



CITY OF TSHWANE METROPOLITAN MUNICIPALITY

TENDER NUMBER:

EED 09-2024.25

TENDER DESCRIPTION:	TENDER FOR THE SUPPLY, REPAIRS, DELIVERY AND OFF-LOADING OF ELECTRICAL TOOLS AND ELECTRICAL TESTING EQUIPMENT FOR THE CITY OF TSHWANE: AS AND WHEN REQUIRED FOR A PERIOD OF THREE (3) YEARS
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NAME OF BIDDER:

CSD NUMBER:

VENDOR NUMBER (WHERE APPLICABLE)

Prepared by:
City of Tshwane Metropolitan Municipality
Tshwane House
320 Madiba Street
Pretoria CBD
0002
Tel: 012 358 9999

BID CLOSING DATE

27 FEBRUARY 2025

Only bidders registered on the central supplier database (CSD) and with a CSD number will be considered for this tender, as this is a requirement from the National Treasury.

“Note: Bidders are required to submit electronic copies of the bid either by memory stick together with the hard copy of the Bid/Proposals”



CITY OF TSHWANE METROPOLITAN MUNICIPALITY

DEPARTMENT: ENERGY AND ELECTRICITY

Bids are hereby invited from suppliers for the following bid:

Bid number	Description	Department	Contact person	Compulsory briefing session	Closing date
EED 09-2024.25	TENDER FOR THE SUPPLY, REPAIRS, DELIVERY AND OFF-LOADING OF ELECTRICAL TOOLS AND ELECTRICAL TESTING EQUIPMENT FOR THE CITY OF TSHWANE: AS AND WHEN REQUIRED FOR A PERIOD OF THREE (3) YEARS	Energy and Electricity	Corrie Lemmer	N/A	27 February 2025 at 10:00

THE DOCUMENT IS DOWNLOADABLE ON THE TSHWANE WEBSITE (www.tshwane.gov.za) and on the E-tender portal.

Each tender shall be enclosed in a sealed envelope that bears the correct identification details and shall be placed in the tender box located at:

“Note: Bidders are required to submit electronic copies of the bid either by memory stick/USB flash drive together with the hard copy of the Bid/Proposals”

**Tshwane House
320 Madiba Street
Pretoria CBD
0002**

Documents must be deposited in the bid box not later than 10:00 on 27 February 2025

Bidders must contact the following officials for any enquiries:

- Technical enquiries: Corrie Lemmer (012 358 2414 or corriel@tshwane.gov.za)
- Supply chain enquiries: Mulondi Rasekgala (012 358 6636 or mulondin@tshwane.gov.za)

Bids will remain valid for a period of 90 days after the closing date.

Bids received after the closing date and time will not be considered. The City of Tshwane does not bind itself to accept the lowest or any other bid in whole or in part.

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VERY IMPORTANT NOTICE ON DISQUALIFICATIONS

A bid that does not comply with the peremptory requirements stated hereunder will be regarded as not being an “acceptable bid”, and such a bid will be rejected. An “acceptable bid” means any bid which, in all respects, complies with the conditions of the bid and the specifications as set out in the bid documents, including the conditions as specified in the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000) and related legislation as published in *Government Gazette* 22549, dated 10 August 2001, in terms of which provision is made for this policy.

1. If any pages have been removed from the bid document and have therefore not been submitted or if a copy of the original bid document has been submitted.
2. If the bid document is completed using a pencil or Tippex corrections were made, or any other colour ink. Only black ink must be used to complete the bid document.
3. The bidder attempts to influence or has in fact influenced the evaluation and/or awarding of the contract.
4. The bid has been submitted after the relevant closing date and time.
5. If any bidder who, during the last five years, has failed to perform satisfactorily on a previous contract with the municipality, municipal entity or any other organ of state after written notice was given to that bidder that performance was unsatisfactory.
6. The accounting officer must ensure that, irrespective of the procurement process followed, no award may be given to a person –
 - (a) who is in the service of the state;
 - i. if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or
 - ii. who is an advisor or consultant contracted to the municipality in respect of a contract that would cause a conflict of interest.
7. Bid offers will be rejected if the bidder or any of his/her directors are listed on the Register of Bid Defaulters in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act 12 of 2004) as a person prohibited from doing business with the public sector.
8. Bid offers will be rejected if the bidder has abused the City of Tshwane supply chain management system.
9. Failure to complete and sign the certificate of independent determination or disclosure of wrong information.
10. Duly Signed and completed MBD forms (MBD 1, 4, 5, 8 and 9) The person signing the bid documentation must be authorised to sign on behalf of the bidder. Where the signatory is not a Director / Member / Owner / Shareholder of the company, an official letter of authorization or delegation of authority should be submitted with the bid document.
11. All MBD documents fully completed (i.e. no blank spaces) and fully signed? By the authorized personnel.
12. False or incorrect declarations on any of the MBD documents will result in the rejection of the bidder.

- 13 It is the responsibility of the bidder to disclose in MBD4 any interest in any other related companies or business whether they are bidding for this contract. Failure to disclose this interest will result in the rejection of the bid.
- 14 Joint Ventures (JV) – (Only applicable when the bidder tender as a joint venture)
- i. Where the bidder bid as a Joint Ventures (JV), the required or relevant documents under administrative requirements must be provided/submitted for all JV parties. (These include MBD4, MBD5, MBD8, MBD 9, CSD and/ or SARS pin, Confirmation that the bidder's municipal rates and taxes are up to date.)
 - ii. In addition to the above the bidder must submit a Joint Venture (JV) agreement signed by the relevant parties.
 - iii. It is a condition of this bid that the successful bidder will continue with same Joint Venture (JV) for the duration of the contract, unless prior approval is obtained from City of Tshwane.
 - iv. JV agreement must be complete, relevant and signed by all parties.

Failure to comply with the above will lead to immediate disqualification.

Bidder

CERTIFICATE OF AUTHORITY FOR SIGNATORY

Status of concern submitting tender (delete whichever is not applicable):

COMPANY/PARTNERSHIP/ONE-PERSON BUSINESS/CLOSE CORPORATION/JOINT VENTURE

A. COMPANY

If the bidder is a company, a certified copy of the resolution of the board of directors that is personally signed by the chairperson of the board, authorising the person who signs this bid to do so and to sign any contract resulting from this bid, and any other documents and correspondence in connection with this bid or contract on behalf of the company, must be submitted with this bid.

An example is shown below:

By resolution of the board of directors on 20.....,
Mr/Ms has been duly
authorised to sign all documents in connection with
Bid Number

SIGNED ON BEHALF OF THE COMPANY:

IN HIS/HER CAPACITY AS

DATE:

SIGNATURE OF SIGNATORY:

WITNESSES: 1.

2.

B. PARTNERSHIP

The following particulars in respect of every partner must be furnished and signed by every partner:

Full name of partner	Residential address	Signature
.....		
.....		
.....		

We, the undersigned partners in the business trading as, hereby authorise to sign this bid as well as any contract resulting from the bid and any other documents and correspondence in connection with this bid or contract on our behalf.

.....		
Signature	Signature	Signature

.....		
Date	Date	Date

C. ONE-PERSON BUSINESS

I, the undersigned,, hereby confirm that I am the sole owner of the business trading as

.....	
Signature	Date

D. CLOSE CORPORATION

In the case of a close corporation submitting a bid, a certified copy of the founding statement of such corporation shall be included with the bid with a resolution by its members, authorising a member or other official of the corporation to sign the documents and correspondence in connection with this bid or contract on behalf of the company.

An example is shown below:

By resolution of the members at the meeting on 20..... at
....., Mr/Ms, whose
signature appears below, has been duly authorised to sign all documents in
connection with Bid Number

SIGNED ON BEHALF OF THE CLOSE CORPORATION:

IN HIS/HER CAPACITY AS:

DATE:

SIGNATURE OF SIGNATORY:

WITNESSES: 1.

 2.

E. CERTIFICATE OF AUTHORITY FOR JOINT VENTURES

This returnable schedule is to be completed by joint ventures.

We, the undersigned, are submitting this bid offer in joint venture and hereby authorise Mr/Ms , authorised signatory of the company..... , acting in the capacity of the lead partner, to sign all documents in connection with the bid offer and any contract resulting from it on our behalf.

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
Lead partner		Signature: Name: Designation:
		Signature: Name: Designation:
		Signature: Name: Designation:
		Signature: Name: Designation:

SPECIFICATION OR TERMS OF REFERENCE

ENERGY AND ELECTRICITY DEPARTMENT

Tender for the supply, repairs, delivery and off-loading of electrical tools and electrical testing equipment for the City of Tshwane: as and when required for a period of three (3) years

BID NUMBER

(EED 09-2024/25)

1. INTRODUCTION AND PURPOSE

This specification is for equipment and tools that are used for testing of electrical cables, substation's, transformers and Medium and Low voltage equipment.

2. BACKGROUND

Interruptions in electricity supply do occur due to faults in the City of Tshwane High, Medium and Low voltage electrical network. To locate faults in the electrical cable network, testing of High, Medium and Low voltage equipment such as substations, transformers etc. This assists the technical teams to speedily locate and identify the faults, to ensure speedy repairs off the said fault.

3. PROJECT SCOPE

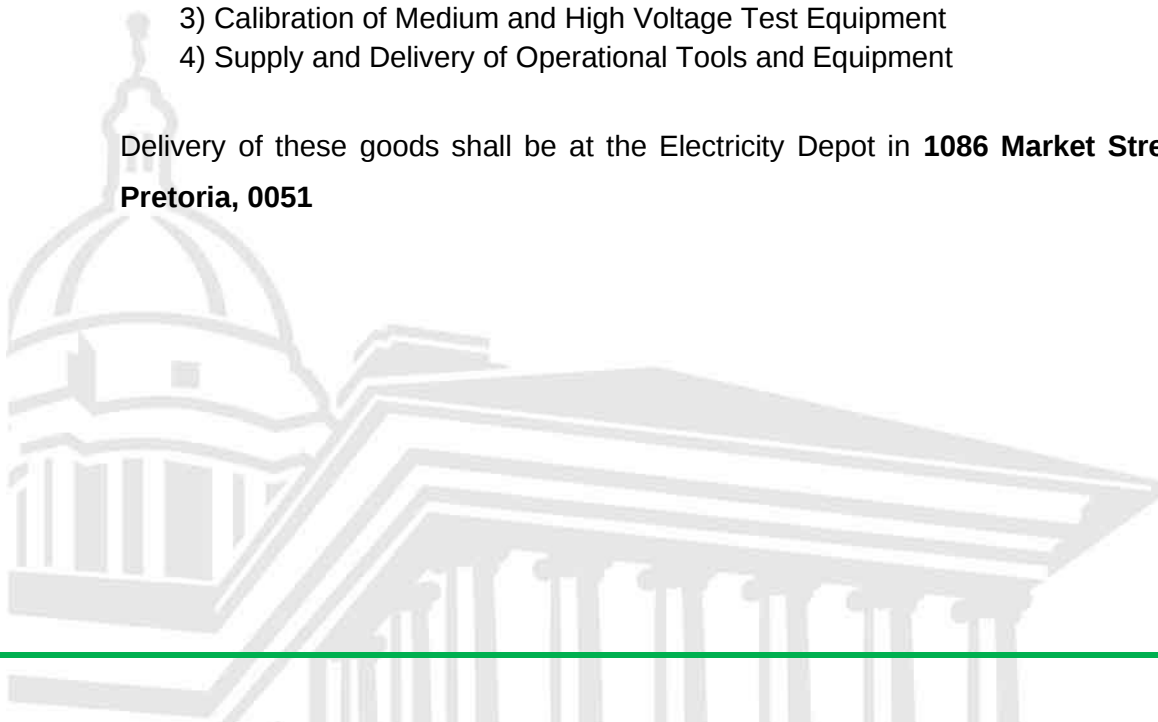
3.1. SCOPE

This specification covers the City of Tshwane (CoT)'s minimum requirements for the supply, repairs, delivery and off-loading of the following Low, Medium and High Voltage equipment (cable fault Equipment, Electrical Testing Equipment, Portable Electrical tools including specialised field test sets and other listed products and services), over a 3-year period. The tender will be awarded in sections and City of Tshwane must appoint One Service Provider per section.

The desired services to be offered by each Service Provider/s are:

- 1) Supply and Delivery of Medium and High Voltage Test Equipment.
- 2) Repair of Medium and High Voltage Test Equipment
- 3) Calibration of Medium and High Voltage Test Equipment
- 4) Supply and Delivery of Operational Tools and Equipment

Delivery of these goods shall be at the Electricity Depot in **1086 Market Street, Claremont Pretoria, 0051**



3.2. GENERAL REQUIREMENTS

Specific requirements for HV, MV and LV equipment are specified in Form A.1."Returnables"

- 1) Deviations offered to this specification shall be listed in the Deviation Schedule.
- 2) Item 1 to 20 is for Cable Fault Equipment.
- 3) Item 21 to 43 is for Electrical Test Equipment and Power measurement instruments.
- 4) The supplier is required to repair/ replace the equipment at no cost if the warranty is still active.
- 5) The supplier is required to repair such instrument with the same electronically affix components in the equipment and not use 2nd grade components, only OEM parts must be used in the execution of the repairs.
 - a) Failure to comply shall result in the supplier carrying the cost of replacement as per the contract agreement.
 - b) Repairs of the equipment must carry a 6 months warranty
- 6) The equipment should be returned not later than 30 days when sent for repairs. Failure to comply the supplier shall make available the instrument that CoT will use while they wait for repairs.
- 7) During repairs of any specific equipment if not returned in 30 days, contractor must provide loan equipment with the same capability of the one being repaired. The loan equipment should have equal ratings to the one being repaired. The provisions of the loan equipment will be on the account of the Supplier.
- 8) Test report and cost breakdown of the repair service should be sent with the invoice if the equipment has outlived its warranty life at the time of repairs.
- 9) The lead time for supply of all equipment should be that of maximum of thirty days.
The City has an option to rent

3.3. Compliance Requirements

All equipment supplied should have SABS certified stamp of approval or other international recognize institutions that have equal or more authority in prescribing quality levels and standards for the Equipment listed in the tender.

For Calibration: A SANAS accredited Laboratory shall be utilized for calibration and Equipment Inspections, to ensure appropriate standard of use for equipment. Calibration certificates will be issued for each machine offered. A periodic calibration schedule for all equipment supplied should be kept by the preferred tenderer. A copy of the schedule shall be made available to the CoT for Audit purposes and be submitted after contract finishes.

3.4. WARRANTY AND GUARANTEE

- All equipment must be warranted for at least two years and serviceable local after warranty at reasonable market related costs.
- Repairs of the equipment must carry a 6 months warrantee

3.5. MANUALS

- a) The successful tenderer shall supply two complete sets of technical manuals, in English, with each unit delivered. These manuals shall contain complete operating and maintenance instructions.
- b) The equipment shall not be considered delivered complete until the manuals have been supplied.

3.6. TSHWANE'S ELECTRICITY NETWORK MV/LV DEMOGRAPHICS

The following MV and LV cables are found in CoT's electricity network

MV and LV cables

MV Electric cable with armoring (SWA) and PVC as outer sheath to SANS 97

- 240 mm² (Copper - stranded)
- 185 mm² (Copper - stranded)
- 150 mm² (Copper - stranded)
- 95 mm² (Copper - stranded)
- 70 mm² (Copper - stranded)

MV Electric cable with polyethylene outer sheath without armouring (SWA) to SANS 97

- 240 mm² (Copper - stranded)
- 185 mm² (Copper - stranded)
- 150 mm² (Copper - stranded)
- 70 mm² (Copper - stranded)

MV Electric cable 6.35/11kV fully impregnated general-purpose single-core cable to SANS 97

- 630 mm² (Copper - stranded)

LV Cable, PVC-insulated 4-core copper cable with armoring (SWA) for the following cross-sectional areas per core:

- **240 mm²**
- **185 mm²**
- **150 mm²**
- **70 mm²**

Electric cable, PVC-insulated, single core copper cable without armoring for the following cross-sectional area per core:

- 400mm²

3.7. SECTION A: SUPPLY, DELIVERY AND OFFLOADING OF EQUIPMENTS AND INSTRUMENTS

3.7.1. Cable fault equipment

- Item 1: 32kV Surge Generator
- Item 2: 16kV Surge generator / thumper
- Item 3: Acoustic Listening Set
- Item 4: Fault Location Scope
- Item 5: Measuring wheel.
- Item 6: Multi-Frequency Line/Cable Location
- Item 7: Cable Identification Unit set
- Item 8: Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable
- Item 9: 45kV Very Low Frequency 0.1Hertz Test Set
- Item 10: 25kV DC Pressure Tester
- Item 11: 30/42kV AC/ DC Test Set
- Item 12: 11kV Phase Comparator
- Item 13: 11kV – 33kV Phase Comparator
- Item 14: Full Cable Testing Trailer
- Item 15: 32kV High Voltage – Cable Real System
- Item 16: Earthing Sets (35mm earthing-cable with 4x600amp clamps)
- Item 17: Installation of Cable Fault Equipment into a Tshwane owned vehicle.
- Item 18: Installation of Pressure Test Equipment into a Tshwane owned vehicle.
- Item 19: Repairs of Item: 1 to Item: 18
- Item 20: Calibration of Item: 1 to Item: 18

3.7.2. Test Instruments

- Item 21: Power Quality Recorder
- Item 22: Portable Power Quality Analyzer
- Item 23: Primary Injection Test Set
- Item 24: Secondary Injection Test Set
- Item 25: Transformer Test Set including Tan-Delta
- Item 26: Medium Voltage Auto Recloser Test Set
- Item 27: Current and Voltage Transformer Test Set
- Item 28: High voltage Circuit Breaker Test Set
- Item 29: Thermal Scanner
- Item 30: Battery Tester
- Item 31: Isolation Tester (500 – 10 000volts)
- Item 32: Small/Mini Clip-On Current Meter
- Item 33: Earth Tester
- Item 34: Transformer Testing Leads Sets (35mm² cable with 4x600amp clamps; 3x 4meter and 1x 15meter leads)
- Item 35: 2.5mm Panel wire
- Item 36: 4mm Panel Wire
- Item 37: 16mm Panel Wire (Green with yellow line)
- Item 38: Laptop for Engineering Configuration in the field/on-site
- Item 39: Laptop for Design; Configuration and running Simulations
- Item 40: Radio Frequency Interference & Acoustic Signal Surveyor

Item 41: Drone with Unique INFRA RED Heat Seeking Vision Detecting Hot-Spots
Item 42: Repairs of Item: 21 to Item: 41
Item 43: Calibration of Item: 21 to Item: 41

3.7.3. Special Equipment/ Tools and accessories

Item 44: Inverter Min 3 KW with Lithium ion 48volt Battery pack
Item 45: Inverter Min 5 KW with Lithium ion 48volt Battery pack
Item 46: Single Phase Generator 5 KVA
Item 47: Single Phase Generator 6.5 KVA
Item 48: Multi Meter
Item 49: Insulation Tester 1000volt
Item 50: Clamp-on Amp Meter 1000Amp AC/DC
Item 51: Cable Tracer, Amplifier Probe and Tone Generator.
Item 52: Repairs of Item: 44 to Item: 51
Item 53: Calibration of Item: 44 to Item: 51

3.7.4. Operational Tools and Equipment

Item 54: Electrical Toolbox Artisan
Item 55: Electrical Toolbox Engineering
Item 56: Electrical Toolbox Scada.
Item 57: Link Stick fixed 2meter
Item 58: Telescopic Link Stick 12m
Item 59: 12 Meter Fiberglass Extension Ladders (Eskom Spec)
Item 60: Small Crocodile clips 50mm
Item 61: Medium Crocodile clips 100mm
Item 62: Medium Battery clamps 300amp
Item 63: Large Battery clamps 600amp8

4. TECHNICAL SPECIFICATIONS

ITEM 1:

SPECIFICATION FOR 32kV SURGE GENERATOR / THUMPER

1. Description

This unit is used for the location of faults in power cable network and it generates voltages from 500 volts up to 32 kilo Volts (kV). This must be able to work in conjunction with pre-location unit and pinpoint location equipment to locate the position of cable faults. It must meet NRS 048 Quality of supply requirements.

2. Physical Characteristics

Weight must be less than 160 Kg

3. Instrument capabilities.

- Must be able to generate high voltages from 500V up to 32 kV with a minimum prove test-current of 20mili Ampere and burn-current of 250mili Ampere for 30seconds.

- The storage energy of the capacitor must at least be 2000 Joules (2kJ)
- The instrument must be able to be discharge into a faulty cable at adjustable intervals.
- The unit must have internal system to discharge both itself and cable under test when it is turned off.
- Surge generator supplied must be equipped with an earth-lock system on both the input and output side, which must lock the surge generator out from being turned on if the earthing is inadequate on either the input or output side.
- The unit must also be able to perform insulation resistant tests up to selected output levels (0 - 8, 16 and 32 kV)
- The unit must be able to perform impulse current method (sim) as well as Arc-echo (surge current method)

Power source

Supply Voltage	220 – 240 VAC
Supply Current	15A
Output Voltage	32kV
Surge Energy	≥2000J at 32kV
Voltage Level	Switched between 8, 16 or 32kV

4. Accessories

- Test cables - 15m, 6mm² HT lead with high current clamps (screened by 6mm²).
- Earth lead - 15m, 25mm² green / yellow earth wire
- Mains lead - 15m, 2.5mm² 3 core cable.

ITEM 2:

SPECIFICATION FOR 16kV SURGE GENERATOR / THUMPER

1. Description

This unit is used for the location of faults in power cable network and it generates voltages from 0 volts up to 16 Kilovolts (kV). This must be able to work in conjunction with pre-location unit and pinpoint location equipment to locate the position of cable faults. It must meet NRS 048 Quality of supply requirements.

2. Physical Characteristics

Weight must be less than 80 Kg

3. Instrument capabilities

- Must be able to generate high voltages from 0V up to 16 kV with a minimum prove test-current of 20mili Ampere and minimum burn-current of 125mili Ampere for 20 Seconds.
 - The storage energy of the capacitor must at least be 1000 Joules
 - The instrument must be able to be discharge into a faulty cable at adjustable intervals.

- The unit must have internal system to discharge both itself and cable under test when it is turned off.
- Surge generator supplied must be equipped with an earth-lock system on both the input and output side, which must lock the surge generator out from being turned on if the earthing is inadequate on either the input or output side.
- The unit must also be able to perform insulation resistant tests up to selected output levels (0 -5; 8 or 16kV)
- The unit must be able to perform impulse current method (sim) as well as Arc-echo (surge current method)

Power source

Supply Voltage	220 – 240 VAC
Supply Current	10A
Output Voltage	16kV
Surge Energy	800j -1100j at 16kV
Voltage Level	Switched between 0 - 5; 8 or 16kV

4. Accessories

- Test cables - 20m, 6mm² HT lead with high current clamps (screened by 6mm²).
- Earth cable - 20m, 25mm² green / yellow earth wire
- Mains lead - 20m, 2.5mm² 3 core cable.

ITEM 3:

SPECIFICATION FOR ACOUSTIC LISTENING SET

1. General description

The instrument specified shall be capable of pinpointing location of electrical cable faults by utilizing both the acoustic as well as the magnetic signals present during surge fault locating techniques.

2. Scope

- The unit shall be robust, compact, portable, and simple to operate and designed to pinpoint locate cable faults in networks up to and including 132 kV.
- The instrument shall be designed to receive both the acoustic and magnetic signals present during surge cable fault location.
- The unit shall consist of two parts namely the Receiver and Microphone with interchangeable feet for different ground conditions.
- The headphone driving amplifier in the instrument shall be capable of driving headphones with impedances as low as 8 ohms. The headphone interface should be such that any standard stereo headphone can be used such as the type available from any electronics utility store.

- The headphone supplied should be of the type that fully enclose the ears of the operator and cut out most ambient noise. The headphone should be made up of plastic and easily cleanable (wipe off with cloth)
- The instrument shall be powered by generally available batteries (with operating time of approximately 16 hours or better) which shall be accessible from the outside of the enclosure.

3. Performance features

- Acoustic amplifier
- The unit shall have excellent acoustic characteristics with a switchable filter against ambient noise and auto ranging digital readout for relative distance to the fault.
- Magnetic amplifier
- The unit shall be capable of receiving magnetic signals which are present along the cable under test. The operator shall have the capability to amplify or attenuate the signal to enable him to locate the position of the cable path under test. The receiver shall have a bar graph to indicate the magnetic field strength.

TECHNICAL SPECIFICATIONS

- Distance measurement
 - The instrument shall be capable of measuring the time interval between the two signals present and the result shall be digital displayed as a relative time difference to the fault.
- Display
 - The receiver shall have an LCD display that indicate the acoustic as well as the magnetic signal strength of the signal received. It will have an indication for the battery condition as well.
- Transmitter and receiver
 - Both will be rugged built for field operations and must be water proof.

4. Technical data

- Amplification adjustable range
Acoustic channel 0 - 65 dB or better
Magnetic channel 0 – 50 dB or better
- Acoustic display range
0 – 99.9 ms with overflow display greater than 100 dB.
- Frequency range with filter
Acoustic 100Hz - 1.5 kHz or better
Magnetic 270Hz - 1.5 kHz or better
- Power supply
Batteries with operation time of approx. 16 hours or better.

- Weight
Not more than 1.5Kg with batteries.

5. Accessories

The unit shall complete with the following standard accessories:

- Instrument case.
- One receiver.
- One ground sensor with extension piece / two ground sensors
- At least one stereo headset with stereo plug.
- All necessary connection cables (at least 1.5m).
- Operator manual in English.
- One (new) set of batteries.
- One handle with extension piece.

ITEM 4

SPECIFICATION FOR FAULT LOCATION SCOPE

1. Description

Fault Location Scope is an instrument used for pre-locating and pre-determining distances to faults existing in power cables. The unit must be able to work with City of Tshwane Medium Voltage Surge Generators which uses a BNC output connector. It must meet NRS 048 Quality of supply requirements.

2. Physical Characteristics

- Portable
 - Less than 3.5 KG
 - With required screening protection
 - Display – LCD with multi-level grey-scaling or colour with backlight.
 - Enclosure – scratch resistant PVC enclosure with lifetime guarantee.
 - Controls – water resistant front panel with switches.
 - Instrument capabilities
 - The instrument must be able to give reading in meters to the fault distance.
 - It must be able to show current waveform flowing in the cable for analysis.
 - The unit must be capable of pre-locating distance to fault in at least three modes.
- I. TDR (Time Domain Reflectometer) mode – matches impedances along the cable.
 - II. Impulse (Sim) Current mode – high voltage discharge generated by surge generator.
 - III. ARC-Echo (Surge current) mode - places over TDR waveform on top of the high voltage surge generated by the surge generator.
 - IV. ICE

3. Power source

- Rechargeable batteries with 240 volt AC-charger

4. Accessories

- Carry case and bag.
- All the necessary cables (at least 2meter long)
- External Coupling unit with BNC connector
- Operators' manual

ITEM 5:

SPECIFICATION FOR MESSURING WHEEL

- Measuring wheel 300mm in diameter.
- With handle +-1m
- Side stand.
- Carry bag.
- Foldable

ITEM 6:

SPECIFICATION FOR MULTI-FREQUENCY LINE LOCATION SYSTEM (ROUTE TRACER)

1. Introduction

The cable locator shall have an audio frequency receiver as well as an audio frequency transmitter in order to do cable route identification.

2. Frequency Receiver

It gives information on the position of the target conductor, the centre - line and the depth of the cable.

3. Features of the Frequency Receiver

- Numerous active frequencies preferably from 82 Hz to 491Hz as well as passive frequencies for power, radio and cathodic corrosion protection signals
- Line identification with "Signal Select" and "Distortion Alert".
- "Guidance Compass" for easier recognition of the direction of the cables and for finding connections and branches quickly.
- Depth and signal current intensity measurement.
- User switchable between automatic and manual sensitivity control
- Colour display with automatic backlight
- Interface for software updates
- Rechargeable Li-ion battery for continuous operation of at least 30 hours
- Precise direction guidance using right / left arrows.
- IP54 protection class or higher.

4. Frequency Transmitter

It transmits frequency signals into the cable for the receiver to be able to route trace the conductor and measures the line impedance.

5. Features of the Frequency Transmitter

- Preferably 6 active frequencies
- Selectable inductive output for every frequency in the range between 8.4 kHz and 82 kHz preferably.
- Automatic adjustment of the impedance in the range between 5 ohms and 5 Kilo ohms preferably.
- Graphically LCD display for the indication of the parameters (among others): current, drag resistance and output power.
- Graphical indication of the output power and the line resistance
- Operation via the integrated rechargeable battery
- Optional sheath fault location function

ITEM 7:

SPECIFICATION FOR CABLE AND PHASE IDENTIFICATION INSTRUMENT

1. Description

Cable and Phase Identification instrument is used to identify the right cable out of bundles of cables in trenches. It also helps in identifying a three-phase circuit by the identification of one of its conductors. This instrument must be able to do identification in all types of de-energised cables. It must meet NRS 048 Quality of supply.

2. Features

- It must consist of a generator / transmitter and receiver in order to do cable and phase identification.
- Online-communication of generator and receiver with digital impulse method.
- Internal rechargeable battery with built-in charger. Operation from 230 V AC mains and 12 V DC car adapter.
- It must be able to do cable selection in all types of de-energised cables.
- Battery status of generator must be displayed on the receiver.
- Receiver must be store and charged in generator case.
- Enclosure – water, dust tight and shock proof case.

3. Technical data

Display	-	125 x 60 pixel monochrome or better
Operation	-	water tight keypad
Power supply	-	internal rechargeable battery, 12 V DC or / and 230 V AC mains
Battery charger	-	built in
Operating time	-	approx. 3hrs or better (generator on rechargeable battery) approx. 7hrs or better (receiver)
Charging time	-	approx. 2hrs or better
Protection class	-	IP 54
Voltage with stand-		240 V AC
Weight	-	≤ 12 kg

4. Scope of delivery

- Generator
- Receiver
- Flexible coupler clamp (120 mm inner diameter) or direct Current Transformer
- Surface sensor
- Connecting leads (2 meters)
- Operating manual in English

ITEM 8:

SPECIFICATION FOR PHASE IDENTIFICATION INSTRUMENT IN EARTHED AND SHORT-CIRCUITED MEDIUM VOLTAGE CABLES

1. Description

The instrument must be able to be used to identify the different phases in three phase earthed and short-circuited medium cables. It must be able to eliminate the need of disconnecting the short-circuited and earthed circuits of cables taken out of service due to faulty conditions. The results of the faulty phase must be able to be displayed on the audio generator. The instrument should be in such a way that only one person can be able to identify the phases without any help. It must be plugged on one side and phases be identified on the other end. This must meet NRS 048 Quality of supply.

2. Features

- It must consist of an audio frequency generator and transceiver in order to do phase identification.
- Internal rechargeable battery with built-in charger. Operation from 230 V AC mains
- Enclosure – water, dust tight and shock proof case.

3. Technical data

Display	-	LCD display 98 x 23 mm or better.
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Power supply	- internal rechargeable battery and 230 V AC mains
Battery charger	- built in
Weight	- 10 kg or less
Output power	- 15 W or less
Frequency	- Any high frequency that will not interfere with other standard Services such as Telkom, Cell phone Services etc.

4. Scope of delivery

- Phase Identification Set.
- Set of cables
- Transporter case
- Operating manual

ITEM 9:

SPECIFICATION FOR A PORTABLE 45KV VERY LOW FREQUENCY (VLF) 0.1 Hertz TEST SET

1. SCOPE

This specification covers the supply and delivery of a Portable 45kV VLF 0.1Hz Test set.

2. STANDARDS

The equipment supplied against this specification shall comply fully with the requirements thereof and any deviations from the specification shall be clearly indicated in the Schedules of Particulars and Guarantees. NRS 048 Quality of supply.

3. CONDITIONS OF SERVICE

The units shall operate accurately and reliably under the following climatic conditions:

- Altitude above sea-level 1 530 m
- Maximum ambient temperature 45°C
- Minimum ambient temperature - 10°C
- Relative humidity up to 94%
- Other At times dry and dusty

SPECIFICATION FOR A PORTABLE 45kV VLF TEST SET

4. GENERAL

- The City of Tshwane has PVC, XLPE and PILC cables in the MV network. In order to carry out an effective over voltage test during acceptance testing of new cable installations and

the maintenance over voltage testing after splicing or fault location we require a lightweight portable Very Low Frequency, High Voltage Test Set. This test set should be capable of testing the above cables to the following relevant SANS Standards.

- SANS 1339 for XLPE Cable
 - SANS 97 for PILC Cable
 - SANS 10142 for MV Bundle Conductor
- The VLF Instrument shall be capable of producing a:
 - VLF Sinusoidal Test Voltage up to 45kV min.
 - VLF Square or Co sinus Test Voltage up to 45kV min.
 - 45kV pure sine wave
- The unit shall be short circuit proof and capable of burning/or arcing onto a fault or in the nearside termination without damaging the test instrument.
- The instrument shall have a burn mode in order to condition or assist in the location of the fault.
- The wave shall be true symmetrical sinusoidal or square (co sinus) wave form where the max. Symmetry allowed is 5% of reading independent of the load range.
- A real time display of the waveform shall be available on the screen together with the instantaneous voltage readings. The real time date and time shall be displayed.
- The load capacitance and meg-ohm-meter reading shall be displayed of the test sample.
- Operation of the unit shall be menu driven and easy to operate. All records shall be stored in the memory and available on the screen, via an RS232 or via Ethernet.
- The VLF must be able to test a cable for greater than 2km at 0.1.

ITEM 10:
SPECIFICATION FOR DC PRESSURE TESTER

1. Description

30kV-DC prove tester use the input voltage through a step-up transformer to obtain the high AC voltages. In case of DC output the AC must be rectified through a suitable rectifier capable of withstanding the high voltages. This units shall use AC to deliver 25kV DC kV with a minimum prove test-current 250m Amp for 30 seconds and burn-current of 200mili Ampere for 30seconds.

2. Features

- Supply voltage 220-240VAC
- Supply current $\leq 10A$
- Weight $\leq 50kg$
- Meters Current and voltage
- Voltage Level Adjustable

- Output burn Current 200mA continuous for 30 seconds
- Output Test Current 250mA continuous for 30seconds
- Output voltage $\geq 25\text{kVDC}$

3. Accessories

- Test cables - 20m, 6mm² HT lead with high current clamps (screened by 6mm²).
- Earth lead - 20m, 25mm² green / yellow earth wire
- Mains lead - 20m, 2.5mm² 3 core cable.

ITEM 11: **SPECIFICATION FOR AC/DC TESTER**

1. Description

AC/DC tester use the input voltage through a step-up transformer to obtain the high AC voltages. In case of DC output the AC must be rectified through a suitable rectifier capable of withstanding the high voltages. This units shall use a combination of AC and DC that is switched to deliver AC or DC or both.

2. Features

- Supply voltage 220-240VAC
- Supply current $\leq 10\text{A}$
- Weight $\leq 50\text{kg}$
- Meters Current and voltage
- Voltage Level Adjustable
- Output Current 250mA continuous.
- Output voltage $\geq 30\text{kVAC}$ and $\geq 42\text{kVDC}$

4. Accessories

- Test cables - 15m, 6mm² HT lead with high current clamps (screened by 6mm²).
- Earth lead - 15m, 25mm² green / yellow earth wire
- Mains lead - 15m, 2.5mm² 3 core cable.

ITEM 12: **SPECIFICATION FOR 11kV PHASE COMPARATOR**

1. Description

- 11kV Phase comparator **with analogue meter.**

2. Features

- 2x Phasing Sticks per 11kV set.
- Weight $\leq 10\text{kg}$
- Meters: Analogue Voltage

3. Accessories

- Aluminium carry case.
- 75mm Copper G-clamp

ITEM 13: **SPECIFICATION FOR 11kV – 33kV PHASE COMPARATOR**

4. Description

- 11kV or 33kV Phase comparator with analogue meter.

5. Features

- 2x Phasing Sticks per 11kV set.
- 2x Phasing Sticks per 33kV set including 2x extensions for the 33kV application.
- Weight ≤ 11kg
- Meters: Analogue Voltage

6. Accessories

- Aluminium carry case.
- 75mm Copper G-clamp

ITEM 14: **SPECIFICATION FOR FULL CABLE TESTING TRAILER**

1. General:

All equipment and accessories shall be installed in the trailer to ensure a safe and comfortable working experience, meeting the following requirements:

- An installation shall include all wiring with DB Board, Separation Transformer, central earth points and a minimum of two additional 3 point-plug outlets,
- Mounted but removable seat,
- Storage shelves for small portable equipment
- A counter-top for control units and additional workspace,
- An installation shall have an external orange warning lights system indicating the presence of high voltage or when the system is earthed.
- Installation shall include mounting brackets for the ground microphone.
- Installation shall include a discharge rod.
- HT Real System

2. Features

- Large Test Trailer
- 32kV Surge Generator as per Item 1
- 32kV HV Filter allows for the SIM/ ICE/ARC reflection method.
- High Resistance TDR Scope as per Item 4
- Secondary Impulse Method
- Measuring wheel as per Item 5.
- Inverter 230V Mains Supply System 5000Watt as per Item 37

- Cable and phase Identification instrument as per Item 7
- 30kV VLF Cable Pressure Tester, as per Item 9.
- Ground Microphone Acoustic Listening set as per Item 3.
- Route tracer as per Item 6
- 30m HV Reel system as per Item 15.
- 12kV Phasing/Test system as per Item 12.
- Discharge rod with a resistor to ensure soft discharge with a minimum voltage rating of 50kV
- An 1.2meter earthing spike and hammer

ITEM 15:
SPECIFICATION FOR 32kV MV– REAL SYSTEM:

1. HT – Real

- 30meter long, 6mm² HV lead with 600amp current clamps (screened by 6mm²).
- Silicone outer protective layer.
- HT coupler/connector must be fitted to the real.
- Must be equipped with braking system.

2. Earthing Real

- 30meter long, 25mm² fine multi strand copper wire with green / yellow PVC protective outer layer, earth wire.
- 25mm² copper centre lugs must be installed at 3meter intervals on the earth lead.
- Must be equipped with a braking system.

3. Mains Real

- 30meter long, 2.5mm² 3 core PVC cable.
- Must be equipped with a braking system.

4. Real Stand

- The real stand must be manufactured from 3mm mild steel, powder coated in black.
- The HT Real must be mounted at the bottom of the real stand.
- The Mains Real must be mounted above the HT Real on the real stand.
- The Earthing Real must be mounted above the Mains Real on the real stand.
- A G-clamp made from copper, must be mounted on top of the real stand.
- The real stand must have a base made of mild steel, measuring 350x450mm.

ITEM 16.

SPECIFICATION FOR MEDIUM VOLTAGE EARTING SET.

1. Description

- The earthing set supplied must have 4x 600amp battery clamps.
- The earthing set supplied must have 4x 40mm² copper leads with translucent PVC, 3 must be a minimum length of 80cm and the 4th lead must be 1.25meter long.
- The earthing set supplied must have a mechanical sound centre that will connect the 4x 40mm copper leads with translucent PVC.

ITEM 17:
SPECIFICATION FOR THE INSTALLATION OF CABLE FAULT EQUIPMENT INTO A
THSWANE OWNED VEHICLE:

1. Description

- Supply bracket for surge generator, fit and install Surge Generator complete with the required wiring, power supply and earthing.
- Supply bracket for the ICE/TDR Scope, fit and install ICE/TDR Scope complete with the required wiring and power supply.
- Supply bracket for the High-Tension Real System, fit and install High-Tension Real System complete with the required wiring and earthing system.
- Supply bracket for the 5kVA Inverter complete with distribution board, chop-over switch (Mains/Inverter), fit and install 5kVA Inverter complete with distribution board, chop-over switch (Mains/Inverter) with all the required wiring and earthing system to enable this system to be fully operational.
- Supply bracket for the 5kVA Generator, fit and install 5kVA Generator complete with exhaust outlet, including all the required wiring and earthing to enable this generator to supply power to the distribution board installed in the said vehicle.

