



# GUIDE TO MANAGING ELECTRICAL SAFETY IN EDUCATION QUEENSLAND SCHOOLS

## PART 1: ELECTRICAL SAFETY REQUIREMENTS

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### Part 1:

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Workplace electrical incidents often arise from:

- Use of faulty electrical equipment, including overloading and continued use of plugs, cords and power boards with obvious evidence of damage.
- A lack of maintenance of electrical equipment
- Electrical work performed by an unlicensed person
- Contact with overhead wires

# PART 1: ELECTRICAL SAFETY REQUIREMENTS

## 1.1 Legislative requirements

The *Electrical Safety Act 2002* and *Electrical Safety Regulation 2013* establish the legislative requirements that must be followed in relation to electrical safety. Because children and young people make up the majority of the population at our schools, in some instances our department has implemented processes that exceed the regulatory requirements to further minimise the risk of injury to students and staff.

*Our department has liaised with the Queensland Regulator of electrical legislation to develop this guide to meet the requirements and help schools maintain electrical safety.*

## 1.2 What are electrical risks?

Electrical risks are risks of death, electric shock or other injury caused directly or indirectly by electricity. The most common electrical risks and causes of injury are:

- electric shock causing injury or death (e.g. a faulty light switch or exposed electrical wire in a cord).
- arcing, explosion or fire causing burns (e.g. high fault currents in switchboards).
- fire resulting from an electrical fault.
- toxic gases released from burning materials caused by electrical fires causing illness or death.

Even the briefest contact with electricity at 50 volts (V) for alternating current (A.C.) or 120 V for direct current (D.C) can have serious consequences to a person's health and safety.

Electric shocks can lead falls from ladders and injury from power tools. Other outcomes may include muscle spasms, palpitations, nausea, vomiting, collapse and unconsciousness (section 3.7).

Employees using electricity may not be the only ones at risk—faulty electrical equipment and poor electrical installations can lead to fires that may also cause death or injury to others. We can manage electrical risks by ensuring we maintain electrical safety in our schools.

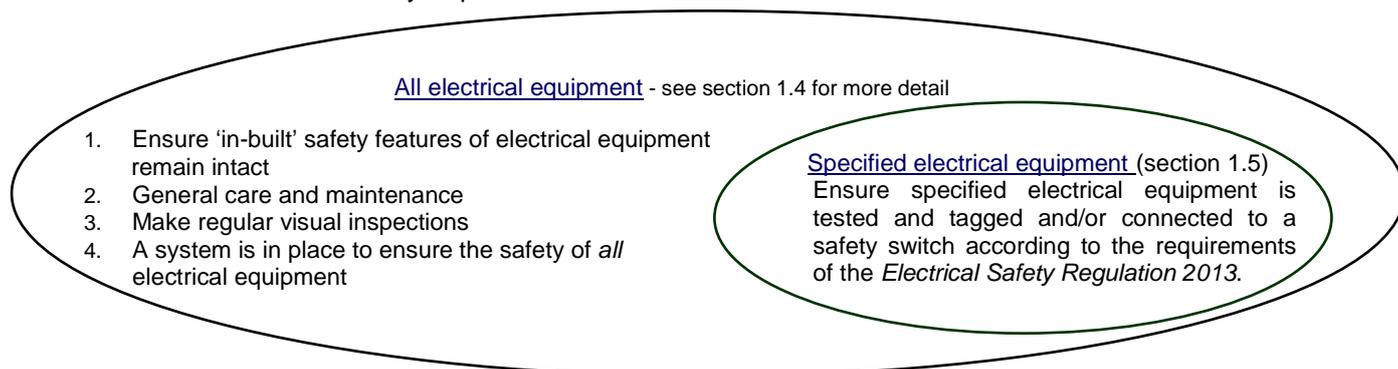
## 1.3 What must be done to ensure electrical safety in schools?

