

**PART B-08: STREET LIGHTING**

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**TITLE: STREET LIGHTING**

**SPECIFICATION NO: B-08**

**INCEPTION DATE: AFTER GAZETTING (WORKING DOCUMENT FOR A 3 YEAR PERIOD)**

**AMENDMENTS / REVISIONS**

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**1 SCOPE**

This part of the specification covers the setting out of streetlight pole positions and the complete installation of the streetlight, either photocell control or timer control. This standard serves as a minimum requirement to meet when constructing street lighting for Rural Electrification. For street lighting in Urban areas shall generally comply with the Local Supply Authority's requirements. The applicable standards to be read in conjunction with this standard are listed below:

**STREETLIGHTING**

SANS 10098-1 : Public Lighting Part 1: The lighting of public thoroughfares

SANS 10098-2 : Public Lighting Part 2: The lighting of certain specific areas of streets and highways

SANS 1277 : Street lighting Luminaires

**POLES**

NRS 038 : Concrete poles

SANS 470 : Concrete poles for telephone, power and lighting purposes

SANS 753 : Pine poles, cross arms and spacers for power distribution, telephone systems and street lighting

SANS 754 : Eucalyptus poles, cross-arms and spacers for power distribution and telephone systems

**WOOD PRESERVATIVES**

SANS 592 : Wood preservatives containing high temperature creosote and coal tar

SANS 593 : Wood preservatives containing low and medium temperature creosote and coal tar

SANS 10005 : The preservative treatment of timber

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**EARTHING**

- NamPower : Code of Practice for the Earthing of Low Voltage Distribution Systems
- SANS 10199 : The design and installation of an earth electrode
- SANS 1063 : Earth rods and couplers
- SANS 10200 : Neutral Earthing in medium voltage industrial power systems
- SANS 10292 : Earthing of low-voltage (LV) distribution systems
- ESKCAAB4 : Zinc coated earth conductor, guy and stay wire for transmission lines.
- SANS 10313 : The protection of structures against lightning

**CIRCUIT BREAKERS**

**Regional Standard**

- SANS 767-1 : Earth leakage protection units Part 1: Fixed earth leakage protection circuit breakers
- SANS 767-2 : Earth leakage protection units Part 2: Single phase portable units
- SANS 60934 : Circuit breakers for equipment ( CBE)
- SANS 10142-1 : The Wiring of premises Part 1: Low-voltage installations
- SANS 152 : Low voltage air break switches, air break disconnections, air break switch disconnections and fuse combination units.
- SANS 156 : Moulded case circuit breakers
- SANS 60056 : High-voltage alternating current circuit breakers
- SANS 60265-1 : High voltage switches Part 1: Switches rated for voltages 1kV and less than 52kV
- SANS 6227 -100 : High voltage switchgear and control gear Part 100: High Voltage alternating current circuit breakers

**International Standard**

- IEC 60056 : High voltage alternating current circuit breakers.
- IEC 60376 : Specification and acceptance of new sulphur hexafluoride (SF<sub>6</sub>).
- IEC 60898 : Electrical accessories – circuit breakers for over current protection for household and similar installations
- VC 8036 : Industry Standards for Circuit Breakers

**2 STREET LIGHTING**

**2.1 General**

As a rule of thumb, streetlights shall be installed on every second pole in built-in areas.

- 2.1.1 Streetlight poles shall be planted not less than 1m away from the erf boundary towards the street.
- 2.1.2 Streetlights shall be mounted on poles not less than 7m from ground level.
- 2.1.3 Streetlight poles shall be planted not less than 30m apart from each other in urban areas and not less than 40m apart in rural areas.
- 2.1.4 Streetlight poles along main road shall be planted not less than 5m from the edge of the road.
- 2.1.5 Streetlight poles shall be planted with a minimum depth of 1.5m in the ground.
- 2.1.6 Streetlights installed in main roads shall have a protruding arm of not less than 1m.
- 2.1.7 Street light constructions in urban areas shall contain a cantilever for an epoxy tar coating.
- 2.1.8 Street lighting in urban area shall also have its own metering point and each street light should have its own daylight sensitive switch.

**2.2 Pole Planting**

The contractor shall be responsible for setting out the pole positions. Approval of the positions shall be obtained from the Engineer before the holes are excavated.

Excavation depths for planting poles shall be as stipulated for the poles. The pole holes shall be suitably sized to allow for working in the hole.

Street lighting poles shall be planted vertical in all directions and in positions indicated on the specification drawings.

