

# Electrical Safety Procedure

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## 1 Purpose

Electrical work presents significant hazards that can result in serious injury, fatality, or property damage if not managed correctly. This procedure establishes the minimum requirements for electrical safety across PBPL worksites and ensures compliance with:

- Electrical Safety Act 2002 (Qld)
- Electrical Safety Regulation 2013 (Qld)
- Electrical Safety and Other Legislation Amendment (ESOLA) Regulation 2024 updates
- Relevant Australian Standards, including AS/NZS 4836 – Safe Working on Low-Voltage Electrical Installations

To provide a structured framework for managing electrical risks, preventing incidents, and ensuring all electrical work is performed safely and legally.

## 2 Scope

This procedure applies to all electrical installations, equipment, and associated activities at PBPL worksites, including emerging technologies such as battery energy storage systems and electric vehicle charging infrastructure. It covers:

- Licensing and competency requirements
- Isolation and testing protocols
- Mandatory controls for live work and work near exposed energised parts
- Personal protective equipment standards
- Incident response and reporting obligations

By following this procedure, PBPL demonstrates its commitment to providing a safe working environment, meeting statutory obligations, and aligning with industry best practice

### 3 Definitions

Term	Definition
<b>Electrical Work</b>	Work involving the installation, maintenance, testing, or repair of electrical equipment or wiring. Tasks that do not interfere with the integrity of circuits (e.g., activating a switch) are excluded.
<b>Licensed Electrical Worker</b>	A person holding a current electrical work licence permitting them to perform or supervise electrical work.
<b>Isolation</b>	The process of de-energising electrical equipment, testing to prove de-energised, earthing (for HV), and securing the isolation by locking.
<b>Live Work</b>	Electrical work performed while equipment remains energised, only allowed when de-energisation is impracticable and additional controls are documented.
<b>Safety Observer</b>	A person assigned to observe electrical work for safety compliance, with competency requirements varying for low and high voltage tasks.
<b>Exclusion Zone</b>	The minimum safe distance from exposed electrical parts for persons, plant, or vehicles, as defined in Appendix 1.
<b>Residual Current Device (RCD)</b>	A safety device designed to disconnect power when a leakage current to earth is detected, reducing electric shock risk.
<b>Permit to Work</b>	A formal authorisation required before commencing specified electrical work, particularly live work or isolation tasks.
<b>Out of Service Tag</b>	A tag applied to defective or unsafe electrical equipment to prevent use until repaired or disposed of.
<b>Low Voltage Rescue Kit</b>	A kit containing insulated tools, gloves, fire blanket, and other items for emergency rescue during electrical incidents.

### 4 Licences

No person is to perform or supervise electrical work at a PBPL site unless they are the holder of a current 'electrical work licence' that permits them to undertake such work or supervision.

PBPL maintains a register of licensed electrical workers which details licence and competency verifications and includes the following details:

- the licence holder's name
- the number of the licence or, if not issued in Queensland, the number, code or another way of identifying the licence and the jurisdiction in which it was issued
- the class of the licence
- if the licence is a restricted electrical work licence—the type of electrical work stated on the licence
- the conditions or restrictions included in the licence

- the day the licence expires.

Tasks/work that does not involve interfering with the integrity of electrical equipment, wiring or circuits, is not defined as electrical work for the purposes of the Electrical Safety legislation in Queensland and thus does not require persons undertaking such tasks as activating a switch for isolating plant, etc to be licensed.

Where cover plates are removed, terminals exposed, or fuses are removed, such tasks are required to be performed by a licensed electrical worker/s.

Team leaders/supervisors require a licence as an electrical worker when directly overseeing electrical work tasks and activities.

Licensed electricians must only perform those activities permitted by the class of licence they hold. Licence classes may include:

- electrical mechanic licence
- electrical lines person licence
- electrical fitter licence
- electrical jointer licence
- restricted electrical work licence
- electrical work training permit.

**Note:**

- TSHD Brisbane Engineers may perform electrical activities as described in Schedule 1 of the AMSA Marine Order 72 (Engineer officers) 2014 made under the *Navigation Act 2012*.
- Where people have received certification from outside of Queensland, it is to be confirmed that their license permits them to undertake their intended activities at PBPL worksites.

## 5 Work Requirements

### 5.1 Operational Licence Conditions

- Simple isolations may be performed by non-licensed persons if integrity of circuits is not affected.
- Where cover plates are removed or terminals are exposed, tasks must be performed by licensed electrical workers.
- Team leaders/supervisors require a licence when directly overseeing electrical work.
- Electrical testing and fault finding must only be performed by licensed electrical workers.
- Apprentices and trainees must be directly supervised by a licensed electrical worker.
- Safety observers must hold an electrical work licence for specific tasks (refer Appendix 4).

If an item of electrical equipment is identified as defective or not electrically safe, it is to comply with Out of Service Tag Out requirements detailed within the Plant Isolation Procedure.

Any exposed electrical part at PBPL worksites is to be treated as if it is energised until it is isolated and proven not to be energised.