Ensuring electrical safety protects students, staff and others from injury relating to electricity and can also prevent property damage. Education Queensland schools must:

1. Purchase appropriate equipment for the task and amount of use. Electrical equipment and appliances sold in Queensland must comply with the *Electrical Safety Act 2002* and the *Electrical Safety Regulation 2013*. Importers, designers, manufacturers, retailers, wholesalers, and other suppliers are required to ensure the products they supply are electrically safe and meet the relevant standards.
2. Follow [general precautions](#) to ensure the electrical safety of **all electrical equipment** (full details are provided in section 1.4)
3. Protect [specified electrical equipment](#) according to the requirements of the *Electrical Safety Regulation 2013* (section 1.5).
4. **Record and notify** electrical incidents as required by the *Electrical Safety Act 2002* and *Electrical Safety Regulation 2013*. These requirements are provided in departmental procedure [Health and Safety Incident Recording, Notification and Management](#).
5. Ensure all staff, students and others using electrical equipment have the **appropriate skills**, information and training to perform the task safely.

The Department has, in some cases, implemented guidance that exceeds the regulatory requirements to further minimise the risk of injury to our students, staff and visitors.

An overview of electrical safety requirements:



## 1.4 General precautions for all electrical equipment

Legislation requires that the safety of all electrical items must be ensured. The following general procedures are to be followed for the use of **all** electrical equipment:

### 1. Ensuring 'in-built' safety features of electrical equipment remain intact

Appropriately designed and manufactured electrical equipment has some 'in-built' safety features that protect the user from harm related to electricity. To ensure these features remain intact and are effective;

- **Use equipment according to instructions**
- **Use appropriate equipment for the task – e.g. do not use domestic equipment for industrial purposes**
- **Do not remove any casings or covers that enclose electrical parts**
- **Do not insert inappropriate items (e.g. metal implements) into electrical equipment**
- **Do not attempt repairs - use a licensed electrical contractor (e.g. an electrician)**

### 2. General care and maintenance

- Protect leads and equipment from damage e.g. position leads and equipment where they are not likely to be damaged or affected by liquids
- Remove faulty electrical items from use immediately to ensure the item is not used inadvertently by someone else; discard it, or clearly label it as 'faulty' or 'out of service' and have it repaired by an electrician
- Use multi-outlet power boards instead of double adaptors but **do not overload**. 'Piggy backing' or 'daisy chaining' of power boards allows for a greater number of appliances to draw large amounts of power from the power boards, creating a potential overheating hazard or fire.

### 3. Making regular visual inspections

More than 90% of defects are detectable by visual inspection. It only takes a few seconds to check the item before you use it.

Check the lead, plug, socket and item for:

- cuts or other damage that exposes the insulation of the inner cores or conductors
- melted, scorched or burnt areas
- damage to covers, guards and controls (e.g. switches)
- cracks and holes that may expose live parts
- obstructed ventilation inlets and exhausts
- deformed leads e.g. permanently twisted



### 4. Electrical items that are not specified electrical equipment

For electrical equipment that is not specified electrical equipment (e.g. fridges, computers) the *Regulation* does not prescribe the way to ensure electrical safety. This is because the risks are seen to be much lower for these types of equipment. For example, the risks (e.g. of electric shock) associated with using a refrigerator in a staff room are much lower than the risks associated with students operating a power drill during industrial technology.

There is still the general duty to ensure electrical safety for these items so your school may choose to take *extra* precautions in addition to steps 1-3 listed above for some items.

For example;

- identify if there are any electrical items that may be exposed to the risk of damage – see examples in section 1.7
- implement a test and tag regime or install a safety switch to increase the level of protection for users.

This approach shows a risk management process has been used and is a way of proving that a system is in place to ensure electrical safety for all electrical equipment.

**BE AWARE OF HIDDEN DANGERS:**

- ➔ Never use damaged power points, switches, equipment or cords.
- ➔ Isolate damaged items from their power supply and remove from service until repaired or replaced.

