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**TITLE STANDARD FOR ENTERPRISE
 NETWORK MAINTENANCE,
 SUPPORT AND MONITORING**

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FOREWORD

This Request for Standard Services was prepared by the following Work Group member/s:

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1. INTRODUCTION

City Power has an enterprise network that serves as a platform enabling all users to connect and communicate with other users while executing their functions. Network components include routers, switches, fiber, copper, Wi-Fi access points and Network Access Control. This document outlines requirements for maintenance and support of ICT's network to improve performance, service delivery and reduce downtime through effective diagnosis and prompt restoration. The proposed solution shall meet the existing and future needs of City Power's business.

2. SCOPE OF WORK

The scope entails design, provisioning, maintenance and support services and monitoring of both the WAN and the LAN Maintenance of all network sites. As well as supply of new and replacement of damaged network infrastructure equipment which includes but not limited to; network switches, network radios, wireless access points, wireless controllers, network access control equipment, cables and connectors which include both fiber and copper. The scope of work will also cover the provision of a Level 3 Network Engineer that will be onsite for 8 hours per day and 5 days per week (Monday – Friday) to monitor and maintain the ICT Network as well as after hours and as and when required for projects.

3. NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

Document number	Document title
IEEE 802.3z	standard for Gigabit Ethernet over optical fibre and shielded twisted pair (STP)
ANSI/IEEE 162-1963	IEEE Standard Definitions of Terms for Electronic Digital Computers
EEE 1680-2009	(IEEE Standard for Environmental Assessment of Electronic Products (Revision of IEEE: 1680-2006)
IEEE 487.3-2014	IEEE Standard for the Electrical Protection of Communication Facilities Serving Electric Supply Locations Through the Use of Hybrid Facilities
IEEE 802.3-2015	IEEE Standard for Ethernet - (Revision of IEEE:802.3-2012)
IEEE 802-2014	IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture (Revision to IEEE: 802-2001)
ITIL V4	ITIL V4 Standard

4. DEFINITIONS

Abbreviation	Description
Mbps	Megabits per second
ICT	Information and Communications Technology
DR	Disaster Recovery
VPN	Virtual private Network
MPLS/VPN	Multi-Protocol Label Switching-VPN
WAN	Wide Area Network
IP-VPN	Internet protocol VPN
SLA	Service Level Agreement
24 X 7 X 365	24 hour seven days a week for everyday of the year
MTTr	Mean Time To respond
MTTR	Mean Time To Repair
SDC	Service Delivery Centre

5. REQUIREMENTS

5.1 Hardware Repair

- 5.1.1 The Service Provider shall repair defective network hardware components within the time frames indicated in the SLA.
- 5.1.2 In a case where the network hardware components are not under support, then a replacement option should be recommended.
- 5.1.3 Installation of network points shall be done to replace damaged ones and/or new ones.

5.2 Software Support

The Service Provider shall be responsible for the provision of software patches as well as onsite assistance, to fix bugs update firmware; as per support terms and conditions.

5.3 Software Upgrade

- 5.3.1 The Service Provider shall be responsible for software upgrades as may be required to fix bugs; introduce added functionality; and to keep the system fully functional.
- 5.3.2 The upgrade shall be carried out under supervision of City Powers' resources.
- 5.3.3 The Service Provider shall perform software upgrades as and when the new versions become available.
- 5.3.4 Upgrades shall be made available either on disc/USB, or download via FTP/SFTP or via a VPN connection
- 5.3.5 City Power shall inform and keep informed the Service Provider of all information related to the software or hardware problem encountered.
- 5.3.6 Service Provider shall respond to hardware, software and systems faults on-site within the required time as outlined under incident management.

5.4 Network Monitoring Tool

- 5.4.1 The Service Provider shall provide an on-premises network monitoring tool as part of the contract, that will be provided as a service.
- 5.4.2 The Service Provider shall provide a 3-year support and license for the monitoring tool and shall be responsible for the management and monitoring of the network with the tool that will be provisioned.
- 5.4.3 The Service Provider shall install and configure the network monitoring tool.

