

National Certificate in Electrical Engineering (Electrician for Registration) (Level 4)

Level 4

Credits 249

This qualification has been **revised**. The last date to meet the requirements is 31 December 2021.

Transition Arrangements

Version 3 of this qualification was republished to extend the last date for entry from 31 December 2016 to 31 December 2017.

This qualification has been reviewed and replaced by the New Zealand Certificate in Electrical Engineering Theory and Practice (Trade) (Level 4) [Ref: 2388].

The last date for entry into programmes leading to this qualification is 31 December 2017.

For detailed information see [Review Summaries](#) on the NZQA website.

NZQF National Qualification Registration Information

| Process | Version | Date | Last Date for Assessment |
|---------------|---------|----------------|--------------------------|
| Registration | 1 | September 2005 | December 2021 |
| Revision | 2 | March 2009 | December 2021 |
| Review | 3 | November 2014 | December 2021 |
| Republication | 3 | June 2016 | December 2021 |

Standard Setting Body

The Skills Organisation
 FREEPOST 5164
 PO Box 24469
 Royal Oak
 Auckland 1345

Telephone 09 525 2590
 Email reviewcomments@skills.org.nz

National Certificate in Electrical Engineering (Electrician for Registration) (Level 4)

| | |
|----------------|------------|
| Level | 4 |
| Credits | 249 |

Purpose

This qualification is for people wishing to pursue a career as an electrician. Electricians install, maintain, and repair electrical wiring and electrical and electronic equipment in residential, commercial, and industrial environments. The qualification has been designed to prepare trainees for a productive role in industry, and to cover the requirements for registration as an electrician under the Electricity Act 1992.

Typically, the qualification will be gained during the course of a three to four year training programme. Holders of this qualification have gained a range of knowledge and skills assessed both off-the-job (during courses conducted by accredited training providers) and on-the-job (in the workplace). As this qualification shares credits with the National Certificate in Electrical Engineering (Level 2) [Ref: 0174] and the National Certificate in Electrical Engineering (Level 3) [Ref: 0223] trainees also have the option of applying for one or both of those certificates.

Holders of this qualification have demonstrated:

- knowledge of electrical theory, concepts, and trade practice, usually assessed during off-job training courses
- skills and knowledge related to working safely in the electrical environment, including first aid, cardio-pulmonary resuscitation, safe-working practices, and safety testing
- knowledge and application of relevant legislation, codes of practice, and standards
- knowledge of the New Zealand electricity supply
- competence in the practical skills of an electrician, usually assessed in the workplace. This includes installation of cables, equipment, and fittings in various environments, maintenance and repair of electrical equipment, and testing of installations
- generic skills and knowledge related to working effectively in the electrical industry, such as communication skills, report writing, and rights and responsibilities as an employee
- knowledge of the theory required for the registration of electricians.

The qualification also includes elective credits, reflecting the wide range of contexts in which electricians work. Trainees may choose standards that cover further skills and knowledge in the areas of electrical and electronic engineering, industrial processes, fire detection and alarm systems, and telecommunications.

Holders of this certificate may apply to the Electrical Workers Registration Board (EWRB) for electrical registration and a practising license under the provisions of the Electricity Act 1992. They must do so if they wish to do prescribed electrical work as an electrician without the supervision of a Supervisor of Electrical Work.

This qualification can lead to the National Certificate in Electrical Engineering (Level 5) [Ref: 0951] or the National Diploma in Engineering (Electrotechnology) (Level 6) [Ref: 1313].

This qualification shares credits with the National Certificate in Electricity Supply (Electrical) (Level 4) with strands in Electricity Supply Electrician, Electrical Fitter, and Electrical Technician [Ref: 1295].

Replacement Information

This qualification replaced the National Certificate in Electrical Engineering (Electrician) (Level 4) [Ref: 0313].

Special Notes

- 1 Achievement of this qualification indicates competence in the skills required by an electrician. However, the Electricity Act 1992 requires that all trainees be subject to supervision by a Supervisor of Electrical Work until they are registered as electricians.
- 2 The National Certificate in Electrical Engineering (Electrician for Registration) (Level 4) [Ref: 1195] is the single requirement for registration as an electrician. It includes Unit 21766, *Demonstrate knowledge of theory for registration of electricians*, which means that trainees who have completed the requirements of this qualification may apply to the EWRB for registration as an electrician.
- 3 Credit for standards 21766 and 1702 satisfy the requirements around the Critical Capabilities of the Essential Capabilities as specified by the EWRB. (The EWRB Regulations Examination is the only valid assessment tool for standard 1702 and the EWRB Theory Examination is the only valid assessment tool for standard 21766.)
- 4 Trainees who have achieved the former qualification, the National Certificate in Electrical Engineering (Electrician) (Level 4) [Ref: 0313] still have to attain a pass in the EWRB Theory Examination, which is external to that qualification.