## 1.5 What is specified electrical equipment?

Specified electrical equipment is defined in the *Electrical Safety Regulation 2013* as any equipment that meets **any** of the following criteria:

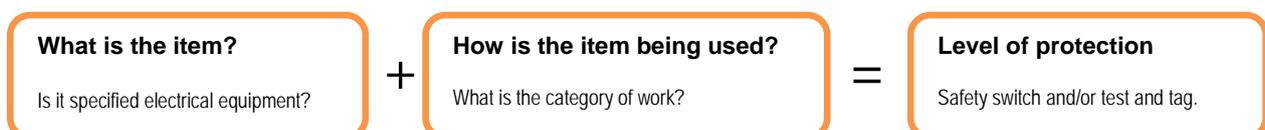
- **All extension leads** (cord extension sets with a current rating of not more than 20 amps)
- **All power boards** (portable outlet devices with a current rating of not more than 20 amps)
- Electrical equipment that is connected by a flexible cord and plug to low voltage supply, has a current rating not more than 20 amps and is used to perform **manufacturing work**. e.g. a bench grinder
- Equipment that is:
  - connected by a flexible cord and plug to a low voltage supply **and**
  - is used to perform “service or office work” **and**
  - **is moved during its normal use for the purpose of its use** e.g. a hand held blow dryer, hot glue gun.

Specified electrical equipment is also grouped into six ‘categories’ according to **how** the equipment is being used. The way a piece of electrical equipment is operated influences the likely wear and tear or damage to the equipment and consequently the level of risk of injury to users.

Our department has liaised with the Queensland Regulator of electrical legislation to clarify the categories of work relevant to school activities. Electrical equipment will predominantly be used in **manufacturing, service and office work** by school staff or students.

1. construction work
2. manufacturing work
3. service work
4. office work
5. amusement work (e.g. amusement rides)
6. rural work

See section 1.6 for examples of school activities, related category of work and the mandatory control measures.



## 1.6 Categories of specified electrical equipment and controls

### 1.6.1 Construction work

Construction work is (WHS Regulation s289) any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning or dismantling of a structure.

**Note:** construction work **does not** include testing, maintenance or repair work of a minor nature carried out in connection with a structure (*WHS Regulation s289 3d*).

The regulatory provisions for construction work are more stringent than for other categories of work due to the high level of risk. If school staff are to undertake construction work the requirements listed below, including the frequency of testing of equipment should be carefully considered in the planning of the work.

For “construction work” **ALL** electrical equipment must meet the requirements of AS/NZS 3012 and:

Table 1: Construction Work

School Application	Electrical Protection Required
<ul style="list-style-type: none"> <li>building a retaining wall</li> <li>contractors performing construction work</li> <li><b>Note:</b> if schools officers are conducting construction work these requirements must be fulfilled.</li> <li>For minor repairs – see ‘manufacturing work’</li> </ul> <p>Double adaptors or piggyback plugs must not be used.</p>	<p>All Electrical Equipment</p> <ol style="list-style-type: none"> <li>Inspected, tested and tagged by a competent person every 3 months</li> </ol> <p>AND</p> <ol style="list-style-type: none"> <li>Connected to one of the following: <ul style="list-style-type: none"> <li>a safety switch permanently installed at the switchboard or</li> <li>a portable safety switch</li> </ul> </li> </ol> <p>Safety Switches Safety Switches <b>permanently installed</b> at the switchboard:</p> <ol style="list-style-type: none"> <li>Push button test (by user): monthly; and</li> <li>Test for operating time/current by competent person: 12 monthly.</li> </ol> <p>Portable safety switches</p> <ol style="list-style-type: none"> <li>Push button test (by user): daily or before every use (whichever is longer) and</li> <li>Test for operating time/current by competent person: 3 monthly</li> </ol>
<p><b>Repair work around swimming pools, ponds, water features etc.</b></p> <ul style="list-style-type: none"> <li>Repairing tiles around pool</li> <li>changing light fixtures or fittings,</li> <li>refixing brackets and fasteners in and around pool.</li> </ul>	<p><b>Extension leads, electrical appliances and cords must not be used where there is a risk of them coming into contact with or falling into water.</b> When working near water e.g. around pools or ponds, battery powered (cordless) or non-powered equipment is to be used instead of electrical equipment connected to mains power</p> <p>For more information see Justice Queensland website – Electricity around water <a href="http://www.justice.qld.gov.au/_data/assets/pdf_file/0003/160077/electrical-safety-and-water-factsheet-ekka.pdf">http://www.justice.qld.gov.au/_data/assets/pdf_file/0003/160077/electrical-safety-and-water-factsheet-ekka.pdf</a></p>

