

Guidelines

Electrical Installations and Electrical Equipment at Public Events

Scope

This document aims to provide guidance on key electrical safety and compliance issues for electricity supplies to and including electrical equipment to be used at events such as exhibitions, shows, carnivals etc.

This document is not intended to replace the relevant Australian Standards. Compliance with this document does not ensure compliance with all aspects of the relevant standards.

The information and checklists that form part of this guideline aim to eliminate the more common electrical installation and equipment issues that arise at public events.

Relevant standards

Events such as exhibitions, shows, carnivals etc. have electrical 'Standards' that are relevant for the installation and use of electrical equipment. These include but are not limited to the 'Standards' listed below:

- AS/NZS 3000:2007 - Wiring Rules.
- AS/NZS 3001:2008 - Electrical Installations – Transportable structures and vehicles including their site supplies.
- AS/NZS 3002:2008 - Electrical Installations – Shows and carnivals.
- AS/NZS 3010:2005 - Generating sets.
- AS/NZS 3760:2010 - In-Service safety inspection and testing of electrical equipment.

Fixed wiring

All fixed wiring is to be performed by Victorian Licensed Electricians to comply with the Electrical Safety Act 1998 and Electrical Safety (Installations) Regulations 2009. The Act also requires all Electricians to complete Certificates of Electrical Safety (COES) for all work they carry out. These COES's should be available at the event site for inspection by Energy Safe Victoria (ESV).

To assist the event organisers and electricians to comply with the relevant standards for the electrical installation work being carried out at event sites, ESV has assembled the checklists below.

Electricians should be completing and keeping these checklists with the equipment being installed to verify the requirements with the relevant standards and eliminate the more common non compliances at the time of installation. See checklists for:

- Event switchboards.
- Portable buildings (Transportable structures) – Connected by fixed wiring.
- Portable buildings (Transportable structures) – Connected by plug and socket.

Portable electrical equipment

To assist the event organisers and proprietors to comply with the relevant standards for the electrical equipment to be used at event sites, ESV has assembled the following information about the requirements of and the use of the electrical equipment below:

- Testing and tagging.
- Use of extension cord sets (Leads).
- Checklist for connection of portable buildings (Transportable structures) – Connected by plug and socket.

Testing and tagging

AS/NZS 3760:2010 In-Service safety inspection and testing of electrical equipment apply to equipment in-service at a place of work or public place, or offered for hire.

In-service testing is a necessary part of any safety program to help ensure the safety of the public and persons within stalls and concessions using electrical equipment. AS/NZS 3760:2010 specifies in-service safety inspection and testing protocols and criteria that satisfy these obligations using a defined methodology of inspection and testing.

The required inspection / testing frequencies in AS/NZS 3760:2010 provide for electrical equipment to be tested at maximum intervals of 12 months. This is appropriate for stall & concession owned equipment that is not subject to a hostile environment.

Where equipment is exposed to a hostile environment, greater frequency of inspection shall be completed e.g. 3 month intervals. Hired equipment is required to be inspected prior to each hire and tagged at maximum intervals of 3 months.

Event organisers may specify shorter testing intervals via site rules or contractual requirements.

Event organisers should ensure equipment log books recording the testing of all appliances associated with a particular stall or concession are held by the stall or concession operators and will be available for view within that stall or concession.

Items that should be inspected and tested would include but not be limited to the following items connected by plug and socket:

- Portable or stationary appliances.
- Extension cord sets.
- Electrical portable outlet devices (EPODS).
- Portable tools and equipment.

Use of extension cord sets (Electrical extension leads)

The use of extension cord sets should be limited by the installation of fixed wiring and socket outlets installed in the vicinity of the intended point of use.

In all cases, where extension cords are to be used:

- Extension cords should be selected for the environment in which they are to be used. eg. Plugs and sockets suitably IP rated where susceptible to weather.
- Extension cords must be positioned / installed so not to obstruct persons or to be damaged.
- All extension cords shall have adequate mechanical protection and supported.

- The length of the extension cords shall be limited to the maximum total lengths as specified in AS/NZS 3002:2008 Table 4.1 as below:

TABLE 4.1
MAXIMUM LENGTHS OF FLEXIBLE CORD

1	2	3	4
Cord extension set rating	Conductor area	Maximum length of flexible cord	
		General use	For equipment with high starting currents that may affect the safe operation of equipment
(A)	(mm ²)	(m)	(m)
10	1.0	25	15
	1.5	35	25
	2.5	60	40
	4.0	100	60
15/16	1.5	25	15
	2.5	40	25
	4.0	65	45
20	2.5	30	20
	4.0	50	30

NOTES:

- 1 The lengths as specified above allow some certainty to designers when planning site layouts. In some applications shorter leads may be required.
- 2 Lengths quoted for flexible cords in Column 3 are taken from AS/NZS 3199 and are based on a 5% voltage drop at the rated current for each cross-sectional area
- 3 Examples of equipment covered by Column 4 are trailing cables for suspended scaffolds, swing stage and false cars or large motors in all locations.

Cord extension sets shall not be joined to form a circuit with a total length that exceeds the relevant maximum value specified in Table 4.1.

NOTE: It is recommended that, where the use of a cord extension set is required, a single cord extension set with no intermediate joins is used. Where such joins cannot be avoided, they should be made using detachable connection devices providing an appropriate IP rating for the degree of exposure.

Cord extension sets should not be used while in coiled or reeled configuration.

Extension cord sets that are not acceptable include:

- Mismatched plugs and sockets on leads (e.g. 10 amp plug 15 amp socket).
- 'Orange circular' cable used for extension cord (lead).
- Extension leads plugged end on end that exceed the maximum allowable lengths.

