



REQUEST FOR PROPOSAL

RATE CONTRACT
FOR
SUPPLY AND INSTALLATION OF NETWORK
EQUIPMENT

BHEL/NETWORK/RC/22-23

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited

Hyderabad, Ramachandrapuram

Rate Contract for Supply and Installation of Network Equipment

Sl.No	Description
	TENDER NOTICE
	Introduction to BHEL
1	Brief Scope of Work
2	Pre-Qualification Criteria
3	General Instruction to Bidders
	Tender documents
	EMD/Tender Fee
	Security Deposit
	Procedure for Submission and Opening of Bids
	Validity of Offer, Deviations
	Rejection of Bids
	Tender Evaluation
	Other instructions
4	Commercial Terms and Conditions for Bidders
	Expectation from Bidders, Supply Condition, Delivery, Rates, Payment Terms, Bank Charges, Penalty, Downtime Calculation, E-Waste Disposal, Training
	Indemnity, Insurance, Nondisclosure Agreement, Confidentiality, Force Majeure, Patents & Trademarks, Subcontracting
	Termination of Lease Contract, Settlement of Disputes, Arbitration
	Acceptance of LOI/Rate Contract, Shifting of Equipment from one Location to another, Terminal Payment, Limitation of Liability, Ethical Standard, Integrity Pact
	Other Clauses
5	Contract Lease Agreement
6	Technical Specifications
	Technical Spec for Active Components
	Technical Spec for Passive Components
7	Brief Scope of Work - Technical
	Scope of work for all active components
	Scope of work for all passive components
8	Warranty and Support
9	Summary of Requirements and Location Details
10	Payment Centre and Administration of Contract
11	Checklist of Enclosures

Rate Contract for Supply and Installation of Network Equipment

**TENDER NOTICE From
M/s. Bharat Heavy Electricals Limited
HYDERABAD**

Ref. No.: BHEL/NETWORK/RC/22-23
Date: 21.04.2022

Subject: Rate Contract for Supply and Installation of Network Equipment – Lease Basis

Bharat Heavy Electricals Limited (BHEL) is the largest Engineering and Manufacturing Enterprise in India in the energy related and infrastructure today with an excellent track record of performance. The company has 17 manufacturing divisions, 4 Power Sector Regional Centers, 8 Service centers, 4 overseas offices, 1 subsidiary and over 100 project sites spread all over India and abroad and also regional operations divisions in various state capitals in India for providing quick service to customers. BHEL manufactures over 180 products under 30 major product groups and meets the needs of core-sectors like Power, Industry, Transmission, Transportation, Oil and Electronics. Products of BHEL make have established an enviable reputation for high quality and reliability.

BHEL (A Government of India Undertaking) invites tenders for Finalizing rate contract for supply, installation and maintenance of Network Equipment under **5 years Lease Basis** as per specifications detailed under "TECHNICAL SPECIFICATIONS" and terms and conditions as enclosed.

Offers shall be uploaded only by online mode through BHEL e-tendering portal – <https://eprocurebhel.co.in/nicgep/app>. Bidders need to log into the website, register for User ID & Password, search for the RFQ No and submit your quotation.

Offers received through any other mode will not be considered.

"BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking."

Rate Contract for Supply and Installation of Network Equipment

Introduction to BHEL

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1. Brief Scope of Work

Bharat Heavy Electricals Ltd. (A Govt. of India Undertaking) invites tenders from bidders who qualify as per criteria listed below. The tender is invited for the Rate Contract on Lease basis for supply, installation & maintenance of Network equipment throughout India at 17 locations for a period of FIVE years. The tender has to be submitted in TWO PARTS namely TECHNO-COMMERCIAL (unpriced) and PRICE.

The total items have been grouped into 2 categories namely, Active Components (Group A) and Passive Components (Group B). A bidder has to quote for both categories and **L1 will be determined on the overall price of both Group A and Group B combined together**. The Group wise items have been listed in Annexure-I (A & B).

2. Qualification Criteria for Bidders

2.1. Bidders shall be either OEMs or System Integrators of OEMs. Bidders other than OEMs must obtain and submit authorization letter (Refer Annexure-II for format) from OEM specifically for this tender only mentioning BHEL's tender reference number. For this tender, definition of OEM means manufacturer of Group A and Group B equipment only.

2.1.1. Group A – Network Active Components

2.1.2. Group B – Network Passive Components

2.2. The pre-qualification criteria for the bidders will be as follows:

Sl. No	Parameter	Description	Documents to be submitted
1	Registered Company	The bidder should be a registered company in India under Indian Companies Act 1956 / 2013.	Certificate of incorporation document to be submitted

Rate Contract for Supply and Installation of Network Equipment

2	Manufacturers Authorization Form	The bidder shall submit OEM Authorization letter (Manufacturers' Authorization Form) specific to this tender	OEM Authorization letter (Refer Annexure-II)
3	OEM Authorization / Partnership	The Bidder should be an Authorized Partner of the OEM and should have partnership with the OEM for a minimum duration of last 5 years.	Authorization letter to be submitted with Partnership certificate attested by the OEM, or a letter from the OEM confirming partnership for last 5 consecutive years, with a commitment to continue the partnership with the bidder.
4	Technical Assistance Centre (TAC)	The OEM should have TAC support in India	Supporting document from OEM to be submitted
5	Turnover	Average Annual financial turnover during the last 3 years ending 31 st March of the previous financial year, should be at least 21 cr.	Audited balance sheet and Profit & Loss Statements or a certificate from CA confirming the same
6	Net Worth	The Bidder should have positive net worth as on 31 st March 2022.	Certificate from CA confirming the same
7	Past Experience	The bidder should have executed any one of the following Similar Works in the preceding seven years in India as on the date of opening of Techno-Commercial proposal: i. One Purchase order costing more than ₹ 35 Crores OR	Relevant Purchase Orders as per Annexure-IX

Rate Contract for Supply and Installation of Network Equipment

		<p>ii. Two Purchase orders costing more than ₹ 25 Crores each</p> <p>OR</p> <p>iii. Three Purchase orders costing more than ₹ 10 Crores each</p>	
8	Quality Certification	The bidder or its associated group companies delivering the services must have ISO 27001 and ISO 9001 Certificate	Copy of ISO certificates
9	Insolvency	<p>a) If “Insolvency Resolution Process” has been initiated against the bidder and is pending, or the bidder is under insolvency, the bidder shall not be eligible to bid for this tender.</p> <p>b) Even during the processing period of tender till declaration of L1 if “Insolvency Resolution Process” is initiated against the bidder, or where the liquidation commencement date has occurred or a liquidation order has been passed or liquidation has been initiated in relation to the bidder, such bidder shall be disqualified from the process and BHEL will proceed further with tendering process without considering such bids.</p>	The bidder should provide an undertaking on its letter head to this effect signed by its authorized signatory.

Note:

- i) “Similar” Work means any work, which includes Supply, Installation and Commissioning of IT Network Equipment like Core Switch, Data Centre Core & Data Centre Access Switch, Distribution Switch, Access Switches, Firewall, Router, NMS, NAC.
- ii) In case where audited results for the last preceding financial year are not available, certification of financial statements from a practicing Chartered Accountant shall be considered acceptable.
- iii) BHEL reserves the right to visit bidder’s facilities like registered office, Service Centers, etc. or talk to customer/ clients to ascertain the capability of the bidder or the veracity of the testimonies at any time during evaluation of the bid.
- iv) For evaluation of PQR, the credentials of the bidder alone, and not that of the Group Company shall be considered.
- v) In case of any discrepancy, the decision of BHEL is final.

3. General Instructions for Bidders in addition to BHEL ITB GCC Rev10:

i) **Submission of Offers:**

- Offers shall be uploaded only by online mode through BHEL e-tendering portal – <https://eprocurebhel.co.in/nicgep/app>. Bidders need to log into the website, register for User ID & Password, search for the RFQ No and submit your quotation.
- Offers received through any other mode will not be considered.

ii) **EMD:**

An amount of Rs.2,00,000 towards EMD shall be paid by RTGS/NEFT/Demand Draft/Banker's cheque on any nationalized bank / scheduled bank in the name of "Bharat Heavy Electricals Limited" payable at Hyderabad and shall be enclosed to the tender bid. No other means of payment shall be accepted. EMD / any money due to the tender by BHEL shall not carry any interest. Copy of EMD payment shall be uploaded along with the technical bid and forward the original copy to AGM/Purchase/CMM , 4th Floor, Admin Building, HPEP – BHEL Hyderabad 502 032 without fail before due date.

Tenders received without EMD as specified above shall be rejected. If EMD is not in line with amount called for, the EMD will be returned and offer stands rejected.

EMD of unsuccessful bidders shall be returned promptly upon award of Contract and EMD of successful bidder will be returned upon the bidder's accepting the contract and furnishing the requisite security deposit.

EMD by the Tenderer will be forfeited as per NIT conditions, if:

- i) After opening the tender and within the offer validity period, the tenderer revokes his tender or makes any modification in his tender which is not acceptable to BHEL.
- ii) The Contractor fails to deposit the required Security deposit or commence the work within the period as per LOI/Contract. EMD by the tenderer shall be withheld in case any action on the tenderer is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" and forfeited/ released based on the action as determined under these guidelines.

- iii) **Opening of Tenders:** This is a Two-Part Bid. The Part I – Technical bid would be opened on the Tender opening date i.e. due date. The Part II – Price bid of Technically & Commercially suitable Bidders alone would be opened. The Technically & Commercially suitable Bidders would be informed about the tender opening date. Clarifications if any required by BHEL for Technical evaluation would be sought from Bidders before opening of Part II – Price bid.

Rate Contract for Supply and Installation of Network Equipment

iv) **Security Deposit:**

Successful bidder has to submit security deposit amount of Rs 1 crore to BHEL Hyderabad valid for the entire lease period.

EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security deposit.

Security deposit shall be furnished in any of the following forms:

- i. Pay order in favour of BHEL.
- ii. Demand draft in favour of BHEL.
- iii. Local cheques of scheduled banks, subject to its realization.
- iv. Bank Guarantee shall be from Nationalized Banks / Scheduled Bank / Public Financial Institutions as per the BHEL's Bank Guarantee Format.
- v. Original Fixed deposit receipt (FDR) issued by scheduled banks / public financial institutions as defined in the Companies Act. The FDR should be in the name of successful bidder, A/c BHEL, duly discharged on the back.

Acceptance of security deposit against point iv and v above, will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected there with. Security deposit shall not be refunded to the Successful bidder except in accordance with the terms of the Contract i.e. upon successful completion of the Contract.

The Security Deposit shall not carry any interest.

The bidder shall forfeit the Security Deposit In the event bidder fails to execute the supply as per terms and conditions of the contract.

The acceptance of the above is mandatory failing which the bidder shall be out rightly rejected.

- v) The quotation should be valid at least for a period of 180 days from the tender opening date. Price quoted should be on firm price basis. Price Variation Clause within this period will not be entertained.

4. Commercial Terms and Conditions for Bidders

4.1. GENERAL

The words incorporating singular shall include plural and vice-versa, in the words importing masculine gender shall include feminine and vice-versa and the words importing persons shall include bodies; corporate, limited liability companies, partnership and other legal entities.

4.2. Expectations from Bidders

Bidder is required to give a total solution & services as per specifications enclosed. The full working of all Network Equipment and Services is the responsibility of the Bidder. In case any extra item is required for complete functioning of the system, the same must be quoted.

4.3. SUPPLY CONDITION

- 4.3.1. All equipment supplied and installed at the stipulated locations shall be NEW and conforming to the contract technical specifications. The certificate of newness is to be furnished.
- 4.3.2. The successful Bidder has also to produce a certificate from his principal OEM for back-to-back support for the complete lease period for all items. The period of back-to-back support with OEM will start from the date of installation note issued by respective locations.

4.4. DELIVERY

- 4.4.1. Delivery (i.e. Supply and installation) period shall start from the date of placement of firm order by respective unit.
- 4.4.2. "Delivery and Installation period" shall be as detailed below and it will be counted from the date of Order:

Item	Delivery Period
All Items	10 months

Note: Delivery period refers to supply, installation and commissioning of all items

4.5. RATES

- 4.5.1. Rates to be quoted are net F.O.R. destination inclusive of freight, handling and packing charges, transit insurance, installation, regular/on-site insurance and on-site comprehensive maintenance including spares at stipulated locations during

Rate Contract for Supply and Installation of Network Equipment

the entire lease period and shall remain FIRM without any variation till completion of the lease contract.

- 4.5.2. Rates are to be quoted as per Price Bid Format providing details of prevailing rates of taxes and duties. Bidders, in their own interest, are requested to check up the different tax tariff like "Right to use" etc. at stipulated locations. After opening of Price Bid, no request for any change in rates/tariff due to above will be entertained.

4.6. PAYMENT TERMS

- 4.6.1. The Lease agreement will be signed centrally; however, the payment of lease charges will be made on quarterly basis after completion of each quarter and submission of invoice(s) in triplicate, uptime report to the respective payment centers from where the payments will be directly released. Purchase Orders will be placed by respective BHEL units. Payment will be released by respective BHEL units within 75 days of submission of invoices and certification by BHEL.
- 4.6.2. Group A (active components) – The lease quarterly payment will be due after completion of the quarter from the date of successful completion of installation & acceptance by BHEL. However, 1st quarter lease payment will be proportionate as per installation dates of various equipment, if required.
- 4.6.3. Group B (passive components) – 100% Payment of passive components will be made after supply, installation, commissioning of the total project and certification by respective unit of BHEL.
- 4.6.4. Bidder shall raise the invoice from the vendor office which is located nearer or within same state of BHEL Unit/Region which placed the firm order and processing shall be done by respective BHEL unit.

4.7. BANK CHARGES

- 4.7.1. Unless otherwise specified, the Bank charges, if any, shall be to the account of Bidder.

4.8. PENALTY FOR LATE DELIVERY OF THE PROJECT

- 4.8.1. For the delay in delivery, penalty shall be levied at the rate of 0.5% per week (or part thereof) subject to maximum of 10% of the total lease rent for entire lease period. This penalty will be deducted from the first quarter rental charges, in case the penalty amount to be deducted is more than the first quarter rental charges, the same will be adjusted from the consecutive quarter. Penalty amount so determined along with applicable GST thereon shall be recovered.
- 4.8.2. Any delay attributable to BHEL will not be considered for penalty.