Live work is not to be performed under any circumstances unless it is not practical to do so due to one or more of the following reasons:

- it is necessary in the interests of safety, whether or not electrical safety, for the work to be performed

while the electrical equipment is energised

- a supply of electricity is necessary for the proper performance of the electrical work
- there is no reasonable alternative to performing the electrical work other than by live means
- the work consists of testing to prove de-energised.

### 5.2 Requirements When Live Work is Justified

Entry into domestic **roof spaces** must only occur **after de-energisation** at the main switchboard unless impracticable, in which case justification and additional controls must be documented.

When it is not practicable to work de-energised, the following requirements are to be ensured:

- a safe system of work is in place which includes a written risk assessment, Live Electrical Control Form and Permit to Work Form (where applicable), developed in consultation with all people involved in the work
- an explanation is detailed within the risk assessment that clarifies why it is not practicable or why there is no alternative to performing the electrical work other than by a live means
- the live work is authorised to be undertaken only after consultation with the person in control of the electrical installation or electrical equipment
- the person(s) performing the work is qualified and trained in the safe work practices for the live work to be performed, including being low voltage rescue trained
- testing equipment and tools appropriate for the live work to be performed is provided, maintained and used correctly
- clothing and personal protective equipment appropriate for the live work to be performed is provided, maintained and used correctly
- the isolation point of the electrical supply for the equipment being worked on is clearly identified and able to be easily reached without having to travel long distances or move around/over plant equipment or obstructions
- the work area is clear of obstructions and allows easy access and egress
- there is a safety observer, observing the performance of the electrical work, unless the work involves testing electrical equipment where the testing task can be done safely without the need for a safety observer
- unauthorised persons are prevented from entering the work area by a means of barrier exclusion, signage or both.
- the appropriate Australian Standard requirements are considered and observed.

### 5.3 Working near Exposed Parts

Workers are not to come into direct contact with an electrical part unless:

- the person is an authorised person or instructed person for the electrical part, which is a low voltage overhead insulated electric line, or
- the following controls are in place:
  - For work within 3 metres of exposed energised parts, apply exclusion zone controls and arc-flash risk assessment as per Appendix 1 and AS/NZS 4836

- the electrical part is isolated from all sources of electricity, and
- is tested or confirmed to be isolated from all sources of electricity, and
- is earthed, if the electrical part is a high voltage electrical part.

PBPL needs to ensure that items of operating plant or vehicles do not come into direct contact with an electrical part unless:

- the item is operating plant and is being operated by an authorised or competent person
- a safety observer is present
- the electrical part is a low voltage overhead insulated electric line.

#### 5.4 *Work within Exclusion Zones for Electrical Parts*

For clarification of the term 'exclusion zone' refer Appendix 1.

Plant operators or vehicles are not to enter or work within an exclusion zone of an electrical part unless that the following controls are in place:

- the electrical part is isolated from all sources of electricity, and
- is tested or confirmed to be isolated from all sources of electricity, and
- is earthed, if the electrical part is a high voltage electrical part.

However, if it is not practicable to test or confirm the isolation of electricity for an electrical part, the entry or work may be performed if:

- the work can be performed safely
- detailed work instructions have been established in relation to the practice, and these have been made known to those performing the activity
- at least one of the following applies:
  - suitable barriers or earthed metal shields are installed between the worker, operating plant or vehicle and the electrical part
  - testing work is being carried out while the person, operating plant or vehicle is within the exclusion zone
  - earthing work is being carried out after the electrical part or equipment has been isolated and proved to be de-energised.

#### 5.5 *Overhead Line Considerations*

Overhead line hazards and controls are to be identified within a written risk assessment where operating plant such as the following may come into contact with overhead lines:

- cranes
- concrete placing booms
- elevating work platforms
- earth moving equipment
- any other plant.

Pre-work planning and consultation with plant operators, plant hire companies and suppliers/contractors is to be undertaken where possible to minimise the likelihood of exclusion zones being entered and to ensure a safe system of work (i.e. a detailed risk assessment) prior to activities commencing.

Only authorised persons or instructed persons are to operate plant near overhead lines. Where suppliers/contractors are involved, PBPL authorised persons are to supervise the work and undertake pre-work consultation with plant operators to ensure all relevant issues are discussed and documented.

A safety observer is to be used at all times where entry into an exclusion zone is possible or where work is performed within a safety observer zone.

As part of pre-work planning and risk assessment, the following issues are to be considered:

- size and dimensions of the load(s)
- the conductive nature of the operating plant or the load(s) and the likelihood of it becoming live due to induced voltages
- special precautions for the lifting of the load(s) above or over electric lines
- the method of securing the load(s)
- whether any part of the load(s) may move inadvertently during lifting and slewing
- whether unexpected movement of the operating plant may cause it to enter an exclusion zone or contact an overhead line
- whether wind factors could cause the operating plant or load to enter an exclusion zone or contact an overhead line.

