

PART R62
MAINS POWER FOR TRAFFIC MANAGEMENT EQUIPMENT

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1. GENERAL

- .1 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.
- .2 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.
- .3 All electrical installations shall be carried out by an electrical worker who is licensed to perform any electrical works and shall comply with AS 3000, the Electrical Legislation and the Service Rules and Conditions of Supply of SA Power Networks.
- .4 Documents referenced in this Part are listed below:
 - (a) AS 3000 Electrical Installations (also referred to as the "Wiring Rules")
- .5 The following definitions apply to this Part:
 - (a) Connected Load Sum of maximum running loads for all electrical Equipment, including devices connected via socket outlet
 - (b) Electrical Legislation Electricity Act 1994 and associated Amendments and Regulations and Electrical Safety Act 2002 and associated Amendments, Regulations and Codes of Practice
 - (c) Outstation an enclosure associated with an ITS or electrical/electronic device
 - (d) Installation Switchboard, enclosure, earthing, and all cabling including consumer's mains
 - (e) Switchboard Enclosure The switchboard mounting chassis
 - (f) Switchboard The entire functional unit, including electrical components and switchboard enclosure
 - (g) ELV Extra-low voltage: Not exceeding 50 V a.c. or 120 V ripple-free d.c.*
 - (h) LV Low voltage: Exceeding extra-low voltage, but not exceeding 1,000 V a.c. or
 - (i) 1,500 V d.c.*
 - (j) HV High voltage: Exceeding low voltage.*

* from AS 3000

2. QUALITY REQUIREMENTS

- .1 Prior to the commencement of this work, the Contractor shall 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.
- .2 If not submitted beforehand, the documentation required by this Clause shall be submitted at least 28 days prior to the commencement of site work.
- .3 Provision of this documentation shall constitute a **HOLD POINT**.

3. SCOPE

- .1 The Contractor shall:
 - (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 AS 3000.
- .2 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

General

- .1 Unless otherwise specified, field Equipment and other electrical installations shall be powered by an un-metered, LV AC mains power supply. The mains power supply shall 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.
- .2 The mains power supply shall meet the power consumption requirements of each individual installation. The switchboard shall protect supplied loads from transients and harmonics as may be expected when connected to a mains electricity supply.
- .3 Persons shall be protected from all points/surfaces at greater than ELV potential within the enclosure. Wherever possible, the switchboard shall maintain uninterrupted electricity supply while being serviced.
- .4 Unless otherwise specified and/or required by SA Power Networks, energy consumption for un-metered installations shall be based on the connected load.

Mains Power

- .5 The mains power supply design shall be in accordance with AS 3000.

Transient Suppression

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

Automatic Change-over Switch

- .7 This Clause only applies if the installation of a secondary power source has been specified.
- .8 An automatic change-over switch shall be provided on the load side of the main switch. Upon detection of mains power failure, the change-over switch shall automatically switch to the alternate power source. Upon detection of stable mains power restoration in excess of one continuous minute, the change-over switch shall automatically switch back to mains power. The change-over switch shall provide display status locally via integral indicators and provide volt-free contacts for remote indication.

5. INSTALLATION REQUIREMENTS**General**

- .1 Wherever practicable, existing power supplies shall remain operational throughout the carrying out of the work under the Contract. If disruption to an existing power supply is unavoidable, the Contractor shall give 7 days written notice of the intention to disrupt an existing supply.
- .2 Provision of this notice shall constitute a **HOLD POINT**.
- .3 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 shall provide a dedicated earthing system in accordance with AS 3000.

Contact with SA Power Networks

- .4 If the Principal has made arrangements for supply point locations, the locations will be shown on the Drawings. The Contractor shall confirm the position of the supply points before installing conduit runs to these points.
- .5 Unless specified otherwise, the Contractor shall 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 shall advise SA Power Networks of changes to connected loads and provide a copy of the advice to the Principal.
- .6 If the Contractor is to arrange supply points, the Contractor shall complete an SA Power Networks Form. At least 7 days prior to contacting SA Power Networks, the Contractor shall 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.
- .7 Provision of the documentation shall constitute a **HOLD POINT**.
- .8 The Contractor shall not proceed with the works until receipt of written authorisation from SA Power Networks.

Inspection

- .9 The Contractor shall 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 shall be paid by the Contractor.

6. ACCEPTANCE TEST REQUIREMENTS

- .1 In addition to any acceptance testing specified elsewhere in this Contract, the Contractor shall 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.
- .2 All "hot" joints identified on the thermal image scan shall be rectified and retested.

7. HOLD POINTS

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

| CLAUSE REF. | HOLD POINT | RESPONSE TIME |
|--------------------|--|----------------------|
| 2.3 | Quality documentation | 7 days |
| 5.2 | Notice to disrupt supply | 7 days |
| 5.7 | Documentation to be forwarded to SA Power Networks | 2 days |

8. VERIFICATION REQUIREMENTS AND RECORDS

.1 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 |