

National Diploma in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering

Level 5

Credits 130

This qualification has been **reviewed**. 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 (Level 5) [Ref: 2384].

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.

This qualification contains a standard that has been replaced by later standards. Reverse transition has been included in this qualification so people can complete the qualification using either the expiring standard or replacement standards.

For the purpose of this qualification, people who have gained credit for the replacement standards are exempt from the requirement to gain credit for the expiring standard – see table below.

Credit for	Exempt from
27520, 27521	25463

NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	October 2009	December 2012
Revision	2	October 2011	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

Reviewed

National Diploma in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering

Level 5

Credits 130

Purpose

This vocational qualification is for qualified electricians who wish to develop their electrical, business, and overall leadership knowledge and skills and gain a qualification at an advanced trade level that builds on the National Certificate in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering [Ref: 0951]. This qualification provides further applied development of management and project management skills along with specific industry skills, including the final phase of the electrical inspector training which is contained in the elective section.

The qualification prepares trainees for a wide range of roles in the electrotechnology, electrical contracting, or industrial electrical engineering sectors at management level, and comprises three sections. The first section is compulsory and covers advanced electrical theory and trade practice. The second is an elective section which allows for a wide choice of applied study in the area of electrical engineering, business, and management. The third section comprising three strands which allows choice of standards to reflect the varied environments in which electricians are employed. At least one of these strands must be completed for award of the qualification.

Typically, the qualification will be gained during the course of a three to four-year training part-time programme. Holders of this qualification have a range of knowledge and skills assessed both off-job (during courses conducted by training providers with consent to assess) and applied on-job (in the workplace).

The qualification is available in three strands reflecting the major sectors of work within the industry as follows:

- Electrotechnology Specialisation – a choice of broader electrotechnology subjects, at a more academic level for people who are involved in electrotechnology design, or to allow trainees to specialise in their chosen field of expertise not specifically covered by the elective section or the other strands.
- Electrical Installation – customer energy solution, electrical switchgear and switchboards, electrical installation practice, standby power plant, lighting installations, and building management systems; and
- Industrial Electrical Engineering – industrial measurement and control, programmable logic controllers, commissioning and handover of electrical engineering projects, electrical machine safety systems, and commission and re-commissioning of plant.

The compulsory section of the qualification covers knowledge and skills relating to:

- project planning and management and quotation preparation;
- CAD tools;
- financial management for a small business;
- electrical circuit protection;
- non-electrical legislation;
- the inspection and certification of electrical installations;
- energy efficiency and related emerging technology; and
- hazard identification.

The elective section includes:

- planning and allocation of work;
- procurement of supplies;
- budgeting;
- designing trainee assessment and assessing trainees;
- advanced electrical testing and measurement;
- energy audits;
- development and implementation of maintenance plans;
- electrical inspection;
- maintenance planning; and
- project estimates.

As this qualification shares credit with the National Certificate in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering [Ref: 0951], trainees may apply for that certificate once they have completed the relevant standards.

The qualification has some credits in common with, and can lead to, the National Diploma in Engineering (Electrotechnology) (Level 6) [Ref: 1313].

Special Notes

- 1 Trainees are encouraged to commence the applied study component of the National Diploma in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering [Ref: 1514] during study towards the National Certificate in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering [Ref: 0951]. The applied study component is contained in the Elective section of the diploma.
- 2 Trainees should note that Unit 25635, *Develop, implement, and review maintenance plans for electrical engineering systems*, is designed to be a capstone standard which would best be completed towards the end of a programme of learning.
- 3 Applications for Recognition of Prior Learning (RPL) or Recognition for Current Competency (RCC), supported by appropriate documentation, should be made either to ElectroTechnology Industry Training Organisation (ETITO) or to a training provider with consent to assess.

