

RLM/DTIS/0057/2025/26 - APPOINTMENT OF ONE OR MORE SERVICE PROVIDERS (MAXIMUM OF 2 PER LINE ITEM) FOR THE SUPPLY AND DELIVERY OF TRAFFIC SIGNAL EQUIPMENT TO RUSTENBURG LOCAL MUNICIPALITY AS AND WHEN REQUIRED FOR A PERIOD OF 3 YEARS

ANNEXURE A - TECHNICAL SPECIFICATIONS

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STANDARD TECHNICAL SPECIFICATION: LV-013/1

SPECIFICATIONS - TRAFFIC SIGNALS

1. GENERAL

This specification is for traffic signal equipment.

1.1 Service conditions:

Maximum temperature	:	40° C
Minimum temperature	:	-5° C
Altitude	:	1200 m above sea level
Lightning conditions	:	Severe

TECHNICAL INFORMATION AND SPECIFICATIONS

STANDARDS

- 1.1 The following standards form an integral part of this contract. All items offered shall conform to the required sections of the specifications which will hereafter be referred to by the abbreviations shown in the relevant square brackets:

South African National Standard specifications SANS 1459:2004 Edition 1.4 Traffic lights [SANS 1459]

The South African Road Traffic Signs Manual Volume 3: Traffic Signal Design, April 2001 [SARTSM].

2 GUARANTEE

- 2.1 The LED traffic signal modules and light emitting diodes (LED) shall be guaranteed for a period of 5 (five) years from the date of delivery
- 2.2 If an LED module fails to function as intended due to workmanship or material defects within 5 years from the date of delivery, the Supplier shall replace the entire LED signal module.
- 2.3 Any faulty equipment must be replaced within a period of 14 days. Failure to comply with this requirement will, at the discretion of the Rustenburg Local Municipality, be regarded as adequate grounds for the Rustenburg Local Municipality to terminate the entire contract at the discretion of the Rustenburg Local Municipality.
- 2.4 The guarantee shall cover the life and luminous intensity as well as the integrated circuitry for the entire guarantee period. If, during the Guarantee period, any one LED fails or no longer complies with the luminous intensity and chromaticity as specified in the Tender, the Rustenburg Local Municipality may require the Supplier to replace the entire LED signal module free of charge, at the discretion of the Rustenburg Local Municipality.
- 2.5 Each LED Module shall be identified on the backside with the manufacturer's name and batch number for guarantee purposes. Identification of the components and sub-

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assembly level may be required if the reliability and performance of the module has to be traced to the original item manufacturer.

3. DEFINITIONS

- 3.1 Chromaticity – The colour of the light emitted by and LED signal module, specified as x-y and x and y chromaticity coordinates.
- 3.2 LED Light Source – A single light emitting diode (LED) or an array of LED's.
- 3.3 LED Signal Module – An array of LED's, integrated circuitry and lens that can provide a circular signal indication. An LED signal module shall be capable of replacing the optical unit of an existing traffic signal head.
- 3.4 Luminous Intensity – The luminous flux per unit solid angle in each direction given in Candelas (cd).
- 3.5 Nominal Operating Voltage – The AC RMS voltage, 220V AC at which photometric performance and power consumption are specified.
- 3.6 Power Consumption – The electrical power in Watts consumed by LED signal module when operated at nominal operating temperature range.
- 3.7 Power Factor (PF) – equals Watts divided by Volt-Ampere (VA) or the ratio of power consumption in Watts to Volts-Amperes.
- 3.8 Total Harmonic Distortion (THD) – is the ratio of the root-mean-square (RMS) value of the harmonics to the amplitude of the fundamental component of the waveform when operated at nominal operating voltage.

4 TECHNICAL SPECIFICATIONS

- 4.1 Unless otherwise stated, all equipment shall comply with SANS 1459.
- 4.2 Complete traffic signals heads and individual LED modules must comply with the various traffic signal configurations specified in SARTSM, including red and green arrows, pedestrian signals and flashing amber.
- 4.3 LED traffic signal modules designed as retrofit replacements for existing incandescent signal lamps shall be compatible with all standard 200 mm signal heads and shall not require special tools for installation. Retrofit replacement LED signal modules shall fit into existing traffic signal housing units without modification to the housing units.
- 4.4 All LED modules must be supplied with a connecting cable that can be screwed into an incandescent fitting and be plugged into the LED module.
- 4.5 The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into existing traffic signal heads.
- 4.6 The LED signal module shall be robust, impact resistant and with adequate protection and insulation against dust and moisture intrusion to protect all internal LED's electronic and electrical components as specified in SANS 1459.

