SAFE WORKING GUIDELINES
ELECTRICAL

1. Introduction

The objective of this procedure is to prevent the occurrence of injury and reduce the severity of injuries resulting from tasks being carried out in or around electrical being performed by employees and subcontractors of Proline Building Commercial Pty Ltd.

2. Purpose

The purpose of this document is to provide suitable information for the identification, assessment and control of hazards associated with electrical hazards.

3. Definitions

Competent Person	A person who has the necessary practical and theoretical skills, acquired through training, qualification, experience or a combination of these, to correctly and safely undertake the tasks.

4. Roles & Responsibilities

Project Managers/ Supervisors and Site Supervisor are responsible for the following:

- Identification, assessment, control and evaluation of electrical hazards;
- Ensure that users of electrical equipment are made aware of their responsibilities;
- Ensure that approved, suitably qualified / competent person/s carry out testing and tagging of equipment only;
- Ensure that records are kept and maintained on the status of electrical testing and tagging of equipment and to provide a monthly report to the OHS Manager.

Suitably Qualified / Competent Person/s carrying out testing & tagging are responsible for the following:

- Perform inspection, testing and tagging of the electrical equipment;
- Withdraw failed or faulty equipment from use;
- Maintain records of testing
- Refuse to undertake any electrical work/s outside their area of expertise;
- Inform the Project Manager/Supervisor or Site Supervisor of any electrical hazards found.

Other Employees / subcontractors are responsible for the following:

- Ensure they do not carry out works in where uncontrolled electrical hazards exist;
- Notify the Site Supervisor of electrical hazards / faults or maintenance requirements of equipment;
- Co-operate with Project Managers/Supervisors and Site Supervisor in implementing the electrical hazards management controls;
- Visually inspect all electrical equipment prior to use;
- Do not use double adapters or ‘piggy back’ plugs;
- Not withdraw a plug from a socket by pulling the cable

5. Procedure

Employees and subcontractors are responsible for developing an understanding of an becoming competent in the implementation of risk management principles and practices on site/s.

This is a four phase process:-
1. Risk Identification
2. Risk Assessment
3. Risk Control
4. Risk Evaluation

5.1 Risk Identification

Identification of risks associated with Electrical hazards should be undertaken by the following means:

- Consultation with employees / subcontractors
- Observation of work practices
- Inspections of the task and associated work areas
- Examine workplace injury records to assess what injuries have occurred to what tasks being carried out.

5.2 Risk Assessment

Identified hazards should then be prioritized according to the severity of injury, frequency of task and probability whilst performing the task. When assessing the risk, consideration will be given to:

- Occupation or job/task of the person exposed
- Work environment
- Duration and frequency

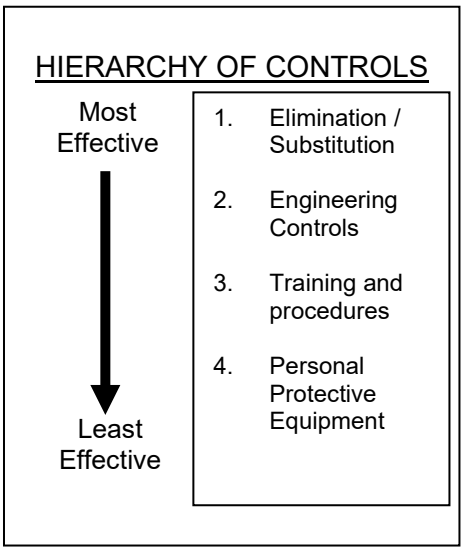
5.3 Risk Control

It is the responsibility of all employees and subcontractors involved in the electrical hazard management process ensure that they co-operate with control measures that are put in place by Proline. Risk Control is the means for minimizing or eliminates the identified risk and is carried out using the following heiarchary of control:

- *Eliminate the risk by ceasing the hazardous component or activity*
- *Substitute a less harmful alternative hazard substance or process*
- *Isolate the hazard at source using engineering means*
- *Introduce administrative controls to minimize exposure*
- *Use of Personal Protective Equipment*

Control options should include the following:

- Remove the electrical hazard or its source totally from the workplace (use of battery operated tools)
- Modify the workplace layout (use of leads stands)
- Use particular training or instruction



5.4 Risk Evaluation

It is important to evaluate the effectiveness of the control measures implemented, to ensure that they are effective and that they do not lead into the introduction of additional hazards within the work environment. An evaluation of control measures must be carried out by the Site Supervisor during the tasks Safe Work Method Statement Reviews.