- 4 Before commencing study towards this qualification it is recommended that candidates either hold at least one of the following qualifications or registrations:
- National Certificate in Electrical Engineering (Electrician for Registration) (Level 4) [Ref: 1195];
 - National Certificate in Electrical Engineering (Electrician) (Level 4) [Ref: 0313];
 - Trade Certificate in Electrical Wiring; or
 - the National Certificate in Electricity Supply (Electrical) (Level 4) with strands in Electricity Supply Electrician, Electrical Fitter, and Electrical Technician [Ref: 1295]; or
 - Registration as an Electrician;
- or are working towards one of the following qualifications:
- National Certificate in Electrical Engineering (Electrician for Registration) (Level 4) [Ref: 1195]; or
 - the National Certificate in Electricity Supply (Electrical) (Level 4) with strands in Electricity Supply Electrician, Electrical Fitter, and Electrical Technician [Ref: 1295].

Credit Range

	Compulsory	Elective	Balance set
Level 3 credits	9	-	0-1
Level 4 credits	10	0-6	0-30
Level 5 or above credits	26	14-20	0-30
Minimum totals	45	20	0-30

	Electrotechnology Specialisation Strand	Electrical Installation Strand	Industrial Electrical Engineering Strand
Level 3 credits	-	-	-
Level 4 credits	-	13	15
Level 5 or above credits	45	34	20
Minimum totals	45	47	35
Qualification total with strand	130	130	130

Requirements for Award of Qualification

Award of NZQF National 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 on the New Zealand Qualifications Authority (NZQA) website: <http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/>.

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

- A minimum of 130 credits
 - Of which a minimum of 120 credits at Level 4 or above
 - Of which a minimum of 72 credits at Level 5 or above
- Compulsory standards
- Elective – A minimum of 20 credits as specified

One of the following strands is required

- Electrotechnology Specialisation Strand
- Electrical Installation Strand
- Industrial Electrical Engineering Strand

- Balance set – Balance

Detailed Requirements

Compulsory

The following standards are required

Business > Financial Management > Financial Skills

ID	Title	Level	Credit
18956	Demonstrate knowledge of financial management for an entity	3	5

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit
19001	Demonstrate advanced knowledge of electrical circuit protection	5	3
19008	Prepare quotations for electrical work	5	5

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

ID	Title	Level	Credit
19009	Apply non-electrical legislation in the electrical industry	5	4
25638	Demonstrate knowledge of inspection and certification of electrical work	5	8

Engineering and Technology > Electrical Engineering > Electrotechnology

ID	Title	Level	Credit
4993	Plan implementation of, manage, and review small to medium sized electrotechnology projects	5	6
16974	Demonstrate and apply knowledge of CAD tools as used in an electrotechnology engineering environment	4	5

ID	Title	Level	Credit
25630	Demonstrate knowledge of and analyse energy efficiency of buildings and plant	4	5

Health > Occupational Health and Safety > Occupational Health and Safety Practice

ID	Title	Level	Credit
17602	Apply hazard identification and risk assessment procedures in the workplace	3	4

Elective

A minimum of 20 credits

Business > Business Operations and Development > People Development and Coordination

ID	Title	Level	Credit
25463	Manage a plan to achieve organisational objectives	5	10

Business > Business Operations and Development > Quality Management

ID	Title	Level	Credit
7459	Develop, manage, and evaluate improvements to products, services, and systems	6	10

Business > Business Operations and Development > Systems and Resources Management

ID	Title	Level	Credit
7461	Plan procurement of material, plant and equipment supplies	6	10

Education > Generic Education and Training > Assessment of Learning

ID	Title	Level	Credit
4098	Use standards to assess candidate performance	4	6
11552	Design assessment	5	6

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit
25635	Develop, implement, and review maintenance plans for electrical engineering systems	5	15
25636	Manage testing and measuring procedures within electrical engineering contexts	5	5
25637	Develop a plan for and manage an electrical engineering project	5	20

ID	Title	Level	Credit
25639	Develop resource procurement options for a significant electrical project and make recommendations	5	5

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

ID	Title	Level	Credit
25640	Inspect and certify electrical work	5	6

Engineering and Technology > Engineering > Generic Engineering

ID	Title	Level	Credit
11405	Prepare estimates of engineering project costings	5	4

