



Installation of streetlights, traffic lights, combination street and traffic lights and public area lighting

Scope

This Electrical Note describes the requirements for the electrical installation of low voltage streetlights, traffic lights, combined street and traffic lights, and public area lighting. It does not cover streetlights mounted on wooden poles supplied directly from a distributor's network.

In addition, this note also describes a number of methods which may be used for the installation of public area lighting supplied from a customer's switchboard, such as that in car parks, ovals, parks, public gardens and university grounds.

Definitions

- **Multiple earthed neutral (MEN) system** A system of earthing in which parts of the installation, required under Australian Standard AS/NZS 3000 to be earthed, are connected to the general mass of earth and in addition are connected within the installation to the neutral conductor of the supply system.
- **MEN point** - The point in the installation where the main neutral conductor is connected to the main earthing conductor to form a MEN system.

Introduction

All lighting installations and their design and construction shall comply with the requirements of the relevant Australian Standards.

- For the installation of electrical wiring, the standard is AS/NZS 3000 Electrical installations known as the Australian/New Zealand Wiring Rules.
- For the design and construction of lights and ancillary equipment, the standard is AS/NZS 60598.1: 2001 *Luminaires Part 1: General requirements and tests*.

Method 1. Wiring of streetlights supplied directly from an electrical distributor's network. (Typical to Main Road or Arterial Road lighting).

Lighting sub-mains shall originate from a main switchboard or distribution board and shall be protected against overload and short-circuit currents by an appropriately rated circuit breaker.

Each lighting column shall be regarded as a main switchboard with its own **MEN** system of earthing. The means of connection shall be as follows:

- **Main switch.** A circuit breaker graded with the sub-main or supply circuit breaker shall be used as a main switch and shall provide protection of circuit wiring and ancillary lighting equipment against overload and short-circuit currents. The circuit breaker is to be located within the column behind the access cover.
- **MEN.** The **MEN** point is to be made at a neutral link located behind the access cover. The incoming and outgoing main neutrals at each column shall not depend upon a terminal of the neutral link for continuity. The neutrals are to be connected together with a take-off tail to the neutral link to make the MEN connection. This will avoid inadvertently opening the neutral conductor to downstream columns, and preventing a rise in potential to the exposed metal of the columns.



- **Earth electrode.** The method of installing the earth electrode depends on the type of column used.
 1. Direct buried and slip base steel columns. Provided the column is directly buried to a depth of 1.2 m, the buried metal of the column may be regarded as the earth electrode. For slip base columns the main earth connection shall be to that part of the column buried in the ground.
 2. Steel columns mounted on a rag bolt assembly and concrete columns. An earth electrode must be installed for each column. The type of earth electrode shall consist of one of the types described in Clause 5.6.2.2 of AS/NZS 3000. Some examples are:
 - (a) An approved earth stake driven to a depth of at least 1.2 m into the ground.
 - (b) A copper strap of at least 25mm x 1.5mm x 3m buried at a depth of at least 0.5 m in a horizontal trench.
 - (c) Bare copper cable of 35mm² x 3m buried at a depth of at least 0.5m in a horizontal trench.
 3. Connection to the earth electrode. A green and yellow insulated copper main earthing conductor shall be installed between the electrode and the main neutral link. The main earth conductor shall be sized appropriately in accordance to the largest active conductor as outlined in Clause 5.5.1 of AS/NZS 3000. Note: The minimum size for main earthing conductors is 4mm².

Method 2. Wiring of traffic lights supplied directly from an electrical distributor's network.

Final sub-circuits that originate from control panels shall supply traffic lights. The control panel is to be regarded as the main switchboard. The means of connection shall be as follows:

- The MEN connection is to be located at the main switchboard and have an earth electrode installed as previously outlined. Any exposed metal of columns and equipment shall be earthed by means of a circuit earth originating from the main switchboard. There shall be no interconnection at any column, between neutral and earth.
- Final sub-circuits shall be protected by circuit breakers that have the appropriate overload and short-circuit characteristics.

Method 3. Wiring of combination street and traffic lights supplied directly from an electrical distributor's network.

Final sub-circuits, which originate from a control panel, shall supply combination street and traffic lights. The control panel is to be regarded as a main switchboard. The means of connection shall be as follows:

- The MEN connection is to be located at the main switchboard and have an earth electrode installed as in dot point two (2) for street lights. Any exposed metal of columns and equipment shall be earthed by means of a reticulated earthing conductor originating from the main switchboard. There shall be no interconnection at any column, between neutral and earth.
- Final sub-circuits shall be protected by circuit breakers that have the appropriate overload and short-circuit characteristics.

Note: Any earthing conductor incorporated in the sheathing of a multicore cable with live conductors shall only be used for the earthing of equipment supplied through the associated active conductors.



Method 4. Wiring of public area lighting supplied from a main switchboard or distribution switchboard. (Typical to local side road lighting)

Lighting sub-mains shall originate from a main switchboard or distribution board and shall be protected against overload and short-circuit currents by an appropriately rated circuit breaker. For the wiring to columns any of the following installation methods may be used:

- All columns are regarded as main switchboards. The method of installation may be the same as outlined in Method 1.
- Separate final sub-circuit. Each light and associated wiring shall be treated as a final sub-circuit protected by a circuit breaker, graded with the reticulated sub-main circuit breaker. The preferred method of supply is to loop the sub main in and out through a set of links on non-frangible (slip base) columns. However the continuity of incoming and outgoing sub-main and earth conductors in slip base columns shall not depend upon terminals within the column. A take-off tail connected to the sub-main below ground shall effect supply and earthing of such columns.

Underground wiring systems

All underground wiring systems shall be installed in accordance with AS/NZS 3000. Where underground systems are in public areas a greater depth of burial may be required.

Access covers

To gain access to electrical equipment located within a column the access cover must only be removed by the use of a tool

Upgrade of existing streetlight columns

When a column is damaged in an accident and is to be replaced or a column becomes unsafe the column is to be upgraded to the standard described in this Electrical Note.

Inspection by the Authority

A Certificate of Electrical Safety (CES) is to be submitted to the Authority within 14 days of completion of the work. No CES certificate is required for replacement columns where there has been no increase in load.

Electrical Inspectors will inspect all or part of the streetlight installation, depending on the installing electrician's previous testing history.

For further information contact the

Construction Occupations Regulations Team.

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