Rate Contract for Supply and Installation of Network Equipment

4.9. Downtime Calculation for Network Equipment

Bidder shall be responsible for running the Equipment at the uptime as per details given below:

The bidder shall ensure that the following SLA parameters are met.

The vendor shall maintain the overall uptime to minimum 99% on quarterly basis during the lease period.

A deduction from the overall quarterly rental shall be made at the rate of 1% for each 1% fall of uptime from 99%, e.g. if the uptime is 98%, one percent of quarterly rental for the particular quarter shall be deducted. The calculation for uptime shall be made on quarterly basis. The downtime calculation shall be based on 24x7 hours.

There shall be no downtime due to mutually agreed scheduled maintenance of equipment or due to power outage.

Downtime of network shall be the period (in hours) during which expected connectivity is not available on the network or part of network. The downtime factors for calculation of the penalty shall be as follows:

SI No	Category	Equipment Covered	Downtime Factor
1	A	Core Switch, Data Centre Core Switch, Data Centre Access Switch, Distribution Switch, Wireless LAN Controller, Firewall, Link Load Balancer, NAC, Web Security Appliance	10
2	B	Router, NMS, Access Switches, Indoor Access Point, Outdoor access point, UPS, 3G 4G Router, CPE, DSLAM	6

Downtime calculation

Downtime calculation will be applicable for non-availability of Network services arising due of malfunctioning of switches, UPS, wireless network components etc.

Example of Downtime Calculation

Penalty will be calculated as indicated below:

Equipment down	-	Distribution switch
Downtime (in Hours)	-	Y
Quarterly maintenance value for the equipment (Rs)	-	A
Acceptable downtime per quarter (in Hours)	-	$24 * 30 * 3 * 1\% = X$
Downtime factor	-	F
Penalty (Rs)	-	$(A * F * (Y - X)) / (3 * 30 * 24)$

Penalty will be limited to maximum quarterly maintenance value for the equipment

Rate Contract for Supply and Installation of Network Equipment

There shall be no downtime due to mutually agreed scheduled maintenance of equipment or due to power outage.

In situations where equipment needs to be repaired/replaced and the same model is not available in the market, the Vendor shall repair/ replace the faulty Equipment immediately of equivalent or higher model considering the compatibility of equipment.

If the uptime for equipment/system falls below 95% continuously for 3 months, the system/equipment shall have to be replaced by the Bidder within 30 days without any extra charge.

4.10. E-Waste disposal

- 4.10.1. Vendor shall ensure full compliance to latest E-waste (Management and Handling) Rules issued by Government for products being supplied to BHEL
- 4.10.2. Vendor should ensure that either them or the producer of products supplied by them has required authorization from respective State Pollution Control Boards / Pollution Control Committees for implementing EPR (Extended Producer Responsibility) across the concerned state.
- 4.10.3. In case BHEL wants to discard the products as E-waste after the end of the lease period as per latest E-Waste Management and Handling Rules, the Vendor should arrange for collection of e-waste and bear all the costs. BHEL will not pay any cost for the same.

4.11. TRAINING

- i) The bidder shall organize minimum 10 working day training courses from authorized training partner of the OEM(s) of the active components with proper lab environment for minimum 15 BHEL officials. The course shall include:
 - a) Advanced switching, routing & security (Switch, Router, NAC, NGFW, WLC)
 - b) WSA and APT (sandboxing technologies).
 - c) LLB & NMS

In case the training involves physical travel of participants, the traveling & stay charges for the participants will be borne by BHEL.

- ii) The bidder shall also organize a full day operational / administration level training at the individual locations for the network administrators for all the supplied equipment.

4.12. INDEMNITY

- 4.12.1. Bidder shall fully indemnify and keep indemnified the Purchaser/Lessee against all claims which may be made in respect of the use of System/Software/Item(s)/services supplied/rendered by the Bidder, for infringement of any rights protected by patent, registration of designs or trademarks and legality of the Software. However, the Bidder will have no obligation for any claim of infringement arising from third party products not supplied in the order, modifications and technical information/instructions advised by purchaser and use of products prohibited by product manuals.
- 4.12.2. All such claims in this regard will be settled as per Indian Laws.
- 4.12.3. In the event of any such claims being made against the Purchaser/ Lessee, Purchaser/Lessee will inform in writing to the Bidder who shall at his own risk and cost either settle any such dispute or conduct any litigation that may arise there from.

4.13. INSURANCE

- 4.13.1. Insurance for the complete Systems/Goods shall be arranged by the Bidder at his own risk and cost during transit, movement, storage and throughout the period of lease. Purchaser/Lessee, under any circumstances, will not be responsible for any loss/damage/theft of any Systems/goods, due to any reasons, whatsoever. Claim(s) etc., if any, will be dealt with the underwriters directly by the Bidder. Evidence of insurance policy shall be submitted to BHEL. If the bidder fails to renew the policy before the expiry, BHEL may renew the insurance and recover from the lease rental.

4.14. NON-DISCLOSURE AGREEMENT

- 4.14.1. The successful bidder shall sign a Non-Disclosure Agreement (NDA) as per BHEL format in compliance to Information Security Management System.

4.15. CONFIDENTIALITY

- 4.15.1. Bidder and its representatives shall, at all times, undertake to maintain complete confidentiality and integrity of all data, information, software, drawings & documents, etc. belonging to the Purchaser and also of the Systems, procedures, reports, input documents, manuals, results and any other company documents discussed and/or finalized during the course of execution of the order/contract.

4.16. FORCE MAJEURE

4.16.1. The supplier shall not be considered in default if delay occurs due to causes beyond their control such as Acts of God, Natural calamities, Fire, Frost, Flood, Civil War, civil commotion, riot, Government Restrictions. Only those causes that have duration of more than seven days shall be considered cause of force majeure. Notification to this effect duly certified by local chamber of commerce/statutory authorities with supporting documents shall be given by the supplier to BHEL by registered letter/courier service immediately within 14 days. In the event of delay due to such causes the delivery schedule shall be extended for a length of time equal to the period of Force Majeure or at the option of BHEL the order may be cancelled. Such cancellation would be without any liability whatsoever on the part of BHEL. In the event of such cancellation the supplier shall refund any amount advanced or paid to the supplier by BHEL and deliver back any material issued to him by BHEL and release facilities, if any provided by BHEL.

4.16.2. Cancellation / Termination of contract and risk purchase

Purchaser shall have the right to completely or partially terminate the agreement by means of written notice to that effect without prejudicing their other rights in the event that :

- The seller is declared bankrupt, its business has been shut down or liquidated, a substantial part of its assets have been attached/destroyed, or the business has been transferred to a third party.
- Any misrepresentation or hiding of material fact if detected at a later stage.
- The delivery is rejected after inspection or re-inspection.
- In the event of termination, the risk of the items already delivered but not of use to Purchaser, as determined by purchaser, remains with the seller. The items shall then be at the seller's disposal and they are to be collected by the seller. The seller shall refund any payments made by purchaser in terms of the terminated agreement immediately, not later than 30 days,

- In the event of Cancellation/ termination of contract, BHEL reserves the right to procure the items which are not delivered as per PO and charge the excess cost from the defaulting seller. In case the excess cost is not repaid by or recovered from the defaulting seller within 30 days, apart from legal recourse for effecting such recoveries, Penal action in line with BHEL's Suspension of Business dealings will be taken.

4.17. PATENTS & TRADEMARKS

4.17.1. Bidder shall at all times indemnify the Purchaser against all claims which may be made in respect of the Systems/goods/Software supplied by the Bidder, for infringement of any right protected by patent, registration of designs or trademarks and legality of usage of Software. In the event of any such claims being made against the Purchaser, Purchaser/Lessee will inform the Bidder who shall at his own cost either settle any such dispute or conduct any litigation that may arise there from.

4.18. SUB-CONTRACTING

4.18.1. Order/contract or any part thereof shall not be sub-contracted, assigned or otherwise transferred to any other party without prior written consent of the Purchaser. (in contradiction to above tie up point).

4.19. TERMINATION OF THE ORDER/ LEASE AGREEMENT & ITS CONSEQUENCES

- 4.19.1. The Purchaser will issue a written notice of non-compliance to the Bidder and after a rectification period of One month, termination and fore-closure clauses will be applicable.
- 4.19.2. Purchaser reserves the right to terminate the order/contract, either wholly or in part, upon situations arising due to non-compliance of stipulations of the Order/contract, by the Bidder, at the risk and cost of the Bidder.
- 4.19.3. Purchaser reserves the right to terminate the order/contract or a portion thereof for the contracted Systems/Goods not delivered within the stipulated period, and procure from an alternate source at the risk and cost to the Bidder. The Bidder shall be liable to the Purchaser/Lessee for any additional costs thereof.
- 4.19.4. Bidder shall continue the performance of the order/contract under all circumstances, to the extent not cancelled expressly by the purchaser.
- 4.19.5. Purchaser reserves the rights to cancel the lease agreement in case the equipment and services are not found to be satisfactory by the purchaser and apply Risk purchase clause for the same as mentioned at clause 4.18 and 4.21.3.
- 4.19.6. Fore-closure: In case of fore-closure of the lease agreement by the lessee for the no fault of the lessor, pro-rata compensation will be payable. Compensation will be equivalent to percentage of outright purchase cost and proportionately linked to balance lease period.
- 4.19.7. Consequences: As soon as the lease agreement is cancelled / terminated by the purchaser on account of fore-closure no further lease rent will be payable to the bidder.

4.20. SETTLEMENT OF DISPUTES

- 4.20.1. Except as otherwise specifically provided in the Order/Contract, all disputes concerning questions of the facts arising under the Order/Contract, shall be decided by the Purchaser, subject to written appeal by the Bidder to the Purchaser, whose decision shall be final to the parties hereto.
- 4.20.2. Any disputes or differences shall be to the extent possible settled amicably between the parties hereto, failing which the disputed issues shall be settled through arbitration.
- 4.20.3. However, the Bidder shall continue to perform the Order/Contract, pending settlement of dispute(s).

4.21. ARBITRATION

- 4.21.1. Shall be as per Clauses 56, 57, 58 of ITB GCC Rev10.

4.22. ACCEPTANCE OF LOI/ Rate Contract.

- 4.22.1. Letter of Seller/ Contractor/ bidder's acceptance of the LOI / Rate Contract is to be submitted within one week of issue date of LOI/Rate Contract. This will be submitted along with the performance Bank guarantee of the value of 10% of the total annual Lease Rent for all the equipment and valid for a period of one year. During the five years lease contract period this Bank guarantee shall be renewed year after year before the expiry of the earlier performance bank guarantee in force.

4.23. SHIFTING OF EQUIPMENT FROM A LOCATION TO OTHER

- 4.23.1. After initial installation as per location details given by BHEL, shifting of equipment from one location to another shall be the responsibility of the Bidder. The entire requisite works like dismantling of equipment, packing, transportation and transit insurance shall be the responsibility of the Bidder. A mutually agreed cost can be paid by BHEL to the Bidder on this account. The time given for shifting and installation of equipment at new location will be mutually agreed and time taken beyond that period will be treated as downtime.

4.24. TERMINAL PAYMENT

- 4.24.1. BHEL shall have the right to acquire or surrender all the equipment at the end of the lease period. In case BHEL decides to acquire the equipment, a nominal charge of Rs.1.00 will be paid as terminal payment and maintenance of these equipment shall be with the successful bidder until the ownership is transferred to the BHEL

without any extra charges for a period of not exceeding 60 days from the last date of the lease period.

4.24.2. In case of termination or surrender of equipment by BHEL at the end of the lease period, Bidder will remove the equipment from Purchaser/Lessee's premises at his own risk and cost after due permission from BHEL.

4.25. LIMITATION OF LIABILITY

4.25.1. The Bidder's liability will be limited to the value of the contract only.

4.26. ETHICAL STANDARD

Bidders are expected to observe the highest standard of ethics during the procurement and execution of this contract. In pursuit of this policy, the purchaser will reject a proposal for award if it is found that the bidder being considered for award has engaged in corrupt or fraudulent practices in competing for the contract. For the purpose of this provision, the terms set forth are defined as follows:

- "Corrupt practice" means offering, giving, receiving or soliciting of anything of value to influence the action in the procurement process or in contract execution; and
- "Fraudulent Practice" means a misrepresentation of facts in order to influence a procurement process including collusive practices designed to establish bid prices at artificial, non-competitive levels to deprive the purchaser of the benefits of competition.

By signing The Bid forwarding letter, the bidder represents that for the software it supplies, either it is the owner or has authorization from the owner of the Intellectual Property Rights in the software. Willful misrepresentation of these facts shall be considered as fraudulent practice without prejudice to the other remedies that the purchaser may take.

4.27. INTEGRITY PACT

The bidder shall sign an integrity pact, to comply with the requirements of the Transparency International Ltd (TIL) and the Central Vigilance Commission (CVC) guidelines to ensure an ethical and corruption-free business environment. The format for Integrity Pact is attached as Annexure-XII.

4.28. OTHER CLAUSES:

- 4.28.1. Bidders must offer all software, licenses and support for complete solution. All licenses must be in the name of BHEL. Licenses must clearly mention their validity period and renewal policies.
- 4.28.2. The bidder shall include and provide all other hardware or software items that are not explicitly mentioned herein but are required to full-fill the intended specifications.

5. Contract Lease Agreement

(Based on the finalized terms and conditions, BHEL will consider signing of **Bipartite /Tripartite Lease Agreement with bidder and lessor (in case of Tripartite)** after placement of LOI.)

After BHEL notifies the successful Bidder that its bid has been accepted (through issuance of LOI / Rate Contract), the Bidder shall sign and return back to BHEL duplicate copy of the LOI/Rate Contract as an acceptance of the LOI/Rate Contract within 7 working days along with Performance Bank Guarantee (PBG). Thereafter, BHEL shall issue the draft contract agreement within 15 days of acceptance of LOI/Rate Contract along with submission of BG by the Bidder. One common agreement with generic terms and conditions, without any commercial and period (start and end of lease) mentioned shall be signed by the lead purchase agency and specific agreement shall be signed by each unit from where PO is released for the required equipment in the next 15 days. Format of Tripartite agreement is placed in Annexure-III.