Electrotechnology Specialisation Strand

A minimum of 45 credits at Level 5 or above

Field	Subfield	Domain
Engineering and Technology	Electrical Engineering	Electrotechnology
	Electronic Engineering	Computer Engineering Electronic Manufacturing
	Mechanical Engineering	Any
	Telecommunications	Any
	Explosive Atmospheres	Any

Electrical Installation Strand

The following standards are required

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit
19002	Demonstrate advanced knowledge of electrical switchgear and switchboards	5	5
19004	Demonstrate knowledge of standby power plant	5	4
19006	Design simple electric lighting installations	5	5
25631	Demonstrate knowledge of and design documentation for the commissioning of significant electrical installations	5	5
25634	Demonstrate advanced knowledge of electrical installation practice and knowledge of data communication principles	5	10
25639	Develop resource procurement options for a significant electrical project and make recommendations	5	5

Engineering and Technology > Electrical Engineering > Electrotechnology

ID	Title	Level	Credit
25629	Demonstrate introductory knowledge of building management systems	4	5

Engineering and Technology > Electricity Supply > Electricity Supply - Utilisation

ID	Title	Level	Credit
14191	Undertake a preliminary analysis and interpretation of customer energy solution	4	8

Industrial Electrical Engineering Strand

The following standards are required

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit
25631	Demonstrate knowledge of and design documentation for the commissioning of significant electrical installations	5	5

Engineering and Technology > Electronic Engineering > Core Electronics

ID	Title	Level	Credit
22727	Demonstrate and apply intermediate knowledge of programmable logic controller engineering applications	5	15

Engineering and Technology > Industrial Measurement and Control > Industrial Measurement and Control - Theory

ID	Title	Level	Credit
2654	Demonstrate knowledge of on/off and proportional integral derivative mode control theory and controllers	4	8
24887	Demonstrate knowledge of electronic variable speed drives	4	3

Health > Occupational Health and Safety > Occupational Health and Safety Practice

ID	Title	Level	Credit
18410	Manage hazard identification and control on plant and machinery	4	4

Balance set

The balance of credits to achieve

A minimum of 130 credits

- Of which a minimum of 120 credits at Level 4 or above
- Of which a minimum of 72 credits at Level 5 or above

May come from the following sets

- Balance standards
- Balance credits at Level 3 or above

- Balance credits at Level 4 or above
- Balance credits at Level 5 or above

Balance standards

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit
25631	Demonstrate knowledge of and design documentation for the commissioning of significant electrical installations	5	5
25632	Demonstrate and apply advanced knowledge of the selection, use, and care of complex electrical measuring equipment	5	5

Engineering and Technology > Electrical Engineering > Electrotechnology

ID	Title	Level	Credit
25633	Demonstrate and apply knowledge of energy audits and emerging developments in energy efficiency	5	10

Balance credits at Level 3 or above

A minimum of 0 credits at Level 3 or above

Field	Subfield	Domain
Business	Business Environment	Business Culture and Environment
Engineering and Technology	Electricity Supply	Electricity Supply - Core Skills
		Electricity Supply - Distribution Networks
		Electricity Supply - Live Work
	Industrial Measurement and Control	Industrial Measurement and Control - Maintenance
Humanities	Communication Skills	Interpersonal Communications

Balance credits at Level 4 or above

A minimum of 0 credits at Level 4 or above

Field	Subfield	Domain
Business	Business Operations and Development	Systems and Resources Management
	Financial Management	Financial Skills
Engineering and Technology	Electricity Supply	Electricity Supply - Utilisation

Balance credits at Level 5 or above

A minimum of 0 credits at Level 5 or above

Field	Subfield	Domain
Business	Business Operations and Development	People Development and Coordination
Engineering and Technology	Electrical Engineering	Electrical Installation and Maintenance
	Electricity Supply	Electricity Supply - Power System Management
	Electronic Engineering	Core Electronics

Transition Arrangements**Version 2**

Version 2 was issued following revision in order to maintain achievability for candidates. The revision reflects changes to classifications, and amendment to the title, credit value and level of one standard.

