1. *INTRODUCTION*

The project is for once off Supply and delivery of Signaling maintenance tools in the Gauteng South

The Gauteng South Region is a network of commuter rail services in Gauteng province in South Africa, servicing the Ekurhuleni and Johannesburg metro areas. It is operated by Metrorail, a division of the Passenger Rail Agency of South Africa (PRASA).

The Gauteng South region consists of the following corridors:

- Germiston Lerala
- Germiston Springs/Daveyton:
- Germiston Kwesine
- Germiston Pretoria
- Germiston Johannesburg:
- Johannesburg Naledi
- Johannesburg Randfontein

- Johannesburg Lawley

2. BACKGROUND INFORMATION

2.1 STATUS QUO

In line with the PRASA strategic objectives, Operational effectiveness, PRASA RAIL – Engineering services aims to achieve continuous service improvement and reliable network. This can be achieved through maximizing focus on improving the condition of the track assets through purchasing of maintenance tools for the Signaling department. This will allow Signaling department to address all technical related issues and maintenance, thereafter, improving infrastructure assets which in turn minimizes delays.

2.2 PROBLEM STATEMENT

The Signals department has been facing a significant challenge due to shortage of Signals tools. This has been caused by non-approval of the refurbishment, repairing Signaling maintenance tools contracts as well Signaling maintenance tools procurement contracts which has resulted in maintenance tools overused and resulted in defaults due to non- maintenance and this has also left most of the tools not working at all.

The procurement of Signaling maintenance tools is urgently required, so that the department can be able to carry routine maintenance which will improve safe passage of trains and mitigate potential incidents and train delays.

Due to the obstacles hindering the process of procuring and refurbishment of Signaling maintenance tools and budget constraints, we have exceeded the normal procurement cycle and as a result are embarking on a project for Supply and once of delivery of Signaling maintenance tools in the Gauteng province.

2.3 PICTORIALS

Figure 1: Flood lights

Figure 2: Digital Multimeter

Figure 3: Digital Megger

Figure 4: 3ph rotation meter 1

3. OBJECTIVE OF THE PROPOSED PROJECT

3.1 DESIRED OUTCOMES FOR CARRYING OUT THE PROPOSED PROJECT

The project aims to restore the Signaling infrastructure to enable the smooth running of the train services. The strategy will be to appoint a supplier for the Supply and delivery of once off maintenance tools in the Gauteng South province.

3.2 PROJECT BENEFITS TO PRASA

The Project will assist the department to carry out routine maintenance which will ensure the Signaling assets stays in a standard conditions and defects are minimized which will improve safe passage of trains and mitigate potential incidents and train delays.

This will therefore assist PRASA in achieving its primary mandate of providing a reliable rail transport service to Gauteng commuters and enable the business to collect fare revenue from those commuters. By restoring the Signaling system to its design specification and train disruptions that

are due to the Signaling system failures will be reduced thus improving the service offering.

3.3 CURRENT MECHANISMS IN PLACE TO ADDRESS THE PROBLEM

The mechanism that is currently in use to support the business, is through the repairs of old Signaling maintenance tools that contributes negatively to the operations as it takes longer and the implications are of high risk, as the response time to the call outs needs to be immediately

This also is a safety hazard as this Signaling maintenance tools are being repaired inhouse by unqualified people, the fore the department do not have capacity to carry out this type of work and the current mechanism is not sustainable.

4. SCOPE OF WORK AND AREAS OF FOCUS

4.1 SCOPE OF THE DESIRED SOLUTION

The scope of work required is for the service providers to supply and deliver Signaling maintenance tools in the Metrorail Gauteng Province.

4.2 DETAILS ON THE PREFERRED SOLUTION

The preferred solution in addressing this challenge is by replacing all the damaged Signaling maintenance tools and adding more by procuring a service provider for the Supply and delivery of Signaling tools in the Gauteng North Region.

4.3 TARGETED AREA BY THIS PROJECT

The place of delivery of this Signaling tools shall be the Gauteng region deports/stores and the sequence of supply shall be determined on an on- going basis based on operational requirements. This will be communicated in time to the contractor

4.4 OTHER RELATED PROJECTS

4.4.1 Supply and delivery of material and engineering support.

5. SPECIFICATION OF THE WORK OR PRODUCTS OR SERVICES REQUIRED

This section will cover the technical capabilities, constraints, and other specific performance required of the product or services to accomplish the supply and delivery of Signaling maintenance tools.

