Title	**Demonstrate knowledge of earthing systems and switchboards**		
Level	**4**	**Credits**	**6**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: – earthing systems; and – the design, construction, and connections of switchboards.

Classification	Electrical Engineering > Core Electrical

Available grade	Achieved

Guidance Information

1 Unit standards or equivalent prior knowledge and skills recommended:
Unit 32622, *Demonstrate knowledge of the national supply grid, MEN system, and earthing*;
Unit 32623, *Demonstrate knowledge of circuit protection and distribution board wiring*.

2 Reference
AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*;
or any current subsequent amendments and replacements.

3 Definition
MEN – multiple earth neutral.

4 This unit standard can be used together with other relevant unit standards, additional learning and workplace training to meet the requirements of the Electrical Workers Registration Board (EWRB) core competencies, available at https://www.ewrb.govt.nz.

5 This unit standard applies to installations and equipment rated above extra-low voltage unless specifically stated.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of earthing systems.

Performance criteria

1.1 Describe alternative earthing systems.

Range includes but is not limited to – TT, TNS and TNSC; description to include the situations where each would be used, advantages, and disadvantages.

1.2 Explain the roles and design of MEN conductors in an installation.

Range two conductors;
may include but is not limited to – protective earthing (PE) and neutral conductors (N), protective earth neutral conductor (PEN), MEN link.

1.3 Explain the consequences of MEN system failures during fault conditions.

Range must include but is not limited to – absence of the MEN link, high impedance of the PEN conductor.

1.4 Identify requirements for earthing and equipotential bonding from AS/NZS 3000.

Range one pool, one spa structure.

Outcome 2

Demonstrate knowledge of the design, construction, and connections of switchboards.

Performance criteria

2.1 Describe the design, placement, and configuration of switchboards, associated control and protection devices, cables and metering equipment.

2.2 Identify requirements for switchboards from AS/NZS 3000.

Range four requirements.

2.3 Explain the testing procedure and documentation required for a new switchboard.

2.4 Explain the testing procedure to ensure correct mains polarity.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference	0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.