**Note:** Site specific procedures that ensure a level of safety equal to or exceeding the above requirements may also be used to supplement the safe system of work where overhead lines present a hazard.

### *5.6 Underground and In-Situ Electrical Considerations*

Specific electrical hazards and controls are to be identified within a written risk assessment where work activities such as the following may cause persons or operating plant to come into contact with electrical cables and installations:

- removing wall sheeting during a building refurbishment
- penetrating a wall cavity or ceiling space with a hand tool or portable electric tool
- using portable electrical tools to cut piping that may contain water
- Work involving water-related electrical equipment (e.g., pumps, heaters) must comply with prescribed equipment requirements and be performed by licensed electrical workers
- excavating on site in preparation for a new facility or building
- digging holes for the erection of fence posts
- any other activity that may require penetration into the ground or work in the vicinity of in-situ electrical installations and entity works.

As part of pre-work planning and risk assessments, the following issues are to be considered:

- the location of work, whether it be in the vicinity of entity works or in the vicinity of electrical installations
- reference to facility drawings, electrical drawings and service drawings

- the method of work being used - machinery, portable electrical tools or by the use of hand tools.

As electrical lines and cables are manufactured in many ways and are often protected by a range of varying electrical conduits, thorough pre-work cable inspection and identification is to be undertaken prior to undertaking work within buildings or facilities.

Where excavation activities or the driving of items into the ground is required, specific controls to address underground service hazards, including locating underground electrical cables, are to be implemented. Refer the Excavation and Digging Procedure.

### 5.7 High Voltage / Cross Boundary Considerations

Only PBPL people or PBPL suppliers/contractors who are competent in High Voltage Isolation and Access procedures and who have been authorised by PBPL to undertake high voltage switching, are permitted to undertake high voltage isolation processes as detailed within the Plant Isolation Procedure.

Only people who are licensed electrical workers and who are competent in High Voltage Isolation and Access procedures are to undertake electrical work involving high voltage electrical apparatus.

Specific safety observation protocols relating to high voltage switching and work involving high voltage electrical apparatus are to be undertaken as per Safety Observer Requirements (Appendix 4).

## 6 Electrical Isolation Requirements

An electrical isolation consists of the following steps:

- isolate or de-energise the installation or equipment
- test to prove de-energised
- earth the installation or equipment (only undertaken for high voltage items)
- securing the isolation by such means as locking.

Specific requirements to safely undertake aspects of these steps are defined below:

### 6.1 Isolate or De-energise

Isolation of electrical energy or de-energising to undertake work on an electrical installation or electrical equipment is to be undertaken in accordance with the processes defined within the Plant Isolation Procedure.

To perform isolations of any kind, the person is to be an authorised Isolating Person.

Where the isolation of electrical energy involves electrical work to be undertaken, the Isolating Person must also be a licensed electrical worker.

Remote controls associated with the isolation are to be isolated also, which may involve the use of a dedicated isolating switch or by the removal of links or fuses.

### 6.2 Test to Prove De-energised

PBPL mandates the need to 'test before you touch' i.e. prior to touching an electrical part that may be live, it is to be tested and proven de-energised.

#### Note:

- Only those testing devices that are approved by PBPL and regularly maintained in accordance with Appendix 3 are to be used.
- Correct operation of the testing device is to be verified immediately before and after proving de-

energised.

- Testing to prove de-energised is to be undertaken by a licensed electrical worker who is authorised by PBPL to undertake testing tasks.

During isolation, testing and prior to work commencing, it may not be practical to isolate all live conductors adjacent to the work area. Where this is the case, these conductors are to be shrouded where practicable with approved insulating mats and covers and specific PPE is to be used to ensure the work can be carried out safely.

### 6.3 Securing / Locking Isolations

An electrical isolation is deemed to be initiated if:

- electrical energy has been removed (energisation cannot occur, or a switching surge will not cross the isolation point)
- testing to prove de-energised has verified the removal of electrical energy
- the isolation point is secured with an isolation lock
- additional tagging and isolation requirements (as per the Plant Isolation Procedure), have been implemented.

## 7 Maintenance and Testing

### 7.1 Electrical Installations and Equipment

Any licensed electrical worker who performs electrical work on an electrical installation must ensure that the electrical installation, to the extent it is affected by the electrical work, is in accordance with the wiring rules in the appropriate legislation.

Where a licensed electrical worker performs part or all the electrical work, and is responsible for bringing the electrical equipment to a state of readiness for connection to a source of electricity, this person must ensure the electrical equipment is tested as follows:

- the testing of the electrical equipment must be directed at ensuring the electrical equipment is electrically safe
- if the electrical equipment is energised for testing, the person who performs the test must ensure others are electrically safe.

Where PBPL procures a licensed electrical supplier/contractor to perform electrical work and test to ensure electrical safety, the supplier/contractor must, as soon as practicable after the testing, ensure that PBPL is given a Certificate of Testing and Safety (in accordance with the appropriate legislation).

### 7.2 General Requirements

PBPL is to provide and maintain electrical equipment that is suitable for the work environment in which it is to be located or used.

