



**Jammu and Kashmir e-Governance Agency
(JaKeGA)
Government of Jammu and Kashmir**

**Notification No: 02- JaKeGA of 2018
Dated 23-04-2018**

INVITATION FOR BID (IFB) & NOTICE INVITING BID (NIB)

S. No	Name & Address of the procuring agency	Jammu and Kashmir e-Governance Agency
1	Subject Matter of Procurement	Selection of Agencies for Supply, Installation and Commissioning of Wireless (Wi-Fi) and wired Network at Civil Secretariat Srinagar
2	Bid Procedure	Through e-Tendering mode. (Two Bid System i.e Technical Bid and Financial Bid)
3	Bid Evaluation Criteria (Selection Method)	Least Cost Based Selection (LCBS) (L1)
4	Websites for downloading RFP, Corrigendum's, Addendums etc.	www.jktenders.gov.in and www.jakega.jk.gov.in
5	Bid Document/Tender Fee	Rs. 25,000/- (Rupees Twenty Five thousand) in form of DD in favor of CEO, JaKeGA payable at Srinagar, J&K. Original DD shall be submitted in the Office of CEO, JaKeGA

6	Bid Security and Mode of Payment	Bid security- Earnest Money Deposit in the form of a CDR/FDR/BG in original, from a scheduled or Nationalized Indian Bank in favor of 'CEO JaKeGA, valid for (01) One Year payable at Srinagar, J&K, for the sum of Rupees Two Lakh shall be required to be submitted in original by the bidder ("bid Security") in the Office of CEO JakeGA. EMD fees shall be submitted alongwith the Bid documents by the bidders by or before last date of submission of bids. Bids not accompanied with the Earnest Money Deposit shall be rejected by JaKeGA.
	Last Date for Submission of written queries by intending bidders on email: ceojakega@nic.in	Start Date: From 10:00 AM of 24 th April 2018 End Date: To 04.00 PM of 26 th April 2018
7	Pre-Bid Meeting	Pre-Bid meeting shall be held on 27 th April 2018 at 3:30 PM at Conference Hall in the office of Transport Commissioner, J&K, Rail Head, Jammu.
8	Data and time of Issuance of Tender	From 11:00 AM of 23 rd April 2018.
9	Start/ End Date for the submission of Bids	Start Date: From 11:00 AM of 29 th April 2018. End Date: 03:00 PM of 14 th May 2018.
10	Submission of Tender Fee, EMD, Form 1 and Form 2 in Original	From 11:00 AM of 29 th April 2018 to 01:00 PM of 14 th May 2018 in the office of JaKeGA, 1 st Floor Civil Secretariat Srinagar.
11	Date/ Time/ Place of Technical Bid Opening	14 th May 2018 at 3:30 PM in the office of JaKeGA, 1 st Floor Civil Secretariat Srinagar.
12	Date/ Time/ Place of Financial Bid Opening	Will be notified later. Financial Bids of only such bidders will considered for opening who qualify in the technical bid.
13	Bid Validity	180 days from the bid submission deadline

TABLE OF CONTENTS

1. INTRODUCTION.....	4
2. SCOPE OF WORK	4
3. STANDARD TERMS AND CONDITIONS OF TENDER.....	5
4. SPECIAL CONDITIONS OF THE TENDER/BID.....	7
5. DELIVERY SCHEDULE	8
6. WARRANTY / GUARANTEE.....	8
7. PASSIVE NETWORK IN QUANTITY AND ANY VARIATION IN WORK.....	8
8. ABBREVIATIONS:	9
9. FORM 1: COVER LETTER	10
10. FORM 2: TECHNICAL COMPLIANCE AS PER DETAILED SPECIFICATIONS OF THE TENDER.....	11
11. (ANNEXURE – I) FORMAT FOR TECHNICAL BID (CHECKLIST / BIDDER COMPLIANCE)	12
12. (ANNEXURE – II) - SERVICE LEVEL AGREEMENT.....	15
13. (ANNEXURE - III) - PASSIVE COMPONENT SPECIFICATIONS.....	16
14. (ANNEXURE - IV) - ACTIVE COMPONENT SPECIFICATIONS.....	24
15. (ANNEXURE V) - TECHNICAL BID COMPLIANCE INFORMATION.....	37
16. (ANNEXURE VI) - COMPONENTS REQUIRING MANUFACTURERS AUTHORIZATION	41
17. (ANNEXURE VII) - FINANCIAL BID FORMAT	42

Government of Jammu and Kashmir
Jammu and Kashmir e-Governance Agency
(JaKeGA)

1. INTRODUCTION

Sealed Tenders are invited from authorized firms/Companies for supply, installation and commissioning of **Wireless and Wired Networking in Civil Secretariat, Srinagar, J&K Government** as per details given below:-

1. Detailed specifications and allied terms: Annexure III to Annexure IV.
2. Tender Fee, EMD, Form 1 and Form 2 in Original needs to be submitted in office of JaKeGA, 1st Floor Civil Secretariat Srinagar from 11:00 AM of 29th April 2018 to 01:00 PM of 14th May 2018 in the office of JaKeGA, 1st Floor Civil Secretariat Srinagar.
3. The Technical Bids will be opened on 14th May 2018 at 3:30 PM in the office of JaKeGA, 1st Floor Civil Secretariat Srinagar.
4. Tender without Tender Fee, EMD, Form 1 and Form 2 in original will be rejected.
5. JaKeGA reserves the right to reject any or all the tenders without assigning any reason.

2. SCOPE OF WORK

JaKeGA desires to set up Wireless (Wi-Fi) Networking infrastructure along with related IT services using state-of-the-art networking equipment, access points, integration with existing Network at **Civil Secretariat Srinagar**

The following summarizes the scope of work.

1. To Implement Wireless (Wi-Fi) and wired Networking at **Civil Secretariat, JAKEGA**.
2. To supply, install and commission all the components mentioned as per the technical and financial bid and to carry out the work besides integration with existing IT Infrastructure.
3. To supply, install and commission Intra building STP CAT6/UTP/ Fiber structured cabling Network as per BOQ.
4. Detailed Specification of Components needed as per Annexure III to IV.
5. Successful bidder will be responsible to rollout the Wireless (Wi-Fi) and wired Network including but not limited to user creation/ deletion/ updation/ provisioning/ tracking/ security/ overall Wireless (Wi-Fi) and wired Network Management and handover to user department and on call support for one year.
6. Successful Bidder to provide detailed connectivity diagram (Physical and Logical) including: Raceway/pathway diagram, Cable and Fiber patching details, naming and labeling details, Cable scanning and test results.

3. STANDARD TERMS AND CONDITIONS OF TENDER

1. The Tender should be neatly typed without over writings, mutilations, tampering and erasures. The correction, if any, should be attested by the tenderer by affixing his signatures. Each page of the tender should be duly signed by the tenderer.
2. The rates must be quoted separately for each item as per Financial Bid format (Financial Instrument) mentioned in Annexure VII via e-tendering mode on www.jktenders.gov.in FOR Civil Secretariat Srinagar.

3. Tenders should contain the following information/documents along with the bid:

- i. Valid GST and PAN No.
 - ii. Manufacturers Authorization Form (MAF) from the respective Original Equipment Manufacturer (OEMs) as per Annexure VI .
 - iii. Proof regarding the execution of:
 - a) One Project of Wireless (Wi-Fi) Networking with work order of the value of 1.0 Cr. or more in any State/Central Government/PSU with satisfactory work completion certificate(s); or
 - b) Two Projects of Wireless (Wi-Fi) Networking with work order of the value of 0.5 Cr. or more in any State/Central Government/PSU with satisfactory work completion certificates.
 - iv. Valid ISO 20000:2011, ISO 27001:2013 Certification from Bidder.
 - v. LAN and WLAN should be from the same OEM to have single TAC for Active components.
 - vi. OEM should have presence in India at least from last five years and making no losses in Networking business in last three years.
 - vii. The Network Management Solution must manage both LAN and Wireless Infrastructure(With location tracking) and should be from same OEM.
 - viii. Required hardware, software and licenses to manage proposed infrastructure should be given from day one.
 - ix. The bidder should have average annual turn over of Rs. Two Crore in last three financial years (2015-16, 2016-17, 2017-18).
 - x. Tender fee of Rs. 25,000/- (Rupees Twenty Five thousand) in form of DD in favor of CEO, JaKeGA payable at Srinagar, J&K. Original DD shall be submitted in the Office of CEO, JaKeGA from 11:00 AM of 29th April 2018 to 01:00 PM of 14th May 2018 in the office of JaKeGA, 1st Floor Civil Secretariat Srinagar.
 - xi. Earnest money of Rs. Two Lakh in the form of DD/FDR/CDR/BG in favor of the CEO, JaKeGA, Civil Secretariat Srinagar/Jammu; which may be forfeited if the successful bidder fails to supply equipment's within the stipulated period and as per the specifications asked for. The EMD must be submitted to CEO, JaKeGA, in the office JaKeGA, at IT Wing, 1st Floor, Civil Secretariat Srinagar from 11:00 AM of 29th April 2018 to 01:00 PM of 14th May 2018 in the office of JaKeGA, 1st Floor Civil Secretariat Srinagar.
4. In case any manufacturing defect arises in the equipment, it should be handled as per SLA defined in Annexure II.

