



ELECTRICAL SAFETY ON CONSTRUCTION AND DEMOLITION SITES

Background

There is some confusion about the standard, maintenance, and testing of appliances and equipment on construction and demolition sites.

Because of the short-term nature of these sites, the electrical equipment used is often sourced from multiple locations, or multiple contractors. It can be difficult to ensure that they have been appropriately maintained and tested prior to their use on the site.

How the HSE Act 1992 applies

Section 6(c) of the HSE Act 1992 requires that employers ensure that plant (which by definition includes appliances, equipment, machines, tools and electric power cords) "is so arranged, designed, made, and maintained that it is safe for the employee to use."

In actual practice there are many aspects to "taking all practicable steps", and it may not be covered adequately by testing. For example, low quality equipment will significantly lift the risk profile. In the case of low quality heat guns, there could be an increased risk of fire.

Regulation 25 and the AS/NZS Standards

Regulation 25 of the Electricity (Safety) Regulations requires that installations, fittings and appliances used at construction sites are "electrically safe" if they meet the requirements of AS/NZS 3012.

AS/NZS 3012 has the context of temporary electrical installations for the purpose of the 'construction and demolition work', as distinct from a permanently installed 'electrical installation' and the electrical installation covered by AS/NZS 3012 would typically be removed at the completion of the work. Note that this includes the supplies from a permanent installation which are used for the construction and demolition work. By inference, the appliances and equipment that are connected to these temporary installations are covered by AS/NZS 3012, and therefore the requirement for three-monthly testing applies.

General Electrical Safety

Hazard Assessments

- Electrical hazards should be taken into account at the time of every worksite hazard assessment being done, and appropriate controls put in place to manage them.
- Conduct daily visual inspections to ensure no new hazards have arisen.

Work Area

- Work areas should be free of flammable/combustible materials.
- Provide easily accessible storage.
- Ensure that there is effective drainage so that any excess water, used as a coolant or dust suppressant, can be safely dispersed.
- Wherever possible work should be performed on a dry, insulated floor. Wooden platforms, rubber mats, or dry areas provide extra protection, especially in confined spaces.

Electrical Supply

- Ensure a supply isolated from earth with a voltage between phase and earth conductors not exceeding 230 volts.
- Servicing and installation must only be undertaken by a qualified person authorised to carry out the work.
- Never tamper with electrical supply circuits or systems.

Sockets and Plugs

- Provide enough socket outlets - overloading socket outlets by using adaptors can cause fires.
- Ensure all connections to power points are made by correct plugs.
- Double adaptors and 'piggy back plugs' should not be used.

Switching on and off

- Tools and power socket outlets should be switched off before plugging in or unplugging.
- Provide an accessible and clearly identified switch near each fixed machine to cut off power in emergency.
- For portable equipment, use socket outlets which are close by so that equipment can be easily disconnected in an emergency.

Lightbulbs

- Check the wattage of all bulbs in light fixtures and lamps to make sure they are the correct wattage.
- Replace bulbs that have a higher wattage than recommended to prevent overheating that could lead to a fire.
- Protect lightbulbs and other equipment which could easily be damaged in use.
- There is a risk of electric shock if they are broken.



Personal wellbeing

- Workers should stop work and rest if they have signs of mental fatigue. Signs include changes in perception (i.e, objects appear larger or smaller than they are), slowing down of normal pace of work, irregular timing and disorganisation.
- Power tools should not be operated under the influence of alcohol or drugs. Even prescription drugs can affect the senses and cause drowsiness.

Temporary supply switchboards

Boards must be checked and certified by a qualified person authorised to carry out the work (using an ELCB Tester to test circuit breakers). A certificate tag must be attached stating the date of last inspection and when the next is due.

Temporary supply switchboards should be readily accessible, and attached to a permanent wall or a permanent structure that has been designed for the purpose. Pole- or post-mounted temporary supply switchboards should be fixed by means of coach screws or bolts. Where installed in outdoor locations, boards should be constructed so that safe operation is not impaired by the weather. All boards should be protected from damage throughout the course of the work.