### 1.6.2 Manufacturing Work

Manufacturing work is the assembly, disassembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair, but does not include amusement work, construction work or rural industry work.

For “Manufacturing Work” – specified electrical equipment\* is:

- an extension cord or
- a power board or
- electrical equipment that is **used to perform manufacturing work and has a flexible cord and plug**

e.g. bench grinder, angle grinder, hand held electric drill. *For legislative definition refer to Electrical Safety Regulation 2013 s97*

#### 1.6.2.1 Use of safety switches for Schools Officer Activities

- Schools Officers **must** have safety switch protection on the specified electrical equipment they use for work e.g. electric bench grinder, drill or electric sander.
- A **fixed** safety switch **is to be** installed to protect circuits in the schools officer’s **shed or workshop**.
- When **performing work around the school site**, safety switch protection can be provided through fixed safety switches or via portable safety switch. A portable safety switch **must** be used unless there is verification that all circuits have fixed safety switch protection.

Table 2: Manufacturing Work

School Application	Electrical Protection Required
<ul style="list-style-type: none"> <li>▪ Industrial Technology</li> <li>▪ Ag Science/ Workshops.</li> <li>▪ Schools Officer tasks such as maintenance or repair work of a minor nature, installation of shelving (see note regarding construction work)</li> </ul> <p style="color: red;">Double adaptors or piggyback plugs must not be used</p>	<p><b>Specified Electrical Equipment</b></p> <ol style="list-style-type: none"> <li>1. Inspected, tested and tagged by a competent person;               <ul style="list-style-type: none"> <li>• double insulated - 12 monthly,</li> <li>• not double insulated - 6 monthly</li> </ul> </li> </ol> <p>AND</p> <ol style="list-style-type: none"> <li>2. Connected to one of the following:               <ul style="list-style-type: none"> <li>• a safety switch permanently installed at the switchboard in a permanent workplace (e.g. in Schools Officer's shed or permanent work shop)</li> </ul> </li> </ol> <p>or</p> <ul style="list-style-type: none"> <li>• a portable safety switch when <u>not</u> in a permanent workplace (e.g. schools officers working around the school)</li> </ul> <p><b>Safety Switches</b></p> <p>Safety Switches <b>permanently installed</b> at the switchboard:</p> <ol style="list-style-type: none"> <li>3. Push button test (by user): 6 monthly; and</li> <li>4. Test for operating time/current by competent person: 12 monthly.</li> </ol> <p>Portable safety switches</p> <ol style="list-style-type: none"> <li>5. Push button test (by user): daily or before every use (whichever is longer) and</li> <li>6. Test for operating time/current by competent person: 12 monthly</li> </ol>

### 1.6.3 Service Work

Service work is work that is not office, manufacturing, construction, amusement or rural. For "Service Work" – specified electrical equipment\* is:

- an extension cord **or**
- a power board **or**
- electrical equipment that has a flexible cord and plug and **is moved during its normal use for the purpose of its use** e.g. hot glue gun, electric engraver, hairdryer.

