Annexure E: Wide Area Network and Firewall Endpoint Technical Specifications

Division/Business Unit:	**Information and Communication Technology**
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1. OVERVIEW

1.1 This document describes the current infrastructure technical specifications applicable to the support and maintenance of the SAFCOL private outdoor wireless Wide Area Network (WAN) including the support and maintenance of SAFCOL's Firewall Endpoint protection.

1.2 The content provides a fundamental knowledge base and understanding of the current solution and implementation which is currently supporting SAFCOL as a business

1.3 The intended audience includes, but is not limited to, external outdoor network service providers, suppliers as well as government agencies or on a need-to-know basis.

2. PURPOSE

2.1 The SAFCOL private outdoor wireless WAN provides wireless connectivity as well as a stable and secure platform for numerous critical business functions and services such as ERP and other application data, general data, VoIP and video to geographically separate sites connected over a large geographical area where terrestrial infrastructure often is either inadequate or unavailable.

2.2 The SAFCOL Firewall Endpoint protection and security system monitors and controls incoming and outgoing network traffic. This is based on predetermined security rules and also acts as a barrier between the trusted internal network and untrusted external networks.

3. SCOPE

3.1 The technical specifications contained in this document should be utilised by a bidder, service provider or supplier as a basis for the minimum requirements that must be met or exceeded, for the support and maintenance of the SAFCOL private outdoor wireless WAN.

3.2 The current outdoor wireless network infrastructure has been architected, designed, implemented and audited according to the "Standards and Guidelines for Communication Sites" R56 Standard (maintained by Motorola Solutions but is not proprietary and therefore can be used for any technology vendor or application) and has demonstrated a high level of operational performance in providing supporting services in a large enterprise environment.

3.3 The complete outdoor wireless network currently comprises 69 sites and consists of 147 nodes covering a total line of sight distance of 1 625.45km. It should be noted that some of these sites are only accessible utilising 4 x 4 vehicles.

3.4 SAFCOL has 3 strategically located datacentres where Fibre lines are providing internet access to the whole company. Traffic entering and leaving the network are protected by the SOPHOS Firewall Endpoint protection devices located at each datacentre.

3.5 All information contained in this document is current as of date of this document, and is subject to change at any time, based on operational requirements, technological obsolescence, or as deemed necessary to meet business requirements.

4. BACKGROUND

4.1 Cambium Networks (formerly known as Motorola) has been selected by SAFCOL, because of being a leader in the field of providing world-class outdoor wireless broadband connectivity. The Point-to- Point (PTP) and Point-to-Multipoint (PMP) solutions offer the bandwidth, flexibility, ease of installation, interoperability, intuitive operation, cost effectiveness and high-speed access which the business requires since reliability and performance are of utmost importance. These Networks produces purpose-built equipment for fixed outdoor applications in harsh and noisy outdoor conditions.

4.2 The Point-to-Point (PTP) backhaul solutions, provide outdoor carrier-grade reliability and have proven themselves in the toughest environments to carry essential communications and services over stable high-speed outdoor wireless links of up to 160 km, line of sight.

4.3 The Point-to-Multipoint (PMP) access networks provide scalability, are interference tolerant and provide consistent low latency for sensitive video and voice applications making them ideal as a last- mile connectivity solution.

4.4 The SOPHOS Firewall Endpoint protection equipment located at each datacentre provides protection against Intrusion and Cyber-attacks.

5. TECHNICAL SPECIFICATION

5.1 The SAFCOL outdoor wireless WAN currently is comprised primarily of Cambium Networks (Motorola) outdoor wireless equipment for the radios, antennas, shrouds, etc. as well as other supporting equipment and consumables. This outdoor carrier-grade wireless equipment is capable of working in the 5Ghz unlicensed radio signal spectrum, and 6Ghz, 7Ghz, 11Ghz and 12Ghz license band radio signal spectrum.

5.2 Annexure A (SAFCOL WAN register) - contains all the equipment details.

5.3 Annexure G (SAFCOL Datacentres) contains the details of the location of the datacentres and the SOPHOS Firewall endpoint protection equipment.