5. Minimum warranty period for each equipment / instrument should be for a period of 03 years from the date of stock entry in JaKeGA.
6. The successful tenderer will have to deposit 5% of the total value of supply as security money deposit in the form of Performance Bank Guarantee in favor of the CEO, JaKeGA, J&K; which will be refunded after completion of the warranty period and will be adjusted in case of violation of terms and conditions laid down above.
7. Successful Tenderer shall have the responsibility of arranging training for JakeGA staff during the implementation phase for smooth handling and proper functioning of supplied equipments.
8. The JaKeGA shall not be responsible if the consignment incurs any demurrage in transit from the point to origin to the point of final destination.
9. The JakeGA reserves the right to make any changes in the Technical Specification, Bill of Quantity of this Tender at anytime during tender process.
10. JaKeGA reserves the right to cancel this tender anytime without assigning any reason.
11. The Bidder should abide by the terms and conditions specified in the Tender document. Conditional bids received will be rejected.
12. Before the deadline for submission of tender, JaKeGA may either on its own initiative or in response to any clarification sought by a prospective Bidder or for any other reason modify the Tender Document by amending, modifying and / or supplementing the same. All changes shall be posted on website www.jakega.jk.gov.in and prospective Bidders shall be required to go through the website before submitting the Tender on regular basis. All such amendments shall be binding on all participating bidders.
13. The compatibility of all the networking components is a must for the efficient working of the network, hence bidders shall essentially quote all active components of one make for Wired/Wireless network. Any deviations in this matter will subject bid(s) to disqualification. Similarly, bidders must either quote all the passive components from same OEM or mutually compatible with each other and fully compatible with active components. Any incompatible active/passive component shall be returned irrespective of it being installed or not and appropriate penalties will be imposed.
14. Validity of the quoted offer should cover the period of the completion of project. Offers without such validity shall be rejected.
15. The vendor must comply to detailed technical specification as mentioned on Annexure III to Annexure IV. The quoted products mentioned on Annexure V must fully comply with the detailed specifications of the corresponding items from Annexure III to IV of this tender. Any non compliance on technical specification will lead to cancellation of work order, blacklisting of successful bidder, forfeiting of PBG submitted and a penalty of Rupees 20 Lakhs from the successful bidder.
16. All information in the Tender/Bid should be in English language and each page of the Tender/Bid document should be signed & stamped by the Bidder.
17. Bidders should bid for an item keeping in consideration and including therein costs of any additional/supporting accessories that may be required for proper functioning of the item concerned. Thus, for accessories of individual items JakeGA shall not pay anything separately and if the functioning of any item is not proper, JakeGA shall have the full right to deduct complete payment of that item(s).
18. The successful Bidder shall have to sign an agreement with JakeGA to comply with all rules, regulations, Laws and Byelaws enforced by the State Govt. and JakeGA in whose premises the work has to be carried out.

19. It shall be the responsibility of the successful bidder to make an inventory of all the supplied materials upon its arrival at the customer's location and inform of missing components, if any.
20. All Passive Cabling work whether it is Fiber, UTP, Patch Panels, Racks Patch Cords etc should be done neatly and with proper tagging. Entire cabling should be structured and aesthetically implemented..
21. Successful Bidder must have a local office presence in J&K or arrange the same within ten days of issuance of work order.
22. Bidder must not have been blacklisted by any State/Central Government Department/Agency. An affidavit in this effect may be submitted.
23. Participating in this tender would mean that Bidder is accepting all terms and conditions of this tender document.
24. Bidders are requested to mandatorily do a survey and understand the existing Network of Civil Secretariat Srinagar for Smooth Integration with proposed network. Survey can be done any day between 23rd April 2018 till 12th May 2018 with prior requisition sent to email: ceojakega@nic.in supported by contact person email and phone no of intending person.
25. All queries regarding the tender must be submitted to email: ceojakega@nic.in from 10:00 AM 24th April 2018 to 04:00 PM of 26th April 2018.
26. Pre-bid meeting shall be held at 03.00 PM on 27th April 2018 at Conference Hall in the office of Transport Commissioner, J&K, Rail Head, Jammu
27. Exemption regarding Tender fee and EMD shall be applicable to SSI units registered with Government of J&K as per State Government norms however no special consideration shall be made for PBG, only on the submission of which Work Order shall be issued.
28. Technical Bid shall constitute of (Annexure – I i.e Format for Technical Bid) Checklist / Bidder Compliance documents with compliance and submission. Further submission of tender fee, EMD, Form 1 and Form 2 is to be submitted in original.
29. All legal disputes, arising if any, would be settled under jurisdiction of Court in Srinagar, J&K.

4. SPECIAL CONDITIONS OF THE TENDER/BID

1. **All Active and passive Components and Services as per Financial BOQ should be quoted in INR.**
2. All prices quoted shall be inclusive of all **taxes, freight and octroi** etc. and shall be FOR **JAKEGA, Civil Secretariat, Srinagar.**
3. JaKeGA may decrease or increase any active or passive component or both and make a commensurate adjustments in the corresponding service components while issuing work order or at a later stage. JaKeGA shall decide to add or drop any item at any stage of the tender process or on award of Purchase order to successful bidder. Bidders are advised to quote competitively on each and every line item of the financial bid.
4. In the event of goods not being in accordance with the specification or the conditions of the contract or failure by the bidder to perform services as outlined in the Tender/Bid document, **JAKEGA** reserves the right to cancel the contract at any stage.

5. Payment Terms will be as follows subject to the successful audit report as decided by JaKeGA:
 - a. 70% of payment shall be made at the time of delivery and Bill of Material (BOM) Verification by JaKeGA, IT Department
 - b. 25% of Payment shall be made on Successful Installation and commissioning and completion of the project.
 - c. 5% of payment shall be made upon successful continuous working of the setup for three months from the date of Go Live.

5. DELIVERY SCHEDULE

The Material delivery has to be done in three weeks from the issue of Work Order and complete installation has to be done in within four weeks from the date of release of Work Order.

6. WARRANTY / GUARANTEE

The equipments supplied and installed shall be guaranteed by the successful bidder for a minimum period of three years with regards to manufacturing defects, quality of material, workmanship, performance, efficiency, installation, etc. All supplied material must be accompanied with back to back warranty from OEM.

7. PASSIVE NETWORK IN QUANTITY AND ANY VARIATION IN WORK

1. The passive quantity mentioned in the Tender/Bid is only indicative. JAKEGA reserves the right to increase/ decrease/ remove any/all quantities while placing the order. All passive components will be paid on actual basis.
2. Any work not covered under this contract which may be essentially required for the completion of job (to the satisfaction of JAKEGA) shall be carried out by the Successful Bidder as extra item with prior approval of JAKEGA for which payment shall be made separately at the rates decided by JAKEGA after following due process.

8. ABBREVIATIONS:

JaKeGA: Jammu and Kashmir e-Governance Agency

TAC: Technical Assistance Center

OEM: Original Equipment Manufacturer

FDR: Fixed Deposit Receipt

CDR: Call Deposit Receipt

BG: Bank Guarantee

PBG: Performance Bank Guarantee

SLA: Service Level Agreement

AMC: Annual Maintenance Contract

Wi-Fi : Wireless Fidelity

EMD: Earnest Money Deposit

DD: Demand Draft

Go Live: Is the date of commissioning of the project

9. FORM 1: COVER LETTER

To
The Chief Executive Officer
Jammu and Kashmir e-Governance Agency
Civil Secretariat
Srinagar 190001.

Sir,

Having examined the Bid Documents of this tender vide Notification No: 02 -JaKeGA of 2018 dated 22rd April 2018, the receipt of which is hereby duly acknowledged, we the undersigned, offer to execute the Networking works in conformity with the said Bid documents and schedule of prices attached herewith as made part of this Bid.

We undertake, if our Bid is accepted, to complete the works within the specified period as per the Bid document.

Until a formal contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, shall constitute a binding contract between us.

We undertake that in competing for and if the award is made, in executing the above work, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988".

Further we certify that our organization is not blacklisted by any State or Central Govt. Department or any PSU.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

10. FORM 2: TECHNICAL COMPLIANCE AS PER DETAILED SPECIFICATIONS OF THE TENDER

(Affidavit duly attested by Oath Commissioner)

**To
The Chief Executive Officer
Jammu and Kashmir e-Governance Agency
Civil Secretariat
Srinagar 190001.**

Sir,

Having examined the Bid Documents of tender vide Notification No: 02 -JaKeGA of 2018 dated 22nd April 2018, the receipt of which is hereby duly acknowledged, we the undersigned, offer to execute the Networking works as per the specifications mentioned in this tender.

