

ELECTRICAL SAFETY PROCEDURES

Section	Health and Safety
Contact	University Health and Safety Manager
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1. Electrical Safety

Mains electrical voltages are a significant hazard. As such, health and safety policies as well as electrical requirements for safety apply. This document details administrative procedures for electrical safety at Massey University.

2. Definitions

Extra Low voltage: less than 50v AC or 120v ripple free DC

Low voltage: between 50v and 1000v AC or between 120v and 1500v ripple free DC

Hazardous location: areas where explosive atmosphere may be present

3. Responsibilities for Electrical Safety

3.1. Fixed Wiring and equipment:

All fixed wiring and equipment irrespective of voltage is to be supervised by campus Facilities Management. This includes testing of in built protection devices as required and any alterations to fixed wiring. There are specific requirements in areas where moisture occurs, flammable liquids and gases, laboratories, physiology suites and operating theatres.

Approval for any changes or alteration to fixed electrical wiring must be obtained from relevant campus Facilities Management.

Examples of applicable regulations and standards for fixed wiring include:

- Electricity (Safety) Regulations 2010 AS/NZS 3000, Electrical installations (known as Australian/New Zealand Wiring Rules) and Amendments
- AS/NZS 2982 Part 1 – Laboratory design and construction, Part 1, General Requirements
- AS/NZS 2430.3.6 – Classification of Hazardous Areas. Part 3.6: Examples of Area Classification – Laboratories including Fume Cupboards and Flammable Medical Agents.
- AS/NZS 2243 – Laboratory Safety. The Standards have a number of parts covering different types of specialist laboratories.
- AS/NZS 3003 Electrical installations – Patient areas of hospitals, medical and dental practices and dialyzing locations.
- AS/NZS 3003.1 – Patient areas of hospital and medical and dental practices – testing requirements.

3.2. Electrical Equipment:

Any repair work with electrical equipment where the voltage in the area being repaired is above extra low voltage (i.e. prescribed electrical work) must be done by or supervised by a Registered Electrical Worker with a current Practising Certificate.

Any repair work to equipment that is used in hazardous location must be done by or supervised by a Registered Electrical Worker with a current Practising Certificate irrespective of voltage. Examples of work, which can be completed by staff who are not Registered Electrical Workers include:

- Replacing a network card that does not involve removing covers which give access to voltages above extra low voltage.
- Mechanical repair to laboratory equipment that does not involve removing covers which allows access to electrical circuits with voltages above extra low voltage.
- Operating or unplugging of equipment.
- Changing a light bulb or projector bulb where access to the bulb doesn't involve removing covers where access to voltages above extra low voltage.

Examples of work requiring registration as an Electrical Worker with a current Practising Certificate includes

- Changing projector bulbs where access to voltages above extra low voltage.
- Fitting a mains rated connector to equipment or cables
- Repairs to power supplies or switches and equipment.
- Changing a power supply in a computer where the power supply is externally switched.

It should be noted that some of the above work can be undertaken by homeowners in a home setting only. People who have done such work at home are not able to do this at work unless they are a Registered Electrical Worker with a current Practising Certificate.

3.3. Statutory Inspection following Repair to an Equipment:

A full electrical inspection and test as described in Standards AS/NZS 3760 (In Service Safety Inspection and Testing of Electrical Equipment) is to be completed if the repair involves access to mains voltage.

This testing is mandatory and must be undertaken by any University staff or external companies who service or repair electrical equipment. It should be noted that the testing is invoked where mechanical repair is undertaken where the mechanical repair involves removing covers, which give access to low or above voltages.

4. Routine Testing and Inspection of Electrical Equipment:

Electrical equipment and portable electrical equipment must be tested prior to purchase by the supplier and tagged with the date prior to service. Tests shall be done thereafter as per the table of testing and inspection intervals (from AS/NZS 3760) in section 7 of this report. Responsibility for routine testing is as follows.

4.1. Rooms with Specialist Equipment

Departments, Schools, Institutes and Sections which have rooms containing specialised electrical equipment which is "owned" by them must arrange for required periodic testing as per AS/NZS 3760 of all electrical equipment in the room to ensure electrical safety during routine use. Specialised electrical equipment includes equipment used in the following areas:

- Laboratories (i.e. includes computer, language, mechanical, and "bench" laboratories)
- Workshops
- Farms

- Research Centres
- Teaching equipment in centrally timetabled rooms (including AV and IT equipment).
- Catering areas and student halls of residence.

Specialised equipment will include equipment that has specialised requirements such as: use in wet areas, use in construction, flameproof, biomedical use, body protection and/or cardiac protection use. In some instances, additional technical registrations will be needed where equipment repairs are undertaken. For example irradiating equipment can be required by people with Electrical Worker Registration and Radiation Equipment maintenance licence.

In addition to periodic testing of specialised equipment it is the responsibility of Departments, Schools, Institute and Sections to ensure that testing following repair is undertaken as in section 2.3 of this procedure.

4.2. Non Specialised Equipment

Electrical equipment in offices and shared spaces are the responsibility of the Regional Facilities Management. Routine testing is to be undertaken as per the Standard AS/NZS 3760.

5. Verification of Testing

All tested equipment must be tagged following the test as per AS/NZS 3760. The tag must detail the following:

- Name of the person or company that performed the test.
- The test, or retest date.

The background colour of the tag is to be used to indicate the test year as in the following schedule. Where testing is more frequent than annually, the test date will need to be read to determine if equipment is still within the test period.