Credit Range

| | Compulsory | Elective |
|--------------------------|------------|----------|
| Level 1 credits | 3 | - |
| Level 2 credits | 50 | 0-25 |
| Level 3 credits | 82 | 0-25 |
| Level 4 credits | 89 | 0-25 |
| Level 5 or above credits | - | 0-25 |
| Minimum totals | 224 | 25 |

Requirements for Award of Qualification

Award of NQF Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided in section 7 of the New Zealand Qualifications Authority (NZQA) Rules and Procedures publications available at <http://www.nzqa.govt.nz/ncea/acrp/index.html>.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- Compulsory standards
- Elective – A minimum of 25 credits as specified

Detailed Requirements

Compulsory

The following standards are required

Core Generic > Core Generic > Work and Study Skills

| ID | Title | Level | Credit |
|------|--|-------|--------|
| 1978 | Identify basic employment rights and responsibilities, and sources of information and assistance | 1 | 2 |

Engineering and Technology > Electrical Engineering > Core Electrical

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 750 | Demonstrate knowledge of electrical test instruments and take measurements | 2 | 2 |
| 1174 | Disconnect and reconnect fixed wired electrical appliances or equipment | 3 | 4 |
| 1178 | Follow safe practices in an electrical workplace | 2 | 3 |
| 1206 | Demonstrate knowledge of a.c. power and power factor | 4 | 4 |
| 2017 | Describe and use complex electrical instruments | 4 | 2 |
| 2031 | Demonstrate knowledge of three-phase theory | 4 | 4 |
| 5926 | Demonstrate knowledge of programmable logic controllers (PLCs) | 4 | 5 |
| 15844 | Select and install flexible cords | 2 | 3 |
| 15845 | Draw and explain simple electrical diagrams | 2 | 4 |

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 15846 | Demonstrate knowledge of capacitors and semiconductor diodes | 2 | 3 |
| 15847 | Demonstrate knowledge of mathematics and mechanics for electrical trades | 2 | 4 |
| 15848 | Demonstrate knowledge of safeguards for use with portable electrical appliances | 2 | 2 |
| 15849 | Perform manual soldering and de-soldering procedures for electrotechnology work | 2 | 2 |
| 15850 | Demonstrate knowledge of single-phase transformers | 3 | 3 |
| 15851 | Demonstrate knowledge of electrical safety and safe working practices for electrical workers | 2 | 3 |
| 15852 | Isolate and test low-voltage electrical subcircuits | 2 | 2 |
| 15853 | Demonstrate knowledge of alternating current (a.c.) theory | 4 | 7 |
| 15854 | Draw and interpret electrical diagrams | 3 | 3 |
| 15856 | Demonstrate knowledge of the New Zealand electricity supply system | 3 | 2 |
| 15857 | Demonstrate knowledge of three-phase transformers | 4 | 3 |
| 15861 | Demonstrate knowledge of direct current (d.c.) power supplies | 3 | 3 |
| 15862 | Demonstrate knowledge of industrial process control | 4 | 3 |
| 15864 | Demonstrate knowledge of semiconductor power devices | 4 | 4 |
| 16407 | Use and maintain hand and power tools for electrical work | 3 | 4 |
| 20961 | Demonstrate knowledge of special electrical installations | 4 | 4 |
| 21766 | Demonstrate knowledge of theory for registration of electricians | 4 | 3 |
| 25070 | Explain the properties of conductors, insulators, and semiconductors and their effect on electrical circuits | 2 | 7 |
| 25071 | Demonstrate knowledge of electromotive force (e.m.f.) production | 2 | 3 |
| 25072 | Demonstrate knowledge of electromagnetism theory | 2 | 5 |

Engineering and Technology > Electrical Engineering > Electrical Appliance Servicing

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 1192 | Fault-find, repair, and test portable electrical tools and appliances | 3 | 2 |
| 6705 | Test electrical appliances for safety | 3 | 3 |
| 16411 | Fault-find, repair, and re-commission fixed-wired electrical appliances | 3 | 4 |