We undertake, that the Bill of material supplied as mentioned in Annexure V are fully compliant with the detailed specifications of the corresponding items from Annexure III to IV of this tender. Any non compliance on technical specification will lead to cancellation of work order, blacklisting of our company, forfeiting of EMD submitted and a penalty of Rupees 30 Lakhs.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

11. (ANNEXURE – I) FORMAT FOR TECHNICAL BID (CHECKLIST / BIDDER COMPLIANCE)

S. No	DESCRIPTION	Documents Required	Provided (Yes/No)	Reference (Page No)
1.	Name and Style Of The Bidder	Company/Firm Registration document under companies act		
2.	a)Postal Address	Address of correspondence or corporate office on company letter head.		
3.	b)Registered Address	Registered Address of Company/Firm		
4.	Telephone/Fax no.			
5.	E-mail address & URL			
6.	Type of Company	Proof of Company Registration along with a copy of the Partnership Deed/ Article of Association and Memorandum of Association.		
7.	Contact Person	Name, designation and contact details (email address and Phone) of the representative of the Bidder to whom all references shall be made to expedite technical co-ordination.		
8.	PAN/TAN Number	A copy of Valid PAN/TAN No		
9.	Valid GSTN Registration	A copy of valid GSTN Registration		
10.	Earnest Money Deposit	DD/FDR/CDR/BG of INR 02 (Two) Lakh (Rs. 200,000/-) in favour of CEO JaKeGA		
11.	Tender Fee:	DD of Rs. 25000/- in favor of CEO JaKeGA, Civil Sectt. Srinagar.		
12.	Cover Letter – Form 1	Cover Letter; as per template provided (Form 1)		
13.	Compliance and details on SLA	Compliance of SLA as per Annexure II		

14.	Local Office in Kashmir Province	A Self Certified letter by an authorized signatory. In case the bidder doesn't have an office, it has to setup its office in Kashmir, J&K within ten days of issue of Work Order.		
15.	Blacklisting	An affidavit must be submitted.		
16.	Technical Bid Compliance in Form 2 and Annexure V	Affidavit as per Form 2 and Compliance as per Annexure V		
17.	The Bidder should submit the Manufacturers Authorization Form (MAF) from the respective OEMs.	Manufacturers Authorization Form (MAF) from respective OEM's for items mentioned on Annexure VI		
18.	<p>a) The Bidder must be a profit making Company/Organization from last 3 years/12 Quarters i.e (2015-16, 2016-17, 2017-18) and</p> <p>b) The Bidder should have average annual turnover of Rs. Two Cr. in last three Financial years i.e (2015-16, 2016-17, 2017-18) duly certified by registered CA.</p> <p>c) Copies of I.T. Returns of assessment year 2016-17 and 2017-18.</p> <p>d) Balance sheet of the company/firm for last three financial years.</p>	<p>a) Audited profit and loss statements last 3 years/12 Quarters i.e (2015-16, 2016-17, 2017-18). (not more than 06 pages)</p> <p>b) CA Certified documentary proof of annual turnover of minimum Rs. Two Cr. in last three Financial years i.e (2015-16, 2016-17, 2017-18). (not more than 06 pages)</p> <p>c) Copies of I.T. Returns of assessment year 2016-17 and 2017-18.</p> <p>d) Balance sheet of the company/firm for last three financial years.</p>		
19.	<p>Switches and Access Points, WLAN Controller, SFP Modules should be from the same OEM to have single TAC for Active components.</p> <p>Bidders must either quote all the passive components from same OEM or mutually compatible OEMs and fully compatible with active components</p>	Documentary Proof of not more than Four pages		

20.	OEM should have presence in India at least for last five years and making no losses in Networking business in last three years	Documentary Proof of not more than Four pages		
21.	NMS to manage LAN and Wireless Network should be from same OEM	Documentary Proof of not more than One page		
22.	Required hardware, Software and Licenses to manage proposed Infrastructure should be given from day 1.	Documentary Proof of not more than one page		
23.	Bidder must have executed the following work in any State/Central Government Department/PSU in last three financial years:	Work Orders and successful completion Certificate from State/Central Government Department/PSU / or their agencies.		
	<ul style="list-style-type: none"> i. One Project of Wireless (Wi-Fi) Networking with work order of the value of 1.0 Cr. or more in any State / Central Government / PSU with satisfactory work completion certificate(s); or ii. Two Projects of Wireless (Wi-Fi) Networking with work order of the value of 0.5 Cr. or more in any State / Central Government / PSU with satisfactory work completion certificate(s) 			
24.	Bidder should be ISO 20000:2011, ISO 27001:2013 certified.	Valid ISO 20000:2011, ISO 27001:2013 certificates.		
25.	Back to Back Warranty from OEM	OEM Certificate specifying warranty for 03 years for all active items and all passive items excluding item no 23 to 30 of Annexure V.		

12. (ANNEXURE – II) - SERVICE LEVEL AGREEMENT

1. Bidder will be responsible for on call maintenance and operations support for a period of One year from the date of Go Live..
2. For the purpose of measurement, “downtime” or “fault duration” constitutes any period of time during which the network connection is not useable for Data, Voice & Video. Causes of downtime include:
 - a) Network connection equipment failures, supplied by Bidder.
 - b) Local loop failure in cables.
 - c) Access Point, Core Switches & Access Switch
 - d) Any failure in the entire solution provided.
3. Cable fault in the network e.g. LAN cable, internal OFC patch cords, patch panel etc.
4. All change requests will be routed to Bidder for next One year and will be taken care by Bidder as a part of warranty with zero Cost on on-call basis.
5. Successful bidder to depute one on call networking resources with not less than 03 years of Networking Experience for day to day operations and changes in the Network till the completion of project implementation work.
6. Successful Bidder to will provide one week training to designated team on the entire setup of this project.
7. Any spare replacement will be competed in maximum of four working days. Any deviation on the part of successful bidder will attract a penalty of Rs 500 per day.
8. For Access Points, Switches, SFP modules and all passive components, the successful bidder shall take immediate action to carry out any rectification work and restore the installation to its normal operating conditions upon receipt of the complaint from the officer in-charge of the END-USER or his representative’s work for One year after the issuance of work order. If no action is taken to carry out the repair within twenty four hours upon lodging of the report, the JakeGA shall reserve the right to engage a third party to carry out the rectification works with all the costs and expenses charged to the successful bidder.
9. For all other active items the successful bidder shall take immediate action to carry out any rectification work and restore the installation to its normal operating conditions upon receipt of the complaint from the officer in-charge of the END-USER or his representative’s work for One year after the issuance of work order. If no action is taken to carry out the repair within fourty eight hours upon lodging of the report, the JakeGA shall reserve the right to engage a third party to carry out the rectification works with all the costs and expenses charged to the successful bidder.

This is certify that the above mentioned SLA shall be complied.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

13. (ANNEXURE - III) - PASSIVE COMPONENT SPECIFICATIONS

Passive Work Specification

Passive Components General Guidelines

1. All the Cat 6 UTP/STP cables and fiber optic cables must be individually tested by the tenderer after installation of the cables for conformance to the said standards. The UTP nodes should be tested using the pentascanner and the fiber testing should be performed using the OTDR.
2. All equipment and materials supplied shall be new, the best of quality and designed to ensure satisfactory operation under varying atmosphere, climatic, humid tropical conditions without distortion and deterioration in any part affecting efficiency and reliability of the systems. The bidder shall provide manufacturer's literature including manufacturer's data on maintenance and operation of all equipment installed. Relevant catalogues of all materials, instruments, equipment, components, etc. supplied shall be included in the Tender.
3. Each equipment, panel and outgoing cable from the patch panels shall be labeled. Proper labeling and numbering shall also be provided on the outlets. All cable labels are to be of clear wrap around self adhesive type & each cable is to be labeled at each end 100mm from termination point. Labeling to be machine typed.
4. The bidder shall plan the cabling system and routing to ensure system integrity and performance, and that it does not present problems of maintenance, access nor conflict with the operation and maintenance of other systems.
5. The bidder shall provide adequate support for all cabling that is vertically installed, ensuring that the weight of the cables is sufficiently supported.
6. The bidder shall provide complete and detailed documentation covering the installation and maintenance of the building cabling system. Including "as built" drawings showing all main cable runs, cable trays and catenaries, outlets, consolidation points. Complete with outlet numbering.
7. The Bidder may use GI Flexible instead of PVC Flexible and ensure the closure of all points in the network racks subject to proper grounding and safety precautions.
8. Materials such as pipe, bricks, sand, stone-chips, cement, paint etc. required for laying the cables and other fixation work will have to be supplied by the Bidder.
9. For passive components, the purchase order will be placed based on estimates only. But the payments will be made based on actual quantities installed/consumed.

TECHNICAL SPECIFICATION FOR COPPER AND FIBER COMPONENTS AND NETWORK RACKS

Fiber Optic Cable Specifications

Specifications for 6 Core Fiber Optic OM3-Multi Mode

Laser Optimized OM3 Optical Fiber Cable specifications	
The Proposed Optical SCS must consist of individual components provided by the same manufacturer. This includes cables, Pigtails, Patch cords, Panels and adapters. “Mix and Match” products are not allowed as there is no guarantee that the overall channel will meet performance requirements for 1G and 10G Ethernet transmission requirements if constructed with components from different vendors.	
Only LC connectors type pigtails, adapters, panels and patch cords shall be proposed in response to this RFP	
The Proposed OM3 Optical Fiber Cabling System must support 1000 Base SX & 10G Base SR.	
Cable Construction: Loose-tube, Gel-free cable	
Armored: Steel-tape armored	
The cable construction should be able to support 800N long term tensile load	
The cable should be able to support a vertical rise of 700m (backbone riser)	
Water Penetration: Comply to FOTP-82 / IEC 60794-1-2, Section 24	
Operating Temperature: -20 Degree C to +70 Degree C	
Compression: 44N/mm using FOTP-41 / IEC 60794-1-2 Section 7	
Cable Qualification Standards ANSI/ICEA S-87-640-2006 / Telcordia GR-20-CORE Issue 3	
ROHS 2011 / 65 / EU compliant	
Standards Compliance:	TIA-492AAAC (OM3)
Rack Mounted Fiber Optic Patch Panel specifications	
1U low-profile, high density fiber optic shelf shall be proposed that can be used for a combination of splicing and termination of fiber optic building cable or outside plant (OSP) cables.	
The 1U height fully enclosed shelves shall include integrated front cable management trough and features either a fixed tray or slide-out tray for easy access.	
The Panel shall accommodate upto 12 fibers to be spliced / terminated	
The front plate of the panel shall be included in the proposal that can support LC-Style Duplex adapters	
The alignment sleeve of the LC Duplex adapter shall be of Phosphor Bronze. This allows better retention and alignment of fiber connectors on patchcords and pigtails.	
The MM adapter shall support OM3 as well as OM4 fibers / patch cords. SM adapters should support OS2 fibers / patchcords.	
The panel shall accommodate fusion splice trays that can support splicing upto 12/24 fibers	
Adequate number of Fusion splice holder trays should be included.	
Cable assemblies - Pigtails and Patch Cords	

The Pigtail shall be assembled with 50 µm multimode fiber (OM4) for MM fiber cabling System and with SM fiber for SM fiber cabling system	
The pigtail shall be assembled using 900 micron buffered fiber	
The pigtails shall be terminated with MM LC-style connector for MM cabling systems and SM LC-Style connector for SM cabling system	
The pigtails shall have a Cable Retention Strength, maximum	3.00 lb @ 90 ° C
	6.00 lb @ 0 ° C
The LC connector on the pigtail shall meet Optical Components Standard ANSI/TIA-568-C.3. please append data sheet	
The Patch cord proposed shall be duplex, 1.6mm jacketed, and shall be of 50 µm multimode fiber (OM4) for MM and SM fiber for SM	

MULTIMODE 10G SFP MODULE TECHNICAL SPECIFICATIONS

SFP+ modules should have following features and benefits.

