4619, robert.haig@dol.govt.nz

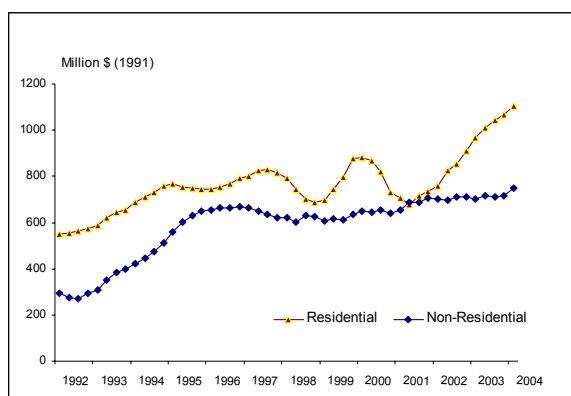
Andrew Whiteford, ph. 04-915 4568, andrew.whiteford@dol.govt.nz

Disclaimer: The Department of Labour has made every effort to ensure that the information contained in this report is reliable, but makes no guarantee of its accuracy or completeness and does not accept any liability for any errors. The information and opinions contained in this report are not intended to be used as a basis for commercial decisions and the Department accepts no liability for any decisions made in reliance on them. The Department may change, add to, delete from, or otherwise amend the contents of this report at any time without notice. The material contained in this report is subject to Crown copyright protection unless otherwise indicated. The Crown copyright protected material may be reproduced free of charge in any format or media without requiring specific permission. This is subject to the material being reproduced accurately and not being used in a derogatory manner or in a misleading context. Where the material is being published or issued to others, the source and copyright status should be acknowledged. The permission to reproduce Crown copyright protected material does not extend to any material in this report that is identified as being the copyright of a third party. Authorisation to reproduce such material should be obtained from the copyright holders.

Appendix 1: Construction Industry Overview

New Zealand has experienced three years of strong growth in construction activity. Figure 1 shows the rapid (36%) growth in building work put in place between mid-2001 and mid-2004. The boom has resulted in construction sector employment growth of 31%

Figure 1: building work put in place, residential and non-residential



Source: Statistics New Zealand

over the same period. The strong construction industry growth has been driven mainly by activity in the residential sector. The non-residential sector has been flat. 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, offshore investment, a previous lull in building activity, and falling household sizes.

Table 1: construction activity and employment, years to June 2001 and June 2004

Construction indicator	Year to June 2001	Year to June 2004	June 2001-June 2004 % change
Work put in place (1991\$m)	5,452	7,408	36%
Residential building consents (number)	19,345	32,851	70%
Non-residential building consents (number)	16,169	15,983	-1%
Construction employment (number of people)	114,300	149,100	31%

Source: Statistics New Zealand

Outlook for the residential sector

The residential sector is likely to slow considerably from the high growth experienced in the past few years. This is because all the key drivers of that growth have turned. Interest rates have risen,¹ lower net inward migration² has slowed population growth, the downturn in international education may hurt apartment building, and the high exchange rate may discourage offshore investors. September 2004 Consensus Forecasts from New Zealand Institute of Economic Research (NZIER) predict that residential investment will grow by 4.8% in the year to March 2005 and then fall by 9.3% in the following year.

¹ The Central Reserve Bank increased its Official Cash Rate to 6.5 per cent in October 2004, a rise of 1.5 percentage points since the beginning of 2004.

² Net inward migration (permanent and long-term arrivals less departures) fell to 22,000 in the year to June 2004 from 42,500 a year earlier and the Department of Labour expects it to continue falling to 15,000 in the year to March 2005 and 10,000 in the year after.

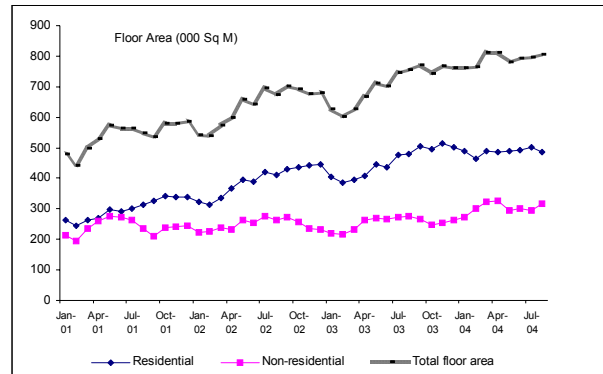
Outlook for the non-residential sector

Non-residential building activity is expected to grow strongly in 2005. This is reflected in an upward trend in building consents since late 2003 (figure 2). Growth will be driven by increased government expenditure on corrections, education and health facilities, upgrading and construction of new primary processing facilities, ongoing construction of retail premises and growing demand for office space arising from strong employment growth.