5.1 TECHNICAL SPECIFICATION (Please refer to annexure A for details specification)

5.1.1. NATURE OF WORK

The work entails the Supply and delivery of Signaling maintenance tools in the Gauteng Region. This is to assist the department to carry out routine maintenance which will ensure the assets stays in a standard conditions and defects are minimized which will improve safe passage of trains and mitigate potential incidents and train delays. The Signaling maintenance tools shall be classified as follows:

A) Digital megger
B) Digital multi meter
C) 3 phase rotation meters
D) Electrical tool set
E) Cable fault detector - receiver
F) Cable fault detector - transmitter

G) Flood lights
H) Generator/welding machine combo
I) Gazebo
J) Mechanical tool set

5.1.2 Technical Specification

a) Digital Meger tester

- Checking the insulation of high-voltage electrical equipment (electric motor, transformer, and cable, etc.).
- Use 50V-1000V voltage to test target insulation.
- It can measure up to 10GΩ resistance.
- Short current up to 1.8mA.
- Automatically calculates PI (Polarization Index) and DAR (Dielectric Absorption Ratio).
- AC/DC voltage measurement and continuity test.
- Display back light and auto power-off.

b). Digital Multimeter

- An auto ranging multifunction digital multimeter with a compact design that makes it ideal for use in the field.
- 3½ Digit, 2000 count LCD display with backlight.
- AC/ DC voltage, AC/DC current, resistance, and frequency measurement
- Diode and continuity test functions
- Data hold and maximum value hold functions
- Meets EN61010-1 and CAT III 600V standards.

Power: 1x PP3 battery

c). 3 Phase Rotation Meter

- 100% Authentic F9040 9040
- 3 Phase Rotation Indicator Motor Drive Tester Meter,700V

d). Electrical Tool set

- Technical data:
- L-BOXX 136 with assortment Electrician,
- 36-pc
- An assortment of essential tools

e). Cable fault locator

Receiver

- Positioning accuracy: ±5% of depth (no adjacent pipeline interference)
- Depth measurement accuracy: ±5% of depth (no adjacent pipeline interference)
- Current measurement accuracy: ±5% of actual current (no adjacent pipeline interference)
- Depth measurement range: 0-6 meters Working mode: valley mode, peak mode, wide peak mode, peak arrow mode
- Working frequency: radio, 50Hz, 100Hz (CPS), 512Hz, 1KHz, 2KHz, 8KHz, 33KHz, 65KHz, 83KHz
- Menu settings: Chinese and English settings menu.
- Working temperature: -20℃ ~ +50℃
- Battery: 7.4V lithium battery
- Dimensions: 595mm × 136mm × 238mm
- Weight: 2.3Kg (including battery)

f). Cable fault locator

Transmitter

- Output power: up to 10W
- Working frequency: 128Hz, 512Hz, 1KHz, 2KHz, 8KHz, 33KHz, 65KHz, 83KHz
- Working mode: automatic conversion of direct mode, induction, and clamp
- Battery: 14.8V built-in lithium battery pack
- Working temperature: -20℃ ~ +50℃
- Dimensions: 348mm × 228mm × 84mm
- Weight: 2.5Kg (including battery).

g). Flood Lights

- Double portable generator outside led flood lights and a mounting frame made of aluminium/ steel.
- Two led flood lights are attached on the mounting frame.
- Technical description:
- Power – 600W per led light
- IP rating – IP 66
- Beam angle – 120 degrees
- Colour temperature – 6500k
- Length of mounting frame – 710 mm
- Width of mounting frame – 580 mm
- Height of mounting frame – 1890 mm

h). Generator/welding machine combo

- Welder Output at 100 % DC: 200
- Open Circuit Voltage: 60 – 7

- Auxiliary Power: 4.2 kVA 220V
- Welding Process: Stick/TIG
- Engine Power: 13 HP
- RPM: 3000
- Engine Type: Air Cooled Starting Recoil/12 V Electric
- Fuel /Tank Capacity: Petrol 6.5 ltr
- Frame Dimensions: 800 x 680 x 740mm
- Dry weight: 90 kg
- Rod Sizes: 2 – 4 mm electrode
- Cable: 25mm/10m

i). Gazebo

- 3m X 3m
- Sturdy steel frame for lasting durability
- Water-resistant canopy for protection against rain
- Easy assembly and disassembly for convenience
- Compact size for effortless storage and transportation

i). Mechanical Tool Set

- Toolbox 1282
- Inserts: 1280/81-DI9 1280/81-1B 1282 - EXT
- 1282-SD-PH-STB 1282-SD-MEC-EL
- Metal Tray: 1282

- Accessories:

137/250 Grip Plier 145/250 Universal Plier

1987 Sliding “T” Bar 1990-75 Extension
1990-125 Extension
1990-250 Extension 1993Z-94 Ratchet

- Sockets: C19

8-5/16 10-3/8 11 12 13-1/2 14
15-19/32 16-5/8 17 18-11/16 19 21-13/16
22 24-15/16 26-1. 27-1.1/16 29-1.1/8 30-1.3/16
32-1.1/4

- Spanners: No. 1B

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

- Allen Keys:

42/88M Plastic Holder 2 2,5 3 4 5 6 8 10

- Screwdrivers:

150MS 1,2x6,5x150 1,2x8,0x175
160PHS 1x80 2x100 3x150
170ELS 0,5x3,0x100 0,8x4,0x125 1,2x6,5x200 STUBBY 1,0x5,5x25
2x25

k). Torque Wrench

- Weight: 1500g
- Dimensions: 487 × 36 × 408 mm
- Drive: 14x18mm
- Main Torque Range: 40~200 N·m
- Secondary Torque Range: 33~151 lbf·ft
- Fine scale: 1N.m
- Accuracy: +-4%
- Structure: Click Type
- Type: Adjustable scale, dual way adjustable torque wrench

5.2 AREA OF OPERATION AND ACCESS OF SITE WORK.

Signaling maintenance tools shall be supplied and delivered to Gauteng region stores/deports either in Langlaagte, this will be communicated to the contractor by the project manager or his/her representative.

5.3 PRODUCT REQUIREMENTS.

5.3.1 All Signaling maintenance tools to be supplied must be SABS and ISO compliant and must meet with the technical specification provided.

5.3.2 All Signaling maintenance tools to be supplied must have a 24-month warranty, with a 24-month maintenance/repair plan and a lead time to repair of five working days.

5.4 INFORMATION TO BE SUBMITTED BY THE SUPPLIER

Details of at least three (3) manufacturers of Signaling maintenance tools they wish to supply and a broacher before purchasing of the maintenance tools.

5.5 DELIVERY AND PACKAGING

All Signaling maintenance tools must be parked and delivered with care and any damage occurred during transit is of the supplier's account and PRASA will not accept any damaged tools or be liable for such.

5.6 GENERAL

a. The supplier is responsible for the safekeeping of all tools in his possession. Any loss of, or damage to tools (while in his possession) will be for the supplier's account.

b. It is a requirement of this contract that the supplier supply PRASA with sufficient prove of relevant

previous experience of supplying of the Signals maintenance tools listed on this contract before the contract can be awarded.

c. The supplier shall supply PRASA with details of at least three (3) manufacturer of tools they wish to supply and a broacher before purchasing of this tool. This is to be submitted with the tender document.

d. PRASA will verify all the provided references and manufacturers.

e. PRASA do reserve the right to verify quality of all supplied tools to see if they conform with the prescribed specifications. Any irregularities will not be accepted by PRASA, who have the right to cancel contract/agreement.

5.7 GUARANTEE

The supplier will be required to guarantee all the Permanent way maintenance tools to be supplied against all defects attributable to faulty manufacture, workmanship and quality of materials for a period of 24 month. Tools that fail in service before the expiration of the guarantee period due to such faults shall be replaced free of charge at the initial point of delivery.

5.8 ACCEPTANCE OF MACHINERIES AT POINT OF DELIVERY

All tools supplied must be completely new as per the manufacturer specification and will be tested by the Technical Manager to ensure that they meet with the required technical specifications.

5.9 PAYMENTS CERTIFICATE

5.9.1 On or after the assessment date, the Supervisor and the supplier will together assess the quantities of the progress on each item in the Bill of Quantities and complete the Progress Assessment Detail form, where after the Progress Assessment Certificate will be issued.

5.9.2 The supplier shall then submit a VAT invoice and attach the above Progress Certificate for payment by the Employer.

5.9.3 Claims for payment will only be made on a monthly basis and payments will be made within 30 days of approved invoices.

5.9.4 The supplier to provide the Employer with the necessary details regarding banking details to enable the Employer to make electronic payments.

5.10 APPLICABLE SPECIFICATIONS

The documents forming the contract are to be taken as complimentary to each other. In case of any discrepancy or inconsistency between contract documents, the order of precedence will be:

a) Manual for Track Maintenance (2000).
b) Safety Arrangements and Procedural Compliance with the Occupational Health and Safety Act (Act 85 of 1993) and Applicable Regulations (E4E); including any subsequent amendments EN13674-1, UIC 860-0, UIC 8610-1 or the latest equivalent standard.
c) Specification for Works On, Over, Under or Adjacent to Railway Lines and Near High Voltage Equipment (SPK7/1).
d) Railway Safety Regulator Act (Act 16 of 2004).
e) Norms, Standards and Guidelines.