- Should have Industry's smallest 10G form factor for greatest density per chassis
- Should be Hot-swappable input/output device that plugs into an Ethernet SFP+ port of a switch (no need to power down if installing or replacing)
- Should have Digital optical monitoring capability for strong diagnostic capabilities
- Should have Optical interoperability with 10GBASE XENPAK, 10GBASE X2, and 10GBASE XFP interfaces on the same link

SFP-10G-SR-S module 10GBASE-SR module should support a link length of 26 meters on standard Fiber Distributed Data Interface (FDDI)-grade Multimode Fiber (MMF). Using 2000 MHz*km MMF (OM3), up to 300-meter link lengths are possible. Using 4700 MHz*km MMF (OM4), up to 400 meter link lengths are possible.

Should have Regulatory and standards compliance

Standards:

- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- IEEE 802.3: 10-Gigabit Ethernet
- ITU-T G.709: Interfaces for the Optical Transport Network

- ITU-T G.975: GFEC
- ITU-T G.975.1: EFEC
- SFP+ MSA SFF-8431 (Optical Modules, Active Optical Cables, and Passive Twinax cables)
- SFP+ MSA SFF-8461 (Active Twinax cables)

Safety:

- Laser Class 1 21CFR-1040 LN#50 7/2001
- Laser Class 1 IEC60825-1
- Cable jacket of SFP+ copper modules is UL #E116441 Compliant
- All length SFP+ copper cables are ELV and RoHS Compliant

12port/24 Port Fiber Optic LIU LC based with Pigtails, Splice Trays& Splice Protectors (Fully Loaded) Specifications

S. No.	Specifications	Requirement
1	Connector Type	LC-Style, Simplex
2	Operating temperature	-40 Degree C to +85 Degree C
3	Durability & color	
3	MM connectors	500 cycles, Beige
4	SM connectors	220 cycles, Blue
5	Ferrules	Pre-radiused Ceramic Ferrules
6	Attenuation	Not more than 0.75 dB per mated pair
7	FMS- Front Patching / Splicing Shelf	1U • 19" / ETSI versions available
		The FMS fiber management shelf series is ideal for high density front patching applications.
		Its compact design and high density capacity allows it to deliver carrier class fiber management to central offices, Pops, FTTx, mobile systems and LANs.
		• High Density:
		1U: 12/24 Fiber terminations
		• Should be supplied loaded with secondary coated SC/LC pigtails
		• Mounting brackets can be placed in different positions
8	Drawer	o Easy access to splicing tray

		o Easy access to back side of connector
		• Trays with hinges(book type) which allows facilitates easy fiber management and greater access during installation and rework
		• Fiber guides, radius controls & secure tie downs provided
9	Dimensions	Width- 450 mm & Depth - 280 mm , Height – 44 mm or similar
10	Color	Black

Cat 6 UTP/STP CABLING SYSTEM Specifications

Sr No.	Details	Specification
1	Type	Unshielded twisted pair cabling system, Certificate by Intertek (ETL) for the 4-Connectors channel testing to the Cat 6/Cat 6 STP Cabling system as per the ANSI/TIA 568 C.2 & as well as the ISO 11801 standards up to 550 MHz or more
2	Networks Supported	10 / 100/1000 Ethernet, 155 Mbps ATM, 1000 Mbps IEEE 802.3ab Ethernet, and proposed Cat 6 Gigabit Ethernet
3	TIA / EIA 568 C.2	ETL Verified / UL Listed
4	Warranty	Minimum of 10 year systems warranty; Warranty to cover Bandwidth of the specified and installed cabling system, and the installation costs
5	Performance characteristics to be provided along with bid	(a) Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4-connector channel (b) Should perform to CAT6 UTP/STP with short channel (c) 4-Connectors channel testing to the Cat 6 Cabling system as per the ANSI/TIA 568 C.2 & as well as the ISO 11801 standards up to 500 MHz or more (d) CAT6 cabling system should be tested and verified by the Independent third party laboratories for Zero BER (Bit Error Rate) testing at the data transmission speed of 1 Gbit/s.
6	ROHS	ROHS Complaint
7	Operating temperature	-20 Deg. C to +60 Deg. C
8	Bend Radius	4 * Cable Diameter

Cat 6 UTP/STP, UTP JACKS Specifications

Sr No.	Details	Specification
1	Type	PCB based, Unshielded Twisted Pair, Category 6, TIA /EIA 568-C.2 and ISO/IEC 11801
2	Modular Jack	750 mating cycles
3	Wire terminal	200 termination cycles
4	Accessories	Integrated bend-limiting strain-relief unit for cable entry or other mechanism to reduce the strain and bends at cable entry

		Integrated hinged dust cover
		Support cable pair termination process on the jacks at 45, 90 or 180 degree angle.
		Bidder should have a mechanism to maintain the quality of the termination irrespective of the skill level of the termination staff.
5	Housing	Polyphenylene oxide, 94V-0 rated.
6	110 Blocks	polycarbonate, 94V-0 rated
7	Jack contacts	Beryllium copper, plated with 1.27 mm [.000050] thick gold in localized area and 3.81 mm [.000150] minimum thick tin-lead in solder area over 1.27 mm [.000050] minimum thick nickel under plate
8	Wiring blocks	Polycarbonate, 94V-0 rated
9	Approvals	(a) UL Listed / CSA Approved
		(b) ETL verified to TIA / EIA Cat 6
10	Performance Characteristics to be provided with bid	Attenuation, NEXT, PS NEXT, FEXT and Return Loss
11	ROHS Compliance	ROHS compliant

UTP Jack Unloaded Panels, Cat 6 Specifications

S No.	Details	Specification
1	Type	24port, 1U, Unloaded Modular, PCB based, Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 and ISO/IEC 11801
2	Ports	24/48
3	Port arrangement	Configured as 6 Port Module with individually replaceable CAT-6 Jacks
4	Circuit Identification	Front of each module shall be capable of accepting labels
5	Port Identification	Labels on each of 48-ports (to be included in supply)
6	Modular Jack	750 mating cycles
7	Wire terminal	200 termination cycles

8	Accessories	Integrated bend-limiting strain-relief unit for cable entry or other mechanism to reduce the strain and bends at cable entry
9	Materials	
	Housing	Polyphenylene oxide, 94V-0 rated
	Wiring blocks	Polycarbonate, 94V-0 rated
	Jack contacts	Beryllium copper, plated with 1.27 mm [.000050] thick gold in localized area and 3.81 mm [.000150] minimum thick tin-lead in solder area over 1.27 mm [.000050] minimum thick nickel under plate
	Panel	Black, powder coated steel
10	Approvals	UL listed / ETL Verified
11	Termination Pattern	TIA / EIA 568 A and B;
12	ROHS Compliant	ROHS/ELV Compliant

Workstation/ Equipment Patch Cords Specification

S.No.	Details	Specification
1	Type	Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801
2	Conductor	24 AWG 7 / 32, stranded copper conductors 100 Ohm
3	Length	4 feet, 7 feet, 10 feet
4	Plug Protection	Transparent/clear/anti snag Slim boot
5	Warranty	25-year component
6	Jacket	CM Rated
7	ROHS Compliance	ROHS/ELV Complaint

Faceplate Specifications

Sr.	Details	Specification
1	Type	Single Gang, US style, 2.5 x 4 inches
2	Material	ABS / UL94 V-0
3	No. of ports	Two/Four/Six
4	Holder, Jack	ABS UL 94V-0
5	Cover Label	Acrylic UL94V-0
6	ROHS Compliance	ROHS/ELV Complaint

LC to LC Patch Cord Single Mode

Sr No.	Specifications	Requirement	Compliance	Deviation
1	Make and Type-	LC to LC Duplex Fiber Optic Patch Cord, 9/125 micron		
2	Cable Sheath	LSZH		
3	Cable Diameter	1.8 mm mini twin zip		
4	Ferrule	Ceramic		
5	Return Loss	> 45 db		
6	Insertion Loss	.1 db Typical Max .3 db		
7	Length	3/5/10 meters.		
8	ROHS	ROHS Compliant		

Network Racks Specifications:

1. Adjustable 12U equipment mounting verticals provide the better mounting flexibility and maximizes the usable mounting space
2. Depth adjustable mounting slots
3. Top and bottom Panel with ventilation and cable entry facility
4. Provision to mount the cooling fans on the top panel
5. Powder coated finish with pretreatment process meeting all industry standards
6. Grounding and Bonding Options.