6. Technical Specifications

Technical specification for active components is attached as Annexure-IV

Technical specification for passive components is attached as Annexure-V

7. Brief Scope of Work –Technical

7.1. General Points

The broad scope of work includes the following:

- 7.1.1. Supply, Installation, Configuration, Commissioning, integration, Migration, Testing and Maintenance of complete hardware including all necessary software licenses as per the BoQ and Technical specifications (Annexure-IV and Annexure-V) at different locations of BHEL as per Annexure-VI.

- 7.1.2. Successful Bidder has to provide hardware and software support, subscription, Upgrades, Updates, patches, support from the OEM for the entire solution during entire lease period.
- 7.1.3. Scope of work consists of two (2) groups:
- Group A: Active Components**
- A.1**
- LAN Core, Data Centre Core, Distribution, Access Switch
 - Access Point (AP) and Wireless Controller (WLC)
 - NAC
 - SFP Modules
- A.2**
- NMS
 - Firewall
 - Web Security Appliance
 - Link Load Balancer
 - Router
 - 3G 4G Router/DSLAM/CPE
 - UPS
- Group B: Passive Components**
- Fiber/Copper cable
 - Racks
- 7.1.4. All active components mentioned under Group A.1 of 7.1.3 should be from same OEM. No third-party components are to be integrated into the system.
- 7.1.5. Passive components (Fiber and copper cabling along with accessories) should be from same OEM.
- 7.1.6. The bidder must undertake the complete responsibility of supply, installation and commissioning of all hardware, software & other equipment which may belong to different OEMs (i.e. the entire scope of work of this tender) and to provide complete warranty and support as per terms and conditions.
- 7.1.7. The selected Bidder shall appoint a single point of contact for any activity pertaining to the requirements of this RFP.
- 7.1.8. OEM best practices must be followed for installation and configuration of hardware /software. Vendor needs to integrate the hardware supplied with the existing Network and structured network cabling should be implemented as per the best practices and to the satisfaction of BHEL. Vendor needs to demonstrate all the features mentioned in the specification after completion of installation.
- 7.1.9. High Level Design (HLD) and Low-Level Design (LLD) must be prepared and proposed by OEM directly and it should be submitted to BHEL by the OEM.

Rate Contract for Supply and Installation of Network Equipment

- 7.1.10. The implementation and deployment should be overseen and handhold by the OEM.
- 7.1.11. Vendor will be responsible to configure and install the solution according to the technical environment of BHEL and specification specified by BHEL to work with its existing infrastructure.
- 7.1.12. NTP server time synchronization should be supported for all the networking components.
- 7.1.13. Successful bidder has to integrate the proposed solution with other existing security solution such as Firewalls, Antivirus, Active Directory (Microsoft), Desktop & patch Management, etc. The bidder should provide necessary licenses as a part of the solution if required to connect / integrate with other above solutions.
- 7.1.14. Vendor has to comply the audit observations conducted by the BHEL or any controlling authorities during the contract period.
- 7.1.15. The products being quoted by the bidder should not be declared as at "end-of-sale" by the respective OEM (Original Equipment manufacturer) within three years from the date of bid submission end date. Undertaking to this effect must be submitted from OEM. In the event of the supplied equipment being declared end-of-sale within the mentioned period, the bidder has to replace the equipment with equipment having equivalent or higher configurations.
- 7.1.16. Access switches shall be deployed in stacking wherever required.
- 7.1.17. Stacking module, stacking cable etc. for the access switch to be provided along with the switches by the successful bidder.
- 7.1.18. Successful bidder shall integrate all endpoints with the proposed NAC solution.
- 7.1.19. Successful Bidder need to carry out the heat map in order to decide the suitable positioning of access point.
- 7.1.20. Supply and configuration of all components for NAC Solution (software, license, firmware etc.) and its integration with BHEL's existing/future network infrastructure (during the period of contract) as per technical specifications. The solution should be capable of being bypassed in the event of any failure of the solution.
- 7.1.21. Solution should have centralized architecture with web or Graphical User, Interface (GUI) based dashboard console to monitor, reporting, notification, maintaining and policy push for the registered users centrally.
- 7.1.22. The solution must be able to generate report on different parameters i.e. Compliance, Non-Compliance, frequency and variety of end points, Corporate, Guest, BYOD, Mobile Devices, IOT's, etc.
- 7.1.23. The solution should able to create complete separation for Guest and BHEL Employee.

- 7.1.24. The proposed solution should be able to integrate with existing Antivirus solutions (TrendMicro), active directory (Microsoft) for compliance. Integration with other solutions if any should not be limited to the above-mentioned OEMs and integration should be available with other OEMs also without any additional licensing
- 7.1.25. The solution should be SDN ready in the data center from Day-1.
- 7.1.26. All supplied Software Licenses should be in the name BHEL and BHEL should be able to log the support calls directly with the OEM.
- 7.1.27. Placement of order for passive component will be done and payment will be done based on actual material/service consumed and upon certification by BHEL.
- 7.1.28. All cabling must be "structured" and cable laying shall be through PVC Pipe, Casing.
- 7.1.29. The successful bidder shall properly dress and label all the cables, I/Os, Jack Panel, Switches for new connections.
- 7.1.30. Repair/Refurnishing work owing to damage caused due to cabling or any other work related to this Project. There should not be any hanging or uncovered wire.

7.2. Scope of work for Active components

For installation, a brief scope of work is given as under. However, if any activity or component is required for the completeness or successful functioning of any item, the same shall be part of the scope of supply and work.

7.2.1. Switches

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Configure VLANs & VTP
- Perform system & verification test
- Mounting into the rack
- Configuration of trunks / Ethernet channels where ever required
- Configuration of HSRP/VRRP
- Enabling / configuring security features like Port Security, BPDU Guard, Root Guard etc.
- Enabling / configuring performance features like Portfast, Link fast, Backbone fast etc.
- Configuring ACLs
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.

7.2.2. Wireless

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Configuration of trunks / Ethernet channels where ever required
- Creating SSIDs for Wireless access
- Configuring High availability for Wireless Controllers
- Applying security policies in Controller
- Mounting of Wireless Access Points
- Configuring Indoor and Outdoor Access Points and associating with Controllers
- Guest access portal for outside users.
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.

7.2.3. NAC

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Integrating NAC with Active Directory
- Creating templates and policies for various devices
- BYOD Access for guest users
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.

7.2.4. NMS

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Integrating all active components such as switches, wireless controller and wireless access points with NMS.
- Daily monitoring of all network devices status using NMS
- Configuration backup of all network devices
- Software image upgrade of network devices
- Reports configuration

- Configuration Backup of NMS
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.

7.2.5. Firewall

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Implementation of security policies
- Enabling next generation firewall features such as IPS/IDS etc
- High availability configuration
- Integrating firewall with SOC
- Configuration backup
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.

7.2.6. Routers

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self test
- Installation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Mounting into the rack
- Configuring ACLs as per BHEL requirement.
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc.
- Configuration of NAT/PAT etc.
- Enabling / configuring IP Routing as per BHEL requirement
- Configuring Packet inspection, Application inspection etc.

7.2.7. Web Security Appliance

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Implementation of security policies
- Integrating web security appliance with SOC
- Configuration backup
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc

7.2.8. Link Load Balancer

- Inventory & Configuration, verification against Ordered Specification
- Perform power on self-test
- Installation/Upgradation of OS
- Assign IP address
- Establish LAN connectivity
- Perform system & verification test
- Configuration of Link Load Balancer for load balancing multiple ISPs
- Configuration backup
- Enabling/ disabling Telnet, SSH, HTTP, SNMP, Syslog etc

7.2.9. UPS

- Inventory & Configuration, verification against Ordered Specification
- Connecting batteries
- Perform power on self-test
- Perform system & verification test
- Verify backup time on full load
- Connecting load to UPS
- Quarterly preventive maintenance
- Attending to UPS related issues
- Replacement of faulty equipment/faulty parts.
- In case of all online UPS, bidder shall inform BHEL at least 1 month before delivery about switchgear, space, cabling and any civil work requirements.

7.3. Scope of work for Passive components

7.3.1. Copper Cabling & Fiber Cabling

- Both Copper Cabling & Fiber Cabling shall be done as per industry standards and best practices.
- Supply, laying, termination, testing and maintenance of OFC cable, UTP cable.
- Repairing/replacing any fiber/UTP during full lease period, cut due to any reason whatsoever, will be done by the vendor. BHEL shall not bear any cost for the same.
- Supply and installation of all passive components including I/O boxes, Light Interconnect Units (LIUs), Patch panels, Patch cords, connectors etc required to complete the work on structured cabling concept.
- Supply of all cable laying accessories including GI/MS conduits, PVC pipes/channels, supporting structures, clamps, identification tags, ferules, cable route markers etc required for laying of cables. The vendor shall include in his scope, any digging work required for laying of cables.
- Minor civil works such as chipping / cutting of floors for making grooves, making holes/opening through walls, ceiling or floors, drilling of holes

through steel structures and frames, grouting of frames, hooks on walls/ceiling etc. required for execution of work. After erection, surface shall be made good by plastering / painting to their original shape and finish. Road cutting, if any, shall also be resurfaced and brought to their original shape and finish.

- The vendor shall ensure that the structured cabling system work is carried out by an experienced, registered and certified contractor of the proposed system. The technical support staff engaged by the contractor shall be experienced and approved by the structured cabling system solution provider.

7.4. EQUIPMENT AND SYSTEMS DELIVERABLES

- 7.4.1. The Successful bidder's scope of work includes supply, installation, configuration, commissioning, acceptance testing, integration and handing over of the proposed solutions and services to BHEL team.
- 7.4.2. It also includes other activities like assembly, quality and quantity checks, packing, supply, transportation, transit insurance, local delivery, unloading, handling, storage at site, mounting, movement of hardware to the designated locations, cabling, integration of devices and systems to the existing BHEL network.
- 7.4.3. It also includes customization, configuration, re-configuration, performance tuning, documentation, warranty and training of BHEL personnel which are supplied as part of this RFP.
- 7.4.4. The vendor shall provide documentation on:
 - Configuration of all active equipment
 - Licensing documents
 - Network architecture
 - Network diagram which includes IP address, Port numbers, Device name etc
 - Passives routing map with route markers
 - Total inventory details
- 7.4.5. The Successful bidder shall also provide all required hardware, software, components and equipment which may not be specifically stated herein, but are required to meet the intent of ensuring completeness, maintainability and reliability of the complete system covered under this scope. List of such items along with Licences, if any, shall also be provided along with the bid and during the execution of the project.
- 7.4.6. Upon successful completion of installation and implementation, the OEM (active components) should check and certify that all components are configured as per industry best security practices.

- 7.4.7. All the cables, power cables, patch cords and connectors required for the functionality of solutions shall be provided by the successful bidder.
- 7.4.8. The successful bidder shall properly dress and label the cables in the network rack. All accessories for dressing and labelling shall be provided by successful bidder at no extra cost.
- 7.4.9. The Successful bidder shall submit a certificate of undertaking from respective OEM certifying that the equipment offered are original and not refurbished as per Undertaking on Authenticity of Devices. (**Annexure-VII**).
- 7.4.10. The Successful bidder shall submit a certificate of undertaking from respective OEM certifying that the equipment offered is not reaching End-of-Sale within next 3 years from the date of bid submission end date.
- 7.4.11. The delivery and installation of hardware, software, licenses and other equipment shall be as per the Bill of Quantities (BoQ) and technical specifications.
- 7.4.12. The successful bidder should take adequate care at the time of installation and should not cause any damage to BHEL property. If any such damage is caused, then the successful bidder shall repair/replace it and the cost of repairing will be borne by the successful bidder.

7.5. IPV6 COMPLIANCE

- 7.5.1. All the network equipment provided should be IPv6 Ready (Dual Stack) and deployed network should be IPv6 ready (Dual Stack) with end to end IPv6 supported applications. The equipment should be either TEC certified or IPv6 Ready Logo certified.
- 7.6. The supplier shall assign a qualified Project Manager having at least 10 years of experience to supervise the installation and deployment of all the items across all the BHEL locations. The engineers deployed to carry out the installation should have the following minimum qualifications/certifications:
- 7.6.1. For installation of network devices, the engineers should have CCNP or equivalent certification.
 - 7.6.2. The resident engineer (RE) posted at BHEL locations should have the following minimum qualification and experience:
 - 3 years diploma/Engineering degree in electronics / computers/ hardware.
 - CCNA or equivalent certified engineers for providing support on network devices.
 - 7.6.3. Before posting engineers to BHEL locations, the supplier/service provider shall submit the CV of engineers to respective BHEL locations for vetting and acceptance. The respective BHEL locations may interview the candidate for acceptance/rejection

- before they are actually posted.
- 7.6.4. The SI has to abide by the rules & regulations of the respective Contract Labour Cell at locations.
 - 7.6.5. The bidder has to submit the PF and ESI registration details at the time of bidding. If the bidder at the time of bidding does not have PF/ESI registration, then the bidder has to submit the undertaking that PF/ESI registration will be submitted within 30 days from the date of issue of LOI. If the required information is not furnished within 30 days then BHEL reserves the right to cancel the Order and forfeit EMD and SD.
 - 7.6.6. The SI has to submit the PF/ESI documents before posting the RE's at locations. The SI will also submit the details (PF/ESI etc) of the OEM personnel who would be coming to the BHEL premise for maintenance calls. The SI has to submit any other documents required by BHEL and or Govt Bodies as and when required.
 - 7.6.7. Contractor has to ensure payment of statutory minimum wages as prescribed by BHEL/Central/State Government (whichever is higher) at respective locations where equipment's are supplied.
 - 7.6.8. The RE's must be on the payrolls of the SI and SI has to submit the payslips (salary statement) to respective locations. Offloading/Sub-contracting of RE's to other vendors is not allowed.
 - 7.6.9. If resident engineer is absent for more than 2 consecutive working days, a substitute shall be arranged.
 - 7.6.10. In case the RE resigns, the same has to be intimated to respective BHEL location and alternative resource has to be deployed prior to the relieving of the RE.