Specific controls are in place for school cleaning equipment see table 3.1

Table 3: Service Work - for legislative definition refer to Electrical Safety Regulation 2013, s97

School Application	Electrical Protection Required
<ul style="list-style-type: none"> <li>▪ Teaching – classrooms</li> <li>▪ Teacher aide activities e.g. preparation for class activities</li> <li>▪ Library</li> <li>▪ Making beverages/food</li> <li>▪ Kitchenettes/tea rooms.</li> <li>▪ Selling goods from a shop e.g. uniform shop</li> <li>▪ Tuckshops*</li> <li>▪ Cooking – home economics*</li> <li>▪ Science laboratories*</li> <li>▪ Kitchens at Outdoor Education Centres*</li> <li>▪ Drama/performance#</li> </ul>	<p><b>Specified Electrical Equipment</b></p> <ul style="list-style-type: none"> <li>▪ Inspected, tested and tagged by a competent person every 12 months</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>▪ Connected to a safety switch (permanently installed or portable type)</li> </ul> <p><b>*Safety Switches – Home Ec, Tuckshops &amp; Catering e.g. kitchens at OEC, Labs</b></p> <p>Safety Switches <b>permanently installed</b> at the switchboard:</p> <ol style="list-style-type: none"> <li>1. Push button test (by user): 6 monthly; and</li> <li>2. Test for operating time/current by competent person: 12 monthly</li> </ol> <p><b>Safety Switches – Classrooms, library, kitchenettes</b></p> <p>Safety Switches <b>permanently installed</b> at the switchboard:</p> <ol style="list-style-type: none"> <li>3. Push button test (by user): 6 monthly; and</li> <li>4. Test for operating time/current by competent person: 2 yearly</li> </ol> <p><b>All Portable</b> safety switches:</p> <ol style="list-style-type: none"> <li>5. Push button test (by user): immediately after it is connected to a socket outlet; and 3 monthly; and</li> <li>6. Test for operating time/current by competent person: 12 monthly.</li> </ol> <p># Note: piggyback plugs (preferably non-rewireable) are permitted for use with sound and light equipment in permanent theatre/venues. Non-rewireable piggyback plugs must be used at temporary premises.</p>

Table 3.1 Electrical Safety Requirements for Cleaning Equipment

Application	Electrical Protection Required
<p><b>Cleaning Equipment</b></p> <ul style="list-style-type: none"> <li>Cleaning equipment is operated in a range of environments and potentially exposed to damage, wear and tear due to the high level of use.</li> <li>Machines are also sometimes operated on a wet surface e.g. when stripping or buffing floors or extracting water with a wet and dry vacuum cleaner.</li> <li>Cleaning equipment is used all over school campuses and therefore safety switch protection may not be provided over all circuits.</li> </ul> <p>Due to these factors our Department has implemented specific electrical control measures for cleaning equipment.</p>	<p>All Electrical Equipment e.g. vacuums, polishers, scrubbers</p> <ol style="list-style-type: none"> <li>Daily visual checks as per instruction and training and</li> <li>Inspected, tested and tagged every 6 months</li> </ol> <p>OR</p> <ol style="list-style-type: none"> <li>Daily visual checks as per instruction and training and</li> <li>Connected to a portable safety switch.</li> </ol> <p>Schools that do not have safety switch protection on all circuits are encouraged to purchase portable safety switches for each school cleaner to use with their electrical equipment.</p> <p>Safety Switches</p> <p>Testing for <b>portable</b> safety switches:</p> <ol style="list-style-type: none"> <li>Push button test (by user): immediately after it is connected to a socket outlet; and 3 monthly; and</li> <li>Test for operating time/current by competent person: 12 monthly (ref: using commercial cleaning requirement)</li> </ol> <p>Double adaptors or piggyback plugs must not be used</p>

#### 1.6.4 Office work

For “Office Work” – specified electrical equipment\* is:

- an extension cord **or**
- a power board **or**
- electrical equipment that has a flexible cord and **is moved during its normal use for the purpose of its use.**

e.g. electric engraver.