14. (ANNEXURE - IV) - ACTIVE COMPONENT SPECIFICATIONS

Core Switch Layer 3 - 10Gig * 24Ports Specifications

Core Switch Layer 3 - 10Gig * 24Ports	
Sr. NO.	Specification
1	General Hardware and Interface requirements
1.1	Switch should have minimum 24 nos. SFP+ ports supporting 10G and 2 No of 40 G ports
1.2	Switch must have 1:1 redundant internal power supply.
1.3	Power supply modules, fan modules and transceivers modules should be hot swappable.
2	Performance Requirements
2.1	Switch shall have minimum 232 Gbps of switching fabric and 170 mpps of forwarding rate or above.
2.2	Switch must have minimum 32K MAC Addresses.
2.3	Switch must have minimum 1K Active VLANs.
2.4	Switch shall support minimum 8K IPv4 and IPv6 unicast routes.
2.5	Switch shall support minimum 4K IPv4 and IPv6 multicast groups.
2.6	Switch shall support minimum 4K IPv4 and IPv6 QoS and Security ACLs.
2.7	Switch shall support static routing, OSPFv2, OSPFv3 and BGPv4.
2.8	Switch shall support policy based routing and virtual routing and forwarding feature.
2.9	Switch shall support Protocol-independent multicast (PIM) for IP multicast routing is supported, including PIM sparse mode (PIM-SM)/PIM dense mode (PIM-DM)/PIM sparse-dense mode and source-specific multicast (SSM).
2.1	Switch must have atleast 2GB RAM and 2GB Flash / SD card
3	IEEE Standards
3.1	Should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z.
3.2	Switch hardware capable for IEEE 802.1AE / MacSec on all ports
4	Quality of Service (QoS) requirements
4.1	Switch shall have 802.1p class of service, IP differentiated service code point (DSCP) and cross stack QoS.
4.2	Switch shall have committed information rate, rate limiting and flow based rate limiting.
4.3	Switch shall have minimum 8 egress queues per port and strict priority queuing.
5	System Management and Administration
5.1	Switch should support SSHv2, SNMPv2c, SNMPv3, NTPv3 and NTPv4.
5.2	Switch should support AAA using RADIUS and TACACS+.
5.3	Switch should support port security, DHCP snooping, Dynamic ARP inspection, IP Source guard, BPDU Guard, Spanning tree root guard and IPv6 First Hop Security.
5.4	Switch should support software upgrades via TFTP or FTP.
5.5	Switch should support IPv4 and IPv6 ACLs, VLAN , Port and Time based access list with time ranges.
5.6	Switch shall have Switch Port Analyzer (SPAN) and Remote Switch Port Analyzer (RSPAN) .

5.7	Switch shall have Layer 2 trace route for ease of troubleshooting by identifying the physical path that a packet takes from source to destination.
5.8	Switch shall have Internet Group Management Protocol (IGMP) Snooping for IPv4 and IPv6, MLD v1 and v2 Snooping and Multicast VLAN Registration protocol.
5.9	Switch shall have per port broadcast, multicast and unicast storm control.
5.1	Switch shall have Unidirectional Link Detection Protocol (UDLD), Aggressive UDLD, Link Aggregation Control Protocol (LACP), Port Aggregation Protocol (PAgP) and Dynamic Trunking Protocol (DTP).
5.11	Switch should be Software Defined Networking Ready with Openflow or similar protocol support
6	Regulatory Compliance
6.1	Switch shall conform to UL 60950 or IEC 60950 or CSA 60950 or EN 60950 Standards for Safety requirements of Information Technology Equipment.
6.2	Switch shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B Standards for EMC (Electro Magnetic Compatibility) requirements.
7	Evaluation Compliance
7.1	Switch should be certified for EAL 2/NDPP or above under Common Criteria Certification.
7.2	Switch should be IPv6 Certified.

Access Switch – Layer 2 -24 Port with 8*802.3bz support specifications

Access Switch - Layer 2 -24 Port with 8*802.3bz support	
Sr. NO.	Specification
1	General Hardware and Interface requirements
1.1	Switch should have minimum 24 nos. PoE+ Copper Ports and 2 nos. of 10 Gig SFP+ uplink ports.
1.2	Switch must support IEEE 802.3bz standard on 8 or more ports to support higher wireless bandwidth from wave 2 Access Points
1.3	Switch shall have minimum 120 Gbps of stacking bandwidth with dedicated stacking ports and cables with minimum 4 switch in stack.
1.4	Switch shall support 1:1 redundant internal power supply.
1.5	Power supply modules, fan modules and transceivers modules should be hot swappable.
2	Performance Requirements
2.1	Switch shall have minimum 232 Gbps of switching fabric and 170 mpps of forwarding rate.
2.2	Switch shall have minimum 32K MAC Addresses.
2.3	Switch shall have minimum 1K Active VLANs.
2.4	Switch shall support minimum 8K IPv4 and IPv6 unicast routes.
2.5	Switch shall support minimum 4K IPv4 and IPv6 multicast groups.
2.6	Switch shall support minimum 4K IPv4 and IPv6 QoS and Security ACLs.
2.7	Switch must have atleast 2GB RAM and 2GB Flash / SD card
3	IEEE Standards
3.1	Should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z.
3.2	Switch hardware capable for IEEE 802.1AE / MacSec on all ports
4	Quality of Service (QoS) requirements
4.1	Switch shall have 802.1p class of service, IP differentiated service code point (DSCP) and cross stack QoS.
4.2	Switch shall have committed information rate, rate limiting and flow based rate limiting.
4.3	Switch shall have minimum 8 egress queues per port and strict priority queuing.
5	System Management and Administration
5.1	Switch should support SSHv2, SNMPv2c, SNMPv3, NTPv3 and NTPv4.
5.2	Switch should support AAA using RADIUS and TACACS+.
5.3	Switch should support port security, DHCP snooping, Dynamic ARP inspection, IP Source guard, BPDU Guard, Spanning tree root guard and IPv6 First Hop Security.
5.4	Switch should support software upgrades via TFTP or FTP.
5.5	Switch should support IPv4 and IPv6 ACLs, VLAN , Port and Time based access list with time ranges.
5.6	Switch shall have Switch Port Analyzer (SPAN) and Remote Switch Port Analyzer (RSPAN) .
5.7	Switch shall have Layer 2 trace route for ease of troubleshooting by identifying the physical path that a packet takes from source to destination.
5.8	Switch shall have Internet Group Management Protocol (IGMP) Snooping for IPv4 and IPv6, MLD v1 and v2 Snooping and Multicast VLAN Registration protocol.
5.9	Switch shall have per port broadcast, multicast and unicast storm control.
5.1	Switch shall have Unidirectional Link Detection Protocol (UDLD), Aggressive UDLD, Link Aggregation Control Protocol (LACP), Port Aggregation Protocol (PAgP) and Dynamic Trunking Protocol (DTP).

5.11	Switch should be Software Defined Networking Ready with Openflow or similar protocol support
6	Regulatory Compliance
6.1	Switch shall conform to UL 60950 or IEC 60950 or CSA 60950 or EN 60950 Standards for Safety requirements of Information Technology Equipment.
6.2	Switch shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B Standards for EMC (Electro Magnetic Compatibility) requirements.
7	Evaluation Compliance
7.1	Switch should be certified for EAL 2/NDPP or above under Common Criteria Certification.
7.2	Switch should be IPv6 Certified.

WLAN Controller Specifications

Wireless LAN Controller	
Sr. NO.	Specification
1	Must be compliant with IEEE CAPWAP or equivalent for controller-based WLANs.
2	Should have atleast 2 x 10 Gigabit Ethernet interface.
3	Should support both centralized as well as distributed traffic forwarding architecture with L3 roaming support from day 1. Should have IPv6 ready from day one.
4	Controller should have hot-swappable redundant power supplies.
5	Controller should support minimum 20,000 users per chassis
6	WLAN Controller must be a dedicated hardware appliance which should support minimum of 1200 Access points in a single chassis. Proposed controller should support 1+1/N+1 redundancy from day one
7	Should be rack-mountable. Required accessories for rack mounting to be provided.
8	WLC should support AVC functionality on local switching architecture
9	WLC should support AC and DC powering options
10	Should support minimum 4000 VLANs
11	WLC should support L2 and L3 roaming for IPv4 and IPv6 clients
12	WLC should support guest-access functionality for IPv6 clients.
13	Should support IEEE 802.1p priority tag.
14	Should ensure WLAN reliability by proactively determining and adjusting to changing RF conditions.
15	Should provide real-time radio power adjustments based on changing environmental conditions and signal coverage adjustments.
16	Should support automatic radio channel adjustments for intelligent channel switching and real-time interference detection.
17	Should support client load balancing to balance the number of clients across multiple APs to optimize AP and client throughput.
18	Should support policy based forwarding to classify data traffic based on ACLs
19	Should support minimum 500 WLANs
20	Should support dynamic VLAN assignment
21	Should support Hot Spot 2.0

22	To deliver optimal bandwidth usage, reliable multicast must use single session between AP and Wireless Controller.
23	Must support coverage hole detection and correction that can be adjusted on a per WLAN basis.
24	Must support RF Management with 40 MHz and 80 Mhz channels with 802.11n & 802.11ac
25	Should provide visibility to Network airtime in order to set the airtime policy enforcement
26	Must be able to restrict the number of logins per user.
27	Should support web-based authentication to provide a browser-based environment to authenticate clients that do not support the IEEE 802.1X supplicant.
28	Should support port-based and SSID-based IEEE 802.1X authentication.
29	Should support MAC authentication to provide simple authentication based on a user's MAC address.
30	WLC Should support Rogue AP detection, classification and standard WIPS signatures.
31	WLC should be able to exclude clients based on excessive/multiple authentication failure.
32	Shall support AES or TKIP encryption to secure the data integrity of wireless traffic
33	Should support AP location-based user access to control the locations where a wireless user can access the network
34	Should support Public Key Infrastructure (PKI) to control access
35	Must be able to set a maximum per-user bandwidth limit on a per-SSID basis.
36	Should support SNMPv3, SSHv2 and SSL for secure management.
37	Should support encrypted mechanism to securely upload/download software image to and from Wireless controller.
38	Should provide visibility between a wired and wireless network using IEEE 802.1AB Link Layer Discovery Protocol (LLDP) and sFlow/equivalent.
39	Should support AP Plug and Play (PnP) deployment with zero-configuration capability
40	Should support AP grouping to enable administrator to easily apply AP-based or radio-based configurations to all the APs in the same group
41	Should support selective firmware upgrade APs, typically to a group of APs minimize the impact of up-gradation
42	Must Support the application visibility from Layer 4-7.
43	Should have a suitable serial console port.