8. Warranty and Support

- 8.1. The successful bidder shall provide comprehensive on-site support of the all the hardware / software with back to back support with the respective OEM, for a period of 5 years, from the date of sign-off.
- 8.2. Contract/Support period of 5(five) years will start from the date of Sign Off or 'Go-Live' date provided by BHEL respective units.
- 8.3. During this Comprehensive Onsite Maintenance Support period, Vendor needs to provide complete support for any Software / Hardware issues and provide either repair or replacement support with identical or higher configuration at no extra cost to BHEL. There shall be no limitations on no. of support calls / visits by the Vendor / Vendor's representative whenever required. Replacement or Repair under Comprehensive Onsite Maintenance Support clause shall be made by the Vendor free of all charges at sites including freight, insurance or any other charges related to maintenance of the items supplied. Comprehensive Onsite Maintenance Support covers all hardware, software patches and upgrades, Firmware Upgrades, Networking and Peripheral components and there shall be no exclusions.
- 8.4. Warranty period of 5 years for all the active components from the project sign-off

Rate Contract for Supply and Installation of Network Equipment

date.

- 8.5. On-Site support from SI should be available during warranty and support period for the offered solution. Escalation support Engineer (Other than Resident Engineer) has to visit BHEL site if needed on BHEL request to attend the issue on priority.
- 8.6. All proposed products shall not be End-of-sale till 3 years from the date of bid submission end date. Letter from OEM mentioning the same shall be provided.
- 8.7. In case a product or part of the product (component) is rendered end of life/support during the contract period, a substitute of equivalent or higher capacity should be provided free of cost to the BHEL in place of the original product given in the bidding document submitted by the successful bidder. The bidder shall inform the BHEL well in advance, whenever OEM declares end of life/support of the relevant product during the contract period.
- 8.8. Warranty Support level from OEM for all active components shall be available 24x7x365 basis. However, RMA Support level from OEM for the following component should be as follows:

UNITS	EQUIPMENT	REQUIRED SUPPORT
Delhi, Hyderabad, Bengaluru, Chennai	Data Centre Core, Data Centre Access, LAN Core Switch, Distribution Switch, Wireless Controller	24 x 7 x 4
	Other Equipment	NBD
All other locations	All Equipment	NBD

Note: NBD – Next Business Day

- 8.9. Component Warranty Support level from OEM during the period of the contract, all upgrades/ patches or requirements in hardware, software, licensing, implementation of upgrades/patches/version changes etc., would be done by the bidder without any additional cost to BHEL.
- 8.10. If during the contract period, the solution is not performing as per specifications and scope of work mentioned in this RFP, bidder shall upgrade/enhance the devices or place additional devices and reconfigure the system without any extra cost to the BHEL till the required performance is achieved.
- 8.11. Repair / Replacement of faulty / defective Hardware and other supplied items inclusive of supply of all types of spare parts etc.
- 8.12. All Software Patches, Upgrades, updates, Service Packs, etc. of Software supplied by the OEM must be made available free of cost during the entire contract period.
- 8.13. The successful bidder shall be responsible for any reconfiguration, new configuration changes in the solution as per BHEL requirements during the entire period of contract.
- 8.14. The Successful bidder should participate and provide necessary support during the DC-DR Drill, or during real disaster.
- 8.15. During the warranty/support period, the vendor in addition to attending to calls for

repairs/maintenance shall conduct on-site preventive maintenance checks on quarterly basis and report is to be submitted to BHEL within 15 days of quarter end. In case bidder does not submit preventive maintenance report as per prescribed time, payment for the comprehensive support will not be released for that quarter until bidder submits the PM report.

- 8.16. Maintenance service shall cover services, repairs and replacements necessary to keep the equipment in good working order on reasonable use of the equipment during the lease period. Preventive maintenance, wherever required, should be carried out to keep the equipment in good working condition. Maintenance shall include, but not limited to, all plastic and/or rubber parts, adapters etc.
- 8.17. The Bidder shall indicate overall AMC percentage on the outright purchase price for the next two years after completion of the five years lease period as per attached format (Annexure-XV). The AMC value will not be considered in the evaluation of L1 bidder. The successful bidder shall have to accept to undertake the AMC after lease period in case BHEL requires AMC from them.

9. Summary of Requirements & Location Details

The tentative list of consignees and respective locations with quantity and type of equipment to be delivered as per Annexure–VIII(a) and VIII(b). The firm order will be subjected to a variation of 10% of the contract value.

10. Payment Centre & Administration of Contract

The tender envisages supply and installation of equipment at different locations as per tentative consignee list enclosed. The administration of contract will be at respective locations. As part of this rate contract, the rates will be finalized centrally and orders will be placed by respective units / divisions for their requirements. The detail of various locations where delivery & supply given below. The bidder is to clearly understand that the service is to be provided on site at all the locations as detailed in relevant section and payment towards lease charges is to be collected from the place of placement of order as per details enclosed below:

Rate Contract for Supply and Installation of Network Equipment

No.	Unit / Division
1.	BHEL, HEEP, Haridwar
2.	BHEL, HEP, Bhopal
3.	BHEL, Tiruchirapalli Complex
4.	BHEL, Hyderabad
5.	BHEL, Ranipet
6.	BHEL, R&D, Hyderabad
7.	BHEL, Jhansi
8.	BHEL, PPPU, Thirumayam
9.	BHEL, PS-WR, Nagpur
10.	BHEL, CDT, Noida
11.	BHEL, PS-SR, Chennai
12.	BHEL, MPC, Chennai
13.	BHEL, HRDI, Noida
14.	BHEL, Jagdishpur
15.	BHEL, PS-NR Noida
16.	SSBG
17.	ROD-HQ

10.1. Documents (Three sets) to be submitted for claiming Quarterly Rental Charges:

10.1.1. In the First Quarter:

- I. Copy of Bipartite/Tripartite Lease Agreement
- II. Copy of Insurance valid for 1 year.
- III. Copy of Installation Certificates signed by BHEL Coordinator.
- IV. Original copy of Certificate signed by BHEL Coordinator certifying only non-availability figures for the quarter.
- V. Newness certificate of the equipment supplied from OEM. Invoice.

10.1.2. Subsequent Quarters:

- I. Original copy of Certificate signed by BHEL Coordinator certifying only non-availability/downtime figures for the quarter.
- II. Invoice.

10.1.3. Annually:

- I. Copy of Renewal of Insurance valid for the next one year.

11. Checklist of Enclosures

SI No	Annexure No	Description
1	Annexure I(A)	List of Active items
2	Annexure I(B)	List of Passive items
3	Annexure-II	Authorization letter format from OEM
4	Annexure-III	Contract Lease Agreement
5	Annexure-IV	Technical specs for Active Components
6	Annexure-V	Technical specs for Passive Components
7	Annexure-VI	Summary of BHEL Locations
8	Annexure-VII	Undertaking from OEM
9	Annexure-VIII	Summary of Requirements
10	Annexure-IX	Copies of Purchase Orders Executed
11	Annexure-X	Annual Turnover and Profit of Bidder
12	Annexure-XI	No Deviation Certificate
13	Annexure-XII	BHEL RCPuram Bank Details
14	Annexure-XIII	Integrity Pact
15	Annexure-XIV	Instructions to Bidders GCC Rev 10
16	Annexure-XV	AMC Format

Annexure - I (A)

Active Components

S.No	Item
1	LAN Core Switch
2	Data Centre Core Switch
3	Data Center Access Switch -Type 1 (Fiber)
4	Data Center Access Switch -Type 2 (Copper)
5	LAN Distribution Switch - Type 1 (16 port)
6	LAN Distribution Switch - Type 2 (24 port)
7	Access Switch -Type 1 (48 port NonPOE)
8	Access Switch -Type 2 (48 port POE)
9	Access Switch -Type 3 (24 port NonPOE)
10	Access Switch -Type 4 (24 port POE)
11	Access Switch -Type 5 (8 port NonPOE)
12	Access Switch -Type 6 (8 port POE)
13	Wireless Controller
14	Wireless Controller Licenses
15	Indoor Access Point
16	Outdoor Access Point
17	NAC Licenses
18	NAC Hardware
19	NMS Licenses
20	NMS Hardware
21	40G SM Fiber Module
22	40G MM Fiber Module
23	10G SM Fiber Module
24	10G MM Fiber Module
25	1G SM Fiber Module
26	1G MM Fiber Module
27	1G UTP Transceivers
28	3G4G Router
29	DSLAM 24 port

30	CPE
31	WAN Router
32	Link Load Balancer
33	Firewall
34	Web Security Appliance
35	L1 Engineer
36	L2 Engineer
37	Office Boy
38	6 KVA UPS
39	2 KVA UPS

Annexure - I (B)

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
	Supply, Installation, Testing, Labelling and Documentation of Cat 6 U/UTP Cable & Components as per the following BOQ:-	
1	CAT6 U/UTP LSZH Cable, 305 Meter	Reel
2	Single Port Face Plate without shutter - Square Type	Nos
3	Dual Port Face Plate with Shutter - Square Type	Nos
4	Quad Face Plate with Shutter- - Square Type	Nos
5	Cat 6 U / UTP Information Outlet	Nos
6	24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos
7	48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos
8	Cat 6 U / UTP Patch Cord, 3 Feet	Nos
9	Cat 6 U / UTP Patch Cord, 7 Feet	Nos
10	24 Port loaded UTP Jock Panel 1U Height	Nos
11	Cat 6 U / UTP Patch Cord, 0.5M	Nos
12	Cat 6 U / UTP Patch Cord, 0.5M	Nos
13	RJ 45 UTP Connector	Nos
14	RJ 45 STP Connector	Nos
15	Cat 6 U / UTP Patch Cord, 15 Feet	Nos
16	F/UTP Cat-6 Cable	Reel
	Supply, Installation, Testing, Labelling and Documentation of Cat 6A U/FTP Cable & Components as per the following BOQ:-	
1	CAT6A U/FTP Cable, 500Meter, LSZH (500 mtr reel)	Reel
2	Single Port Face Plate without shutter- White- Square Type	Nos
3	Dual Port Face Plate with Shutter- White - Square Type	Nos
4	Quad Face Plate with shutter, White - Square Type	Nos
5	Cat 6A Information Outlet	Nos
6	CAT6A 24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos
7	CAT6A 48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos
8	Cat 6A Patch Cord, 3 Feet	Nos
9	Cat 6A Patch Cord, 7 Feet	Nos

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
	Supply, Installation, Testing, Labelling and Documentation of Cat 6A Shielded Cable & Components as per the following BOQ:-	
1	CAT6A U/FTP Cable, 500Meter, LSZH (500 mtr reel)	Reel
2	Single Port Face Plate with shutter, White - Square Type	Nos
3	Dual Port Face Plate - with shutter, White - Square Type	Nos
4	Quad Face Plate - with shutter, White - Square Type	Nos
5	Cat 6A Shielded Information Outlet	Nos
6	CAT6A 24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos
7	CAT6A 48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos
8	Cat 6A Patch Cord, 1 Mtrs, LSZH	Nos
9	Cat 6A Patch Cord, 2 Mtrs, LSZH	Nos
10	CAT6A 24 Port loaded Patch Panel, Shielded - Straight,with rear coble manager •	Nos
	Supply, Installation, Testing, Labelling and Documentation of Single Mode Fiber & Components (OS2) as per the following BOQ:-	
1	Single Mode, OS2, 6Core, Outside Plant, Armor, Outdoor Stranded Loose Tube Cable	Mtr
2	12 Port LIU with OS2 modular cassettes with pigtails, splice trays and accessories (With SC adapter plate)	Nos
3	24 port loaded LIU with SC type pigtails, & 6-Pak MM SC Adapter Plate	Nos
4	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 10 ft (3 Mtr)	Nos
5	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 15 ft (5 Mtr)	Nos
6	Single Mode, OS2, SC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 10 ft (3 Mtr)	Nos
7	Single Mode, OS2, SC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 15 ft (5 Mtr)	Nos
8	Singlemode OS2 pigtail - SC type	Nos

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
1	Single Mode, OS2, 12Core, Outside Plant, Armor, Outdoor Stranded Loose Tube Cable	Mtr
2	12 Port LIU with OS2, modular cassettes with pigtails, splice trays and accessories (With LC adapter plate)	Nos
3	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 10 ft (3 Mtr)	Nos
4	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 15 ft (5 Mtr)	Nos
1	24 Core, Single Mode, Outside Plant, Stranded Loose Tube, Metallic Armored	Mtr
2	48 Core, Single Mode, Outside Plant, Stranded Loose Tube, Metallic Armored	Mtr
3	24 Port LIU with OS2 modular cassettes with pigtails, splice trays and accessories (LC adapter Plate)	Nos
4	48 Port LIU with OS2 modular cassettes, pigtails, splice trays and accessories (LC adapter Plate)	Nos
5	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 10 ft (3 Mtr)	Nos
6	Single Mode, OS2, LC - LC Duplex Fiber Patch Cord – 1.6 mm Duplex, Riser, yellow jacket, 15 ft (5 Mtr)	Nos
	Supply, Installation, Testing, Labelling and Documentation of Multi - Mode Fiber & Components (OM3) as per the following BOQ:-	
1	6 Core, Outside Plant, Multi Mode, OM3, Stranded Loose Tube, Mettalic Armored,	Mtr
2	12 Port Loaded Fiber LIU for Multimode Mode with OM3 Modular Cassettes with Pigtails, Splice kit / Splice Trays (SC type)	Nos
3	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
4	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
5	Multimode OM3 SC to LC, Fiber Patch Cord, Duplex 10 ft	Nos
6	Multimode OM3 SC to LC, Fiber Patch Cord, Duplex 15 ft	Nos
7	Multimode OM1 pigtail - SC type (OM3 Pigtail)	Nos

