Title	**Demonstrate practical application of theory and legislation for electrical appliance servicepersons (endorsed)**		
Level	**3**	**Credits**	**3**

Purpose	This unit is not intended for use by electricians. It is designed to meet the practical competencies of the EWRB *Teaching Guidelines for Electrical Appliance Serviceperson (endorsed to disconnect and connect*), which is a requirement for registration as an Electrical Appliance Serviceperson (endorsed to disconnect and connect). People credited with this unit standard are able to: – make up single-phase extension leads; – connect single-phase appliances to the supply using flexible cords; – construct and test simple electrical circuits; – connect and test single-phase electric motors; – reinstate circuit protection after the operation of protective device; – test single-phase appliances for safety and compliance; – perform supply voltage and current tests; and – isolate fixed wired electrical appliances.

Classification	Electrical Engineering > Electrical Appliance Servicing

Available grade	Achieved

Guidance Information

1 This unit standard is intended for use by technicians for electrical engineering, electronic engineering, or telecommunications courses at certificate level, and has been developed for learning and assessment on-job or off-job.

2 Under the Electricity Amendment Act 2006 the Electrical Workers Registration Board (EWRB) has a responsibility to set registration criterion for electrical workers and ensure that all persons applying for electrical registration are competent.

3 To be eligible for registration as an Electrical Appliance Serviceperson (EAS) or an Electrical Appliance Serviceperson (endorsed to disconnect and connect), candidates must complete a competency-based programme of learning approved by the EWRB and must pass the EWRB examination for the registration class, which is based on the requirements of the EWRB *Teaching Guidelines and resources* available at EWRB – Teaching guidelines by registration class. Candidates also need to pass the practical skill assessment programme or an EAS (endorsed) practical examination.

The examination prescription and practical skill assessments prescribed in the EWRB *Electrical Appliance Serviceperson (endorsed to disconnect and connect)* are structured around the essential capabilities and critical items that are considered relevant to this class of registration.

4 Performance in relation to the outcomes of this unit standard must meet the needs at an introductory level of Essential Knowledge competencies in the Essential Capabilities for Electrical Registration as defined by the EWRB under the Rules of the Board.

5 Test result documentation for performance criterion 6.3 shall not be substantially different from the test sheets published by the EWRB.

6 References
AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*;
AS/NZS 3760:2010, In-service safety inspection and testing *of electrical equipment;*
AS/NZS 4701:2000 *Requirements for domestic electrical appliances and equipment for reconditioning or parts recycling;*
AS/NZS 5761:2011, *In-service safety inspection and testing – Second-hand electrical equipment prior to sale;*
AS/NZS 5762:2011 *In-service safety inspection and testing of electrical equipment – Repaired electrical equipment;*
Electricity (Safety) Regulations 2010 Schedule 2 Standards;
Electricity (Safety) Regulations 2010;
Electricity Act 1992;
Electricity Amendment Act 2006.
EWRB *Teaching Guidelines* available from EWRB;
Electrical Codes of Practice (issued by Worksafe under section 36 of the electricity act 1992, ISSN 0114-0663) available from Electrical codes of practice | WorkSafe;
Rules of the Board – as available from EWRB;
and all subsequent amendments and replacements.

7 Definitions
HRC – high rupturing capacity.
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules).*

8 Range
a Candidates must refer to current legislation and Standards during assessment.
b Demonstration of safe working practices in accordance with safe and sound practice are essential components of assessment of this unit standard.

c All activities and evidence presented for all outcomes and performance criteria in 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; and,
  vi where appropriate, manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Make up single-phase extension leads.

Performance criteria

1.1 Select flexible cord to match the plug and cord connectors, length, and environment in accordance with current regulations and standards.

1.2 Terminate flexible cord at plug and cord connector according to current regulations and standards, and industry practice.

Range termination considerations may include but are not limited to – matching conductors to terminations, colour code, strands are not weakened by being nicked or cut from conductors, no stray strands protruding, strands are twisted, and where necessary doubled over, terminal screws are tightened, earth conductor is installed so that it will suffer least or last under cord tension, fabric covered cords are sleeved or whipped, cord clamp arrangement is secured so that conductors are not strained, cord protector shroud is replaced, flexible cord insulation integrity is maintained.

1.3 Test extension lead for continuity, polarity, and insulation resistance, and record results in accordance with current regulations and standards.

