

PART R62**MAINS POWER FOR TRAFFIC MANAGEMENT EQUIPMENT****CONTENTS**

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1. GENERAL

This Part specifies the requirements for the supply and installation of low voltage (LV) mains power for ITS and Traffic Management Equipment (including Outstations and traffic signal controllers). Refer to Part R52 "Installation of Lighting" the requirements for power supply for road lighting.

The mains power supply includes Consumer's Mains, Submains (where applicable), switchboard electrics, switchboard enclosure, associated pit and ducts, and any other works necessary to meet the functional requirements.

All electrical installations must be carried out by an electrical worker who is licensed to perform any electrical works and must comply with AS 3000, the Electrical Legislation and the Service Rules and Conditions of Supply of SA Power Networks.

Documents referenced in this Part are listed below:

AS 3000	Electrical Installations (also referred to as the "Wiring Rules")
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The following definitions apply to this Part:

Connected Load	Sum of maximum running loads for all electrical Equipment, including devices connected via socket outlet
Electrical Legislation	Electricity Act 1994 and associated Amendments and Regulations and Electrical Safety Act 2002 and associated Amendments, Regulations and Codes of Practice
Outstation	an enclosure associated with an ITS or electrical/electronic device
Installation	Switchboard, enclosure, earthing, and all cabling including consumer's mains
Switchboard Enclosure	The switchboard mounting chassis
Switchboard	The entire functional unit, including electrical components and switchboard enclosure
ELV	Extra-low voltage: Not exceeding 50 V a.c. or 120 V ripple-free d.c.*
LV	Low voltage: Exceeding extra-low voltage, but not exceeding 1,000 V a.c. or 1,500 V d.c.*
HV	High voltage: Exceeding low voltage.*

* from AS 3000

2. QUALITY REQUIREMENTS

Prior to the commencement of this work, the Contractor must provide:

- (a) a statement of currency of all electrical workers licences for all electricians working on the contract;
- (b) the proposed cable sizes and details of any proposed switchboard(s)
- (c) details of any planned disruptions to supply to existing connected loads; and
- (d) a copy of the calculations showing current carrying capacity, voltage drop and fault loop impedance.

If not submitted beforehand, the documentation required by this Clause must be submitted at least 28 days prior to the commencement of site work.

Provision of this documentation shall constitute a **HOLD POINT**.

3. **SCOPE**

The Contractor must:

- (a) where an existing mains power supply is unavailable or unsuitable for alteration, provide a new protected mains power supply;
- (b) where an existing protected mains power supply is available and suitable for alteration, perform alterations as necessary for the change in supply and/or connected load, including all Equipment and cabling that is entirely contained within the switchboard enclosure;
- (c) where necessary, disconnect, remove and/or relocate and reconnect existing switchboards;
- (d) where necessary, provide protected Consumer's Mains and / or submains to existing, replacement and new switchboards, including those in outstations and traffic signal controllers;
- (e) where required to complete the mains power supply, provide pits, poles, ducts, footings and any other necessary materials, Equipment and works;
- (f) connect new/replacement switchboards to the point of supply;
- (g) unless specified otherwise, act as the Principal's agent concerning all aspects relating to the electricity supply;
- (h) carry out all design, documentation, supply, installation, disconnection, removal, relocation, connection, testing and commissioning of the abovementioned works; and
- (i) Provide all Electrical Certificates of Compliance in accordance with AS3000.

The following is excluded from the scope of this Part

- (a) supply and installation of switchboards that are integral to either outstations or traffic signal controllers; and
- (b) provision of a non-mains electricity supply and associated auto changeover Equipment and / or control system.

4. **OPERATIONAL REQUIREMENTS**

4.1 **General**

Unless otherwise specified, field Equipment and other electrical installations must be powered by an un-metered, LV AC mains power supply. The mains power supply must only be metered when consistent daily power consumption cannot be reliably predicted (for example: buildings, mechanical plant), or when otherwise directed by SA Power Networks.

The mains power supply must meet the power consumption requirements of each individual installation. The switchboard must protect supplied loads from transients and harmonics as may be expected when connected to a mains electricity supply.