6. SUPPORT AND MAINTENANCE

6.1 SERVICE PROVIDER'S RESPONSIBILITIES

6.1.1 General

- 6.1.1.1. Attend to all logged service requests.
- 6.1.1.2. Complete and submit change requests forms and supporting documents (Standard Operating Procedures) as well as present planned changes at CAB meetings.
- 6.1.1.3. Compile and provide service improvement plans
- 6.1.1.4. Compile and provide service monthly reports
- 6.1.1.5. Submit hardware OEM support certificates

6.1.2 Local Area Network – LAN

- 6.1.2.1. Design/Re-Design, implement and commission a segmented Local Area Network.
- 6.1.2.2. Provisioning of Local Area Network based on request
- 6.1.2.3. Install, configure and commission Local Area Network based on request
- 6.1.2.4. Maintain and update configurations document for Local Area Network installations
- 6.1.2.5. Document configurations of all Local Area Network installations
- 6.1.2.6. Maintain and Support new and existing LAN installations
- 6.1.2.7. Perform backup of configurations for LAN equipment
- 6.1.2.8. Apply security configuration on LAN equipment
- 6.1.2.9. Address audit findings on LAN equipment
- 6.1.2.10. Address identified security risks
- 6.1.2.11. Apply best practice configurations on LAN equipment
- 6.1.2.12. Maintain and support IOS on switches and Wireless Access Points & Controllers
- 6.1.2.13. Extract information as requested from LAN Equipment i.e. Audit requests, compliance requests, etc.
- 6.1.2.14. Address identified vulnerabilities on LAN Equipment
- 6.1.2.15. Perform configurations to enable other services such as VOIP, QoS, etc. on LAN equipment
- 6.1.2.16. Data points installation (material included as per BOQ).
- 6.1.2.17. Repair faulty network points.
- 6.1.2.18. Perform firmware upgrades on Local Area Equipment as per Original Equipment Manufacturer standards and best practice.
- 6.1.2.19. Troubleshooting and resolving problems related to LAN equipment and performance
- 6.1.2.20. Provision of IP addresses and subnets
- 6.1.2.21. Maintain IP addressing and subnets
- 6.1.2.22. Configure DHCP on switches where required
- 6.1.2.23. Maintain and support DHCP on switches where configured
- 6.1.2.24. Manage and report on switch port capacity
- 6.1.2.25. Install, configure and commission Wireless Network controllers
- 6.1.2.26. Recommend service improvements as per standards and best practice that governs LAN equipment installations.
- 6.1.2.27. Install, Move, Add, Change and Decommission (IMACD) LAN equipment

- 6.1.2.28. Update Bill of Quantities
- 6.1.2.29. Assist in asset verification as and when required
- 6.1.2.30. Liaise with other support teams in terms of any change on the LAN configurations
- 6.1.2.31. Attend and implement service requests
- 6.1.2.32. Raise change requests (to implement any changes requested by the client)
- 6.1.2.33. Liaise with third parties and original equipment manufacturers on technical matters on behalf of the City Power
- 6.1.2.34. Keep the bill of material document updated
- 6.1.2.35. Submit Daily, Weekly, Monthly and ad-hoc reports
- 6.1.2.36. Manage, Maintain and Support FortiNAC (Network Access Control)
- 6.1.2.37. Manage and configure all new switches and AP's with FortiNAC Configuration