ITEM 18:
SPECIFICATION FOR THE INSTALLATION OF PRESSURE TEST EQUIPMENT INTO A
THSWANE OWNED VEHICLE:

1. Description

- Supply bracket for DC Pressure Tester, fit and install DC Pressure Tester complete with the required wiring, power supply and earthing.
- Supply bracket for the High-Tension Real System, fit and install High-Tension Real System complete with the required wiring and earthing system.
- Supply bracket for the 5kVA Inverter complete with distribution board, chop-over switch (Mains/Inverter), fit and install 5kVA Inverter complete with distribution board, chop-over switch (Mains/Inverter) with all the required wiring and earthing system to enable this system to be fully operational.
- Supply bracket for the 5kVA Generator, fit and install 5kVA Generator complete with exhaust outlet, including all the required wiring and earthing to enable this generator to supply power to the distribution board installed in the said vehicle.

ITEM 19.
REPAIRS OF ITEM 1 TO ITEM 18

1. Description

- Repairs needs to be done from time to time on the above equipment on an as-and-when-needed basis.
- Tenders must quote for small, medium and major repairs respectively per Item.
- Small Repairs: voltmeter, current meter; MOV; LV wiring; key-lock; selection buttons
- Medium Repair: PC boards; contactors; Selector switches; HT wiring; LV Transformer; HT connectors.
- Major Repairs: Variable Voltage Transformer; HT Capacitor; HT Transformer.
- Service and repair report must be submitted with each repair.
- Repairs of the equipment must carry a 6 months guarantee

ITEM 20.
CALIBRATION OF ITEM 1 TO ITEM 18

1. Description

- Equipment must be calibrated on an annual basis.
- Repaired equipment must also be calibrated.

ITEM 21.
SPECIFICATION FOR POWER QUALITY RECORDER

1. Description

The power quality recorder, a measurement tool instrument for Voltage harmonics; current load manage management; Voltage profiles. It must meet NRS 048 Quality of supply requirements.

2. Physical Characteristics

- Portable
- Mountable type
- Less than 8 KG
- Metal casing: non-corrosive material

3. Equipment/ instrument capabilities

Voltage Inputs

- Must have 4 Differential input channels
- Voltage input range of 300 V rms
- Voltage accuracy 0.1 %(50- 300Vrms)
- VA Loading > 1M Ω (resistive)

Current Inputs

- | | |
|--------------------------------------|---------------------|
| • Galvanic isolated inputs | (4 channels) |
| • Input Range | 7.5 A rms |
| • Resolution | 250μA rms |
| • VA Loading | < 0.1VA @ 7.5 Arms |
| • Over-current withstand | 50 Arms up to 3 sec |
| • Continuous over-current withstands | 15 Arms |

Transducers inputs

- | | |
|------------------------------------|----------------------|
| • Must have 4 differential inputs. | |
| • Input range | 5Vrms |
| • Accuracy | 0.1% (50mV- 5 V rms) |
| • VA Loading | > 1MΩ (resistive) |

Other inputs

- | | |
|---------------------------------|------------------|
| • 8 Differential Voltage inputs | |
| • Voltage Input range | ± 300 Vdc |
| • Threshold | 12 Vdc (Digital) |

Data Analysis and conversion

- | | |
|--------------------------------|-------------------------------------|
| • Resolution | 16 Bits or more |
| • Sampling Rate | 128 x Fundamental Frequency(50 HZ) |
| • Over sampling | ≥ 4" |
| • Must have frequency locking. | |

Memory storage capacity

≥ 32 Megabytes (Flash RAM)

Communications

- | | |
|----------|--|
| • Medium | 2 x RS232; Direct; Modem; and / Ethernet |
|----------|--|

Supply Voltage

- | | |
|--------------|-----------------|
| • AC Voltage | 80-300V(50 HZ) |
| • DC Voltage | 50- 150 V DC |

ITEM 22.
SPECIFICATION FOR A PORTABLE POWER QUALITY ANALYZER

1. Description

Power quality analyser measure and monitor electrical power parameters (voltage, current, frequency, power consumption and harmonics) to avoid disturbances (abnormalities in voltage and current changes) and it also ensures the reliability of power distribution systems. It must meet NRS 048 Quality of supply.

2. Features

- Software compatible to Microsoft office format – software for analysis of recorded data
- Portable - less than 3.5 kg
- Display – colour graphical monitor (to indicate parameters falling outside limits)
- Enclosure – water and dust tight case and shock proof

3. Instrument capabilities

- It must have an internal memory of not less than 10 MB.
- It must be able to measure power systems parameters (voltage, current, frequency, power consumption/energy and harmonics)
- It must have at least four channels to measure voltage and current on all three phases and neutral.
- It must come with software that analyse recorded data and be able to create reports (Micro-soft office)
- Measuring voltage ac/dc – 1 up to 1000 V rms
- Frequency – 50 Hz

4. Included accessories.

- Carry case.
- Current clamps
 - Flexible current clamps for measuring up to 3000A
 - Small current clamps for measuring up to 400A
- Test leads.
- Battery charger
- Software compatible to Microsoft office format – software for analysis of recorded data
- Optical cable for USB
- User's manual in English

ITEM 23.
SPECIFICATION FOR PRIMARY INJECTION TEST SET FOR POWER SYSTEM EQUIPMENT IN THE HV/MV AND LV NETWORK.

1. Introduction

- Tests are to be performed manually or automatically (user selectable).

- The test system must have a wide range of output currents (ac + dc), output voltages as well as measurement options
- The current and voltage outputs shall be stabilized and regulated, i.e. the wave shape of the currents and voltages in terms of amplitude and frequency shall be independent of the quality of the mains supply. The unit shall be operable from a portable generator. Units utilizing an internal variac are not permissible.
- The unit shall include adequate precautions for safety: Emergency Off, bright ON and OFF lights, keyboard lock, earth wire connection check, optional facility for Deadman button
- The unit must have a front-panel control with back-lit LCD screen and keyboard.
- Test reports are to be generated on-line and automatically
- The test system shall be optionally controllable from PC in order to achieve fully automatic tests.
- Test templates are to be prepared in advance on a PC controller. Such test templates are to be up-loaded, and test results are to be down-loaded via either Ethernet LAN or USB memory stick.

2. Physical characteristics

- Multipurpose variable knob for high or low input levels
- Ethernet interface or USB connector for computer connection
- Safety power button

3. Equipment capabilities

- Must be able to inject up to a minimum of 800Amps of Current.
- Testing Current Transformers
- Testing Voltage Transformers
- Testing of Power Transformers
- Testing of Breaker's and Recloser's
- Measuring Resistances
- Sequencer Testing
- Primary Protection Relay Testing / Breaker Speed Timing
- Test reports are to be generated on-line and automatically
- Data Management Functions

TECHNICAL SPECIFICATIONS

Frequency

- Frequency of AC Signal shall be variable from 15 to 400Hz independent of the mains supply frequency
- User shall have the option of synchronizing output frequency to frequency of an external signal, e.g. mains supply
- Output frequency shall be regulated and independent of mains frequency and/or quality of mains supply.

Current Outputs

- AC Range 1 0 - 800A @ 4800VA; $V_{comp} = 6V$; Accuracy $<0.1\%$
- AC Range 2 0 - 6A @ 330VA; $V_{comp} = 55V$; Accuracy $<0.05\%$

- AC Range 3 0 - 3A @ 330VA; $V_{comp} = 110V$; Accuracy $<0.05\%$
- DC Range 1 0 - 400A @ 2600W; $V_{comp} = 6.5V$; Accuracy $<0.05\%$
- DC Range 2 0 - 6A @ 360W; $V_{comp} = 60V$; Accuracy $<0.08\%$

Voltage Outputs

- AC Range 1 0 - 2kV @ 2500VA; $I_{load} = 1.25A$; Accuracy $<0.05\%$
- AC Range 2 0 - 1kV @ 2500VA; $I_{load} = 2.5A$; Accuracy $<0.05\%$
- AC Range 3 0 - 500V @ 2500VA; $I_{load} = 5A$; Accuracy $<0.05\%$
- AC Range 4 0 - 130V @ 390VA; $I_{load} = 3A$; Accuracy $<0.05\%$

Current Inputs

- AC / DC range 0 - 10A AC or DC
- AC amplitude accuracy 0.05% of reading
- DC amplitude accuracy 0.03% of reading
- AC phase angle accuracy 0.10°

Voltage Inputs

- AC Range 1 0 - 300V AC
- AC Range 2 0 - 3V AC
- DC Range 0 - 10V DC
- AC Amplitude accuracy 0.05% for 3 - 300V AC (Range 1)
0.03% for 300mV - 3V AC (Range 2)
- AC Phase angle accuracy 0.10°
- DC Amplitude accuracy 0.03%

Resistance Measurements

- Range 1 $10\mu\Omega$ with 400Aac; Accuracy $<0.70\%$
- Range 2 $100\mu\Omega$ with 400Aac; Accuracy $<0.55\%$
- Range 3 $1m\Omega$ with 400Aac; Accuracy $<0.50\%$
- Range 4 $10m\Omega$ with 400Aac; Accuracy $<0.50\%$
- Range 5 $100m\Omega$ with 6Aac; Accuracy $<0.35\%$
- Range 6 1Ω with 6Aac; Accuracy $<0.35\%$
- Range 7 10Ω with 1Aac; Accuracy $<0.25\%$
- Range 8 100Ω with 5mA; Accuracy $<0.65\%$
- Range 9 $1k\Omega$ with 5mA; Accuracy $<0.51\%$
- Range 10 $10k\Omega$ with 5mA; Accuracy $<0.50\%$

Functional Tests

Manual Testing

- The user shall be able to do general purpose manual testing by selecting an injection source and up to two measuring variables. Based on the measuring variables, the test set shall calculate for: Power (real, apparent, reactive, j, $\cos(j)$)
- Impedance [Ω], resistance [Ω], reactance [Ω], capacitance [μF], inductance [μH].
- Ratio (if both variables selected is of the same type).
- Difference (if both variable selected is of the same type).
- Manual testing of current and/or voltage transformers should be possible by performing a manual ratio test, phase angle error test and measure the burden connected to the secondary of an instrument transformer.

Testing Current Transformers

- The testing unit shall be able to perform the following tests on CTs:
- Ratio test with measurement of nominal ratio, actual ratio and ratio error.
- Ratio test of bushing CTs of a power transformer
- Measurement of phase angle error.
- Measurement of burden connected to secondary (test to be performed at nominal current).
- Polarity check of CT at secondary terminals.
- Polarity check of secondary wiring with sawtooth waveform to check polarity at various points in substation (equivalent of flick test).
- Recording magnetization curve with automatic calculation of knee-point voltage and automatic demagnetization of core after the test.
- Secondary winding resistance measurement with automatic charging of winding before test and discharging of winding after test.
- AC voltage withstand test.

Special Applications

- Ratio test for bushing CTs of power transformers
- Ratio test of Rogowski coils (output: 150mV for I_{nom})
- Ratio test of optic CTs (output: low voltage signal)

Testing Voltage Transformers

- The testing unit shall be able to perform the following tests on VTs:
- Ratio test with measurement of nominal ratio, actual ratio and ratio error.
- Measurement of phase angle error.
- Measurement of burden connected to secondary (test to be performed at nominal voltage).
- Polarity check of VT at secondary terminals.
- Polarity check of secondary wiring at various points in substation, including checking the polarity of zero sequence (open delta connected) VTs
- Secondary winding resistance measurement with automatic charging of winding before test and discharging of winding after test.
- AC voltage withstand test.
- **Special Applications:** Ratio test of optic VTs (output: low voltage signal)

Testing of Power Transformers

- The testing unit shall be able to perform the following tests on PTs:
- Ratio test for each tap with measurement of nominal ratio, actual ratio and ratio error.
- Winding resistance measurement for each tap with automatic charging of winding before overall test and discharging of winding after overall test.
- Tap changer (OLTC) continuity test for each tap transition utilizing a dynamic winding resistance measurement technique.

Measuring Resistances

- Secondary winding resistance measurement of any CT, VT or PT with automatic charging of winding before test and discharging of winding after test.
- Contact resistance of breakers, isolators, etc.

Sequencer Testing

- The user shall be able to define a sequence of current or voltage states, each with independent amplitude and time length, e.g. 200A for 5s, 0A for 2s, 400A for 3s, 0A for 2s, 600A for 1s to test the tripping characteristic of pole-mounted auto-reclosers.

Primary Protection Relay Testing / Breaker Speed Timing

- The user shall be able to inject primary current quantities into a CT connected to a relay. The response / tripping time of the relay shall be timed accurately from the instance of current inception until the pick-up of the trip contact (voltage sensitive or potential free) .
- In a separate test the user shall be able to inject a primary current quantity into both a circuit breaker connected in series with the CT. The CT secondary is connected to a relay, which due to sufficient primary current will trip and thus trip the breaker. This in turn will result in an open circuit condition on the current outputs of the test set, which can be detected and thus timed. The time from current inception until such an open circuit is detected on the test set equates to the relay operating time plus the breaker tripping time. Subtracting the relay operating time, which was determined in the first test, the breaker tripping can be determined.

Power Supply Requirements:

- Nominal Voltage 240 V
- Permissible Voltage Range 215 V – 253 V
- Nominal Frequency 50 Hz
- Power Consumption <3500VA at 230V
<7000VA at 230V for a time of less than 10s
- Rated Current 10A at 230V
- South African Power cord

Software Requirements:

- Supported Operating Systems Newest Micro Soft Windows (32bit and 64bit)
- Data Management Functions Required:
 - Automatic Testing Database for HV plant assets
 - Data management functions for locations of assets
 - Data management functions for primary assets (power transformers, current transformers, circuit breakers, etc.)
 - Data management of testing jobs to be done on all primary assets
 - Provision of automatic connection diagrams for each type of test
 - Flexible tools to select specific tests ON and OFF
 - Automatic generation of reports including automatic Pass/Fail assessments
 - Back-up of Database

Accessories Required:

- High current test leads 2 x 9 m; 70 mm² (800 A)
- High voltage test leads 2 x 10 m; 0,5 mm² (screened, 2,000V)
- Measurement leads 6 x 10 m; 2,5 mm²
- Connection clamps 4x with connectors for 4mm banana plugs
- Crocodile clamps 4x with connectors for 4mm banana plugs

- Grounding cable 1 x 9 m; 6 mm² with connection clamp
- Other accessories: Connection lead from test set to PC
- Hardcover carry cases for test hardware with retractable handle and wheels
- Software for report downloading and configuration as well as offline test sequence generation.

Certificates Required for the Items to be delivered

- Environment: IP22 tested according to EN60529/A1:2000
- Safety: IEC61010-1; EN60950; EN50191, IEC61010-1 produced and tested in an EN ISO 9001 certified company
- Independent Test Laboratory: Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender

Local Support Required:

- Local on-site presentation LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
- Hotline support hours Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.
- Email support Email support to be offered with a guaranteed turnaround time of 1 business day.
- Number of units in operation in South Africa 10 units in Southern Africa (separate list of users with contact details to be provided)
- No of back-up units available in South Africa 2
- Calibration facility available in South Africa Yes
- Guaranteed turnaround time for repairs and calibration < 5 working days
- Product training offered in South Africa Training offered every three months in Tshwane
In-house / On-site training to be offered on request
- Warranty on Hardware Minimum of 5 years from date of delivery

ITEM 24.

SPECIFICATION FOR SECONDARY INJECTION TEST SET FOR ELECTRICAL PROTECTION RELAY TESTING AND MINI CIRCUITS OF THE HV/MV AND LV PANEL'S IN THE NETWORK.

1. Introduction

The secondary injection test set used for relay testing.

2. Physical characteristics

- LCD screen for measured readings value and result.
- Multipurpose variable knob for high or low input levels.
- Plastic/aluminium/ casing (IEC 60068-2-6 and IEC 60068-2-6)
- Ethernet interface or USB connector for computer connection

3. Equipment capabilities Required:

- Independent 110volt DC output for relay supply under test conditions.
- Must be able to generate AC Voltages, AC currents DC voltages.
- Must be able to inject up to a minimum of 130Amps of Current.
- Have a phase shift AC Voltage.
- Must be able to do secondary single and three phase injection.
- Be able to transfer results via an Ethernet interface or USB connector.
- Time delayed operation.
- Show test in progress indication.
- Automatic Pass/Fail assessment of all relay functions tested.

Must be able to tests the following types of relays:

- Directional Over current
- Distance relays.
- Over/under voltage relays
- Under current relays
- Earth fault relays
- Voltage regulation relays
- Auxiliary tripping relays
- Power factor relays
- Directional voltage relays
- Timers
- Testing of goose messages
- Energy meter testing.

Technical Specification Requirements:

- | | |
|------------------------------|--|
| • Current Output: | Variable amplitude, phase angle and Frequency |
| • Output Current | 0 - 110Aac and 0 - 100Adc |
| • Maximum output power | 600W (40A - 110A) -> Up to a max of 1000W at 50A and 400mΩ |
| • Maximum compliance voltage | 20V (0 - 15A) |
| • Maximum injection time | 110A for 2.2s; 15A for >2h |
| • Frequency range | 15 - 500Hz |

- Amplitude accuracy <1% at full scale
- Phase angle accuracy <0.1°

Voltage Output:

Independent and in addition to current output Variable amplitude, phase angle and frequency

- Output Voltage 0 - 150Vac and 0 - 220Vdc
- Maximum output power 30W (@150V)
- Maximum load current 200mA (0 - 150V)
- Maximum injection time 1min
- Frequency range 15 - 500Hz
- Amplitude accuracy <0.3% at full scale
- Phase angle accuracy <0.1°

Analogue Inputs:

- Number of inputs 2
- Measurement ranges 100mV, 1V, 30V, 300V
- Measurement amplitude accuracy <0.3% at full scale
- Measurement phase angle accuracy <0.1°

Binary Inputs:

- Number of inputs 2
- Timing accuracy 0.2ms

Micro-ohm Measurement:

- Measurement range 10μΩ - 10kΩ
- Measurement accuracy <0.15%

TEST FUNCTIONS:

- **Manual Injection** The user shall be able to do general purpose manual testing by selecting an injection source and up to two measuring variables. Based on the measuring variables, the test set shall calculate for:

Power (real, apparent, reactive, j, cos(j))

Impedance [Ω], resistance [Ω], reactance [Ω], capacitance [μF], inductance [μH].

Ratio (if both variables selected is of the same type).

Difference (if both variable selected is of the same type).

Manual testing of current and/or voltage transformers should be possible by performing a manual ratio test, phase angle error test and measure the burden connected to the secondary of an instrument transformer.

- **Timing measurement** Timing measurement defining the Start event and Stop event of a timing measurement
- **Timing events** Starting to inject, binary input picking up / dropping off; overload

Ramping Mode / State Sequencer

- The user shall be able to string any number of states of voltage and/or current after each other
- Transition from one state to the next should be either after a fixed time OR a specific event occurring at one of the binary inputs (e.g. pick-up and/or drop-out) OR an overload at the current output
- The transition from one state to the next should either be a step-change (instantaneous change), OR a linear ramp (of which the rate of change is definable) OR a pulse ramp (of which the pulse duration and reset states are fully definable)

Resistance Measurements

- The user shall be able to perform the following resistance measurements:
 - Micro-ohm (using DC current)
 - Ground-resistance (using AC current)
 - Normal resistance (using AC or DC current)

Secondary Polarity Tests

- The user shall be able to perform polarity checks of secondary wiring with a sawtooth waveform to check polarity at various points in substation (equivalent of flick test).

Software Requirements:

- Supported Operating Systems Newest Micro Soft Windows (32bit and 64bit)
- Data Management Functions Required:
 - Automatic Testing Database for plant assets
 - Data management functions for locations of assets
 - Data management functions for assets (power transformers, current transformers, circuit breakers, etc.)
 - Data management of testing jobs to be done on all assets
 - Provision of automatic connection diagrams for each type of test
 - Flexible tools to select specific tests ON and OFF
 - Automatic generation of reports including automatic Pass/Fail assessments
 - Back-up of Database

Accessories

- Current Injection Cable 2 x 2 m with 6mm plugs and heavy duty battery Clamps
- Measurement Cables 6 x (for injection and measurement cables with Battery Clamps)
- Power Supply Cable AC charger with AC cord
- Grounding Cable 1 x 6 m
- Carrying Bag For test set and accessories
- Hardcover Transportation Case For test set and accessories
- User Manual Via QR codes or Smartphone App
- Test Report Via HTML export via USB stick
- Software Newest Microsoft Office compatible

Power Supply

Unit to be battery powered for operation independent of any power / mains supply.

- Battery Capacity 150Wh
- Nominal voltage of charger 230 V
- Permissible voltage range 215 V - 253 V
- Nominal Frequency 50Hz
- Power Consumption Max. 180W

Dimensions and Weight

- Size (WxHxD) 360 mm x 320 mm x 230 mm
- Volume Max. 25 litre
- Weight Max. 15 kg (with protection cover)

Environment

- Operating Temperature -10 °C ...+ 50 °C
- Temperature for charging +5 °C ...+ 45 °C
- Storage Temperature -20 °C ...+ 50 °C
- Humidity 5 % ... 95 % r.h. (non-condensing)
- Max. altitude for operation 4000m

Certification:

- EMC – Immunity IEC 61326-1; IEC61000-6-5; IEC 61000-4-2/3/4/5/6/8/11/16/18
- Independent Test Laboratory Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender.

Local Support

- Local on-site presentation LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
- Hotline support hours Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.
- Email support Email support to be offered with a guaranteed turnaround time of 1 business day.
- Number of units in operation in South Africa 10 units in Southern Africa (separate list of users with contact details to be provided)
- No of back-up units available 2

in South Africa

- | | |
|--|--|
| • Calibration facility available in South Africa | Yes |
| • Guaranteed turnaround time for repairs and calibration | < 5 working days |
| • Product training offered in South Africa | Training offered every three months in Tshwane

In-house / On-site training to be offered on request |
| • Warranty on Hardware | Minimum of 5 years from date of delivery |

ITEM 25.

SPECIFICATION FOR POWER TRANSFORMER TEST SET FOR POWER SYSTEM EQUIPMENT IN THE HV/MV AND LV NETWORK.

Applications:

- Electrical Tests on Power Transformers
- Pure Three Phase Testing
- Testing of Power Transformers on Three and Single Phase Mode
- Auto transformers with or without tertiary
- All kinds of vector groups: YD, DY, ZD, DZ, 1 - 12
- Phase-shifting transformers.
- Ratio Test
- Magnetization currents
- Static Winding Resistance
- Dynamic Winding Resistance
- Short Circuit Impedance
- Demagnetization
- Tan-Delta / Capacitance Tests
- Data Management Functions:
- Data Management Functions
- Tests are to be performed manually or automatically (user selectable).
- The test system must have **THREE** independent phases of AC voltage output as well as **THREE** independent phases of DC current outputs.
- The voltage and current outputs shall be stabilized and regulated, i.e. the wave shape of the currents and voltages in terms of amplitude and frequency shall be independent of the quality of the mains supply. The unit shall be operable from a portable generator. Units utilizing an internal variac are not permissible.
- The unit shall include adequate precautions for safety: Emergency Off, bright ON and OFF lights, keyboard lock, earth wire connection check, optional facility for Deadman button.
- The unit shall have optionally a front-panel control with back-lit colour and touch-sensitive LCD screen

- Test reports are to be generated on-line and automatically and to be user customizable.
- The test system shall be controllable from PC in order to achieve fully automatic tests.

1. Physical characteristics

- Multipurpose variable knob for high or low input levels
- Plastic/aluminium/ casing (IEC 60068-2-6 and IEC 60068-2-27)
- Hardcover Transport case
- Ethernet interface or USB connector for computer connection
- Safety power button

Functional Tests

• Supported Assets

- Three phase and single phase transformers
- Auto transformers with or without tertiary
- All kinds of vector groups: YD, DY, ZD, DZ, 1 - 12
- Phase-shifting transformers

• Ratio Test

- All measurements to be performed on all three phases simultaneously and automatically
- All tap positions to be measured with the tap-changer controlled automatically from the test set for all tapping up and tapping down operations
- Measurements: Voltage ratio measurement, vector group phase shift and excitation current
- Calculations: Ratio deviation
- Assessment: Automatic assessment according to IEC, i.e. pass is when the ratio deviation $<0.5\%$
- Graphics: VTR vs. tap position, VTR deviation vs. tap position, vector group phase angle vs. tap position, excitation current vs. tap position

• Static Winding Resistance

- All measurements to be performed on all three phases simultaneously and automatically
- All tap positions to be measured with the tap-changer controlled automatically from the test set for all tapping up and tapping down operations
- Measurements: Winding resistance vs. tap position
- Assessment: Automatic assessment according to IEC, i.e. pass is when the resistance between the phases deviated by $>2\%$
- Graphics: Static winding resistance

• Short Circuit Impedance

- Short Circuit Impedance to be measured for a number of taps (typically minimum, nominal and maximum tap).

- No need to apply an external short circuit on the LV winding of the transformer, i.e. the short circuit should be applied internal to the test equipment, with allowance made for the test leads.
- Frequency Response of Stray Losses (FRSL) measurement to be possible
- **Demagnetization**
 - Test equipment to be able to demagnetize the core of a power transformer. A measurement of the magnetization level before and after de-magnetization is to be displayed.
- **Dynamic Winding Resistance**
 - All tap positions to be measured with the tap-changer controlled automatically from the test set for all tapping up and tapping down operations
 - Test routine is to automatically monitor the charging of the winding inductance and only take a measurement once measured values have stabilized. Also the test routine shall discharge the winding inductance of ALL charge after the test.
 - Measurements: Winding resistance, ripple of tap change current
 - Assessment: Automatic assessment according to IEC, i.e. pass is when the resistance between the phases deviated by >2%
 - Graphics: OLTC Scan for each tap transition superimposed on top of each other; Static winding resistance vs. tap position; ripple vs. tap position
- **Tan-Delta / Capacitance Tests**
 - Two independent measurement inputs should be provided
 - GST and UST tests should be possible for both inputs / switching unused inputs to guard.
 - Tip-up test by varying the voltage in a range of 2kV to 12kV
 - Frequency dependency: Varying the frequency in a range of 15Hz to 400Hz while performing the capacitance and tan-delta measurement.
 - Graphics: Capacitance and Tan-Delta vs. frequency

Software

Operating System Windows 10 (32bit and 64bit)

Data Management Functions Required:

- Automatic Testing Database for HV plant assets
- Data management functions for locations of assets

- Data management functions for all primary assets (e.g. power transformers, current transformers, circuit breakers, etc.)
- Data management of testing jobs to be done on all primary assets
- Provision of automatic connection diagrams for each type of test
- Flexible tools to select specific tests ON and OFF
- Automatic generation of reports including automatic Pass/Fail assessments
- Back-up of primary assets database with test results.
- Optional centralized database to which multiple users can synchronize their location, asset and job data and test results.

Hardware Specification Requirement:

- **Frequency** Frequency of AC Signal shall be variable from 15 to 599Hz independent of the mains supply frequency.

Output frequency shall be regulated and independent of mains frequency and/or quality of mains supply.
- **Voltage Outputs**
 - AC Range 1 $3 \times 0 - 230V$ L-N; $I_{load} = 100mA$
 - AC Range 2 $3 \times 0 - 80V$ L-N; $I_{load} = 16A$
 - AC Range 3 $3 \times 0 - 40V$ L-N; $I_{load} = 33A$
- **Current Outputs**
 - DC Range 1 $3 \times 0 - 16A$; $V_{max} = 113V$
 - DC Range 2 $3 \times 0 - 33A$; $V_{max} = 56V$
 - DC Range 3 $1 \times 0 - 100A$; $V_{max} = 56V$
- **Voltage Inputs**
 - AC range $0 - 300V$
 - Other AC ranges $30V, 3V, 300mV$
 - AC amplitude accuracy 0.012% reading + 0.003% range
 - DC range $0 - 424V$
 - Other DC ranges $42V, 4.2V, 420mV$
 - DC amplitude accuracy 0.01% reading + 0.02% range
- **Current Inputs**
 - AC range $0 - 40A$
 - Other AC ranges $4A$
 - AC amplitude accuracy 0.04% reading + 0.02% range
 - DC Range $0.56A$
 - Other DC ranges $5.6A$

- DC amplitude accuracy 0.04% reading + 0.03% range
- **Ratio Measurements**
 - Main Range 1:1 to 1:10
 - Other ranges 1:10 - 100; 1:100 - 1000; 1:1,000 - 10,000
 - Ratio accuracy 0.03% reading + 0.05% range
- **Resistance Measurements**
 - Range 1 0.1Ω..100Ω with up to 3Adc;
Accuracy <0.1% reading + 0.3% range
 - Range 2 0.1mΩ..10Ω with up to 30Adc;
Accuracy <0.05% reading + 0.05% range
 - Range 3 30μΩ - 30mΩ with up to 100Adc;
Accuracy <0.05% reading + 0.05% range

Tan-Delta / Capacitance Measurement

- Output voltage 0 - 12kV
- Output current up to 300mA for up to 2min
up to 100mA steady state
- Frequency 15Hz - 500Hz
- Accuracy Tan-delta < 0.1% of reading + 0.005% " (for readings of 0..10%, 45 - 70Hz, I<8mA)
- Capacitance Range 1pF ... 80nF at 12kV; 1pF...3μF at reduced voltage
- Accuracy Capacitance < 0.05% of reading + 0.1pF for I<8mA

Accessories

- High voltage and low voltage test leads: 15 m combination lead for all three phases and neutral, colour-coded RED, YELLOW, BLUE and Black
- Tap changer control lead 15m combination lead for tapping up and Tapping down signal.
- Connection clamps 4x Red & 4x Black Kelvin clamps
- Grounding cable 1 x 9 m; 6 mm² with connection Clamp
- Other accessories:
 - Power cord
 - Connection lead from test set to PC
 - Hardcover carrying cases for test hardware with retractable handle and wheels
 - Instruction Manual
 - Software for report downloading and configuration as well as offline test sequence generation.
- Hardcover Transport case A hardcover transport case is to be

provided for the test equipment for shipment / courier purposes.

Power Supply

- Nominal Voltage 240 V
- Permissible Voltage Range 215V - 253 V
- Nominal Frequency 50Hz
- Permissible Frequency Range 50Hz
- Power Consumption <3500VA at 230V continuous
- Connection IEC320/C20

Dimensions and Weight

- Size (W x H x D) 600mm x 400mm x 250mm
- Volume max. 55 litre
- Weight max. 20 kg

Environment

- Operating Temperature -10 °C ... +55 °C
- Storage Temperature -30 °C ... +70 °C
- Humidity 5 % ... 95 % r.h. (non-condensing)
- Altitude up to 2,000m operating, up to 12,000m storage

Certificates

- Independent Copies of test certificates from independent test laboratories Test
Laboratory proving compliance with the above standards are to be supplied together with the tender.

Local Support

- Local on-site presentation LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
- Hotline support hours Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.
- Email support Email support to be offered with a guaranteed turnaround time of 1 business day.
- Number of units in operation in South Africa 10 units in Southern Africa (separate list of users with contact details to be provided)
- No of back-up units available in South Africa 2
- Calibration facility available in South Africa Yes
- Guaranteed turnaround time < 5 working days

for repairs and calibration

- Product training offered in South Africa

Training offered every three months in Tshwane

In-house / On-site training to be offered on request

- Warranty on Hardware

Minimum of 5 years from date of delivery

ITEM 26.

SPECIFICATION FOR MEDIUM VOLTAGE AUTO RECLOSER TEST SET FOR AUTOMATED EQUIPMENT IN THE HV AND MV NETWORK

- All functions should be combined in one hardware unit
- The unit shall be of a robust and sturdy construction
- PC card design: Wire jumpers on a single printed circuit board are not permissible
- Electronic components: No potentiometers are allowed
- No moving elements or elements that are susceptible to damage, i.e. controls elements or displays on the face plate are permissible

Output Amplifiers

- The amplifier stages are to be fully electronic, i.e. not via transformer
- All current amplifiers to be fully protected and proof against any open-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shutdown of the amplifiers is NOT permissible
- All voltage amplifiers to be fully protected and proof against any short-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shutdown of the amplifiers is NOT permissible
- All amplifiers to use linear amplification elements and to be dc-coupled
- Ability to generate dc and ac signals
- The amplifiers, low-level outputs, the measurement inputs and the main power supply to be galvanically isolated from each other and earth (2kV insulation voltage)

Voltage Amplifiers

- Setting range 6x 0..8V, Option: 6x 0..150V_{rms} (L-N)
- Output power 6x 42W at 150V
- Load current 6x 280mA
- Accuracy < 0.05% typically, <0.1% guaranteed
- THD+N < 0.1% at full scale

Current Amplifiers

- Setting range 3x 0..12.5A_{rms}
- Output power 3x 95W
- Compliance voltage 3x 12V_{rms}, 3x 18V_{pk}
- Accuracy < 0.05% typically, <0.1% guaranteed

- THD+N < 0.1% at full scale
- Independent amplifiers The three current amplifiers are to be independent from the six voltage amplifiers

Low-level signal Generators

- 6 analogue low level signals to test controllers with low-level input, e.g. from Rogowski coils, linear voltage or linear current sensors must be provided
- Full simulation of Rogowski coil signal (i.e. first order differential of signal) to be performed in hardware.

Signal Generation

- All outputs to be continuously and independently adjustable in amplitude, phase (0 to +/- 360°) and frequency.
- Able to generate continuous sine waves with a frequency between dc and 599Hz.
- Frequency error to be less than 0.5 ppm.
- Phase error to be less than 0.005°

Binary Inputs

- Number of inputs 6 fully isolated galvanic inputs (2kV insulation voltage)
- Mode/Trigger criteria Pick-up and drop-out of potential-free contacts or dc voltages of up to 250Vdc. Trigger levels to be adjustable.
- Max. Input Voltage 250V
- Max. error < 100 μ seconds

Binary output contacts

- Number 9 in three potential groups
- Breaking capacity 250V / 0.5A
- Type Dry contacts that can be used to switch ac or dc

Time Synchronization

- Test set needs to be synchronise to the IEEE 1588 Precision Time Protocol (PTP) via Ethernet.
- Timing accuracy for PTP: 100ns.
- Maximum distance between GPS receiver and test equipment for PTP: 2000m.
- IEEE 1588 / PTP clock to be powered over Ethernet (PoE), i.e. no separate power supply should be necessary.

Interface to PC

- Interface to the IBM compatible PC via Ethernet interface OR USB
- 10/100Mbit/s copper (autosensing, autocross over) via RJ45 connector
- Note: Centronics parallel port (Lpt) and/or serial RS232 ports are not permissible as modern laptops do not provide such ports.
- Communications card to support IEEE 1588 / Precision Time Protocol (PTP) to synchronize the test set to a PTP enabled Grandmaster clock in the substation for Distributed tests of Distribution Automation Schemes.

Smart Adapters

- Connection to all kinds of recloser controllers via Smart Adapters
- Safe to Touch, Plug & Play technology, i.e. by plugging the relevant test lead in, the test set should configure itself for that specific recloser controller whilst all electrical outputs are insulated from the user's touch.
- Lead length: 2m and 7m
- One connector to support ALL types of recloser controllers

Software

- Windows 10 (32bit and 64bit) software. Long filenames, tool tip help, context sensitive menu function (right mouse click) and an integrated help browser must be provided.
- No programming to be necessary to test an application - entry of setting parameters to be all that is required to set up and perform a test
- Future expansions in functionality by means of software updates. Firmware updating to be handled by the software, i.e. exchange of any hardware components is not permissible.
- Generation of reports on paper or file. All graphics and text to be printable.
- Test report must be configurable to include custom information (tester, date of test, substation, reminders)
- It must be possible to test the whole recloser controller with one test routine.
- Test sequence to be pausable at pre-defined points in the test sequence, by popping up a custom instruction dialogue, instructing the user to switch certain functions ON or OFF, change a setting on the controller, ...
- Online Pass/ Fail assessment for ALL tests. This is particular important for automatic testing.
- Test software to be future proof to allow the complete testing of any new recloser controller, both in form of new smart adapters as well as in terms of the capability of the hardware of the test equipment.
- Full breaker simulation of the binary outputs in terms of auxiliary contacts (52a and/or 52b) as well as when to switch off the current must be possible in each test module
- Full control of the breaker in terms of closing or tripping the breaker from inside the software or from the front panel of the test equipment hardware must be possible.

Manual Test Functions

- Analogue Output Check:
 - Enter six phase voltages and three phase currents (in terms of unsymmetrical amplitudes, phase angle and frequency), displaying the voltage, currents and

power either numerically or vectorially - and compare these voltages, currents and power to the values displayed on the controller. Quantities to be displayed either in primary or in secondary quantities.

- Pick-up Test:
 - Manually ramp any voltage or current in terms of amplitude or frequency to determine the pick-up level of any such function. Automatic recording of results should be possible when a pick-up contact is available. Else manual stepping up/down must be possible.
- Tripping Sequence:
 - Determine the sequence of tripping and reclosing for all possible fault scenarios, i.e. successful and un-successful reclosing. All deadtimes and trip times are to be measured. Deadtimes are to be assessed automatically against nominal deadtimes entered
- Trip Time Characteristic Test:
 - The trip times are to be assessed against the theoretical tripping curve for all typical tripping curves available (Definite Time, Normally inverse, Very inverse, extremely inverse, Long-time inverse, TCC101, etc....) for all kinds of fault (A-N, B-N, C-N, A-B, B-C, C-A, A-B-C)
- Direct Test Mode:
 - Similar to the automatic output check - but with the option to switch instantaneously between pre-fault and fault states. Each of the six voltages and three currents are to be adjustable in amplitude, phase angle and frequency. Any binary input changes are to be recorded and timed in relation to the state switches.
- Restoration Test Mode:
 - This is a test mode to synchronize multiple hardware units via GPS and to ensure a time synchronized injection of all test quantities into multiple recloser controllers forming part of a Distribution Automation Scheme.
- Sequencer Test Mode:
 - The Sequencer tool allows creation and execution of custom test sequences.
- Harmonic:
 - The Harmonics tool tests harmonic blocking or restraint functions by applying harmonics of the 2nd and/or 5th order to currents and voltages.

Test Templates

- It must be possible to prepare test templates offline (i.e. without the test hardware connected) and ahead of the time.
- The person in the field then simply needs to execute each of the pre-prepared tests. Hence it should be possible for a lower-skilled person to conduct and execute the test template - with adequate training as well as guided by user instructions, which are part of the test template.
- Automatic assessment of the test results must be provided - where possible.

- The test template software should have a similar look and feel with the same setting possibilities as the manual test software.
- Test report with both numeric and graphical test results must be printable from the test results file.

ACCESSORIES REQUIRED:

- **Smart Adapters:** Nulec PTCC,
Schneider ADVC,
Tavrida RC05,
Cooper Form 4C,
Enteccc ETR300-R,
Noja RC15
- **Measurement leads:** 2m and 7m lead to be provided
- **Other accessories:** South African power cord with 16amp 3-pin plug
Connection lead from test set to PC
Hardcover carrying cases for test hardware with retractable handle and wheels
Soft Bag for test set and accessories
Instruction Manual
Software for report downloading and configuration as well as offline test sequence generation.