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
1	12 Core, Outside Plant, Multi Mode, OM3, Gel Free, Stranded Loose Tube, Mettalic Armored,	Mtr
2	12 Port Loaded Fiber LIU for Multimode Mode with OM3 Modular Cassettes with Pigtails, Splice kit / Splice Trays	Nos
3	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
4	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
1	24 Core, Outside Plant, Multi Mode, OM3,Stranded Loose Tube, Mettalic Armored,	Mtr
2	24 Port Loaded Fiber LIU for Multimode Mode with OM3 Modular Cassettes with Pigtails, Splice kit / Splice Trays and Accessories	Nos
3	48 Port Loaded Fiber LIU for Multimode Mode with OM3 Modular Cassettes with Pigtails, Splice kit / Splice Trays and Accessories	Nos
4	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
5	Multimode OM3 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
	Supply, Installation, Testing, Labelling and Documentation of Multi - Mode Fiber & Components (OM4) as per the following BOQ:-	
1	6 Core, Outside Plant, Multi Mode, OM4, Gel Free, Stranded Loose Tube, Mettalic Armored,	Mtr
2	6 Core, Indoor Unarmored, Multi Mode, OM4, Gel Free, Stranded Loose Tube,	Mtr
3	12 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtails, Splice kit / Splice Trays and Accessories	Nos
4	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
5	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
1	12 Core, Outside Plant, Multi Mode, OM4, Gel Free, Stranded Loose Tube, Mettalic Armored,	Mtr

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
2	24 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtails, Splice kit / Splice Trays	Nos
3	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
4	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
1	24 Core, Outside Plant, Multi Mode, OM4, Gel Free, Stranded Loose Tube, Mettalic Armored,	Mtr
2	24 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtails, Splice kit / Splice Trays and Accessories	Nos
3	48 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtails, Splice kit / Splice Trays and Accessories	Nos
4	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos
5	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos
	Testing:-	
1	Testing of all the Copper Ports by suing DTX 1800	Port
2	Testing of all the Fiber Cores by using OTDR	Core
	Supply, Installation, Testing, Labelling and Documentation of Racks & Accessories as per the following BOQ:-	
1	Standard Racks with Accessories - 6U, with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos
2	Standard Racks with Accessories - 12U, , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos
3	Standard Racks with Accessories - 15U , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos
4	Standard Racks with Accessories - 24U, , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
5	Standard Racks with Accessories - 800 x 800, 42U, - Perforated doors metal, 1Ph, 230V, 32A, Zero U standard Vertical rack mount power distribution unit with 12 X Indian Round Pin 5/15A, (Inlet Plug Not Installed, Recommended IEC30932A 2P +E), 16A MCB X 2 Circuits- PDU Rating 7.3KVA/Bottom feed- 3Mt/ Black, Horizontal Cable Manager	Nos
Supply & Installation of GI Raceways:-		
1	50 x 50 mm GI Raceway with Cover Threaded Rods Flats	Mtr
2	100 x 50 mm GI Raceway with Anchor Bolts & Nuts	Mtr
3	200 x 50 mm GI Raceway with Cover	Mtr
4	300 x 50 mm GI Raceways with cover	Mtr
Supply & Installation of PVC Conduits:-		
1	25 mm PVC conduit with the accessories	mtr
2	50 mm PVC conduit with the accessories	mtr
3	1" PVC conduit with the accessories	mtr
4	1.25" PVC conduit with the accessories	mtr
5	1.5" PVC conduit with the accessories	mtr
Supply & Installation of Casing & Capping:-		
1	25 mm casing & capping with the accessories	mtr
2	50 mm casing & capping with the accessories	mtr
3	1" casing & capping with the accessories	mtr
4	1.25" casing & capping with the accessories	mtr
5	1.5" casing & capping with the accessories	mtr
Supply & Installation of HDPE Pipes:-		
1	25 mm HDPE PLB Pipe with the accessories	mtr
2	40 mm HDPE PLB Pipe with the accessories	mtr
3	50 mm HDPE PLB Pipe with the accessories	mtr
4	80 mm HDPE PLB Pipe with the accessories	mtr
Trench Work:-		
1	100 cm depth x 30 cm width Soft Soil Trenching in meters	mtr
2	100 cm depth x 30 cm width Hard Soil Trenching in meters	mtr
Chambers & Splice Enclosures:-		

PASSIVE COMPONENTS		
Sr. No.	Description	UoM
1	Construction of Chambers 100 cm dia x 100 cm depth for joining the OFC cables	mtr
2	Installation of Readymade concrete chambers for joining the OFC cables	mtr
3	Splice Enclosure - 48F	Nos
4	Splice Enclosure - 24F	Nos
5	Splice Enclosure - 12F	Nos
	Supply & Installation of GI Pipes:-	
1	25 mm GI Pipes with the accessories	mtr
2	40 mm GI Pipes with the accessories	mtr
3	MS 25 mm	Mtr
4	50 mm GI Pipes with the accessories	mtr
	Civil Works:-	
1	Road Cutting & refilling with Concrete as per the standards of Customer	mtr
2	Road Cutting & refilling with Asphalt / Bitumen as per the standards of Customer	mtr
3	Wall Chipping for the Raceway Installation	CM
4	Core Cutting for the Conduit Installation	Nos

Annexure-II

AUTHORIZATION BY OEM

Date:

To,

BHEL
RCPURAM
HYDERABAD

Subject: Letter of Authority

Tender Ref. No Ref. No: _____ dated _____

Dear Sir,

We hereby authorize _____ who fulfills the requirements of the tender enquiry ref. no Ref. No.: _____ dated _____ to quote/ negotiate and service the equipment as required in the above tender enquiry.

This authorization is valid only for the following equipment for which we are the OEM:

-
-
-
-
-
-

The authorized agency would ensure reliable service during complete lease period of 5 years.

(Authorized Signatory)

For

Note: This 'Letter of Authority' should be issued on the letterhead of OEM

FINANCE LEASE CUM HIRE PURCHASE AGREEMENT (TRIPARTITE)

THIS FINANCE LEASE AGREEMENT executed on this _ day ____ of , (_dd / _mm/yyy) at [place].

BETWEEN

[Name of the Company], a Company incorporated under the Companies Act, 1956, having its Registered Office at [Address of the company] REPRESENTED by its **Financing Account Manager**, [Name of Finance Manager] herein after called the **LESSOR** (which expression shall, unless repugnant to the subject or context thereof include its successors and assigns) of the first part.

AND

BHARAT HEAVY ELECTRICALS LIMITED a Company incorporated under the Companies Act, 1956, having its Registered office at BHEL house, Siri Fort, New Delhi 110049, through one of its units at [Name of the Unit], represented by its competent authorities Sri. [Name and designation] hereafter called **the LESSEE** (which expression shall unless repugnant to the subject or context thereof include its successors and assigns) of the second part.

AND

[Name of the vendor] a Firm incorporated / a Company incorporated under the Indian Partnership Act 1932 / Companies Act, 1956 having its Principal Office at [address of the vendor] represented by its Managing Partner/The designation, Mr. (Name) hereinafter called **the VENDOR** (which expression shall unless repugnant to the subject or context thereof include its successors and assigns) of the third part.

Whereas the **LESSEE** has placed a purchase order no. [PO No.] dated [dd] / [mm] / [yyyy] on the **VENDOR** for supply, Installation and maintenance of Network equipment described in Schedule A to the said purchase order for a period of 5 years on finance lease rental basis. Further, Lessee shall place Purchase order on Lessor for supply of equipment. Such equipments shall be supplied by vendor to Lessee .

Whereas, the **LESSOR** and the **VENDOR** through this Agreement have impliedly entered into a business arrangement for leasing out the Equipment more fully described in Schedule A to the **LESSEE** on certain terms and conditions mentioned in this Agreement.

And whereas the **LESSOR** has offered to purchase from the **VENDOR** the said equipment more fully described in **Schedule A** hereto (herein after referred to as the Equipment) at the acquisition cost specified in **Schedule A** to this Agreement for leasing the same to **LESSEE** upon the terms and conditions contained herein.

And whereas the **LESSEE** has offered to take on lease the Equipment so purchased by the **LESSOR**, and the **LESSOR** has agreed to lease out the Equipment to the **LESSEE** upon the terms and condition contained herein.

And whereas the **VENDOR** has agreed to supply the Equipment purchased by the **LESSOR** install the Equipment in the premises of the **LESSEE** at desired places and provide maintenance services to the **LESSEE** subject to the terms and conditions of this agreement.

1. DEFINITIONS

In this agreement, unless context otherwise so requires, the following expressions shall have the following meanings viz:

1.1. Agreement

Shall mean this Agreement.

1.2. Clause

Shall mean clause of this agreement and accordingly the word Sub-Clause shall mean Sub-Clause of a clause of this agreement.

1.3. Commencement Date

Shall mean the date of installation of this Equipment as mentioned in the Purchase order [PO No.] dated [dd]/[mm]/[yyyy] as confirmed by the **LESSEE** to the **LESSOR** by the **LESSEE** signing an Acceptance Certificate in the form of Schedule D to this Agreement and inserting the Acceptance Date .

1.4. Equipment

Shall mean all the articles and things described in **Schedule - A** to this Agreement purchased by the **LESSOR** from the **VENDOR** and leased to the **LESSEE** and includes any individual items contained in the Equipment and all alterations, replacements and / or additions to the Equipment or any item or part thereof during the period of this Agreement.

Provided that where there is more than one item of Equipment, the lease hereunder shall be deemed to be of each such of Equipment individually and the provisions of this agreement shall be applicable independently to each such item of Equipment individually, whether or not such item of Equipment be of same or similar description or use, or is to be placed at the same location.

1.5. Lease Period

Shall mean five years from the Acceptance Date specified in the Acceptance Certificate which is non-cancelable by the **LESSEE** or the **LESSOR** except as provided herein.

1.6. Rental

Shall mean the lease rental to be paid by the **LESSEE** to the **LESSOR** as mentioned in **Schedule - B** of this Agreement.

1.7. Maintenance Fee

Shall mean the maintenance fee payable by the **LESSEE** to the **VENDOR** as specified in **Schedule - C** of this Agreement.

1.8. Schedule

Shall mean the schedule or schedules, which may now or from time to time be incorporated hereunder as an integral part of this agreement.

1.9. Lease

Shall mean the lease of the Equipment by the **LESSOR** to the **LESSEE** on FINANCE LEASE basis (wherein all the risks and rewards incidental to the ownership of the leased assets is transferred to the **LESSEE** at the inception of the lease as per AS-17 (Accounting Standard 17) issued by the Institute of Chartered Accountants Of India) and the grammatical variations or cognate expressions of the term shall be construed accordingly.

- 1.10. Commissioning
Installing and configuring the Network Equipment that form part of the Purchase Order No [PO No.] dated [dd]/[mm]/[yyyy].

2. BASIC TERMS OF LEASE

- 2.1. The **LESSEE** will avail Income Tax Depreciation since all the risks and rewards incidental to ownership is transferred to the **LESSEE** as per AS-17 issued by ICAI.

The supply of the Equipment to the **LESSEE** is on the basis of finance lease rentals. The purchase orders issued by **LESSOR** on the **VENDOR** will be the effective purchase order for this transaction to establish the ownership of the Equipment and **LESSOR** will be the sole and full owner of the Equipment. **LESSEE**'s only rights to the Equipment are as a lessee under this Agreement. **LESSEE** shall hold the Equipment as lessee and shall not contest Lessors sole and exclusive ownership of the Equipment

Equipment may not be moved to a location outside India. If **LESSEE** wishes to move Equipment from the location specified in Schedule A to another of **LESSEE**'s business locations in India, **LESSEE** must first give notice to **LESSOR**. Lessor's prior consent to such a move is required but may not be unreasonably withheld, delayed or conditioned as long as the Equipment remains in **LESSEE**'s possession and control.

- 2.2. If **LESSOR** has not already done so, then upon execution of this Agreement, **LESSOR**, agrees to release confirmed regular Purchase Order for the Equipment as defined in **Schedule A** in favor of the **VENDOR**.
- 2.3. After purchase of the Equipment by the **LESSOR**, the **VENDOR** will ensure delivery, installation and commissioning of the Equipment at the **LESSEE**'s premises located at [Place] as per the Purchase Order No [PO No.] dated [dd]/[mm]/[yyyy]
- 2.4. The entire risk, cost or any outgoing pertaining to the delivery and installation of the Equipment shall be borne by the **VENDOR**. **LESSOR** will have no obligation to pay the purchase price for the Equipment until the **LESSEE** has confirmed the due delivery and installation of the Equipment by signing the Acceptance Certificate attached as Schedule D.
- 2.5. The **LESSOR** hereby gives on lease and the **LESSEE** hereby takes on lease the Equipment for the Lease Period subject to the terms of this Agreement.
- 2.6. All the terms and conditions mentioned in the NIT shall form an integral part of this Agreement.

NOW THEREFORE THIS AGREEMENT WITNESSETH THAT for and in consideration of the mutual covenants and conditions hereafter set forth, the parties hereto agree as follows: -

3. LESSEE'S CONFIRMATION

Upon receiving delivery, installation and commissioning of the Equipment from the **VENDOR**, the **LESSEE** will certify that the Equipment are as per specifications provided by the **LESSEE** to the **VENDOR** by signing the Acceptance Certificate in the form of Schedule D.

The **LESSOR** agrees to pay the Purchase Price for the Equipment to the **VENDOR** immediately after the **LESSEE** signs the Acceptance Certificate and gives it to the **VENDOR** as per Schedule D.

4. LESSOR'S RIGHT TO LEASE

The **LESSOR** guarantees that upon paying the purchase price for the Equipment to the **VENDOR**, the **LESSOR** has the right to lease the Equipment to the **LESSEE** under this Agreement.

5. LESSOR'S COVENANTS

The **LESSOR** hereby covenants that they undertake to comply with the terms and conditions stipulated in the Purchase Order no. **[PO No.] Dated [dd]/[mm]/[yyyy]** placed by the **LESSEE on the Vendor**, which will form part and parcel of this Agreement. For the avoidance of doubt, in the event of any conflict between the terms of this Agreement and the terms of the Purchase Order Number **[PO No.]**, the Purchase Order No. dt. shall prevail.

The **LESSOR** shall not divert the equipments after purchase or acquisition of the Equipment to any third party. The **LESSOR under any circumstances** shall not disturb the possession of the equipment with the **LESSEE**, during the currency of the agreement subject to clauses 7, 18 and 19 of this Agreement. Lessor shall not lein, attach, hypothecate, mortgage , etc, any of the equipment which is in possession with the **LESSEE**.

6. LESSEE'S COVENANTS

6.1. LESSEE NOT TO PART WITH POSSESSION AND RISK OF LOSS

LESSEE shall not part with possession of the Equipment or any part of it to any third party, without the prior written consent of the **LESSOR**, which the **LESSOR** may decline without assigning any reason.

