

Title	Demonstrate knowledge of earthing in the electricity supply industry		
Level	3	Credits	5

Purpose	People credited with this unit standard are able to demonstrate knowledge of: portable and/or temporary earthing requirements for electrical conductors, plant, and equipment; checking portable and/or temporary earths before applying to electrical conductors, plant and equipment of all voltages; proving earthing points are de-energised; applying and removing portable and/or temporary earths from electrical equipment, conductors, and plant; earthing regulatory requirements; and electrical bonding.
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Classification	Electricity Supply > Electricity Supply - Core Skills
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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:
 - Health and Safety at Work Act 2015
 - Electricity Act 1992
 - Electricity (Safety) Regulations 2010
 - Electricity supply industry codes of practice and documented enterprise procedures, including *Safety Manual – Electricity Industry (SM-EI)* and relevant EEA guides available from www.eea.co.nz
 - NZECP 35:1993 *New Zealand Electrical Code of Practice for Power System Earthing* available at <https://www.worksafe.govt.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.

Earths include three-phase and single-phase earths and equipment-specific earths.

Industry requirements include all asset owner requirements and standards; 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 It is recommended people achieve Unit 10507, *Use personal protection equipment in an electricity supply environment*; or demonstrate equivalent knowledge and skills, before being assessed against this unit standard.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of portable and/or temporary earthing requirements for electrical conductors, plant and equipment.

Range includes but is not limited to – Electricity (Safety) Regulations 2010, SM-EI.

Performance criteria

- 1.1 Requirements for earthing for safe working are described.
- 1.2 Reasons for earth switches, where available, to be the first earth applied are described with reference to SM-EI.
- 1.3 Responsibilities of employees when applying earths are described.
- 1.4 Statutory and enterprise inspections and care of insulating sticks and voltage detection devices are demonstrated.

Outcome 2

Demonstrate knowledge of checking portable and/or temporary earths before applying to electrical conductors, plant and equipment of all voltages.

Performance criteria

- 2.1 The conductors or item of plant or equipment are identified in terms of single line diagram, labels, line, plant and equipment layout.
- 2.2 Inspection requirements for conductors or item of plant or equipment to be earthed are described.
- 2.3 Earth attachment positions on conductors, plant and equipment and the local earth are described in terms of earthing terminals, tail clamp attachment points, clamp rating and compatibility.
- 2.4 Earths and procedures are described in terms of portable earths, voltage rating, fault level, and conductor rating.
- 2.5 Earthing compliance requirements are described in terms of acceptable surface condition and cleanliness; and clamps, leads, fittings, sticks and poles, and terminations.

Outcome 3

Demonstrate knowledge of proving earthing points are de-energised.

Range voltage detection device, proving unit, insulation stick.

Performance criteria

3.1 Voltage detection device operation is described.

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

3.2 Voltage detection devices and insulating sticks for system voltage are described in terms of voltage rating.

3.3 Voltage detection device testing requirements are described.

Range audible test, visual test, industry standards.

3.4 The requirements of de-energised earthing points are described.

Outcome 4

Demonstrate knowledge of applying and removing portable and/or temporary earths from electrical equipment, conductors and plant.

Performance criteria

4.1 Personal protective equipment requirements are described.

4.2 Approval requirements are described.

Range access permit, operating order.

4.3 Earth application requirements are described.

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.

Outcome 5

Demonstrate knowledge of earthing regulatory requirements.

Performance criteria

- 5.1 Earthing terms are described.
 Range earthed, earthing system, earth electrode, earth impedance, earthing conductor, main earthing conductor.
- 5.2 Reasons for the requirement of low resistance for an earthing system are explained.
- 5.3 Metalwork that must be earthed is identified.
 Range metalwork forming parts of works, electrical installations.
- 5.4 Earthing and bonding requirements for high voltage (HV) equipment and substations are described.
 Range NZECP 35:1993.

Outcome 6

Demonstrate knowledge of electrical bonding.

Performance criteria

- 6.1 Bonding terms are described.
 Range electrical bonding, earth bonding, equipotential bonding.
- 6.2 The need for bonding metalwork is explained in terms of the elimination of the risk of electric shock, insulation, and lightning.
- 6.3 Bonding methods are described.

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	20 April 2004	31 December 2018
Rollover and Revision	2	20 June 2008	31 December 2018
Review	3	19 November 2010	31 December 2019
Review	4	16 March 2017	31 December 2024
Review	5	2 March 2023	N/A

Consent and Moderation Requirements (CMR) reference	0120
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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.