Power Supply

- Nominal Voltage 240Volt
- Permissible Voltage Range 215 – 253Volt
- Nominal Frequency 50Hz
- Permissible Frequency Range 50Hz
- Power Consumption 1000W at 230V
- Rated Current 8A at 230V
- Connection Must be a South African 1 phase - 3pin plug

Certificates

- Independent Test Laboratory Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender

Local Support

- Local on-site presentation LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
- Hotline support hours Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.

• Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.
• Number of units in operation in South Africa	10 units in Southern Africa (separate list of users with contact details to be provided)
• No of back-up units available in South Africa	2
• Calibration facility available in South Africa	Yes
• Guaranteed turnaround time for repairs and calibration	< 5 working days
• Product training offered in South Africa	Training offered every three months in Tshwane In-house / On-site training to be offered on request
• Warranty on Hardware	Minimum of 5 years from date of delivery

ITEM 27.

SPECIFICATION FOR CURRENT & VOLTAGE TRANSFORMER TEST SET IN THE HIGH VOLTAGE AND MEDIUM VOLTAGE NETWORK

1. Equipment capabilities

Voltage transformer

- Automatic testing
- Connection check
- Demagnetization
- Measurement of secondary winding resistance
- Measurement of excitation curve
- Measurement of ratio error and phase angle error
- Data Management Functions
- Test reports are to be generated automatically.
- Data Management Functions.

Current transformer

- Current and Winding Ratio
- Phase Displacement
- Polarity
- ALF (Accuracy Limiting Factor)
- Class
- Excitation Curve
- Knee-point Calculation
- Winding Resistance
- Secondary Burden
- Saturated and Unsaturated Inductance
- Demagnetization

Functions Required:

- Output Voltage 0 - 120Vac or dc
- Safe Output Voltages Higher Voltages than 120Vac are NOT permissible
- Output Current 0 - 5Aac / 15Apc
- Current Ratio 0.1 – 10000
- Phase Displacement 0 ° - +/-360 °
- Polarity Required (OK or NOT OK)
- Winding Ratio Ratio 0.1 – 10000
- ALF (Accuracy Limiting Factor) ALF to be determined for P class CTs
- Class Class is to be determined automatically
- FS (Instrument Security Factor) FS to be determined for M class CTs
- Ktd Transient dimensioning factor according IEC60044 6
- Kssc Symmetrical overcurrent factor according IEC60044-6
- Excitation Curve Knee points possible up to 30,000 V
- Knee point Calculation Depending on selected standard
- Winding Resistance 1mOhm - 300 Ohm (including temperature compensation)
- Secondary Burden 1m Ohm - 1kOhm, 35 VA
- Saturated Inductance Required
- Unsaturated Inductance Required
- Remanence Flux Required
- Secondary Time Constant Required
- Burden Simulation/Modelling No external burden to be required
Burden free adjustable
Recalculation of ratio error depending on actual burden
- Primary Current Simulation Recalculation of ratio error depending on actual primary current
- Automation Fully automatic test of selectable tests
- Duty Cycle Continuous
- Remote Control Must be possible via PC
- Nameplate Guessing possible without the knowledge of the nominal
Data determination of type, nominal currents, burden, class/ALF
- Demagnetization Automatically after CT test
- Assessment Automatically according to nominal data and standard
- Tapped CTs Automatic testing without the need for rewiring of tapped CTs with up to five taps is required
Winding resistance, excitation curve and ratio tests are to be carried out for all intermediate taps, i.e. 1S1-1S2, 1S1-1S3, 1S2-1S3
- Speed of full test The full test of each core must be completed in less than 60s

Accuracy

- Ratio Range 0.2 - 1: 0.1 % (Must be guaranteed)

- Phase
Range 1 - 2000: 0.05% (Must be guaranteed)
Range 2000 - 5000: 0.1 % (Must be guaranteed)
Range 5000 - 10000: 0.2 % (Must be guaranteed)
Accuracy: 0.05 ° (Must be guaranteed)
Resolution: 0.01 min
- Winding Ratio
Accuracy: 0.1 % (Must be guaranteed)
Resolution: 0.01 turns
- Winding Resistance
Accuracy: 0.1 % + 1m Ohm (Must be guaranteed)
Resolution: 1m Ohm
- Secondary Burden
Accuracy: 1 % (Must be guaranteed)
- Measurement Secondary Voltage
Range: 0 - 300 V
Accuracy: 0.1 % (Must be guaranteed)
- Measurement Primary Voltage
Range: 0 - 30 V
Accuracy: 0.1 % (Must be guaranteed)
- Copies of detailed calibration report and certificates from independent calibration laboratories proving above accuracy figures are to be supplied together with the tender

Standards

- Measurement CTs: Class 0.1 - 5 IEC 60044-1; IEC 61869-2
- Protection CTs(class P, PR and PX, e.g. 5P20, ...) IEC 60044-1; IEC 61869-2
- Protection CTs: Class TPS, TPX, TPY, TPZ IEC60044-6
- Measurement CTs: Class 0.3 - 1.2 IEEE C57.13-1993
- Protection CTs (class C, K, T) IEEE C57.13-1993

Reporting and Software

- Embedded Software
Must allow fully automatic tests
- Display
Must be sunlight readable graphic display with contrast adjustment
- Keyboard
must be available for entering the settings
- Remote Control
on PC for remote control
- Test Storage
min. 1000 test records
- PC-Connection
USB connection
- Storage Medium
Compact Flash Card
- Viewer/Printing
software must be able to view and print on PC
built in thermal printer is allowed
- Reporting
Automatic import into MS Excel for post-processing with full customization possible (e.g. own logo)
Comparison of various test results on same report

Accessories

- Injection Cable 1 x 3 m
- Measurement Cables 1 x 3 m + 1 x 15 m
- Battery Clamps 6 x (for injection and measurement cables)
- Power Supply Cable Must be an South African power cord
- Grounding Cable 1 x 6 m
- Carrying Bag Must be included for test set and accessories

• Hardcover Transportation Case	Must be included for test set and accessories
• Connection Cable to PC	Must be included
• Flash Card	Minimum of 128 MB
• Flash Card Reader	Required
• User Manual	Required
• Software	Required for Test Set and PC
• Test Report	Required
• Calibration Certificate	Required

Power Supply

• Nominal Voltage	240 V
• Permissible Voltage Range	215 V – 253 V
• Nominal Frequency	50 Hz
• Power Consumption	Max. 500 VA

Certificates

• Environment	IP22 tested according to EN60529/A1:2000
• Safety	IEC61010-1; EN60950; EN50191, IEC61010-1 produced and tested in an EN ISO 9001 certified company

Local Support

• Local on-site presentation	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
• Hotline support hours	Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.
• Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.
• Number of units in operation in South Africa	10 units in Southern Africa (separate list of users with contact details to be provided)
• No of back-up units available in South Africa	2
• Calibration facility available in South Africa	Yes
• Guaranteed turnaround time	< 5 working days

ITEM 28.

SPECIFICATION FOR HIGH VOLTAGE 3-IN-1 3-PHASE CIRCUIT BREAKER TEST SET IN THE HIGH VOLTAGE AND MEDIUM VOLTAGE NETWORK

Applications

- High-Voltage Three Phase Circuit Breakers
- Medium-Voltage Three Phase Circuit Breakers

General

- Main test system to combine timing test, contact resistance test and power sources for trip and close coils in ONE test hardware.
- Tests are to be performed manually and/or fully automatically
- User friendly test software to guide user through all the tests necessary for a specific type of breaker, including connection diagrams for each type of test etc.
- Testing of high voltage circuit breakers without rewiring in-between timing and contact resistance tests.
- Reduced wiring effort between main poles of breaker and the test set, by using mobile satellite modules mounted at the head of a breaker (multiple units for multiple breaks).
- Three phase testing of HV breakers with up to eight breaks per phase must be possible with one test, i.e. with no re-wiring in between.
- The unit includes adequate precautions for safety: Emergency Off, bright ON and OFF lights, ground wire connection check, optional facility for Deadman button.

Functional Tests Required to be Performed

Testing Medium-Voltage CB

- **Contact resistance test**
 - Resistance measurement data:
 - I DC - DC test current
 - V DC - Measured voltage
 - R meas - Measured resistance
 - R min/R ref - Minimum assessment limit / reference resistance value
 - R max/R dev - Maximum assessment limit / Allowed deviation from the reference resistance value
 - Assessment - Automatic measurement assessment
- **Minimum pickup test**
 - Minimum Pickup Measurement Data
 - Number of measurements
 - Trip or close
 - Pickup voltage of the circuit breaker under test
 - V min/ V ref - Assessment limit
 - V max/V dev - Assessment limit
 - Assessment - Automatic measurement assessment

- **Timing test**
 - Timing measurement data:
 - Open time - Contact open time
 - Open synch. - Open synchronization time
 - Close time - Contact close time
 - Close synch. - Closing synchronization time
 - Reclose time - Contact reclose time of OC operation
 - Trip-free time - Contact trip-free time of CO and O-CO operation
 - Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation
 - Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation
 - t_{min}/t_{ref} - Minimum operating time limit/Operating time reference value
 - t_{max}/t_{dev} - Maximum operating time limit/Operating time deviation
 - Peak current - Coil peak current value through a trip or close coil
 - Assessment - Automatic assessment of coil characteristics
 - Software to graphically display the main contacts, auxiliary contacts and trip and close coil currents and voltages vs. time.
 - Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.
- **Motor current test**
 - Software to display the motor current vs. time graphically.
 - Measurement of peak motor current and duration of spring re-charging
 - Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities, zoom facilities as well as graphical comparison is to be provided.

Testing High-Voltage CB

- **Contact resistance test**
 - Test with mobile satellite unit
 - Resistance measurement data:
 - Channel - Channel of the mobile unit
 - I_{DC} - DC test current
 - V_{DC} - Measured voltage
 - R_{meas} - Measured resistance
 - R_{min}/R_{ref} - Minimum assessment limit / reference resistance value
 - R_{max}/R_{dev} - Maximum assessment limit / Allowed deviation from the reference resistance value
 - Assessment - Automatic measurement assessment
- **Timing test**
 - Timing measurement data:
 - Open time - Contact open time
 - Open synch. - Open synchronization time
 - Close time - Contact close time
 - Close synch. - Closing synchronization time
 - Reclose time - Contact reclose time of OC operation
 - Trip-free time - Contact trip-free time of CO and O-CO operation

- Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation
 - Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation
 - t_{min}/t_{ref} - Minimum operating time limit/Operating time reference value
 - t_{max}/t_{dev} - Maximum operating time limit/Operating time deviation
 - Peak current - Coil peak current value through a trip or close coil
 - Assessment - Automatic assessment of coil characteristics
 - Software to graphically display the main contacts, auxiliary contacts and trip and close coil currents and voltages vs. time.
 - Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.
- **Dynamic contact resistance measure**
 - Dynamic contact resistance measurement data:
 - Open time - Contact open time
 - Open synch. - Open synchronization time
 - Close time - Contact close time
 - Close synch. - Closing synchronization time
 - Reclose time - Contact reclose time of OC operation
 - Trip-free time - Contact trip-free time of CO and O-CO operation
 - Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation
 - Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation
 - t_{min}/t_{ref} - Minimum operating time limit/Operating time reference value
 - t_{max}/t_{dev} - Maximum operating time limit/Operating time deviation
 - Peak current - Coil peak current value through a trip or close coil
 - Assessment - Automatic assessment of coil characteristics
 - Software to graphically display the main contacts, auxiliary contacts, dynamic contact resistance for each pole and phase and trip and close coil currents and voltages vs. time.
 - Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided
- **Minimum pickup test**
 - Minimum Pickup Measurement Data
 - Number of measurements
 - Trip or close
 - Pickup voltage of the circuit breaker under test
 - V_{min}/V_{ref} - Assessment limit
 - V_{max}/V_{dev} - Assessment limit
 - Assessment - Automatic measurement assessment
- **Motor current test**
 - Software to display the motor current vs. time graphically.
 - Measurement of peak motor current and duration of spring re-charging.
 - Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.

- **Physical motion analysis**

- For HV breakers with independent mechanisms, the test set should record the physical motion of three independent phases at the same time.
- Facility to connect rotational and/or linear motion transducers.
- Both analogue transducers (using resistance principle) and digital transducers (using an optical pick-up principle) to be supported.
- Measurement of physical motion (distance) and average speed.
- Software to graphically display the physical motion vs. time on the same graph as the dynamic contact resistance vs. time.
- Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.

Software

- Supported Operating System Windows 10 (32-bit and 64-bit)
- Functionality
 - Creation of manual tests with assessment functions
 - Creation of pre-prepared test templates which include all test object parameters as well as test settings.
 - Automatic generation of test reports including automatic Pass/Fail assessments
 - Database functionality to sort and manage test data by location, asset and job.
 - Comparison of test results between different assets of the same type and/or jobs performed on the same asset.

ACCESSORIES REQUIRED:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Mobile satellite module for main contacts | <p>THREE mobile main contact modules to be provided. Each mobile module is a probe for timing, static and dynamic resistance measurements on circuit breaker's main contacts. It facilitates measurements where current is injected over the circuit breaker interrupter while the circuit breaker is operated (tripped or closed).</p> |
| <ul style="list-style-type: none"> • Mobile satellite unit for physical motion transducer | <p>ONE mobile transducer module to measure THREE independent mechanisms with an analogue or digital transducer</p> |
| <ul style="list-style-type: none"> • Physical motion transducers | <p>ONE digital linear transducer and ONE digital rotational transducer to be provided</p> |
| <ul style="list-style-type: none"> • Main lead • Ground lead | <p>South African power cord
1 x 6 m grounding cable (6 mm²) with connection clamp</p> |
| <ul style="list-style-type: none"> • Communication lead • Ether-CAT cable | <p>Connection lead from test set to PC
15m Ether-CAT connection leads for connection of all mobile modules</p> |
| <ul style="list-style-type: none"> • Measurement leads | <p>All necessary test leads and test clamps to conduct a full test on either a MV breaker (with just the main unit) or HV breaker (with mobile satellite units) to be provided with the test equipment.</p> |

- Crocodile clamps
- Kelvin clamps
- Physical motion analysis

Sufficient clamps for 4mm banana plugs
Sufficient Kelvin clamps FZ60, rated for 100A
All accessories to mount the physical motion transducer for both linear motion analysis as well as rotational motion analysis to be provided with the test equipment.

- Hardcover case

Hardcover carrying cases for test hardware with retractable handle and wheels

- Manual

Start-up manual in English both in hardcopy and full user / reference manual in softcopy (PDF) format.

HARDWARE SPECIFICATIONS:

Current Outputs Required:

- DC source - single phase
- DC source - three phase
- Compliance voltage
- DC source - mobile units
- Compliance voltage -

1x 0 $\pm$ 150Adc for up to 5min, 0 $\pm$ 72Adc for up to 15min

3x 0 $\pm$ 50Adc for up to 5min, 0 $\pm$ 24Adc for up to 15min

Vcomp = 50Vdc subject to a power limit of 3200W for 30s and 2400W for 2h

6x 0 $\pm$ 100Adc or 3x 0 $\pm$ 200Adc for up to 6.2s based on 100 $\mu\Omega$

Vcomp = 2.6Vdc subject to the mobile units mobile units charged to 100%

Voltage Outputs Required:

- DC high range
- DC low range
- AC high range
- AC low range
- Power limit

0 to $\pm$ 300Vdc for max. 27.5Adc for 30s (12Adc for 2h)

0 to $\pm$ 150Vdc for max. 55Adc for 30s (24Adc for 2h)

0...240Vac for max. 20Aac for 30s (12Aac for 2h)

0...120Vac for max. 40Aac for 30s (24Aac for 2h)

All voltage output specifications are subject to a power limit of 3200W for 30s and 2400W for 2h

Resistance Measurements Required:

- Range 30mV
- Range 300mV
- Range 3V
- Range 3V

0.1 $\mu\Omega$ - 300 $\mu\Omega$ at 100A meas. current, 0.2% rd + 0.1 $\mu\Omega$ accuracy

0.5 $\mu\Omega$ - 3m Ω at 100A meas. current, 0.2% rd + 0.5 $\mu\Omega$ accuracy

5 $\mu\Omega$ - 30m Ω at 100A meas. current, 0.2% rd + 5 $\mu\Omega$ accuracy

50 $\mu\Omega$ - 300m Ω at 10A meas. current, 0.2%

rd + 50μΩ accuracy

Voltage Input (V IN) CAT III

- DC Input 0 - 420V with 0.5% rd + 0.5% fs typical Accuracy
- AC input 0 - 300V with 0.5% rd + 0.5% fs typical Accuracy

Internal Measurement of Outputs

- 300V range 0 - 300V, DC 0.1% rd + 0.05% fs acc. AC: 0.03% rd + 0.01% fs acc.
- 3V range 0 - 3V, DC: 0.1% rd + 0.05% fs accuracy
- 300mV range 0 - 300mV, DC: 0.1% rd + 0.05% fs accuracy
- 30mV 0 - 30mV, DC: 0.1%
- 55A range 0 - 55A, DC 0.1% rd + 0.2% fs accuracy
- 40A range 0 - 40A, AC 0.1% rd + 0.1% fs accuracy

Binary Input (A) CAT III

- Binary input type Toggling with potential-free (dry)
- Maximum sample rate 40kHz
- Minimum resolution 25μs

POWER SUPPLY SPECIFICATION:

- Nominal Voltage 240Volt
- Permissible Voltage Range 215 – 253Volt
- Nominal Frequency 50Hz
- Permissible Frequency Range 50Hz
- Power Consumption <3500W at 230V (<5000W peak)
- Rated Current 16A at 230V
- Connection Must be a South African 1 phase 3pin

CERTIFICATES REQUIRED:

- Independent Test Laboratory Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender

LOCAL SUPPORT:

- Local on-site presentation Local based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at our companies. substation on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.
- Hotline support hours Local telephonic support to be offered in the

	hours of 07h00 - 20h00 South African time.
• Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.
• Number of units in operation in South Africa	10 units in Southern Africa (separate list of users with contact details to be provided)
• Number of back-up units available in South Africa	2
• Calibration facility available in South Africa	Yes
• Guaranteed turnaround time for repairs and calibration	< 5 working days
• Product training offered in South Africa	Training offered every three months in Tshwane
	In-house / On-site training to be offered on request
• Warranty on Hardware	Minimum of 5 years from date of delivery

ITEM 29.
SPECIFICATION FOR THERMAL SCANNER

1. Physical characteristics

- Rugged casing.
- one-handed, easy-to-use interface
- Less than 2kg

2. Device capabilities

- High performance 320x240 thermal imaging camera.
- Measures temperatures from -20 °C to +1200 °C (-4 °F to +2192 °F).
- Faster communication with wireless image transfer directly to PC or smart phone.
- Backlit ruggedized LCD capacitive touchscreen.

ITEM 30.
SPECIFICATION FOR BATTERY TESTER

Application

The most reliable method for the determination of battery capacity is to perform a discharging cycle periodically.

The charger must be able to perform such test combining efficiency with portability. It must be capable to test any type of battery with a discharging current up to 130Ampere with external loads.

Medium and High Voltage Substations are equipped with batteries of different types and regular test according to international standard are requested to assure the standby power for relays, circuit breakers, measuring equipment and communication systems.

- High power battery capacity test system
- Discharging current up to 1300A with external loads (up to 9)
- Graphical display showing test parameters, curves and results
- Internal memory
- Light and easy to carry, with handles and wheels
- Shunt or clamp metering of an additional current
- Suitable for all battery types

Specification

Maximum discharging current

<u>Battery Nominal Voltage</u>	<u>Max Current Discharged</u>
• 240 V	70 A
• 220 V	70 A
• 140 V	130 A
• 110 V	130 A
• 48 V	130 A
• 24 V	130 A
• It is possible to parallel up to 9 external loads ELU 200 MKII	
• The test set shows on the large back-lighted LCD display the following parameters:	
- Battery voltage	
- Minimum voltage threshold (adjustable), with automatic stop	
- Discharging current, power or profile	
- Ah (ampere-hour) discharged	
- Test time duration with automatic stop at time out	
- Test conditions are all displayed	
- Discharging curve is displayed	
- Test parameters are entered via the functional push button and the graphical display on the front panel	

Load patterns required:

- Constant discharge current
- Constant power
- Current profile (up to 20 steps)
- Power profile
- Manual control

Measurement of the Discharging Current required:

- Range: 0 - 130 A
- Display: 0 - 130 A (0 - 1300 A with external loads)
- Accuracy: $\pm 1\%$ of the value, $\pm 0.2\%$ of the range
- The discharging activity can be stopped and started again later from the same level

External Current Measurements Required:

- Testing to be carried out without disconnecting the battery.

- Using the optional current clamp, it must measure the total current while regulating it at a constant level.
- The external current measurement can be performed also by shunt connection.

External Current Measurement Required with Clamp or Shunt:

- 1V - 100mV (100m Ohm - 0.1m Ohm) with 10A - 1000A

Maximum Float Voltage Required:

- Up to 270V

Required Measurement of the Battery Voltage:

- Range: 0 - 300 V
- Display: 0 - 99.9 or 0 - 999 V; auto ranging
- Accuracy: $\pm 1 \%$ of the range, $\pm 0.2 \%$ of the range

Required Setting of the Maximum Testing Time:

From 0 to 15 hours or infinite (without recording)

Internal Memory Required:

- 8 discharging sequences; non-volatile internal memory

Minimum Automatic Stop Functions:

- Minimum voltage threshold
- Maximum capacity
- Time out (Max. 9h.59')
- System alarm

Interfaces Required:

USB and CAN - BUS for external loads control

Software Requirements:

- The software for the charger must be integrable with the newest Microsoft Windows and allows you to control the charger from a Lap-Top PC.
- The software must perform the following features:
- Set the charger testing parameters;
- Display on the PC screen the following parameters in graphic and tabular form:
 - Battery voltage
 - Current discharged
 - Ampere-hour discharged
 - Time - Test duration
- IT manages the BTS alarms
- Possibility to define a discharge current profile with max. 20 steps
- When the test is completed, it is possible to save the results and to print it both in graphic and tabular form
- Software and firmware must be downloadable to be updated directly

The following table lists a number of different types of batteries, the discharge current and the discharge power that must be programmable. The value chosen for the Ah capacity is just a reference one: test current can be scaled to the actual capacity.

NOMINAL BATTERY VOLTAGE	NOMINAL CAPACITY	CONSTANT CURRENT	CONSTANT POWER	TEST DURATION	DISCH. CAPACITY	END OF TEST VOLTAGE
V	Ah	A	kW	h	Ah	V
24	500	50	1	10	500	20
48	500	50	2	10	500	40
110	500	50	4.7	10	500	94
120	500	50	5.1	10	500	102
220	500	50	9.4	10	500	188
240	500	50	10.2	10	500	204

External Load

- When higher load-current is necessary, it must be possible to use the charger in connection with external load
- The charger must have an active programmable burden.
- The charger must be able to allow the connection up to 9 external loads.

Protection Required on the Charger:

- Fuse on the power supply
- Thermal protection. It stops the current discharge of the batteries and displays the message "STOP OVER-TEMPERATURE" on the LCD display
- Protection against the wrong battery polarity, with message on the display "WRONG POLARITY"

Accessories Supplied with the Unit

- Power supply cable and earth cable.
- No. 2 battery cables, terminated with crocodile clamps.
- Software for the charger.
- USB interface cable.
- Operating Manual.

Current Clamp Required:

- Ranges: 40 A DC (10 mV/A) and 400 A DC (1 mV/A).
- Accuracy: 1.5% up to 40 A; 2% up to 400 A.
- Maximum conductor diameter: 30 mm.

Power Supply Requirements:

- 240Volt must be able to operate with a minimum of 215Volt and a Maximum of 253Volt AC, 50Hz
- 100 V - 270 V DC

From the Battery Under Test

- 110 V - 240 V DC.

Weight and Dimensions

- Including handles and wheels
- Dimensions: 300 x 700 x 450 mm;
- Weight: 32 kg (without the optional case).

ITEM 31.**SPECIFICATION FOR 500 VOLT TO 15 000V INSULATION TESTING UNIT****1. Physical characteristics**

- Less than 10kg
- Rugged utility hard case
- Large digital/analog LCD for easy viewing

2. Equipment capabilities

- Output voltage of 500Volt to 15kV DC.

- Selectable test voltages in 50 V steps from 250 V to 1000 V, and 100 V steps above 1000 V
- Visual graphing of results through real-time.
- Easy creation of test result documentation through drag and drop report creation.
- Automatic calculation of Dielectric Absorption (DAR) and Polarization Index (PI).
- Capacitance and leakage current measurement
- Start and stop the test remotely a safe distance away from any operating or energized equipment.

ITEM 32.

SPECIFICATION FOR SMALL/MINI CLIP-ON CURRENT METER

1. Description

- To be used in conjunction with multi meter
- Must be able to read 200mili Amp
- Small and robust
- Clip-on
- 40mm Heigh x 15mm wide x 150mm long

ITEM 33.

SPECIFICATION FOR EARTH GROUND TESTER

1. Physical Characteristics

- Rugged utility hard case
- Less than 5kg.

2. Instrument Capabilities

- Testers offer data storage and download capabilities via USB port.
- Large digital for easy viewing
- R* measurement—calculates earth ground impedance at 55 Hz to more accurately reflect the earth ground resistance that a fault-to- earth ground would see.

ITEM 34.

SPECIFICATION FOR MEDIUM / HIGH VOLTAGE TRANSFORMER TEST LEADS.

1. Description

- High Voltage Transformer Test Leads supplied must have 4x 600amp battery clamps.

- High Voltage Transformer Test Leads supplied must have 4x 35mm² leads, 3 must be a minimum length of 100cm and the 4th lead must be 7.5meter long.
- The earthing set supplied must have a mechanical sound centre that will connect the 4x 35mm leads.

ITEM 35.

SPECIFICATION FOR LOW VOLTAGE 2.5MM PANEL WIRE.

1. Description

- 2.5mm panel wire must be supplied in a roll of 100meter.
- The 2.5mm copper core must be flexible multi copper strands.
- The panel wire must be insulated by soft PVC outer layer.
- The panel wire insulation must be grey in colour.

ITEM 36.

SPECIFICATION FOR LOW VOLTAGE 4MM PANEL WIRE.

1. Description

- 4mm panel wire must be supplied in a roll of 100meter.
- The 4mm copper core must be flexible multi copper strands.
- The panel wire must be insulated by soft PVC outer layer.
- The panel wire insulation must be grey in colour.

ITEM 37.

SPECIFICATION FOR LOW VOLTAGE 16MM PANEL EARTH WIRE.

1. Description

- 16mm panel earth wire must be supplied in a roll of 100meter.
- The 16mm copper core must be flexible multi copper strands.
- The panel wire must be insulated by soft PVC outer layer.
- The panel earth wire insulation must be green with yellow line in colour.

ITEM 38.

SPECIFICATION FOR LAPTOP FOR ENGINEERING CONFIGURATION ON-SITE

1. Description

- Be able to download and interrogate data from Power Quality recorders.
- The unit must have Windows 10/11 operating system
- Charger,
- 512 GB Static Hard Drive,
- 15,6" Screen, with resolution of 1920x1080 Full HD
- 16GB DDR5 RAM,
- Latest Generation of Core-i7 or better processor

- HDMI port,
- USB ports
 - 2x A-Type
 - 1x B-type
 - 1x C-type
- MicroSD slot.
- Slot for Sim Card
- Rugged Carry case.

ITEM 39.

SPECIFICATION FOR LAPTOP FOR DESIGN; & SIMULATIONS OF PROTECTION SYSTEMS

1. Description

- Be able to download and interrogate data from Power Quality recorders.
- Rugged carry case
- The unit must have Windows 11 or latest operating system,
- Charger,
- 1Terrabyte Static Hard Drive,
- 15,6” Screen, with resolution of 1920x1080 Full HD
- 32GB DDR5 RAM,
- Core-i9 Latest Generation processor,
- HDMI port,
- USB ports
 - 2x A-Type
 - 1x B-type
 - 1x C-type
- MicroSD slot.
- Slot for Sim Card

ITEM 40.

SPECIFICATION FOR MEDIUM VOLTAGE & HIGH VOLTAGE ACOUSTIC SIGNAL SURVEYOR.

CHECK FOR INSULATION OR MECHANICAL PROBLEMS IN GAS INSULATED SWITCHGEAR OR IN-SERVICE SUBSTATIONS

Identify and locate insulation defects with the Acoustic signal Surveyor, a surveying tool that combines radio frequency interference (RFI) and acoustic emission (AE). It can detect and locate partial discharge (PD) in a few seconds. Designed for surveying live, high voltage apparatus, its versatility makes it the perfect, multi-purpose tool for condition-based maintenance programs.

1. Description

- Combination tool uses both RFI and acoustic technology.
- Registers RFI from apparatus with insulation problems including PD and arcing.
- Synchronize signal capture to the power cycle to facilitate phase resolved PD analysis.
- Locate and diagnose internal problems using the acoustic sensor on grounded surfaces.
- Easy to use, handheld device with large display screen.
- Perform non-invasive surveys of critical assets.
- Identify and locate insulation defects in gas insulated and open air substations, transformers, instrument transformers and cable terminations.
- Convenient tool for daily use or routine substation surveys along with thermography.

INPUT CHANNEL DESCRIPTION

- It must be a dual function instrument capable of analysing either acoustic or RF emissions. There is a single input connection which can accept either a RF or an acoustic sensor.

ACOUSTIC EMISSION CHANNEL

- Inputs: 1 channel
- Connector: BNC
- Input Impedance: 50 Ω or 22k Ω , software switchable (low noise preamp: 22k Ω only)
- AE Operating Frequency: 10 kHz to 500 kHz at -3dB points
- Phantom Power: 28 VDC on BNC centre conductor (100mA current limited), software switchable.
- AE Sensor: R3 α (standard),
R6 α , R6I,
R15 α R15I

UHF CHANNEL

- Inputs: 1 channel
- Connector: BNC
- Input Impedance: 50 Ω
- Bandwidth: 50-1000 MHz with 6 MHz RBW
- Accuracy: ± 100 kHz
- Detection Types: Peak and average detector

- Sweep Processing: Continuous, Average, Max Hold and differential.

ACCESSORIES

- Transient Earth Voltage (TEV) capacitive probe
 - Capacitive probe for finding PD in metal-clad switchgears. BNC-BNC sensor cable included.
- HF Current Transformer,
 - Split core, internal diameter Ø 127mm Scan for electrical pulses as evidence for partial discharge to earth. Can be clipped on an apparatus ground wire (incl. transformers, cable terminations and dead tank breakers). BNC-N sensor cable included.
- Directional Antenna
 - Provides more specific location of RFI source for surveying Air Insulated Substations (AIS), including direction of the radiations. BNC-BNC sensor cable included.
- Acoustic emission sensor with preamplifier.
 - Application for detecting and localizing a PD source inside transformer tank. BNC-BNC sensor cable included.
- UHF Drain Valve Sensor DN-50/80
 - For detecting electromagnetic PD signals in oil filled transformer tank. Application through oil drain valve without outage on the transformer. Suitable only for valves types: ball and gate. BNC-N sensor cable included.

POWER SUPPLY

- External Supply: External DC adapter, 12V @ 2A
- DC Adapter: 85-264 VAC (47-63 Hz) / 12 VDC
- Internal Battery: Li-Ion, high capacity 7.2V, 6.6 Ah
- Battery Life: >6 hours
- Charging Time: 3 hours

MECHANICAL

- Instrument 225 x 310 x 70 mm (WxHxD) 8.85 x 12.20 x 2.25 ins (WxHxD) Weight 2.4 kg / 5.5 lbs
- Transport Case 425 x 284 x 155 mm (WxHxD) 16.75 x 11.20 x 6.10 ins (WxHxD) Weight 3.4 kg / 7.5 lbs
- Total Weight 6.0 kg / 13.2 lbs incl. instrument, transport case, manuals, CD and charger

LCD SCREEN

- Display TFT, 6.4" Trans reflective.

- Size (W x H) 132 x100 mm
- Resolution 640 x 480 pixels, 256 colours.
- Backlight LED

DATA STORAGE AND TRANSFER

- Internal NV Flash Memory (SD)
- External USB storage class compliant USB Flash Drive / Hard Disk Drive
- Data Transfer USB A/B to and from computer
- File Format XML for use with PD Viewer software.
- Real Time Clock Battery backed.

CONNECTIVITY

- USB 1.1 Host and Client

ENVIRONMENTAL

- Enclosure IP64
- Transport Case IP67
- Electrostatic discharge according to EN 61000-4-2
- Humidity 0-95% non-condensing
- Temperature Operating temperature:
-10°C to + 50°C / 14°F to 122°F

Storage temperature:
-20°C to + 70°C / -4°F to 158°F

ITEM 41.

SPECIFICATION: DRONE WITH UNIQUE INFRA RED HEAT SEEKING VISION – DETECTING HOTSPOTS IN THE HIGH VOLTAGE SUBSTION YARD.

1. Description

- Drone with Unique GPS satellite positioning technology allows drones to prevent loss, the aircraft can automatically follow the manipulator, or open the aerial shot function, automatic follow-up shooting.
- Equipped with IFRA RED Vision to seek out Hot-Spots in the City of Tshwane High Voltage Substation Yard's
- Advanced intelligent identification technology, the air craft must allow recognition of gesture against the aircraft lens for automatic photo shots and video shots.
- Must also have one button takes off, one button landing to allow take off through the remote control and convenient fast landing, with 360 ° camera via the remote control.
- The built-in battery must allow minimum of 45 minutes flight when fully charged, and the drone system information must allow the user to know the status of the battery remotely.
- Payload 3.5kg

- Max Transmission distance 10km
- Max Speed 45km/h
- Max Wind Resistance 11.88m/s (39ft/s)
- Visual Sensor size: 1.27cm (1/2inch) CMOS, 4K
- Infrared resolution 640x512 pixels
- Infrared frame rate: 30Hz
- Thermal Imager Uncooled Vox Micro bolometer
- Infrared Wavelength: 8-14micron

ITEM 42.

REPAIRS OF ITEM 21 TO ITEM 41.

1. Description

- Repairs needs to be done from time to time on the above equipment on an as-and-when-needed basis.
- Tenders must quote for small, medium and major repairs respectively per Item.
- Small Repairs: voltmeter, current meter; MOV; LV wiring; key-lock; selection buttons
- Medium Repair: PC boards; Low Voltage Contactors in the control circuit; Selector switches; HT wiring; LV Transformer; HT connectors.
- Major Repairs: Variable Voltage Transformer; HT Capacitor; HV Transformer other large components.
- Service and repair report must be submitted with each repair.
- Repairs of the equipment must carry a 6 months guarantee

ITEM 43.

CALIBRATION OF ITEM 21 TO ITEM 41.

1. Description

- Equipment must be calibrated on an annual basis.
- Repaired equipment must also be calibrated.

ITEM 44:

SPECIFICATION FOR INVERTER 3 KW

1. General

- Model: 3kW.
- Capacity (W): 3000W.

2. DC Input

- Input Voltage (VDC): 48VDC Lithium Ion Battery Pack.
- Max Input Amps: 100.
- Standby Power: 3000w.

3. AC Output

- Voltage (VAC): 230VAC.

- Amps (A): 20A.
- Voltage Regulation: <3% RMS for entire battery voltage range.
- Frequency: 50Hz.
- Frequency Regulation: $\pm 0.1\text{Hz}$.
- Power factor: 1.
- Wave form: Pure Sine Wave.
- Peak Efficiency: 94%.
- Protection: Hardware Protection (Circuit Breaker); Overload Protection (Programmable Overload Levels and Auto Retry).

4. Charger

- Float Voltage 60-72VDC
- Maximum Current 60A Default 30Amp.
- Boost Time: Selectable 1,2 or 3 hours

ITEM 45: **SPECIFICATION FOR INVERTER 5KW**

1. General

- Model: 5kW.
- Capacity (W): 5000W.

2. DC Input

- Input Voltage 48VDC Lithium Ion Battery Pack.
- Max Input Amps: 150.
- Standby Power: 5000W.

3. AC Output

- Voltage (VAC): 230V.
- Amps (A): 30A.
- Voltage Regulation: <3% RMS for entire battery voltage range.
- Frequency: 50Hz.
- Frequency Regulation: $\pm 0.1\text{Hz}$.
- Power factor: 1.
- Wave form: Pure Sine Wave.
- Peak Efficiency: 94%.
- Protection: Hardware Protection (Circuit Breaker); Overload Protection (Programmable Overload Levels and Auto Retry).

4. Charger

- Float Voltage 60-72VDC
- Maximum Current 60A Default 30Amp.
- Boost Time: Selectable 1,2 or 3 hours

ITEM 46.

SPECIFICATION FOR 5kVA SINGLE PHASE GENERATOR.

1. Description

- Two 15amp three-point plugs.
- Must be equipped with automated voltage regulator.
- Must be equipped with pull-start and self-starter.
- Fuel tank must have a minimum capacity of 25litre.
- Must be equipped with overload protection.
- Must be fitted in steel frame with at least two rubber wheels.

ITEM 47.

SPECIFICATION FOR 6.5kVA SINGLE PHASE GENERATOR.

1. Description

- Two 15amp three-point plugs.
- Must be equipped with automated voltage regulator.
- Must be equipped with pull-start and self-starter.
- Fuel tank must have a minimum capacity of 25litre.
- Must be equipped with overload protection.
- Must be fitted in steel frame with at least two rubber wheels.

ITEM 48.

SPECIFICATION FOR MULTI-METER

1. Description

The multi-meter must be full-featured, true-rms digital multi-meter in a single compact, handheld unit, which provides maximum versatility for both troubleshooting and preventative maintenance.

2. Requirements:

- Handheld unit.
- Rugged utility hard case.
- DC Voltage Range to a maximum of 750volt
- DC millivolts range
- AC Voltage Range to a maximum of 750volt
- AC/DC Milli Ampere range
- AC/DC Ampere range
- Resistance (Ω) range
- Bell/continuity function
- Capacitance Test Function

- Diode test Function
- Temperature measurement function
- Min/Max hold function

3. Equipment/ instrument capabilities

- Frequency (Hz).
- Large display with backlight
- Memory storage through application eliminates writing down results, reduces errors and saves data for historical tracking over time.
- Auto power off to save battery power.

ITEM 49.

SPECIFICATION FOR 1000VOLT INSULATION TESTER.

1. Description

- Sturdy PVC case.
- Battery operated.
- Analogue display.
- 250volt test range and scale on analogue display.
- 500volt test range and scale on analogue display.
- 1000volt test range and scale on analogue display.

ITEM 50.

SPECIFICATION FOR CLAMP-ON METER 1000AMP AC/DC.

1. Description

- Handheld unit.
- Rugged utility hard case.
- DC Voltage Range to a maximum of 1000volt
- AC Voltage Range to a maximum of 1000volt
- AC Amp range to a maximum of 1000Amp
- DC Ampere range to a maximum of 1000amp
- Resistance (Ω) range
- Bell/continuity function
- Min/Max hold function

4. Equipment/ instrument capabilities

- Frequency (Hz).

- Large display with backlight
- Memory storage through application eliminates writing down results, reduces errors and saves data for historical tracking over time.
- Auto power off to save battery power.

ITEM 51.

SPECIFICATION FOR MEDIUM VOLTAGE CABLE/WIRE TRACER.

1. Description

- The amplifier probe must be designed to trace wire and cables within a group without damaging the insulation.
- It must work with a tone generator to identify wires.
- It must be equipped with a volume control for increase in sensitivity and adjustable work environment.

ITEM 52.

REPAIRS OF ITEM 44 TO ITEM 51.