Outlet boxes

'Outlet boxes' are required to comply with AS/NZS 3100 and when intended to be used at shows and carnivals must meet the requirements of clause 4.4 of AS/NZS 3002.

The construction of the outlet box is required to be durable, providing a degree of protection of IPX4.

The maximum loading in watts or amps is to be legibly and indelibly marked on the outlet box in a conspicuous position with the total output from the outlet box to be limited by over-current and 30mA residual current (RCD) protective device(s) that operate in all live (active and neutral) conductors to limit the current to be carried by the supply lead or appliance inlet as applicable.

Electrical portable outlet devices

All EPODS (often referred to as power-boards) are required to comply with AS/NZS 3105 and when used at events must:

- Only be installed to provide power supply to consuming devices within a single stall or concession and directly via a supply lead or appliance lead.
- EPODS shall not be connected to a socket outlet located on another EPOD (EPODS are not to be cascaded).
- Where EPODS are in use, they are to be adequately supported by a rigid section of the concession structure and shall not be laid on the ground.

Electricity supply via generating sets

Generator sets that supply permanent low-voltage installations and/or any electrical equipment by means of direct connection (Not a plug and socket at both ends) shall be connected by a Licensed Electrician and certified on a Prescribed Certificate of Electrical Safety as required by the Act. The use of Generator Sets shall comply with the appropriate Standards including AS/NZS 3010. This includes:

- Location of the generator set.
- Access around the generator set.
- Means and location of isolation.
- Adequate location/protection of cables.

CHECKLIST FOR CONNECTION OF EVENT SWITCHBOARDS		
Switchboard Number / Identity:COES No:		
Switchboard Location:		
CHECKED	YES	NO
LOCATION		
Switchboard <i>is</i> stable when free standing or adequately secured if fixed.		
Switchboard <i>is</i> suitably International Protection (IP) rated for its location (minimum IPX3 rated).		
Switchboard <i>is</i> readily accessible – e.g. provided with at least 1 metre clear access.		
IDENTIFICATION AND LABELLING		
The switchboard is identified by unique & distinguishing letters / numbers (where there is more than one switchboard on site).		
All circuit protection devices are marked to identify the equipment they control.		
SWITCHBOARD CONSTRUCTION AND CONDITION		
Switchboard components have adequate mechanical protection for its environment.		
All pole fillers and fuses in place (e.g. blanks – no access to live parts).		
Switchboard doors/lids are lockable and include a facility for retaining in the open position.		
The switchboard is fitted with a non conductive tie rail for flexible cords (if it incorporates socket outlets).		
Switchboard is constructed to prevent damage to flexible cords entering or leaving the enclosure.		
PROTECTION AND CONTROL		
All electrical equipment within the switchboard is located no higher than 2 meters.		
Every connection facility is controlled by its own isolating switch mounted on or adjacent to it.		
All socket outlets are protected by a RCD (safety switch) with a rating not exceeding 30 mA.		
SOCKET OUTLETS		
All socket outlets are appropriately rated (e.g. 15 amp outlets provided for 15 amp leads).		
All socket outlets have a control switch or are a switched outlet.		
All socket outlets are secured and maintain IP rating.		

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CHECKLIST FOR CONNECTION OF PORTABLE BUILDINGS (TRANSPORTABLE STRUCTURES) – CONNECTED BY FIXED WIRING		
Building Number: Building Location:		
Building Owner / Contact Person: Phone:		
CHECKED	YES	NO
GENERAL CONDITION		
All electrical equipment secured and undamaged.		
Testing and Tagging of equipment within the transportable structure is in-date.		
Electrical equipment log book is available for view in transportable structure.		
SUPPLY		
Overhead Ariel supply cable height is not less than 4.6 meters above the ground and minimum 6 meters above the ground in areas with vehicular traffic.		
Connection box is in good condition – International protection (IP) rating is maintained.		
SWITCHBOARD		
Isolating switch is located no higher than 2 meters.		
All pole fillers in place (e.g. circuit breaker blanks – no access to live parts).		
Protective devices are double pole switched.		
Every final sub-circuit is protected by an RCD (safety switch) rated at not greater than 30 mA.		
SOCKET OUTLETS		
All socket outlets are secured and maintain IP rating.		
All socket outlets have adjacent control switch.		
All socket outlets are double pole switched (Test required).		
LIGHTING		
All light switches are double pole switched (Test required).		
All lighting is secured.		

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CHECKLIST FOR CONNECTION OF PORTABLE BUILDINGS (TRANSPORTABLE STRUCTURES) – CONNECTED BY PLUG & SOCKET		
Building Number: Building Location:		
Building Owner / Contact Person: Phone:		
CHECKED	YES	NO
GENERAL CONDITION		
All electrical equipment is secured and undamaged.		
Testing and tagging of equipment is in-date.		
Electrical equipment log book is available for view in transportable structure		
SUPPLY		
Socket inlet is rated not less than International Protection (IP) rating IPX4.		
The supply lead is of the correct IP rating for the conditions.		
The supply lead does not exceed the maximum length for its size and current rating.		
The supply lead does not obstruct persons walking in the vicinity.		
The supply lead is not subject to mechanical damage.		
SWITCHBOARD		
Isolating switch is located no higher than 2 meters.		
All pole fillers are in place (e.g. circuit breaker blanks – no access to live parts).		
Protective devices are double pole switched.		
Every final sub-circuit is protected by an RCD (safety switch) not greater than 30 mA.		
SOCKET OUTLETS		
All socket outlets are secured and maintain IP rating.		
All socket outlets have a control switch which is double pole switched.		
All socket outlets are identified with supplying circuit breaker No.		
LIGHTING		
All light switches are double pole switched (Test required).		
All lighting is secured.		

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