6. Access to Electrical Switchboards / Temporary Boards

Access to Electrical Switchboards / Temporary Boards and resetting of circuit breakers is restricted (via a lockage box) to the Site Supervisor and/or licensed electrician on site only. Reports of tripped circuits and requests for resetting tripped circuits must be directed to the Site Supervisor.

6.1 Clearance in front of Switchboards

Switchboards should have at least 1 metre of clearance provided in front of the switchboard to allow clear unobstructed access.

6.2 Mounting of Switchboards

Attach switchboards security to a permanent wall, or a temporary structure that is secure and stable and that has been specifically designed for the purpose and meets the requirements of the local electricity network operator.

6.3 General Information on Switchboards

- Connected to incoming supply by a direct method.
- Switchboard protective cover or lid is providing and fitted with a locking device for security purposes.
- Isolating switch is provided that removes power from all outgoing circuits when it is in the open position. The isolating switch must be able to be locked or secured in the open position.
- Lockable cover is provided over circuit-breakers and RCDs associated with outgoing circuits but which does not prevent access to isolating switches.
- Labelling or signage
- Switchboards must be easily accessible and for multi-level construction, boards must be provided for each level in sufficient numbers and spacing to accommodate the works to be performed to minimise long runs of leads. Flexible cords must not be run between levels unless being used for work in stairwells and lift shafts and similar multi-level work.
- All switchboards must be fitted with at least one 15A single-phase 240 volt socket outlet.

6.4 Portable Distribution Power boards

The use of purpose built portable power distribution boards is permitted. The units are to be purpose built on a stable self supporting frame with a lockable access door, access for leads through the bottom of the box and tie rail for the leads with a main switch and Earth Leakage Circuit Breaker (ELCB). These boards are to be numbered, registered, certified by a licensed electrician on commissioning and following each move. Testing of the ELCB shall be recorded on Electrical Equipment Register QA008.

6.5 Distribution of Electrical Leads

In the distribution of electrical leads, observe the following practices:

- Place leads away from traffic areas to prevent them being run over and damaged
- Protect from acid damage

- Do not place or stack equipment or materials over electrical leads
- Leads must not exceed 25m in length
- Raise leads off the ground on stands with insulated hooks
- Conforms to:
    - AS/NZS 3012 electrical Installations – Construction and Demolition Sites
    - AS/NZS 3190 approval and test specifications – RCDs

6.6 Working in Substations

Proline does not carry out works in substations, in the event this was to occur, a risk assessment must be carried out with the Project Manager and licenced electrician prior to commencing works.

7. Testing & Tagging of Electrical Appliances

Prior to, or on arriving at site, all subcontractors must submit a register of their portable electrical leads, to ensure that all tagging and checking requirements as per the industry standard have been adhered to.

Prior to the electrical equipment being placed into service the electrical equipment must be made available for checking by the Proline Site Supervisor or designated Representative.

7.1 Frequency of Testing & Tagging

7.1.1: Periodic verification intervals (AS/NZS 3012: Electrical installations – construction and demolition sites)

Table 7.1.1: Inspection and testing intervals	
Equipment class	Testing intervals
Construction wiring, including switchboards	Inspected and tested at time of installation, then re-inspected every 6 months
Re-locatable structures, fixed and transportable equipment	6 months
Portable equipment and flexible electrical cords (extension leads)	3 months
Equipment in amenities and site offices	3 months
Portable RCDs – push button test	Before each use of equipment
Portable RCDs – operating time	3 months
Fixed RCDs – push button test	1 month
Fixed RCDs – operating time	12 months
Hire equipment	Upon introduction to service, then in accordance with the testing intervals appropriate to the equipment class.

