



FACILITIES MANAGEMENT CENTRAL TECHNICAL SERVICES

SPECIFICATION FOR SERVICE AND MAINTENANCE OF HIGH-TENSION (11KV) ELECTRICAL RETICULATION FOR THE UNIVERSITY OF JOHANNESBURG

SPECIFICATIONS

The University of Johannesburg (UJ) invites service providers to tender for Service and Maintenance of high-tension (11kV) electrical reticulation systems at all four (4) campuses and associated facilities namely: Auckland Park Kingsway Campus (APK), Sophiatown Residence, Auckland Park Bunting Road Campus (APB), Johannesburg **Business School (JBS)** Park, UJ Island, Doornfontein Campus (DFC), **Q/k** Building, and Soweto Campus (SWC) for a (1) one-year period with option to extend for an additional (2) two years based on performance for a total of (3) three years, as per the specification contained in this document.

1. PURPOSE

UJ requires to appoint suitably qualified persons or organizations for the following work at the University of Johannesburg: for Service and Maintenance of high-tension (11kV) electrical reticulation systems at all four (4) campuses, JBS Park, UJ Island, Sophiatown Residence and Q/k Building. The service provider shall perform one (1) major routine maintenance (Service) and testing of the following equipment per year:

- High Voltage Switchgear (Switchboards)
- High Voltage Power Transformers (Standards – IEC 60422:2013 and 60422:2005)

- Earthing (Standards – SANS 10313:2010 and SANS 10199:2010)
- Substations and mini substations
- Service provider will be required to be on standby for emergencies and call outs at all times.
- The service provider shall attend the call out within 1 hour (60 minutes)

2. SCOPE DESCRIPTION

2.1 The scope comprises of High Voltage Switchgear, High Voltage Transformers, Substations, Mini-substations, 11kV cable, earthing and lightning protection as follows:

High Voltage Switchgear

- Open all covers and where applicable clean and remove dust
- Inspect cable terminations
- Test HV protection relays by secondary injection for trip timing
- Trip and rack out 11KV breakers
 - Oil Circuit Breakers (OCB): Open oil tank and check condition of main contact
 - OCB: Inspect oil condition, check for oil leaks, ensure oil level is correct
 - OCB: Inspect condition of tank gasket and replace if necessary
 - OCB: Replace OCB oil if necessary (New Virgin Oil)
 - Vacuum Circuit Breaker (VCB): Pressure test vacuum bottles at 22KV DC
 - SF6 Circuit Breakers: Evaluate, Clean, Service, Test and Refill gas if low
- Service and lubricate switch and trip mechanisms
- Trip test HV circuit breakers by secondary injection through protection relays
- Test 11 000/110 volt potential transformers for correct operation
- Verify voltage and current loads to instrumentation
- Service batteries and test battery trip unit for correct operation
- Clean High Voltage Switch rooms
- Check switchgear and switch rooms for compliance with the Occupational Health and Safety Act and other applicable regulations as required.

High Voltage Transformers

- Test transformer temperature and buchholz relay alarm and trip
- Inspect cable terminations
- Wipe down transformers and insulators with trichloroethylene
- Clean transformers
- Take transformer oil samples for routine testing (Oil purification not included)
- Test transformer oil samples at accredited laboratory and submit report
- Ensure that oil levels are correct, top up oil if necessary (New Virgin Oil)
- Replace silica gel if required
- Clean HV transformer room
- Check transformer and transformer room for compliance with the Occupational Health and Safety Act and other applicable regulations as required.

Mini – Substations

- Overall maintenance and cleaning of mini-substations
- Check and test secondary Low Voltage wiring
- Conduct infra-red scans for hot spots
- Inspect High Voltage protection-fuse size and protection
- Top up transformer and switchgear oil if necessary
- Inspect instrumentation
- Service and check switching mechanisms
- Test thermal tripping where applicable
- Check mini-substations for compliance with the Occupational Health and Safety Act and other applicable regulations as required.

Earthing and Lightning Protection

- Conduct earthing and lightning protection survey in accordance to SANS 10313:2010 and SANS 10199:2010

NOTE: The above tasks shall be done on an **annual basis** (Will be discussed and confirmed during handover and shall be configured on Archibus Maintenance Management System. A checklist will be issued on the agreed frequency to ensure that the scope is adhered to)

11kV Cable Maintenance Strategy

The purpose of this testing is to ensure the footprint of the cable is taken which points out the overall condition of the cable insulation. For the critical cables: 11kV cable from the main substation to campus and 11kv cables to the ring the following testing is required:

- VLF testing (tan delta), or alternative.
- Ramp-up curve to be included in the report (with baseline curve).
- Applicable standards shall be used for Acceptance Criteria.
- Cable replacement strategy shall be provided to UJ based on the results of the testing.
- Cable baseline readings shall be taken upon appointment of the service provider thereafter every 6 months.

