

Title	Apply and remove earths from conductors on electricity supply networks		
Level	4	Credits	4

Purpose	People credited with this unit standard are able to: demonstrate knowledge of earthing and bonding requirements for conductors on electricity supply networks; prepare to apply earths to conductors in electricity supply networks of all voltages; prove earthing point de-energised; apply and remove the earths from conductors on the electricity supply network; and report work done on applying and removing earths from electrical conductors, plant and equipment.
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Classification	Electricity Supply > Electricity Supply - Distribution Networks
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Available grade	Achieved
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Guidance Information

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.
- 2 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to:
 - Electricity Act 1992
 - Electricity (Safety) Regulations 2010
 - Health and Safety at Work Act 2015
 - NZECP 35:1993 *New Zealand Electrical Code of Practice for Power Systems Earthing* available at <https://www.worksafe.govt.nz/>
 - Electricity supply industry codes of practice and documented enterprise procedures, including *Safety Manual – Electricity Industry (SM-EI)* and relevant EEA guides available at www.eea.co.nz
 and any subsequent amendments and replacements.
- 3 **Definitions**
Asset owner refers to a participant who owns or operates assets used for generating or conveying electricity.
Industry requirements include all asset owner requirements; manufacturers' specifications; and enterprise requirements which cover the documented workplace policies, procedures, specifications, business, and quality management requirements relevant to the workplace in which assessment is carried out.
- 4 Assessment of practical skills against the outcomes in this standard requires three practical observations from three different workplace activities.

5 Earths include multi-phase and single-phase earths.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of earthing and bonding requirements for conductors on electricity supply networks.

Range Electricity (Safety) Regulations 2010, SM-EI, *EEA Guide to Work on De-energized Distribution Overhead Lines*, NZECP 35.

Performance criteria

- 1.1 Requirements for earthing for safe working are described.
- 1.2 Responsibilities of employees when applying earths to overhead line conductors or underground cables are described.
- 1.3 Statutory and enterprise inspections and care of insulating sticks and voltage detection devices are demonstrated in terms of manufacturers' specifications and recommendations.
- 1.4 Requirements of earthing for operation of protective equipment are described.
- 1.5 Equipotential zones in the workplace are described.
- 1.6 The causes of step and touch voltages in the workplace are described.
- 1.7 Bonding of conductors, equipment and plant to create an equipotential work zone is described.

Outcome 2

Prepare to apply earths to conductors in electricity supply networks of all voltages.

Range overhead electric lines or underground cables.

Performance criteria

- 2.1 Conductors are physically identified.

Range single line diagram, labels, line, plant and equipment layout.
- 2.2 Inspection confirms or assures that the conductors to be earthed have been isolated in accordance with industry standards.

Range Electricity Safety Regulations 2010, SM-EI, *EEA Guide to Work on De-energized Distribution Overhead Lines*.

2.3 Earth attachment positions on conductors and the local earth are identified.

Range industry standards, earthing terminals, tail clamp attachment points, clamp rating and compatibility.

2.4 Procedures and requirements for portable earths are determined.

Range issuer instructed, recipient applied.

2.5 Earthing equipment is inspected for compliance.

Range compliance – satisfactory for use, surface condition and cleanliness;
equipment – clamps, leads, fittings, sticks and poles, terminations.

Outcome 3

Prove earthing point de-energised.

Range includes but is not limited to – voltage detection device, proving unit, insulation stick.

Performance criteria

3.1 Circumstances when use of voltage detection device is required are identified.

Range overhead or underground conductors, first earth, out of sight of other applied earths, integral earthing not possible, capacitor.

3.2 Voltage detection device and insulating stick for network system voltage are selected.

3.3 Voltage detection device is tested before and after use to ensure serviceable condition is maintained.

Range audible test, visual test.

3.4 Earthing points are proven de-energised on overhead or underground cable.

Range voltage detection device or spiking tool.

Outcome 4

Apply and remove the earths from conductors on the electricity supply network.

Performance criteria

4.1 Personal protective equipment is worn and used in accordance with SM-EI.

Range includes but is not limited to – hard hats, appropriate gloves, overalls, footwear.

4.2 Approvals are obtained.

Range access permit, operating order, teams warned off permit area.

4.3 Earths are applied.

Range tail clamp connection to earth first, leads kept away from person, positive connection made and held in place before clamping, bonding across any conductor to be broken or equipment to be opened, bonding to adjacent metal, equipotential environment for work.

4.4 Earths are removed.

Range issuer instructed, recipient applied.

4.5 Access permit is returned.

Range issuer instructed, recipient applied.

Outcome 5

Report work done on applying and removing earths from electrical conductors, plant and equipment.

Range may include but is not limited to – operating order, recipient safety measure form.

Performance criteria

5.1 Reported information is complete, concise, and legible.

5.2 Information is recorded in the required format and filed in the correct location.

Planned review date	31 December 2027
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 August 1997	31 December 2016
Review	2	27 April 2001	31 December 2016
Review	3	22 October 2003	31 December 2016
Rollover and Revision	4	20 June 2008	31 December 2016
Review	5	21 July 2011	31 December 2016
Review	6	20 March 2014	31 December 2020
Review	7	28 September 2017	31 December 2020
Revision	8	28 June 2018	31 December 2024
Review	9	2 March 2023	N/A

Consent and Moderation Requirements (CMR) reference

0120

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@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.