2. Description

- Repairs needs to be done from time to time on the above equipment on an as-and-when-needed basis.
- Tenders must quote for small, medium and major repairs respectively per Item.
- Small Repairs: Volt Meter, Current Meter; LV wiring; Key-Lock; Selection Buttons
- Medium Repair: PC Boards; Low Voltage Contactors in the control circuit; Selector Switches; HT Wiring; LV Transformer; HT Connectors.
- Major Repairs: HV Transformer and other large components.
- Service and repair report must be submitted with each repair.
- Repairs of the equipment must carry a 6 months guarantee

ITEM 53.

CALIBRATION OF ITEM 44 TO ITEM 51.

1. Description

- Equipment must be calibrated on an annual basis.
- Repaired equipment must also be calibrated.

ITEM 54.

SPECIFICATION FOR Electrician and Linesman Toolbox 1

1. Description

- Steel 3xtear toolbox Heavy Duty
- 7 to 32mm Ring/flat spanner set (26-piece)
- 7 to 32mm Socket set 26-piece; 1/2inch drive; with Ratchet and 150mm extension
- 1000volt Screwdriver set 7-piece
- 1000volt Combination Plier 250mm Cressent
- 1000volt Side-Cutter 230mm Cressent
- 1000volt long nose plier
- Gas plier
- Duspul Line Tester 110 – 750volt
- 5meter steel measuring tape
- 400mm steel ruler
- 16 to 35mm Lobster Crimper
- Shifting spanner 300mm
- File set of 3; 400mm long (first cut, second cut, Fine)
- Cable knife
- Hammer 500gram
- Hammer 1kg
- Concrete Chisel 400m long
- Wire stripper
- Hacksaw steel
- Panel Key
- Crow-bar 500mm
- Bolt cutter 600mm
- Hole-saw set of 3 (20mm; 25mm; 32mm)
- Multi Meter 1000v
- Amp Meter 1000Amp AC & DC
- Steel Drill set 25-piece (1mm to 13mm)
- Centre Punch
- Torch 3 cell Maglite
- LED Headlamp
- Proximity Tester with two LED Lights and elastic head strap
- Rubber Gloves 1000volt class 00 3-piece set
- Allen-key set 15-piece
- Soldering Iron Electrical 200Watt
- Tool Chest 400x400x800mm

ITEM 55.

SPECIFICATION FOR MEDIUM VOLTAGE ENGINEERING TOOLBOX 2.

1. Description

- Steel 3x Tear toolbox Heave duty
- Tool Bag Heavy Duty
- 7 to 22mm Ring/flat spanner set 16-piece

- 7 to 22mm Socket set 1/2inch drive; 16-piece; with Ratchet and 150mm extension
- 1000volt Screwdriver set 9-piece
- 1000volt Combination Plier 250mm Cressent
- 1000volt Side-Cutter 230mm Cressent
- 1000volt long nose plier
- 1000volt Combination Panel Plier 250mm
- Wire stripper
- Gas plier
- Duspul Line Tester 110 – 750volt
- 5meter steel measuring tape
- 400mm steel ruler
- 16 to 35mm Lobster Crimper
- Crimper for pre-insulated lugs
- Shifting spanner 300mm
- File set of 3; 400mm long (first cut, second cut, Fine)
- Cable knife
- Gas Soldering Iron handheld
- Hammer 500gram
- Hammer 1kg
- Hacksaw steel
- Hacksaw Jnr
- 0BA
- 1BA
- 2BA
- Panel Key
- Crow-bar 500mm
- Hole-saw set of 3 (20mm; 25mm; 32mm)
- Allen-key Set 15-piece
- Proximity Tester with two LED Lights and elastic head strap
- Multi Meter 1000v
- Amp Meter 1000Amp AC & DC
- Steel Drill set 25-piece (1mm to 13mm)
- Centre Punch
- Torch 3 cell Maglite
- LED Headlamp
- Tool Chest 400x400x800mm

ITEM 56.

SPECIFICATION FOR LOW VOLTAGE SCADA TOOLBOX 3.

1. Description

- Tool Bag Heavy Duty
- 7 to 17mm Ring/flat spanner set 11-piece

- 7 to 17mm Socket set 1/2inch drive; 11-piece; with Ratchet and 150mm extension
- 1000volt Screwdriver set 9-piece
- Electronic screwdriver set non-magnetic
- Electronic Small Plier: Side Cutter
- Electronic Small Combination Plier
- Electronic Small Longnose Plier
- Electronic Small Long Nose Plier with bend nose
- Electronic Small Tube spanner set
- 1000volt Combination Plier 250mm Cressent
- 1000volt Side-Cutter 230mm Cressent
- 1000volt long nose plier
- 1000volt Combination Panel Plier 250mm
- Wire stripper
- 5meter steel measuring tape
- 400mm steel ruler
- Crimper for pre-insulated lugs
- Shifting spanner 250mm
- File set of 3; 400mm long (first cut, second cut, Fine)
- Gas Soldering Iron handheld with docking station
- Hammer 500gram
- Hammer 1kg
- Hacksaw steel
- Hacksaw Jnr
- 0BA
- 1BA
- 2BA
- Panel Key
- Hole-saw set of 3 (20mm; 25mm; 32mm)
- Allen-key Set 15-piece
- Multi Meter 1000v
- Amp Meter 1000Amp AC & DC
- Steel Drill set 25-piece (1mm to 13mm)
- Centre Punch
- Torch 3 cell Maglite
- LED Headlamp
- Tool Chest 400x400x800mm

ITEM 57.

SPECIFICATION FOR MEDIUM VOLTAGE 2-METER LINK STICK.

1. Description

- 2meter long by 60mm in diameter with a 5mm wall thickness fibreglass.
- One end closed of with a 3mm thick rubber grommet.
- The other end must be equipped with a brass TJ casting.

- Must be supplied in a canvas carry bag.

ITEM 58.

SPECIFICATION FOR MEDIUM VOLTAGE & HIGH VOLTAGE TELOSCOPIC LINK STICK.

1. Description

- 12meter long made up by 8 sections of 1.6meter that fit into one-another, forming the telescopic link-stick.
- The base tube must not exceed 1.6meter in length and 70mm in diameter with a 3.5mm wall thickness of fibreglass.
- The base tube must be closed off with a 3mm thick rubber boot at the bottom.
- The 8th and smallest cylindrical tube must be equipped with a brass TJ casting.
- Must be supplied in a canvas carry bag.

ITEM 59.

SPECIFICATION FOR LOW VOLTAGE 9-METER EXTENTION LADDER.

- 9.6meter Fiberglass extension ladder
- Must not weigh more than 40kg.
- C -Channel must not be less than 100mm high
- Equipped with 2x spiked feet.
- Equipped with V-runner on the top of the portion that will be extended upwards.
- 10mm rope with pully must be fitted of the left-hand side of the extension ladder.
- The frame of the extension ladder must be made of 8mm thick fibreglass in a C-channel form.
- The steps must be made from 40mm semi round aluminium with a flat section to step on.

ITEM 60.

SPECIFICATION FOR LOW VOLTAGE - SMALL CROCODILE CLIPS.

1. Description

- Push-on to multi-meter lead.
- 100mm in length.
- 12mm wide.
- To be delivered in pairs of two, 1x Red; 1x Black
- Class 0 Isolation.
- 1000Volt isolation.

ITEM 61.

SPECIFICATION FOR LOW VOLTAGE - MEDIUM CROCODILE CLIPS.

1. Description

- 150mm in length.
- 15mm wide.
- To be delivered in pairs of two, 1x Red; 1x Black
- 1000volt isolation.
- Class 0 Isolation

ITEM 62.

SPECIFICATION FOR LOW & MEDIUM VOLTAGE - CLAMP BATTERY 300AMP.

1. Description

- 160mm in length.
- 20mm wide.
- To be delivered in pairs of two, 1x Red; 1x Black

ITEM 63.

SPECIFICATION FOR LOW; MEDIUM & HIGH VOLTAGE - CLAMP BATTERY 600AMP.

1. Description

- 200mm in length.
- 28mm wide.
- To be delivered in pairs of two, 1x Red; 1x Black

5. FORM A.1

5.1. SCHEDULE OF PARTICULARS AND GUARANTEES

SCHEDULE A: Purchaser's specific requirements. (CoT minimum requirements)

SCHEDULE B: Guarantees and particulars of equipment supplied. (Offered by the bidder)

NOTE: Tenders will not be considered unless this form is completed in full and signed. Item offered must comply with CoT's minimum requirements (Schedule A)

SECTION 1: CABLE FAULT INSTRUMENTS			
ITEM 1: 32kV Surge Generator			
NO.	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	SCHEDULE B (Offered by the bidder)
1.	Manufacturer	XXXXXXXXXXXX	
2.	Model offered	XXXXXXXXXXXX	
3.	Surge energy ≥ 2000 J at 32kV	2000 Joule	
4.	Voltage level	Switched between 8, 16 and 32kV	
5.	Mass (kg)	≤ 160 kg	
6.	Proof Testing	250mili Amp for 30 Seconds, on all voltage rating levels.	
7.	Surge	Min 3s - 10s Max, on solitary pulse	
8.	Sampling Rate range	200MHZ	
9.	Resolution of measurement	Surge rate 3 ... 10 s, Single pulse	
10.	Power Supply	220V- 240V,50HZ	
11.	PC Interface	TDR: ICE technology	
12.	Auxiliary Miscellaneous		
13.	Calibration Certificate	Recently Sold Equipment	

Item 2: 16kV SURGE GENERATOR / THUMPER

1.	Manufacturer	XXXXXXXXXXXX	
2.	Model offered	XXXXXXXXXXXX	
3.	Proof Testing	125mili Amp for 30 Seconds, on all voltage rating levels.	
4.	Surge	At Low voltage rating Levels	
5.	Sampling Rate range	0 - 200 MHZ	
6.	Output Testing Voltage	0 KV – 16 KV	
7.	Power Supply	220V- 240V,50HZ	
8.	Resolution of measurement	Surge rate in seconds, mins and KM	
9.	Auxiliary and Miscellaneous	Software, TDR Screen, etc.	
10.	Power Rating	800J – 900 J	
11.	Weight	Less than 80 KG	
12.	PC Interface	TDR Technology	

Item 3: Acoustic Listening Set (Ground Micro-phone)

1.	Manufacturer	XXXXXXXXXXXX	
2.	Model offered	XXXXXXXXXXXX	
3.	Height	140 mm	
4.	Frequency Range	100HZ – 1500HZ, or better Magnetic 270Hz – 1.5kHz or better	
5.	Magnetic Range	> 110 db	
6.	Acoustic Range	> 110 db	
7.	Weight	≤ 1.5 kg	
8.	Sensor Height	> 200mm	

9.	Receiver weight	> 4KG	
10	Low by Pass Filter	100~ 1000 hz	
11	Band Pass Filter	100~ 2000 hz	
12	Hi Pass Filter	100~ 3600 HZ	
13	Calibration Certificate	Recently Sold Equipment	

Item 4: Fault Location Scope

1.	Manufacturer:	XXXXXXXXXXXXXXXXXXXX	
2.	Model Offred	XXXXXXXXXXXXXXXXXXXX	
3.	Weight	> 3.5KG	
4.	Display	≤ 240 x 320 Pixel Trans- missive LCD with multilevel grey scaling	
5.	Operating system	Windows 10	
6.	Data sharing	Yes...exchange/ storage	
7.	Power Supply	220V	
8.	Resolution of measurement	TDR Mode; ICE and SIM Mode	
9.	Auxiliary Miscellaneous	Water proof casing/ data ports and converters	
10	Power Rating		
10.	Three Modes of pre-locating faults	1 TDR (Time Domain Reflectometer) 2. Impulse (Sim) Current mode 3. ARC-Echo (Surge current)	
11.	Calibration Certificate	Recently Sold Equipment	

Item 5: Measuring wheel

1.	Model offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	

3.	Total Length:	$\leq 980\text{mm}$	
4.	Mass (kg)	$\leq 5 \text{ kg}$	
5.	Measuring Capacity	$\geq 10000\text{m}$	
6.	Wheel Diameter:	$\leq 305\text{mm}$	
7.	Certificate	CE, RoHS, SGS	
8.	Accuracy:	+/- 1%	
9.	Calibration Certificate	Recently Sold Equipment	

Item 6: Multi-Frequency Line Location (Route Tracer)

1.	Make offered	XXXXXXXXXXXX	
2.	Operative module depth	15 meters	
3.	Digital screen	yes	
4.	Accuracy	+/- 1 %	
5.	Frequency receiver Range	Preferably 82-491Hz or better	
6.	Frequency transmitter Range	Preferably 8.4 – 82kHz or better	
7.	Mass (kg)	$\leq 15 \text{ kg}$	
8.	Calibration Certificate	Recently Sold Equipment	

Item 7: Cable and Phase Identification

1.	Manufacturer & Model	XXXXXXXXXXXX	
2.	Power supply	12 V DC and 230 V AC	
3.	Pulse current	State	
4.	Pulse sequence	State	

5.	Dimension	State	
6.	Pulse voltage	82 Hz to 491Hz	
7.	IP rating	IP54 or better	
8.	Power supply	Internal rechargeable battery, 12 V DC and 230 V AC mains	
9.	Mass (kg)	≤ 12 kg	
10.	Calibration Certificate	Recently Sold Equipment	

Item 8: Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable

1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Power supply	Internal Rechargeable Battery and/or 230 V AC mains	
3.	Output power	15 W or less	
4.	Display	LCD 98 x 23 mm or better	
5.	Weight	10 kg or less	
6.	Enclosure	water, dust tight and shock proof case	
7.	Mass (kg)	10kg or less	
8.	Calibration Certificate	Recently Sold Equipment	

Item 9: 45kV Very Low Frequency (VLF) 0.1 Hertz Test Set

1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Dimensions : Dimensions (W x H x D)	≤ 544 x 520 x 416 mm	
4.	Mass (kg)	40 kg or less	
5.	Input (single-phase supply) : i) Voltage	 230V	

	ii) Frequency	50 Hz	
6.	Rated output :		
	i) Voltage	45 kV	
7.	Digital Display	Size	
8.	Testing Leads	Length	
9.	USB Port	Yes / No	
10.	Manual Cable Testing	Yes / No	
11.	Automated Cable Testing	Yes / No	
12.	Tan Delta Test Function Voltage	45kV	
13.	Test Report	Automated Yes / No	
14.	Calibration Certificate	Recently Sold Equipment	
ITEM 10: 25kV DC PRESURE TESTER			
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model	XXXXXXXXXXXX	
3.	Mass (kg)	50kg or less	
4.	Power supply	220-230V AC 5 - 10A	_____
5.	Rated output :		
	ii) Voltage	≥ 25kVDC	
	iii) Current	250mA for 30 Seconds	
6.	Meter	Current Voltage	
7.	Calibration Certificate	Recently Sold Equipment	

ITEM 11: 30/42kV AC/DC PRESURE TESTER			
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	Mass (kg)	50kg or less	
4.	Power supply	220-230V AC 5 - 10A	_____
5.	Rated output : iv) Voltage v) Current	≥ 30kVAC and ≥ 42kVDC 50mA Continuous	
6.	Meter	Current Voltage	
7.	Calibration Certificate	Recently Sold Equipment	

ITEM 12: 11kV PHASE COMPARATOR			
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Mass (kg)	12.5kg or less	
4.	Analog Meter	Voltage	
5.	Voltage Rate Rating :	12kV Minimum	
6.	Carry Case	Aluminium	
7.	Detecting and Measured Voltage:	Yes / No	
8.	Phase Comparator:		
9.	Calibration Certificate	Recently Sold Equipment	

ITEM 13: 11 to 33kV PHASE COMPARATOR			
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Mass (kg)	15kg or less	
4.	Analog Meter	Voltage	
5.	Voltage Rate Rating :	33kV Minimum	
6.	Carry Case	Aluminium	
7.	Detecting and Measured Voltage:		
8.	Phase Comparator:	Yes / No	
9.	Calibration Certificate	Recently Sold Equipment	

ITEM 14: Full Cable Testing Trailer			
	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	SCHEDULE B (Offered by the bidder)
	Offer	Large Test Trailer	
	Features:	32kV Surge Generator	
		High Resistance TDR; ICE Scope	
		Secondary Impulse Method	
		5000Watt Inverter 230V Mains Supply System	
		48v Lithium Ion Battery	
		VLF Cable Pressure Tester	
		Ground Micro Phone Amplifier	
		Route tracer	
		Measuring wheel	
		30m HV Cable Reel System	
		12kV Phasing stick	
		Earthing spike and Hummer	

		Discharge rod with a resister to ensure soft discharge with a minimum voltage rating of 30kV	
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ITEM 15: High Voltage Cable Reel System

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	All Lead must have a minimum Length of:	30x meter Minimum.	
4.	Cable Reel Features	3x reels 1x 32kV MV leads, 4mm ² x 30meter long 1x 1mm Earth lead, 30 meter 1x 2.5mm ² cabtyre extension reel. 30meter	
5.	Over-run Brake	All reels must be equipped Anti-Overrun Braking system to prevent overrunning when unwound.	

ITEM 16: High Voltage Earthing Sets

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Lead thickness	Minimum 40mm ² copper with translucent PVC	
4.	Lead length's	3x 80 centimetre 1x 125 centimetre All mechanically joint together in a star-point	
5.	Clamps	Must be made from high strength brass	

ITEM 17: High Voltage Cable Fault Equipment Installation in CoT Fleet

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Supply and fit all brackets required:	YES /NO	
4.	Securely fit all equipment on brackets installed	YES /NO	
5.	Wire all equipment installed to be operational	YES /NO	
6.	Calibration Certificate	Recently Sold Equipment	

ITEM 18: High Voltage Pressure Test Equipment Installation in CoT Fleet

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Product Manufacturer	XXXXXXXXXXXX	
2.	Product Model:	XXXXXXXXXXXX	
3.	Supply and fit all brackets required:	YES /NO	
4.	Securely fit all equipment on brackets installed	YES /NO	
5.	Wire all equipment installed to be operational	YES /NO	
6.	Calibration Certificate	Recently Sold Equipment	

ITEM 19: Repairs of Item 1 to 18

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Manufacturer Workshop	Yes / No	
2.	Dedicated Workshop to do Repairs	Yes / No	
3.	Workshop with-in Tshwane	Yes / No	

ITEM 20: Calibration of Item 1 To 18

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
1.	Manufacturer Approved Calibration Laboratory	Yes / No	
2.	SABS Approved Calibration Laboratory	Yes / No	
3.	Dedicated Laboratory to do Calibration	Yes / No	
4.	Calibration Laboratory with- in Tshwane		

SECTION 2: TEST INSTRUMENTS**Item 21: Power Quality recorder**

1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	Surge / Spike Inputs Input resolution	230 V	
4.	Laptop connection	Wi-Fi, LAN or USB	
5.	Mass (kg)	≤ 5kg	
6.	Calibration Certificate	Recently Sold Equipment	

Item 22: Portable Power Quality Analyser

1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
	Instrument capabilities. Internal memory Frequency	Not less than 10 MB 50 Hz	_____ _____
3.	Laptop connection	Wi-Fi, LAN or USB	
4.	Mass (kg)	≤ 5kg	
5.	Calibration Certificate	Recently Sold Equipment	

Item 23: Primary injection test set

1.	Manufacturer offered	XXXXXXXXXXXX	
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2.	Manufacturer Model Offered	XXXXXXXXXXXX	
3.	AC power input	220~240V	
4.	General		
		Tests are to be performed manually or automatically (user selectable).	
		The test system shall have a wide range of output currents (ac + dc), output voltages as well as measurement options	
		The current and voltage outputs shall be stabilized and regulated, i.e. the wave shape of the currents and voltages in terms of amplitude and frequency shall be independent of the quality of the mains supply. The unit shall be operable from a portable generator. Units utilizing an internal variac are not permissible.	
		The unit shall include adequate precautions for safety: Emergency Off, bright ON and OFF lights, keyboard lock, earth wire connection check, optional facility for Deadman button, .	
		The unit shall have a front-panel control with back-lit LCD screen and keyboard.	
		Test reports are to be generated on-line and automatically.	
		The test system shall be optionally controllable from PC in order to achieve fully automatic tests.	
		Test templates are to be prepared in advance on a PC controller. Such test templates are to be up-loaded and test results are to be down-loaded via either Ethernet LAN or USB memory stick.	
5.	Power Supply		
	Nominal Voltage	230 V	
	Nominal Frequency	50 Hz	
	Power Consumption	<3500VA at 230V	
		<7000VA at 230V for a time of less than 10s	
	Rated Current	10A at 230V 3-point plug	

6.	Certificates		
	Vibration	IEC60068-2-6	
	Shock	IEC60068-2-27	
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	
7	Hardware Specifications		
7.1	Frequency		
		Frequency of AC Signal shall be variable from 15 to 400Hz independent of the mains supply frequency	
		User shall have the option of synchronizing output frequency to frequency of an external signal, e.g. mains supply	
		Output frequency shall be regulated and independent of mains frequency and/or quality of mains supply	
7.2	Current Outputs		
	AC Range 1	0 .. 800A @ 4800VA; $V_{comp} = 6V$; Accuracy $<0.1\%$	
	AC Range 2	0 .. 6A @ 330VA; $V_{comp} = 55V$; Accuracy $<0.05\%$	
	AC Range 3	0 .. 3A @ 330VA; $V_{comp} = 110V$; Accuracy $<0.05\%$	
	DC Range 1	0 .. 400A @ 2600W; $V_{comp} = 6.5V$; Accuracy $<0.05\%$	
	DC Range 2	0 .. 6A @ 360W; $V_{comp} = 60V$; Accuracy $<0.08\%$	
7.3	Voltage Outputs		
	AC Range 1	0 .. 2kV @ 2500VA; $I_{load} = 1.25A$; Accuracy $<0.05\%$	
	AC Range 2	0 .. 1kV @ 2500VA; $I_{load} = 2.5A$; Accuracy $<0.05\%$	
	AC Range 3	0 .. 500V @ 2500VA; $I_{load} = 5A$; Accuracy $<0.05\%$	
	AC Range 4	0 .. 130V @ 390VA; $I_{load} = 3A$; Accuracy $<0.05\%$	

7.4	Current Inputs		
	AC / DC range	0..10A AC or DC	
	AC amplitude accuracy	0.05% of reading	
	DC amplitude accuracy	0.03% of reading	
	AC phase angle accuracy	0.10°	
7.5	Voltage Inputs		
	AC range 1	0..300V AC	
	AC range 2	0..3V AC	
	DC range	0..10V DC	
	AC amplitude accuracy	0.05% for 3..300V AC (Range 1)	
		0.03% for 300mV..3V AC (Range 2)	
	AC phase angle accuracy	0.10°	
	DC amplitude accuracy	0.03%	
7.6	Resistance Measurements		
	Range 1	10μΩ with 400Aac; Accuracy <0.70%	
	Range 2	100μΩ with 400Aac; Accuracy <0.55%	
	Range 3	1mΩ with 400Aac; Accuracy <0.50%	
	Range 4	10mΩ with 400Aac; Accuracy <0.50%	
	Range 5	100mΩ with 6Aac; Accuracy <0.35%	
	Range 6	1Ω with 6Aac; Accuracy <0.35%	
	Range 7	10Ω with 1Aac; Accuracy <0.25%	
	Range 8	100Ω with 5mA; Accuracy <0.65%	
	Range 9	1kΩ with 5mA; Accuracy <0.51%	

	Range 10	10k Ω with 5mA; Accuracy <0.50%	
8	Functional Tests		
8.1	Manual Testing		
	The user shall be able to do manual testing by selecting an injection source and up to two measuring variables. Based on the measuring variables, the test set shall calculate for:		
		Power (real, apparent, reactive, ϕ , $\cos(\phi)$)	
		Impedance [Ω], resistance [Ω], reactance [Ω], capacitance [μF], inductance [μH].	
		Ratio (if both variables selected is of the same type).	
		Difference (if both variable selected is of the same type).	
		Manual testing of current and/or voltage transformers should be possible by performing a manual ratio test, phase angle error test and measure the burden connected to the secondary of an instrument transformer.	
8.2	Testing Current Transformers		
	The testing unit shall be able to perform the following tests on CTs:		
		Ratio test with measurement of nominal ratio, actual ratio and ratio error.	
		Ratio test of bushing CTs of a power transformer	
		Measurement of phase angle error.	
		Measurement of burden connected to secondary (test to be performed at nominal current).	
		Polarity check of CT at secondary terminals.	
		Polarity check of secondary wiring with sawtooth waveform to check polarity at various points in substation (equivalent of flick test).	
		Recording of magnetization curve with automatic calculation of knee-point voltage and automatic demagnetization of core after the test.	

		Secondary winding resistance measurement with automatic charging of winding before test and discharging of winding after test.	
		AC voltage withstand test.	
	Special Applications	Ratio test for bushing CTs of power transformers	
		Ratio test of Rogowski coils (output: 150mV for I _{nom})	
		Ratio test of optic CTs (output: low voltage signal)	
8.3	Testing Voltage Transformers		
	The testing unit shall be able to perform the following tests on VTs:		
		Ratio test with measurement of nominal ratio, actual ratio and ratio error.	
		Measurement of phase angle error.	
		Measurement of burden connected to secondary (test to be performed at nominal voltage).	
		Polarity check of VT at secondary terminals.	
		Polarity check of secondary wiring at various points in substation, including checking the polarity of zero sequence (open delta connected) VTs.	
		Secondary winding resistance measurement with automatic charging of winding before test and discharging of winding after test.	
		AC voltage withstand test.	
	Special Applications	Ratio test of optic VTs (output: low voltage signal)	
8.4	Testing of Power Transformers		
	The testing unit shall be able to perform the following tests on PTs:		
		Ratio test for each tap with measurement of nominal ratio, actual ratio and ratio error.	
		Winding resistance measurement for each tap with automatic charging of winding before overall test and discharging of winding after overall test.	

		Tap changer (OLTC) continuity test for each tap transition utilizing a dynamic winding resistance measurement technique.	
8.5	Measuring Resistances		
		Secondary winding resistance measurement of any CT, VT or PT with automatic charging of winding before test and discharging of winding after test.	
		Contact resistance of breakers, isolators, etc.	
8.6	Sequencer Testing		
		The user shall be able to define a sequence of current or voltage states, each with independent amplitude and time length, e.g. 200A for 5s, 0A for 2s, 400A for 3s, 0A for 2s, 600A for 1s to test the tripping characteristic of pole-mounted auto-reclosers.	
8.7	Primary Protection Relay Testing / Breaker Speed Timing		
		The user shall be able to inject primary current quantities into a CT connected to a relay. The response / tripping time of the relay shall be timed accurately from the instance of current inception until the pick-up of the trip contact (voltage sensitive or potential free) .	
		In a separate test the user shall be able to inject a primary current quantity into both a circuit breaker connected in series with the CT. The CT secondary is connected to a relay, which due to sufficient primary current will trip and thus trip the breaker. This in turn will result in an open circuit condition on the current outputs of the test set, which can be detected and thus timed. The time from current inception until such an open circuit is detected on the test set equates to the relay operating time plus the breaker tripping time. Subtracting the relay operating time, which was determined in the first test, the breaker tripping can be determined.	

8.10	Software		
	Supported Operating Systems	Windows 10 (32bit and 64bit)	
	Data Management Functions:	Automatic Testing Database for HV plant assets	
		Data management functions for locations of assets	
		Data management functions for primary assets (power transformers, current transformers, circuit breakers, etc.)	
		Data management of testing jobs to be done on all primary assets	
		Provision of automatic connection diagrams for each type of test	
		Flexible tools to select specific tests ON and OFF	
		Automatic generation of reports including automatic Pass/Fail assessments	
		Back-up of Database	
9	Accessories		
	High current test leads	2 x 9 m; 70 mm ² (800 A)	
	High voltage test leads	2 x 10 m; 0,5 mm ² (screened, 2,000V)	
	Measurement leads	6 x 10 m; 2,5 mm ²	
	Connection clamps	4x with connectors for 4mm banana plugs	
	Crocodile clamps	4x with connectors for 4mm banana plugs	
	Grounding cable	1 x 9 m; 6 mm ² with connection clamp	
	Other accessories:	South African Power cord	
		Connection lead from test set to PC	
		Hardcover carrying cases for test hardware with retractable handle and wheels	
		Software for report downloading and configuration as well as offline test sequence generation.	
10	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to	

		present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Hotline support hours	Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.	
	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	Number of units in operation in South Africa	10 units in SA (separate list of users with contact details to be provided)	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	
	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
		In-house / On-site training to be offered on request	
	Warranty on Hardware	FIVE years from date of delivery	
12.	Calibration Certificate	Recently Sold Equipment	

Item 24: Secondary Injection Test set			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	Power Supply: Unit to be battery powered for operation independent of any power / mains supply:		
	AC power input	230V	
	Battery Capacity	150Wh	
	Nominal Frequency	50 Hz	
	Power Consumption	max. 180W	
4.	Certification:		
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	
5.	Hardware Specifications:		
5.1	Current Output:	Variable amplitude, phase angle and frequency	
	Output Current	0 - 110Aac	
		0 - 100Adc	
	Maximum output power	600W (40A..110A) -> Up to a max of 1000W at 50A and 400mΩ	
	Maximum compliance voltage	20V (0 - 15A)	
	Maximum injection time	110A for 2.2s; 15A for >2h	
	Frequency range	15 - 500Hz	
	Amplitude accuracy	<1% at full scale	
	Phase angle accuracy	<0.1°	

5.2	Voltage Output:	Variable amplitude, phase angle and frequency	
		Independent and in addition to current output	
	Output Voltage	0 - 150Vac	
		0 - 220Vdc	
	Maximum output power	30W (@150V)	
	Maximum load current	200mA (0 - 150V)	
	Maximum injection time	1min	
	Frequency range	15 - 500Hz	
	Amplitude accuracy	<0.3% at full scale	
	Phase angle accuracy	<0.1°	
5.3	Analogue Inputs:		
	Number of inputs	2	
	Measurement ranges	100mV, 1V, 30V, 300V	
	Measurement amplitude accuracy	<0.3% at full scale	
	Measurement phase angle accuracy	<0.1°	
5.4	Binary Inputs:		
	Number of inputs	2	
	Timing accuracy	0.2ms	
5.5	Micro-ohm Measurement:		
	Measurement range	10μ - 10kΩ	
	Measurement accuracy	<0.15%	

6	Test Functions:		
6.1	Manual Injection		
	The user shall be able to do manual testing by selecting an injection source and up to two measuring variables. Based on the measuring variables, the test set shall calculate for:		
		Power (real, apparent, reactive, ϕ , $\cos(\phi)$)	
		Impedance [Ω], resistance [Ω], reactance [Ω], capacitance [μF], inductance [μH].	
		Ratio (if both variables selected is of the same type).	
		Difference (if both variable selected is of the same type).	
		Manual testing of current and/or voltage transformers should be possible by performing a manual ratio test, phase angle error test and measure the burden connected to the secondary of an instrument transformer.	
	Timing measurement	Timing measurement defining the Start event and Stop event of a timing measurement	
	Timing events	Starting to inject, binary input picking up / dropping off; overload	
6.2	State Sequencer / Ramping Mode	The user shall be able to string any number of states of voltage and/or current after each other	
		Transition from one state to the next should be either after a fixed time OR a specific event occurring at one of the binary inputs (e.g. pick-up and/or drop-out) OR an overload at the current output	
		The transition from one state to the next should either be a step-change (instantaneous change), OR a linear ramp (of which the rate of change is definable) OR a pulse ramp (of which the pulse duration and reset states are fully definable)	
6.3	Resistance Measurements		
	The user shall be able to perform the following resistance measurements:		
		Micro-ohm (using DC current)	
		Ground-resistance (using AC current)	

		Normal resistance (using AC or DC current)	
6.4	Secondary Polarity Tests	The user shall be able to perform polarity checks of secondary wiring with a sawtooth waveform to check polarity at various points in substation (equivalent of flick test).	
7	Accessories		
	Current Injection Cable	2 x 2meter with 6mm plugs and heavy duty battery clamps	
	Measurement Cables	4 x 3meter	
	Battery Clamps	6 x (for injection and measurement cables)	
	Power Supply Cable	AC charger with AC cord	
	Grounding Cable	1 x 6 meter	
	Carrying Bag	for test set and accessories	
	Hardcover Transportation Case	for test set and accessories	
	User Manual	No - only via QR codes or Smartphone App	
	Software	not applicable	
	Test Report	Required - via HTML export via USB stick	
	Calibration Certificate	Required	
8	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Hotline support hours	Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.	

	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	Number of units in operation in South Africa	10 units in SA (separate list of users with contact details to be provided)	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	
	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
	Warranty on Hardware	In-house / On-site training to be offered on request	
9.	Calibration Certificate	Recently Sold Equipment	

Item 25: Power Transformer Test Set			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	AC power input	240V	
4.	General		
		The test system shall have BOTH <u>THREE</u> independent phases of AC voltage output and <u>THREE</u> independent phases of DC current outputs.	
		The voltage and current outputs shall be stabilized and regulated, i.e. the wave shape of the currents and voltages in terms of amplitude and frequency shall be independent of the quality of the mains supply. The unit shall be operable from a portable generator. Units utilizing an internal variac are not permissible.	
		The unit shall include adequate precautions for safety: Emergency Off, Bright ON and OFF lights, keyboard lock, earth wire connection check, optional facility for Deadman button, .	
		The unit shall have optionally a front-panel control with back-lit colour and touch-sensitive LCD screen.	
		Test reports are to be generated on-line and automatically and to be user customizable.	

		The test system shall be controllable from PC in order to achieve fully automatic tests.	
5.	Power Supply		
	Nominal Voltage	240 V	
	Nominal Frequency	50 Hz	
	Power Consumption	<3500VA at 230V continuous	
6.	Certificates		
	Vibration	IEC60068-2-6 - frequency range from 10Hz to 150Hz, continuous acceleration 2g, 20 cycle per axis	
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	
7.	Hardware Specifications		
7.1	Frequency		
		Frequency of AC Signal shall be variable from 15 to 599Hz independent of the mains supply frequency	
		Output frequency shall be regulated and independent of mains frequency and/or quality of mains supply	
7.2	Voltage Outputs		
	AC Range 1	3x 0..230V L-N; $I_{load} = 100mA$	
	AC Range 2	3x 0..80V L-N; $I_{load} = 16A$	
	AC Range 3	3x 0..40V L-N; $I_{load} = 33A$	
7.3	Current Outputs		
	DC Range 1	3x 0..16A; $V_{max} = 113V$	

	DC Range 2	3x 0..33A; $V_{\max} = 56V$	
	DC Range 3	1x 0..100A; $V_{\max} = 56V$	
7.4	Voltage Inputs		
	AC range	0 - 300V	
	Other AC ranges	30V, 3V, 300mV	
	AC amplitude accuracy	0.012% reading + 0.003% range	
	DC range	0..424V	
	Other DC ranges	42V, 4.2V, 420mV	
	DC amplitude accuracy	0.01% reading + 0.02% range	
7.5	Current Inputs		
	AC range	0..40A	
	Other AC ranges	4A	
	AC amplitude accuracy	0.04% reading + 0.02% range	
	DC range	0 - 56A	
	Other DC ranges	5.6A	
	DC amplitude accuracy	0.04% reading + 0.03% range	
7.6	Ratio Measurements		
	Main Range	1:1 to 1:10	
	Other ranges	1:10..100; 1:100..1000; 1:1,000..10,000	
	Ratio accuracy	0.03% reading + 0.05% range	
7.7	Resistance Measurements		
	Range 1	0.1 Ω - 100 Ω with up to 3Adc; Accuracy <0.1% reading + 0.3% range	
	Range 2	0.1m Ω . - 10 Ω with up to 30Adc; Accuracy <0.05% reading + 0.05% range	
	Range 3	30 $\mu\Omega$. - 30m Ω with up to 100Adc; Accuracy <0.05% reading + 0.05% range	
8	Functional Tests		
8.1	Supported Assets	Three phase and single phase transformers	
		Auto transformers with or without tertiary	

		All kinds of vector groups: YD, DY, ZD, DZ, 1..12	
		Phase-shifting transformers	
8.2	Ratio Test	All measurements to be performed on all <u>three phases simultaneously; manually or automatically</u>	
		All tap positions to be measured with the tap-changer controlled automatically from the test set for all tapping up and tapping down operations	
		Measurements: Voltage ratio measurement, <u>vector group phase shift</u> and excitation current	
		Calculations: Ratio deviation	
		Assessment: Automatic assessment according to IEC, i.e. pass is when the ratio deviation <0.5%	
		Graphics: VTR vs. tap position, VTR deviation vs. tap position, vector group phase angle vs. tap position, excitation current vs. tap position	
8.3	Static Winding Resistance	All measurements to be performed on all <u>three phases simultaneously</u> and <u>automatically</u>	
		All tap positions to be measured with the tap-changer controlled automatically from the test set for all tapping up and tapping down operations	
		Measurements: Winding resistance vs. tap position	
		Assessment: Automatic assessment according to IEC, i.e. pass is when the resistance between the phases deviated by >2%	
		Graphics: Static winding resistance	
8.4	Short Circuit Impedance	Short Circuit Impedance to be measured for a number of taps (typically minimum, nominal and maximum tap).	
		No need to apply an external short circuit on the LV winding of the transformer, i.e. the short circuit should be applied internal to the test equipment, with allowance made for the test leads.	
		Frequency Response of Stray Losses (FRSL) measurement to be possible	
8.5	Demagnetization	Test equipment to be able to demagnetize the core of a power transformer. A measurement of the magnetization level before and after de-magnetization is to be displayed.	