As required by AS/NZS 3760 In-service safety inspection & testing of electrical equipment, the following table.

Testing & Inspection Intervals for Electrical Equipment

Type of Environment and/or equipment	Interval between inspections & tests				
	Class of Equipment		RCD's		Cord sets & power boards
	Class I (Protectively earthed)	Class II (Double Insulated)	Push Button test by user (Portable/Fixed)	Operating time & push button test (Portable / Fixed)	
Workshops, places of repairs, assembly maintenance or fabrication	6 months	12 months	3 months n/a	12months n/a	12months
Environment where the equipment or flexible supply cord is subject to flexing in normal use OR is open to abuse OR is in a hostile environment	12 months	12 months	3/6months	12/12months	12months
Environment where the equipment or supply chord is NOT subject to flexing in normal use and is NOT open to abuse and is NOT in a hostile environment	5 years	5 years	3/6months	2/2years	5 years
Equipment used for commercial cleaning	6 months	12 months	3months n/a	12months n/a	12months
Repaired, serviced & second hand equipment	After repair or service which could affect electrical safety, or on re-introduction to service				

7.2 Compliant Electrical Appliances

Electrical Equipment which are compliant, are to be fitted with an appropriate tag. The tag must include the identity of the person carrying out the testing, the date tested and the date due for retest.

7.3 Non Compliant Electrical Appliances

Electrical Equipment which are NOT compliant, are to be fitted with an appropriate 'Danger' tag, warning person/s of the possible hazard. The item is to be reported to the Project Manager / Supervisor and removed from site to ensure it can not be used again until rectified. Removal of the plug may be appropriate to ensure that equipment cannot be used. This should only be undertaken by a licensed Electrician or Competent person and when the equipment is unplugged from the power point and safe to do so.

7.4 Equipment Requiring Repair

Repair of any faulty electrical equipment shall be carried out by an authorized repair agent or suitably qualified electrician. The equipment must be re-tested prior to re-introduction to the site.

8. Temporary Power Certification

A Certificate of Compliance for Temporary Electrical Works is to be issued to certify that the temporary electrical wiring and equipment has been installed, inspected, tested and commissioned in accordance with relevant electrical safety legislation, AS 3008 – Electrical installations – Selection of Cables, AS/NZS 3017 Electrical Installations – Testing and Inspection Guidelines, AS/NZS 3000 Wiring Rules, AS/NZS 3012 Electrical Installations – Construction and Demolition Sites, and all other statutory requirements where applicable. This certificate is to be completed by

relevant electrical workers and submitted Proline Site management on the day of commissioning of the temporary electrical installation.

9. Residual Current Device

- AS/NZS 3012 Electrical Installations requires that a Residual Current Device (RCD) that complies with AS 3190 must protect each of the following:

    - Socket outlets including GPOs
    - Lighting circuits
    - Transportable hut
    - Welding equipment

- These units must be backed up for overload and short circuit protection by a circuit breaker of adequate capacity. Fuses are not permitted on final sub-circuits.

- Equipment may be connected to a permanent on site supply, but if this is done, portable RCDs must be used.

- For portable RCDs, the non-protected portion of flexible cord before the RCD must not exceed two metres.

- The terms “Residual Current Device”, “Earth Leakage Device” and “Safety Switch” refer to the same thing.

- To comply with AS/NZS 3012 Electrical Installations, generators not fitted with an Earth Leakage Device by the manufacturer should be provided with a portable Earth Leakage Device plugged into the power outlet on the generator. This will also require the installation of an earthing rod for effective function of the ELCB.