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- 4.7 Each aspect shall present a uniform appearance free from excessive bright or dark spots over the whole of the lens when the aspect is viewed within the range of angles specified in SANS 1459.
- 4.8 LED signal module lenses shall be UV stabilized, scratch resistant and shall minimize sun-phantom effects.
- 4.9 It is important that LED modules do not leave a residual voltage on the cable after the Traffic Controller has switched off the aspect. 'Residual' voltage to be well below 60 volts within 100 milliseconds of lap drive switch off.
- 4.10 The current draw and turn-off voltage decay shall be sufficient to ensure compatibility and proper triggering and operation of load current switches and conflict monitors in existing signal controllers.
- 4.11 A minimum AC switch on threshold, as specified by the traffic signal controller supplier shall be complied with. This is to ensure that the LED modules does not activate at a low-level cable fault voltage, which is part of the controller fault monitoring functionality.
- 4.12 Self-flashing units shall operate at a cycle frequency of between one and two flashes per second. The luminous intensity shall be zero for 30% - 50% of the period and not less than the specified minimum for 30% - 50% of the period.
- 4.13 All LED modules shall comply with the following technical specifications:
- 4.13.1 Chromaticity: The colour of the light emitted by an LED module shall be red, amber or green, as required. The measured chromaticity co-ordinates of LED signal modules shall conform to the appropriate chromaticity requirements defined in SANS 1459: Table 1 – Colour boundaries
- 4.13.2 Luminous intensity and Distribution: The maintained luminous intensity values throughout the guarantee period and at the end of the guarantee period shall not be less than specified in SANS 1459 (Table 2 for pedestrian aspects and Table 3 for vehicular aspects).
- 4.13.3 Maximum luminous intensity:
- | | |
|--------|---------|
| Red | 1800 cd |
| Yellow | 1800 cd |
| Green | 1800 cd |
- 4.13.4 Minimum luminous intensity:
- | | |
|--------|--------|
| Red | 600 cd |
| Yellow | 600 cd |
| Green | 600 cd |
- 4.13.5 Angular coverage, all units: 30° left and right 30°.
Down
- 4.13.6 Dimming control: Self-dimming and/or
Controller dimming
- 4.13.7 Maximum dimmed intensity: 600 cd for vehicle signals
200 cd for pedestrian signals
- 4.13.8 Supply voltage options: 220 Volt AC
- 4.13.9 Power Factor (PF): 0.90 or greater when
operated at nominal
operating voltage, and 25°C

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|---------|---|--|
| 4.13.10 | Guaranteed no switch-on voltage: | 90 Volt AC and less |
| 4.13.11 | Total harmonic distortion (THD): | Less than 20% |
| 4.13.12 | Power consumption: | Less than 15 Watts |
| 4.13.13 | Ambient operating temperature | -40°C to +75°
Range (measured at the exposed rear of the module): |
| 4.13.14 | Absolute maximum operating temperature: | 95°C |
| 4.13.15 | Flammability rating: | UL-V 94B (self-extinguishing) |

5 TESTING AND INSPECTION

- 5.1 Suppliers should test and inspect all modules prior to delivery to ensure that the modules comply with the above technical standards. All modules shall be visually inspected for any exterior physical damage or assembly anomalies. Test results documentation shall be kept on file for a minimum period of five years after the module was supplied to the Rustenburg Local Municipality. The Rustenburg Local Municipality may request copies of the test and inspection records from the Suppliers during the five-year guarantee period.

6 SIGNAL HEADS

- 6.1 Traffic signal heads should be supplied as complete units with LED traffic signal modules, associated signal housing, cables, visors, backboards, two right angle mounting brackets and buckles together with two separate adjustable mounting straps. A combined brackets and strap arrangement is not acceptable.
- 6.2 All housing units and signal head assemblies must be fitted with incandescent light fittings allowing the LED connecting cables to be screwed into the incandescent fittings and be plugged into the LED modules.
- 6.3 The LED traffic signal heads shall be suitable for direct mounting on existing Rustenburg Local Municipality poles ranging from approximately 150mm to 270 mm diameter.
- 6.4 A visor or hood of approximately 240 mm and at least 160 mm must be fitted around each lens. These visors must be made of black polyethylene suitable for outdoor exposure. Metal or other non-flexible visors are not acceptable.
- 6.5 The signal heads shall, wherever possible, be made of nylon 66 material. Signal heads with a high resistance to breakage are preferred.
- 6.6 The signal heads must be all black and, if painted, have a durable weather resistant finish coat over a suitable undercoat.
- 6.7 The design shall be such as to enable two heads with backing boards facing at right angles to be mounted on the same pole at the same height.
- 6.8 Protrusions from the top, bottom and sides of the head assemblies are not acceptable since they may lead to difficulties in the mounting of the units.

7 REPLACEMENTS BACKBOARDS

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- 7.1 If backboards on LED traffic signal heads are damaged, they will be replaced with the same type of backboard as supplied by the Tenderer that is awarded the Contract(s) for the supply of the signal heads and/or housing units.
- 7.2 This Tender therefore requires Tenderers who have tendered for the supply of signal heads and/or housing units to also submit a separate rate for the supply and delivery of replacement backboards only. Rates tendered for the supply of complete LED signal heads and/or housing units shall be deemed to include backboards.