6. CURRENT SITE LOCATIONS

6.1 There are 52 WAN sites located on SAFCOL managed property.

6.2 There are 17 WAN sites located on property not managed by SAFCOL.

6.3 Refer to Annexure B (WAN Sites) for all the site names and their locations (Coordinates).

6.4 Refer to Annexure C: General Conditions of Access

6.5 Refer to Annexure D: Sentech KLF Main Agreement

6.6 Refer to Annexure F: (SAFCOL Wide Area Network layout diagram) for a complete layout of the current WAN.

7. MANDATORY WAN SUPPORT AND MAINTENANCE REQUIREMENTS

7.1 The WAN Maintenance service provider needs to be able to competently supply, support and maintain a converged outdoor wireless network with the efficient coexistence of telephone, video and data communication within a single network.

7.2 The business requires a Mean Time to Respond of 1 hour and a Mean Time to Repair of 12 hours across all high sites from the service provider. Highest priority will need to be given to links which form part of the Transmission Network (links serving multiple endpoints) and next highest priority to links which form part of the Access Network (links serving a single endpoint). Critical sites (most of which are closer to Mbombela) will have a Mean Time to Repair of 6 hours. Uptime requirements: The SP must maintain WAN uptime of 95%.

7.3 The service provider is required to ensure compatibility to the existing outdoor network infrastructure equipment are always adhered to, to eliminate any possible downtime caused by incompatible equipment to ensure a network availability of 95%. This outdoor carrier-grade wireless equipment must be capable of working in the 5Ghz unlicensed radio signal spectrum, and 6Ghz, 7Ghz, 11Ghz and 12Ghz license band radio signal spectrum.

7.4 The service provider will be required to carry stock of all necessary outdoor Cambium or equivalent to equipment and parts. Replacement of faulty or damaged equipment should be carried out immediately to ensure high availability and uptime of the network while any warranty claims should be submitted afterwards. Any replacement equipment or parts should be swopped out with same or equivalent equipment.

7.5 The service provider is required to keep up to date training and certification for current outdoor Cambium or equivalent range of products including PTP 670, PTP550, PTP820S, ePMP and PMP 450 which are all being implemented across the WAN.

7.6 The service provider is required to have at least 4 years prior experience maintaining an outdoor Cambium or equivalent to PTP/PMP based network.

7.7 The service provider should provide contactable references for maintaining a large (more than 50 nodes) outdoor Cambium or equivalent to, based network.

7.8 SAFCOL currently makes use of outdoor Cambium Networks equipment exclusively at all sites. This equipment will always be replaced with the same or equivalent equipment, unless approval is given in writing by the contract manager.

7.9 The service provider is required to actively monitor the network links for availability, degradation and provide reporting monthly to the CIO.

7.10 The service provider is required to have knowledge of proper techniques for the correct earthing of equipment (refer to the R56 Standard).

7.11 The service provider is required to have knowledge of Delta and/or Victron rectifier/inverter/charge controllers. Victron certification must be provided.

7.12 The service provider is required to have knowledge of solar and wind generating and charging systems.

7.13 The service provider is required to have the ability to provide generator power to high sites in the eventuality of an extended power outage.

7.14 The service provider is required to provide an up-to-date safety file containing the following:

7.14.1 Proof of valid working on heights training.

7.14.2 Proof of valid fall arrestor plan, drawn up by a certified fall arrestor planner.

7.14.3 Proof of valid basic fire-fighting training for all team members working on site.

7.14.4 Proof of valid rope rigging training certifications for all team leaders on site.

7.14.5 List of safety and first aid equipment.

7.14.6 Proof of valid first aid training Level 1 certifications for all team leaders on site.

7.14.7 Proof of valid Certificates of Fitness (COF/medical) for all team members on site.

7.14.8 Appointment letter specifying exactly who has been trained and is responsible for safety.

7.15 The service provider will be expected to carry out onsite inspections and audit of towers and equipment and report the presence of erroneous or unauthorized equipment on a quarterly basis.

7.16 The service provider will be required to have a fleet of vehicles available to perform the work required which shall be suitable for all terrain and weather conditions.

7.17 The service provider shall provide support contact details, call logging and escalation procedures.

7.18 The servicing and support of the onsite switches are excluded and will not form part of the responsibility of the service provider for WAN maintenance; however, the service provider will be required to engage with the onsite SAFCOL team, or third party appointed service provider and work together to resolve outstanding issues and ensure that services are restored.