10. Guidelines – General Requirements

- The power supply must have one main switch that is easily accessible and protected from damage. It must be of robust construction and be situated as near as possible to work sites.
- Mains cables that run horizontally must be supported at intervals not exceeding three metres and at height not less than two metres above working platform level.
- Mains cables which run vertically must be supported at intervals not exceeding six metres with a special support at its uppermost point that is at least 12 times the diameter of the cable.
- All aerial wiring is to be insulated. Where possible, it should avoid crossing access ways, but if this is unavoidable, flagged catenary wires must be placed 0.6 metres lower than and six metres either side of the aerial conductors.
- Aerial wiring supported by catenary wire must be double insulated.
- Socket outlets on distribution boards must have a minimum rating of 10A and must be separately switched.
- Double adaptors, piggy-back units and domestic type multi-outlet devices are not permitted.
- Position and protect lighting so as to minimise accidental damage. Where possible it should be positioned at least 2.5m from floor level. Only factory moulded festoon lighting is to be used at 240 volts and a non-conducting guard must adequately protect the lamp.
- Transportable construction huts must be separately connected to the supply.
- Outlets within these units must not be used to supply power elsewhere on the construction site.

10.1 Lightning

The Site Manager will ensure suitable lighting is available when working on sites. The following would be standards below are set as a minimum.

Lighting, lift shafts, transportable structures

(Refer section 2.7 – 2.9 of AS/NZS 3012)

Lighting

- Where more than one lighting circuit is installed, the lighting circuits must be distributed between RCDs.
- The recommended minimum lighting level for walkways is 40 lx, and 160 lx[c] for general areas.
- Lamps in luminaires must be protected against mechanical damage.
- Sufficient lighting must be provided in locations including stairways, passageways and next to switchboards to allow safe access and exit – see clauses 40 and 43 of the WHS Regulation
- Section 2.7 of the Australian Standard AS/NZS 3012:2010, Electrical installation – Construction and demolition sites, provides guidance on lighting requirements. However, this guidance should be considered in conjunction with Section 18, 'what is reasonably practicable' of the WHS Act 2011. This includes consideration of the potential risks of individual locations, eg walkways without obstructions may not need as much lighting as stairways and walkways with obstructions.
- Edison screw type lamp holders must be connected to the supply with the neutral conductor connected to the outer contact.
- Festoon lighting must be connected to an Extra low Voltage power source (<50 V a.c). It must be suspended at a minimum height of 2.5m or above or directly below the ceiling.
- Portable luminaries (eg flood light tripods) must have a minimum degree of protection (refer to AS 60529), a mechanical guard on the lamp and adequate stability.

11. Overhead Power lines

When carrying out works in / underneath or around overhead power lines the following requirements are required to be carried out:

1. Check the distance, note power lines should be de-energised or grounded prior to use
2. Conduct a risk assessment and safe work method statement for the task being carried out – spotters should be included in this SWMS.
3. Refer to the Worksafe Overhead Power Lines Code of Practice – for further information regarding using plant / setting up scaffold and working near or around power lines.

3.2.1 Assessing the relevant approach distance

Prior to the start of any work near overhead power lines it is essential that the height and voltage of the overhead power lines (and if applicable the horizontal safety clearance) be assessed at the worksite. When assessing the relevant approach distances for the work a number of factors must be taken into account including,

- the possibility of errors in estimating distances, especially at higher voltages, where the approach distance is large. It may be necessary either to allow more clearance or to use methods that provide more accurate estimation of distances, for example, an ultrasonic cable height indicator, which provides a safe and accurate method of estimating distances near overhead power lines. If the height or voltage of the overhead power lines cannot be accurately determined consult the network operator.

WARNING

Do not attempt to directly measure the height of overhead power lines. Do not use conductive metallic objects or measuring devices such as metal tape measures for estimating the height of overhead power lines.

