

## **Annexure E - Wide Area Network Technical Specifications**

<b>Division/Business Unit:</b>	<b>Information and Communication Technology</b>
<b>Date:</b>	<b>20 May 2022</b>
<b>Subject:</b>	<b>WAN Technical Specifications</b>

### **1. OVERVIEW**

- 1.1 This document describes the current infrastructure technical specifications applicable to the support and maintenance of the SAFCOL/KLF wireless Wide Area Network (WAN).
- 1.2 The content provides a fundamental knowledge base and understanding of the current solution and implementation which is currently supporting SAFCOL/KLF as a business
- 1.3 The intended audience includes, but is not limited to, external network service providers, suppliers as well as government agencies or on a need to know basis.

### **2. PURPOSE**

- 2.1 The SAFCOL/KLF wireless WAN provides wireless connectivity as well as a stable and secure platform for numerous critical business functions and services such as ERP 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.

### **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/KLF wireless WAN.
- 3.2 The current 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 wireless network currently comprises 60 sites and consists of 121 nodes covering a total line of sight distance of 1 413.732km.

3.4 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/KLF, because of being a leader in the field of providing world-class 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 carrier-grade reliability and have proven themselves in the toughest environments to carry essential communications and services.

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.

#### **5. TECHNICAL SPECIFICATIONS**

5.1 The SAFCOL/KLF wireless WAN currently is comprised primarily of Cambium Networks (Motorola) wireless equipment for the radios, antennas, shrouds, etc. as well as other supporting equipment and consumables.

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

#### **6. CURRENT SITE LOCATIONS**

6.1 There are 44 WAN sites located on SAFCOL/KLF owned property

6.2 There are 14 WAN sites located on property not owned by SAFCOL/KLF.

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

## **7. MANDATORY WAN SUPPORT AND MAINTENANCE REQUIREMENTS**

- 7.1 The WAN Maintenance contractor needs to be able to competently supply, support and maintain a converged 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 Nelspruit) will have a Mean Time to Repair of 6 hours.
- 7.3 The service provider is required to ensure compatibility to the existing network infrastructure equipment are adhered to at all times to eliminate any possible downtime caused by incompatible equipment to ensure a network availability of 99%.
- 7.4 The service provider will be required to carry stock of all necessary 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 swapped out like-for-like.
- 7.5 The service provider is required to keep up to date training and certification for current Cambium or equivalent range of products including PTP 670, 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 a 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) Cambium or equivalent to, based network
- 7.8 SAFCOL/KLF currently makes use of Cambium Networks equipment exclusively at all sites. This equipment will at all times be replaced with the same or equivalent to 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 on a monthly basis 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 rectifier systems.
- 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 up to date working on heights training.
  - 7.14.2 Proof of up to date fall arrestor plan, drawn up by a certified fall arrestor planner.
  - 7.14.3 Proof of up to date first aid and fire-fighting training for all personnel working on site.
  - 7.14.4 Proof of up to date rope rigging training.
  - 7.14.5 List of safety and first aid equipment.
  - 7.14.6 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 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 outsourced to a separate third party 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 third party 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 cameras 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/KLF property. SAFCOL/KLF is a FSC certified company adhering at all times 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/KLF 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 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. NETWORK EXPANSION**

- 8.1 The service provider needs to be aware that there may be network expansion carried out during the term of the contract which will not necessarily form part of this contract and may be sourced out to other suppliers. 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.
- 8.2 Any installation of additional equipment to the value of less than R100 000 shall form part of the expansion of the network and will be quoted and carried out by the service provider separately to the WAN maintenance and support retainer.

## **9. SUPPORT AND MAINTENANCE CONSIDERATIONS**

- 9.1 High sites which host the equipment are spread out over a large geographical area. The service provider should be located ideally to dispatch a team to be able to meet the Mean Time to Repair.
- 9.2 Since equipment is located at high sites, it is susceptible to all the seasonal elements including wind, fire, rain, sun, hail, and lightning damage. This will play an important role in the conclusion of the support and maintenance agreement.