<u>Year</u>	<u>Tag Colour</u>	<u>Year</u>	<u>Tag Colour</u>
		2021	Blue
2012	Green	2022	Green
2013	Orange	2023	Orange
2014	Red	2024	Red
2015	Yellow	2025	Yellow
2016	Blue	2026	Blue
2017	Green	2027	Green
2018	Orange	2028	Orange
2019	Red	2029	Red
2020	Yellow	2030	Yellow

Non-compliant equipment must be:

- Withdrawn from service immediately.
- Sent for repair, disposal or destruction by a Registered Electrical Worker with a current Practising Certificate.

6. Scope of Equipment to be tested

- All laboratory equipment.
- All equipment used in teaching spaces.
- All equipment in common rooms and office kitchens.
- All office equipment where the supply cord is subject to flexing in normal use - example, extension leads, portable fans, heaters.

Where the supply cord to the equipment is not subject to flexing in normal use, a testing regime of five years is acceptable. Such equipment may include faxes, fixed computers and printers that are normally in a stationary location.

7. Requirements for Staff Undertaking Testing and Inspection of Electrical Equipment

Staff undertaking electrical tests must be competent as defined by AS/NZS 3760. Specialised electrical equipment is also required to undertake some tests. Access to PAT testers in each workshop is required. Staff members who undertake equipment repairs outside of a central workshop will need to be supplied with portable PAT testers.

Where existing in-house resources do not have appropriate expertise and equipment then arrangements should be made either with other Institutes or Department who can support electrical testing or alternatively sub-contract equipment testing. Organisations that undertake testing are listed in yellow pages under Electrical Equipment Repairs and Services. Outsourcing of testing should be arranged using the procurement processes. .

8. Use of Personally Owned Electrical Equipment

Where a staff member uses personally owned electrical equipment for work purposes, the staff member must arrange for this equipment to be tested prior to use on campus and inspected as required by this procedure. The cost of testing is the staff member's responsibility.

Students may bring electrical equipment in to accommodation rooms for personal use. The equipment must comply with the specification in accommodation handbooks. It is strongly recommended for student well being the equipment is tested to confirm its safety.

Where students' use personally owned electrical equipment in teaching and research, it must be tested and inspected as required by this procedure. The cost of testing is the student's responsibility.

9. Accident Reporting

Accidents involving electricity are to be reported the University, and Energy Safety. Serious injury will also require notification to Department of Labour.

Unsafe installations must first be reported to the University and Energy Safety.

Unsafe equipment must first be reported to the University and Energy Safety.

10. Testing and Inspection Intervals for Electrical Equipment (This page is reproduced from AS/NZS 3760 (2010))
(Caution: This page must be read in conjunction with the Standard as a whole, and particularly Clause 2.1)

Type of environment and/or equipment (a)	Interval between inspection and tests				
	Class of equipment (b)	Residual Current Devices (RCDs)			
		Push-button test by user		Operating time and push-button test	
		Portable (c)	Fixed (d)	Portable (e)	Fixed (f)
1. Factories, workshops, places of work or repair, manufacturing, assembly, maintenance or fabrication	6 months	Daily, or before every use, whichever is the longer	6 months	12 months	12 months
2. Environment where the equipment or supply flexible cord is subject to flexing in normal use OR is open to abuse OR is in a hostile environment	12 months	3 months	6 months	12 months	12 months
3. Environment: where the equipment or supply cord is NOT subject to flexing in normal use and is NOT open to abuse and is NOT in a hostile environment.	5 years	3 months	6 months	2 years	2 years
4. Residential type areas of: hotels, residential institutions, motels, boarding houses, halls, hostels accommodation houses, and the like.	2 years	6 months	6 months	2 years	2 years
5. Equipment used for commercial cleaning	6 months	3 months	N/A	12 months	N/A
6. Hire equipment:					
Inspection	Prior to hire	Including push-button test by hirer prior to hire		N/A	N/A
Test and tag	3 months	N/A		3 months	12 months
7. Repaired, serviced and second-hand equipment.	After repair or service which could affect electrical safety, or on reintroduction to service, refer to AS/NZS 5762				
8. New Equipment	Inspection, testing and tagging is required prior to use in service by Massey.				

NOTES:

- 1 The actual sub-environment in which the equipment is located determines the row for the environment to be used in Table 4. e.g. A computer in a non-hostile environment in an office within a factory would attract a test/inspection action in accordance with Row 3.
- 2 Regulatory authorities, other Standards, workplace safety requirements or manufacturers' instructions may specify intervals appropriate to particular industries or specific types of equipment.
- 3 RCDs in transportable equipment shall be regarded as portable RCDs
- 4 The following Standards refer only to the inspection and testing method of Clause 2.3 of this Standard, but not to the intervals of testing in Table 4 above. Refer to the appropriate Standards for specific test intervals:
 - AS 1674.2 Safety in welding and allied processes - Electrical
 - AS/NZS 3001 Electrical installations – Re-locatable premises (including caravans and tents) and their site installations
 - AS/NZS 3002 Electrical installations – Shows and carnivals
 - AS/NZS 3003 Electrical installations –Patient treatment areas of hospitals and medical and dental practices and dialysing locations
 - AS/NZS 3004 Electrical installations –Marinas and pleasure craft at low voltage
 - AS/NZS 3012 Electrical installations –Construction and demolition sites
 - AS/NZS 4249 Electrical safety practices – Film, video and television sites

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