All electrical equipment items are to be appropriately inspected, tested and tagged by a competent person to ensure they are electrically safe in accordance with the frequencies detailed in Appendix 2.

Any new item of electrical equipment is to be inspected, tested and tagged immediately after it is procured to ensure that it is electrically safe and fit for use.

When the equipment is purchased new, the supplier is deemed responsible for its initial electrical safety. New equipment does not need to be initially tested but shall be examined for obvious damage by the relevant Cost Centre Manager/Site Manager or their representative.

New electrical equipment and during periodic electrical equipment inspections, the electrical equipment is to be visually and physically checked for the following:

- obvious damage or defects in accessories, connectors, plugs or extension outlet sockets
- damage to flexible leads
- controls that are in good working order
- covers and guards that are secured as per the manufacturer's specifications
- safety facilities and devices that are in good working order
- ventilation inlets and exhaust areas that are unobstructed.

The Cost Centre Manager / Site Manager will contact Facilities Management to attach a "New Appliance to Service" label – see example attached.



The equipment is to be tested and tagged by a competent person at a frequency no longer than that detailed in Appendix 2. The Cost Centre Manager/Site Manager is to maintain a register of new equipment requiring testing.

Personal electrical equipment must be inspected or tested before being used in the workplace. The owner of the equipment is responsible for ensuring compliance.

After electrical equipment is inspected and tested, a non-reusable and non-metallic tag that is suitable for the work environment in which the equipment may be used is to be immediately attached to the equipment, noting the following:

- date the inspection and test was carried out
- due date of next inspection and test
- identity of the competent person who carried out the inspection and test.

Double adaptors and piggyback plugs are not to be used for any construction or manufacturing work.

Each PBPL workplace is to maintain electrical equipment records that include:

- registers of all electrical equipment items owned or hired
- repair details for specific items
- faulty equipment details for specific items.

**Note:** These records may be workplace, area, or Business Unit specific or organisation-wide. The above records may be made up of external registers, asset registers, repair, and maintenance records etc. Cost Centre Managers are to inform Facilities Management of any purchase of electrical equipment that requires periodic testing.

Records, inclusive of when tests have been performed, are to be maintained with the inspection and testing details over at least the last 5 years.

Items that are defective, non-compliant or out of test date are to be immediately disconnected, removed from use and tagged Out of Service until inspected, tested, and deemed as electrically safe and tagged, or disposed of, by a competent person.

### 7.3 Leads, Portable Outlet Devices and Portable Electrical Tools

Leads are to be appropriately located to minimise and protect against sources of damage and wear.

Leads are not to be damaged while stored or transported, and are to be inspected for damage to the following parts of the lead prior to use:

- inner cores (not exposed or twisted)
- external sheaths (not cut, abraded, twisted or damaged to the extent that the insulation of the inner core is visible)
- unprotected conductors or insulation tape are not evident.

As deemed necessary, leads are to be appropriately anchored to equipment, plugs and cord extension sockets such that they remain tightly fitted during use.

Leads and portable electrical tools fitted with flat pin type plugs and extension sockets are to be fitted with clear backed or integrally moulded (non-rewireable) plugs and leads for easy inspection.

Portable electric tools, appliances, and equipment are to be connected to a Residual Current Device (RCD).

### 7.4 Residual Current Devices (RCDs)

Workplaces are to be maintained in an electrically safe manner which incorporates installation or supply of RCDs for electrical supply to all electrical tools, appliances, and equipment.

RCDs are to be Type I (10mA) or Type II (30mA) and comply with the appropriate standards:

**Note:** RCDs do not protect people where:

- there is no current path to earth
- an appliance comes into contact with an alternate source of electricity
- there is a risk of electric shock from the electrode or return leads when welding, or
- an appliance is supplied from an isolating transformer.

RCDs are to be inspected and tested to ensure they are electrically safe in accordance with the frequencies detailed in Appendix 2. As part of RCD testing, maximum tripping times are not to exceed the values shown in the following table:

RCD Type	A.C. RMS Test Current mA	Maximum Tripping Time mS
Type I	10	40
Type II	30	300

## 7.5 Electrical Tools and Protective Clothing

PPE is to be used as a last resort and as the least preferred form of control. It is recognised, however, that in relation to working near exposed parts, PPE is often required to be worn.

As PPE is often required to protect people from electrical hazards, each workplace is to maintain a ready supply of well-maintained PPE, in accordance with relevant Australian Standards and tested as per recommended frequencies where relevant.

People required to wear items of PPE are not to modify, damage or use PPE in a way contrary to manufacturer's instructions or training provided for that particular PPE item.

Items that are defective or out of test date are to be immediately removed from service and tagged as faulty until repaired and/or tested by a competent person.

During the performance of electrical related tasks or when in close vicinity to exposed parts, people are not to wear conductive items such as bracelets, rings, neck chains, exposed metal zips, watches etc.