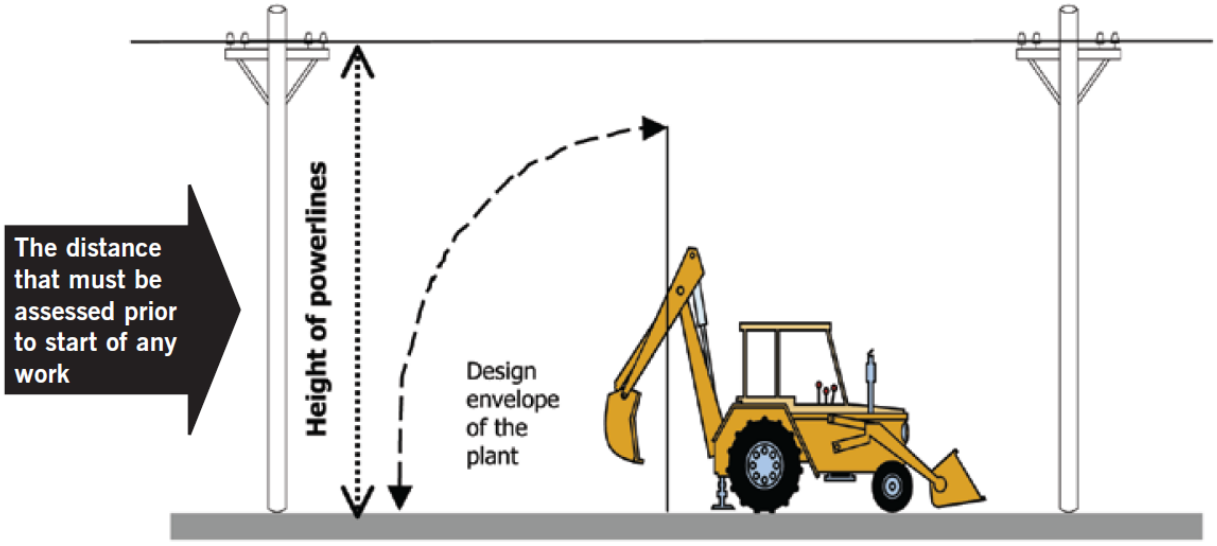


Figure 1: Distance that must be assessed for each worksite

3.3 Ordinary Person Zone

Table 1 provides approach distances for:

- ordinary persons performing work near overhead power lines, (including plant, hand tools, equipment or any other material held by a person); or
- cranes (and their loads) and items of mobile plant operated by an ordinary person near overhead power lines.

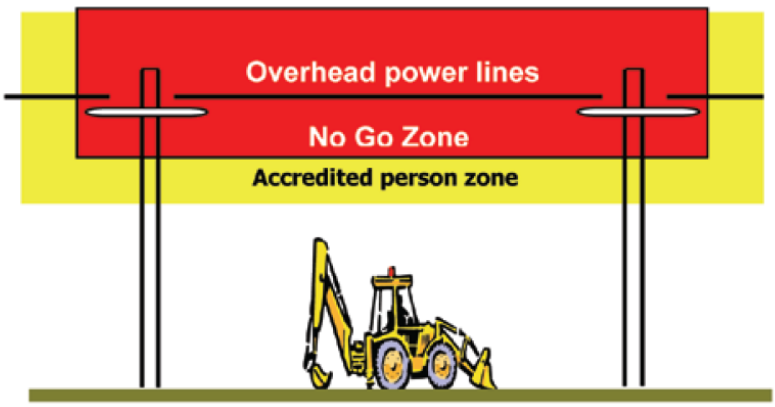
Note: Where a written risk assessment determines it necessary, the use of a safety observer should also be considered for work performed by ordinary persons working outside but up to the approach distances specified in Table 1. The duties of the safety observer are described in Section 3.8.

TABLE 1

Approach distances for work performed by Ordinary Persons

Nominal phase to phase a.c. voltage (volts)	**Approach distance (m)**
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
Nominal pole to earth d.c. voltage (volts)	**Approach distance (m)**
Up to and including +/- 1500 Volts	3.0

Note: Special approach distances apply for scaffolding work (Chapter 6) and work near low voltage overhead service lines (Chapter 8).



