**TECHNICAL SPECIFICATIONS**

**Tender No: HBCH&RCV/IT/2022-23/PT/01**

1. **ACTIVE AND PASSIVE NETWORK COMPONENTS BOQ SUMMARY**

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| **Component** | **Quantity** |
| **Access points (indoor)** | **90 Nos** |
| **Wireless controller** | **1 No’s** |
| **Scope of work** | **1 No’s** |

The detailed technical specifications of the above components are given in the next section

1. **TECHNICAL SPECIFICATIONS**
2. **Access points (Indoor) - QTY: 90 Nos**

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| **S. No.** | **Technical Specifications** | **Compliance  (Y/N)** |
| 1 | Access point shall be with dual Radio with 4x4:4 MIMO on 5GHz radio and a minimum of m one 2.5G Ethernet Port |  |
| 2 | Access Point should be 802.11ax ready from day one and support WPA3 and Enhanced Open security from day one |  |
| 3 | The access point should support built-in technology that resolves sticky client issues for Wi-Fi 6 and Wi-Fi 5 devices |  |
| 4 | The access point should be IoT-ready supporting Bluetooth 5 and Zigbee radios (internal or external) to support advanced location-based services for Mobile engagement solutions and Applications. |  |
| 5 | Access Point should have integrated internal antennas |  |
| 6 | The Max transit power of the AP + Antenna should be as per WPC norms for indoor Access Points. OEM should give an undertaking letter stating that the AP will be configured as per WPC guidelines for indoor AP and also submit the WPC certificate showing approval. |  |
| 7 | Should support 16x BSSIDs per AP radio. |  |
| 8 | The access point should be capable of performing security scanning and serving clients on the same radio. It should be also capable of performing spectrum analysis and security scanning using the same radio. |  |
| 9 | Should support BPSK, QPSK, 16-QAM, 64-QAM, 256 QAM, and 1024 QAM modulation types |  |
| 10 | The access point should support 802.3af/at/bt POE standard for powering |  |
| 11 | The access point should support Intelligent Power Monitoring (IPM) capability to continuously monitor and report hardware energy consumption. |  |
| 12 | The access point should have a console port for local management |  |
| 13 | The access point should operate as a sensor for Wireless IPS |  |
| 14 | The Access Point should have the technology to improve downlink performance to all mobile devices. |  |
| 15 | The access point must incorporate radio resource management for power, channel, coverage hole detection, and performance optimization |  |
| 16 | AP mounting kit should be with a locking mechanism so that AP cannot be removed without using special tools. AP should have e Kensington security slot |  |
| 17 | AP should support standalone mode or Inbuilt Virtual controller mode for specific deployment requirements |  |
| 18 | The AP should support Advanced Cellular Coexistence (ACC) or equivalent to minimize interference from 3G/4G cellular networks, distributed antenna systems, and commercial small cell/femtocell equipment |  |
| 19 | The AP should support priority handling and policy enforcement for unified communication apps, including Skype for Business with encrypted videoconferencing, voice, chat, and desktop sharing |  |
| 20 | The AP should support deep packet inspection to classify and block, prioritize, or limit bandwidth for thousands of applications in a range of categories |  |
| 21 | AP should support Pass point Wi-Fi (Hotspot 2.0) offering seamless cellular-to-Wi-Fi carryover for guests |  |
| 22 | The Access point should support maximum ratio combining (MRC) for improved receiver performance |  |
| 23 | The Access point should support cyclic delay/shift diversity (CDD/CSD) for improved downlink RF performance |  |
| 24 | The Access point should support Space-time block coding (STBC) for increased range and improved reception |  |
| 25 | The Access point should support a Low-density parity check (LDPC) for high-efficiency error correction and increased throughput |  |
| 26 | The Access point should support Transmit beamforming (Tx BF) for increased signal reliability and range |  |
| 27 | The Access point should support 802.11ax Target Wait Time (TWT) to support low-power client devices |  |
| 28 | AP should be UL 2043 certified. |  |
| 29 | AP should support various deployment options including, managed by an on-premises controller or stand-alone mode |  |
| 30 | The solution should have the ability to provide AI-ML Powered radio resource algorithm |  |
| 31 | AP should provide SLA-grade performance by allocating radio resources, such as time, frequency, and spatial streams, to specific traffic types. |  |
| 32 | The Wireless solution proposed and PoE switches shall be from the same OEM for ease of integration. |  |
| 33 | **Regulatory Compliance** FCC/ISED, CE Marked, RED Directive 2014/53/EU, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU, UL/IEC/EN 60950, EN 60601-1-1, EN60601-1-2 or equivalent certifications |  |
| 34 | **Wi-Fi Alliance Certification**s from Day 1: - Wi-Fi CERTIFIED a, b, g, n, ac - Wi-Fi CERTIFIED 6 (ax) - WPA, WPA2, and WPA3 – Enterprise with CNSA option, Personal (SAE), Enhanced Open (OWE) - WMM |  |
| 35 | OEM shall be present in Leader’s quadrant consistently in the latest Gartner’s Magic Quadrant for Wired and Wireless LAN Access Infrastructure for the last five years. |  |
| 36 | APs shall be offered with a limited lifetime hardware warranty (up to 5 years from EOS) with Next Business Day shipment, 8x5 business hours technical support, and access to all generally available software/OS releases |  |
| 37 | Bidder has to submit Part Coded Bill of Materials of the offered Product |  |
| 38 | Manufacturers Authorization Letter Specific to this tender must be submitted. Tenders submitted without **MAF** will be rejected. |  |