7.19 CCTV cameras have been installed and are in operation on several of the sites. Activation is triggered by motion detection. There will be ongoing expansion of the CCTV camera network, and the service provider will be expected to maintain this part of the network.

7.20 In addition to the WAN Maintenance contract, the successful bidder will also be required to sign a Conditions of Access Agreement. This will outline the guidelines and conditions for entering and carrying out any work on SAFCOL property. SAFCOL is a FSC certified company always adhering to the requirements of the FSC and subscribes to the NOSA principles for SHEQ (Safety, Health, Environment and Quality). Also see Annexure C: General Conditions of Access for gaining entry onto SAFCOL property.

7.21 Onsite safety is of utmost importance for the prevention and mitigation of risks while carrying out any maintenance or repair work on site. There are inherent risks involved with handling generators, welding, fires, etc. as well as tower access.

7.22 Any installation of replacement equipment to the value of more than R100 000 will be quoted and communicated to the contract owner before maintenance/repairs is carried out.

7.23 **The service provider will be required to provide services based on a fixed monthly retainer, which will include a specified number of kilometres travelled, labour rates for any work carried out as well as labour rates per kilometre travelled. Anything over and above this will need to be specified at a certain rate**

8. MANDATORY FIREWALL ENDPOINT SUPPORT AND MAINTENANCE REQUIREMENTS

8.1 Firewall Management

To reduce the attack surface and ensure maximum security while allowing for flexibility, the service provide should:

8.1.1 Efficiently manage firewall rules.
8.1.2 Manage Firewall configuration.
8.1.3 Manage Firewall logs, alerts and security in line with best practice and SAFCOL information security policy.
8.1.4 Report on any suspicious activity and attacks.
8.1.5 Provide monthly monitoring reports on all Firewall activities.
8.1.6 SAFCOL utilises SOPHOS as it's Firewall solution. The service provider should provide contactable references for managing and maintaining SOPHOS or similar to, Firewall solutions at large organisations similar to SAFCOL.

8.2 **Vulnerability and Penetration testing**

By utilising and applying security recommendations and best practices, the service provider should conduct the following:

8.2.1 Vulnerability and Penetration testing twice each year of the duration of the contract.
8.2.2 Provide complete report to the CIO after each test has been performed and completed.
8.2.3 Provide guidance and solutions to ICT management on improving SAFCOL's security posture.

8.3 **Physical WAN Security**

8.3.1 Uptime requirements: The SP must maintain WAN uptime of 95%. Any downtime resulting from theft, tampering, equipment failure due to poor security, or delayed restoration shall be included in downtime calculations.
8.3.2 Security equipment failure: respond within 3 days; Protect Company infrastructure from theft, vandalism, or unauthorised access.
8.3.3 Evidence and monitoring requirements: The SP shall ensure continuous monitoring and recording capabilities at all sites, with footage retained for at least 30 days
8.3.4 Procurement of additional equipment: service provider to provide
i) Itemised list of proposed equipment with estimated cost ranges and
ii) Confirmation of equipment ownership transferring to the Company after installation.
8.3.5 Service provider to provide proposed security approach and capability matrix.

9. **NETWORK EXPANSION**

9.1 The service provider needs to be aware that there may be outdoor network expansions carried out during the term of the contract which will not necessarily form part of this contract and **may be outsourced** to other service providers. The service provider will be required to perform a due diligence on the completed work once carried out to ensure that it meets minimum standards and criteria which apply across the rest of the network. The service provider will be expected to carry out maintenance on any network expansions.

9.2 Any installation of additional equipment by the WAN maintenance service provider, to the value of less than R100 000 shall form part of the expansion of the network and form part of the WAN maintenance and support retainer. This should be quoted and communicated to the contract owner.

9.3 Any installation of additional equipment by the WAN maintenance service provider, to the value of more than R100 000, should be quoted and communicated to the contract owner. In this case the SAFCOL SCM process must be adhered to.

10. **SUPPORT AND MAINTENANCE CONSIDERATIONS**

10.1 High sites which host the equipment are spread out over a very large geographical area. The service provider should be located ideally to dispatch a team to be able to meet the Mean Time to Repair.

10.2 Since equipment is located at high sites, it is susceptible to all the seasonal elements including wind, fire, rain, sun, hail, and lightning damage. High sites are also exposed to vandalism, thus securing equipment plays a vital role. This will play an important role in the conclusion of the support and maintenance agreement.