6.1.3 Wide Area Network – WAN

- 6.1.3.1 Design/Re-Design, Implement and Commission a segmented Wide Area Network, including MPLS networks
- 6.1.3.2 Provisioning of Wide Area Network based on request
- 6.1.3.3 Install, configure and commission Wide Area Network
- 6.1.3.4 Document configurations for Wide Area Network installations
- 6.1.3.5 Maintain and update configurations documents for Wide Area Network installations
- 6.1.3.6 Maintain and Support new and existing WAN installations
- 6.1.3.7 Apply security configurations on WAN equipment
- 6.1.3.8 Perform backups of configurations for WAN installations
- 6.1.3.9 Maintain and update backups of configurations for WAN installations
- 6.1.3.10 Extract information as per requests from WAN equipment i.e. audit requests, compliance requests, etc.
- 6.1.3.11 Apply security configurations on WAN equipment
- 6.1.3.12 Address identified audit findings on WAN equipment
- 6.1.3.13 Address identified vulnerabilities on WAN equipment
- 6.1.3.14 Perform firmware upgrades on WAN equipment as per Original equipment Manufacturer standards and best practice
- 6.1.3.15 Recommend service improvements as per standards and best practice which governs the WAN equipment configurations
- 6.1.3.16 Apply Quality of Services (QoS) and Packet Shaping where required
- 6.1.3.17 Apply Protocol Acceleration on the network
- 6.1.3.18 Out-of-Band management
- 6.1.3.19 Manage, Maintain and Support FortiNAC (Network Access Control)
- 6.1.3.20 Manage and configure all new switches and AP's with FortiNAC Configuration
- 6.1.3.21 Implement Bandwidth compression where required
- 6.1.3.22 Install, Move, Add, Change and Decommission (IMACD) WAN equipment
- 6.1.3.23 Update design WAN design documents
- 6.1.3.24 Update Bill of Quantities
- 6.1.3.25 Assist in asset verification as and when required
- 6.1.3.26 Liaise with other support teams in terms of any change on the WAN configurations
- 6.1.3.27 Attend and implement service requests
- 6.1.3.28 Raise change requests (to implement any changes requested by the client)
- 6.1.3.29 Liaise with third parties and Original equipment manufacturer on behalf of the City Power
- 6.1.3.30 Provide daily, weekly, monthly and ad-hoc reports.

6.2 CITY POWER'S RESPONSIBILITIES

- 6.2.1 Provide standards documents for all network services areas of support
- 6.2.2 Provide Policies for all network services areas of support
- 6.2.3 Provide Security Standards to be implemented on network devices

- 6.2.4 Log service requests
- 6.2.5 Log asset verification requests
- 6.2.6 Approve change Requests
- 6.2.7 Approve service improvement plans
- 6.2.8 Provide requirements for LAN, WAN and MPLS Networks
- 6.2.9 Sign-off on design documents
- 6.2.10 Sign-off configurations documents
- 6.2.11 Sign-off on completion certificates
- 6.2.12 Sign off on service monthly reports
- 6.2.13 Provide reports on identified audit findings
- 6.2.14 Provide reports on identified security risks
- 6.2.15 Ensure that all equipment is under Original Equipment Manufacturer maintenance and support

7. NETWORK SUPPORT RESOURCES

- 7.1. The Service Provider shall provide a dedicated Level 3 Network Engineer for on-site support. The Network Engineer shall be available on-site for eight (8) hours per day, five (5) days per week (Monday to Friday) for the duration of the Contract. The engineer shall be responsible for monitoring, maintaining, and supporting the ICT network. The engineer shall also be available to provide after-hours support when required.
- 7.2. The Service Provider shall, as part of this contract, provide the network resources listed below, each possessing the specified qualifications and certifications.

7.2.1. Resources Qualifications and Certifications

Item	Network Resource	Qualifications and Certifications
1	Junior Network Engineer (Level 1)	• CompTIA A+ Certification. • CompTIA Network+ Certification. • CompTIA Security+ Certification
2	Network Engineer (Level 2)	• CompTIA A+ Certification. • CompTIA Network+ Certification. • CompTIA Security+ Certification. • Cisco CCNA Certification. • Huawei HCIA-Routing and Switching • H3C Network Engineer (H3CNE)
3	Network Engineer (Level 3)	• CompTIA A+ Certification. • CompTIA Network+ Certification. • CompTIA Security+ Certification. • Cisco CCNA Certification. • Cisco CCNP Certification. • Huawei HCIA-Routing and Switching • Huawei HCIP-Routing and Switching • FortiNAC Specialist • H3C Network Engineer (H3CNE) • H3C Certified Senior Engineer for Routing & Switching (H3CSE)
4	Senior Network Engineer (Level 4)	• Cisco CCNA Certification. • Cisco CCNP Certification. • CCIE Collaboration • CCIE Data Center