Changes to structure and content

- Removed the *Electrical Equipment in Hazardous Areas* domain from the Electrotechnology Specialisation Strand because it had been designated expiring.
- Removed the *Electronic Installation and Maintenance* domain from the Electrotechnology Specialisation Strand because there were no Level 5 standards from which to choose.
- Added the *Explosive Atmospheres* subfield to the Electrotechnology Specialisation Strand to meet current industry needs.
- Removed expiring standards 8505 and 15560.
- Amended the title, credit value and level of unit standard 18956.

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

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

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
19007	25641
19014	25638, 25640

This qualification contains classifications that replaced earlier classifications. For the purposes of this qualification people with credit for standards listed in the lapsing domains can use them to meet the relevant qualification elective requirements - see table below.

Credit for	Exempt from
Engineering and Technology > Electrical Engineering > Electrical Equipment in Hazardous Areas	Engineering and Technology > Explosive Atmospheres
Business > Management > First Line Management	Business > Business Operations and Development > People Development and Coordination
Business > Management > First Line Management	Business > Business Operations and Development > Systems and Resources Management
Business > Management > First Line Management	Business > Financial Management > Financial Skills
Business > Management > First Line Management	Humanities > Communication Skills > Interpersonal Communications
Business > Management > Management - Developing and Coordinating People	Business > Business Operations and Development > People Development and Coordination
Business > Management > Small Business Management	Business > Business Environment > Business Culture and Environment
Business > Management > Small Business Management	Business > Business Operations and Development > Systems and Resources Management
Business > Management > Small Business Management	Business > Financial Management > Financial Skills
Engineering and Technology > Electricity Supply > Electricity Networks	Engineering and Technology > Electricity Supply > Electricity Supply - Core Skills
Engineering and Technology > Electricity Supply > Electricity Networks	Engineering and Technology > Electricity Supply > Electricity Supply - Distribution Networks
Engineering and Technology > Electricity Supply > Electricity Networks	Engineering and Technology > Electricity Supply > Electricity Supply - Live Work
Engineering and Technology > Electricity Supply > Electricity Utilisation	Engineering and Technology > Electricity Supply > Electricity Supply - Utilisation
Engineering and Technology > Electricity Supply > Power System Management	Engineering and Technology > Electricity Supply > Electricity Supply - Power System Management
Engineering and Technology > Electronics Technology	Engineering and Technology > Electronic Engineering

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 ETITO at the address below.

Previous versions of the qualification

This qualification was developed in conjunction with the review of the National Certificate in Electrical Engineering (Level 5) [Ref: 0951] version 4 following a major review of competency training. This was carried out by the electrical industry during 2008, which resulted in many standards being revised, replaced or removed from that qualification. The review reflected the experience of several years of training, assessment, and industry experience and took into account the anticipated future skill requirements of the industry.

The industry saw the need for a diploma at Level 5 to build on the National Certificate in Electrical Engineering (Advanced Trade) (Level 5) with strands in Electrotechnology Specialisation, Electrical Installation, and Industrial Electrical Engineering [Ref: 0951] in order to encourage practitioners to further develop their electrical, business, management, electrotechnology project management, and overall leadership knowledge and skills beyond the certificate requirements and have this recognised in a qualification.

Some content of this qualification is based on components removed from Ref: 0951 at review. Candidates may wish to transition directly from Ref: 0951 to Ref: 1514. For those that do, the similarities in structure and content include

- The elective section from Ref: 0951 was moved to Ref: 1514 and restructured as an elective and balance set.
- Standards 19001, 19008, and 19009 from the compulsory section of Ref: 0951 are also included in the compulsory section of Ref: 1514.
- Standard 19002 from the compulsory section of Ref: 0951 was also included in the Electrical Installation strand of Ref: 1514.

Other standard setting bodies whose standards are included in the qualification

Electricity Supply Industry Training Organisation
 Infratrain New Zealand
 New Zealand Industry Training Organisation
 NZQA

Certification

This certificate will display the logos of NZQA, ETITO and the organisation that has been granted consent to assess against standards that meet the requirements of the qualification (accredited).

Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		NZSCED	
Code	Description	Code	Description

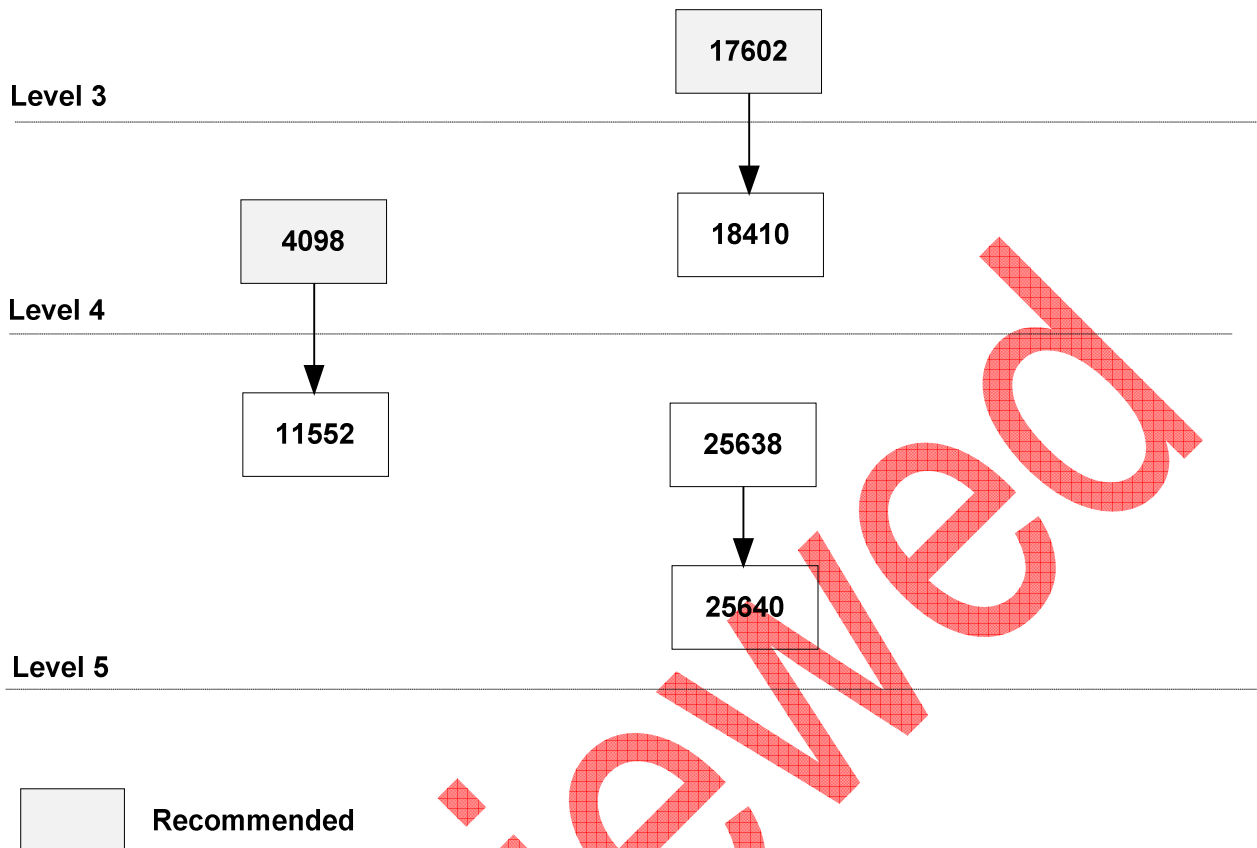
DAS Classification		NZSCED	
Code	Description	Code	Description
204	Engineering and Technology > Electrical Engineering	031301	Engineering and Related Technologies > Electrical and Electronic Engineering and Technology > Electrical Engineering

Quality Management Systems

Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.

Reviewed

Prerequisite Diagram



Reviewed