8.6	Dynamic Winding Resistance	All tap positions to be measured with the tap-changer controlled <u>automatically</u> from the test set for all tapping up and tapping down operations	
		Test routine is to automatically monitor the charging of the winding inductance and only take a measurement once measured values have stabilized. Also the test routine shall discharge the winding inductance of ALL charge after the test.	
		Measurements: Winding resistance, ripple of tap change current	
		Assessment: Automatic assessment according to IEC, i.e. pass is when the resistance between the phases deviated by >2%	
		Graphics: OLTC Scan for each tap transition superimposed on top of each other; Static winding resistance vs. tap position; ripple vs. tap position	
9	Software		
	Operating System	Windows 10 (32bit and 64bit)	
	Data Management Functions:	Automatic Testing Database for HV plant assets	
		Data management functions for locations of assets	
		Data management functions for all primary assets (e.g. power transformers, current transformers, circuit breakers, etc.)	
		Data management of testing jobs to be done on all primary assets	
		Provision of automatic connection diagrams for each type of test	
		Flexible tools to select specific tests ON and OFF	
		Automatic generation of reports including automatic Pass/Fail assessments	
		Back-up of primary assets database with test results.	
		Optional centralized database to which multiple users can synchronize their location, asset and job data and test results.	
10	Accessories		

	High voltage and low voltage test leads	15 m combination lead for all three phases and neutral, colour-coded RED, YELLOW and BLUE	
	Tap changer control lead	15m combination lead for tapping up and tapping down signal.	
	Connection clamps	4x Red & 4x Black Kelvin clamps	
	Grounding cable	1 x 9 m; 6 mm ² with connection clamp	
	Other accessories:	Power cord	
		Connection lead from test set to PC	
		Hardcover carrying cases for test hardware with retractable handle and wheels	
		Instruction Manual	
		Software for report downloading and configuration as well as offline test sequence generation.	
	Hardcover Transport case	A hardcover transport case is to be provided for the test equipment for shipment / courier purposes.	
11	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Hotline support hours	Local telephonic support to be offered in the hours of 07h00 - 20h00 South African time.	
	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	Number of units in operation in South Africa	10 units in SA (separate list of users with contact details to be provided)	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	

	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
		In-house / On-site training to be offered on request	
	Warranty on Hardware	FIVE years from date of delivery	
12.	Calibration Certificate	Recently Sold Equipment	

Item 26: Medium Voltage Auto Recloser Test Set			
1	General		
	Manufacture	XXXXXX	
	Type	XXXXXXXX	
2	Power Supply		
	Nominal Voltage	240 V	
	Nominal Frequency	50 Hz	
	Power Consumption	1000W at 230V	
	Rated Current	8A at 230V	
	Connection	Standard AC sockets 15Amp 3point plug	
3	Certificates		
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	
4	Hardware		
4.1	General		
		All functions should be combined in one hardware unit	

		The unit shall be of a robust and sturdy construction	
		PC card design: Wire jumpers on a single printed circuit board are not permissible	
		Electronic components: No potentiometers are allowed	
		No moving elements or elements that are susceptible to damage, i.e. controls elements or displays on the face plate are permissible	
4.2	Output Amplifiers		
		The amplifier stages are to be fully electronic, i.e. not via transformer	
		All current amplifiers to be fully protected and proof against any open-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shutdown of the amplifiers is NOT permissible	
		All voltage amplifiers to be fully protected and proof against any short-circuit-, overload-, overburden- and over-temperature- condition. Any such condition is to be immediately displayed in all active software modules. Except for an over-temperature condition an automatic shutdown of the amplifiers is NOT permissible	
		All amplifiers to use linear amplification elements and to be dc-coupled	
		Ability to generate dc and ac signals	
		The amplifiers, low-level outputs, the measurement inputs and the main power supply to be galvanically isolated from each other and earth (2kV insulation voltage)	
4.3	Voltage Amplifiers		
	Setting range	6x 0..8V, Option: 6x 0..150V _{rms} (L-N)	
	Output power	6x 42W at 150V	
	Load current	6x 280mA	
	Accuracy	error < 0.05% typically, <0.1% guaranteed	

	THD+N	< 0.1% at full scale	
4.4	Current Amplifiers		
	Setting range	3x 0..12.5A _{rms}	
	Output power	3x 95W	
	Compliance voltage	3x 12V _{rms} , 3x 18V _{pk}	
	Accuracy	error < 0.05% typically, <0.1% guaranteed	
	THD+N	< 0.1% at full scale	
	Independent amplifiers	The three current amplifiers are to be independent from the six voltage amplifiers	
4.5	Low-level signal Generators		
		6 analogue low level signals to test controllers with low-level input, e.g. from Rogowski coils, linear voltage or linear current sensors must be provided	
		Full simulation of Rogowski coil signal (i.e. first order differential of signal) to be performed in hardware.	
4.6	Signal Generation		
		All outputs to be continuously and independently adjustable in amplitude, phase (0 to +/- 360°) and frequency.	
		Able to generate continuous sine waves with a frequency between dc and 599Hz.	
		Frequency error to be less than 0.5 ppm.	
		Phase error to be less than 0.005°	
4.7	Binary Inputs		
	Number of inputs	6 fully isolated galvanic inputs (2kV insulation voltage)	
	Mode/Trigger criteria	Pick-up and drop-out of potential-free contacts or dc voltages of up to 250Vdc. Trigger levels to be adjustable	
	Max. Input Voltage	250V	

	Max. error	< 100 μ s	
4.8	Binary output contacts		
	Number	9 in three potential groups	
	Breaking capacity	250V / 0.5A	
	Type	Dry contacts that can be used to switch ac or dc	
4.9	Time Synchronization		
		Test set needs to be synchronise to the IEEE 1588 Precision Time Protocol (PTP) via Ethernet.	
		Timing accuracy for PTP: 100ns.	
		Maximum distance between GPS receiver and test equipment for PTP: 2000m.	
		IEEE 1588 / PTP clock to be powered over Ethernet (PoE), i.e. no separate power supply should be necessary.	
4.10	Interface to PC		
		Interface to the IBM compatible PC via Ethernet interface OR USB	
		10/100Mbit/s copper (autosensing, autocross over) via RJ45 connector	
		Note: Centronics parallel port (Lpt) and/or serial RS232 ports are not permissible as modern laptops do not provide such ports.	
		Communications card to support IEEE 1588 / Precision Time Protocol (PTP) to synchronize the test set to a PTP enabled Grandmaster clock in the substation for Distributed tests of Distribution Automation Schemes.	
4.11	Smart Adapters	Connection to all kinds of recloser controllers via Smart Adapters	
		Safe to Touch, Plug & Play technology, i.e. by plugging the relevant test lead in, the test set should configure itself for that specific recloser controller whilst all	

		electrical outputs are insulated from the user's touch.	
		Lead length: 2m and 7m	
		One connector to support ALL types of recloser controllers	
5	Software		
5.1	General		
		Windows 10 (32bit and 64bit) software. Long filenames, tool tip help, context sensitive menu function (right mouse click) and an integrated help browser must be provided.	
		No programming to be necessary to test an application - entry of setting parameters to be all that is required to set up and perform a test	
		Future expansions in functionality by means of software updates. Firmware updating to be handled by the software, i.e. exchange of any hardware components is not permissible.	
		Generation of reports on paper or file. All graphics and text to be printable.	
		Test report must be configurable to include custom information (tester, date of test, substation, reminders)	
		It must be possible to test the whole recloser controller with one test routine.	
		Test sequence to be pausable at pre-defined points in the test sequence, by popping up a custom instruction dialogue, instructing the user to switch certain functions ON or OFF, change a setting on the controller, ...	
		Online Pass/ Fail assessment for ALL tests. This is particular important for automatic testing.	
		Test software to be future proof to allow the complete testing of any new recloser controller, both in form of new smart adapters as well as in terms of the capability of the hardware of the test equipment.	
		Full breaker simulation of the binary outputs in terms of auxiliary contacts (52a and/or 52b) as well as when to switch off the current must be possible in each test module	
		Full control of the breaker in terms of closing or tripping the breaker from inside the software or from the front panel of the	

		test equipment hardware must be possible.	
5.2	Manual Test Functions		
		<u>Analogue Output Check:</u> Enter six phase voltages and three phase currents (in terms of unsymmetrical amplitudes, phase angle and frequency), displaying the voltage, currents and power either numerically or vectorially - and compare these voltages, currents and power to the values displayed on the controller. Quantities to be displayed either in primary or in secondary quantities.	
		<u>Pick-up Test:</u> Manually ramp any voltage or current in terms of amplitude or frequency to determine the pick-up level of any such function. Automatic recording of results should be possible when a pick-up contact is available. Else manual stepping up/down must be possible.	
		<u>Tripping Sequence:</u> Determine the sequence of tripping and reclosing for all possible fault scenarios, i.e. successful and un-successful reclosing. All deadtimes and trip times are to be measured. Dettimes are to be assessed automatically against nominal deadtimes entered	
		<u>Trip Time Characteristic Test:</u> The trip times are to be assessed against the theoretical tripping curve for all typical tripping curves available (Definite Time, Normally inverse, Very inverse, extremely inverse, Long-time inverse, TCC101, etc....) for all kinds of fault (A-N, B-N, C-N, A-B, B-C, C-A, A-B-C)	
		<u>Direct Test Mode:</u> Similar to the automatic output check - but with the option to switch instantaneously between pre-fault and fault states. Each of the six voltages and three currents are to be adjustable in amplitude, phase angle and frequency. Any binary input changes are to be recorded and timed in relation to the state switches.	
		<u>Restoration Test Mode:</u> This is a test mode to synchronize multiple hardware units via GPS and to ensure a time synchronized injection of all test quantities into multiple recloser controllers forming part of a Distribution Automation Scheme.	
		<u>Sequencer Test Mode:</u> The Sequencer tool allows creation and execution of custom test sequences.	

		<u>Harmonic:</u> The Harmonics tool tests harmonic blocking or restraint functions by applying harmonics of the 2nd and/or 5th order to currents and voltages.	
5.3	Test Templates	It must be possible to prepare test templates offline (i.e. without the test hardware connected) and ahead of the time.	
		The person in the field then simply needs to execute each of the pre-prepared tests. Hence it should be possible for a lower-skilled person to conduct and execute the test template - with adequate training as well as guided by user instructions, which are part of the test template.	
		Automatic assessment of the test results must be provided - where possible.	
		The test template software should have a similar look and feel with the same setting possibilities as the manual test software.	
		Test report with both numeric and graphical test results must be printable from the test results file.	
6	Accessories		
	Smart Adapters:	for Nulec PTCC, Schneider ADVC, Tavrida RC05, Cooper Form 4C,	
	Measurement leads:	2m and 7m lead to be provided	
	Other accessories:	South African power cord	
		Connection lead from test set to PC	
		Hardcover carrying cases for test hardware with retractable handle and wheels	
		Soft Bag for test set and accessories	
		Instruction Manual	
		Software for report downloading and configuration as well as offline test sequence generation.	
7	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its	

		suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	
	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
		In-house / On-site training to be offered on request	
	Warranty on Hardware	FIVE years from date of delivery	
8.	Calibration Certificate	Recently Sold Equipment	

Item 27: Current and Voltage Transformer Test Set for High & Medium Voltage			
1.	Manufacture Offered	XXXXXX	
2.	Model Offered	XXXXXX	
3.	Power Supply		
	Nominal Voltage	240 V	
	Nominal Frequency	50 Hz	
	Power Consumption	Max. 500 VA	
4.	Certificates		
	Safety	The product adheres to the low voltage Directive 2006 / 95 / EC (CE conform)	
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	

5.	Functions		
	Output Voltage	0 - 120Vac or dc	
	Safe Output Voltages	Higher Voltages than 120Vac are NOT permissible	
	Output Current	0 - 5Aac / 15Apc	
	Current Ratio	0.1 - 10000	
	Phase Displacement	0 ° - +/-360 °	
	Polarity	Yes (OK or NOT OK)	
	Winding Ratio	Ratio 0.1 - 10000	
	ALF (Accuracy Limiting Factor)	ALF to be determined for P class CTs	
	Class	Class is to be determined automatically	
	FS (Instrument Security Factor)	FS to be determined for M class CTs	
	Ktd	Transient dimensioning factor according IEC60044-6	
	Kssc	Symmetrical overcurrent factor according IEC60044-6	
	Excitation Curve	Knee points possible up to 30,000 V	
	Knee point Calculation	Depending on selected standard	
	Winding Resistance	1mOhm - 300 Ohm (including temperature compensation)	
	Secondary Burden	1 mOhm - 1kOhm, 35 VA	
	Saturated Inductance	Yes	
	Unsaturated Inductance	Yes	
	Remanence Flux	Yes	
	Secondary Time Constant	Yes	
	Burden Simulation/Modelling	No external burden to be required	
		Burden free adjustable	
		Recalculation of ratio error depending on actual burden	
	Primary Current Simulation	Recalculation of ratio error depending on actual primary current	
	Automation	Fully automatic test of selectable tests	

	Duty Cycle	Continuous	
	Remote Control	Possible via PC	
	Nameplate Guessing	Possible without the knowledge of the nominal data	
		Determination of type, nominal currents, burden, class/ALF	
	Demagnetization	Automatically after CT test	
	Assessment	Automatically according to nominal data and standard	
		Considering duty (C-O / C-O-C-O) e.g. auto-reclosure system	
	Tapped CTs	Automatic testing without the need for rewiring of tapped CTs with up to five taps is required	
		Winding resistance, excitation curve and ratio tests are to be carried out for all intermediate taps, i.e. 1S1-1S2, 1S1-1S3, 1S2-1S3	
	Speed of full test	The full test of each core must be completed in less than 60s	
6.	Accuracy		
	Ratio	Range 0.2 - 1: 0.1 % (guaranteed)	
		Range 1 - 2000: 0.05% (guaranteed)	
		Range 2000 - 5000: 0.1 % (guaranteed)	
		Range 5000 - 10000: 0.2 % (guaranteed)	
	Phase	Accuracy: 0.05 ° (guaranteed)	
		Resolution: 0.01 min	
	Winding Ratio	Accuracy: 0.1 % (guaranteed)	
		Resolution: 0.01 turns	
	Winding Resistance	Accuracy: 0.1 % + 1mili Ohm (guaranteed)	
		Resolution: 1mili Ohm	
	Secondary Burden	Accuracy: 1 % (guaranteed)	
	Measurement Secondary Voltage	Range: 0 - 300 V	
		Accuracy: 0.1 % (guaranteed)	

	Measurement Primary Voltage	Range: 0 - 30 V	
		Accuracy: 0.1 % (guaranteed)	
		Copies of detailed calibration report and certificates from independent calibration laboratories proving above accuracy figures are to be supplied together with the tender	
7.	Standards		
	IEC 60044-1; IEC 61869-2	Measurement CTs: Class 0.1 - 5 (e.g. 0.1 FS10, ...)	
		Protection CTs: (class P, PR and PX, e.g. 5P20, ...)	
	IEC60044-6	Protection CTs: Class TPS, TPX, TPY, TPZ	
	IEEE C57.13-1993	Measurement CTs: Class 0.3 - 1.2 (e.g. class 0.3, ...)	
		Protection CTs (class C, K, T)	
8.	Reporting and Software		
	Embedded Software	Allows fully automatic tests	
	Display	Sunlight readable graphic display with contrast adjustment	
	Keyboard	Must be available for entering the settings	
	Remote Control	On PC for remote control	
	Test Storage	min. 1000 test records	
	PC-Connection	USB connection	
	Storage Medium	Compact Flash Card	
	Viewer/Printing	Software to view and print on PC built in thermal printer is NOT allowed	
	Reporting	Automatic import into MS Excel for post-processing	
		Full customization possible (e.g. own logo)	

		Comparison of various test results on same report	
9.	Accessories		
	Injection Cable	1 x 3 m	
	Measurement Cables	1 x 3 m + 1 x 15 m	
	Battery Clamps	6 x (for injection and measurement cables)	
	Power Supply Cable	South African power cord	
	Grounding Cable	1 x 6 m	
	Carrying Bag	for test set and accessories	
	Hardcover Transportation Case	for test set and accessories	
	Connection Cable to PC	Yes	
	Flash Card	min. 128 MB	
	Flash Card Reader	Yes	
	User Manual	Yes	
	Software	for test set and PC	
	Test Report	Yes	
	Calibration Certificate	Yes	
10.	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	

	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
		In-house / On-site training to be offered on request	
	Warranty on Hardware	FIVE years from date of delivery	
11.	Calibration Certificate	Recently Sold Equipment	

Item 28: High Voltage Circuit Breaker Test Set			
1.	Manufacture Offered	XXXXXX	
2.	Model Offered	XXXXXX	
3.	Applications		
	High-Voltage Circuit Breakers	Yes	
	Medium-Voltage Circuit Breakers	Yes	
	Main test system to combine timing test, contact resistance test and power sources for trip and close coils in ONE test hardware.	Yes	
	Tests are to be performed manually and/or fully automatically	Yes	
	Testing of high voltage circuit breakers WITHOUT rewiring in-between timing and contact resistance tests.	Yes	
	Reduced wiring effort between main poles of breaker and the test set, by using mobile satellite modules mounted at the head of a breaker (multiple units for multiple breaks).	Yes	
	Three phase testing of HV breakers with up to eight breaks per phase must be possible with one test, i.e. with no re-wiring in between.	Yes	
	The unit includes adequate precautions for safety: Emergency Off, bright ON and OFF lights, ground wire connection check, optional facility for Deadman button.	Yes	
4	Power Supply		
	Input Voltage	240 V	
	Nominal Frequency	50 Hz	
	Power Consumption	<3500W at 230V	

		<5000W peak	
	Rated Current	16A at 230V	
	Connection	3pin plug; 15amp; 1 phase	
5	Certificates		
	Independent Test Laboratory	Copies of test certificates from independent test laboratories proving compliance with the above standards are to be supplied together with the tender	
6	Hardware Specifications		
6.1	Current Outputs		
	DC source - single phase	1x 0..±150Adc for up to 5min, 0..±72Adc for up to 15min	
	DC source - three phase	3x 0..±50Adc for up to 5min, 0..±24Adc for up to 15min	
	Compliance voltage	Vcomp = 50Vdc subject to a power limit of 3200W for 30s and 2400W for 2h	
	DC source - mobile units	6x 0..±100Adc or 3x 0..±200Adc for up to 6.2s based on 100μΩ	
	Compliance voltage - mobile units	Vcomp = 2.6Vdc subject to the mobile units charged to 100%	
6.2	Voltage Outputs		
	DC high range	0 - ±300Vdc for max. 27.5Adc for 30s (12Adc for 2h)	
	DC low range	0 - ±150Vdc for max. 55Adc for 30s (24Adc for 2h)	
	AC high range	0 - 240Vac for max. 20Aac for 30s (12Aac for 2h)	
	AC low range	0 - 120Vac for max. 40Aac for 30s (24Aac for 2h)	
	Power limit	All voltage output specifications are subject to a power limit of 3200W for 30s and 2400W for 2h	
6.3	Resistance Measurements		

	Range 30mV	0.1 $\mu\Omega$ - 300 $\mu\Omega$ at 100A meas. current, 0.2% rd + 0.1 $\mu\Omega$ accuracy	
	Range 300mV	0.5 $\mu\Omega$ - 3m Ω at 100A meas. current, 0.2% rd + 0.5 $\mu\Omega$ accuracy	
	Range 3V	5 $\mu\Omega$ - 30m Ω at 100A meas. current, 0.2% rd + 5 $\mu\Omega$ accuracy	
	Range 3V	50 $\mu\Omega$ - 300m Ω at 10A meas. current, 0.2% rd + 50 $\mu\Omega$ accuracy	
6.4	Voltage Input (V IN) CAT III		
	DC Input	0 - 420V with 0.5% rd + 0.5% fs typical accuracy	
	AC input	0 - 300V with 0.5% rd + 0.5% fs typical accuracy	
6.5	Internal Measurement of Outputs		
	300V range	0 - 300V, DC 0.1% rd + 0.05% fs acc. AC: 0.03% rd + 0.01% fs acc.	
	3V range	0 - 3V, DC: 0.1% rd + 0.05% fs accuracy	
	300mV range	0 - 300mV, DC: 0.1% rd + 0.05% fs accuracy	
	30mV	0 - 30mV, DC: 0.1%	
	55A range	0 - 55A, DC 0.1% rd + 0.2% fs accuracy	
	40A range	0 - 40A, AC 0.1% rd + 0.1% fs accuracy	
6.6	Binary Input (A) CAT III		
	Binary input type	Toggling with potential-free (dry)	
	Maximum sample rate	40kHz	
	Minimum resolution	25 μ s	
		(item 8.3, 8.4 & 8.5: rd - reading; fs - full scale)	
7	Functional Tests		
7.1	Testing Medium-Voltage CB		

	Contact resistance test	Resistance measurement data:	
		I DC - DC test current	
		V DC - Measured voltage	
		R meas - Measured resistance	
		R min/R ref - Minimum assessment limit / reference resistance value	
		R max/R dev - Maximum assessment limit / Allowed deviation from the reference resistance value	
		Assessment - Automatic measurement assessment	
	Minimum pickup test	Minimum Pickup Measurement Data	
		Number of measurements	
		Trip or close	
		Pickup voltage of the circuit breaker under test	
		V min/ V ref - Assessment limit	
		V max/V dev - Assessment limit	
		Assessment - Automatic measurement assessment	
	Timing test	Timing measurement data:	
		Open time - Contact open time	
		Open synch. - Open synchronization time	
		Close time - Contact close time	
		Close synch. - Closing synchronization time	
		Reclose time - Contact reclose time of OC operation	
		Trip-free time - Contact trip-free time of CO and O-CO operation	
		Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation	
		Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation	
		t min/t ref - Minimum operating time limit/Operating time reference value	

		t max/t dev - Maximum operating time limit/Operating time deviation	
		Peak current - Coil peak current value through a trip or close coil	
		Assessment - Automatic assessment of coil characteristics	
		Software to graphically display the main contacts, auxiliary contacts and trip and close coil currents and voltages vs. time.	
		Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.	
	Motor current test	Software to display the motor current vs. time graphically.	
		Measurement of peak motor current and duration of spring re-charging	
		Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities, zoom facilities as well as graphical comparison is to be provided.	
7.2	Testing High-Voltage CB		
		Test with mobile satellite unit	
	Contact resistance test	Resistance measurement data:	
		Channel - Channel of the mobile unit	
		I DC - DC test current	
		V DC - Measured voltage	
		R meas - Measured resistance	
		R min/R ref - Minimum assessment limit / reference resistance value	
		R max/R dev - Maximum assessment limit / Allowed deviation from the reference resistance value	
		Assessment - Automatic measurement assessment	
	Timing test	Timing measurement data:	
		Open time - Contact open time	

		Open synch. - Open synchronization time	
		Close time - Contact close time	
		Close synch. - Closing synchronization time	
		Reclose time - Contact reclose time of OC operation	
		Trip-free time - Contact trip-free time of CO and O-CO operation	
		Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation	
		Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation	
		t min/t ref - Minimum operating time limit/Operating time reference value	
		t max/t dev - Maximum operating time limit/Operating time deviation	
		Peak current - Coil peak current value through a trip or close coil	
		Assessment - Automatic assessment of coil characteristics	
		Software to graphically display the main contacts, auxiliary contacts and trip and close coil currents and voltages vs. time.	
		Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.	
	Dynamic contact resistance measure	Dynamic contact resistance measurement data:	
		Open time - Contact open time	
		Open synch. - Open synchronization time	
		Close time - Contact close time	
		Close synch. - Closing synchronization time	
		Reclose time - Contact reclose time of OC operation	
		Trip-free time - Contact trip-free time of CO and O-CO operation	
		Trip-free time - Second contact trip-free time of CO-CO and O-CO-CO operation	

		Pause time - Contact pause time of O-CO, CO-CO, and O-CO-CO operation	
		t min/t ref - Minimum operating time limit/Operating time reference value	
		t max/t dev - Maximum operating time limit/Operating time deviation	
		Peak current - Coil peak current value through a trip or close coil	
		Assessment - Automatic assessment of coil characteristics	
		Software to graphically display the main contacts, auxiliary contacts, dynamic contact resistance for each pole and phase and trip and close coil currents and voltages vs. time.	
		Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.	
	Minimum pickup test	Minimum Pickup Measurement Data	
		Number of measurements	
		Trip or close	
		Pickup voltage of the circuit breaker under test	
		V min/ V ref - Assessment limit	
		V max/V dev - Assessment limit	
		Assessment - Automatic measurement assessment	
	Motor current test	Software to display the motor current vs. time graphically.	
		Measurement of peak motor current and duration of spring re-charging.	
		Graphical analysis tools, such as cursors facilities, detailed time and physical quantity measurement facilities as well as zoom facilities to be provided.	
8	Software		
	Supported Operating System	Windows 10 (32-bit and 64-bit)	

	Functionality	Creation of manual tests with assessment functions	
		Creation of pre-prepared test templates which include all test object parameters as well as test settings.	
		Automatic generation of test reports including automatic Pass/Fail assessments	
		Database functionality to sort and manage test data by location, asset and job.	
		Comparison of test results between different assets of the same type and/or jobs performed on the same asset.	
9	Accessories		
	Mobile satellite module for main contacts	THREE mobile main contact modules to be provided. Each mobile module is a probe for timing, static and dynamic resistance measurements on circuit breaker's main contacts. It facilitates measurements where current is injected over the circuit breaker interrupter while the circuit breaker is operated (tripped or closed).	
	Main lead	South African power cord	
	Ground lead	1 x 6 m grounding cable (6 mm ²) with connection clamp	
	Communication lead	Connection lead from test set to PC	
	Ether-CAT cable	15m Ether-CAT connection leads for connection of all mobile modules	
	Measurement leads	All necessary test leads and test clamps to conduct a full test on either a MV breaker (with just the main unit) or HV breaker (with mobile satellite units) to be provided with the test equipment.	
	Crocodile clamps	Sufficient clamps for 4mm banana plugs	
	Kelvin clamps	Sufficient Kelvin clamps FZ60, rated for 100A	
	Hardcover case	Hardcover carrying cases for test hardware with retractable handle and wheels	
	Manual	Start-up manual in English both in hardcopy and full user / reference manual in softcopy (PDF) format.	

10	Local Support		
	Local on-site presentation and demonstration	LOCALLY based engineers (i.e. from the Southern African region) are to present and demonstrate the equipment to our engineers at City of Tshwane substations on our own test application to prove its suitability to operate in local environmental conditions as well as to be able to test our test objects adequately.	
	Email support	Email support to be offered with a guaranteed turnaround time of 1 business day.	
	No of back-up units available in South Africa	More than 1	
	Calibration facility available in South Africa	Yes	
	Guaranteed turnaround time for repairs and calibration	< 5 working days	
	Product training offered in South Africa	Standard training offered every three months in Tshwane	
		In-house / On-site training to be offered on request	
	Warranty on Hardware	FIVE years from date of delivery	
11.	Calibration Certificate	Recently Sold Equipment	

Item 29: Thermal Scanner			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	AC power input	220~240V	
4.	Laptop connection	Wi-Fi, LAN, USB connector and Printer cable	
5.	Key Features		
	Infrared resolution	320 x 240 (76,800 pixels)	
	Super Resolution	No	
	IFOV with standard lens (spatial resolution)	1.85 mRad, D:S 532:1	
	Field of view	34° H x 24° V	

	Minimum focus distance	15 cm (approx. 6 in)	
	Multi Sharp Focus	No	
	Laser Sharp Auto Focus	Yes, for consistently in-focus images. Every. Single. Time.	
	Laser distance meter	Yes, calculates distance to the target for precisely focused images and displays distance on screen	
	Advanced manual focus	Yes	
	Wireless connectivity	Yes, to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN (where available)	
	Connect app compatible	Yes*, connect your camera to your smartphone, and images taken automatically upload to the Connect app for saving and sharing	
	Connect Assets	Through the desktop, assign images to assets, easily compare measurement types in one location and create reports.	
	Connect instant cloud upload	Yes*, connect your camera to your building's WiFi network, and images taken automatically upload to the Connect system for viewing on your smartphone or PC	
	Connect instant server upload	No	
	IR-Fusion technology	Yes, adds the context of the visible details to your infrared image	
	Ruggedized touchscreen display	3.5 inch (landscape), 640 x 480 LCD	
	Ergonomic design	Pistol-grip design for one-handed use	
	Thermal sensitivity (NETD)	$\leq 0.075\text{ }^{\circ}\text{C}$ at $30\text{ }^{\circ}\text{C}$ target temp (75 mK)	
	Level and span	Smooth auto and manual scaling	
	Touchscreen adjustable level/span	Yes	
	Fast auto toggle between manual and auto modes	Yes	
	Fast auto-rescale in manual mode	Yes	
	Minimum span (in manual mode)	$2.0\text{ }^{\circ}\text{C}$ ($3.6\text{ }^{\circ}\text{F}$)	
	Minimum span (in auto mode)	$3.0\text{ }^{\circ}\text{C}$ ($5.4\text{ }^{\circ}\text{F}$)	

	Built-in digital camera (visible light)	5MP	
	Frame rate	60 Hz or 9 Hz versions	
	Laser pointer	Yes	
	LED light (torch)	Yes	
	Digital zoom	No	
6.	Power Supply		
	Batteries (field-replaceable, rechargeable)	Two lithium ion smart battery packs with five-segment LED display to show charge level	
	Battery life	2-3 hours per battery (actual life varies depending on settings and usage)	
	Battery charging time	2.5 hours to full charge	
	Battery charging system	Two-bay battery charger or in-imager charging. Optional 12 V automotive charging adapter	
	AC operation	AC operation with included power supply (100 V ac to 240 V ac, 50/60 Hz)	
	Power saving	User selectable sleep and power off modes	
7.	Temperature Measurement		
	Temperature measurement range (not calibrated below -10 °C)	-20 °C to 650 °C (-4 °F to 1,202 °F)	
	Accuracy	± 2 °C or 2 % (at 25 °C nominal, whichever is greater)	
	On-screen emissivity correction	Yes (both value and table)	
	On-screen reflected background temperature compensation	Yes	
	On-screen transmission correction	Yes	
8.	General Specifications		
	Color alarms (temperature alarms)	High temperature, low temperature, and isotherms (within range)	

	Infrared spectral band	7.5 μm to 14 μm (long wave)	
	Operating temperature	-10 °C to 50 °C (14 °F to 122 °F)	
	Storage temperature	-20 °C to 50 °C (-4 °F to 122 °F) without batteries	
	Relative humidity	10 % to 95 % non-condensing	
	Center-point temperature measurement	Yes	
	Spot temperature	Hot and cold spot markers	
	User-definable spot markers	No	
	User defined measurement boxes	1 expandable-contractible measurement box with MIN-MAX-AVG temp display	
	Hard case	Rugged, hard carrying case; soft transport bag	
	Safety	IEC 61010-1: Overvoltage category II, Pollution Degree 2	
	Electromagnetic compatibility	IEC 61326-1: Basic EM environment. CISPR 11: Group 1, Class A	
	Australian RCM	IEC 61326-1	
	US FCC	CFR 47, Part 15 Subpart B	
	Vibration	0.03 g ² /Hz (3.8 g), 2.5 g IEC 60068-2-6	
	Shock	25 g, IEC 68-2-29	
	Drop	Engineered to withstand 2 meter (6.5 feet) drop with standard lens	
	Size (H x W x L)	27.7 cm x 12.2 cm x 16.7 cm (10.9 in x 4.8 in x 6.5 in)	
	Weight (battery included)	1.04 kg (2.3 lb)	
	Enclosure rating	IEC 60529: IP54 (protected against dust, limited ingress; protection against water spray from all directions)	
	Warranty	Two-years (standard), extended warranties are available	
	Recommended calibration cycle	Two-years (assumes normal operation and normal aging)	
	RoHS compliant	Yes	

Item 30: Battery Tester			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	Power Supply		
	Nominal Voltage	240 V	
	Nominal Frequency	50 Hz	
	Discharge Current up to	130Ampere	
4.	Application		
	Suitable for all battery types	Required	
	High power battery capacity test system		
	Discharging current up to 1300A with external loads (up to 9)		
	Graphical display showing test parameters, curves and results		
	Internal memory	16Gig	
	Shunt or clamp metering of an additional current		
5.	Functions		
	Maximum discharging current		
	Battery Nominal Voltage	Max Current Discharged	
	240Volt	70Amp	
	220Volt	70Amp	
	140Volt	130Amp	
	110Volt	130Amp	
	48Volt	130Amp	
	24Volt	130Amp	

6.	Load Patterns required		
	Constant Discharge current		
	Constant Power		
	Current Profile up to 20 steps		
	Power Profile		
	Manual Control		
7.	Accuracy		
	Accuracy: $\pm 1\%$ of the value, $\pm 0.2\%$ of the range The discharging activity must be able to be stopped and started again later from the any level		
8.	Reporting and Software		
	The software for of the charger	Must be integrable with the newest Microsoft Windows and allows to control the charger from a Lap-Top PC.	
	The software performs the following features:	Set the charger testing parameters;	
	Display on the PC screen the following parameters in graphic and tabular form:	• Battery voltage • Current discharged • Ampere-hour discharged • Time - Test duration	
	IT manages	The BTS alarms	
	Possibility to define a discharge current profile	With an maximum of 20 steps	
	When the test is completed	It must be possible to save the results and to print it both in graphic and tabular form	
	Software and firmware	Must be downloadable to be updated directly	
9.	Accessories		

	Power supply cable and earth cable.	15meter long	
	No. 2 battery cables, terminated with crocodile clamps.	15meter long	
	Software for the charger.		
	USB interface cable.		
	Operating Manual.	Hard Copy	
10.	Calibration Certificate	Recently Sold Equipment	

Item 31: Insulation Tester 500 to 15kV			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacture	XXXXXXXXXXXX	
3.	AC power input	220~240V	
4.	Test Lead	10Meter	
5.	Rated output	500V - 15kV	
6.	Mass (kg)	≤ 15kg	
7.	Calibration Certificate	Recently Sold Equipment	

Item 32: Small/Mini Clip-on Current Tester			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	To be used in conjunction with multi meter		
4.	Must be able to read	400mili Amp to 60 Amp	
5.	Small and robust		
	Clip-on		
6.	Hold / Memory Function		

Item 33: Earth Tester			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	AC power input	220~240V	
4.	Laptop connection	Wi-Fi, LAN or USB	
5.	Mass (kg)	≤ 5kg	

Item 34: Transformer Test Leads			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	10mm ² per core	Isolation rating?	
4.	Clamps: 600Amp	Current Carry Rating	
5.	Length	40meter required	

Item 35: 2.5mm ² PANEL WIRE			
1.	Make offered	XXXXXXXXXXXX	
2.	Colour	Grey	
3.	2.5mm ²	Isolation rating?	
4.	Multi Stran / Fine Stran's	Current Rating	
5.	Flexibility	Soft outer insulation	

Item 36: 4mm ² PANEL WIRE			
1.	Make offered	XXXXXXXXXXXX	
2.	Colour	Grey	
3.	4mm ²	Isolation rating?	
4.	Multi Stran / Fine Stran's	Current Rating	
5.	Flexibility	Soft outer insulation	

Item 37: 16mm ² PANEL WIRE			
1.	Make offered	XXXXXXXXXXXX	
2.	Colour	Green/Yellow or Grey	
3.	10mm ²	Isolation rating?	
4.	Multi Stran / Fine Stran's	Current Rating	

5.	Flexibility	Soft outer insulation	

Item 38: Laptop – Engineering Configuration On-Site			
1.	Make offered	XXXXXXXXXXXX	
2.	Model Offered	XXXXXXXXXXXX	
3.	Operating System	Windows 10/11 Operating System	
4.	Charger		
5.	Hard drive	512 GB Static Hard Drive	
6.	Screen	15,6" Resolution of 1920x1080 Full HD	
7.	RAM	16GB DDR5	
8.	Processor	Core-i7 Latest Generation processor	
9.	Port	HDMI	
10.	Slots	• MicroSD • Sim card	
11.	USB ports	2x A-Type 1x B-type 1x C-type	
12.	Carry Case	Leather	

Item 39: Laptop – Design & Running Protection Simulation's			
1.	Make offered	XXXXXXXXXXXX	
2.	Model Offered	XXXXXXXXXXXX	
3.	Operating System	Windows 11 or latest operating system	
4.	Charger		
5.	Hard Drive	1 Terabyte, Static HD	
6.	Screen	15,6"	

		Resolution of 1920x1080 Full HD	
7.	RAM	32GB DDR5	
8.	Processor	Core-i9 Latest Generation processor	
9.	Port	HDMI	
10.	USB ports	2x A-Type 1x B-type 1x C-type	
11.	slot	• Sim Card • MicroSD	
12.	Carry Case		

Item 40: Radio Frequency Interference & Acoustic Signal Surveyor			
1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	ACOUSTIC EMISSION CHANNEL		
	Inputs:	1 channel	
	Connector:	BNC	
	Input Impedance:	50Ω or 22kΩ, software switchable (low noise preamp: 22kΩ only)	
	AE Operating Frequency:	10 kHz to 500 kHz at -3dB points	
	Phantom Power:	28 VDC on BNC centre conductor (100mA current limited), software switchable.	
	AE Sensor:	R3α (standard), R6α, R6I, R15α R15I	
4.	UHF CHANNEL		
	Inputs:	1 channel	
	Connector:	BNC	
	Input Impedance:	50Ω	
	Bandwidth:	50-1000 MHz with 6 MHz RBW	
	Accuracy:	± 100 kHz	
	Detection Types:	Peak and average detector	
	Sweep Processing:	Continuous, Average, Max Hold and differential.	
5.	ACCESSORIES		
	Transient Earth Voltage (TEV) capacitive probe	Capacitive probe for finding PD in metal-clad switchgears. BNC-BNC sensor cable included.	
	HF Current Transformer,	Split core, internal diameter Ø 127mm Scan for electrical pulses as evidence for partial discharge to earth. Can be clipped on an apparatus ground wire (incl.	

		transformers, cable terminations and dead tank breakers). BNC-N sensor cable included.	
	Directional Antenna	Provides more specific location of RFI source for surveying Air Insulated Substations (AIS), including direction of the radiations. BNC-BNC sensor cable included.	
	Acoustic emission sensor with preamplifier.	Application for detecting and localizing a PD source inside transformer tank. BNC-BNC sensor cable included.	
	UHF Drain Valve Sensor DN-50/80	For detecting electromagnetic PD signals in oil filled transformer tank. Application through oil drain valve without outage on the transformer. Suitable only for valves types: ball and gate. BNC-N sensor cable included.	
6.	LCD SCREEN		
	Display	TFT, 6.4" Trans reflective.	
	Size	132 x100 mm(W x H)	
	Resolution	640 x 480 pixels, 256 colours.	
	Backlight	LED	
7.	DATA STORAGE AND TRANSFER		
	Internal	NV Flash Memory (SD)	
	External	USB storage class compliant USB Flash Drive / Hard Disk Drive	
	Data Transfer	USB A/B to and from computer	
	File Format	XML for use with PD Viewer software.	
	Real Time Clock	Battery backed.	
	Connectivity	USB 1.1 Host and Client	
8.	POWER SUPPLY		
	External Supply:	External DC adapter, 12V @ 2A	

	DC Adapter:	85-264 VAC (47-63 Hz) / 12 VDC	
	Internal Battery:	Li-Ion, high capacity 7.2V, 6.6 Ah	
	Battery Life:	>6 hours	
	Charging Time:	3 hours	

ITEM 41: Drone with INFRA RED Vision to Detect Hot-Spot's

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
4.	Manufacturer Offered	XXXXXXXXXXXX	
5.	Model Offered	XXXXXXXXXXXX	
6.	Technical Description	Unique GPS satellite positioning technology allows drones to prevent loss	
7.		Drone can automatically follow the manipulator	
8.		With advanced intelligent identification technology	
9.		must allow recognition of gesture against the aircraft lens for automatic photo shots and video shots	
10.		Must also have one button takes off, one button landing to allow take off through the remote control and convenient fast landing	
11.		with 360 ° camera via the remote control	
12.		The built-in battery must allow minimum of 45minutes flight when fully charged	

13.		drone system information must allow the user to know the status of the battery remotely.	
14.		Must Be equipped with INFRA RED Vision capabilities	
15.	Payload	Maximum 3.5kg	
16.	Max Transmission distance	10km	
17.	Max Speed	45km/h	
18.	Max Wind Resistance	11.88m/s (39ft/s)	
19.	Visual Sensor size:	1.27cm(1/2inch) CMOS, 4K	
20.	Infrared resolution	640x512 pixels	
21.	Infrared frame rate:	30Hz	
22.	Thermal Imager	Uncooled Vox Micro bolometer	
23.	Infrared Wavelength:	8-14micron	

ITEM 42: Repairs of Item 21 to 41

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
24.	Manufacturer Workshop	Yes / No	
25.	Dedicated Workshop to do Repairs	Yes / No	
26.	Workshop with-in Tshwane	Yes / No	

ITEM 43: Calibration of Item 21 To 41

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
5.	Manufacturer Approved Calibration Laboratory	Yes / No	
6.	SABS Approved Calibration Laboratory	Yes / No	
7.	Dedicated Laboratory to do Calibration	Yes / No	
8.	Calibration Laboratory with-in Tshwane		

Item 44: 3kW INVERTER

1.	Manufacturer	XXXXXXXXXXXX	
2.	Make offered	XXXXXXXXXXXX	
3.	Output Voltage	235Volt	
4.	Standby time	4 Hours	
5.	Battery Type	48 volt Lithium ion Battery Pack	

Item 45: 5kW INVERTER

1.	Manufacturer	XXXXXXXXXXXX	
2.	Make offered	XXXXXXXXXXXX	
3.	Output Voltage	235 Volt	
4.	Standby time	4 Hours	
5.	Battery type	48 volt Lithium ion Battery Pack	

