

Field Engineering and Technology

Review of *Electrical Engineering* and *Electronic Engineering* unit standards

Subfield	Domain	ID
Electrical Engineering	Core Electrical	15844, 15862, 29441
	Electrical Appliance Servicing	29421, 29427
	Electrical Installation and Maintenance	2016, 2020, 2021, 2030, 5931, 10787, 15869, 15870, 16415, 29419, 29422-29424, 29426, 29428, 29430-29436, 29438, 29439, 29446
	Electrical Machines	29420, 29443
	Electrical Standards and Statutes	1702, 21766, 29484
	Electric Switchboards	29440
	Electrotechnology	29437
Electronic Engineering	Core Electronics	19747

The Skills Organisation has completed the review of the unit standards listed above.

Date new versions published

March 2022

Planned review date

December 2026

Summary

The Skills Organisation (Skills), industry, and provider representatives reviewed and developed unit standards to support unit standard based programmes for the New Zealand Certificate in Electrical Trade (Level 4) with strands in General Electrical, and Electricity Supply [Ref: 4204], with a particular focus on the core and the General Electrical strand. As the Standard Setting Body for Electrical Supply, Connexis identified unit standards for programmes for the Electricity Supply strand.

The unit standards were developed with industry and provider representatives between April 2019 to September 2021 as part of the discussions and development of a competency framework for electrical apprentices.

As the review began during the early stages of the sector-wide Review of Vocational Education (RoVE), it was unclear which educational products would be required for the long term. To bridge the uncertainty, The Skills Organisation, industry, and providers agreed to produce a document describing the sequencing, teaching, and assessment content. This document would be used to form programmes of study and/or unit standards and programmes of industry training, which would ensure consistency across the sector. These unit standards address the assessment and sequencing requirements of that document.

The unit standards also embed the changes that occurred in the Electrical Workers Registration Board Essential Capabilities for Electrical Registration. Consultation was undertaken via surveys, email, face to face, and online meetings over the multiyear period.

Since the original unit standards were developed, industry and providers have altered their view of which competencies logically fit together and what stages of learner development they are best introduced. The original unit standards were used in apprenticeship programmes, supported by the provider network delivering off-job teaching and assessment. They have also been used in

Gateway products to support school leavers into apprenticeships. As the apprenticeship changes are embedded using the new suite of unit standards, the provider network and Gateway products will change to use the new unit standards. As this change is occurring during the same time as transitions occurring under RoVE, there is an extended expiry date for the expiring standards. Providers should move to the new standards as soon as possible.

The new unit standards are fit for purpose, current, and relevant to the Electrical Engineering industry.

Main changes

- 38 unit standards were reviewed and a new suite of 44 unit standards were developed to meet current and future requirements of the electrical industry, based on the competency framework to train electrical apprentices.
- 34 of the reviewed unit standards were designated as expiring and will not be replaced as the relationship between them and the new suite of standards was too complex to list as direct replacements.
- 4 of the reviewed unit standards were amended. Of these, 21766 increased in credit value from 3 to 6 credits and 1702 decreased from 8 to 5 credits, to better reflect the time required for learning and assessment.
- AS/NZS 3000:2018 version is not yet cited in the Electricity (Safety) Regulations 2010. To address this, the two sector regulators, WorkSafe and the Electrical Workers Registration Board (EWRB), have agreed that any reference to AS/NZS 3000 in the unit standards will be written as “AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), Electrical Installations (known as the Australian/New Zealand Wiring Rules)”.

Category D unit standards will expire at the end of December 2025

The last date for assessment of superseded versions of Category B unit standards is December 2027

Detailed list of unit standards – classification, title, level, and credits

All changes are in **bold**.

Key to review category	
A	Dates changed, but no other changes are made - the new version of the standard carries the same ID and a new version number
B	Changes made, but the overall outcome remains the same - the new version of the standard carries the same ID and a new version number
C	Major changes that necessitate the registration of a replacement standard with a new ID
D	Standard will expire and not be replaced

Engineering and Technology > Electrical Engineering > Core Electrical

ID	Title	Level	Credit	Review Category
15844	Select and install flexible cords	3	2	D
15862	Demonstrate knowledge of industrial process control	4	2	D
29441	Demonstrate and apply knowledge of cable coding, colours, characters, applications, and capacity	4	2	D
32605	Demonstrate knowledge for working safely in the electrical industry	3	6	New
32606	Demonstrate knowledge of tools, fittings, and plans in the electrical industry	3	5	New
32607	Apply knowledge of working safely in the electrical industry	4	8	New

ID	Title	Level	Credit	Review Category
32608	Apply knowledge of electrical tools, fittings, and plans in the workplace	4	7	New
32609	Demonstrate knowledge of mathematical principles, conductors and insulators	3	7	New
32610	Demonstrate knowledge of voltage, power and energy, and DC circuits	3	6	New
32611	Demonstrate knowledge of magnetism and AC generation	3	6	New
32613	Demonstrate knowledge of cords, cables, and cable installation	3	4	New
32614	Demonstrate knowledge of electrical faults, circuit protection, de-commissioning, and commissioning	3	6	New
32615	Demonstrate cable handling and fixing techniques, pre-wire electrical circuits, and join and test TPS cables	4	5	New
32616	Apply knowledge of common cords, cables, and electrical fittings	4	6	New
32617	Select and use instruments for testing, fault finding, and repairing basic appliances	4	4	New
32618	De-commission, test and commission basic electrical appliances, fittings, and equipment	4	4	New
32620	Demonstrate knowledge of electrical plans, switching circuits, and lighting systems	3	5	New
32621	Demonstrate knowledge of wiring support systems and cable installation	3	5	New
32622	Demonstrate knowledge of the national supply grid, MEN system, and earthing	3	6	New
32623	Demonstrate knowledge of circuit protection and distribution board wiring	4	5	New
32625	Demonstrate knowledge of damp situations, SELV and PELV systems, and single-phase transformers	3	5	New
32626	Demonstrate knowledge of capacitors, inductors, and electronics in the electrical trade	3	5	New
32629	Demonstrate knowledge of electric motors and alternators	4	5	New
32638	Demonstrate knowledge of earthing systems and switchboards	4	6	New
32639	Demonstrate knowledge of cable selection, underground cable systems, and specialised cables	4	4	New
32640	Demonstrate knowledge of power factor, three-phase AC power, and transformer safety and performance	4	6	New
32641	Demonstrate knowledge of electric motors and motor faults	4	3	New