Indoor AP Specifications

Indoor Wireless Access Point - Wave 2	
Sr. No.	Specification
1	Access Points proposed must include radios for 2.4 GHz and 5 GHz with 802.11ac Wave 2
2	Mounting kit should be standard from OEM directly.
3	Access point must support flexible Dynamic Frequency Selection across 20Mhz, 40Mhz, 80MHz and 160Mhz wide channels to combat performance problems due to wireless interference. And when radar is detected, it should able to identify the exact 20 Mhz channel & should able to block that channel only
4	Access point should have serial/console port
5	Access point should have a IEEE 802.3bz/ Multigigabit Ethernet to take the full advantage of Wave 2 throughput.
6	Must have atleast 4 x dBi Antenna gain on both 2.4 Ghz and 5Ghz
7	Must support 4X4 multiple-input multiple-output (MIMO) with three spatial streams
8	The access point should have a capability to enable both the radios on 5Ghz for serving the client thereby increasing the bandwidth capacity.
9	Must support minimum of 23dbm of transmit power on both 2.4 Ghz & 5GHz Radio.
10	The AP must be capable of optimizing the SNR exactly at the position where 802.11a/g/n/ac client is placed (beamforming) without requiring any support or feedback from clients, hence it should work with all 802.11a/g/n/ac clients.
11	Should have detecting and classifying non-Wi-Fi wireless transmissions while simultaneously serving network traffic
12	Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data.
13	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.
14	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization
15	Must have -90 dB or better Receiver Sensitivity.
16	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.
17	Must support Management Frame Protection.
18	Should support locally-significant certificates on the APs using a Public Key Infrastructure (PKI).
19	Must operate as a sensor for wireless IPS
20	Should support non-Wi-Fi detection for off-channel rogues and Containment for both radio while serving the client simultaneously.

21	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.
22	AP model proposed must be able to be both a client-serving AP and a monitor-only AP for Intrusion Prevention services.
23	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.
24	Mesh support should support QoS for voice over wireless.
25	Must be plenum-rated (UL2043).
26	Must support 16 WLANs per AP for SSID deployment flexibility.
27	Must continue serving clients when WAN link to controller is back up again, should not reboot before joining
28	The APs must support centralized wireless mode with the use of a controller, but the APs must also support operation in autonomous mode without the presence of any controller, when needed.
29	When operated in remote AP mode, the AP must not disconnect any clients when the connection to the controller fails or in the case the failed connection has been restored again.
30	When operated in remote AP mode, the AP must be able to authenticate new users with local radius server directly at the AP itself in case of link failure to controller.
31	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.
32	Must support Power over Ethernet/ power injectors.
33	802.11e and WMM

Outdoor Access Point Specifications

Outdoor Wireless Access Point	
Sr. No.	Specification
1	Access Points proposed must be 802.11ac, Wave 2 compliant, include radios for both 2.4 GHz and 5 GHz.
2	Must have -88 dB or better Receiver Sensitivity.
3	Must support 3X3 multiple-input multiple-output (MIMO) with three spatial streams
4	Must support data rates upto 860 Mbps on 5Ghz radio.
5	Must support 80 MHz wide channels in 5 GHz.
6	Must support WAP enforced load-balance between 2.4Ghz and 5Ghz band.
7	Must support upto 28dbm or heigher of transmit power
8	Access point should 802.11ac, Wave 2 802.11n and 802.11a/b/g Beamforming
9	Support Encrypted and authenticated connectivity between all backhaul components
11	Access point should have multiple wired uplink interfaces including 10/100/1000BASE-T Ethernet autosensing (RJ-45) and a build-in SFP port
12	Wireless AP should support beam forming technology to improve downlink performance of all mobile devices, including one-, two-, and three-spatial-stream devices on 802.11ac without taking the inputs from client.
13	Wireless AP Should able to detect and classify non-Wi-Fi wireless transmissions.
14	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization
15	Access point shall support pole, wall and Cable strand mounting options.
16	The equipment shall support up to 100 MPH sustained winds & 165 MPH wind gusts.
17	The Access point shall be IP67 and NEMA rated
18	The Access point shall support operating temperature of -30 to 55°C
19	The Access point shall support Storage temperature of -50 to 70°C
20	802.11e and WMM
21	Wi-Fi Alliance Certification for WMM and WMM power save
22	Must support QoS and Video Call Admission Control capabilities.
23	Must support Spectrum analysis including @ 80 MHz
24	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.
25	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.
26	Must support 16 WLANs per AP for BSSID deployment flexibility.
27	Must support telnet and SSH login to APs directly for troubleshooting flexibility.
28	Must have accessories like mounting kit and antennas etc from same OEM

Network Management System and Automation Specifications

Network Management System and Automation (Software Solution)	
Sr. NO.	Specification
	NMS
1	Solution must manage wireless and LAN networks proposed
2	Solution must have location-based tracking of interferers, rogues, and Wi-Fi clients
3	Solution must integrate with AAA Policy server
4	Solution must have RF prediction tools
5	GUI/Web based Interface which can manage proposed network upto node level.
6	Should offer integrated functions to manage–
7	* Devices (Switches, Wireless Controller & APs) Monitoring & Management,, Troubleshooting,
8	*VLAN management
9	*Real-time device status & operational & configuration functions
10	*Device software upgrades management, Configuration file management, Fault & performance management
11	SDN Automation and Orchestration
12	The bidder shall propose a software-defined networking (SDN) controller as single point of automation and control network-wide to support centralized control of any device, any policy, for any user.
13	Solution must support policy-based automation that applies business intent to dynamic network policies and configurations.
14	Solution must support northbound representational state transfer (REST) APIs and southbound protocols/APIs to communicate network devices
15	The solution shall support zero-touch-deployment and change management to lower operational expenditures and increase network quickly changes to align with business needs
16	The solution shall periodically scan the network to create an inventory of all network devices for the entire enterprise network.
17	The solution shall auto-discover and place devices to a physical topology with detailed device-level informations.
18	The solution must support automated inspection and visualization of the path taken by a flow between two endpoints in the network by analyzing 5-Tuple (source IP address/port number, destination IP address/port number and the protocol) .
19	Must have required software, License for smooth running for NMS, SDN to support wired and wireless network as proposed in this tender

Rack Server Specifications

Rack Server		
Sr. NO.	Item	Specification
1	Processors	Each server shall have a minimum of two (2) Intel CPU with 16 Core series CPUs or Higher
2	Chipset	Latest chipset supporting and optimized for the above processor
3	Hard Disk	The server should have up to 8, 2.5" front-accessible, hot-swappable, SAS/SSD or SATA drives with 4X600 GB, 15K SAS HDD
4	RAID	The Server RAID controller should support the following configurations RAID 0, 1, 5, 6
5	Raid Card	Internal 8-port 12Gb/s PCIe RAID controller Supports up to 255 3Gb/s, 6Gb/s and 12Gb/s SAS or SATA HDDs or SSDs 2GB 1866MT/s DDR3 SDRAM nonvolatile cache
6	Memory	Support for advanced memory redundant technologies like Advanced error- correcting code (ECC) and memory mirroring. Up to 64GB (4 DIMM slots) with 64 GB ram from day 1:
7	Network	Should have 4 * 1 GbE LAN on Motherboard (LOM) for network Connectivity and 2*10 G
8	Optical Drive	Internal DVD-ROM drive
9	I/O	2 x PCIe 3.0 slots + 1 slot for internal storage with 16 Gb FC HBA
10	Ports	Should have the atleast following ports for server connectivity: 1 serial port, 2 USB ports, 1 VGA video port
12	Certification	Platinum efficiency, hot-plug, redundant 350W and 550W power supplies; Bronze efficiency, cabled 350W power supply Auto-ranging power supplies
13	Server Mgmt.	OEM embedded controller with dedicated management port with IPMI 2.0 compliance and Server Management Tool from same OEM
14	Power supplies	Redundant efficient Power Supply (atleast 500 Watts each) to sustain above configuration.
15	Cooling	Hot plug and redundant fans
16	Systems management	Should be IPMI 2.0 compliant, and provides server-level management that monitors, reports and controls power consumption at the processor, memory and system level.
17	OS and Virtualization	The quoted server models should have the following Certifications: Microsoft Windows Server2008 R2, Microsoft® Windows® HPC Server 2008, Novell SUSE Linux Enterprise Server, Red Hat Enterprise Linux,