Incorporate a stand for the support of cables and flexible extension cords. Doors should be designed and attached in a manner that will not damage any flexible cord connected to the board and should protect the switches from mechanical damage. Ensure that the door and locking facility are acceptable to the electrical supply authority. Have an insulated slot in the bottom for the passage of leads. Boards must be fitted with isolating transformers or with earth leakage devices. Check to see that fuse links or circuit breakers are the correct size for the circuit. Replacing a correct size fuse with a larger size fuse can present a serious fire hazard.

Electrical Equipment

All electrical tools and equipment should be inspected prior to their first use by a competent person and thereafter at three monthly intervals.

- All tools and equipment should have an identification tag stating date of last inspection and when next inspection is due.
- Ensure quick inspection of tools is made prior to use.
- Take out of service when faults/damage is detected – don't wait for the tagging and testing period to elapse; label it 'DO NOT USE' and keep it secure until examined by a competent person.

Choose equipment that is suitable for its working environment and for the tasks performed. Electrical risks can sometimes be eliminated by using air, hydraulic or hand-powered tools. Electrical equipment used in flammable/explosive atmospheres should be designed to stop it from causing ignition.

- Ensure that there is provision for all equipment to be stored carefully, securely and safely.
- Equipment should be switched off and/or unplugged before cleaning or making adjustments.
- All power tools should have a safety control switch which operates the motor only when the switch is held in the on position by the operator and which is located on the tool so as to be readily operated by the person using the machine.
- Ensure those workers using equipment are trained and competent in its use.
- Don't drop or misuse equipment and keep it equipment clean and dry.

A tradesman's cords, appliances and equipment taken from their workshop to a construction or demolition site have to comply with AS/NZS 3012, but a plumber, or other tradesman, may take their electrical tools and equipment from one construction or demolition site to another without additional tests to the 3 monthly tests.

Electrical cords

Extension cords should be inspected regularly by a competent person.

- A certificate tag must be attached stating the date of last inspection and when the next is due.
- Check for damaged insulation and plugs before every use.
- Damaged or worn cords should be replaced immediately.
- The ends of flexible cables should always have the outlet sheath of the cable firmly clamped to stop the wires (particularly the earth) pulling out of the terminals.
- Always pull out by plug not extension cord.
- Put cords away once you have finished with them.
- Extension cords should not be used while wound around storage reels or on retractable reels. This increases the electrical resistance in the cord which can lead to overheating and subsequent fire.
- The cord should always be fully extended.
- Keep power cords away from mechanical forces, liquids, sharp objects, oil, grease and heat.
- Where possible, cords should not cross aisles or passageways where they can cause trip hazards or be cut through.



Residual current devices

Electrical extension cords connected to power tools require the use of a Residual Current Device (RCD) or Isolating Transformer. Appliances and equipment supplied by RCDs must be tested and tagged, as well as the RCD itself.

A permanently fitted RCD in a permanent installation (such as a power point in a shed, office or adjacent room in a house) does not require testing (as per AS/NZS 3012) other than the six-monthly “push the button” test provided that:

- the permanent installation must meet the requirements of AS/NZS 3000
- any construction or demolition equipment and appliances feed from this supply are required to comply with AS/NZS 3012.

If the RCD trips, it is a sign of a fault. Check the system before using it again.

Pushbutton tests should be conducted after connection to a socket or before connection of equipment, and at least once every day in use. Workers should know how to test any portable RCD they are about to use and tests should be carried out before using the equipment. If they are not working properly, withdraw from use immediately.

Examples of equipment intended to be protected by a RCD include:

- Hand held electric power tools, such as drills, saws and similar equipment.
- Tools such as jack-hammers, electric lawn mowers.
- Equipment on construction sites.
- Equipment such as appliances which move while in operation, such as vacuum cleaners and floor polishers.
- Cord extension leads.

Testing and Tagging

Testing and tagging is not “the end in itself”. It is a means of ensuring that the equipment is safe and it is vital as it can detect faults that will not be apparent from visual inspection alone. The required frequency of testing and tagging is three months.

Equipment and appliances are only tested and tagged on one day and reflect their state on that day. It is up to the user to check (both visually for damage & the periodic pushbutton tests required by AS/NZS 3012) that the appliance is in good condition between tests.

Note: all values of “competent” and “qualified” are according to AS 3012:2010.