6.2. LESSEE NOT TO CONVERT THE PROPERTY AND ALLOW FIXING OF NAME PLATE OF LESSOR

LESSEE shall not in any way impair the identifiability, ascertainability, severability and redeliverability of the Equipment during the currency of the Lease period. **LESSEE** will allow affixing of nameplate or other perishable mark on the Equipment identifying the leased Equipment covered in **Schedule A** and not to allow or permit the same to be removed or defaced during the currency of the Lease period.

6.3. LESSEE TO MAKE PROPER USE OF THE EQUIPMENT

LESSEE shall use and operate the Equipment carefully in the same way as would have been the case with the **LESSEE'S** own Equipment. **LESSEE** must at all times operate and **VENDOR /** shall maintain the Equipment in good working order, repair, condition and appearance, and in accordance with the manufacture s and/or supplie s specifications and recommendations. **LESSEE** must not do or omit to be done any act or thing that would result in the warranties and performance guarantees given by the supplier or manufacturer being invalidated or unenforceable, either wholly or in part, and **LESSEE** shall ensure that the Equipment is operated by suitably trained personnel for the purpose for which it is designed and manufactured.

7. INSPECTION BY THE LESSOR

The **LESSEE** shall permit the **LESSOR** or any person authorized by the **LESSOR** at all reasonable times (immediately in case of an emergency) to inspect, view and examine the state and condition of the Equipment and for that purpose permit the **LESSOR** or any person authorized by the **LESSOR** to enter

the premises where the Equipment is used or stored. The **LESSOR** shall give One Week Notice for any such inspection / examination. Provided further, the **LESSOR** hereby agrees that no such inspection or examination of the state and condition of the Equipment will be made within a period of less than three months from the date of the previous inspection / examination. The **LESSOR** hereby permits immediate inspections/examinations of the state and condition of the Equipment, in case of any emergency, only twice a year.

8. INSURANCE

- 8.1. The **VENDOR** shall keep the Equipment insured with an insurer acceptable to which covers against all risks loss up to its full replacement value. **VENDOR** must promptly produce evidence of current insurance policies and of payment of premiums whenever reasonably requested by **LESSOR**.
- 8.2. In the event of failure on the part of the **VENDOR** to maintain the insurance required under clause 8.1 or to pay the insurance premium as above, the Vendor agrees that the **LESSOR** may purchase such insurance itself or pay the insurance premium as above and shall forthwith on receipt of a notice of demand from the **LESSOR** reimburse all sums so paid by **LESSOR** together with interest. On receipt of demand notice from **LESSOR** to the **LESSEE**, the **LESSEE** may pay the insurance premium amount from the payments due and payable to the **VENDOR**.
- 8.3. An item of Equipment suffers a Casualty Loss if the Equipment is lost, destroyed, stolen or damaged beyond repair. If a Casualty Loss occurs **LESSEE** must promptly notify **LESSOR** within 30 days from the date of knowledge of occurrence of such Casualty Loss to the **LESSEE** or on or by the next Rent payment date whichever is later
In support of filing of insurance claim by the **Lessor/vendor** with respect to any casualty loss of the Equipment or part of the Equipment mentioned above, the following documents may be provided by the **LESSEE** to the Insurance Company:
- a. Letter of the **LESSEE** confirming happening of the Casualty Loss.
 - b. Copy of the Complaint filed by **LESSEE/VENDOR** before the Police Authorities regarding Casualty Loss.
 - c. FIR Copy / Non-traceable Certificate issued by the respective Police Authorities in case of stolen/Theft Equipment.

In the event of occurrence of any Casualty Loss irrespective of the status of the insurance claim filed against such casualty loss, the **LESSOR** shall replace / substitute Equipment, to the **LESSEE** within weeks from the date of occurrence of such Casualty Loss.

Substitute Equipment means a substantially equivalent or better item of hardware or software having equal or greater capabilities and equal or greater fair market value manufactured or licensed by the same manufacturer or licensor as the item of hardware or software which it is to replace under this Agreement. **LESSEE** acknowledges and agrees that Substitute Equipment is **LESSOR**'s property. Notwithstanding anything contained herein, the **VENDOR/LESSOR** shall be fully responsible for all renewal of insurance of equipments from time to time. If the claim(s) amount is rejected by insurance company for whatsoever reason, the **LESSEE** will not be responsible and shall not be liable to pay such amount.

9. DISCLAIMER OF ANY WARRANTY

- 9.1. The **LESSOR** has not at any time made nor does it hereby make any representation or warranty whatsoever with respect to the merchantability, quality, conditions or durability of the Equipment;
- 9.2. All Equipment will be used for business purposes only and for the purpose for which it is designed;
- 9.3. The **VENDOR** hereby confirms that it makes and accepts all representation or warranty whatsoever with respect to the merchantability, quality, conditions or durability of the Equipment.
-

10. VENDOR'S CONVENANTS

The **VENDOR** hereby covenants that they undertake to comply with the terms and conditions stipulated in the Purchase Order No. [PO No.] Dated [dd]/[mm]/[yyyy] issued by the **LESSEE** which form a part and parcel of this agreement

11. Liability towards quality of the equipment:

Both the **LESSOR** and the **VENDOR** hereby accepts liabilities on any account pertaining to the quality of the Equipment to the **LESSEE**. The liability to the **LESSEE** is restricted to the value of the contract of the items supplied by the **VENDOR WITH THE SUPPORT OF LESSOR**.

12. MAINTENANCE

The **VENDOR** shall be responsible for the continuous and smooth operation of the Equipment for the entire lease period as mentioned below for a consideration, which is incorporated as a part of equipment as in **Schedule A** and the Maintenance Charges as in the **Schedule C** to be paid by **LESSEE** to the **VENDOR**.

12.1. Maintenance services shall cover services, repairs, and replacements necessary to keep the Equipments in good working conditions and to use the Equipments by the **LESSEE**.

12.2. **VENDOR shall be responsible for running the Equipment at the uptime as per details given below:**

The vendor shall ensure that the following SLA parameters are met.

The vendor shall maintain the overall uptime to minimum 99% on quarterly basis during the lease period.

A deduction from the overall quarterly rental shall be made at the rate of 1% for each 1% fall of uptime from 99%, e.g. if the uptime is 98%, one percent of quarterly rental for the particular quarter shall be deducted. The calculation for uptime shall be made on quarterly basis. The downtime calculation shall be based on 24x7 hours.

There shall be no downtime due to mutually agreed scheduled maintenance of equipment or due to power outage.

Downtime of network shall be the period (in hours) during which expected connectivity is not available on the network or part of network. The downtime factors for calculation of the penalty shall be as follows:

SI No	Category	Equipment Covered	Downtime Factor
1	A	Core Switch, Data Centre Core Switch, Data Centre Access Switch, Distribution Switch, Wireless LAN Controller, Firewall, Link Load Balancer, NAC, Web Security Appliance	10
2	B	Router, NMS, Access Switches, Indoor Access Point, Outdoor access point, UPS, 3G 4G Router, CPE, DSLAM	6

Downtime calculation

Downtime calculation will be applicable for non-availability of Network services arising due of malfunctioning of switches, UPS, wireless network components etc.

Example of Downtime Calculation

Penalty will be calculated as indicated below:

Equipment down - Distribution switch
Downtime (in Hours) - Y

Quarterly maintenance value for the equipment (Rs)	-	A
Acceptable downtime per quarter (in Hours)	-	$24 * 30 * 3 * 1\% = X$
Downtime factor	-	F
Penalty (Rs)	-	$(A * F * (Y - X)) / (3 * 30 * 24)$

Penalty will be limited to maximum quarterly maintenance value for the equipment

There shall be no downtime due to mutually agreed scheduled maintenance of equipment or due to power outage.

In situations where equipment needs to be repaired/replaced and the same model is not available in the market, the Vendor shall repair/ replace the faulty Equipment immediately of equivalent or higher model considering the compatibility of equipment.

If the uptime for equipment/system falls below 95% continuously for 3 months, the system/equipment shall have to be replaced by the VENDOR within 30 days without any extra charge.

12.3. **LESSEE** shall be finally compensated for any short fall in the guaranteed uptime as specified hereunder:

- a) The penalty amount so computed may be deducted from the payment towards the maintenance fee payable to the **VENDOR**. If it exceeds, it may be deducted from the lease rental payable to the **LESSOR**. **VENDOR** will promptly indemnify the **LESSOR** with respect to any deduction made by **LESSEE** under this clause.

13. IMPOSTS, TAXES AND OTHER CHARGES

LESSEE agrees that the lease created under this Agreement is a net lease and that **LESSEE** will pay all tax costs connected with the lease, such as GST. Any fresh levies/ duties/taxes imposed by Govt. subsequent to the date of Purchase Order shall be borne by the **LESSEE**.

If **LESSEE** is required by any law or regulation to make any deduction or withholding with respect to any amount payable under this Agreement, **LESSEE** shall recover such amounts at applicable rates and pay the net amount to the **LESSOR**. Necessary tax declaration forms shall be provided by the **LESSEE** to the **LESSOR**.

Valid documents and compliances regarding taxes and duties for availing Input Tax Credit if any should be furnished by the **VENDOR/ LESSOR** to the **LESSEE**. If any relevant documents are not furnished to the **LESSEE** to avail Input Tax Credit, the same will not be paid to the **LESSOR / VENDOR** as the case may be. Due to defaults of the **LESSOR / VENDOR**, if any imposts / penalty / incremental duty / interest are charged, it should not be passed on to the **LESSEE**.

For the purposes of this clause VAT means any value added tax, any goods and services tax or any like tax (including any interest, fines and penalties) payable on the sale of goods or provision of services in India or in any state in India.

14. CONSIDERATION FOR THE LEASE - LEASE RENTALS AND MAINTENANCE FEE

The **LESSEE** will pay the Rentals to the **LESSOR** and the Maintenance Fee to the **VENDOR** in accordance with Schedule B and C.

15. OBLIGATION TO PAY LEASE RENTALS AND MAINTENANCE FEE

Unless provided otherwise, the **LESSEE** shall pay the Lease Rentals regularly and punctually.

The **VENDOR** agrees that in the event:

- a) the **LESSEE** exercises any of the **LESSEE**'s rights under this Agreement or Purchase Order Number [PO No.] to make deductions against or otherwise withhold payment of lease rentals or any amount due by the **LESSEE** to the **LESSOR**, or

16. PAYMENTS OF RENTALS AND ARREARS IN RENTALS

- 16.1. Rental and Maintenance Fee accounts are calculated quarterly in arrears. The **LESSOR** will raise the bills on the **LESSEE** on a quarterly basis on the Lease rental amount and the **VENDOR** will raise the bills on the **LESSEE** on a quarterly basis on the Maintenance Fee amount (as appropriate).
- 16.2. The amounts payable by the **LESSEE** under clause 16.1 with respect to each quarter during the Lease Period are specified in Schedules B and C respectively. The first such bill of the Site (as specified in the **Schedule B and C**) will be raised on completion of first calendar quarter from the date of the certificate of acceptance for the site on pro rata basis. Subsequent bills will be raised on completion of each calendar quarter from the date of the first bill. The final bill will be on the pro rata basis on the left over days of the last calendar quarter.
- 16.3. **LESSEE** reserves the right to retain the equipment at the end of the lease period by making a terminal payment of Re. 1/-. On such payment of RS. 1/- to the **LESSOR**, the ownership shall be transferred to the **LESSEE** and thereafter the **LESSEE** shall be the owner of the equipment(s) automatically. The **LESSOR** shall not have any claim(s) over the equipment(s). In case **LESSEE** decides not to retain the Equipment, dismantling and removing the Equipment from the premises of the **LESSEE** shall be at the **LESSOR/Vendor's** cost.

17. TERMINATION

On the first occurrence of any events specified below, any Party to this Agreement shall be entitled without prejudice to any other right or remedy available terminate this Agreement, after providing three months notice to all the parties to this Agreement after the occurrence of such event except expiry of the lease period.

- a) Breach of terms and conditions of the Agreement by any party of this Agreement.
- b) Any Board resolution or Company Petition filed for winding up against **LESSEE**.
- c) By mutual consent.
- d) On expiry of the lease period
- e) After completion of one year of this agreement, the **LESSOR/VENDOR** shall not terminate the agreement for whatsoever reasons.

The **LESSOR** and the **VENDOR** shall not be entitled to terminate this agreement on account of any material change in the financial or corporate position of **LESSOR / VENDOR** or any resolution or petition filed for winding up against **LESSOR / VENDOR**.

In the event of termination of the agreement, **LESSEE** shall not pay any lease amount to **LESSOR** and maintenance charges to **VENDOR**.

18. REDELIVERY OF THE EQUIPMENT BY THE LESSEE ON TERMINATION

- 18.1 Upon termination of this Agreement as defined herein above during the currency of this agreement, the **LESSEE** shall, on its own without demand forthwith deliver the Equipment to the **LESSOR**, at such time and place as may be directed by the **LESSOR** in 'as is where is' condition. The cost for such delivery will be borne by the defaulting party.
- 18.2 In the event this Agreement is terminated due to reasons attributable to **LESSOR** or **VENDOR**, the **LESSOR** shall not have the right to demand the redelivery of the equipments by the **LESSEE**.

19. LESSOR'S RIGHTS AND LESSEE'S OBLIGATION ON TERMINATION

- 19.1. RE-POSSESSION OF THE EQUIPMENT BY THE LESSOR AND HIS RIGHTS FOR THAT PURPOSE

If **LESSOR** is entitled to repossess Equipment pursuant to Clause 17 of this Agreement and without prejudice to the rights of the **LESSEE**, the **LESSOR** shall remove or repossess the Equipment and for that purpose by itself, its servants or agents, enter upon any land, buildings or premises where the Equipment is situated or is reasonably believed by the **LESSOR** to be situated for the time being and for such entry. But this clause cannot be invoked if there is a default on the part of the **VENDOR / LESSOR** as per the terms and conditions of the contract.