Outcome 2

Connect single-phase appliances to the supply using flexible cords.

Range appliances – metal framed, double insulated;
connections – appliance to three-pin plug, appliance to permanent wired connection point by means of an appliance cord;
terminations – evidence of the use of two types of crimp connectors is required.

Performance criteria

2.1 Confirm appliance is isolated from the supply.

2.2 Confirm permanent wired connection point is isolated from the supply and tagged.

2.3 Select flexible cord to match the appliance.

2.4 Terminate flexible cord at both ends.

2.5 Complete crimp terminations using the appropriate crimping tool for the type of termination.

2.6 Visually check and electrically test earthing, continuity, correct circuit connections, polarity, and insulation resistance to confirm that it is safe to reconnect the supply and record test results.

2.7 Connect appliance to the supply and where necessary remove the tag and restore the supply.

2.8 Confirm operation of the appliance.

Outcome 3

Construct and test simple electrical circuits.

Range circuits – one-way and two-way lamp switching circuits employing Edison screw and bayonet cap lamp fittings, electronic control module, energy regulator (simmerstat), fluorescent light fitting, led light fitting, double-pole switching circuits, replacement of a three-heat switch with an energy regulator (simmerstat); candidates may be supplied with circuit diagrams; evidence of five examples is required.

Performance criteria

3.1 Assemble and wire components.

3.2 Test circuits for safety.

3.3 Verify circuit operation.

Outcome 4

Connect and test single-phase electric motors.

Performance criteria

4.1 Confirm that the motor is safe to connect to the supply in accordance with safety inspection and testing requirements of AS/NZS 3760:2010.

4.2 Connect motor to the electricity supply.

4.3 Confirm safe motor operation using observation and electrical testing.

Range tests – polarity, continuity of earthing, on/off switching, live rated-voltage, no-load current, comparison with name plate values. observation – direction of motor rotation, smooth and quiet running, operation of centrifugal starter switches where appropriate.

4.4 Reverse direction of rotation of the motor.

Outcome 5

Reinstate circuit protection after the operation of a protective device.

Range rewirable fuse links, HRC fuse, plug-in type miniature circuit breaker.

Performance criteria

5.1 Turn off and disconnect defective appliance and turn off main switch before removal of protective device if possible.

5.2 Replace fuse wire in rewirable fuse.

Range fuse carrier is cleaned of fragments of old fuse wire, fuse wire matches the current rating marked on the carrier, fuse carrier is free of protruding ends of fuse wire and is fully seated in its base.

5.3 Replace HRC fuse.

Range fuse cartridge is replaced in carrier with one of same size, characteristic, and rating; fuse carrier is fully seated in its base.

5.4 Replace and re-set plug-in type of miniature circuit breakers.

Range replacement circuit breaker matches the base and has the same characteristic and rating as the original protective device, circuit breaker is fully seated in its base.

Outcome 6

Test single-phase appliances for safety and compliance.

Range standards – AS/NZS 3760; AS/NZS 5761; AS/NZS 5762; AS/NZS 4701;
appliances – Class 1; Class 2;
evidence of at least one non-compliant appliance is required.

Performance criteria

6.1 Complete visual inspections and safety checks.

6.2 Complete electrical tests.

Range electrical tests – earth continuity, correct circuit connections, polarity where appropriate and accessible, insulation resistance or earth current leakage;
evidence of at least one earth current leakage test is required.

6.3 Record test results.

6.4 Label or tag appliances.

Outcome 7

Perform supply voltage and current tests.

Range evidence of two different single-phase appliances.

Performance criteria

7.1 Carry out voltage and current measurements and record the results.

7.2 Confirm measurements are within acceptable norms for the type of appliance, and are in accordance with values on the manufacturer's plate.

Outcome 8

Isolate fixed wired electrical appliances.

Range evidence of one single-phase and one poly-phase supplied appliance is required.

Performance criteria

8.1 Switch appliance off before isolation.

8.2 Identify protective device or point of isolation for the appliance circuit.

8.3 Employ safety tag procedure or lockout method as appropriate.

8.4 Confirm isolation using the prove-test-prove method.

Range tests – phase to neutral, earth to neutral, phase to phase where appropriate, phase to earth.

Planned review date	31 December 2027

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	14 December 2017	31 December 2024
Review	2	2 March 2023	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@waihangaararau.nz if you wish to suggest changes to the content of this unit standard.