1. **Wireless controller - QTY: 1 No’s**

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| **S. No.** | **Technical Specifications** | **Compliance (Y/N)** |
| 1 | The proposed Wireless LAN Controller should be a 19" Rack Mountable |  |
| 2 | Should have a minimum of 2 x 10G SFP+ slots and 4x1G Combo ports from day 1 |  |
| 3 | Should support local bridge mode, tunnel mode, or a mixed mode based on SSIDs for wireless traffic between APs and Controller |  |
| 4 | Should have wired throughput of a minimum of m 10 Gbps and 3DES/AES encryption throughput of a minimum of 5 Gbps |  |
| 5 | Should be deployed in High-Availability/Clustering |  |
| 6 | Should enable seamless WLAN mobility (L2/L3 roaming) across Layer-3 boundaries within the LAN infrastructure |  |
| 7 | Should provide role-based access policy enforcement across Wireless network |  |
| 8 | Should function as dynamic Radius Proxy between Wireless Access Points and AAA solution |  |
| 9 | Should support a minimum of 256 Access Points, 8,000 concurrent users/devices |  |
| 10 | Should support 802.11ac Wave 2/802.11ax standard, latest security standard WPA3, reliable fast roaming standards 802.11k/r, per user Rate limiting control |  |
| 11 | Should provide advanced Wireless Intrusion Detection/Prevention capability for Secure WLAN and perform spectrum analysis to detect and classify sources of interferences.  **Any licenses (i.e Access point, Policy Enforcement, RF Protect, etc.) or components required for the same shall be included on Day 1 itself.** |  |
| 12 | Should provide adaptive Radio Management to automatically assign channel and power settings and deliver reliable, high-performance WLANs |  |
| 13 | OEM shall be present in Leader’s quadrant consistently in the latest Gartner’s Magic Quadrant for Wired and Wireless LAN Access Infrastructure for the last five years. |  |
| 14 | Wi-Fi Controller shall be offered with 3 years of NBD support and support to be provided directly by OEM during the warranty period |  |
| 15 | The Wireless solution proposed and PoE switches shall be from the same OEM for ease of integration. |  |
| 16 | Bidder has to submit Part Coded Bill of Materials of the offered Product |  |
| 17 | Manufacturers Authorization Letter Specific to this tender must be submitted. Tenders submitted without **MAF** will be rejected. |  |