Item	Network Resource	Qualifications and Certifications
		• CCIE Routing and Switching • CCIE Security • CCIE Service Provider • CCIE Wireless • Huawei HCIA-Routing and Switching • Huawei HCIP-Routing and Switching • Huawei HCIE-Routing and Switching • FortiNAC Specialist • Fortinet NSE 6 Specialist • H3C Network Engineer (H3CNE) • H3C Certified Senior Engineer for Routing & Switching (H3CSE) • Certified Senior Engineer for WLAN (H3CSE-WLAN) • <u>H3CIE-RS+</u>
5	Network Solution Architect	• Cisco Certified Architect • Cisco Certified Design Associate • Cisco Certified Design Professional • Cisco Certified Design Expert • TOGAF 9 Foundation • TOGAF 9 Certified • Fortinet NSE 7 Architect • H3C Network Engineer (H3CNE) • H3C Certified Senior Engineer for Routing & Switching (H3CSE) • Certified Senior Engineer For WLAN (H3CSE-WLAN) • H3CAr
6	Project Manager	• Project Management Professional (PMP) • Program Management Professional (PgMP) • Portfolio Management Professional (PfMP) • Certified Associate in Project Management (CAPM) • PMI Professional in Business Analysis (PMI-PBA) • PMI Agile Certified Practitioner (PMI-ACP)

8. INCIDENT MANAGEMENT

The following priority levels and response times shall apply and be adhered to by the service provider. Loan equipment shall be provided during repair or maintenance of Level 1 and Level 2 equipment. In case of Level 3 and Level 4, City power shall determine severity and recommend the appropriate response.

8.1 Priority Levels

Incidents shall be classified as follows:

8.1.1 Priority Level 1 (Mission critical)

This is defined as a failure, which denies or severely limits users' access to a 'live' or on-line system and where 1st line support did not succeed. This is typically a situation where critical business systems fail.

8.1.2 Priority Level 2 (Urgent)

This is defined as a failure that results in diminished functionality or performance (The Equipment still works) to the users that 1st line support cannot solve.

8.1.3 Priority Level 3 (Medium priority)

This is defined as a request from the City Power for clarification regarding procedural problems which cannot be solved by the 1st line service.

8.1.4 Priority Level 4 (Low priority)

System or equipment issues which fall in this category are qualified as not time critical and shall be solved during normal scheduled maintenance or upgrades to the system.

TABLE A: PRIORITY LEVEL RATING:

PRIORITY	DESCRIPTION	CONDITION
1	CRITICAL	TOTAL SYSTEM FAILURE
2	HIGH	UNAVAILABILITY OF MAJOR SYSTEM FUNCTIONALITY
3	MEDIUM	UNAVAILABILITY OF MINOR SYSTEM FUNCTIONALITY
4	LOW	ALL CONFIGURATIONS AND MINOR AD HOC PROGRAMMING ON REQUEST
5	CONFIGURATION AND PROGRAMMING	INCLUDES ALL CONFIGURATIONS AND MINOR AD HOC PROGRAMMING ON REQUEST

8.2 Response Times

8.1.5 Response time priority level 1

Service Provider's technical representative shall contact the City Power's technical representative within 1 hour of the initial request for support being logged at the Support Desk. Priority effort shall be maintained to restore the system or provide a workaround resolution.

8.1.6 Response time priority level 2

Service Provider's technical representative shall contact the City Power's technical representative within 2 hours of the initial request for support being logged at the Support Desk. Priority effort shall be maintained to restore the system or provide a workaround resolution.

8.1.7 Response time priority level 3

Service Provider's technical representative shall contact the City Power's technical representative within 4 hours of the initial request for support being logged at the Support Desk.

8.1.8 Response time priority level 4

Service Provider's technical representative shall contact City Power's technical representative within next business day of the initial request for support being logged at the Support Desk. Solutions shall typically come in the next software/firmware update within one year.

TABLE B RESPONSE TIMES:

PRIORITY	RESPONSE TIME	COMMENCEMENT	FEEDBACK	MAXIMUM TIME TO REPAIR
1	1/2 HR	1 HR	ON SITE	4 HOURS
2	1 HRS	2 HRS	ON SITE	5 HOURS
3	2 HRS	3 HRS	ON SITE	6 HOURS
4	6 HRS	8 HRS	DAILY	12 HOURS
5	24 HRS	36 HRS	DAILY	48 HOURS

9. SERVICE LEVELS

The service level agreement shall include the following requirements.