		Sun Solaris, Microsoft® Windows Server® 2008 Hyper-V, VMware® ESXi Version 4.1, Citrix® XenServer 5 and all latest versions. The Server must be supplied with virtualization software that sits directly on bare metal hardware with capability to add(CPU, memory, devices) to VM's when needed. It should have less agentless integration with 3rd party security(AV, anti malware). The Network Management System and Automation Software Solutions shall host on the VM created in this Server hence the solution of NMS should have complete compatibility with this virtual setup of this server.
18	Industry Certification	The server OEM must be ISO-14001, FCC, UL, ROHS
19	Form factor	1U Rack form factor with sliding rails to fit into industry standard 19" Server Rack
20	Warranty	3 years onsite warranty with 6 hrs CTR (24 x 7 support) by OEM Pre-failure warranty on CPU, Memory & Hard disks;
21	OS	The Server must be supplied with one no of RedHat Linux OS Enterprise Version or higher and one no of Windows Enterprise Version or higher

Large Display Technical Specifications

S.No.	Technical Specification of Large Monitor	
1	Screen Size	55 Inch Edge-lit LED
2	Panel Technology	60Hz LED
3	Resolution	1920 x 1080
4	Aspect Ratio	16:09
5	Brightness	350 nits or higher
6	Contrast Ratio (Typical)	5000:01:00 or higher
7	Viewing Angle (H/V)	178Deg /178Deg
8	Response Time	8ms or higher
9	Connectivity	LAN and Wi-Fi
10	Input	VGA (D-sub 15 pin), DVI-D, HDMI, DisplayPort, Component/Composite, USB, Stereo Mini Jack, TV In
11	Output	DVI-D (Digital Loop out), Stereo Mini Jack
12	External Control	RS232C (in/out) through Stereo Jack, RJ45
13	Sensor	Stereo Mini Jack (IR in/out), Mini USB (Ext. Brightness/IR Sensor)
14	Power	
15	Power Supply	AC 100 - 240 V~ (+/- 10 %), 50/60 Hz
16	Power Consumption (Typical/Max)	86W / 102W
17	Power Consumption (Standby)	Less than 1W
18	Environmental Conditions	

19	Operating Temperature	0°C - 40°C
20	Operating Humidity	10%~80% Non-Condensing
21	Features	
22	Special	Built-in TV Tuner, Built-in Speaker (10W + 10W), Simple Plug & Play Media Player (through USB), Narrow Bezel, Slim Chassis Depth (1.18")
23	Built-in Tuner	Yes
24	Standard Interface	Wall-Mount 200 x 200mm Wall Mount or better

5 KVA UPS with 1 Hour Backup Technical Specifications

Sl. No	Specification	
1	capacity	5KVA Online with Two hours backup
2	Wave form	Pure Sine wave
3	Rectifier	IGBT based
4	Display	LED/LCD
5	Input power factor correction	0.99
6	input configuration	1Ph,L-N+PE
7	Output Power factor	0.8
8	frequency (Input)	50Hz frequency
9	frequency (output)	50Hz/60Hz frequency
10	V threshold	2%max full linear load,5% max on Nonlinear load
11	PF	>=0.99
12	AC-AC Efficiency	90% or batter
13	Transfer time Main-Battery	0
14	Transfer time Inverter-Bypass	4 msec
15	Emergency Power off function	Yes
16	Monitoring software for	Battery , health of UPS, any critical parameter change
17	communication	SNMP V1/V2
18	Programmable power management outlets	Ready from Day one
19	Port	USB,RS-232
20	Batter Type	SMF – Rocket/Excide/Quanta
21	Battery backup	2 Hours with full load
22	Environmental Parameter	
A	operating temperature range	0-50deg
B	Over Temperature, Load on Battery, Battery on Charge, Battery low, Mains on	Indication required

C	EPO function	Yes
D	Tel line surge protection	inbuilt
E	Humidity	0% to 95% non-condensing
F	Noise Level	50 dBA max
G	Size	not more than 2U rack mountable
23	Protection	IP20
A	Mechanical Parameter	EMI
B	Safety	EN
C	Performance	IEC/EN
24	MANAGEMENT Software	
	Supports Windows® Latest, Linux	Yes with SNMP ready from day 1

15. (ANNEXURE V) - TECHNICAL BID COMPLIANCE INFORMATION

Note: Bidders to ensure that the detailed technical specifications mentioned on Annexure III and IV in this tender are complied.

Wi-Fi Networking Requirement for Civil Sectt. Srinagar			
S.No	Item Description as per Technical Specifications in this Tender	UoM	Qty
A: Active Items Item Description as per Technical Specifications in this Tender			
1	Core Switch Layer 3 - 10Gig – 24 Ports	Nos.	2
2	Access Switch - Layer 2 -24 Port - 8*802.3bz support	Nos.	26
3	Wireless LAN Controller	Nos.	2
4	Indoor Wireless Access Point	Nos.	10
5	Outdoor Wireless Access Points	Nos.	168
6	Rack Server with OS	Nos.	1
7	NMS & SDN to manage LAN and Wireless Infrastructure	Nos.	1
8	SFP Optics- 10GBASE-SR SFP Module for L3 Core Switch	Nos.	28
9	SFP Optics- 10GBASE-SR SFP Module for L2 Access Switch	Nos.	28
10	SFP Optics- 1Gig Copper RJ45 for L3 Switch	Nos.	4
11	LED Display Screen	Nos.	1
12	5 Kva Online UPS with 2 hours Backup	Nos.	1

This is certified that the above mentioned Bill of Quantity is complied to the technical specification as mentioned in Annexure III and IV.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

S.No	Item Description as per Technical Specifications in this Tender	UoM	Qty
B: Passive Components as per Specifications in this Tender			
13	24 Port Patch Panel with Cable Manager	Nos.	6
14	Single Port STP Cat6A Information Outlet with Face Plate & SMB	Nos.	168
15	STP Cat6A Cable Box in Meters	Nos.	8235
16	1 Meter STP Cat6A Patch Cord	Nos.	336
17	6 Core Multi Mode Fiber Cable	Nos.	680
18	24 Port LIU LC based Rack Mount Loaded with all accessories	Nos.	2
19	12 Port LIU LC based Rack Mount Loaded with all accessories	Nos.	6
20	Multi Mode Fiber Patch Cord 3 Meter LC to LC	Nos.	16
21	LC Type Multi Mode Pigtail	Nos.	72
22	12 U Rack with 2 Fans with Fan Tray, 1 x Cable Manager, 1 x 6 Socket PDU, 1 x H/w Packet and should be complete with all accessories.	Nos.	6
23	PVC Conduit – 1” ISI Certified Prefreably AKG	Nos.	6588
24	PVC Conduit – 1.5” ISI Certified Prefreably AKG	Nos.	1318
25	Unslotted PVC Channel 25 mm – ISI Certified	Nos.	200
26	32 mm diameter PLB HDPE Pipe per meter	Meters	200
27	1-inch PVC Flexible pipe including all accessories (Reputed Brand)	Meters	200
28	RJ 45 Connector Box containing 100 RJ45 Connectors	Nos.	1
29	Electrical supply of Switch boards and cables, connectors for electric connectivity for the complete setup using standard ISI mark products (Lump Sum)	Nos	1

This is certified that the above mentioned Bill of Quantity is complied to the technical specification as mentioned in Annexure III and IV.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

S.No	Item Description as per Technical Specifications in this Tender	UoM	Qty
C: Service Components (will be calculated on actuals upon billing)			
31	Installation, Configuration and commissioning of Core Layer 3 - 10Gig – 24 Ports	Nos.	2
32	Installation, Configuration and commissioning of Access Switch - Layer 2 -24 Port - 8*802.3bz support	Nos.	26
33	Installation, Configuration and commissioning of WLAN Controller	Nos.	2
34	Installation, Configuration and commissioning of Indoor Wireless Access Point 802.11ac wave 2 – 4x4 MIMO with mounting kit and accessories.	Nos.	168
35	Installation, Configuration and commissioning of Outdoor Wireless Access Point 802.11ac wave 2 with mounting kit and accessories.	Nos.	10
36	Installation, Configuration and commissioning of Rack Server with OS and Virtualization setup	Nos.	1
37	Installation, Configuration and commissioning of NMS Server Software on Rack Server	Nos.	1
38	Installation, Configuration and commissioning of Large Display Technical Specification	Nos.	1
39	Installation, Configuration and commissioning of 10GBASE-SR SFP Module, Enterprise-Class	Nos.	56
40	Installation, Configuration and commissioning of 1000BASE-T SFP transceiver module for Category 5 copper wire	Nos.	4
41	Installation, Configuration and commissioning of 5 Kva Online UPS with 2 hours Backup	Nos.	1
42	Installation and commissioning of 24 Port Patch Panel with Cable Manager	Nos.	6
43	Installation and commissioning of Single Port STP Cat6A Information Outlet with Face Plate & SMB	Nos.	178
44	Laying, Installation & Commissioning of STP Cat6A Cable (In Meters)	Nos.	8235
45	Laying, Installation & Commissioning o of 1 Meter STP Cat6A Patch Cord	Nos.	336
46	Laying, Installation & Commissioning of above ground 6 Core Single Mode Fiber Cable above ground	Meters	680

This is certified that the above mentioned Bill of Quantity is complied to the technical specification as mentioned in Annexure III and IV.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