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 1204 | Demonstrate knowledge of earthing | 3 | 2 |
| 1205 | Demonstrate knowledge of electrical switchboards | 3 | 3 |
| 1710 | Demonstrate knowledge of electric lighting | 4 | 3 |
| 2016 | Install earthing systems for multiple earthed neutral installations | 3 | 3 |
| 2020 | Plan and install cable support systems | 3 | 4 |
| 2021 | Plan, install, and commission a power supply on a construction or demolition site | 4 | 2 |
| 5931 | Select and install electric switchboards | 3 | 4 |
| 15855 | Demonstrate knowledge of circuit protection | 3 | 3 |
| 15859 | Demonstrate knowledge of electrical cables and accessories | 3 | 7 |
| 15866 | Demonstrate procedures for examination and testing of electrical installations | 4 | 2 |
| 15867 | Install, wire, and test lights in existing installations | 3 | 5 |
| 15868 | Install, wire, and test power outlets in existing installations | 3 | 5 |
| 15869 | Install electrical equipment in damp situations | 4 | 3 |
| 15870 | Inspect and test an electrical installation for compliance with AS/NZS 3000:2000 | 4 | 3 |
| 15871 | Demonstrate knowledge of electrical installation in damp situations | 4 | 3 |
| 16408 | Pre-wire an electrical installation | 3 | 5 |
| 16409 | Fit-off an electrical installation | 3 | 5 |
| 16410 | Plan, install, test, and commission small electrical installations | 4 | 5 |
| 16412 | Fault-find, repair, and re-commission electric lighting | 3 | 4 |
| 16414 | Carry out planned electrical maintenance work of electrical equipment | 4 | 6 |
| 20962 | Demonstrate knowledge of a.c. electric motor control and installation | 4 | 8 |

Engineering and Technology > Electrical Engineering > Electrical Machines

| ID | Title | Level | Credit |
|-------|---|-------|--------|
| 1184 | Test, and locate and diagnose faults in electrical machine windings | 3 | 2 |
| 15858 | Demonstrate knowledge of a.c. motors | 4 | 7 |

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

| ID | Title | Level | Credit |
|-------|--|-------|--------|
| 1702 | Demonstrate knowledge of, and apply electrical legislation, codes of practice, and standards | 4 | 8 |
| 15860 | Demonstrate knowledge of legislation and standards governing the work of electricians | 3 | 2 |

Health > Health Studies > Core Health

| ID | Title | Level | Credit |
|------|-------------------------------|-------|--------|
| 6401 | Provide first aid | 2 | 1 |
| 6402 | Provide resuscitation level 2 | 1 | 1 |

Humanities > Communication Skills > Interpersonal Communications

| ID | Title | Level | Credit |
|------|--|-------|--------|
| 1277 | Communicate information in a specified workplace | 2 | 3 |

Humanities > Communication Skills > Writing

| ID | Title | Level | Credit |
|------|----------------------|-------|--------|
| 3492 | Write a short report | 2 | 3 |

Elective

A minimum of 25 credits at Level 2 or above

| Field | Subfield | Domain |
|----------------------------|------------------------------------|---------------------------------------|
| Engineering and Technology | Electrical Engineering | Any |
| | Electronic Engineering | Any |
| | Industrial Measurement and Control | Any |
| | Mechanical Engineering | Fire Detection and Alarm Systems |
| | Telecommunications | Telecommunications - Service Delivery |

Transition Arrangements

Version 2

Version 2 was issued following revision in order to include magnetism and electricity standards 25070-25072, which replaced standard 15843 to improve assessability.

Changes to structure and content

- standards 25070-25072 replaced standard 15843
- the credit value of standard 1192 was changed from 4 to 2
- qualification references were updated
- the credit total decreased from 251 to 249.

For detailed information see [Review Summaries](#) on the NZQA website.

Trainees may either complete the requirements of version 1 of the qualification or transfer to version 2.

All new trainees will be enrolled in programmes leading to version 2 of the qualification.