Overall outlook

Current high levels of construction activity are expected to be maintained in 2005 as growth in the non-residential sector compensates for the expected slowdown in the residential sector. This will result in current levels of employment being sustained. However, the shift in emphasis from residential activity to non-residential will require a transfer of workers from one sector to the other and a change in the mix of skills applied in the construction sector as a whole.

Figure 2: building consents issued, residential and non-residential



Source: Statistics New Zealand

APPENDIX 2. TRAINING ENROLMENTS FOR ELECTRICIAN TRADE: 2003

Enrolments in National Certificate Level 4 and equivalent qualifications: 2003

Qualification Title	Qualification Code	Provider Name	Level	Credits	Share of Enrolments (%)
NC in Electrical Engineering	NC5502	Electro-Tech. ITO	4	257	96.3%
NC in Electrical Engineering	NC5502	Bay of Plenty Polytechnic	4	257	0.4%
NC in Electrical Engineering	NC5502	Christchurch Polytechnic Inst of Tech	4	257	3.0%
NC in Electrical Engineering	NC5502	The Open Polytechnic of New Zealand	4	257	0.4%
Total					100.0%

Enrolments in other qualifications

Qualification Title	Qualification Code	Provider Name	Level	Credits	Share of Enrolments (%)
NC in Electrical Engineering	NC5391	Electro-Tech. ITO	2	52	33.7%
Certificate in Electrotechnology	CH3798	Christchurch Polytechnic Inst of Tech	2	120	1.9%
Certificate in Electrical Engineering	CH3826	Christchurch Polytechnic Inst of Tech	2	72	2.6%
MIT Cert in Electrical Engineering	MN4325	Manukau Institute of Technology	2	60	13.6%
Certificate in Electrical Engineering	HV4127	Wellington Institute of Technology	2	103	8.6%
Northland Polytechnic Certificate in Electrical Engineering	NT4656	Northland Polytechnic	2	2	9.7%
Certificate in Electrotechnology	CH3798	Christchurch Polytechnic Inst of Tech	2	120	0.2%
Certificate in Electrical Engineering	CH3725	Christchurch Polytechnic Inst of Tech	2	120	3.1%
Certificate in Electrical & Electronic Industry Skills	HV4177	Wellington Institute of Technology	2	120	2.0%
NC in Electrical Engineering	na	Electricity Supply ITO	3	na	0.7%
NC in Electrical Engineering	NC5415	Electro-Tech. ITO	3	153	1.4%
MIT Cert in Electrical Engineering	MN4326	Manukau Institute of Technology	3	60	2.3%
NC in Electrical Engineering	na	Electricity Supply ITO	4	na	2.1%
NC in Electrical Engineering & Motor Rewind	NC5502	Electro-Tech. ITO	4	257 & 126	0.3%
NC in Electrical Engineering and Electrical Appliance	NC5502 & NC5584	Electro-Tech. ITO	4	257 & 141	0.1%
NC in Electrical Engineering and Electronics Technology	NC5502 & NC5582	Electro-Tech. ITO	4	na	0.2%
NC in Electrical Engineering and Industrial Measurement Control	NC5502 & NC5583	Electro-Tech. ITO	4	257 & 223	3.1%

NC in Electrical Engineering (Motor Rewinding and Repair)	na	Electro-Tech. ITO	4	126	1.3%
MIT Cert in Electrical Engineering	MN4327	Manukau Institute of Technology	4	60	7.1%
Advanced Pre Trade Certificate in Electrical Eng Trades	ST5006	Southern Institute of Technology	4	48	0.3%
Certificate in Electrical Engineering Theory	HV4200	Wellington Institute of Technology	4	150	3.6%
Certificate in Electrical Engineering	HB3853	Eastern Institute of Technology	na	120	1.5%
NC in Electrical Engineering (L4) and Electronic Security (L3)	NC5502 & NC5590	Electro-Tech. ITO	3 & 4	257 & 130	0.6%
Total					100.0%