Terminal poles of all straight runs of poles shall be planted first after which intermediate poles shall be planted to line up accurately with the terminal poles. Care shall be taken that the mounting height of all luminaires above final street level is equal and as required by SANS 1277.

After the pole has been located in its hole backfilling shall take place in stages. Each layer not exceeding 300mm shall be well tamped before the next layer is applied.

Where the excavated material consist of broken rock, shale or loose sand is not suitable for backfill the contractor shall be responsible and shall import soil for backfill to the approval of the Engineer and which consolidates perfectly. Surplus backfill shall be removed from site to a point approved by the Engineer.

### 2.3 Wooden Street Lighting Poles

#### Wooden Pole

Pine species Class A (treated Tanalith CCA) in accordance with SANS 753 and SANS 754. The poles shall be specially selected with straight poles with SANS permissible values for crook and sweep reduced by 60%.

#### Overall length and size

Poles shall be tanalith treated 8m or 9m long having a top diameter of 120 to 140mm.

#### Plant depth

Poles shall be planted 1,5m deep to provide a mounting height for the luminaire of normal height of 7,5m.

### 2.4 Streetlight Brackets

For mounting the luminaire a side entry hot dip galvanized bracket in accordance with SANS 121 (150mm short), no outreach required shall be clamped to the top of the pole providing a 15 degree rake angle for the luminaire.

**Care shall be taken that the luminaire is fixed properly and that the axis of the luminaire is vertical to the line of the street.**

### 2.5 Streetlight Junction Box

A cable Y-junction box shall be mounted 400mm above ground level against the pole suitable to take the street lighting cable to be looped into at each pole and the luminaire supply cable. 60 A terminal blocks for terminating the street lighting cables and a 5A or 10A miniature circuit breaker for individual control of the light shall be provided inside the junction box, depending on the voltage of the lamps. Alternatively Y-joints may be used instead of the junction boxes.

### 2.6 Supply Cable to Luminaire

The supply cable to the luminaire shall be 4 core 6mm<sup>2</sup> (Phase, Neutral, Earth) PVC SWA PVC cable terminated at the junction box and run along the pole through the bracket to the luminaire. The cable shall be neatly saddled in a straight run onto the pole.

The street lighting cable shall be looped into each pole. The cable ends shall be made off inside the junction box to be provided on 5 terminal blocks. From the junction box mounted against the pole the luminaire shall be supplied by means of a 3 core 2,5mm<sup>2</sup> cable (phase, neutral, earth). A 10A miniature circuit breaker for the individual control of the luminaire shall be installed either inside the junction box at the bottom of the pole or the luminaire as agreed to by the engineer or inside the miniature substation control board.

All streetlights to be connected to a single street lighting feeder shall be distributed equally over the three phases and the expected load balanced.

**2.7 Street Lighting Luminaire**

The street lighting luminaires shall be of the side entry type suitable to be mounted onto the bracket mentioned above at a rake angle of 15°. The luminaires shall be supplied complete with ballast, power factor correction gear, etc.

The circuit breaker 5A or 10A to be provided in the pole junction box may if suitable also be installed inside the luminaire easily accessible for the maintenance staff.

**2.8 Streetlight Supply Circuit**

Contactor

The street lighting control contactor C1 shall have 3 N/O contacts rated 60A. The contactor shall be mounted in a separate dustproof box and shall be positioned easily accessible for maintenance purposes.

The control wiring shall be as schematically indicated on the drawing and shall provide C1 to be energized by the photo electric relay.

Circuit breakers

Circuit breakers for controlling the individual streetlight circuits, the photo electric relay and contractor coil and to provide a bypass for the contractor shall be circuit breakers having a rupturing capacity of 5kA and in accordance with SANS 152 and SANS 156.

Photo electric relay bypass switch

A 5A switch in accordance with BS 2631 shall provide for manually bypassing the photo electric relay.

**2.9 Daylight Switch / Photocell**

A Photocell suitable for mounting inside kiosk, rated for 220 V a/c, 10 A shall be installed. One photo electric relay shall be supplied loose with each substation. The contactor shall be rated 5A and all switching shall be time delayed for a period of 30 to 60 seconds.

**2.10 Streetlight Metering**

Streetlight metering shall be provided by the Supply Authority if required.

**3 EARTHING OF STREET LIGHT BRACKETS**

Streetlight brackets and any other metal part shall be bonded to the earth wire in accordance with SANS 10292.