Engineering and Technology > Electrical Engineering > Electrical Appliance Servicing

ID	Title	Level	Credit	Review Category
29421	Inspect, test, fault-find, and repair fixed-wired electrical appliances and portable appliances	3	3	D
29427	Install, test, and commission electrical appliances	4	2	D

Engineering and Technology > Electrical Engineering > Electrical Installation and Maintenance

ID	Title	Level	Credit	Review Category
2016	Install earthing systems for multiple earthed neutral installations	3	3	D
2020	Plan and install cable support systems	3	3	D
2021	Plan, install, and commission a power supply on a construction or demolition site	4	2	D
2030	Schedule and manage preventative maintenance for industrial electrical equipment	5	6	D
5931	Select and install domestic or commercial electric switchboards	4	3	D
10787	Install and test transducers	4	2	D
15869	Install electrical equipment in damp situations	4	3	D
15870	Inspect and test an electrical installation for compliance with AS/NZS 3000	4	5	D
16415	Install and commission extra-low voltage equipment	4	3	D
29419	Prepare for, install, test, and commission new electrical installations	4	10	D
29422	Install, wire, test and fault-find, and repair power outlets and electric lighting systems in existing installations	4	7	D
29423	Carry out planned maintenance of electrical equipment	4	3	D
29424	Install, commission, and maintain emergency lighting systems	4	2	D
29426	Follow a control drawing and install, wire, and commission a control panel	4	3	D
29428	Install, test, and commission a.c. rotating machines	4	2	D
29430	Select and install industrial electric switchboards	4	3	D
29431	Select and install electric motor starters	4	2	D
29432	Select, install, and commission a variable frequency drive	4	2	D
29433	Install, wire to, and connect a machine safety device	4	2	D
29434	Install and programme a PLC	4	2	D
29435	Install computer networking infrastructure systems	4	4	D
29436	Wire and connect control devices used in the electrical environment	4	4	D
29438	Install, commission, and maintain a power quality protection system	4	4	D
29439	Schedule and manage preventative maintenance for domestic or commercial electrical equipment	4	5	D
29446	Demonstrate knowledge of computer networking infrastructure principles	4	2	D
32624	Demonstrate knowledge of electrical installation testing, fault finding, and rectification of discovered faults	4	6	New
32630	Establish new worksites and interpret plans	4	4	New
32631	Install, join, and terminate cables	4	7	New
32632	Design switching circuits and a PLC programme	4	4	New
32633	Install electrical equipment in damp situations and install earthing and lighting	4	9	New
32634	Plan circuit protection, and install and test distribution boards	4	10	New
32635	Use fault finding and fault rectification techniques on electrical installations	4	4	New

ID	Title	Level	Credit	Review Category
32642	Demonstrate knowledge of de-commissioning, commissioning, and verification of electrical installations	4	6	New
32643	Demonstrate knowledge of alternative energy systems	4	3	New
32644	Demonstrate knowledge of hazardous areas, construction and demolition sites, and special electrical installations	4	5	New
32646	Select cables for different applications	4	3	New
32647	Install mains and submains cables	4	5	New
32648	Install a main switchboard	4	5	New
32649	Install electric motors and diagnose and repair faults	4	5	New
32650	Install a complete electrical installation	4	10	New
32651	Carry out verification of an electrical installation	4	5	New
32652	De-commission and commission electrical installations	4	6	New
32653	Maintain electrical installations	4	5	New

Engineering and Technology > Electrical Engineering > Electrical Machines

ID	Title	Level	Credit	Review Category
29420	Fault-find, test, and commission electric motors	4	4	D
29443	Demonstrate and apply knowledge of a.c. motors	4	4	D

Engineering and Technology > Electrical Engineering > Electrical Standards and Statutes

ID	Title	Level	Credit	Review Category
1702	Demonstrate knowledge of, and apply electrical legislation, New Zealand Codes of Practice and Standards Demonstrate knowledge of electrical legislation, New Zealand Codes of Practice, and Standards	4	8 5	B
21766	Demonstrate knowledge of theory for registration of electricians Demonstrate knowledge of electrical theory for registration of electricians	4	3 6	B
29484	Demonstrate knowledge of theory and practice for electrical workers Demonstrate intermediate knowledge for working in electrical trades	3	1	B
32612	Demonstrate knowledge of legislation, industry governance bodies, and AS/NZS3000 for the electrical industry	3	4	New
32619	Demonstrate fundamental knowledge for working in electrical trades	3	1	New

Engineering and Technology > Electrical Engineering > Electric Switchboards

ID	Title	Level	Credit	Review Category
29440	Demonstrate knowledge of electric switchboards	4	3	D

Engineering and Technology > Electronic Engineering > Electrotechnology

ID	Title	Level	Credit	Review Category
29437	Analyse building and plant energy efficiency	4	3	D

Engineering and Technology > Electronic Engineering > Core Electronics

ID	Title	Level	Credit	Review Category
19747	Demonstrate and apply fundamental knowledge of microcontrollers	3	5	B