8. WIRING

- 8.1 The wiring of the signal heads must be colored according to the following table and must be brought to a terminal block housed in the top section of the head: -

<u>Lens</u>	<u>Colour of Lead</u>
Red	Both red
Amber	Both orange
Green	Both green

- 8.2 All wires must be connected by means of a lug attached to a terminal block fixing screw. Wire ends at the terminal block must be fitted with suitable cable lugs.
- 8.3 For electrical connection purposes a 20 mm clearance hole must be provided at the back of the head not more than 150 mm from the top of the head. A 20 mm right angle yprague connector must be fitted to the hole and a length of flexible tubing must be attached to the connector.
- 8.4 The respective lengths of the flexible tubing must be: -
- | | | |
|---|--------------------------------------|---------|
| - | 3 and 5 aspect traffic signal heads: | 900mm |
| - | 1 and 2 aspect traffic signal heads: | 1200 mm |
- 8.5 The length of the five connecting leads from the terminal block through the flexible tubing must be such that there is at least 230 mm protruding from the flexible tubing. The wire ends at the terminal block must be fitted with suitable cable lugs, but the protruding ends must be left free.
- 8.6 The flexible tubing must have an internal diameter of approximately 12 mm and an external diameter of approximately 16 mm.

9 FULL DETAILS

- 9.1 Comprehensive details, including manufacturer's catalogues, drawings and specifications must accompany the Tender.

- 1) A Complete 3 Way Signal Head 220volt With Backboard
- 2) A Complete LED Traffic Lamp, Red Ball, Clear Lens
- 3) A Complete Pole Termination Box

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4) A Minimum 2-Way Microprocessor Based Traffic Signal Controller

Failure to submit the said samples on request will lead to disqualification.

10 MANUALS

10.1 All traffic signal equipment must be supplied with instruction manuals which must be detailed enough to enable the electricity supply authority staff to install, maintain, test, configure and use each item of equipment.

10.2 Drawings which are required to test, configure, maintain or use the equipment must be contained in the instruction manuals as per clause 12. The equipment must comply with SANS.

11 TRAINING

Training must be provided free of charge, by the supplier of the traffic signal equipment, at a venue provided by the electricity supply authority. A comprehensive schedule of the training, which will be provided, must be submitted with the bid documents. This training must cover at least the following:

1. the installation procedure of the equipment
2. the operation of the equipment specially data based
3. The installation and operation of the software, typical application of the software in the programming of the controllers for use in the specific electricity supply authority.

12 TECHNICAL DATA AND DRAWINGS

It is compulsory that full technical data and dimensional drawings must be included in the tender documents of all material offered. Items offered must also be clearly marked in the data sheets.

13 WARRANTY

The equipment offered shall be warranted free from defects in workmanship and materials for a period of at least twelve (12) months from date of final commissioning or delivery. Any failures shall be repaired or replaced at the bidder's expense during the 12 months warranty period.

14 CERTIFICATES

Bidders must submit Eskom SANS, BS and IEC certificates of the equipment offered.

15 GENERAL

Only new manufactured equipment will be accepted.

16 SUPPLIERS

If the bidder is not the manufacturer, it is the responsibility of the bidder to ensure that he has a credit agreement as well as a after sales agreement with his supplier (Company) from which he will be sourcing the product.

17 AFTER SALE SERVICE

The bidder shall supply all details regarding their after-sale service on the equipment offered.

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18 SAMPLES

No Samples are required. Delivery of substandard material or equipment will result in no approval of payment and the return of the product.

19 ALTERNATIVE OFFERS

No Alternative offers on specifications of material will be considered.

20 LOCAL CONTENT

Local Content on material or products will be in accordance with the Department Trade and Industry where applicable.

No imported product will be excepted unless no manufacturing company exists in South Africa.

Local content does not refer the base address in area of jurisdiction of suppliers

21 PRICE ESCALATION CLAUSE

The tender appointment prices shall be the ordering prices after adjudication and Contract Price Adjustment shall be clearly defined such as SEIFSA indices, CPI, ROE, Foreign Currency Components such as rates on which tender is based, Custom duties percentage, forward cover and the relevant clauses must find expression in the tender submitted.

SEIFSA indices, CPI, ROE, Foreign Currency Components such as rates on which tender is based, Custom duties percentage, forward cover and the relevant clauses shall be included then in the Service level agreement when adjudication is successful.

All quantities will be verified after adjudication, Quantities may differ after adjudication on purchase orders.

22 CANCELATION CLAUSE

The delivery of substandard material or equipment or refrain from supplying it within the required timeframe will result in cancelation of the contract and the second highest scorer will be appointed.

END OF SPECIFICATION