19.2 In the event this agreement is terminated due to reasons attributable to **LESSOR** or **VENDOR**, the **LESSOR** shall not have the right to demand the redelivery of the equipments. In case **LESSEE** informs **LESSOR/ VENDOR** to remove the equipments from **LESSEE**'s premises and the Lessor and Vendor fails to remove or re-possess the Equipment within 30 days from the date of intimation at their risk and own cost, then in such cases, the Lessor and Vendor shall pay to the Lessee ____ % of the contract value towards retention charges/ground rent. If the Lessor and Vendor fails to remove or repossess the Equipment within 60 days from the date of intimation, the Equipment will be sold by the Lessee at the risk and cost of the Lessor and Vendor and the retention charges/ground rent will be adjusted by the Lessee from out of the sale proceeds and remaining amount after adjusting all the dues will be returned to the Lessor and / or Vendor, if any. The Lessee shall not be liable for any claims over the Equipment for such Sale Proceeds after 60 days from the date of intimation.

20. ALL INDEMNITIES TO SURVIVE THE AGREEMENT

All indemnities and covenants as contained in Clause 4, 5 and 6 under this agreement shall survive the termination of the Agreement or expiry of the lease as the case may be.

21. GENERAL CONDITIONS

21.1. Service of Notices

Any notice issued by the parties hereto shall be in writing and sent by Registered Post Acknowledgement Due, speed post, email to the other party to the address first above written.

21.2. Time to be Essence of this Agreement:

Time shall be the essence of this Agreement for all the three contracting parties in so far as it relates to the observance or performance of all or any of its obligations including payment of any sum hereunder.

21.3. Waiver or Remission not to have precedent value over Demands or Notices Waived.

The failure of the **LESSOR** to insist upon the punctual performance of any of the obligations of the **LESSEE** hereunder, or the failure of the **LESSOR** to exercise any right or remedy available to the **LESSOR**, under this Agreement or any failure of the **LESSOR** to require payment from or by the **LESSEE**, when due of any sum owing hereunder, or any extension of credit or any forbearance on the part of the **LESSOR** shall not constitute a waiver by the **LESSOR** of any subsequent or continuing default by the **LESSEE** under this Agreement

nor shall the same prejudice affect or restrict the rights and powers of the **LESSOR** hereunder.

The failure of the **LESSEE** to insist up on the punctual performance of any of the obligations of the **VENDOR** or **LESSOR** hereunder or the failure of the **LESSEE** to exercise any right or remedy available to **LESSEE** under this Agreement or any failure of the **LESSEE** to require any contractual obligations or any forbearance on the part of the **LESSEE** shall not constitute a waiver by the **LESSEE** nor shall the same prejudice or affect or restrict the rights and powers of the **LESSEE** hereunder.

21.4. Agreement to be sole and Exclusive

This Agreement represents the entire Agreement between the parties hereto and shall be capable of variation in writing by a Note of Amendment signed by and on behalf of the **LESSOR**, the **VENDOR** and the **LESSEE**.

If any provision of this Agreement is prohibited by or invalid under any law, that provision will be ineffective only to the extent of the prohibition or invalidity. The remainder of the affected provision and all other provisions of this Agreement are unaffected by the invalidity and the parties shall continue with the obligations entered in this Agreement unless and otherwise the invalid provision affects the whole object of this Agreement.

INTEREST CLAUSE:

“No interest shall be payable by BHEL on earnest money or security deposit or any money due to the Lessor and Vendor by BHEL.”

LIMITATION OF LIABILITY:

Except as provided otherwise in the Contract and except for willful misconduct or gross negligence, neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or any other indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract. Neither party liability for any direct damages resulting from its performance or failure to perform here under shall not exceed the total contract price.

However, that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Lessor/vendor, or to any obligation of the Lessor and Vendor to indemnify the Lessee with respect to Intellectual Property Rights or Under any other provisions of the Contract which expressly impose a greater liability or in cases of fraud, willful misconduct or illegal or unlawful acts.

LABOUR LAWS

The Vendor shall ensure abidance of all the labour laws especially including Contract Labour (R&A) Act 1970, Payment of wages Act 1936, Employees Compensation Act 1923, Factories Act, 1948, Minimum Wages Act 1948, Payment of Bonus Act 1965, Payment of Gratuity Act 1972, ESI Act, 1948, Provident Fund Misc. Prov. Act 1952, **Child Labour (Prohibition & Regulation) Amendment Act, 2016** and all other applicable Laws as amended from time to time **w.r.t. to its employees/agents placed at BHEL premises for performing its contractual obligations or part thereof.**

The VENDOR at its own costs shall provide adequate training, safety gadgets, instruments, dress etc. to its to its employees/agents placed at LESSEE’s premises for performing its contractual obligations or part thereof.

The LESSEE instructions as issued from time to time in regard to working hours, wages, leave, holidays, bonus, **health, etc. shall be abided by the Vendor and its employees/agents in letter and spirit.**

The Vendor shall obtain License from the Competent Authority if he engages 20 (twenty) or more workmen in LESSEE’s premises under Contract Labour (Regulation and Abolition) Act, 1970. The Contractor shall submit a valid Contract Labour License to LESSEE on or before the date of commencement of contract.

The Vendor shall attend all inspections notified/conducted by the personnel department, Labour department, P.F. authorities, Factory Inspectors, ESI inspectors or any other such authorities under the Act, failing which appropriate action shall be initiated.

Non-compliance of provisions under any Acts/Rule/instructions/guidelines shall make the Lessor and vendor liable for penal action including termination of contract.

Force Majeure:

If at any time during the continuance of this agreement, the performance in whole or in part by either party or any obligations under the Contract shall be prevented or delayed by reason of any war, hostilities, act of public enemy, civil commotion, sabotage, fire, floods, explosions, epidemics, quarantine restrictions and Acts of God (hereinafter referred to as 'Events') and provided notice of the happening of any of the above mentioned Events duly certified concerned authorities by either party to the other within Fifteen (15) days from the date of occurrence.

Neither party shall be held liable or responsible to the other party nor be deemed to have defaulted under or breached this Agreement for failure or delay in fulfilling or performing any obligation under this Agreement when such failure or delay is caused by or results from causes beyond the reasonable control of the affected party due to occurrence of the said events.

Due to said events if the equipment's are damaged or destroyed, LESSOR or VENDOR shall replace the equipment's within Days from the date of occurrence of event. LESSEE shall not be responsible for any loss cause to other party due to the said events.

21.5 Interpretation of Words

Words importing the plural shall, except where the context otherwise requires, include the singular and vice-versa. Clauses including headings shall not control the otherwise clear meaning of the text within the relevant clause, but such heading may be used to clarify the intention in case the same is not clear.

21.6 This lease transaction shall be considered as finance lease in terms of Accounting Standard -19 of ICAI.

22. ARBITRATION

This agreement shall be governed by the applicable Law is Indian Law and the Courts at Sangareddy of Andhra Pradesh only should have jurisdiction in case of any legal dispute.

ARBITRATION & CONCILIATION CLAUSE:

The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding (delete whichever is inapplicable), which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.

The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof

Except as provided elsewhere in this contract, in case amicable settlement is not reached between the parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the contract; or, in any manner touching upon the contract, then, either party may, by a notice in writing to the other

party refer such dispute or difference to the sole arbitration of an arbitrator appointed by head of the BHEL unit issuing the contract.

The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause, the seat of arbitration shall be at Hyderabad.

The cost of arbitration shall be borne as per the award of the Arbitrator.

Subject to the arbitration in terms of clause, the courts at Hyderabad, Telangana State shall have exclusive jurisdiction over any matter arising out of or in connection with this contract.

Notwithstanding the existence or any dispute or differences and / or reference for the arbitration, the contractor shall proceed with and continue without hindrance the performance of its obligations under this contract with due diligence and expedition in a professional manner except where the contract has been terminated by either party in terms of this contract.

This agreement shall be governed by and applicable Law is Indian Law. The Courts at Hyderabad, Telangana State shall have exclusive jurisdiction for any dispute arising out of this agreement.

In case of contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

"In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No 4(1)/2013-DPE(GM/FTS 1835 dated 22- 05-2018".

23. VENDOR OBLIGATIONS:

1) CONTRACTUAL

- a) Vendor to ensure that the employees deployed in the premises of BHEL are physically and mentally fit and do not have any criminal record. Such employees should possess requisite skill, proficiency, qualification, experience etc.
- b) Vendor to maintain appropriate records of his employees deployed to carry out the maintenance.
- c) Vendor should issue appropriate appointment letters to his employees.
- d) Vendor to provide employment card/identity card with photograph duly verified and attested by the Vendor to his employees. Vendor to indicate the name of the proprietary/partnership firm/company, place of work, contract number and duration of validity of card.
- e) Vendor will be responsible for the good conduct of his employees. In case of any misconduct/misbehavior by any employee, the vendor will replace such employee(s) immediately.
- f) Vendor will ensure that the job is executed through his employees on his rolls and under no circumstances the vendor will deploy any casual employee to carry out the job nor shall sub-contract the job without prior written permission.
- g) Vendor will keep watch on his employees and he will be liable for any pilferage / loss to BHEL due to acts of omission and commission by his employees. Similarly, liability for any compensation to outsiders on account of any act of omission and commission by the employees deployed by the vendor shall lie exclusively with him.
- h) Vendor to ensure that all precautions are taken for safety of his employees and equipment.
- i) In the event of termination of contract for any reason whatsoever, the vendor shall withdraw all his employees from the establishment of BHEL. In case vendor decides to terminate services of his employees, he should settle all terminal dues including retrenchment compensation.

- j) Vendor shall provide to his employees all tools, tackles and equipment and maintain the same to carry out the job under the contract at his cost and if necessary vendor may take insurance policy of his men, material, equipment and tools and tackles.
- k) Vendor shall provide safety appliances and maintain the same at his own cost which may be required under the statute or otherwise.
- l) Vendor shall provide material at his cost as mentioned in the contract to his employees for carrying out the job.
- m) The entry permits are to be issued to the service engineer as per respective location practices.
- n) All safety equipment such as safety belts, helmets & other equipment (as required for this work) are to be positioned by the vendor & used as per requirement.
- o) Violation of applicable safety, health & environment related norms, a penalty of ₹ 5,000.00(Rupees Five thousand) per occasion shall be imposed.
- p) Any compensation paid to victim shall be recovered from Contractor, agency or firm, if the accident is attributable to negligence of Contractor, agency or firm or any of its employees.
 - a) Victim: Any person who suffers permanent disablement or dies in an accident as defined below.
 - b) Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/operation and works incidental thereto at BHEL factories/ offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works /during working at BHEL Units/ Offices/ townships and premises/ Project Sites.
 - c) Compensation in respect of each of the victims:
 - (i) In the event of death or permanent disability resulting from Loss of both limbs: Rs.10,00,000/- (Rs.Ten Lakh)
 - (ii) In the event of other permanent disability: Rs.7,00,000/- (Rs.Seven Lakh)
 - d) Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to Section 2 (1) of the Employee's Compensation Act.1923."

II) TOWARDS STATUTORY LIABILITY

- a) Vendor shall comply with all the statutory provisions such as Bonus, PF, EDLI, ESI, Gratuity, Service Tax and other applicable taxes, BHEL Fair Wages prevailing at the time of payment or arrears thereof, declared Holidays, leave etc. The contractor shall submit the documentary evidence of payment on account of submission of statutory payments made to the concerned agencies every month and same may be submitted for clearance of bill.
 - b) Vendor shall comply with all statutory requirements, rules, regulations, notifications in relation to employment of his employees issued from time by the concerned authorities.
 - c) Vendor shall pay to their workmen applicable minimum wages / BHEL Fair Wages whichever is higher.
 - d) Vendor shall ensure payment of statutory prescribed minimum wages as applicable from time to time in the presence of authorized representative of BHEL and maintain proper records of their timely disbursement. These records need to be preserved for a period of at least 3 years and should be made available even after the contract is over for any verification by the statutory authorities / BHEL authorities.
 - d) Vendor to provide PF pass book to his employees and ensure payment of PF, EDLI, pension dues under EPF & MP Act, 1952 to the PRFC.
 - e) Vendor shall ensure payment of ESI contribution under ESI Act, 1948 and provide ESI membership No. / card of each employee.
 - f) Vendor shall produce proof of deductions as well as remittances of PF, EDLI, Pension, ESI contribution, administrative charges etc. wherever applicable and shall maintain proper records. Vendor to issue wage slips to his employees.
 - g) Vendor shall furnish proper returns to the concerned statutory authorities and provide a copy of the same to BHEL.
 - h) Vendor shall be solely responsible for nonpayment / delayed payment of wages / DA, contributions under EPF & MP Act, ESI Act etc.
 - i) In case the vendor fails to make payment of wages to his employees or remittance of contribution to the concerned authorities, the security deposit / other dues / running bills under the contract can be utilized by BHEL to discharge the liability of the vendor.
-

- j) Vendor shall indemnify BHEL against all claims and losses under various Labour Laws, statutes or any civil or criminal law in connection with employees deployed by him.
- k) The liability for any compensation on account of injury sustained by an employee of the vendor will be exclusively that of the vendor.
- l) Vendor to obtain insurance cover for his employees / equipment / tools and tackles etc. and take third party risk insurance coverage at his own cost. BHEL shall not be responsible for any loss, damage, and pilferage of property and / or his employees.
- m) Vendor should have independent code numbers / exemptions under EPF & MP Act, 1952 and ESI Act, 1948 and shall cover his employees under the said codes.
- n) Payment of bonus under the payment of Bonus Act, Payment of gratuity under the Gratuity Act, and retrenchment compensation under Act will be the sole responsibility of the vendor.
- o) Over and above the daily wage rate, payment shall be made for leave with wages.
- p) Vendor shall observe Provisions of the Factories Act in respect of working hours, holidays, rest intervals, leave and overtime to his employee. No work shall be done on second/third shift, overtime, Sundays or on other declared holidays without written permission.
- q) In case a vendor employs women as employee he will discharge his obligation under law in respect of such women workers such prohibition of engaging them during night-hours, prohibition of employing them for more than 9 hours per day, provision of crèche facility, grant of maternity leave as per rules etc.
- r) Vendor shall be responsible for making payment of wages before expiry of 7days from the last day of wage period and to ensure disbursement of wages in the presence of the authorities' representative of contract operating division who shall record under his signature at the end of entries in the Register of wages.
- s) Vendor will have to extend paid National Holidays and Festival Holidays to their workmen as per the provisions of the relevant Act and the Rules thereof. However, if due to exigencies of work the vendor engages his workmen on National Holidays or Festival Holidays contractor shall pay additional wages as prescribed under the provisions of the Act.
- t) In addition to the above holidays mentioned at Clause (s), in the event the Central / State Government declares any other holiday/s and if such Holiday/s is/are applicable to BHEL also, then the vendor shall extend paid Holiday/s to his workmen.
- u) **IMPLEMENTATION OF PRICE VARIATION CLAUSE:** Any increase in consolidated Wages of BHEL or increase in Variable Dearness Allowance by appropriate government to the eligible workmen of contractors, will be reimbursed by BHEL to the contractor to that extent of increase on production of proof of payment to the workmen by the Contractor duly verified by the Contract Executing Officer, HR/IR and Finance. In case of decrease in the Variable Dearness Allowance by the Appropriate Government, the same will be deducted from the running bills of the Contractor to that extent. (Note: Increase is admissible on the variable components such as wages, Dearness Allowance, PF, ESI, and leave wage etc., which will be notified by the HR/IR from time to time).
- v) Vendor should engage only those labours who shall be more than 18 (eighteen)years of age.
- w) Vendor shall not resort to subcontracting under any circumstances without written consent from BHEL

24. INFORMATION SECURITY REQUIREMENTS

- 24.1. The vendor/service engineer should abide by ISMS policies of BHEL.