Mobile plant including cranes, excavators, EWPs, earth moving machinery, tipper trucks and concrete placing booms whose design envelope is within the approach distances specified in Table 1 must be controlled by safe systems of work as described in this chapter.

Figure 6: Cranes and mobile plant working near overhead power lines

12. Training

The Systems Manager will train employees during WHS EMS QA Seminars to ensure that employees can identify risky activities and receive appropriate training.

Project Manager/Supervisors should ensure Site Supervisor train employees / subcontractors in identifying, assessing and controlling risks during Safe Work Method Statement training for any electrical hazard related type work activities. Site Supervisor should ensure the person/s being trained understand the reason for performing the task with the least amount of risk, can recognise the risks and decide the most appropriate method to complete the task and can perform the task in the correct way.

COMPETENT PERSON/S

AS/NZS 3760 states the inspection and testing of electrical equipment should be carried out by a Competent Person. Therefore testing can only be carried out by a qualified electrician or any other person who has been trained in the use of a portable appliance tester. Training for Portable Appliance Testing is carried out through the Master Builders Association. It should be noted Competent Person/s can only test and tag electrical items only, and not perform any electrical works.

13. Review & Evaluation

In order to ensure this procedure remains effective, it will be reviewed by Senior Management on an annual basis or in the event of an injury or near miss resulting from any electrical activity, changes in legislation or if raised by an employees concern.

14. References / Legislation

- Work Health & Safety Act 2011
- Work Health & Safety Regulation 2017
- AS/NZS 3760 In-service safety inspection & testing of electrical equipment
- AS/NZS 3017 Electrical Installations – Testing and Inspection Guidelines
- AS/NZS 3000 Wiring Rules
- AS/NZS 3012 Electrical Installations – Construction and Demolition Sites
- AS/NZS 3190 Approval and test specification - Residual current devices
- AS 3008 – Electrical installations – Selection of Cables
- Overhead Power Lines Code of Practice

15. Version Control

Date	Version	Owner	Comments
12.03.09	1	Michelle Noy	For Issue
14.02.11	2	Michelle Murphy	Inclusion of Switchboards
11.11.11	3	Michelle Murphy	Following External 3rd Party Audit
18.04.12	4	Michelle Murphy	Changes in legislation
05.06.15	5	Michelle Murphy	Following Management Review
11.08.17	6	Michelle Murphy	Update as per Avetta Requirement
24.08.17	7	Michelle Murphy	Update as per Avetta Requirement
01.06.18	8	Michelle Murphy	Changes in legislation
01.12.23	9	Michelle Murphy	General Revision

Energy Control Procedures & Lockout / Tag out Program

This form is used to identify lockout/tagout procedures involved when servicing / maintaining the equipment / machine listed below.

Equipment/Machine Name: _____ Location: _____

Authorised Employees:

_____

Affected Employees:

_____

Service/Maintenance Activities Requiring Lockout/Tagout:

_____

Procedure (Circle): Lockout Tagout

Energy Type (Circle): Steam Natural Gas Moving Parts Chemicals Electric Power
Water Pneumatic Compressed Air Hydraulic Other: _____

Lockout Device (Circle): Switch Valve Block Chain Hasp Other: _____

Energy Release Method (Circle): Ground Dissipate Drain Restrain Other: _____

Lockout/Tagout Checklist

1. Complete an Energy Control Procedure form	☐	7. Reduce equipment to a zero energy state	☐
2. Identify all Energy Sources	☐	8. Verify equipment isolation	☐
3. Notify all Affected Employees	☐	9. Perform task	☐
4. Shut down the equipment	☐	10. Remove lockout/tagout device, notify employees	☐
5. Isolate equipment	☐	11. Return equipment to service	☐
6. Apply lockout / tagout devices	☐		

Proline Building Commercial Pty Ltd

Lockout / Tag out Record

Hazard	Action Required	Lock #	Name	Locks / Tags on	Locks / Tags Off