S.No	Item Description as per Technical Specifications in this Tender	UoM	Qty
47	Installation and commissioning of 24 Port LIU Rack Mount Loaded with all accessories	Nos	2
48	Installation and commissioning of 12 Port LIU Rack Mount Loaded with all accessories	Nos	6
49	Laying, Installation and commissioning of PVC Conduit per meter– 1” and 1.5” ISI Certified Preferably AKG	Meters	7906
50	Laying, Installation and Commissioning of Unslotted PVC Channel 25mm per meter	Meters	200
51	Laying, Installation and Commissioning of 32 mm diameter PLB HDPE Pipe per meter	Meters	200
52	Laying, Installation and Commissioning of 1-inch PVC Flexible pipe including all accessories (Reputed Brand)	Meters	200
53	Installation and Commissioning of 12 U Rack with 2 Fans with Fan Tray, 1 x Cable Manager, 1 x 6 Socket PDU, 1 x H/w Packet of 10 and should be complete with all accessories.	Nos	6
54	Installation and Commissioning of Fiber Patch Cord Pig tails	Nos	72
55	Installation and Commissioning of Fiber Patch Cord LC to LC	Nos	56
56	Installation and commissioning of RJ 45 Connector - Crimping work	Nos	100
57	Installation and termination of Information outlet from Rack Side per unit	Nos	178
58	Splicing of Fiber Per core	Nos	72
59	Labeling of Jack Panels with Printed labels	Nos	28
60	Labeling of patch cords with Printed Labels	Nos	356
61	Pentascanning Testing of Data Nodes	Nos	200
62	Complete Documentation w.r.t. network layout, cable structure, with count of Active, Passive Components with segregated list of each component for each network site implemented / operational.	Nos	1
63	Project Management Charges for execution of this project	Nos	1
64	On call Engineer Support per Year Cost (Min One Resource for One Year)	Nos	1
65	Electrical work as lump sum for installation and commissioning of electrical setup for the above work (lump sum)	Nos	1

This is certified that the above mentioned Bill of Quantity is complied to the technical specification as mentioned in Annexure III and IV.

Dated _____

Authorized Signatory Signature of Bidder with Company Stamp

16. (ANNEXURE VI) - COMPONENTS REQUIRING MANUFACTURERS AUTHORIZATION

Major Components	
S.No	Items
1	Core Switch Layer 3 - 10Gig – 24 Ports
2	Access Switch - Layer 2 -24 Port - 8*802.3bz support - Type 1
3	Wireless LAN Controller
4	Outdoor High End Wireless Access Points
5	Indoor High End Wireless Access Point
6	Rack Server with OS
7	NMS & SDN to manage LAN and Wireless Infrastructure
8	SFP Optics- 10GBASE-SR SFP Module for L3 SW
9	SFP Optics- 10GBASE-SR SFP Module for L2 Access SW
10	SFP Optics- 1Gig Copper RJ45 for L3 Switch
11	STP Cat6A Cable Box in Meters
12	6 Core Multi Mode Fiber Cable

17. (ANNEXURE VII) - FINANCIAL BID FORMAT

Wi-Fi Networking Requirement for Civil Sectt. Srinagar								
S.No	Item Description as per Technical Specifications in this Tender	UoM	Qty	Unit Rate	Amount in INR	Tax %	- Tax Amount	Total Amount in INR.
A: Item Description as per Technical Specifications in this Tender								
1	Core Switch Layer 3 - 10Gig – 24 Ports	Nos.	2					
2	Access Switch - Layer 2 -24 Port - 8*802.3bz support	Nos.	26					
3	Wireless LAN Controller	Nos.	2					
4	Outdoor Wireless Access Points	Nos.	10					
5	Indoor Wireless Access Point	Nos.	168					
6	Rack Server with OS	Nos.	1					
7	NMS & SDN to manage LAN and Wireless Infrastructure	Nos.	1					
8	SFP Optics- 10GBASE-SR SFP Module for L3 Core SW	Nos.	28					
9	SFP Optics- 10GBASE-SR SFP Module for L2 Access SW	Nos.	28					
10	SFP Optics- 1Gig Copper RJ45 for L3 Switch	Nos.	4					
11	LED Display Screen	Nos.	1					
12	5 Kva Online UPS with 2 hours Backup	Nos.	1					
B: Passive Components as per Specifications in this Tender								
13	24 Port Patch Panel with Cable Manager	Nos.	6					
14	Single Port STP Cat6A Information Outlet with Face Plate & SMB	Nos.	168					
15	STP Cat6A Cable Box in Meters	Nos.	8235					
16	1 Meter STP Cat6A Patch Cord	Nos.	336					
17	6 Core Multi Mode Fiber Cable	Nos.	680					
18	24 Port LIU LC based Rack Mount Loaded with all accessories	Nos.	2					
19	12 Port LIU LC based Rack Mount Loaded with all accessories	Nos.	6					
20	Multi Mode Fiber Patch Cord 3 Meter LC to LC	Nos.	16					
21	LC Type Multi Mode Pigtail	Nos.	72					

22	PVC Conduit – 1” ISI Certified Prefreibly AKG	Nos.	6588					
23	PVC Conduit – 1.5” ISI Certified Prefreibly AKG	Nos.	1318					
24	Unslotted PVC Channel 25 mm – ISI Certified	Nos.	200					
25	32 mm diameter PLB HDPE Pipe per meter	Meters	200					
26	12 U Rack with 2 Fans with Fan Tray, 1 x Cable Manager, 1 x 6 Socket PDU, 1 x H/w Packet and should be complete with all accessories.	Nos.	6					
27	1-inch PVC Flexible pipe including all accessories (Reputed Brand)	Mtrs.	200					
28	RJ 45 Connector Box containing 100 RJ45 Connectors	Nos.	1					
29	Electrical supply of Switch boards and cables, connectors for electric connectivity for the complete setup using standard ISI mark products (Lump Sum)	Nos	1					
C: Service Components (will be calculated on actuals upon billing)								
31	Installation, Configuration and commissioning of Core Layer 3 - 10Gig – 24 Ports	Nos.	2					
32	Installation, Configuration and commissioning of Access Switch - Layer 2 -24 Port - 8*802.3bz support	Nos.	26					
33	Installation, Configuration and commissioning of WLAN Controller	Nos.	2					
34	Installation, Configuration and commissioning of Indoor Wireless Access Point 802.11ac wave 2 – 4x4 MIMO with mounting kit and accessories.	Nos.	168					
35	Installation, Configuration and commissioning of Outdoor Wireless Access Point 802.11ac wave 2 with mounting kit and accessories.	Nos.	10					
36	Installation, Configuration and commissioning of Rack Server with OS and Virtualization setup	Nos.	1					
37	Installation, Configuration and commissioning of NMS Server Software on Rack Server	Nos.	1					
38	Installation, Configuration and commissioning of Large Display Technical Specification	Nos.	1					
39	Installation, Configuration and commissioning of 10GBASE-SR SFP Module, Enterprise-Class	Nos.	56					

40	Installation, Configuration and commissioning of 1000BASE-T SFP transceiver module for Category 5 copper wire	Nos.	4					
41	Installation, Configuration and commissioning of 5 Kva Online UPS with 2 hours Backup	Nos.	1					
42	Installation and commissioning of 24 Port Patch Panel with Cable Manager	Nos.	6					
43	Installation and commissioning of Single Port STP Cat6A Information Outlet with Face Plate & SMB	Nos.	178					
44	Laying, Installation & Commissioning of STP Cat6A Cable (In Meters)	Nos.	8235					
45	Laying, Installation & Commissioning of of 1 Meter STP Cat6A Patch Cord	Nos.	336					
46	Laying, Installation & Commissioning of above ground 6 Core Single Mode Fiber Cable above ground	Meters	680					
47	Installation and commissioning of 24 Port LIU Rack Mount Loaded with all accessories	Nos	2					
48	Installation and commissioning of 12 Port LIU Rack Mount Loaded with all accessories	Nos	6					
49	Laying, Installation and commissioning of PVC Conduit per meter– 1” and 1.5” ISI Certified Preferably AKG	Meters	7906					
50	Laying, Installation and Commissioning of Unslotted PVC Channel 25mm per meter	Meters	200					
51	Laying, Installation and Commissioning of 32 mm diameter PLB HDPE Pipe per meter	Meters	200					
52	Laying, Installation and Commissioning of 1-inch PVC Flexible pipe including all accessories (Reputed Brand)	Meters	200					
53	Installation and Commissioning of 12 U Rack with 2 Fans with Fan Tray, 1 x Cable Manager, 1 x 6 Socket PDU, 1 x H/w Packet and should be complete with all accessories.	Nos	6					
54	Installation and Commissioning of Fiber Patch Cord Pig tails	Nos	72					
55	Installation and Commissioning of Fiber Patch Cord LC to LC	Nos	56					
56	Installation and commissioning of RJ 45 Connector - Crimping work	Nos	100					

57	Installation and termination of Information outlet from Rack Side per unit	Nos	178					
58	Splicing of Fiber Per core	Nos	72					
59	Labeling of Jack Panels with Printed labels	Nos	28					
60	Labeling of patch cords with Printed Labels	Nos	356					
61	Pentascanning Testing of Data Nodes	Nos	200					
62	Complete Documentation w.r.t. network layout, cable structure, with count of Active, Passive Components with segregated list of each component for each network site implemented / operational.	Nos	1					
63	Project Management Charges for execution of this project	Nos	1					
64	On call Engineer Support per Year Cost (Min One Resource for One Year)	Nos	1					
65	Electrical work as lump sum for installation and commissioning of electrical setup for the above work (lump sum)	Nos	1					
TOTAL INSTALLATION COST = (A+B+C)								