Additional requirements outlined within Appendix 3, are to be adopted in relation to:

- testing equipment
- insulated tools, mats, covers and barriers
- insulating gloves
- face shields and goggles
- fire retardant clothing
- safety helmets
- rescue equipment.

## 8 Electrical Incidents and Events

### 8.1 Response and Reporting Requirements

If an electrical incident occurs that requires rescue of a person still connected to a supply voltage, the person responding is to ensure all rescue from Live Switchgear Procedures are implemented so that the rescuer does not become a second casualty.

An item of electrical equipment, part of electrical equipment or the scene of a serious electrical incident or dangerous electrical event is not to be interfered with unless permission is granted by an Inspector from the Electrical Safety Office or similar statutory authority, or a Police Officer.

Anyone who witness a serious electrical incident or dangerous electrical event may move equipment items or interfere with the scene if it is necessary to save a life or relieve suffering, or to prevent further injury to a person or property damage.

In the event of a serious electrical incident or dangerous electrical event, the incident is to be reported as soon as possible to the relevant supervisor/manager, gives notice of the incident or event to the Electrical Safety Office via the Workplace Health and Safety Queensland – Incident Notification. This is to be undertaken within 24 hours of the incident or event occurring or from the time the incident or event was discovered. Refer the Reporting and Investigation Standard.

If the incident or event is a serious electrical incident (such as electrocution), however, this notification is to be undertaken as soon as possible via any means of communication. The Police must also be contacted immediately following the incident.

Incident Notifications and corresponding incident investigation forms and reports completed for serious electrical incidents or dangerous events are to be maintained for a period of not less than 3 years.

If the incident involves an electric shock the following is to be undertaken:

- the casualty is to be provided with first aid (if applicable)
- the casualty is to be transported by ambulance or escorted to a medical provider for further treatment and monitoring.

## 9 Supplier Engagement Management

As part of establishing contractual arrangements for suppliers/contractors to access PBPL locations and undertake electrical work or work in the vicinity of electrical parts, PBPL is to provide the following information to suppliers/contractors as appropriate for the scope of work:

- this Electrical Safety Procedure
- access to a copy of the Live Electrical Control Form, Plant Isolation Control Form and Plant Isolation Steps sheet
- access to necessary service plans and circuit drawings relating to electrical services, plant and overhead lines
- Electrical contractors must notify PBPL of any changes to Qualified Technical Person (QTP) or Qualified Business Person (QBP) within 10 business days.
- the identity of relevant PBPL authorised persons who can authorise specified electrical access and work tasks that require a Permit.

As part of the OH&S related documentation typically requested of suppliers/contractors procured to undertake work for PBPL, suppliers/contractors are to provide the following details with respect to electrical work or work in the vicinity of electrical parts:

- confirmation that those involved in electrical work are licensed
- confirmation that all electrical test tools, PPE and other relevant equipment etc. have been adequately maintained, inspected and tested
- confirmation that all those involved with electrical works are aware of the intended scope of work, nature of the work locations, and PBPL's electrical work expectations.

Suppliers/contractors must obtain a Permit to Work before commencing work on a specified isolation, or electrical work which is required to be undertaken on live plant / parts, excluding the following:

- test to prove de-energised actions during isolations, or
- basic low voltage fault finding tasks that are undertaken prior to an isolation and corrective electrical works.

The relevant PBPL supervisor is to monitor the supplier/contractor's methods of work and the implementation of the proposed controls to ensure the company's standards are achieved.

Following electrical work or access activities that required a Permit to Work, the completed Permit to Work and risk assessment documentation are to be returned to the PBPL authorised person.

## 10 General Requirements

Licensed electrical workers are to maintain currency in aspects such as low voltage rescue from live switch gear and undertake refresher training/certification at prescribed periods. Non-compliance with electrical safety obligations may result in penalties under the Electrical Safety Act and ESOLA amendments. PBPL requires immediate corrective action for any identified breach.

# 11 Appendix 1: Exclusion Zone Details

**Exclusion zone:**

The exclusion zone for a person:

- (a) for an electrical part
- (b) for operating plant for an electrical part
- (c) for operating a vehicle for an electrical part

means the distance from the part stated for the person, plant, or vehicle in the following table.

When using the following table, the information listed below, applies:

- The definition of direct contact for a person, operating plant or a vehicle must be considered.
- Where operating plant is used without a safety observer or another safe system, the person (be they authorised or instructed) is to be taken as being an untrained person, unless:
  - the operating plant is fitted with a device capable of stopping the operation of the plant immediately when the plant is at the exclusion zone for an authorised/instructed person for the electrical part and checks are undertaken to ensure that this device is operating properly and set for at least the correct exclusion zone distances,
  - there is in place a safe system of work for the use of the operating plant, and this system provides for persons and property, the same or greater level of electrical safety than the level of electrical safety that could be provided with a safety observer, and
  - the safe system of work has been developed in consultation with persons who are broadly representative of industrial organisations of employees whose members commonly operate plant of the plant’s type.
- A vehicle does not include reference to an aircraft, or a vehicle that is operating plant.