- 9.1 24 X 7 X 365 Support
- 9.2 99.99 % network availability.
- 9.3 24-hour Network Management/Monitoring services to monitor the availability and performance of the network. City Power to have access to the Network/Monitoring Management solution
- 9.4 Monthly Incident Report reflecting all logged calls and associated resolutions.
- 9.5 Monthly performance, availability and utilization reports indicating general health of the network as well as utilization of the bandwidth for each SDC.
- 9.6 MTTr and MTTR shall be based on the SLA agreement and include the below:
 - a) QoS for Critical Systems to be configured as per City Power business requirements.
 - b) Severity 1 incidents shall be repaired within 2 hours (network outage)
 - c) Severity 2 incidents shall be repaired within 4 hours during business hours and in 6 hours after hours.
 - d) Severity 3 incidents shall be repaired within 6 hours during business hours and in 8 hours after hours.
 - e) Severity 4 incidents shall be repaired within 8 hours during business hours and in 24 hours after hours.

10. LIST OF LOCATIONS

#	SITE NAME	ADDRESS	GPS CO-ORDINATES
1	HEAD OFFICE	40 HERONMERE ROAD, REUVEN	28° 1' 49.607" E 26° 13' 53.692" S
2	ROODEPOORT DR	CNR HAMBURG & WEST LAKE ROAD, FLORIDA	27°53' 59.936" E 26° 10' 43.616" S
3	ROODEPOORT SDC	CNR HAMBURG & WEST LAKE ROAD, FLORIDA	27°53' 59.936" E 26° 10' 43.616" S
4	MIDRAND SDC	DALE RD, KAALFONTEIN, MIDRAND	28° 10' 15.460" E 25° 58' 51.003" S
5	LENASIA SDC	9 PLOT STREET, LAWLEY	27° 50' 58.907" E 26° 21' 4.150" S
6	BRYANSTON SDC	8 HOMESTEAD AVE, BRYANSTON	28° 0' 0.500" E 26° 3' 59.700" S
7	KLIPSPRUIT SDC	1101 MOKOENA STR, KLIPSPRUIT EXT. 4, SOWETO	27° 54' 19.404" E 26° 15' 15.179" S

#	SITE NAME	ADDRESS	GPS CO-ORDINATES
8	INNERCITY SDC	108 SIEMERT RD, NEW DOORNFONTEIN	28° 3' 28.678" E26° 11' 42.852" S
9	HURSTHILL SDC	4 WHITEHALL STR, HURSTHILL	27° 59' 5.353" E26° 11' 10.692" S
10	ALEXANDRA SDC	CNR EAST AVE & CANNING RD, KEW	28° 6' 5.603" E26° 6' 57.847" S
11	RANDBURG SDC	CNR HANS SCHOEMAN & MALIBONGWE, FERNDAL	27°58' 57.989" E26° 5' 34.451" S

11. MAINTENANCE AND WARRANTY CONDITIONS

The supplier shall guarantee correct operation of the new equipment for at least 12 months, as of the date of installation.

12. MARKING AND LABELLING

The supplier's information shall appear in legible and indelible marking on the outside of the equipment.

13. TECHNICAL SUPPORT

The suppliers shall provide technical support on system and equipment queries for the duration of the contract as per SLA

14. QUALITY MANAGEMENT

A quality management system shall be set up to ensure the quality of the system during design, development, production and service. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001; 2015. The details shall be subject to the agreement between the purchaser and supplier.

15. HEALTH AND SAFETY

A health and safety plan shall be set up to ensure proper management and compliance of the system during installation, operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in ISO 45001:2018 standards. The details shall be subject to the agreement between City Power and the Supplier.

16. ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up to ensure the proper environmental management and compliance of the system during their entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning as well as disposal phases). Guidance on the requirements for an environmental management system may be found in ISO 14001:2015 standards. The details shall be subject to the agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHEQ Policy.

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ANNEX A - BIBLIOGRAPHY

None

ANNEX B - REVISION INFORMATION

DATE	REV. NO.	NOTES
April 2021	0	First issue
July 2026	1	Second issue Service requirements changes and general editing