Persons must be protected from all points/surfaces at greater than ELV potential within the enclosure. Wherever possible, the switchboard must maintain uninterrupted electricity supply while being serviced.

Unless otherwise specified and/or required by SA Power Networks, energy consumption for un-metered installations must be based on the connected load.

4.2 **Mains Power**

The mains power supply design must be in accordance with AS 3000.

4.3 **Transient Suppression**

Surge suppression must be provided on the load-side of the main switch. The suppression device must be designed to withstand a minimum of three (3) surge events. It must display health status locally via integral indicators.

4.4 **Automatic Change-over Switch**

This Clause only applies if the installation of a secondary power source has been specified.

An automatic change-over switch must be provided on the load side of the main switch. Upon detection of mains power failure, the change-over switch must automatically switch to the alternate power source. Upon detection of stable mains power restoration in excess of one continuous minute, the change-over switch must automatically switch

back to mains power. The change-over switch must provide display status locally via integral indicators and provide volt-free contacts for remote indication.

5. INSTALLATION REQUIREMENTS

5.1 General

Wherever practicable, existing power supplies must remain operational throughout the carrying out of the work under the Contract. If disruption to an existing power supply is unavoidable, the Contractor must give 7 days written notice of the intention to disrupt an existing supply.

Provision of this notice shall constitute a **HOLD POINT**.

The use of un-metered switchboards as a source of power for temporary works during construction is permitted where approved in writing by SA Power Networks. Where the switchboard is installed in the field on pre-cast plinths and as otherwise necessary, the Contractor must provide a dedicated earthing system in accordance with AS 3000.

5.2 Contact with SA Power Networks

If the Principal has made arrangements for supply point locations, the locations will be shown on the Drawings. The Contractor must confirm the position of the supply points before installing conduit runs to these points.

Unless specified otherwise, the Contractor must make applications for supply, on behalf of, and in the name of, the Principal. The Principal's relevant customer details will be provided to the Contractor. The Principal will sign all correctly completed forms prepared by the Contractor as required by SA Power Networks. The Contractor must advise SA Power Networks of changes to connected loads and provide a copy of the advice to the Principal.

If the Contractor is to arrange supply points, the Contractor must complete an SA Power Networks Form. At least 7 days prior to contacting SA Power Networks, the Contractor must provide the following documentation as a minimum:

- (a) a completed copy of any documents and supporting information the Contractor intends to forward to SA Power Networks; and
- (b) calculations to determine the prospective unfused fault current, connected load and maximum demand at the line side of the main switch.

Provision of the documentation shall constitute a **HOLD POINT**.

The Contractor must not proceed with the works until receipt of written authorisation from SA Power Networks.

5.3 Inspection

The Contractor must apply for the SA Power Networks connection test, arrange for Certificates of Compliance in accordance with the Electricity Act and submit copies of the certificates. Any fees for connections must be paid by the Contractor.

6. ACCEPTANCE TEST REQUIREMENTS

In addition to any acceptance testing specified elsewhere in this Contract, the Contractor must undertake the following tests:

- (a) thermal (infrared) image scan of the switchboard under maximum anticipated load conditions;
- (b) where a secondary power supply is used, reliable changeover between mains and alternate power source(s) and back to mains.

All "hot" joints identified on the thermal image scan must be rectified and retested.

7. HOLD POINTS

The following is a summary of Hold Points referenced in this Part:

CLAUSE REF.	HOLD POINT	RESPONSE TIME
2	Quality documentation	7 days
5.1	Notice to disrupt supply	7 days
5.2	Documentation to be forwarded to SA Power Networks	2 days

8. VERIFICATION REQUIREMENTS AND RECORDS

The following is a summary of records to be supplied by the Contractor to demonstrate compliance with this Part:

CLAUSE REF	RECORD
2	Statement of the electrical workers licence
2	Details of proposed cable sizes and switchboard details
2	Details of any planned disruptions
2	Calculations
5.3	SA Power Networks Connection Test and Electrical Certificates of Compliance
6	Acceptance Test records