1. **Scope of work - QTY: 1 No’s**

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| **S. No.** | **Technical Specifications** | **Compliance (Y/N)** |
| 1 | **Optical Fibre Cable (OFC):**  Supply, installation, testing & commissioning of 6 Core, single mode armored outdoor OFC in 40/33 mm OD/ID self-lubricated HDPE pipes in the ground at depth of 750 mm including excavation in all types of soil including hard rock if any cutting of existing footpath, road, etc., sand bedding, laying of warning tape on top, temporary reinstatement, backfilling, dewatering if necessary consolidation, disposal of excess earth within the radius of 500Mtrs, etc. or in existing conduit/duct/trench or fixed on wall/column/slab with 5mm thick M.S. flat /GI spacer/angle/ support fixed with coach screws/ grouted in wall/anchor fasteners 2mm thick G.I. fabricated saddle, all fixing accessories, etc. complete including painting of M.S spacers/angles all as per the attached work specification and instructions of Engineer-in-charge.  **Note:**  1) The scope of work includes HDPE pipe accessories such as couplers, cable end plugs, cable sealing plugs, terminations accessories LIU, Pigtails, couplers, duplex fiber patch cords, and fiber termination. |  |
| 2 | **Cat 6 A /UTP Cable:**  Supplying, Laying, termination, testing, and commissioning in the PVC conduit / Duct, labeling for the identification of Category 6A/UTP Cable- LSZH (Low Smoke Zero Halogen), complete in all respects complying with relevant EIA/TIA standards and as directed by the Engineer-in-charge.  **Preferred make:** CommScope |  |
| 3 | **Cat 6 A I/O Module:**  Supplying, installation, termination, testing, commissioning and fixing, labeling for the Identification of Category 6A I/O Module and also submit the Testing Report using Fluke Scanner for voice, complete in all respects complying with relevant EIA/TIA standard and as directed by the Engineer-in-charge.  **Preferred make:** CommScope |  |
| 4 | **Cat 6A Patch Cable (2m/7ft):**  Supplying and testing of factory-made Category 6A U/UTP Patch Cable 2M/7ft-LSZH (Low Smoke Zero Halogen), complete in all respects complying with relevant EIA/TIA standards and as directed by the Engineer-in-charge.  **Preferred make:** CommScope |  |
| 5 | **Cat 6A Patch Cable (1m/3ft):**  Supplying and testing of factory-made Category 6A U/UTP Patch Cable 2M/7ft- LSZH (Low Smoke Zero Halogen), is complete in all respects complying with relevant EIA/TIA standards and as directed by the Engineer-in-charge.  **Preferred make:** CommScope |  |
| 6 | **Single Port Faceplate:**  Supplying, Erection in the existing concealed box / modular of Single Port with removable shutter faceplate for CAT6A I/O. The rate shall include necessary accessories like screws, proper labeling with color code, etc., as complete with all respects complying with the relevant standard specification as mentioned in the Technical Specification, as directed by the Engineer-in-charge. |  |
| 7 | **Surface Backbox for Faceplate:**  Supply and Fixing of surface Backbox compatible with CAT 6A faceplate. The rate shall include necessary accessories as complete in all respects complying with relevant standard specifications as directed by the Engineer-in-Charge. |  |
| 8 | 1. The bidders should be authorized partners for the **OEM**. 2. The same should be submitted along with the tender otherwise bidder shall be technically disqualified in the technical bid. 3. Before bidding the bidder should visit the site physically and do a proper assessment and understand the requirement. 4. If the bidder has any Queries regarding quantity or execution of the work or related to any aspects it should be brought to the notice of the competent authority before the same shall be responded to by the Competent authority in the **Prebid meeting**. |  |

**Signature**

**Name of authorized person for bidder with seal**