This qualification contains standards that replace earlier standards. For the purposes of this qualification, people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement standards – see table below.

| Credit for | Exempt from |
|------------|---------------------|
| 15843 | 25070, 25071, 25072 |
| 15863 | 20962 |

Credits gained in the Electronics Technology subfield can be used to meet the requirements of the Elective – see table below.

| Standards from | Are treated as Standards from |
|---|---|
| Engineering and Technology > Electronics Technology | Engineering and Technology > Electrical Engineering |
| Engineering and Technology > Electronics Technology | Engineering and Technology > Electronic Engineering |
| Engineering and Technology > Electronics Technology | Engineering and Technology > Industrial Measurement and Control |
| Engineering and Technology > Electronics Technology | Engineering and Technology > Mechanical Engineering > Fire Detection and Alarm Systems |
| Engineering and Technology > Electronics Technology | Engineering and Technology > Telecommunications > Telecommunications - Service Delivery |

It is not intended that anyone is disadvantaged by this revision and the above arrangements have been designed for a smooth transition. However, anyone who feels they have been disadvantaged may appeal to the ElectroTechnology Industry Training Organisation at the address below.

Previous version of the qualification

Version 1 of this qualification replaced the National Certificate in Electrical Engineering (Electrician) (Level 4) [Ref: 0313]. This followed a major review of competency training, carried out by the electrical industry during 2003 and 2004, which resulted in many standards being revised. The inclusion of standard 21766 was reflected in the qualification title, which was changed to simplify identification between holders of this and the previous qualification where the EWRB Theory Examination was external.

Changes to structure and content included: standard 2780 was removed; standard 15863 was replaced with standard 20962; standard 20961 was added; standard 21766, which can only be assessed by the EWRB Theory Examination, was added; standards 2013, 5929, 5930, and 16413 were removed from the compulsory, however, they were included in the elective section; titles of standards 3492, 6402, 15846, 15849, 15851, 15852, 15856, 15870, and 16414 were updated; the elective section was expanded to include the Fire Detection and Alarm Systems, and Telecommunications - Service Delivery domains; and the credit total decreased from 257 to 251.

Industry will continue to recognise the National Certificate in Electrical Engineering (Electrician) (Level 4) [Ref: 0313], and there should be no need to 'upgrade' by those who have already achieved it.

Other standard setting bodies whose standards are included in the qualification

NZQA

Certification

The certificate will display the logos of NZQA, the ElectroTechnology Industry Training Organisation and the accredited organisation.

Classification

This qualification is classified according to the NQF classification system and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

| DAS Classification | | NZSCED | |
|--------------------|---|--------|--|
| Code | Description | Code | Description |
| 204 | Engineering and Technology > Electrical Engineering | 031301 | Engineering and Related Technologies > Electrical and Electronic Engineering and Technology > Electrical Engineering |

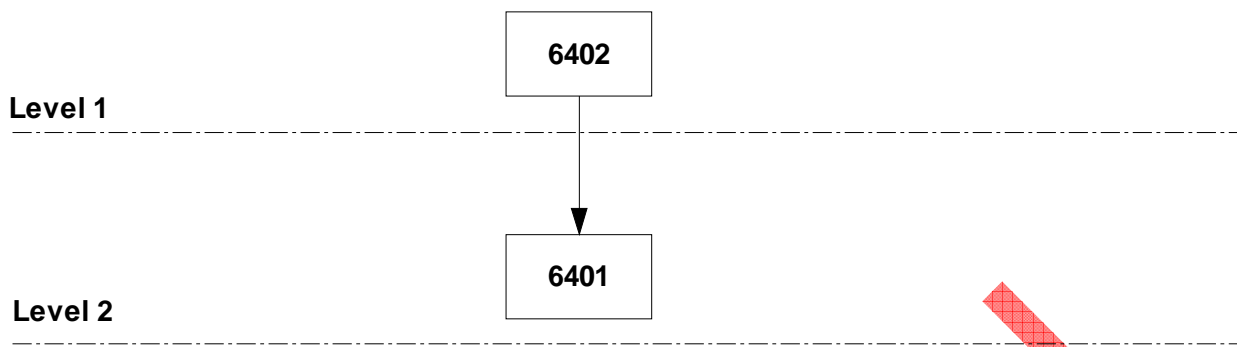
Quality Management Systems

Providers and Industry Training Organisations must be accredited by a recognised Quality Assurance Body before they can register credits from assessment against standards. Accredited providers and Industry Training Organisations assessing against standards must engage with the moderation system that applies to

those standards. Accreditation requirements and the moderation system are outlined in the associated Accreditation and Moderation Action Plan (AMAP) for each standard.

Reviewed

Prerequisite Diagram



Reviewed