Table 4: Office Work - for legislative definition refer to Electrical Safety Regulation 2013, s97

School Application	Electrical Protection Required
<p>Administration tasks such as using computers, photocopying or faxing</p> <ul style="list-style-type: none"> <li>Office work</li> <li>Administration areas</li> <li>Staff rooms</li> </ul>	<p>Specified Electrical Equipment</p> <ul style="list-style-type: none"> <li><b>Inspected, tested and tagged by a competent person every 5 years;</b></li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li><b>Connected to a safety switch (permanently installed or a portable type).</b></li> </ul> <p>Safety Switches</p> <p><b>Safety Switches permanently installed at the switchboard:</b></p> <ol style="list-style-type: none"> <li><b>Push button test (by user): 6 monthly;</b> and</li> <li><b>Test for operating time/current by competent person: 2 yearly</b></li> </ol> <p>Portable safety switches:</p> <ol style="list-style-type: none"> <li><b>Push button test (by user): immediately after it is connected to a socket outlet; and 3 monthly;</b> and</li> <li><b>Test for operating time/current by competent person. 2 yearly</b></li> </ol>

1.6.5 Amusement work (e.g. amusement rides): this category is relevant for contractors who supply and operate amusement rides for school fetes and functions – refer to the [“Checklist for School Fete/Event Organisers – Mobile Amusement Devices”](#).

1.6.6 Rural industry work: For the purposes of schools, Agricultural Science activities have been included in the category of Manufacturing work.

## 1.7 What is not specified electrical equipment?

Many electrical items do not meet the definition of 'specified electrical equipment' and the requirements listed above (section 1.6) do not have to be implemented for these pieces of equipment. However, **there is still a requirement to ensure electrical safety** for the use of these items. Your school may choose to take extra precautions in addition to general care and maintenance, for example;

- identify electrical items that are exposed to damage or greater wear and tear; and
- implement a testing and tagging regime **OR** connection to a safety switch to increase the level of protection for users.

For example; these items are not specified electrical equipment however they may be exposed to damage or greater wear and tear:

- lap top computers
- mobile electronic whiteboards
- overhead projectors
- laboratory power supplies
- mobile phone and camera battery chargers etc.
- appliances that are often unplugged and stored away after use
- toasters, jugs and frying pans
- TVs and/or VCRs on trolleys
- portable heaters and air conditioners
- powered microscopes

These items are not specified electrical equipment, are predominantly stationary and therefore the risk of damage and wear and tear is minimal. Testing & tagging is not required however general care and maintenance is essential:

- personal desktop computers, modems and printers
- fixed electronic whiteboards
- refrigerators, freezers and microwave ovens
- water coolers
- wall mounted heaters or fans
- vending machines
- photocopiers and facsimile machines
- televisions, videos (fixed or stationary)
- urns and wall mounted boilers
- air conditioners
- washing machines and clothes dryers

## 1.8 Can staff bring electrical items to school?

Principals have the discretion to allow staff to bring personal electrical items onto the school site.

If electrical equipment is brought from home, it is to be managed the same way as electrical items owned by school *i.e.* visually inspected before use, protected from damage and managed as per section 1.4 and 1.6

Some schools implement additional processes such as requiring all items to be tested and tagged prior to them being brought to school.

### Keeping yourself and others safe around electricity



- ➞ **NEVER** do your own electrical work. ALWAYS get a licensed electrician to do any electrical work.
- ➞ Buy and use the right electrical equipment for the task.
- ➞ Use your appliance correctly. Follow the instructions.
- ➞ Don't mix water and electricity. Keep electrical appliances away from water and wet areas.
- ➞ Be diligent with inspection and maintenance. Keep your appliances in safe working order.
- ➞ Disconnect broken appliances and have frayed cords or broken power points replaced.
- ➞ Keep electrical cords off the floor to reduce the risk of damage from drag or contact with sharp objects. A damaged electrical cord can cause a fatal electric shock.
- ➞ Know the location of your main electricity supply. Ensure controls are in place to prevent unauthorised access to switchboards.
- ➞ Remember that solar panels *and their isolation switches* must be managed safely during electrical work.
- ➞ Check the location of overhead wires and stand clear of any fallen power lines.
- ➞ Dial before you dig – phone 1100 or go to <http://www.1100.com.au/#>
- ➞ Take extra care with electrical safety during storms and floods