

| | | | |
|--------------|---|----------------|-----------|
| Title | Demonstrate and apply knowledge of earthing systems, bonding, shrouding, and access control for switchboards | | |
| Level | 4 | Credits | 11 |

| | |
|----------------|---|
| Purpose | <p>This unit standard is for people engaged in the manufacture of switchboards in the electrotechnology industry.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of current regulations applicable to earthing, bonding, and shrouding of switchboards – install switchboard earthing and bonding systems – fabricate and install switchboard shrouding – demonstrate knowledge of access control for switchboards. |
|----------------|---|

| | |
|-----------------------|--|
| Classification | Electrical Engineering > Electric Switchboards |
|-----------------------|--|

| | |
|------------------------|----------|
| Available grade | Achieved |
|------------------------|----------|

Guidance Information

1 This unit standard may be used for learning and assessment on-job.

2 References

- Accident Compensation Act 2001
- AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical installations (known as the Australian/New Zealand Wiring Rules)*
- AS/NZS 61439.4:2016, *Low-voltage switchgear and controlgear assemblies – Part 4: Particular requirements for assemblies for construction sites (ACS)*, available at [Standards NZ](https://standards.nz)
- Electricity Act 1992
- Electricity (Safety) Regulations 2010
- Health and Safety at Work Act 2015
- The New Zealand Electrical Codes of Practice, available at WorkSafe New Zealand, worksafe.govt.nz and all subsequent amendments and replacements.

3 Definitions

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

IP – Ingress Protection.

Safe and sound practice – this relates to the installation of electrical equipment and is defined in AS/NZS 3000.

Unskilled personnel – means non-ticketed personnel and personnel who are authorised but are not skilled and competent in carrying out an activity.

4 Range

- a Candidates may refer to current legislation and Standards during assessment.
- b Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
- c All evidence presented for assessment against this unit standard must be in accordance with:
 - i legislation
 - ii policies and procedures
 - iii ethical codes
 - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010
 - v applicable site, enterprise, and industry practice
 - vi where appropriate manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria**Outcome 1**

Demonstrate knowledge of current regulations applicable to earthing, bonding, and shrouding of switchboards.

Performance criteria

- 1.1 Identify current regulations relevant for earthing, bonding, and shrouding of switchboards.
- 1.2 Explain the roles of earthing, bonding, and shrouding to ensure the electrical safety of a switchboard.

Outcome 2

Install switchboard earthing and bonding systems.

Performance criteria

- 2.1 Plan and size earth termination points for outgoing circuit connections.
- 2.2 Identify all metal parts of an enclosure that require bonding.
- 2.3 Explain bonding methods or techniques that are used to bond metal parts in terms of conductors, fittings, and fixings.

Range bonding methods for metal parts include but are not limited to – star washers, braided connection.
- 2.4 Install earthing systems and bonding into switchboards.

Outcome 3

Fabricate and install switchboard shrouding.

Performance criteria

- 3.1 Select suitable shrouding material for the purpose in terms of electrical and mechanical properties and function.
- 3.2 Cut shrouding safely, accurately, and in a cost-effective manner.
- 3.3 Fit and install shrouding to meet job specifications and IP rating requirements.

Outcome 4

Demonstrate knowledge of access control for switchboards.

Performance criteria

- 4.1 Explain the importance of access control on a switchboard.
- 4.2 Identify areas of the switchboard that are accessible by unskilled personnel, to put measures in place to eliminate or minimise risk of harm.

| | |
|--------------------------------|--|
| Replacement information | This unit standard replaced unit standard 14975. |
|--------------------------------|--|

| | |
|----------------------------|------------------|
| 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 | 17 November 2016 | N/A |
| Rollover and Revision | 2 | 25 July 2024 | 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 the Waihangā Ara Rau Construction and Infrastructure Workforce Development Council qualifications@WaihangāAraRau.nz if you wish to suggest changes to the content of this unit standard.