Item 46: 5kVA STANDBY GENERTOR

1.	Manufacturer	XXXXXXXXXXXX	
2.	Make offered	XXXXXXXXXXXX	
3.	Output Voltage	235Volt	

4.	Standby time	24Hours non stop	
5.	AVR	Required	
6.	Overload protection	2x 15Amp Output Socket with overload protection	
7.	Enclosed	Silent Type	

Item 47: 6.5kVA STANDBY GENERTOR			
1.	Manufacturer	XXXXXXXXXXXX	
2.	Make offered	XXXXXXXXXXXX	
3.	Output Voltage	235Volt	
4.	Standby time	24Hours non stop	
5.	AVR	Required	
6.	Overload protection	Two x 15 amp Output Socket with overload protection	

Item 48: Multi Meter			
1.	Model offered:	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	Mass	≤ 1kg	
4.	Insulation test voltages	50 V, 100 V, 250 V, 500 V, 1000 V	
5.	Voltage DC: Accuracy1 Max. resolution Maximum	±(0.09% + 2) 0.1 mV 1000 V	
6.	Voltage AC: Accuracy1 Max. resolution Maximum	±(1.0% + 3) 0.1 mV 1000 V	
7.	Current DC: Accuracy1 Max. resolution Maximum	±(1.0% + 3) 0.01 mA 10 A	

8.	Current AC:	Accuracy ¹ Max. resolution Maximum	$\pm(1.5\% + 3)$ 0.01 mA 10 A	
9.	Resistance:	Accuracy ¹ Max. resolution Maximum	$\pm(0.9\% + 1)$ 0.1 Ω 50 M Ω	
10.	Capacitance:	Accuracy ¹ Max. resolution Maximum	$\pm(1.2\% + 2)$ 1 nF 10,000 μ F	
11.	Frequency:	Accuracy ¹ Max. resolution Maximum	$\pm(0.1\% + 1)$ 0.01 Hz 100 kHz	
12.	Temperature:	Accuracy ¹ Max. resolution Range	$\pm(1.0\% + 10)$ 0.1°C -40°C / 400°C	

Item 49: INSULATION TESTER 1000VOLT

1.	Make offered	XXXXXXXXXXXX	
2.	Manufacturer	XXXXXXXXXXXX	
3.	AC power input	220~240V	
4.	Meter	Analogue	
5.	Rated output	1000V	
6.	Mass (kg)	≤ 15 kg	
7.	Heavy Duty Case	Required	

Item 50: CLAMP-ON AMP METER 1000AMP AC

1.	Make offered	XXXXXXXXXXXX	
2.	Model Offered	XXXXXXXXXXXX	
3.	Technical Description	Handheld unit with rugged case.	
4.		DC Voltage Range to a maximum of 1000volt	
5.		AC Voltage Range to a maximum of 1000volt	

6.		AC Amp range to a maximum of 1000Amp	
7.		DC Ampere range to a maximum of 1000amp	
8.		Resistance (Ω) range	
9.		Bell/continuity function	
10.		Min/Max hold function	
11.		Frequency (Hz).	
12.		Large display with backlight	
13.		Memory storage through application eliminates writing down results, reduces errors and saves data for historical tracking over time.	
14.		Auto power off to save battery power	

Item 51: CABLE TRACER, AMPLIFIER PROBE & TONE GENERATOR			
1.	Make offered	XXXXXXXXXXXX	
2.	Model Offered	XXXXXXXXXXXX	
3.	Probe must be designed to trace wire and cables within a group without damaging the insulation.	Requirement	
4.	Must work with a tone generator to identify wires	Requirement	
5.	Equipped with a volume control for increase in sensitivity and adjustable work environment.	Requirement	

ITEM 52: Repairs of Item 48 to 55

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
27.	Manufacturer Workshop	Yes / No	
28.	Dedicated Workshop to do Repairs	Yes / No	
29.	Workshop with-in Tshwane	Yes / No	

ITEM 53: Calibration of Item 48 To 55

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	
9.	Manufacturer Approved Calibration Laboratory	Yes / No	
10.	SABS Approved Calibration Laboratory	Yes / No	
11.	Dedicated Laboratory to do Calibration	Yes / No	
12.	Calibration Laboratory with-in Tshwane	Yes / No	

ITEM 54: Electrical Tool Box 1 Electrician

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	SCHEDULE B (Offered by the bidder)
1.	Electrician Tool Box Contents:	7 Piece VDE 1000V Screwdriver Set (Slotted: 2.5, 4, 5, 6.5mm, Phillips: PH0, PH1, PH2)	
		Steel 3xtear toolbox Heavy Duty	
		7 to 32mm Ring/flat spanner set (26-piece)	
		7 to 32mm Socket set 28-piece; 1/2inch drive Ratchet and 150mm extension	
		1000volt Combination Plier 250mm Cressent	
		1000volt Side-Cutter 230mm Cressent	
		1000volt long nose plier	
		Gas plier	
		Duspol Line Tester 110 – 750volt	
		5meter steel measuring tape	

		400mm steel ruler	
		16 to 35mm Lobster Crimper	
		Shifting spanner 300mm	
		File set of 3; 400mm long (first cut, second cut, Fine)	
		Cable knife	
		Hammer 500gram	
		Hammer 1kg	
		Concrete Chisel 400m long	
		Wire stripper	
		Hacksaw steel	
		Panel Key	
		Hole-saw set of 3 (20mm; 25mm; 32mm)	
		Multi Meter 1000v	
		Amp Meter 1000Amp AC & DC	
		Steel Drill set 25-piece (1mm to 13mm)	
		Torch 3 cell Maglite	
		LED Headlamp	
		Proximity Tester with two LED Lights and elastic head strap	
		Rubber Gloves 1000volt class 00 3-piece set	
		Allen-key set 15-piece	
		Soldering Iron Electrical 200watt	
		Bolt cutter 600mm	
		Crow-bar 500mm	
		Center Punch	
		Tool Chest 400x400x800mm	

Item 55: Electrical Tool Box 2 Engineering

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	SCHEDULE B (Offered by the bidder)
1	Professional tool Bag Contents:	Steel 3x Tear toolbox Heave duty	
		7 to 22mm Ring/flat spanner set (16-piece)	
		7 to 22mm Socket set 18-piece; 1/2inch drive Ratchet and 150mm extension	
		1000volt Screwdriver set 7-piece (Slotted: 2.5, 4, 5, 6.5mm, Phillips: PH0, PH1, PH2)	
		1000volt Combination Plier 250mm Cressent	
		1000volt Side-Cutter 230mm Cressent	
		1000volt Combination <u>Panel</u> Plier 250mm	
		1000volt long nose plier	
		Gas plier	
		Duspol Line Tester 110 – 750volt	
		5meter steel measuring tape	
		400mm steel ruler	
		16 to 35mm Lobster Crimper	
		Crimper for pre-insulated lugs	
		Shifting spanner 300mm	
		File set of 3; 400mm long (first cut, second cut, Fine)	
		Cable knife	
		Hammer 500gram	
		Hammer 1kg	
		Concrete Chisel 400m long	
		Wire stripper	
		Hacksaw steel	

		Panel Key	
		Hole-saw set of 3 (20mm; 25mm; 32mm)	
		Multi Meter 1000v	
		Amp Meter 1000Amp AC & DC	
		Steel Drill set 25-piece (1mm to 13mm)	
		Torch 3 cell Maglite	
		LED Headlamp	
		Proximity Tester with two LED Lights and elastic head strap	
		Rubber Gloves 1000volt class 00 3-piece set	
		Allen-key set 15-piece	
		Gas Soldering Iron handheld	
		0BA	
		1BA	
		2BA	
		Bolt cutter 600mm	
		Center Punch	
		Tool Bag Heavy Duty	
		Tool Chest 400x400x800mm	

Item 56: Electrical Tool Box 3 Scada

	DESCRIPTION	SCHEDULE A (CoT minimum requirements)	SCHEDULE B (Offered by the bidder)
1	Professional tool Bag Contents:	Tool Bag Heavy Duty	
		Steel 3x Tear toolbox Heave duty	
		7 to 17mm Ring/flat spanner set (11-piece)	
		7 to 17mm Socket set 13-piece; 1/2inch drive Ratchet and 150mm extension	
		1000volt Screwdriver set 7-piece (Slotted: 2.5, 4, 5, 6.5mm, Phillips: PH0, PH1, PH2)	

		Electronic screwdriver set non-magnetic	
		Electronic Small Plier: Side Cutter	
		Electronic Small Combination Plier	
		Electronic Small Longnose Plier	
		Electronic Small Long Nose Plier with bend nose	
		Electronic Small Tube spanner set	
		1000volt Combination Plier 250mm Cressent	
		1000volt Side-Cutter 230mm Cressent	
		1000volt Combination <u>Panel</u> Plier 250mm	
		1000volt long nose plier	
		Gas plier	
		Duspol Line Tester 110 – 750volt	
		5meter steel measuring tape	
		400mm steel ruler	
		16 to 35mm Lobster Crimper	
		Crimper for pre-insulated lugs	
		Shifting spanner 250mm	
		File set of 3; 400mm long (first cut, second cut, Fine)	
		Cable knife	
		Hammer 500gram	
		Hammer 1kg	
		Wire stripper	
		Hacksaw steel	
		Panel Key	
		Hole-saw set of 3 (20mm; 25mm; 32mm)	

		Multi Meter 1000v	
		Amp Meter 1000Amp AC & DC	
		Steel Drill set 25-piece (1mm to 13mm)	
		Torch 3 cell Maglite	
		LED Headlamp	
		Allen-key set 15-piece	
		Soldering Iron handheld with docking station	
		0BA	
		1BA	
		2BA	
		Center Punch	

Item 57: LINK STICK FIXED 2METER			
1.	Make offered	XXXXXXXXXXXX	
2.	Fibre Glass	Lenth	
		Wall Thickness	
3.	Brass Fitting	J -Type	
		Adjustable	

Item 58: TELESCOPIC LINK STICK FIXED 9METER			
1.	Make offered	XXXXXXXXXXXX	
2.	Fibre Glass	Lenth	
		Wall Thickness	
3.	Brass Fitting	J -Type	
		Adjustable	
4.	Tubes	Seven	

Item 59: Fibre Glass Ladder 9METER			
1.	Make offered	XXXXXXXXXXXX	
2.	Fibre Glass	Lenth	
		C- Channel Thickness	
3.	Spike feet	Two	
	Pole Runner	V- type with Rollers	
4.	Rope and Pully	On the right hand side	

Item 60: Small Crocodile Clip			
1.	Make offered	XXXXXXXXXXXX	
2.	Insulated	Partially / Fully	

3.	Amp Rating	5 to 10 ampere	
4.	Connection for the lead wire	Lug or Push-in	

Item 61: Medium Crocodile Clip			
1.	Make offered	XXXXXXXXXXXX	
2.	Insulated	Partially / Fully	
3.	Amp Rating	10to 20 Ampere	
4.	Connection for the lead wire	Lug	

Item 62: Medium Battery Clamp			
1.	Make offered	XXXXXXXXXXXX	
2.	Insulated	Partially / Fully	
3.	Amp Rating	15 to 30 Ampere	
4.	Connection for the lead wire	Lug	

Item 63: Large Battery Clamp			
1.	Make offered	XXXXXXXXXXXX	
2.	Insulated	Partially / Fully	
3.	Amp Rating	30 to 80 Ampere	
4.	Connection for the lead wire	Lug	

5.2. Deviation Schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by the CoT.

Item	Sub-clause	Proposed deviation

6. DELIVERABLES

The successful bidder must submit a comprehensive project schedule that clearly indicates the deliverable milestones, costs, time frames, delivery dates and progress reports.

Delivery of these goods shall be at the Electricity Depot in **1086 Market Street, Claremont Pretoria, 0051**

7. STAGES OF EVALUATION

Stage 1: Administrative Compliance

Stage 2: Mandatory Requirements

Stage 3: Functionality Criteria

Stage 4: Preferential Points System

7.1 Stage 1 ADMINISTRATIVE COMPLIANCE

All the bids will be evaluated against the administrative responsiveness requirements as set out in the list of returnable documents.

Compulsory Returnable Documentation (Submission of these are compulsory)	Submitted (YES or NO)	Checklist (Guide for Bidder and the Bid Evaluation Committee)
a) To enable The City to verify the bidder's tax compliance status, the bidder must provide; • A copy of their Tax Clearance Certificate (TCS); or • Indicate their tax compliance status PIN.		TCS must be in the same business name as the bidding company. TCS must be valid. Tax status must be compliant before the award.
b) A copy of their Central Supplier Database (CSD) registration; or indicate their Master Registration Number / CSD Number;		CSD must be valid. Tax status must be compliant before the award.
c) Confirmation that the bidding company's rates and taxes are up to date: Original or copy of Municipal Account Statement of the Bidder (bidding company) not older than 3 months and account must not be in arrears for more than ninety (90) days; or ,signed lease agreement or In case of bidders located in informal settlement, rural areas or areas where they are not required to pay Rates and Taxes a letter from the local councillor confirming they are operating in that area		Was a Municipal Account Statement or landlord letter provided for the bidding company? The name and / or addresses of the bidder's statement correspond with CIPC document, Address on CSD or Company profile? Are all payment(s) up to date (i.e. not in arrears for more than 90 days?
d) In addition to the above, confirmation that all the bidding company's owners / members / directors / major shareholders rates and taxes are up		Was a Municipal Account Statement or landlord letter provided for the bidding company? The

Compulsory Documentation (Submission of these are compulsory)	Returnable	Submitted (YES or NO)	Checklist (Guide for Bidder and the Bid Evaluation Committee)
to date: • Original or copy of Municipal Account Statement of all the South African based owners / members / directors / major shareholders not older than 3 months and the account/s may not be in arrears for more than ninety (90) days; or a signed lease agreement of owners / members / directors / major shareholders or In case of bidders located in informal settlement, rural areas or areas where they are not required to pay Rates and Taxes a letter from the local councillor confirming they are residing in that area			name and / or addresses of the bidder's statement correspond with CIPC document, Address on CSD or Company profile? Are all payment(s) up to date (i.e. not in arrears for more than 90 days?
e) Duly Signed and completed MBD forms (MBD 1, 4, 8 and 9) The person signing the bid documentation must be authorized to sign on behalf of the bidder. Where the signatory is not a Director / Member / Owner / Shareholder of the company, an official letter of authorization or delegation of authority should be submitted with the bid document. NB: Bidders must ensure that the directors, trustees, managers, principal shareholders, or stakeholders of this company, declare any interest in any other related companies or business, whether or not they are bidding for this contract. <u>See Question 3.14 of MBD 4. Failure to declare interest will result in a disqualification</u>			All documents fully completed (i.e. no blank spaces)? All documents fully signed? Signature authorized (any director / member / trustee as indicated on the CIPC document, alternatively a delegation of authority would be required? Documents completed in black ink (i.e. no "Tippex" corrections, no pencil, no other color ink, or non-submission of the above , will be considered)?
f) Financial Statements for the most recent three (3) years or financial statements from date of existence for companies less than three years old.			Applicable for tenders above R10m in conjunction with MBD 5)

Compulsory Returnable Documentation (Submission of these are compulsory)	Submitted (YES or NO)	Checklist (Guide for Bidder and the Bid Evaluation Committee)
NB: The bidder must submit signed audited annual financial statements for the most recent three years, or if established for a shorter period, submit audited annual financial statements from date of establishment. If the bidder is not required by law to prepare signed annual financial statements for auditing purposes, then the bidder must submit proof that the bidder is not required by law to prepare audited financial statements.		Are Audited financial statements provided (Audited financials must be signed by auditor)? Or proof that the bidder is not required by law to prepare audited financial statements.
g) Joint Ventures (JV) – (Only applicable when the bidder tenders as a joint venture) Where the bidder bids as a joint venture (JV), the required or relevant documents as per (a) to (f) above must be provided for all JV parties. In addition to the above the bidder must submit a Joint Venture (JV) agreement signed by the relevant parties. NB: It is a condition of this bid that the successful bidder will continue with the same Joint Venture (JV) for the duration of the contract unless prior approval is obtained from the City.		If applicable. JV agreement provided? JV agreement complete and relevant? Agreement signed by all parties? All required documents as per (i.e. a to f) must be provided for all partners of the JV.
h) Bidder attended a compulsory briefing session where applicable		A compulsory briefing register must be signed by the bidder. Bidders will be disqualified should they fail to attend compulsory briefing session
i) Pricing schedule (All items must be quoted for in pricing schedule and if not, all items are quoted the bidder will be disqualified). Unless the tender is awarded per item or per section where the bidder only quoted		Incomplete pricing schedule results in totals being incomparable. Bidder must be disqualified.

Compulsory Documentation (Submission of these are compulsory)	Returnable	Submitted (YES or NO)	Checklist (Guide for Bidder and the Bid Evaluation Committee)
the items or sections, they are interested in.			Bidder will be disqualified should they make corrections on the price schedule without attaching a signature thereto. Bidder will be disqualified should they use tippex/ correction ink, on the price schedule.

7.2 Stage 2: MANDATORY REQUIREMENT

- **DOCUMENTATION**

Technical Schedule

The full Technical Schedule B Form A.1 and the Deviation Schedule Form A.1 shall be completed by the tenderer and together with the Technical Schedule A, shall be submitted to the CoT for approval when the tender is submitted at the time of tendering.

- **MANUALS**

Tenderers shall supply complete sets of technical manuals, in English, with tender for evaluation purposes. Failure to submit manuals will lead to disqualifications.

7.3 Stage 3: FUNCTIONALITY CRITERIA

	CRITERIA	SUB-CRITERIA	SCALE	WEIGHT	HIGH POSSIBLE SCORE
1	Company experience: Number of similar contracts completed. Attach Appointment letter/s and or Work Completion Letter/s with the letter head of the client.	0 letter 1 letter 2 – 4 letters 5 + letters	0 1 3 5	10	50
2	Experience of key staff: General Experience and qualifications Key Staff's experience that is relevant to the scope of work (Submit CVs and certified proof of qualifications as proof of compliance) Key Staff as Indicated Below:				
	1. Project Manager (National Diploma or higher from a tertiary institution: Electrical Engineering)	Year of experience 2-3 years Above 3 years	 1 2	10	20
	2. Test Technician (National Diploma or higher from a tertiary institution: Electrical Engineering)	Year of experience 1 year 2-3 years Above 3 years	 1 2 3	5	15
	3. Electrician with trade test.	(Years of experience after obtaining trade test) 1-2years Above 2-4 years 5 and above	 1 2 3	5	15
	HIGHEST POSSIBLE SCORE				100

Failure to obtain the minimum score of **60** shall disqualify the tender from further evaluation. The following criteria and weights will be applied when bids are assessed for **functionality**
Bids that do not achieve a minimum score of 60 (out of 100) for functionality will not be evaluated further

7.4 Stage 4: PREFERENTIAL POINTS SYSTEM

The preferential point system used will be the 90/10 points system in terms of the Preferential Procurement Policy Framework Act, 2000 (Act 5 of 2000) Regulations 2022.

- 90 points for price
- 10 points for Specific goals

Specific Goals

- Bidders are required to submit supporting documents for their bids to claim the specific goal points.
- Non-compliance with specific goals will not lead to disqualification but bidders will not be allocated specific goal points. Bidders will score points out of 90 for price only and zero (0) points out of 10 for specific goals.
- Cot shall act against any bidder or person when it detects that the specific goals were claimed or obtained on a fraudulent basis.

The specific goal for this bid is outlined below.

Specific goals	90/10 preference point system	Proof of specific goals to be submitted
BB-BEE score of companies • Level 1 • Level 2 • Level 3 • Level 4 • Level 5 • Level 6 • Level 7 • Level 8 • Non-compliant	• 4 Points • 3.5 Points • 3 Points • 2.5 Points • 2 Points • 1.5 Points • 1 Point • 0.5 Points 0 Points	Valid Certified copy of BBEE certificate. Sworn Affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises or CIPC BBEE certificate.
EME and/ or QSE	1 Point	Valid Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises or CIPC BBEE certificate
At least 51% of Women-owned companies	1 Point	Certified copy of Identity Document/s and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro

Specific goals	90/10 preference point system	Proof of specific goals to be submitted
		Enterprises, CIPC registration or any other proof of ownership)
At least 51% owned companies by People with disability	1 Point	Medical Certificate with doctor's details (Practice Number, Physical Address, and contact numbers) and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership
At least 51% owned companies by Youth	1 Point	Certified copy of Identity Document/s and proof of ownership (Sworn affidavit for B-BBEE qualifying small enterprise or Exempt Micro Enterprises, CIPC registration or any other proof of ownership
Local Economic Participation • City of Tshwane • Gauteng • National	2 Points 1 Point 1 Point	Municipal Account statement/Lease agreement.

For points to be allocated as per above the tenderers will be required to submit proof of documentation as evidence for claims made. Any tenderer that does not submit evidence as stated in the bid document to claim applicable points will be allocated zero points.

8. VALIDITY PERIOD

The validity period for the tender after closure is 90 days. CoT shall have right and power to extend any tender validity period beyond any initial validity period set and subsequent extensions. SCM shall ensure that an extension of validity is requested in writing from all bidders before the validity expiry date. Extension of validity shall be finalised while the quotations/bids are still valid

9. TYPE OF AGREEMENT REQUIRED

The leading department should indicate whether there will be a Service Level Agreement or Memorandum of Understanding/Agreement to be completed after the appointment.

10. PRICING SCHEDULE

10.1. General

10.1.1. This section provides the tenderer with guidelines and requirements with regard to the completion of the Price Schedule. The Schedule has to be completed in black ink and the tenderer is referred to the Tender Specifications in regard to the correction of errors.

10.1.2. The Price Schedule shall be read with all the documents which form part of this Contract.

10.1.3. The following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work in terms of the Specifications and the Project Specifications.

Quantity: The number of units of work for each item.

Rate: The payment per unit of work at which the tenderer tenders to do the work.

Amount: The product of the quantity and the rate tendered for an item.

Lump sum: An amount tendered for an item, the extent of which is described in the Price Schedule, the Specification and the Scope of Work, but the quantity of work of which is not measured in any units.

10.2. Units of Measurements

The units of measurement described in the Price Schedule are metric units.

Abbreviations used in the Quantities are as follows:

mm	=	millimetre	h	=	hour
m	=	metre	kg	=	kilogram
km	=	kilometre	nF	=	Nanofarad
m ²	=	square metre	no.	=	number
Vac	=	Voltage alternating current	kVA	=	kilovolt-ampere
V	=	Volts	Hz	=	Hertz
mA	=	Milliamps	W.H.D	=	Weight. Height. Width
kW	=	kilowatt	r.m.s	=	Root Mean Square
l	=	litre	HV	=	High Voltage
%	=	Per cent	VLF	=	Very low frequency
MΩ	=	megaOhms	TDR	=	time-domain reflectometer

10.3. Rates

This price list has columns for unit, quantities, unit price and total price of estimated quantities for the goods/service. Entries in these columns are made as follows:

- 10.3.1. The amount payable to the service provider is the product of the rate tendered and quantity of the service provided.

10.4. PRICE SCHEDULE

Note 1: City of Tshwane will appoint one service provider per section of this tender and may enter into price negotiations. The tender will be awarded per section and each section must be priced in full. Quantities that are provided in section I, II, III and IV price schedules are only an estimate for evaluation purpose.

Note 2. Quantities are for evaluation purposes only.

11. SECTION 1: CABLE FAULT INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 1	32kV Surge Generator	Each	10		
Item 2	16kV Surge Generator	Each	10		
Item 3	Acoustic Listening Set (Ground Micro-Phone)	Each	10		
item 4	Fault Location Scope	Each	10		
item 5	Measuring wheel	Each	20		
item 6	Multi-Frequency Line/Cable Location (Route Tracer)	Each	10		
item 7	Cable Identification Unit set	Each	10		
Item 8	Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable	Each	10		
Item 9	45 kV Very Low Frequency (VLF) 0.1 Hertz Test Set	Each	10		
Item 10	25 kV DC Pressure Test Set	Each	10		
Item 11	30/42 kV - AC/DC Test Set	Each	10		
Item 12	Phase Comparator 11kV	Each	10		
Item 13	Phase Comparator 11-33kV	Each	10		
Item 14	Full Cable Testing Trailer	Each	10		
Item 15	32kV High Voltage Cable Real System	Each	10		
Item	Earthing Sets	Each	10		

11. SECTION 1: CABLE FAULT INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 17	Installation of Cable Equipment on CoT Fleet	Each	10		
Item 18	Installation of Testing Equipment on CoT Fleet	Each	10		
Item 19	Repairs Small				
Item 19.1	32 kV Surge Generator	Each	10		
Item 19.2	16 kV Surge Generator	Each	10		
Item 19.3	Acoustic Listening Set (Ground Micro-Phone)	Each	10		
Item 19.4	Fault Location Scope	Each	10		
Item 19.5	Multi-Frequency Line/Cable Location (Route Tracer)	Each	10		
Item 19.6	Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable	Each	10		
Item 19.7	45 kV Very Low Frequency (VLF) 0.1 Hertz Test Set	Each	10		
Item 19.8	25 kV DC Pressure Test Set	Each	10		
Item 19.9	30/42 kV AC/DC Test Set	Each	10		
Item 19.10	Phase Comparator 11kV	Each	10		
Item 19.11	Phase Comparator 11-33kV	Each	10		
Item 19.12	Full Cable Testing Trailer	Each	10		

11. SECTION 1: CABLE FAULT INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 19.13	32kV Real System	Each	10		
Item 19.14	Installation of Cable Equipment on CoT Fleet	Each	10		
Item 19.15	Installation of Testing Equipment on CoT Fleet	Each	10		
Repairs Medium:					
Item 19.16	32kV Surge Generator	Each	10		
Item 19.17	16kV Surge Generator	Each	10		
Item 19.18	Acoustic Listening Set (Ground Micro-Phone)	Each	10		
Item 19.19	Fault Location Scope	Each	10		
Item 19.20	Multi-Frequency Line/Cable Location (Route Tracer)	Each	10		
Item 19.21	Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable	Each	10		
Item 19.22	45 kV Very Low Frequency (VLF) 0.1 Hertz Test Set	Each	10		
Item 19.23	25kV DC Pressure Test Set	Each	10		
Item 19.24	30/42kV AC/DC Test Set	Each	10		
Item 19.25	Phase Comparator 11kV	Each	10		
Item 19.26	Phase Comparator 11-33kV	Each	10		
Item 19.27	Full Cable Testing Trailer				

11. SECTION 1: CABLE FAULT INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 19.28	32kV Real System	Each	10		
Item 19.29	Installation of Cable Equipment on CoT Fleet	Each	10		
Item 19.30	Installation of Testing Equipment on CoT Fleet	Each	10		
Repairs Major:					
Item 19.31	32kV Surge Generator	Each	10		
Item 19.32	16kV Surge Generator	Each	10		
Item 19.33	Acoustic Listening Set (Ground Micro-Phone)	Each	10		
Item 19.34	Fault Location Scope	Each	10		
Item 19.35	Multi-Frequency Line/Cable Location (Route Tracer)	Each	10		
Item 19.36	Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable	Each	10		
Item 19.37	45 kV Very Low Frequency (VLF) 0.1 Hertz Test Set	Each	10		
Item 19.38	25kV DC Pressure Test Set	Each	10		
Item 19.39	30/42kV AC/DC Test Set	Each	10		
Item 19.40	Phase Comparator 11kV	Each	10		
Item 19.41	Phase Comparator 11-33kV	Each	10		

11. SECTION 1: CABLE FAULT INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 19.42	Full Cable Testing Trailer	Each	10		
Item 19.43	32kV Real System	Each	10		
Item 19.44	Installation of Cable Equipment on CoT Fleet	Each	10		
Item 19.45	Installation of Testing Equipment on CoT Fleet	Each	10		
Item 20	Calibrations:				
Item 20.1	32kV Surge Generator	Each	10		
Item 20.2	16kV Surge Generator	Each	10		
Item 20.3	Fault Location Scope	Each	10		
Item 20.4	Multi-Frequency Line/Cable Location (Route Tracer)	Each	10		
Item 20.5	Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable	Each	10		
Item 20.6	45 kV Very Low Frequency (VLF) 0.1 Hertz Test Set	Each	10		
Item 20.7	25kV DC Pressure Test Set	Each	10		
Item 20.8	30/42kV AC/DC Test Set	Each	10		
Item 20.9	Phase Comparator 11kV	Each	10		
Item 20.10	Phase Comparator 11-33kV	Each	10		

11. SECTION 1: CABLE FAULT INSTRUMENTS					
ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Total price excluding VAT					
VAT amount (15%)					
Total price including VAT					

11. SECTION I: CABLE FAULT INSTRUMENTS

SECTION I: Total Offer Price in words excluding VAT

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SECTION I: Total Offer Price in words including VAT

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12. SECTION II: TEST INSTRUMENTS

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 21	Power Quality Recorder	Each	15		
Item 22	Portable Power Quality Analyser	Each	15		
Item 23	Primary Injection test set	Each	5		
Item 24	Secondary Injection Test Set	Each	40		
Item 25	Transformer Test Set Including Tan-Delta	Each	5		
Item 26	Medium Voltage Auto Recloser Test Set	Each	5		
Item 27	Current and Voltage Transformer Test Set	Each	20		
Item 28	High Voltage Circuit Breaker Test Set	Each	10		
Item 29	Thermal Scanner	Each	15		
Item 30	Battery Tester	Each	10		
Item 31	Insulation Tester (500V – 10000V)	Each	15		
Item 32	Small/Mini Clip-on Current Meter	Each	100		
Item 33	Earth Tester	Each	30		
Item 34	Transformer Testing Leads	Each	30		

Item 35	2.5mm ² Grey Panel Wire (roll off 100m)	Roll	100		
Item 36	4mm ² Grey Panel Wire (roll off 100m)	Roll	100		
Item 37	16mm ² Green/yellow Auto Wire (roll off 100m)	Roll	100		
Item 38	Laptop for Engineering Configuration of Relay's	Roll	100		
Item 39	Laptop for Design & Running Protection Simulation's	Each	15		
Item 40	Radio Frequency Interference Surveyor	Each	10		
Item 41	Drone with IFRA RED Vision	Each	5		
Item 42	Repairs Small:				
Item 42.1	Power Quality Recorder	Each	10		
Item 42.2	Portable Power Quality Analyser	Each	10		
Item 42.3	Primary Injection Test Set	Each	10		
Item 42.4	Secondary Injection Test Set	Each	10		
Item 42.5	Transformer Test Set Including Tan-Delta	Each	10		
Item 42.6	Medium Voltage Auto Recloser Test Set	Each	10		
Item 42.7	Current and Voltage Transformer Test Set	Each	10		
Item 42.8	High Voltage Circuit Breaker Test Set	Each	10		
Item 42.9	Thermal Scanner	Each	10		
Item 42.10	Battery Tester	Each	10		

Item 42.11	Insulation Tester (500V – 10000V)	Each	10		
Item 42.12	Small/Mini Clip-on Current Meter	Each	10		
Item 42.13	Earth Tester	Each	10		
Item 42.14	Laptop for Engineering Configuration of Relay's	Each	10		
Item 42.15	Laptop for Design & Running Protection Simulation's	Each	10		
Item 42.16	Radio Frequency Interference Surveyor	Each	10		
Item 42.17	Drone with IFRA RED Vision				
Repairs Medium:					
Item 42.18	Power Quality Recorder	Each	10		
Item 42.19	Portable Power Quality Analyser	Each	10		
Item 42.20	Primary Injection Test Set	Each	10		
Item 42.21	Secondary Injection Test Set	Each	10		
Item 42.22	Transformer Test Set Including Tan-Delta	Each	10		
Item 42.23	Medium Voltage Auto Recloser Test Set	Each	10		
Item 42.24	Current and Voltage Transformer Test Set	Each	10		
Item 42.25	High Voltage Circuit Breaker Test Set	Each	10		
Item 42.26	Thermal Scanner	Each	10		
Item 42.27	Battery Tester	Each	10		

Item 42.28	Insulation Tester (500V – 10000V)	Each	10		
Item 42.29	Small/Mini Clip-on Current Meter	Each	10		
Item 42.30	Earth Tester	Each	10		
Item 42.31	Laptop for Engineering Configuration of Relay's				
Item 42.32	Laptop for Design & Running Protection Simulation's	Each	10		
Item 42.33	Radio Frequency Interference Surveyor	Each	10		
Item 42.34	Drone with IFRA RED Vision				
Repairs Major:					
Item 42.35	Power Quality Recorder	Each	10		
Item 42.36	Portable Power Quality Analyser	Each	10		
Item 42.37	Primary Injection Test Set	Each	10		
Item 42.38	Secondary Injection Test Set	Each	10		
Item 42.39	Transformer Test Set Including Tan-Delta	Each	10		
Item 42.40	Medium Voltage Auto Recloser Test Set	Each	10		
Item 42.41	Current and Voltage Transformer Test Set	Each	10		
Item 42.42	High Voltage Circuit Breaker Test Set	Each	10		
Item 42.43	Thermal Scanner	Each	10		
Item 42.44	Battery Tester	Each	10		

	Insulation Tester (500V – 10000V)	Each	10		
Item 42.45	Small/Mini Clip-on Current Meter	Each	10		
Item 42.46	Earth Tester	Each	10		
Item 42.47	Laptop for Engineering Configuration of Relay's				
Item 42.48	Laptop for Design & Running Protection Simulation's	Each	10		
Item 42.49	Radio Frequency Interference Surveyor	Each	10		
Item 42.50	Drone with IFRA RED Vision				
Item 43	Calibrations:				
Item 43.1	Power Quality Recorder	Each	10		
Item 43.2	Portable Power Quality Analyser	Each	10		
Item 43.3	Primary Injection Test Set	Each	10		
Item 43.4	Secondary Injection Test Set	Each	10		
Item 43.5	Transformer Test Set Including Tan-Delta	Each	10		
Item 43.6	Medium Voltage Auto Recloser Test Set	Each	10		
Item 43.7	Current and Voltage Transformer Test Set	Each	10		
Item 43.8	High Voltage Circuit Breaker Test Set	Each	10		
Item 43.9	Thermal Scanner	Each	10		
Item 43.10	Battery Tester	Each	10		

Item 43.11	Insulation Tester (500V – 10000V)	Each	10		
Item 43.12	Small/Mini Clip-on Current Meter	Each	10		
Item 43.13	Earth Tester	Each	10		
Item 43.14	Recorder Interphase/Downloader	Each	10		
Item 43.15	Radio Frequency Interference Surveyor	Each	10		
Item 43.16	Drone with IFRA RED Vision				
TOTAL PRICE EXCLUDING VAT					
VAT AMOUNT (15%)					
TOTAL PRICE INCLUDING VAT					

SECTION II: Total Offer Price in words excluding VAT

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SECTION II: Total Offer Price in words including VAT

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13. SECTION III: SPECIAL EQUIPMENT TOOLS AND ACCESSORIES

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 44	Inverter 3kW with 48volt Lithium Ion Battery Pack	Each	15		
Item 45	Inverter 5kW with 48volt Lithium Ion Battery Pack	Each	15		
Item 46	Single Phase Power Generator 5kVA	Each	25		
Item 47	Single Phase Power Generator 6.5kVA	Each	25		
Item 48	Multi Meter	Each	25		
Item 49	Insulation Tester 1000volt	Each	50		
Item 50	Clamp-On Amp Meter 1000Amp AC/DC	Each	50		
Item 51	Cable/wire Tracer	Each	15		
Item 52	Repairs Small:				
Item 52.1	Inverter 3kW with 48volt Lithium Ion Battery Pack	Each	10		
Item 52.2	Inverter 5kW with 48volt Lithium Ion Battery Pack	Each	10		
Item 52.3	Single Phase Power Generator 5kVA	Each	10		
Item 52.4	Single Phase Power Generator 6.5kVA	Each	10		
Item 52.5	Multi Meter	Each	10		
Item 52.6	Insulation Tester 1000volt	Each	10		
Item 52.7	Clamp-On Amp Meter 1000Amp AC/DC	Each	10		

Item 52.8	Cable/wire Tracer	Each	10		
Repairs Medium:					
Item 52.9	Inverter 3kW with 48volt Lithium Ion Battery Pack	Each	10		
Item 52.10	Inverter 5kW with 48volt Lithium Ion Battery Pack	Each	10		
Item 52.11	Single Phase Power Generator 5kVA	Each	10		
Item 52.12	Single Phase Power Generator 6.5kVA	Each	10		
Item 52.13	Multi Meter	Each	10		
Item 52.14	Insulation Tester 1000volt	Each	10		
Item 52.15	Clamp-On Amp Meter 1000Amp AC/DC	Each	10		
Item 52.16	Cable/wire Tracer	Each	10		
Item 53	Calibrations:				
Item 53.1	Single Phase Power Generator 5kVA	Each	10		
Item 53.2	Single Phase Power Generator 6.5kVA	Each	10		
Item 53.3	Multi Meter	Each	10		
Item 53.4	Insulation Tester 1000volt	Each	10		
Item 53.5	Clamp-On Amp Meter 1000Amp AC/DC	Each	10		
Item 53.6	Cable/wire Tracer	Each	10		
Item 53.7	Calibrations:	Each	10		

TOTAL PRICE EXCLUDING VAT		
VAT AMOUNT (15%)		
TOTAL PRICE INCLUDING VAT		

SECTION III: Total Offer Price in words excluding VAT

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SECTION III: Total Offer Price in words including VAT

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14. SECTION IV: OPERATIONAL TOOLS AND EQUIPMENT

ITEM NO	EQUIPMENT DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL PRICE
Item 54	Electrical Toolbox Artisan/Line Worker	Each	15		
Item 55	Electrical Toolbox Engineering	Each	15		
Item 56	Electrical Toolbox Scada	Each	15		
Item 57	Link Stick 2meter Fixed	Each	10		
Item 58	Link Stick Telescopic 12meter	Each	10		
Item 59	9meter Fiber Glass Extension Ladder	Each	50		
Item 60	Small Crocodile Clips 50mm	Each	50		
Item 61	Medium Crocodile Clips 100mm	Each	50		
Item 62	Medium Battery Clamps 300Amp	Each	50		
Item 63AA	Large Battery Clamps 600Amp				
TOTAL PRICE EXCLUDING VAT					
VAT AMOUNT (15%)					
TOTAL PRICE INCLUDING VAT					

SECTION IV: Total Offer Price in words excluding VAT

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SECTION IV: Total Offer Price in words including VAT