Nominal phase to phase voltage (kV) (Exposed unless otherwise specified)	Untrained Persons (mm)			Instructed Persons (IP) & Authorised Persons (AP) (mm)								
	Untrained Persons	Operation of operating plant	Operation of vehicle	Instructed Persons (IP) & Authorised Persons (AP)	Operation of operating plant, with safety observer or another safe system		Operation of vehicle					
					Un-insulated	Insulated						
Insulated low voltage with consultation & insulation verified by AP	No contact	1000	300	Contact allowable	-	Contact allowable	No contact					
Low voltage (LV) with consultation	1000	3000	600	IP – no contact AP – insulated contact only	1000	Contact allowable	600					
Low voltage (LV) without consultation	3000											
>LV & up to 33 with consultation	2000											
>LV & up to 33 without consultation	3000							900	700	1200	700	700
>33 & up to 50								2100	750	1300	750	750
>50 & up to 66									1000	1400	1000	1000
>66 & up to 110										1200	1800	
>110 & up to 132	4500							6000	2900	1800	2400	1800
>132 & up to 220										3000	2300	3000
>220 & up to 275	6000							3400	3000		3700	3000
>275 & up to 330		8000	4400	3300	4000	3300						
>330 & up to 400	3900			4600	3900							
>400 & up to 500												
<b>Nominal Pole to Earth dc Voltage (kV)</b>												
+/- 25	3000	3000	900	700	1200	700	700					
+/- 85	3000			2100	1000	1800	1000	1000				
+/- 150	3000				1200		1200					
+/- 270	4500	6000	2900	1800	2400	1800						
+/- 350	5000			2500	3200	2500						
+/- 400	6000						2900	3600	1900			

## 12 Appendix 2: Testing and Inspection Intervals for Electrical Equipment

Category of Work	Portable Electrical Equipment	Fixed - Type 1 or 2 Safety Switch	Portable – Type 1 or 2 Safety Switch
Construction Work	<ul style="list-style-type: none"> <li>☑ At least 3 monthly intervals by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use the inbuilt test button at least monthly</li> <li>❖ An operating time / current test at least every 12 months by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use the inbuilt test button immediately after it is connected and immediately before it is used for the first time each day</li> <li>➤ By a competent person at least every 3 months</li> </ul>
Manufacturing Work	<ul style="list-style-type: none"> <li>☑ To be connected to a safety switch, <b>AND</b></li> <li>☑ If equipment is double insulated, at least every 12 months by a competent person</li> <li>☑ If not double insulated, at least every 6 months by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use the inbuilt test button at least every 6 months</li> <li>❖ An operating time / current test at least every 12 months by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use the inbuilt test button daily or before each use, whichever is longer</li> <li>➤ By a competent person at least every 12 months</li> </ul> <p><i>From 01/03/08, portable safety switches are not to be used in manufacturing work.</i></p>
Service Work	<ul style="list-style-type: none"> <li>☑ To be connected to a safety switch, <b>OR</b></li> <li>☑ At least every 12 months by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use the inbuilt test button at least every 6 months</li> <li>❖ An operating time / current test at least every 2 years by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use the inbuilt test button at least every 3 months or before each use, whichever is longer</li> <li>➤ An operating time / current test at least every 2 years by a competent person</li> </ul>
Office Work	<ul style="list-style-type: none"> <li>☑ To be connected to a safety switch, <b>OR</b></li> <li>☑ At least every 5 years by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use the inbuilt test button at least every 6 months</li> <li>❖ An operating time / current test at least every 2 years by a competent person</li> </ul>	<ul style="list-style-type: none"> <li>➤ Use the inbuilt test button at least every 3 months</li> <li>➤ An operating time / current test at least every 2 years by a competent person</li> </ul>
Amusement Work	<i>Not detailed here due to its applicability throughout PBPL operations.</i>		
Rural Industry Work	<i>Not detailed here due to its applicability throughout PBPL operations.</i>		

Construction work	Means construction work, or work done in conjunction with construction work, within the meaning of the <i>WH&amp;S Act, Section 14</i> , other than amusement work or rural industry work.
Manufacturing work	Means the work of assembly, disassembly, fabrication, installation, maintenance, manufacturing, refurbishment or repair, but does not include amusement work, construction work or rural industry work.
Service work	Means work that is not amusement work, construction work, manufacturing work, office work or rural industry work.
Office work	Means work conducted within an office environment.

## 13 Appendix 3: Maintenance and Testing of Electrical Tools and Protection Clothing

### 13.1 Testing Equipment

**All test instruments supplied, or used at PBPL workplaces are:**

- to be designed for and capable of correctly performing the required test,
- not expose users to a risk of electric shock during correct use,
- to be clearly and individually labelled with details of the last test date and next test date due, and
- to be in good working order, clean and have no cracked or broken insulation.

Calibration and testing frequencies and procedures are to be undertaken in accordance with manufacturer requirements for each type of testing device used.

Each PBPL workplace is to maintain a register or record of electrical testing devices that details at least the last test date and next test date due for each device.