Exclusions:

- Broken parts will be quoted for and replaced on the client's account.
- Fill up oil on transformers and circuit breakers where required
- Repair and maintenance of smart meters
- Call out and emergencies will be quoted for and paid by the client.

NOTE: The drawings of the High-Tension reticulation are attached separately.

3. LEGAL COMPLIANCE

All work to comply with the Occupational Health and Safety Act (Act 85 of 1993), IEC 60422:2013, IEC 60422:2005, SANS 10313:2018, SANS 10199:2016, SANS, SANS 10199:2016, SANS 10142, SANS 10198, IEEE Std 400.2 and all other applicable standards and regulations.

4. COMPILING OF SAFETY FILE

It is a requirement that the appointed service provider be able to supply the University with a Safety File with the items listed below; where applicable to the scope of work being tendered upon:

- Section 37 (2) (Mandatory agreement)
- Project description/Scope of work
- Risk Assessments

- Safe Work Procedures
- COVID Compliance where applicable
- Personal Protective Equipment
- Checklists of all equipment
- Details of employees on site
- Appointment letters
- Letter of good standing/Insurance
- Incident Management Plan
- Emergency Plan & Emergency numbers
- Waste Management
- Material Safety Data Sheets (if applicable)
- Fall Protection Plan
- Health and Safety Policy
- Tool box talks
- Safety meetings
- Monthly Health & Safety Rep inspection sheets
- Site Safety Rules
- Training
- Isolation procedures for electrical contractors
- Permits (such as Hot work /Confined space entry)

5. COMMENCEMENT OF WORK

The supplier is to commence work within seven (7) days from the issue of an official purchase order from UJ.

6. REPORTING

Upon successful appointment, the service provider will provide a detailed service plan, organize access to perform the services and report all breakdowns to the UJ maintenance coordinator or applicable designated UJ staff member. Post-service meetings will be held with Archibus staff, UJ maintenance manager and maintenance coordinator where the services, any risks, and the mitigation and resolution of risks will be discussed in detail.

7. PERFORMANCE

The following shall be used as basis for measuring the service provider's performance:

Ref	Service Items	Performance Targets
1.	Substations Availability	≥99%
2.	Ring Availability	≥99%
3.	Response Time to Fault Call a. For emergency b. General	<1 hour <1 day
4.	Fault Reporting a. routine inspections, calls logged, repairs b. major incidents	≤24 hours ≤48 hours
5.	Service Reporting a. Yearly reports b. 11kV Cable Report – Every 6 months	After every service or testing (as per plan)
6.	Customer Service feedback a. Customer satisfaction Survey will be sent to the users to rate the level of service	Survey will be done on an annual basis

8. PRELIMINARY PROJECT TIMELINE AND ESTIMATED BUDJECT

No	Description	Achievement Date
1	Envisaged time of appointment	November 2022
2	Handover	November 2022
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9. RECOMMENDATION

It is recommended that the RFP to appoint suitably qualified persons or organizations for the service and maintenance of high-tension (11kV) electrical reticulation systems at all four (4) campuses namely: Auckland Park Kingsway Campus (APK), Auckland Park Bunting Road Campus (APB), Doornfontein Campus (DFC) and Soweto Campus (SWC) and including JBS Park, UJ Island, Sophiatown Residence and Q/k Building, for a (1) one-year period with option to extend for an additional (2) two years for a total of (3) three years based on performance – be approved for Procurement purposes.

A. RECOMMENDATION: MAINTENANCE MANAGER: CENTRAL TECHNICAL SERVICES

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MR THABISHO KUNTWANE
24 August 2022
DATE

B. RECOMMENDATION: DIRECTOR: CENTRAL TECHNICAL SERVICES

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MR GREG JAMES
24 August 2022
DATE

C. RECOMMENDATION: SENIOR DIRECTOR: INFRASTRUCTURE DEVELOPMENT AND LOGISTICS

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MR ABRAHAM SNYDERS
25 Aug 2022
DATE

D. RECOMMENDATION: EXECUTIVE DIRECTOR: FACILITIES MANAGEMENT

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PROF A. NEL
25 August 2022
DATE

E. APPROVAL: CHIEF OPERATING OFFICER

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DR MA RALEPHATA
2022
DATE