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MATERIAL NUMBERS							
1	200000043102	GE NERATOR SURGE 32KV	20	41113600	41110000	120	32KV SURGE GENERATOR
2	200000043103	GENERATOR SURGE PORTABLE 16KV	29	41113600	41110000	120	PORTABLE 16KV SURGE GENERATOR
3	200000043106	LISTENING ACCOUSTIC/ GROUND MICRO PHONE	39	41113600	41110000	120	ACOUSTIC LISTENING SET (GROUND MICRO-PHONE)
4	200000043108	SCOPE LOCATION FAULT	20	41113600	41110000	120	FAULT LOCATION SCOPE
5	200000043114	WHEEL MEASURING	15	41111616	41110000	120	MEASURING WHEEL
6	200000043112	TRACER ROUTE/ LOCATOR LINE MF	29	41113600	41110000	120	MULTI-FREQUENCY LINE/CABLE LOCATION (ROUTE TRACER)
7	200000043104	IDENTIFICATION CABEL UNIT/ SET	30	41113600	41110000	120	CABLE IDENTIFICATION UNIT SET
8	200000043105	INSTRUMENT ID PHASE CABLE MV	28	41113600	41110000	120	PHASE IDENTIFICATION INSTRUMENT IN EARTHED AND SHORT-CIRCUITED MEDIUM VOLTAGE CABLE
9	200000043111	TEST SET FREQUENCY HERTZ 45KV	29	41113600	41110000	120	45 KV VERY LOW FREQUENCY (VLF) 0.1 HERTZ TEST SET
10	200000043110	TEST SET DC PRESSURE 11KV	25	41113600	41110000	120	11KV DC PRESSURE TEST SET
11	200000043109	TEST SET AC/DC 30/42KV	22	41113600	41110000	120	30/42KV - AC/DC TEST SET
12	200000043099	COMPARATOR PHASE 11KV	21	41113600	41110000	120	PHASE COMPARATOR 11KV
13	200000043100	COMPARATOR PHASE 11KV 33KV	26	41113600	41110000	120	PHASE COMPARATOR 11-33KV
14	200000043113	TRAILER TESTING CABLE	21	25171700	25170000	114	FULL CABLE TESTING TRAILER
15	200000043107	REEL CABLE SYSTEM HV 32KV	25	41113600	41110000	120	32KV HIGH VOLTAGE CABLE REAL SYSTEM
16	200000043101	EARTHING/ SET	13	41113600	41110000	120	EARTHING SETS
25	200000043131	RECORDER POWER QUALITY	22	41113600	41110000	120	POWER QUALITY RECORDER
26	200000043115	ANALYSER POWER QUALITY PORTABLE	31	41113600	41110000	120	PORTABLE POWER QUALITY ANALYSER

27	200000043138	TEST SET INJECTION PRIMARY	26	41113600	41110000	120	PRIMARY INJECTION TEST SET
28	200000043139	TEST SET INJECTION SECONDARY	28	41113600	41110000	120	SECONDARY INJECTION TEST SET
29	200000043141	TEST SET TRANSFORMER	20	41113600	41110000	120	TRANSFORMER TEST SET INCLUDING TAN-DELTA
30	200000043140	TEST SET RECLOSER AUTO MEDIUM VOLTAGE	37	41113600	41110000	120	MEDIUM VOLTAGE AUTO RECLOSER TEST SET
31	200000043142	TEST SET TRANSFORMER MEDIUM VOLTAGE	35	41113600	41110000	120	CURRENT AND VOLTAGE TRANSFORMER TEST SET
32	200000043137	TEST SET CIRCUIT BREAKER HIGH VOLTAGE	37	41113600	41110000	120	HIGH VOLTAGE CIRCUIT BREAKER TEST SET
33	200000043132	SCANNER THERMAL	15		41110000	120	THERMAL SCANNER
34	200000043143	TESTER BATTERY	14	26111719	26110000	100	BATTERY TESTER
35	200000043146	TESTER INSULATION 500V - 10 000V	32	41113624	41110000	120	INSULATION TESTER (500V – 10000V)
36	200000043129	METER CURRENT CLIP-ON SMALL/MINI	32	41103327	41100000	120	SMALL/MINI CLIP-ON CURRENT METER
37	200000043144	TESTER EARTH	12	41113600	41110000	120	EARTH TESTER
38	200000043136	TEST LEAD TRANSFORMER	21	41113600	41110000	120	TRANSFORMER TESTING LEADS
39	200000043152	WIRE PANEL 2.5MM2 ROLL/100M GREY	32	26121500	26120000	100	2.5MM2 GREY PANEL WIRE (ROLL OFF 100M)
40	200000043153	WIRE PANEL 4.00MM2 ROLL/100M GREY	33	26121500	26120000	100	4MM2 GREY PANEL WIRE (ROLL OFF 100M)
41	200000043151	WIRE AUTO 16MM2 /ROLL 100M GREEN/YELLOW	39	26121800	26120000	100	16MM2 GREEN/YELLOW AUTO WIRE (ROLL OFF 100M)
42	200000043126	LAPTOP CONFIGURATION ENGINEERING	32	43211503	43210000	107	LAPTOP FOR ENGINEERING CONFIGURATION OF RELAY'S
43	200000043127	LAPTOP SIMULATION DESIGN+RUN PROTECTION	39	43211503	43210000	107	LAPTOP FOR DESIGN & RUNNING PROTECTION SIMULATION'S

44	200000043135	SURVYEOR INTERFERENCE RADIO FREQUENCY	37	41113600	41110000	120	RADIO FREQUENCY INTERFERENCE SURVEYOR
45	200000043120	DRONE INFRA-RED	15	25131705	25130000	114	DRONE WITH IFRA RED VISION
48	200000043123	INVERTOR W BATTERY PACK 3KW	27	39121006	39120000	100	INVERTER 3KW WITH 48VOLT LITHIUM ION BATTERY PACK
49	200000043124	INVERTOR W BATTERY PACK 5KW	27	39121006	39120000	100	INVERTER 5KW WITH 48VOLT LITHIUM ION BATTERY PACK
50	200000043121	GENERATOR POWER 1PH 5KW	25	26111600	26110000	100	SINGLE PHASE POWER GENERATOR 5KVA
51	200000043122	GENERATOR POWER 1PH 6.5KW	25	26111600	26110000	100	SINGLE PHASE POWER GENERATOR 6.5KVA
52	200000043130	METER MULTI	11	41113600	41110000	120	MULTI METER
53	200000043145	TESTER INSULATION 1 000V	24	41113624	41110000	120	INSULATION TESTER 1000VOLT
54	200000043128	METER AMP CLAMP-ON AC/DC 1 000A	31	41113600	41110000	120	CLAMP-ON AMP METER 1000AMP AC/DC
55	200000043150	TRACER CABLE/WIRE	17	41113600	41110000	120	CABLE/WIRE TRACER
58	200000043147	TOOLBOX ELECTRICAL ARTISAN/LINEWORKER	37	24113106	24110000	114	ELECTRICAL TOOLBOX ARTISAN/LINE WORKER
59	200000043148	TOOLBOX ELECTRICAL ENGINEERING	30	24113106	24110000	114	ELECTRICAL TOOLBOX ENGINEERING
60	200000043149	TOOLBOX ELEXTRICAL SCADA	24	24113106	24110000	114	ELECTRICAL TOOLBOX SCADA
61	200000043133	STICK LINE FIXED 2M	19	39121700	39120000	100	LINK STICK 2METER FIXED
62	200000043134	STICK LINE TELESCOPIC 12M	25	39121700	39120000	100	LINK STICK TELESCOPIC 12METER
63	200000043125	LADDER EXTENSION FIBERGLASS 9M	30	30191500	30190000	105	9METER FIBER GLASS EXTENSION LADDER
64	200000043118	CLIP CROCODILE 50MM SMALL	26	39121700	39120000	100	SMALL CROCODILE CLIPS 50MM

65	200000043119	CLIP CROCODILE 100MM MEDIUM	27	39121700	39120000	100	MEDIUM CROCODILE CLIPS 100MM
66	200000043116	CLIP BATTERY 300AMP MEDIUM	26	26111700	26110000	100	MEDIUM BATTERY CLAMPS 300AMP
67	200000043117	CLIP BATTERY 600AMP LARGE	25	26111700	26110000	100	LARGE BATTERY CLAMPS 600AMP

15. AWARD

City of Tshwane will appoint one service provider per Section and may enter into price negotiations. The tender will be awarded per section, and each section must be priced in full. Quantities that are provided in section I, II, III and IV price schedule quantities are only an estimate for evaluation purpose only.

16. MARKET ANALYSIS

The city of Tshwane reserves the right to conduct market analysis. Should the city exercise this option, where a tenderer offers a price that is deemed not to be viable to supply goods or services as required, written confirmation will be made with the tenderer if they will be able to deliver on the price, if a tenderer confirm that they cannot, The tenderer will be disqualified on the basis of being non-responsive. If they confirm that they can deliver, a tight contract to mitigate the risk of non-performance will be entered into with the service provider. Further action on failures by the supplier to deliver will be handled in terms of the contract including performance warnings and listing on the database of restricted suppliers.

The city further reserves the right to negotiate a market related price with a tenderer scoring the highest points. If the tenderer does not agree to a market-related price, the city reserves the right to negotiate a market-related price with the tenderer scoring the second highest points, if the tenderer scoring the second highest points does not agree to a market-related price, negotiate a market-related price with the tenderer scoring the third highest points. If a market-related price is not agreed, the city reserves the right to cancel the tender

DRAFT SERVICE LEVEL AGREEMENTS

Specification to be accompanied by draft service level agreements



PART A INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE CITY OF TSHWANE MUNICIPALITY					
BID NUMBER:	EED 09-2024.25	CLOSING DATE:	27 February 2025	CLOSING TIME:	10:00
DESCRIPTION	TENDER FOR THE SUPPLY, REPAIRS, DELIVERY AND OFF-LOADING OF ELECTRICAL TOOLS AND ELECTRICAL TESTING EQUIPMENT FOR THE CITY OF TSHWANE: AS AND WHEN REQUIRED FOR A PERIOD OF THREE (3) YEARS				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					

BID RESPONSE DOCUMENTS MAY BE
DEPOSITED IN THE BID BOX SITUATED AT
(STREET ADDRESS)

Tshwane House					
Supply Chain Management					
320 Madiba Street					
Pretoria CBD					
0002					
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN:		OR	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		☐ Yes ☐ No

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		TOTAL BID PRICE	R
SIGNATURE OF BIDDER		DATE	
CAPACITY UNDER WHICH THIS BID IS SIGNED			
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		TECHNICAL INFORMATION MAY BE DIRECTED TO:	
DEPARTMENT	Supply Chain Management	CONTACT PERSON	Corrie Lemmer
CONTACT PERSON	Mulondi Rasekgala	TELEPHONE NUMBER	012 358 2414
TELEPHONE NUMBER	012 358 6636	FACSIMILE NUMBER	n/a
FACSIMILE NUMBER	n/a	EMAIL ADDRESS	corriel@tshwane.gov.za
EMAIL ADDRESS	mulondin@tshwane.gov.za		

**PART B
TERMS AND CONDITIONS FOR BIDDING**

1. BID SUBMISSION	
1.1	BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2	ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR ONLINE
1.3	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
2. TAX COMPLIANCE REQUIREMENTS	
2.1	BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.
- 2.3 APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.
- 2.4 FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.
- 2.5 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

- 3.1 IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? YES ☐ NO ☐
- 3.2 DOES THE ENTITY HAVE A BRANCH IN THE RSA? YES ☐ NO ☐
- 3.3 DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? YES ☐ NO ☐
- 3.4 DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? YES ☐ NO ☐
- 3.5 IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? YES ☐ NO ☐

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID. NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

DATE:

PRICING SCHEDULE: FIRM PRICES (PURCHASES)

NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder.....	Bid Number
Closing Time	Closing Date

OFFER TO BE VALID FOR DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)
----------	----------	-------------	--

- Required by:
- At:
- Brand and Model
- Country of Origin
- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s)
- Period required for delivery
*Delivery: Firm/Not firm
- Delivery basis

Note: All delivery costs must be included in the bid price, for delivery at the prescribed destination.

** "all applicable taxes" includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

* Delete if not applicable

PRICING SCHEDULE: NON-FIRM PRICES (PURCHASES)

NOTE: PRICE ADJUSTMENTS WILL BE ALLOWED AT THE PERIODS AND TIMES SPECIFIED IN THE BIDDING DOCUMENTS.

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder	Bid number
Closing Time	Closing Date

OFFER TO BE VALID FOR 90 DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)
----------	----------	-------------	--

- Required by:
- At:
- Brand and model
- Country of origin
- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s)
- Period required for delivery
- Delivery: *Firm/Not firm
- ** "all applicable taxes" includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.
- * Delete if not applicable

PRICE ADJUSTMENTS

A. NON-FIRM PRICES SUBJECT TO ESCALATION

1. IN CASES OF PERIOD CONTRACTS, NON FIRM PRICES WILL BE ADJUSTED (LOADED) WITH THE ASSESSED CONTRACT PRICE ADJUSTMENTS IMPLICIT IN NON FIRM PRICES WHEN CALCULATING THE COMPARATIVE PRICES
2. IN THIS CATEGORY PRICE ESCALATIONS WILL ONLY BE CONSIDERED IN TERMS OF THE FOLLOWING FORMULA:

$$Pa = (1 - V)Pt \left(D1 \frac{R1t}{R1o} + D2 \frac{R2t}{R2o} + D3 \frac{R3t}{R3o} + D4 \frac{R4t}{R4o} \right) + VPt$$

Where:

- Pa = The new escalated price to be calculated.
- (1-V) Pt = 85% of the original bid price. **Note that Pt must always be the original bid price and not an escalated price.**
- D1, D2.. = Each factor of the bid price eg. labour, transport, clothing, footwear, etc. The total of the various factors D1,D2...etc. must add up to 100%.
- R1t, R2t..... = Index figure obtained from new index (depends on the number of factors used).
- R1o, R2o = Index figure at time of bidding.
- VPt = 15% of the original bid price. This portion of the bid price remains firm i.e. it is not subject to any price escalations.

3. The following index/indices must be used to calculate your bid price:

Index..... Dated.....	Index..... Dated.....	Index..... Dated.....
Index..... Dated.....	Index..... Dated.....	Index..... Dated.....

4. FURNISH A BREAKDOWN OF YOUR PRICE IN TERMS OF ABOVE-MENTIONED FORMULA. THE TOTAL OF THE VARIOUS FACTORS MUST ADD UP TO 100%.

FACTOR (D1, D2 etc. eg. Labour, transport etc.)	PERCENTAGE OF BID PRICE

B. PRICES SUBJECT TO RATE OF EXCHANGE VARIATIONS

1. Please furnish full particulars of your financial institution, state the currencies used in the conversion of the prices of the items to South African currency, which portion of the price is subject to rate of exchange variations and the amounts remitted abroad.

PARTICULARS OF FINANCIAL INSTITUTION	ITEM NO	PRICE	CURRENCY	RATE	PORTION OF PRICE SUBJECT TO ROE	AMOUNT IN FOREIGN CURRENCY REMITTED ABROAD
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		
				ZAR=		

2. Adjustments for rate of exchange variations during the contract period will be calculated by using the average monthly exchange rates as issued by your commercial bank for the periods indicated hereunder: (Proof from bank required)

AVERAGE MONTHLY EXCHANGE RATES FOR THE PERIOD:	DATE DOCUMENTATION MUST BE SUBMITTED TO THIS OFFICE	DATE FROM WHICH NEW CALCULATED PRICES WILL BECOME EFFECTIVE	DATE UNTIL WHICH NEW CALCULATED PRICE WILL BE EFFECTIVE

ADJUSTMENT PERIODS	DATE FROM WHICH NEW CALCULATED PRICES WILL BECOME EFFECTIVE
1 st Adjustment	After 12 calendar months
2 nd Adjustment	After 24 calendar months

NB: Unless prior approval has been obtained from Supply Chain Management, no adjustment in contract prices will be made

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state¹.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.
3. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**
 - 3.1 Full Name of bidder or his or her representative:
 - 3.2 Identity Number:
 - 3.3 Position occupied in the Company (director, trustee, shareholder²)
 - 3.4 Company Registration Number:
 - 3.5 Tax Reference Number:
 - 3.6 VAT Registration Number:
 - 3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.
 - 3.8 Are you presently in the service of the state? **YES / NO**
 - 3.8.1 If yes, furnish particulars.

¹ MSCM Regulations: "in the service of the state" means to be –

- (a) a member of –
 - (i) any municipal council;
 - (ii) any provincial legislature; or
 - (iii) the national Assembly or the national Council of provinces;
- (b) a member of the board of directors of any municipal entity;
- (c) an official of any municipality or municipal entity;
- (d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
- (e) a member of the accounting authority of any national or provincial public entity; or
- (f) an employee of Parliament or a provincial legislature.

² Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months? **YES/NO**

3.9.1 If yes, furnish particulars.

.....

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.10.1 If yes, furnish particulars.

.....

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.11.1 If yes, furnish particulars.

.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.12.1 If yes, furnish particulars.

.....

3.13 Are any spouse, child or parent of the company's directors trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.13.1 If yes, furnish particulars.

.....

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract. **YES / NO**

3.14.1 If yes, furnish particulars:

.....

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

.....

Signature

.....

Date

.....

Capacity

.....

Name of Bidder



DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire:

1 Are you by law required to prepare annual financial statements for auditing? ***YES / NO**

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

.....

2 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? ***YES / NO**

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days. ***YES / NO**

2.2 If yes, provide particulars.

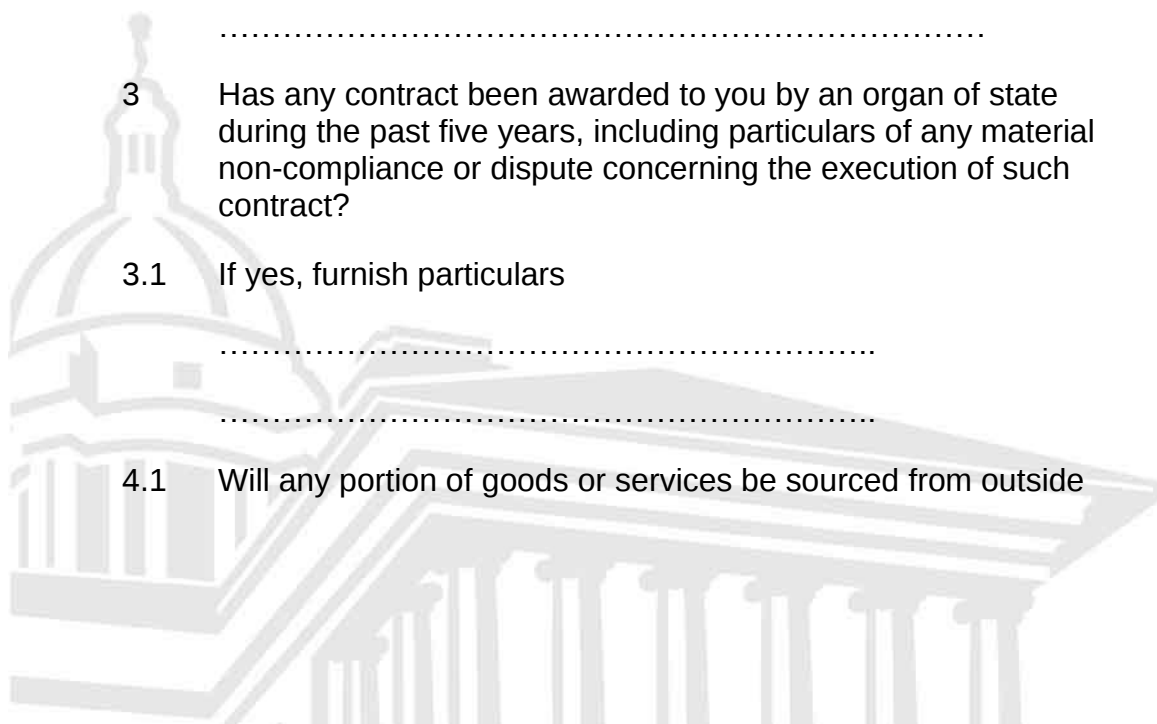
.....

3 Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? ***YES / NO**

3.1 If yes, furnish particulars

.....

4.1 Will any portion of goods or services be sourced from outside ***YES / NO**



the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?

4.1 If yes, furnish particulars

.....
.....

CERTIFICATION

**I, THE UNDERSIGNED (NAME)
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM
IS CORRECT. I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS
DECLARATION PROVE TO BE FALSE.**

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1. GENERAL CONDITIONS

- 1.1 The following preference point systems are applicable to invitations to tender:
- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
 - the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).
- 1.2 **To be completed by the organ of state**
(delete whichever is not applicable for this tender).
- a) The applicable preference point system for this tender is the 90/10 preference point system.
- 1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:
- (a) Price; and
 - (b) Specific Goals.
- 1.4 **To be completed by the organ of state:**
The maximum points for this tender are allocated as follows:
- | | Points |
|--|------------|
| PRICE | 90 |
| SPECIFIC GOALS | 10 |
| TOTAL POINTS FOR PRICE AND SPECIFIC GOALS | 100 |
- 1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.
- 1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20	or	90/10
$Ps = 80 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)$	or	$Ps = 90 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20	or	90/10
$Ps = 80 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right)$	or	$Ps = 90 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right)$

Where

- Ps = Points scored for price of tender under consideration
 Pt = Price of tender under consideration
 Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.)

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

Specific goals	90/10 preference point system	Number of points claimed (90/10 system) (To be completed by the tenderer)
BB-BEE score of companies • Level 1 • Level 2 • Level 3 • Level 4 • Level 5 • Level 6 • Level 7 • Level 8 • Non-compliant	• 4 Points • 3.5 Points • 3 Points • 2.5 Points • 2 Points • 1.5 Points • 1 Point • 0.5 Points • 0 Points	
EME and/ or QSE	1 Point	
At least 51% of Women-owned companies	1 Point	
At least 51% owned companies by People with disability	1 Point	
At least 51% owned companies by Youth	1 Point	
Local Economic Participation • City of Tshwane • Gauteng	2 Points 1 Point	

Specific goals	90/10 preference point system	Number of points claimed (90/10 system) (To be completed by the tenderer)
• National	1 Point	

N.B For points to be allocated as per above the tenderers will be required to submit proof of documentation as evidence for claims made. Any tenderer that does not submit evidence as stated in the bid document to claim applicable points will be allocated zero points.

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Public Company
- ☐ Personal Liability Company
- ☐ (Pty) Limited
- ☐ Non-Profit Company
- ☐ State Owned Company

[TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
- (e) forward the matter for criminal prosecution, if deemed necessary.

..... SIGNATURE(S) OF TENDERER(S)	
SURNAME AND NAME:	
DATE:	
ADDRESS:	

CONTRACT FORM: PURCHASE OF GOODS/WORKS

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to **CITY OF TSHWANE MUNICIPALITY** in accordance with the requirements and specifications stipulated in bid number **EED 09-2024.25** at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the purchaser during the validity period indicated and calculated from the closing time of bid.
2. The following documents shall be deemed to form and be read and construed as part of this agreement:
 - (i) Bidding documents, viz
 - Invitation to bid;
 - Tax clearance certificate;
 - Pricing schedule(s);
 - Technical Specification(s);
 - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
 - Declaration of interest;
 - Declaration of bidder's past SCM practices;
 - Certificate of Independent Bid Determination;
 - Special Conditions of Contract;
 - (ii) General Conditions of Contract; and
 - (iii) Other (specify)
3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.
4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.
5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.
6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT)

CAPACITY

SIGNATURE

NAME OF FIRM

DATE

WITNESSES

1.

2.

DATE:

CONTRACT FORM: PURCHASE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I in my capacity as accept your bid under reference number dated for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).
2. An official order indicating delivery instructions is forthcoming.
3. I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	PRICE (ALL APPLICABLE TAXES INCLUDED)	BRAND	DELIVERY PERIOD	B-BBEE STATUS LEVEL OF CONTRIBUTION

4. I confirm that I am duly authorized to sign this contract.

SIGNED ATON.....

NAME (PRINT)

SIGNATURE

OFFICIAL STAMP

WITNESSES

1.

2.

DATE:

CONTRACT FORM: RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to (name of the institution)..... in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number **EED 09-2024.25** at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.
2. The following documents shall be deemed to form and be read and construed as part of this agreement:
 - (i) Bidding documents, viz
 - Invitation to bid;
 - Tax clearance certificate;
 - Pricing schedule(s);
 - Filled in task directive/proposal;
 - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2022;
 - Declaration of interest;
 - Declaration of Bidder's past SCM practices;
 - Certificate of Independent Bid Determination;
 - Special Conditions of Contract;
 - (ii) General Conditions of Contract; and
 - (iii) Other (specify)
3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.
4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.
5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT)

CAPACITY

SIGNATURE

NAME OF FIRM

DATE

WITNESSES

1

2

DATE:

CONTRACT FORM: RENDERING OF SERVICES

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I..... in my capacity as accept your bid under reference number dated..... for the rendering of services indicated hereunder and/or further specified in the annexure(s).
2. An official order indicating service delivery instructions is forthcoming.
3. I undertake to make payment for the services rendered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	PRICE (ALL APPLICABLE TAXES INCLUDED)	COMPLETION DATE	B-BBEE STATUS LEVEL OF CONTRIBUTION

4. I confirm that I am duly authorised to sign this contract.

SIGNED AT ON

NAME (PRINT)

SIGNATURE

OFFICIAL STAMP

WITNESSES

1
2

DATE:

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 This Municipal Bidding Document must form part of all bids invited.
- 2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3 The bid of any bidder may be rejected if that bidder, or any of its directors have:
 - a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
 - b. been convicted for fraud or corruption during the past five years;
 - c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
- 4 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied). The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	Yes ☐	No ☐

4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

**I, THE UNDERSIGNED (FULL NAME)
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM
TRUE AND CORRECT.**

**I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION
MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE
FALSE.**

.....
Signature

.....
Date

CERTIFICATE OF INDEPENDENT BID DETERMINATION

- 1 This Municipal Bidding Document (MBD) must form part of all bids¹ invited.
- 2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).² Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.
- 3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. take all reasonable steps to prevent such abuse;
 - b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
- 4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
- 5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

¹ Includes price quotations, advertised competitive bids, limited bids and proposals.

² Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid: **EED 09-2024.25**

TENDER FOR THE SUPPLY, REPAIRS, DELIVERY AND OFF-LOADING OF ELECTRICAL TOOLS AND ELECTRICAL TESTING EQUIPMENT FOR THE CITY OF TSHWANE: AS AND WHEN REQUIRED FOR A PERIOD OF THREE (3) YEARS

(Bid Number and Description)

in response to the invitation for the bid made by:

CITY OF TSHWANE MUNICIPALITY

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: _____ that:
(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation;
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.

³ Joint venture or consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
- (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....
Signature Date

.....
Position Name of Bidder

THE NATIONAL TREASURY

Republic of South Africa



GOVERNMENT PROCUREMENT

GENERAL CONDITIONS OF CONTRACT

July 2010

GOVERNMENT PROCUREMENT

GENERAL CONDITIONS OF CONTRACT

July 2010

NOTES

The purpose of this document is to:

- (i) Draw special attention to certain general conditions applicable to government bids, contracts and orders; and
- (ii) To ensure that clients be familiar with regard to the rights and obligations of all parties involved in doing business with government.

In this document words in the singular also mean in the plural and vice versa and words in the masculine also mean in the feminine and neuter.

- The General Conditions of Contract will form part of all bid documents and may not be amended.
- Special Conditions of Contract (SCC) relevant to a specific bid, should be compiled separately for every bid (if applicable) and will supplement the General Conditions of Contract. Whenever there is a conflict, the provisions in the SCC shall prevail.

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General Conditions of Contract

1. Definitions

1. The following terms shall be interpreted as indicated:
 - 1.1 “Closing time” means the date and hour specified in the bidding documents for the receipt of bids.
 - 1.2 “Contract” means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
 - 1.3 “Contract price” means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.
 - 1.4 “Corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
 - 1.5 "Countervailing duties" are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.
 - 1.6 “Country of origin” means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.
 - 1.7 “Day” means calendar day.
 - 1.8 “Delivery” means delivery in compliance of the conditions of the contract or order.
 - 1.9 “Delivery ex stock” means immediate delivery directly from stock actually on hand.
 - 1.10 “Delivery into consignees store or to his site” means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.
 - 1.11 "Dumping" occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.
 - 1.12 ”Force majeure” means an event beyond the control of the supplier and not involving the supplier’s fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
 - 1.13 “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.

- 1.14 “GCC” means the General Conditions of Contract.
- 1.15 “Goods” means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.
- 1.16 “Imported content” means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.
- 1.17 “Local content” means that portion of the bidding price which is not included in the imported content provided that local manufacture does take place.
- 1.18 “Manufacture” means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.
- 1.19 “Order” means an official written order issued for the supply of goods or works or the rendering of a service.
- 1.20 “Project site,” where applicable, means the place indicated in bidding documents.
- 1.21 “Purchaser” means the organization purchasing the goods.
- 1.22 “Republic” means the Republic of South Africa.
- 1.23 “SCC” means the Special Conditions of Contract.
- 1.24 “Services” means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.
- 1.25 “Written” or “in writing” means handwritten in ink or any form of electronic or mechanical writing.

1. Application

- 2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services, sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.
- 2.2 Where applicable, special conditions of contract are also laid down to cover specific supplies, services or works.
- 2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.

3. General

- 3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid.
Where applicable a non-refundable fee for documents may be charged.

	3.2	With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria 0001, or accessed electronically from www.treasury.gov.za
4. Standards	4.1	The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.
5. Use of contract documents and information inspection.	5.1	The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.
	5.2	The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 5.1 except for purposes of performing the contract.
	5.3	Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.
	5.4	The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.
6. Patent rights	6.1	The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.
7. Performance security	7.1	Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.
	7.2	The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.
	7.3	The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms: (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or (b) a cashier's or certified cheque
	7.4	The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.
8. Inspections, tests and analyses	8.1	All pre-bidding testing will be for the account of the bidder.

- 8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organization acting on behalf of the Department.
- 8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.
- 8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.
- 8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.
- 8.6 Supplies and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.
- 8.7 Any contract supplies may on or after delivery be inspected, tested or analyzed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with supplies which do comply with the requirements of the contract. Failing such removal the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.
- 8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 23 of GCC.

9. Packing

- 9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.
- 9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

- 10.1 Delivery of the goods shall be made by the supplier in accordance with the terms specified in the contract. The details of shipping and/or other documents to be furnished by the supplier are specified in SCC.
- 10.2 Documents to be submitted by the supplier are specified in SCC.

11. Insurance	11.1	The goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the SCC.
12. Transportation	12.1	Should a price other than an all-inclusive delivered price be required, this shall be specified in the SCC.
13. Incidental services, services	13.1	The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC: (a) performance or supervision of on-site assembly and/or commissioning of the supplied goods; (b) furnishing of tools required for assembly and/or maintenance of the supplied goods; (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods; (d) performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and (e) training of the purchaser's personnel, at the supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.
	13.2	Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.
14. Spare parts	14.1	As specified in SCC, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier: (a) such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and (b) in the event of termination of production of the spare parts: (i) Advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and (ii) following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.
15. Warranty	15.1	The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

	15.2	This warranty shall remain valid for twenty-four (24) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract.
	15.3	The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.
	15.4	Upon receipt of such notice, the supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.
	15.5	If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.
16. Payment	16.1	The method and conditions of payment to be made to the supplier under this contract shall be specified in SCC.
	16.2	The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract.
	16.3	Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.
	16.4	Payment will be made in Rand unless otherwise stipulated in SCC.
17. Prices	17.1	Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized in SCC or in the purchaser's request for bid validity extension, as the case may be.
18. Contract	18.1	No variation in or modification of the terms of the contract shall be made amendments except by written amendment signed by the parties concerned.
19. Assignment	19.1	The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.
20. Subcontracts	20.1	The supplier shall notify the purchaser in writing of all subcontracts awarded under this contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.
21. Delays in the supplier's performance	21.1	Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.
	21.2	If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

- 21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority.
- 21.4 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier's point of supply is not situated at or near the place where the supplies are required, or the supplier's services are not readily available.
- 21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.
- 21.6 Upon any delay beyond the delivery period in the case of a supplies contract, the purchaser shall, without canceling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.
- 22. Penalties**
- 22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.
- 23. Termination for default**
- 23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:
- (a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;
 - (b) if the Supplier fails to perform any other obligation(s) under the contract; or
 - (c) if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.
- 23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.
- 23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.
- 23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated

fourteen (14) days the purchaser may regard the intended penalty as not objected against and may impose it on the supplier.

23.5 Any restriction imposed on any person by the Accounting Officer / Authority will, at the discretion of the Accounting Officer / Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the Accounting Officer / Authority actively associated.

23.6 If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

- (i) the name and address of the supplier and / or person restricted by the purchaser;
- (ii) the date of commencement of the restriction
- (iii) the period of restriction; and
- (iv) the reasons for the restriction.

These details will be loaded in the National Treasury's central database of suppliers or persons prohibited from doing business with the public sector.

23.7 If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Anti-dumping and countervailing duties and rights

24.1 When, after the date of bid, provisional payments are required, or antidumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favourable difference shall on demand be paid forthwith by the contractor to the State or the State may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplies or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all

		reasonable alternative means for performance not prevented by the force majeure event.
26. Termination for insolvency	26.1	The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.
27. Settlement of Disputes	27.1	If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.
	27.2	If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.
	27.3	Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.
	27.4	Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.
	27.5	Notwithstanding any reference to mediation and/or court proceedings herein, (a) the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and (b) the purchaser shall pay the supplier any monies due the supplier.
28. Limitation of liability	28.1	Except in cases of criminal negligence or willful misconduct, and in the case of infringement pursuant to Clause 6; the supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and the aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.
29. Governing language	29.1	The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.
30. Applicable law	30.1	The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.
31. Notices	31.1	Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice

- 31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.
- 32. Taxes and duties**
- 32.1 A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.
- 32.2 A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.
- 32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.
- 33. National Industrial Participation (NIP) Programme**
- 33.1 The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation
- 34. Prohibition of Restrictive practices**
- 34.1 In terms of section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder (s) is / are or a contractor(s) was / were involved in collusive bidding (or bid rigging).
- 34.2 If a bidder(s) or contractor(s), based on reasonable grounds or evidence obtained by the purchaser, has / have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in the Competition Act No. 89 of 1998.
- 34.3 If a bidder(s) or contractor(s), has / have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

Js General Conditions of Contract (revised July 2010)

DRAFT SERVICE-LEVEL AGREEMENT

ENTERED INTO BETWEEN

THE CITY OF TSHWANE METROPOLITAN MUNICIPALITY

AND

Registration number: _____

Doc2 Version 1 3 March 2022

DRAFT SERVICE-LEVEL AGREEMENT

ENTERED INTO BETWEEN

THE CITY OF TSHWANE METROPOLITAN MUNICIPALITY

A municipality, as described in Section 2 of the Local Government: Municipal Systems Act, 2000 and as contemplated in Section 155 of the Constitution of the Republic of South Africa, 1996 as a category A municipality, or the Assignee, if applicable, herein represented by Mr Johann Mettler in his/her capacity as City Manager duly authorised thereto under and by virtue of a resolution passed on 26 January 2012, and who by his/her signature hereto warrants that he/she is properly authorised to sign this Agreement.

(Herein referred to as the “**CITY**”)

AND

Registration number: _____

Herein represented by _____ in his/her capacity as _____ is duly authorised thereto under and by virtue of a resolution of the board passed on _____, a copy of which is annexed as Annexure A, and who by his/her signature hereto warrants that he/she is properly authorised to sign this agreement.

(Herein referred to as the “**SERVICE PROVIDER**”)

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ANNEXURE A: BOARD RESOLUTION

ANNEXURE B: SCOPE OF WORK AND DELIVERABLES

ANNEXURE C: PAYMENT TERMS

RECORDAL:

WHEREAS the City requires various services to be provided or carried out and delivered at the service areas;

AND WHEREAS the City wishes to appoint the service provider;

AND WHEREAS the service provider wishes to provide such services;

AND WHEREAS the service provider has indicated that it has the necessary expertise, skills and capabilities to provide the service;

NOW THEREFORE, the parties have agreed to enter into this agreement, in terms of which the service provider shall provide the services in the service areas and/or delivery area, and provide maintenance and support thereof to the City in accordance with the terms and subject to the conditions of this agreement.

1. DEFINITIONS

Unless otherwise expressly stated, or if the context requires otherwise, the following words and expressions, when used in this agreement, including in this introduction, shall bear the following meanings ascribed to them:

- 1.1 **“Agreement”** means this service-level agreement and shall include any annexures, schedules, attachments, appendices and/or any addenda hereto or incorporated herein by reference, as amended from time to time;
- 1.2 **“Business day”** means any day from Monday to Friday, excluding public holidays, as defined in the Public Holidays Act, 1994 (Act 36 of 1994), as amended from time to time;
- 1.3 **“Business week”** means five consecutive business days, excluding public holidays as defined in the Public Holidays Act, 1994;
- 1.4 **“City”** means the City of Tshwane Metropolitan Municipality, a metropolitan municipality established in terms of Section 12 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998);
- 1.5 **“Contact persons”** means persons identified by the parties as persons who are responsible for the execution of the agreement and whose names are set out in Clause 35 below and who can be substituted in writing from time to time;
- 1.6 **“Contract price”** means the amount reflected as the contract price in Clause 9 below;
- 1.7 **“Contract period”** means the contract period as reflected in Clause 6 below;
- 1.8 **“Effective date”**, notwithstanding the signature date, means _____;
- 1.9 **“Intellectual property”** means patents, designs, know-how, copyright, trademarks and all rights having an equivalent or similar effect which may exist anywhere in the world, introduced and required by either party to give effect to

their obligations under this agreement, owned in whole or in part by, or licenced to either party before the commencement date or developed after the commencement date, and includes all further additions and improvements to the intellectual property, otherwise pursuant to this agreement;

- 1.10 **“Month”** means a calendar month;
- 1.11 **“Parties”** means the City of Tshwane and the service provider and “party” means either of these, as the context requires;
- 1.12 **“Services”** means services to be provided by the service provider to the City as detailed in Clause 8 below;
- 1.13 **“Service provider”** means _____, a company duly incorporated in accordance with the company laws of the Republic of South Africa with company registration number: _____;
- 1.14 **“Signature date”** means the date of signature of this agreement by the party signing last;
- 1.15 **“Subcontract”** means any contract, agreement or proposed contract between the service provider and any third party whereby that third party agrees to provide to the service provider the services or any part thereof;
- 1.16 **“Subcontractor”** means the third party with whom the service provider enters into a subcontract;
- 1.17 **“Tax invoice”** means the document, as required by Section 20 of the Value-added Tax Act, 1991 (Act 89 of 1991), as amended from time to time;
- 1.18 **“VAT”** means value-added tax, as defined in terms of the Value-added Tax Act, 1991.

2. INTERPRETATION

- 2.1 Headings and subheadings are inserted for information purposes only and shall not be used in the interpretation of this agreement.
- 2.2 Unless the context clearly indicates a contrary intention, any word that connotes –
 - 2.2.1 any singular shall be deemed to include a reference to the plural and *vice versa*;
 - 2.2.2 any one gender shall be deemed to include a reference to any other gender; and
 - 2.2.3 a natural person shall be deemed to include a reference to a legal or juristic person.

- 2.3 The expiry or termination of this agreement shall not affect provisions of this agreement, which expressly provide that they will operate after any such expiry or termination of this agreement. Provisions of necessity shall continue to have been effective after such expiry or termination of this agreement, notwithstanding that the clauses themselves do not expressly provide for this.
- 2.4 The rule of interpretation that a written agreement shall be interpreted against the party responsible for the drafting or preparation of that agreement shall not apply.
- 2.5 Where figures are referred to in numerals and in words and there is any conflict between the two, the words shall prevail.
- 2.6 Any reference to any legislation is a reference to such legislation as at the signature date and as amended or re-enacted from time to time.
- 2.7 If any provision in a definition is a substantive provision that confers any rights or imposing any obligations on any party, then, notwithstanding that it is only in this interpretation clause, effect shall be given to it as if it were a substantive provision in this agreement.

3. APPOINTMENT

The City hereby appoints the service provider, who accepts such appointment, to provide the services in accordance with the terms and subject to the conditions of this agreement.

4. PURPOSE OF THE AGREEMENT

- 4.1 The purpose of this agreement is to –
- 4.1.1 formalise and regulate the working relationship between the parties;
 - 4.1.2 set out the roles and responsibilities of the parties; and
 - 4.1.3 define process and procedures to be followed by the parties.