### 13.2 Insulated Tools

**Insulated tools are to be of an approved electrically rated type, kept clean and regularly maintained and tested at intervals not less than six months.**

Where doubt exists about the insulation of a tool, it is not to be used until it is tested to ensure appropriate insulation.

Insulated tools are to be marked on the handle with the voltage rating and are to be rated to at least 1000 volts r.m.s.

Insulated tools are to be stored in cases that protect the insulation from being damaged, and prior to use, insulated tools are to be visually inspected for any sign of damage or deterioration of the insulation.

### 13.3 Insulated Mats, Covers and Barriers

- Insulated barriers are to be of a suitable material to effectively insulate and separate the user from adjacent energised equipment.

Insulating mats used with equipment rated at voltages less than 650 volts are to be used and tested in accordance with **AS/NZS 2978 – Insulating Mats for Electrical Purposes.**

Insulating mats are to be a minimum thickness of 6mm for general purpose use or 3mm for restricted use indoors on surfaces free from projections.

Insulating covers used with equipment rated at voltages less than 650 volts are to be used and tested in accordance with **AS 4202 – Insulating Covers for Electrical Purposes.**

Insulating covers are to be provided with a securing means to effectively prevent it dislodging from the protected area. The means by which it is secured is to be non-conductive and is not to reduce the mechanical strength of the cover.

**Prior to and after each use, insulating mats, covers, and barriers are to be visually inspected for the following defects:**

- blisters, cracks, cuts, and holes,
- embedded foreign matter, and
- defective fastenings.

Insulating mats, covers, and barriers are to be individually labelled or marked with a means of establishing the last test date and next test date due.

Insulating mats, covers, and barriers are to be washed and tested at intervals not less than six months.

### 13.4 Insulating Gloves

**People are to ensure insulating gloves comply with and are marked in accordance with AS 2225 – Insulating Gloves for Electrical Purposes.**

Insulating gloves are to be a minimum length of 360mm and are to be individually labelled or marked with a means of establishing the last test date and next test date due.

Immediately prior to use, insulating gloves are to be visually examined for any sign of damage or deterioration and for legibility of marking. Users are to stretch the gloves by hand to ensure the mechanical strength is adequate and then test the glove by rolling it from the cuff to force air into it.

Insulating gloves are to be washed and tested at intervals not less than six months.

Where gloves fail testing requirements or are identified as being damaged such that they would not provide adequate insulation, they are to be removed from service and discarded.

Insulating gloves are to be stored unfolded in clean containers and in a cool, dry place away from direct sunlight.

Insulating gloves are to be carried in a durable protective bag. Treated canvas is not to be used as it is detrimental to the insulation rubber of the gloves.

### 13.5 Face Shields & Goggles

**People are to wear eye protection in accordance with AS/NZS 1336 – Recommended Practices for Occupational Eye Protection.**

**Eye protection is to be worn when undertaking the following:**

- working on or within the safe approach distance to exposed conductors of live or de-energised overhead electrical apparatus
- conducting outdoor electrical work
- within the boundary of outdoor substations/electrical stations.

The following issues must also be considered and implemented as deemed appropriate:

- the use of lenses to assist in minimising the effects of arc and flash
- the use of suitable side shields to protect from flying fragments, particles, or radiation
- the use of face and eye protection when undertaking electrical work
- where there is an increased risk of eye and/or face injury.

Eye protection used during electrical related tasks is to be constructed of non-conductive materials.

### 13.6 Fire Retardant Clothing

**Fire retardant clothing worn for the performance of specific electrical activities is to:**

- be not inferior to 185 gsm 100% cotton drill,
- cover the whole body from neck to wrist to ankle,
- have non-metallic fasteners or fasteners that are protected by a layer of the same material as that of the garment on both the top and underside, and
- be laundered and used in accordance with manufacturer requirements.

Prior to use, clothing is to be visually inspected for signs of damage, deterioration, and areas where metallic fasteners may not be adequately covered.

### 13.7 Safety Helmet

**People are to wear safety helmets in accordance with *AS/NZS 1801 – Occupational Protective Helmets*.**

**Prior to use and at least 6 monthly, safety helmets are to be inspected for, but not limited to:**

- dents, cracks or other damage, discolouration, weathering, or loss of glaze,
- straps condition to ensure a secure fit, and
- modifications that could make the helmet weaker.

Where a safety helmet is identified with a defect or damaged to the extent that it can no longer afford adequate head protection, it is to be destroyed and replaced.

Safety helmets are to be cleaned regularly using warm water and soap.

Safety helmets are not to be stored in hot places such as on hot plant or vehicle dashboards.

Safety helmets in regular use for more than 3 years are to be thoroughly inspected for any damage or discolouration and replaced as deemed appropriate or as per manufacturer's recommendations.

### 13.8 Rescue Equipment

**Prior to the commencement of electrical work in the vicinity exposed parts or live work, the contents of rescue kits are to be checked to ensure they are in good condition and are suitable for the work situation.**

Prior to use, the due date for tests are to be checked to ensure currency.