5. RELATIONSHIP

Nothing in this agreement shall constitute or be deemed to constitute a partnership or joint venture between the parties. Furthermore, the service provider acknowledges and agrees that its status under this agreement is that of an independent service provider and its status shall in no way be deemed to be that of an agent or employee of the City for any purpose whatsoever. The service provider shall have no authority or power to bind the City or to contract in the name of the City or create a liability against the City in any way or for any purpose.

6. DURATION

This agreement shall commence on the effective date and shall subsist for three years, unless terminated earlier or if there is extension on the contract, pursuant to Clause 32 below.

7. CONTACT PERSON

- 7.1 The work to be performed by the service provider hereunder will be supervised by City's contact person referred to in Clause 35 below.
- 7.2 The parties shall notify each other in writing from time to time of the details of the nominated contact person.
- 7.3 The contact persons shall liaise and update each other on the progress of the services rendered and shall endeavour to resolve and remedy any problems or disputes that may arise in relation to the services.
- 7.4 Either party may substitute a contact person at its discretion, provided that each party shall give the other party reasonable notice of such substitution and will provide replacement employees of equivalent ability.
- 7.5 Without derogating from the foregoing, should either party replace a contact person for any reason whatsoever, it shall ensure, to the greatest extent possible in the circumstances, that the suitable period of handover and overlap takes place, at its cost, between the new and the incumbent contact person.

8. SCOPE OF GENERAL SERVICES

The service provider shall, for the duration of this agreement, provide the services/goods set out in the scope of work and in accordance with the deliverables and milestones attached hereto as Annexure B, including but not limited to the maintenance and support services, as provided for in Clause 20 below.

9. PRICE AND PAYMENT

- 9.1 The City shall pay to the service provider the contract price per unit, payable in accordance with the terms of the appointment letter, attached hereto as Annexure C, and subject to deliverables.
- 9.2 All payments under this agreement shall be made by electronic fund transfer or other forms of payment as the parties may agree upon from time to time, upon receipt of valid and undisputed tax invoices and month-end statements together with the supporting documentation from the service provider, once the undisputed tax invoices or such portion of the tax invoices which are undisputed become due and payable.
- 9.3 All amounts and other sums payable in terms of this agreement and schedules hereto will be stipulated exclusive of VAT, unless expressly stated otherwise.

- 9.4 Unless otherwise provided in the schedules, valid tax invoices shall be submitted together with a month-end statement. Payment against such month-end statement shall be made by the City within 30 (thirty) days after the date of receipt by the City of the service provider's statement together with the relevant valid and undisputed tax invoice(s) and supporting documentation, but in any event no later than 90 (ninety) days of receipt of such statement.
- 9.5 Where the payment of any valid and undisputed tax invoice, or any part of the said tax invoice which is not in dispute, is not made by the due date, the service provider shall be entitled to charge interest on the outstanding amount, at the service provider's prime rate of interest in force, for the period from the due date of payment until the outstanding amount is fully paid.
- 9.6 There shall be no interest levied on a tax invoice that is in dispute between the parties.
- 9.7 The City shall pay the amount reflected on a tax invoice once the City's contact person has verified that the services set out in a schedule have been rendered and the tax invoice amount has been approved by the City.
- 9.8 All tax invoices shall be addressed to the City's contact person.
- 9.9 All payments shall be transferred by the City to the service provider electronically into the service provider's bank account, the details of which are as follows:
- Bank: _____
Account type: _____
Account number: _____
Branch number: _____
- 9.10 Failure to comply with the clauses above may result in late payment of the total amount of an invoice by the service provider to the City. The City shall not be liable for any costs or damages suffered by the service provider as a result of such late payment.

10. PRICE RESTRUCTURING

- 10.1 The service provider shall be subject to a price review every year.
- 10.2 The City shall embark on a benchmarking exercise every 12 (twelve) months where the City shall benchmark the service provider's contract price against the prevailing market rates.
- 10.3 In the event that it emerges that the service provider's charges regarding the contract price and other charges under this agreement are materially higher than the reasonable benchmark ascertained by the City or that the City can acquire similar services of a like quality from another supplier at a total delivered cost that is lower than the total delivered cost of the services acquired hereunder from the service provider, the City shall have the right to notify the service provider of such total delivered cost and the service provider shall have an opportunity to adjust the contract price and any other charges hereunder, on

such a basis as to result in the same total delivered cost to the City, within 30 (thirty) calendar days of such notice.

10.4 If the service provider fails to do so or cannot legally do so, the City may –

10.4.1 acquire the services from such other supplier in which case the obligations, including, but not limited to, any purchase and sale requirements and/or commitments, if any, of the City and the service provider hereunder shall be reduced accordingly;

10.4.2 terminate this agreement without any penalty, liability or further obligation; or

10.4.3 continue under this agreement.

10.5 Within 30 (thirty) calendar days of a notice by the City or at any time the City so requests, the service provider shall certify in writing to the City that it is in compliance with this clause and shall provide all information that the City reasonably requests in order to verify such compliance.

11. SERVICE LEVELS

11.1 The service provider recognises that the City has entered into this agreement relying specifically on the service provider's representations regarding service levels including, *inter alia* –

11.1.1 capacity allocations in accordance with the service to be provided; and

11.1.2 all work to be performed and services rendered under this agreement shall comply with industry norms and best practice acceptable within the services industry and shall be executed by the service provider to the total satisfaction of the City.

11.2 The service provider shall provide suitably qualified and trained employees to provide the services to the City in terms of this agreement, and shall allocate, in its discretion, employee resources in accordance with the technical skill and knowledge required, provided that any exercise of such discretion by the service provider shall not negatively impact the provision of the services by the service provider to the City. The service provider shall also allocate employees with the technical skill and knowledge on-site at the City at all times during normal working hours, if the City so requires.

11.3 Among others, the service provider shall comply with and provide the services as set out in Clause 8 above.

12. WITHHOLDING OF PERFORMANCE

The service provider may not, under any circumstances, including, without limitation, non-payment by the City, withhold any services from the City during the currency of this agreement, unless it validly terminates this agreement, in terms of Clause 32 below.

13. PENALTY

- 13.1 Should the service provider fail to comply with its obligations in terms of this agreement, the City may –
 - 13.1.1 exercise its rights in terms of Clause 31 below; or
 - 13.1.2 impose a penalty on the service provider.
- 13.2 An election of any of the above by the City shall not mean that the City has waived any other rights which the City might have in law.
- 13.3 Should the City choose to impose a penalty on the service provider, the City shall provide the service provider with a written notice requiring the service provider to remedy the default within 7 (seven) days from the date of delivery of the notice.
- 13.4 Should the service provider fail to remedy the default within 7 (seven) days after receiving the notice, the City shall be entitled, without prejudice to any alternative or additional right of action or remedy available to the City and without further notice, to impose a penalty, which penalty shall be a deduction of 5% of the monthly contract price for the contract period. For the avoidance of doubt, the penalty amount shall be 5% of the monies due for payment to the service provider monthly, in terms of Clause 9 above.
- 13.5 Should there be a dispute as to whether the failure to deliver was caused by the City or was the service provider's fault, such dispute shall be dealt with in accordance with Clause 33 below.

14. ACCESS

- 14.1 The City shall allow the service provider reasonable access to its premises, provided that –
 - 14.1.1 access is related to the services to be provided by the service provider; and
 - 14.1.2 the service provider adheres to all rules, regulations and instructions applicable at the City's premises.
- 14.2 The service provider is required to notify the City every month of employees who are to provide services at the service areas and/or delivery areas.
- 14.3 The City shall grant the service provider and/or its employees, referred in Clause 14.2 above, access to its premises to perform its obligations in terms of this agreement.
- 14.4 The service provider and its employees shall at all times, when entering the premises and/or service areas and/or delivery areas of the City, comply with all rules, laws, regulations and policies of the City.

15. ORDERS OF GOODS

- 15.1 The service provider's contact person shall advise the City in writing of the goods required to enable the service provider to render the services. On the order form, the service provider shall set out the quantity, description of goods and the anticipated date of delivery of the goods ("delivery date").
- 15.2 The City shall confirm the order in writing and authorise the service provider to order the goods necessary for the provision of the service.
- 15.3 All orders for goods ordered under Clause 15 shall be for the separate account of the City, the cost of which shall be invoiced to the City by the service provider upon confirmation of the order, in terms of Clause 15.2 above. The City shall not be obliged to order the goods from the service provider and shall be entitled to use any company that it deems most suitable for the provision of the goods.

16. DELIVERY OF GOODS

- 16.1 The service provider shall deliver the goods on the delivery date.
- 16.2 Should the service provider be unable to deliver the goods on the delivery date, the service provider shall inform the City of its inability to deliver the goods, the reason therefor, and shall provide the City with a reasonable alternative delivery date, which, in any event, shall not be more than 14 (fourteen) days from the original delivery date.
- 16.3 In the event that the service provider is unable to deliver the goods on the delivery date 3 (three) times in a period of 6 (six) months, the City shall be entitled to terminate this agreement by giving the service provider one (1) month's written notice to terminate.
- 16.4 Upon delivery of the goods by the service provider, the City's contact person shall sign the delivery document provided by the service provider as acknowledgement of receipt of the goods. Such acknowledgement of receipt shall not constitute an acceptance –
 - 16.4.1 that the goods were received in good condition;
 - 16.4.2 that the goods were free of any defects;
 - 16.4.3 that the goods were fit for the purpose for which they were purchased; and/or
 - 16.4.4 of any terms and conditions of the delivery document.
- 16.5 In the event that the City notifies the service provider, within 5 (five) business days, that the goods delivered are not in accordance with the order, the City shall be entitled to return the goods to the service provider at the service provider's cost and the service provider shall deliver the replacement goods ordered within 5 (five) business days of taking delivery of the defective goods.

17. DEFECTIVE GOODS OR LATENT PRODUCTS

- 17.1 The service provider shall verify whether the goods received are in order and without any defects.
- 17.2 In the event that the City realises that the goods have any defect, including (but not limited to) manufacture and/or latent defects, the City shall inform the service provider in writing within 5 (five) days of becoming aware of the defect ("Notice of Defect").
- 17.3 Upon receipt of the Notice of Defect, the service provider shall immediately deliver replacement goods to the City within 14 (fourteen) business days of receiving the Notice of Defect, referred to in Clause 17.2 above, and replace the defective goods.
- 17.4 The cost of returning and replacing the defective goods shall be borne by the service provider.
- 17.5 The service provider shall be responsible for the replacement amount of any parts of the goods that are to be replaced in terms of this agreement.

18. AMENDMENT OR CANCELLATION OF PURCHASE ORDER

The City is entitled to cancel an order, reschedule delivery of the goods or change the delivery area and delivery date on 14 (fourteen) days' written notice to the service provider.

19. INSPECTION

- 19.1 The City may, at any time, inspect the goods and/or service levels of the service provider in terms of this agreement.
- 19.2 If the City is, at any time, dissatisfied with the service levels, the City shall, within 7 (seven) days, notify the service provider in writing of the failure or default.
- 19.3 The service provider shall immediately upon receipt of written demand by the City remedy such failure or default, within 7 (seven) business days from the date of receipt of the notice, free of charge.
- 19.4 Should the service provider fail to remedy the failure or default referred to above, the City shall have the right to impose penalties as provided for in Clause 12 above or invoke the provisions of clauses and/or Clause 31 below.
 - 19.4.1 To enable the City to determine whether the goods and/or services rendered in terms of this agreement are being complied with, the service provider shall –
 - 19.4.1.1 provide the City with such information as it may reasonably require;
 - 19.4.1.2 allow the City to inspect and take copies of any records of the service provider relating to the goods and/or services, including all hardware, software, data, information, visuals,

procedures, event logs, transaction logs, audit trails, books, records, contracts and correspondence; or

- 19.4.1.3 allow the City or its authorised representatives to conduct interviews with any of the service provider's employees, subject to reasonable notice being given to the service provider.

19.5 Service provider to provide reasonable assistance

19.5.1 Where any information is required for inspection in terms of this clause and the information is kept in a computer, the service provider shall give the City reasonable assistance required to facilitate inspection and obtain copies of the information in a visible and legible form or to inspect and check the operation of any computer and any associated apparatus or material that is or has been in use in connection with the keeping of the information.

19.5.2 Any information required to be provided to the City, pursuant to Clause 19, shall be provided by the service provider, as the case may be in such form (including a form otherwise than in writing) as the City may reasonably specify.

19.5.3 The cost of any inspection contemplated in terms of Clause 19 shall be for the account of the City unless any material irregularity or failure on the part of the service provider is determined by the City in the course of such inspection.

19.6 The inspection contemplated in this agreement will be conducted –

19.6.1 during normal business hours; and

19.6.2 where the circumstances justify it, on reasonable notice to the service provider, with the minimum interference in the provision of the services and the service provider's other operations.

20. MAINTENANCE AND SUPPORT

The essential and critical elements of the maintenance and support to be provided by the service provider to the City shall be detailed in the scope of work attached hereto as Annexure B.

21. TRAINING

If required, the service provider shall, after delivery and installation of the goods, and as part of maintenance and support, ensure that the City's nominated employees, from time to time, receive the required and necessary training relating to the nature, purpose and appropriate use of the goods.

22. SERVICE PROVIDER'S WARRANTIES AND INDEMNITIES

22.1 Service warranties

22.1.1 The service provider warrants that, in relation to each service provided in terms of this agreement, –

- 22.1.1.1 it has full capacity and authority to enter into and perform this agreement, and that this agreement is executed by duly authorised representatives of the service provider;
- 22.1.1.2 it possesses or has access to the requisite knowledge, skill and experience to provide the services in an expert manner;
- 22.1.1.3 it will discharge its obligations under this agreement and any annexure, appendix or schedule hereto with all due skill, care and diligence;
- 22.1.1.4 all work performed and services rendered under this agreement shall comply with prevailing practice, standards and specifications within the industry;
- 22.1.1.5 it will be solely responsible for the payment of remuneration and associated benefits, if any, of its personnel and for withholding and remitting income tax for its personnel in conformance with any applicable laws and regulations;
- 22.1.1.6 the use or possession by the City of any materials will not subject the City to any claim for infringement of any intellectual property rights of any third party;
- 22.1.1.7 it will, with promptness and diligence, and in a skilful manner and in accordance with the practices and professional standards of operations, perform services and/or deliver goods;
- 22.1.1.8 its services and/or goods will, in all aspects, comply with industry norms and best practice to the satisfaction of the City with regard to materials and workmanship;
- 22.1.1.9 it will use and adopt any standards, processes and procedures required under this agreement;
- 22.1.1.10 it shall employ suitably qualified and trained employees to provide the services and/or goods to the City and it shall allocate employees in accordance with the technical skills and knowledge required;
- 22.1.1.11 the goods and/or services will be free from any defects in material and workmanship;
- 22.1.1.12 it will maintain and cause to be maintained the highest standard of workmanship and care in undertaking the services and/or processing the goods;

- 22.1.1.13 it will maintain and cause to be maintained the highest standard of care and diligence in providing the services, maintenance and support;
- 22.1.1.14 it will ensure that all applicable laws are observed;
- 22.1.1.15 without derogating from the generality of the foregoing, it will strictly adhere to any or all laws, regulations and accepted procedures with regard to health, hygiene and the maintaining of the environment in the manufacture, packaging, labelling, identification, storage and transportation of the goods; and
- 22.1.1.16 it guarantees that the goods shall be in good working condition for the 2 year warranty and/or maintenance period of the goods, and that the service provider shall be responsible for the costs of repair of the goods should the goods require to be repaired to their normal use.

22.2 Indemnity

22.2.1 The service provider hereby indemnifies the City against any claim which may be brought against the City by the service provider's personnel or a third party arising from the execution of this agreement or which arises against the City as a result of the service provider's breach of any of the provisions of this agreement. This is provided that the City notifies the service provider in writing within a reasonable time, and, in any event, no less than 14 (fourteen) business days of the City becoming aware of any such claim to enable the service provider to take steps to contest it. The City shall provide the service provider with such reasonable assistance as may be necessary to enable the service provider to defend the claim to the extent only that it is in a position to render such assistance. The service provider may, within 5 (five) business days of receipt of written notice from the City aforesaid, elect in writing to contest such a claim in the name of the City and shall be entitled to control the proceedings in regard thereto. This is provided that the service provider indemnifies the City against all and any costs (including attorney and own client costs) which may be incurred by or awarded against the City as a consequence of the defence of the claim.

23. SERVICE PROVIDER'S PERSONNEL

23.1 Liability for criminal acts of employees

The service provider shall be liable to the City for any loss that the City or any third party may suffer as a result of any theft, fraud or other criminal act of any employee of the service provider which arises within the course and scope of such employee's employment with the service provider.

23.2 Character of employees

- 23.2.1 Due to the confidential nature of certain aspects of the services and the position of trust which the service provider's employees will fulfil, the service provider hereby undertakes to use its best commercial endeavours to ensure that it only assigns to the City employees who are fit and proper persons, who display the highest standards of personal integrity and honesty, and who have not, to their knowledge, been convicted of any crime.
- 23.2.2 The service provider shall, at its own cost, conduct all reasonable background checks into its employees before using them to provide the services in terms of this agreement.
- 23.3 The City shall conduct all reasonable background checks into the service provider's employees from time to time, where it deems it necessary to do so.

24. STATUTORY AND EMPLOYMENT ISSUES

24.1 The service provider shall comply with all employment legislation

- 24.1.1 The service provider warrants that it has full knowledge of all relevant statutory, collective and other stipulations applicable to the relationship with its personnel and its relationship with the City. This includes, but is not limited to, the Labour Relations Act, 1995 (Act 66 of 1995), the Basic Conditions of Employment Act, 1977 (Act 75 of 1997), the Employment Equity Act, 1998 (Act 55 of 1998) and any other applicable employment legislation currently in force.
- 24.1.2 The service provider warrants further that it is not and will not in future be in contravention of any of the provisions of any such legislation and in the event of such contravention, the service provider shall immediately take all steps to remedy such contravention. If the City advises the service provider of any contravention of such legislation in writing, the service provider shall, within 10 (ten) days after receipt of such notice, take all steps necessary to remedy such contravention and shall keep the City informed regarding the steps taken and the implementation and result thereof.

24.2 No employment

The service provider warrants that none of its personnel shall be regarded as employees of the City. The service provider shall assist to defend and bear all costs in the event that the City is required to defend a claim, whether civil or employment related, instituted against it by the service provider's personnel should the City defend the matter. The service provider hereby indemnifies the City against all and any costs (including attorney and own client costs) which may be incurred by or awarded against the City as a consequence of the defence of the claim.

24.3 Occupational Health and Safety Act, 1993

The service provider shall be responsible for ensuring compliance with all the provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)

and it indemnifies the City against any claim which may arise in respect of such act by its personnel against the City.

25. SUBCONTRACTING

- 25.1 The service provider may not subcontract the whole of or any portion of the services in terms of this agreement to any third party without the prior consent of the City.
- 25.2 In the event the service provider wishes to subcontract the whole of or any portion of the services in terms of this agreement, it shall apply to the City in writing for consent to do so.
- 25.3 In its application, the service provider shall give the name of the subcontractor, the subcontractor's obligations, the proposed date of commencement of the subcontract, which shall include the fees payable to the subcontractor, and a report of the background security check on the subcontractor's suitability, financial and otherwise.
- 25.4 The City may, in its sole and absolute discretion, refuse consent to subcontract. In the event the City approves the subcontracting of the whole of or any portion of the services in terms of this agreement, –
 - 25.4.1 the service provider shall ensure that the subcontractor's BBEE level is equal or better than that of the service provider, its price is competitive and it has the capacity to provide the service;
 - 25.4.2 such subcontracting shall not absolve the service provider from the responsibility of achieving the service levels or complying with its obligations in terms of this agreement, and the service provider hereby indemnifies and holds the City harmless against any loss, harm or damage which the City may suffer as a result of such subcontracting;
 - 25.4.3 the service provider shall, at all times, remain the sole point of contact for the City in respect of the acquisition of services by the City; and
 - 25.4.4 no such subcontracting shall have any effect on the contract price and charges payable by the City to the service provider in terms of this agreement.

26. CONFIDENTIALITY

- 26.1 The service provider acknowledges that all information relating to the City's confidential business and technical information, data, documents or other information necessary or useful for the carrying on by the City of its business which shall include, but shall not be limited to, operating procedures, quality control procedures, approximate operation personnel requirements, descriptions, trade names and trademarks, know how, techniques, technology, information relating to clients, customers, suppliers and relevant authorities, copyright, trade secrets and all goodwill relating to the business and any other intellectual property rights, technical data and documents in whole or in part, used by the City in respect of its business ("confidential information") shall

remain confidential and shall not be made known unless the City has given written consent to do so.

- 26.2 The information provided by the City in the context of this agreement is confidential information and the service provider shall take all reasonable measures to keep the information confidential and will only use the information for the purpose for which it was provided.
- 26.3 The service provider undertakes to not disclose any such confidential information. However, there will be no obligation of confidentiality or restriction on use where –
 - 26.3.1 the information is publicly available, or becomes publicly available otherwise than by action of the receiving party;
 - 26.3.2 the information was already known to the receiving party (as evidenced by its written records) prior to its receipt under this or any previous agreement between the parties or their affiliates; or
 - 26.3.3 the information was received from a third party not in breach of an obligation of confidentiality.

27. INTELLECTUAL PROPERTY RIGHTS

- 27.1 All intellectual property rights of the contractor and/or third party vest in the contractor and/or third party, as appropriate.
- 27.2 All rights in the City name and logo remain the absolute property of the City.
- 27.3 The contractor warrants that no aspect of the services provided in terms thereof will infringe any patent, design, copyright, trademark, trade secret or other proprietary right of any third party.
- 27.4 The contractor shall promptly notify the City, in writing, of any infringement or apparent or threatened infringement or any circumstances which may potentially give rise to an infringement, or any actions, claims or demands in relation to any intellectual property rights.
- 27.5 In the event the City becomes aware of any such infringement, the contractor shall, at its cost, defend the City against any claim that the services infringe any such third party intellectual property rights, provided that the City gives notice to the contractor of such claim and the contractor controls the defence thereof. The contractor further indemnifies the City against, and undertakes that it will pay all costs, damages and attorney fees, if any, finally awarded against the City in any action which is attributable to such claim and will reimburse the City with all costs reasonably incurred by the City in connection with any such action.
- 27.6 Should any claim be made against the City by any third party in terms of Clause 27.1 above, the City shall give the contractor written notice thereof within 3 (three) days of becoming aware of such claim to enable the contractor to take steps to contest it.

27.7 Should any third party succeed in its claim for the infringement of any third party proprietary rights, the contractor shall, at its discretion and within 30 (thirty) days of the services having been found to infringe, at its own cost, –

27.7.1 obtain for the City the right to continue using the subject of infringement or the parts thereof which constitute the infringement;

27.7.2 replace the subject of infringement or the parts thereof which constitute the infringement with another product or service which does not infringe and which is materially similar to the subject of infringement;

27.7.3 alter the subject of infringement in such a way as to render it non-infringing while still in all respects operating in substantially the same manner as the subject of infringement; or

27.7.4 withdraw the subject of infringement.

28. FORCE MAJEURE

28.1 For the purposes hereof, “*force majeure*” shall mean civil strife, riots, insurrection, sabotage, national emergency, acts of war of public enemy, rationing of supplies, flood, storm, fire or any other like forces of nature beyond the reasonable control of the party claiming *force majeure* and comprehended in the terms thereof.

28.2 If *force majeure* causes delays in or failure or partial failure of performance by a party of all or any of its obligations hereunder, this agreement shall be suspended for the period agreed in writing between the parties.

28.3 In the event of circumstances arising which the other party believes that it constitutes a *force majeure* (“the affected party”), such affected party shall send, within 5 (five) days from the interrupting circumstances, a written notice of the interrupting circumstances specifying the nature and date of commencement of the interrupting event to the other party. The parties shall agree, in writing, to suspend the implementation of this agreement for a specific period (“agreed period”).

28.4 In the event that both parties reasonably believe that the affected party shall be unable to continue to perform its obligations after the agreed period, either party shall be entitled to terminate this agreement without further notice to the other party.

28.5 The party whose performance is interrupted by the interrupting circumstances shall be entitled, provided that such party shall have given notice to that effect with a written notice of the interrupting circumstances as provided above, to extend the period of this agreement by a period equal to the time that its performance is so prevented.

29. CESSION

The service provider shall not be entitled to cede, assign or transfer in any other way and/or alienate its rights and obligations in terms of this agreement without the prior written consent of the City.

30. CHANGE OF CONTROL OR CIRCUMSTANCE

- 30.1 The service provider shall notify the City in writing of any change in the service provider's shareholding or membership or any change in the service provider's subsidiary companies or holding or its affiliates (such change shall be considered a material change in the constitution and identity of the service provider). The City may terminate this agreement upon becoming aware of such material change.
- 30.2 The parties agree that should there be a change, as envisaged in Clause 30.1 above, the service provider will no longer exist and a new third party or entity shall have been constituted. In this regard, such third party shall not be entitled to inherit any of the service provider's rights and obligations in terms of this agreement, which will only be transferred to the new entity in writing by the City following the City's satisfaction and approval in writing of such new entity.
- 30.3 The service provider shall further notify the City of any material changes or circumstance which might have led the City to appoint the service provider to provide the goods and/or services. In the event that any material change or circumstance occurs and the service provider fails to inform the City of such a change or circumstance, the service provider shall be deemed to have breached a material term of this agreement and the City shall be entitled to cancel the agreement on 1 (one) month's prior notice.

31. BREACH

- 31.1 Subject to Clause 30.3 above, should either party commit a breach of any term of this agreement ("the defaulting party") then the affected party ("aggrieved party") shall be entitled to inform the defaulting party in writing to remedy such failure or default within 5 (five) business days. Should the defaulting party fail to remedy the breach within 5 (five) business days after receipt of the notice, the aggrieved party shall be entitled, without prejudice to any of its rights under this agreement or law, to –
- 31.1.1 immediately terminate this agreement without giving written notice and claim damages (which shall include legal costs on an attorney or client scale);
- 31.1.2 request specific performance and claim damages (which shall include legal costs on an attorney or client scale); or
- 31.1.3 impose penalties as provided for in Clause 13 above.

32. EARLY TERMINATION

The City shall have the right to terminate this agreement by giving 30 (thirty) days' notice in writing to the service provider of its intention to terminate the agreement.

33. DISPUTES

33.1 Save for Clause 31 above or any other clause in this agreement which provides for its own remedy, should any dispute arise between the parties in respect of or pursuant to this agreement, including, without limiting the generality of the foregoing, any dispute relating to –

33.1.1 the interpretation of the agreement;

33.1.2 the performance of any of the terms of the agreement;

33.1.3 any of the parties' rights and obligations;

33.1.4 any procedure to be followed;

33.1.5 the termination or cancellation or breach of this agreement; or

33.1.6 the rectification or repudiation of this agreement,

any party may give the other party written notice of such dispute, in which event the provisions below shall apply.

33.2 Within 7 (seven) days of the declaration of such dispute, the parties' representatives or their nominated persons shall meet in the spirit of goodwill and endeavour to resolve the dispute, failing which (and without prejudice to any other alternative dispute resolution to which the parties may agree, either prior to or concurrently with arbitration) the provisions of Clause 33 shall apply.

33.3 If the parties are unable to resolve the dispute within 14 (fourteen) days of the notice of the dispute (or such longer period as they may have agreed to in writing), then either party may, on written notice to the other party, require that the dispute be submitted to and decided by arbitration, in terms of the Arbitration Act, 1965 (Act 42 of 1965).

33.4 The arbitration shall be held under the provisions of the Arbitration Act, 1965 provided that the arbitration shall be –

33.4.1 at any place which the parties agree, in writing, to be mutually convenient; and

33.4.2 in accordance with such formalities and/or procedures as may be settled by the arbitrator and may be held in an informal and summary manner, on the basis that it shall not be necessary to observe or carry out the usual formalities of procedure, pleadings and/or discovery or respect rules of evidence.

33.5 If the arbitration is –

33.5.1 a legal matter, then the arbitrator shall be a practising advocate or a practising attorney of no less than 10 (ten) years' standing;

- 33.5.2 an accounting matter, then the arbitrator shall be a practising chartered accountant of no less than 10 (ten) years' standing; and
- 33.5.3 any other matter, then the arbitrator shall be any independent person agreed upon between the parties.
- 33.6 Should the parties fail to agree on an arbitrator within 14 (fourteen) days after the arbitration has been demanded, then the arbitrator shall be nominated at the request of either of the parties, by the president for the time being of the Law Society of the Northern Provinces.
- 33.7 Should the parties fail to agree whether the dispute is of a legal, accounting or other nature within 7 (seven) days after the arbitration has been demanded, it shall be deemed to be a dispute of a legal nature.
- 33.8 The arbitrator may –
 - 33.8.1 investigate or cause to be investigated any matter, fact or thing which he/she considers necessary or desirable in connection with the dispute and, for that purpose, shall have the widest powers of investigating all documents and records of any party that have a bearing on the dispute;
 - 33.8.2 interview and question under oath the parties or any of their representatives;
 - 33.8.3 decide the dispute according to what he/she considers just and equitable in the circumstances; and
 - 33.8.4 make such award, including an award for specific performance, damages or otherwise, as he/she in his/her discretion may deem fit and appropriate. The arbitration shall be held as quickly as possible after it is requested, with a view to it being completed within 30 (thirty) days after it has been so requested.
- 33.9 The arbitrator's decision and award shall be in writing with reasons and shall be subject to appeal by either party.
- 33.10 Subject to the provisions of Clause 33.9 above, the arbitrator's award may, on application by either party to a court of competent jurisdiction and after due notice is given to the other party, be made an order of court.
- 33.11 Notwithstanding the provisions of Clauses 33.1, 33.2, 33.3, 33.4, 33.5, 33.6 and 33.7 above, in the event of either party having a claim against the other party for a liquidated amount or an amount which arises from a liquid document, or for an interdict or other urgent relief, then the other party having such a claim shall be entitled to institute action therefor in a court of law rather than in terms of the above clauses, notwithstanding the fact that the other party may dispute the claim.

33.12 The provisions of Clause 33 are severable from the rest of this agreement and shall remain in effect even where this agreement is terminated or cancelled for any reason.

34. LAWS AND JURISDICTION

34.1 This agreement shall be governed by and interpreted according to the law of the Republic of South Africa.

34.2 Each party submits to the exclusive jurisdiction of the South African courts in respect of any matter arising from or in connection with this agreement, including its termination. Each party further consents to the jurisdiction of the High Court of South Africa (North Gauteng High Court (in Pretoria)).

35. NOTICES AND COMMUNICATION

35.1 The Parties choose, as their respective *domicilium citandi et executandi* (hereinafter referred to as the "*domicilium*") and for the delivery of any notices arising out of the agreement or its termination or cancellation, whether in respect of court process, notices or other documents or communication of whatsoever nature (including the exercise of any option), the address, as set out below.

35.1.1 The City:

2nd Floor, Block D
Tshwane House
320 Madiba Street
Pretoria CBD
0001

Attention: _____
Telephone: _____
Fax: 086 214 9544
Email: _____

35.1.2 The service provider:

Attention: _____
Telephone: _____
Fax: _____
Email: _____

35.2 Each party shall be entitled, from time to time, by written notice to the other party, to vary its *domicilium* to any other address, which is not a post office box or *poste restante*.

- 35.3 Any notice given and any payment made by any party to another party (hereinafter referred to as “the addressee”) which –
- 35.3.1 is delivered by hand during normal business hours of the addressee at the addressee’s *domicilium*, shall be deemed, until the contrary is proved by the addressee, to have been received by the addressee at the time of delivery;
 - 35.3.2 is posted by prepaid registered post to the addressee at the addressee’s *domicilium* shall be deemed, until the contrary is proved by the addressee, to have been received on the 7th (seventh) day after the date of posting; or
 - 35.3.3 is sent by email or facsimile machine shall be deemed, until the contrary is proven by the addressee, to have been received within 1 (one) hour of transmission where it is transmitted during business hours of the receiving instrument and at noon on the following business day (excluding Saturdays) where it is transmitted outside such business hours.
- 35.4 Any notice or communication required or permitted in terms of this agreement shall be valid and effective only if in writing, but it shall be competent to give notice by facsimile.
- 35.5 Notwithstanding anything to the contrary in this agreement, a notice or communication actually received by one party shall be an adequate notice or communication notwithstanding that it was not sent to or delivered at the chosen *domicilium citandi et executandi*.

36. GENERAL AND MISCELLANEOUS

36.1 Sole record of agreement

This agreement constitutes the sole record of the agreement between the parties with regard to the subject matter hereof. No party shall be bound by any express or implied term, representation, warranty, promise or the like not recorded herein.

36.2 No amendment except in writing

No addition to, variation of or agreed cancellation of this agreement shall be of any force or effect unless in writing and signed by or on behalf of the parties. Any alleged waiver of this requirement must itself be reduced to writing and signed by the relevant party to be of any effect.

36.3 Waivers

No relaxation or indulgence which any party may grant to any other shall constitute a waiver of the rights of that party and shall not preclude that party from exercising any rights which may have arisen in the past or which might arise in future.

36.4 **Survival of obligations**

Any provision of this agreement which contemplates performance or observance subsequent to any termination or expiration of this agreement shall survive any termination or expiration of this agreement and continue in full force and effect.

36.5 **Approvals and consents**

An approval or consent given by a party under this agreement shall only be valid if in writing and shall not relieve the other party from the responsibility of complying with the requirements of this agreement nor shall it be construed as a waiver of any rights under this agreement, except as and to the extent otherwise expressly provided in such approval or consent, or elsewhere in this agreement. Any alleged waiver of the requirement that the approval or consent must be in writing must itself be reduced to writing and signed by the relevant party to be of any effect.

37. **EXECUTION**

37.1 This agreement may be executed in several counterparts, which shall each be deemed an original, but all of which shall constitute one and the same instrument. A facsimile shall constitute a valid counterpart for all purposes hereunder.

37.2 The signatories to this agreement, by their signature, warrant their authority to enter into this agreement and the capacity of their principal, if signing in a representative capacity, to enter into this agreement.

Signed at on this day of 20.....

Witnesses:

1.

2.

For and on behalf of **the City of
Tshwane Metropolitan
Municipality**
(duly represented by Mr Johann
Mettler)

Signed at on this day of 20.....

Witnesses:

1.
2.

For and on behalf of

(duly represented by

_____)

ANNEXURE A

RESOLUTION OF THE BOARD

Resolution by the board of directors of _____
(the “company”) made at a meeting held at _____ on
_____ 20__.

NOTED: THAT _____ intends to enter into an agreement with the City of Tshwane Metropolitan Municipality in terms of which the company shall provide various services (the “agreement”) on the terms and subject to the conditions of the agreement to which this resolution is attached as Annexure A.

RESOLVED:

THAT the company approves and enters into the agreement on the terms and subject to the conditions of the agreement to which this resolution is attached.

THAT _____ in his/her capacity as a _____ of the company, be and is hereby authorised to negotiate, settle and sign the agreement attached hereto, and to sign all documentation and do all things necessary to give effect to the aforesaid resolutions on behalf of the company.

Read and confirmed

CHAIRPERSON/COMPANY SECRETARY

ANNEXURE B

SCOPE OF WORK

This specification covers the City of Tshwane (CoT)'s minimum requirements for the supply, repairs, delivery and off-loading of the following Low, Medium and High Voltage equipment (cable fault Equipment, Electrical Testing Equipment, Portable Electrical tools including specialised field test sets and other listed products and services), over a 3 year period. The tender will be awarded in sections and City of Tshwane must appoint One Service Provider per section.

The desired services to be offered by each Service Provider/s are:

- 1) Supply and Delivery of Medium and High Voltage Test Equipment.
- 2) Repair of Medium and High Voltage Test Equipment
- 3) Calibration of Medium and High Voltage Test Equipment
- 4) Supply and Delivery of Operational Tools and Equipment

Delivery of these goods shall be at the Electricity Depot in **1086 Market Street, Claremont Pretoria, 0051**

DELIVERABLES

Cable fault equipment

- Item 1: 32kV Surge Generator
- Item 2: 16kV Surge generator / thumper
- Item 3: Acoustic Listening Set
- Item 4: Fault Location Scope
- Item 5: Measuring wheel.
- Item 6: Multi-Frequency Line/Cable Location
- Item 7: Cable Identification Unit set
- Item 8: Phase Identification Instrument in Earthed and Short-Circuited Medium Voltage Cable
- Item 9: 45kV Very Low Frequency 0.1Hertz Test Set
- Item 10: 25kV DC Pressure Tester
- Item 11: 30/42kV AC/ DC Test Set
- Item 12: 11kV Phase Comparator
- Item 13: 11kV – 33kV Phase Comparator
- Item 14: Full Cable Testing Trailer
- Item 15: 32kV High Voltage – Cable Real System
- Item 16: Earthing Sets (35mm earthing-cable with 4x600amp clamps)
- Item 17: Installation of Cable Fault Equipment into a Tshwane owned vehicle.
- Item 18: Installation of Pressure Test Equipment into a Tshwane owned vehicle.
- Item 19: Repairs of Item: 1 to Item: 18
- Item 20: Calibration of Item: 1 to Item: 18

Test Instruments

- Item 21: Power Quality Recorder
- Item 22: Portable Power Quality Analyzer
- Item 23: Primary Injection Test Set
- Item 24: Secondary Injection Test Set
- Item 25: Transformer Test Set including Tan-Delta
- Item 26: Medium Voltage Auto Recloser Test Set
- Item 27: Current and Voltage Transformer Test Set
- Item 28: High voltage Circuit Breaker Test Set
- Item 29: Thermal Scanner
- Item 30: Battery Tester
- Item 31: Isolation Tester (500 – 10 000volts)
- Item 32: Small/Mini Clip-On Current Meter
- Item 33: Earth Tester
- Item 34: Transformer Testing Leads Sets (35mm² cable with 4x600amp clamps; 3x 4meter and 1x 15meter leads)
- Item 35: 2.5mm Panel wire
- Item 36: 4mm Panel Wire
- Item 37: 16mm Panel Wire (Green with yellow line)
- Item 38: Laptop for Engineering Configuration in the field/on-site
- Item 39: Laptop for Design; Configuration and running Simulations
- Item 40: Radio Frequency Interference & Acoustic Signal Surveyor
- Item 41: Drone with Unique INFRA RED Heat Seeking Vision Detecting Hot-Spots
- Item 42: Repairs of Item: 21 to Item: 41
- Item 43: Calibration of Item: 21 to Item: 41

Special Equipment/ Tools and accessories

- Item 44: Inverter Min 3 KW with Lithium ion 48volt Battery pack
- Item 45: Inverter Min 5 KW with Lithium ion 48volt Battery pack
- Item 46: Single Phase Generator 5 KVA
- Item 47: Single Phase Generator 6.5 KVA
- Item 48: Multi Meter
- Item 49: Insulation Tester 1000volt
- Item 50: Clamp-on Amp Meter 1000Amp AC/DC
- Item 51: Cable Tracer, Amplifier Probe and Tone Generator.
- Item 52: Repairs of Item: 44 to Item: 51
- Item 53: Calibration of Item: 44 to Item: 51

Operational Tools and Equipment

- Item 54: Electrical Toolbox Artisan
- Item 55: Electrical Toolbox Engineering
- Item 56: Electrical Toolbox Scada.
- Item 57: Link Stick fixed 2meter
- Item 58: Telescopic Link Stick 12m
- Item 59: 12 Meter Fiberglass Extension Ladders (Eskom Spec)
- Item 60: Small Crocodile clips 50mm
- Item 61: Medium Crocodile clips 100mm
- Item 62: Medium Battery clamps 300amp
- Item 63: Large Battery clamps 600amp

ANNEXURE C
PAYMENT TERMS