On at least six-monthly intervals rescue kits are to be fully inspected and items are to be tested in accordance with manufacturer requirements.

Items that are defective or out of test date equipment are to be immediately removed, replaced by a compliant item, and tagged as faulty until repaired and/or tested by a competent person.

Specific low voltage rescue kits are to include, but not be limited to, the following:

- container
- insulated crook
- insulated gloves in a protective covering
- "Isolate Here in Emergency" sign
- fire blanket
- non-conductive torch
- burns dressing
- list of rescue kit contents.

Low voltage rescue containers are to be large enough to accommodate the required contents and be labelled in 60mm high writing "LV Rescue Kit".

Insulated crooks are to be type tested to withstand 5kV between the handle and hook and be constructed of such material as solid PVC or fibreglass rod of 25mm in diameter.

"Isolate Here in Emergency" signs are to be approximately 250mm x 150mm with 'Isolate Here in Emergency' printed in red in writing at least 40mm high. The signs are to be durable, and lettering is to be permanent.

Fire blankets are to be in accordance with **AS/NZS 3504 – Fire Blankets** and approximately 1800mm x 1200mm in size. If used, the fire blanket is to be replaced with a new blanket.

Burns dressings are to be on non-stick material and appropriately sized. If used, burns dressings are to be replaced with new dressings.

Low voltage rescue kit contents listings are to include the test dates and next test dates due for all applicable items.

## 14 Appendix 4: Safety Observer Requirements

For high-voltage live work, the safety observer must hold an electrical work licence. For low-voltage work, observer must be rescue/CPR competent (assessed within last 6 months)

Exclusion Zone Safety Observer	Low Voltage Safety Observer	High Voltage Safety Observer
<b>Should<sup>1</sup></b> be hazard and risk aware	<b>Must</b> be hazard and risk aware	<b>Must</b> be hazard and risk aware
<b>Should<sup>1</sup></b> be assigned to no other duties, other than as safety observer, to observe, warn and communicate	<b>Must</b> be assigned to no other duties, other than as safety observer, to observe, warn and communicate	<b>Must</b> be assigned to no other duties, other than as safety observer, to observe, warn and communicate
<b>Should<sup>1</sup></b> not observe more than one crane or plant at a time	<b>Should<sup>1</sup></b> not observe more than one crane or plant at a time	<b>Not a requirement</b>
<b>Should<sup>1</sup></b> not be positioned in an elevating work platform basket	<b>Should<sup>1</sup></b> not be positioned in an elevating work platform basket	<b>Must</b> maintain a suitable position to observe the work
<b>Should<sup>1</sup></b> be appropriately skilled in observing, warning, and communicating effectively; and should warn about: <ul style="list-style-type: none"> <li>• Approach to electrical apparatus</li> <li>• Unsafe conditions</li> </ul>	<b>Must</b> be appropriately skilled in observing, warning, and communicating effectively; and should warn about: <ul style="list-style-type: none"> <li>▪ Approach to electrical apparatus</li> <li>▪ Unsafe conditions</li> </ul>	<b>Must</b> be appropriately skilled in observing, warning, and communicating effectively; and must warn about: <ul style="list-style-type: none"> <li>▪ Potentially unsafe actions</li> <li>▪ Lack of compliance and approved work documentation</li> </ul>
<b>Should<sup>1</sup></b> be able to stop the work being performed	<b>Should<sup>1</sup></b> be able to stop the work being performed	<b>Must</b> be able to stop the work being performed
	<b>Must</b> be competent to help with the electrical work. The safety observer does not need to hold an electrical work licence or do the work themselves. To 'help' is to assist or facilitate the work being performed	<b>Must</b> be competent to help with the electrical work being performed. This means that the safety observer must be the holder of an electrical work licence
	<b>Must</b> be competent in isolation techniques where appropriate	<b>Not a requirement</b>
	<b>Must</b> provide assistance in emergencies and be competent to: <ul style="list-style-type: none"> <li>▪ Rescue the person performing the work</li> <li>▪ Provide resuscitation to the person performing the work (assessed in the last six months)</li> </ul>	<b>Must</b> provide assistance in emergencies and be competent to: <ul style="list-style-type: none"> <li>▪ Rescue the person performing the work</li> <li>▪ Provide resuscitation to the person performing the work (assessed in the last six months)</li> </ul>
<b>Notes:</b> <ol style="list-style-type: none"> <li>1. A reference to '<b>should</b>' is to something that is equivalent or better.</li> <li>2. In regard to electrical work, the difference between the level of skills and qualifications required by a <i>Safety Observer</i> directly correlates with the differing level of risk involved in each type of electrical work. These requirements are consistent with the relevant Australian Standard <i>AS4836 Safe Working on Low-Voltage Electrical Installations</i>. The level of skill and qualification of a <i>Safety Observer</i> may alter depending on the risks identified in the risk assessment for the work being performed.</li> </ol>		



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**Electrical Safety Procedure**

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