25. GENERAL

It is confirmed that the authorized signatories of all the three body corporate are authorized by their respective competent authority to execute this tripartite lease agreement and affix the common seal, where applicable.

This tri partite agreement is prepared in triplicate and each contracting party will retain one original for their records and reference.

26. Limitation of Liability

VENDOR's liability will be limited to the value of this contract only.

27. RISK PURCHASE

The **LESSEE** shall reserve the right to terminate the order/contract and avail/purchase from elsewhere at the risk and cost of the **LESSOR** and **VENDOR**, either the whole or part of the Systems/goods, or services which the **LESSOR** and **VENDOR** have failed to deliver within the stipulated delivery period or if the same were not available, the best and the nearest available substitute(s) thereof which is no technically inferior to the undelivered System/Goods or services. The **LESSOR** and the **VENDOR** would be liable to compensate the **LESSEE** for any loss, which the **LESSEE** may sustain by reason of such Lease.

28. INDEMNITY

Vendor shall defend, indemnify and hold harmless Lessee from and against any and all Third Party claims and liabilities (including, without limitation, reasonable attorneys' fees and costs), regardless of the form of action, arising out of or in connection with a claim that the Equipment supplied, installed and Leased to Lessee, when used within the scope of this Agreement, infringes, violates or misappropriates a valid third party patent, copyright or other proprietary right, Civil, Criminal or any other action.

Infringement Claim

The term Infringement Claim means any claim that the manufacture, use, offer to sell, sale, Lease or other exploitation of any Product infringes, misappropriates or otherwise violates any patent right, copyright, trademark right, trade dress right or other intellectual property right of any Third Party in any jurisdiction worldwide, use by Lessee of the Product in connection with or in combination with any hardware, software, network system, network protocol, products, equipment, material, content, information or data not supplied, installed by the by lessor and vendor.

Indemnification Demand to Defend.

If Lessee makes a demand for Lessor and / or Vendor to defend an Infringement Claim made against Lessee, Lessor and / or Vendor shall indemnify, defend and hold harmless Lessee from, against and in respect of any and all Losses arising out of or relating to such Infringement Claim and, in the case of Losses that involve obligations in the nature of an injunction, shall secure for Lessee the right to continue exploiting the applicable Product or shall provide noninfringing specifications for a new Product and secure the right to continue to exploit any remaining inventory of the existing Product. Once Lessee makes a demand for Lessor and / or Vendor to defend an Infringement Claim, Lessee may defend against the Infringement Claim in any manner it reasonably may deem appropriate unless and until Lessor and / or Vendor assumes control of such defense. If Lessor and / or Vendor assumes the defense of the Infringement Claim, Lessor and / or Vendor must do so using counsel that is reasonably acceptable to Lessee. Lessee shall reasonably cooperate with Lessor and / or Vendor, at Lessor and / or Vendor expense, in the defense or settlement of any such Infringement Claim and shall provide access to its records and personnel as reasonably requested by Lessor and / or Vendor for the purpose thereof. If Lessor and / or Vendor refuses or fails to assume or maintain control of any such Infringement Claim, Lessee's right to indemnification pursuant to this Section shall not be adversely affected by virtue of Lessee assuming or continuing the defense thereof.

27. Further Assurances

The parties agree to promptly execute and deliver to each other such further documents and take such further action as any party to this Agreement reasonably requires in order to more effectively carry out the intent and purpose of this Agreement.

28. Export Compliance

The Equipment subject to this Agreement may be subject to United States, Indian and other government export control laws and regulations. The parties each undertake to comply with all such laws and regulations.

IN WITNESS THEREOF the parties hereto have caused these presents to be executed in triplicate on the day, month and year first above written at [Place].

The LESSEE, LESSOR and the VENDOR hereby affix their respective Common Seals to this document in acceptance of the terms and conditions herein contained.

**LESSOR
AUTHORISED SIGNATORIES**

1 Name/s: -----
Designation: -----
Address -----

2. Name/s: -----
Designation: -----
Address -----

LESSEE AUTHORISED SIGNATORIES

1 Name/s: -----
Designation: -----
Address -----

2. Name/s: -----
Designation: -----

Address -----

VENDOR AUTHORISED SIGNATORIES

1 Name/s: -----
Designation: -----
Address -----

WITNESSES

1 Name/s: -----
Designation: -----
Address -----

2. Name/s: -----
Designation: -----
Address: -----

SCHEDULE B - LEASE RENTAL PAYMENTS

Pricing Expiration Date: [specify]

LessorLESSOR is not obliged to purchase the Equipment if the Acceptance Date occurs on or after the Pricing Expiration Date.

Rental Due Dates:

Rentals will be payable on a quarterly in arrears basis with a single Rental installment payable per quarter.

SI.No	Rental Period		Invoice Date	Quarterly Rental Charges
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

SCHEDULE C - MAINTENANCE CHARGE PAYMENTS

Maintenance fee Due Dates:

Maintenance fee will be payable on a quarterly in arrears basis with a single maintenance fee payable per quarter.

SI.No	Rental Period		Invoice Date	Quarterly Maintenance Charges
	From	To		
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
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21				

SCHEDULE D: ACCEPTANCE CERTIFICATE

[Name] ("**LESSOR**") and Bharat Heavy Electricals Limited ("**LESSEE**") are parties to this Agreement.

All capitalized terms used in this Acceptance Certificate without definition have the meanings given to them in the Agreement.

1 Lease Acceptance

LESSEE acknowledges that the Equipment described in Schedule I has been:

- (a) delivered to the Equipment Location specified in Schedule A, inspected by **LESSEE** and found to be in good operating order and condition, and has been accepted by **LESSEE** under the lease created under this Agreement on the Acceptance Date specified below; and
- (b) the Commissioning and installation of the Equipment by the **VENDOR** has been completed to **LESSEE**'s satisfaction on the Acceptance Date specified below.

2 Acceptance Date

The Acceptance Date is _____.

You:

Signed for and on behalf of **LESSEE** by:

Annexure-IV

Active Components Specification

Item Name:		LAN Core Switch	
Item Code		SW01	
Make & Model			
S.No	Criteria	Feature Description	Vendor Compliance
Hardware and Performance Requirements			
1	Architecture	Chassis based Multilayer Switch with sufficient modules/line cards to fit required transceivers/UTP ports. Chassis shall have minimum 4 payload slots.	
2	System Throughput	The total aggregate switching capacity should be 8 Tbps or more. Switch should support 1.2 Tbps or more per slot throughput	
3	Switch Redundancy	There should not be any single point of failure in the switch. All the main components like CPU module, switching fabric, support module, power supplies and fans etc should be in redundant configuration. Components, like modules/power supplies/fan tray should be Hot Swappable	
4	CPU Level Redundancy	The switch should have redundant CPU's working in an active-active or active-standby mode. There should not be any traffic disruption during the CPU fail-over/change-over.	
5	Flash & Memory	The proposed switch should have sufficient RAM and Storage to hold the latest Software Release. It should support all features of switch and parameters like MAC Address Table, IP Routing Tables, VLANs etc.at their peak values as claimed in the Data Sheets of the Switch.	
6	Switch Forwarding Rates (Layer 2)	The Switch should support non-blocking Layer 2 switching and Layer 3 routing on all ports	
7	Backplane Connect Capacity	The switch should have modular-chassis based design, hot-swappable components and optimized airflow/power consumption	
8	Fiber Connectivity Options	The switch must support 1/10G/25 SFP+ ports with 40G QSFP up link ports as Day 1 Requirement. The switch must support 100 Gbps SFPs for future scalability.	
9	UTP Connectivity Options	The switch must support 1/10 G Base - T connectivity (interface or using transceivers)	
10	Line Cards required from day 1	48 port 1/10G SFP+ Fiber ports, 48 port 1/10G UTP ports (interfaces or using modules/transceivers), 24Port 40G ports , One line card free for future scalability	
Layer 2 Functionality			
12	802.3ad	Should support Industry Standard Port/Link Aggregation for All Ports. Also Cross Module Link aggregation should be supported	
13	Jumbo Frames	Jumbo Frames support more than 9000 Bytes on Gigabit / 10 G Ports and 40G ports	
14	Storm Control	Support for broadcast, multicast and unknown unicast storm control to prevent degradation of switch performance from faulty end stations	
15	802.1Q	Should support port, subnet based 802.1Q VLANs. The switch should support 4000 vlans. The switch must support Private VLAN or equivalent.	
16	Layer 2 scale	The switch should support minimum 80,000 no. of MAC addresses	
17	Spanning-Tree protocol	The switch must support IEEE 802.1w RSTP and IEEE 802.1s MSTP.	
18	Multi Chassis Link Aggregation	Switch must support Multi Chassis Link Aggregation feature and work with any downstream switch and server from various vendors.	
Layer 3 Functionality			
19	Routing Protocols	Should support routing protocol IP v4 - Static routing, OSPF v2, BGPv4, and IP v6 - BGP, OSPF v3.	
20	FHRP Support	Switch must support IP v4 VRRP and VRRP v6. It must also support DHCP Relay V4 and V6.	

21	VRF Functionality	Switch should support VRF - Lite and VRF Route leaking functionality (or) equivalent.	
22	No. of Route Entries	Should support minimum 128K Route entries for IPv4 and IPv6 routes. The switch must support minimum 8 way ECMP.	
Security Features			
23	Access Control Lists	Should support Standard and Extended ACLs	
24	Various type of ACLs	Should support various type of ACLs like MAC Based, Port based, Vlan Based and routed ACLs.	
25	Integrated Security	Should support integrated security features like DHCP snooping with option-82, Dynamic Arp Inspection, IP Source guard and MACSec-128/256	
26	MAC Address Filtering	Should Support MAC Address Filtering based on source and destination address	
27	AAA	Should support AAA, with CHAP, PAP. It must support LDAP, RADIUS and TACACS+ protocol as well. The switch must support Role Based access control (RBAC).Should be able to integrate with all leading PIM solutions	
28	Access Control Entries	It should support Security and QOS ACL's.	
29	Port Security	The switch should support Port-security.	
Switch Redundancy			
30	Redundancy in Hardware	Must Have Redundancy for Power Supply, FANs to minimize unavailability of switch. Online insertion and removal (OIR) support is must for modules, Power supply and FAN.	
31	Stateful Supervisor Switchover	Stateful Switchover to ensure that in case of failure of active CPU module the redundant CPU should start switching L2/L3 traffic in less than 1 sec (in case switch has redundant CPU).	
32	Hitless Software Upgrades	Should Support Hitless software upgrades (ISSU) to reduce downtime during software upgrade. The switch must support Fault isolation per process and process patching to enhance the switch availability	
Quality of Service			
33	Ingress/Egress Queuing	Should support Ingress or Egress Queuing.	
34	QoS Scheduling	Should support QoS scheduling with queues supported in hardware	
35	Queue per port	Should support up to 4 queues per port	
36	Traffic Classification	Should support ACL based traffic classification	
Multicast			
37	Multicast	Should support H/W based IPv4 and IPv6 Multicasting	
38	IGMP	Should Support IGMP v1, v2 , v3, IGMP Snooping	
39	PIM	Should support IPv4 Multicast with support for PIM-SM and IGMPv3. Should support IPv6 Multicast with support for MLD, MLD v2, IGMPv3, SSM for IP and PIM-SM.	
40	Multicast route Scalability	Switch should support 8K Multicast route for IPV4 and IPV6, scalable to 16K Route.	
41	Multicast Group Scalability	Switch should support minimum 1K IGMP Group.	
Management			
42	Network monitoring/management	Switch should be manageable through NMS on per port/switch basis with common interface for all manageable devices on the network. Should Support SNMP, RMON/RMON-II, SSH/telnet, web management through network management software.	
43	Port Mirroring	Should support port mirroring feature for monitoring network traffic of a particular port/VLAN/group of ports/entire switch. The switch should support 4 port mirroring Session.	

44	Management interface support	Switch should support Syslog, XML (NetConf) or REST API or equivalent, SSHv2/Telnet, OOB Management port, Console Port.	
45	Config rollback	The switch should support configuration verification and roll-back.	
46	SNMP	The switch should support SNMP v1,v2c and V3	
SDN			
47	SDN support	Switch should support Open Flow/Open Day light/Open Stack controller/ANSIBLE or equivalent	
		Switch should support Python/NetConf/XML/REST API or equivalent, Bash/ Power shell/ Industry standard CLI	
		Switch should support VXLAN (Bridging and Routing) or NVGRE or both overlay encapsulation protocol in hardware to support multiple hypervisor deployment.. Switch should also support VXLAN based architecture	
		Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
Certification			
48	Supported Standards	IEEE 802.1D Bridging and Spanning Tree	
		IEEE 802.1p QoS/CoS	
		IEEE 802.1Q VLAN Tagging	
		IEEE 802.1w Rapid Spanning Tree	
		IEEE 802.1s Multiple Spanning Tree Protocol	
		IEEE 802.1AB Link Layer Discovery Protocol	
		IEEE 802.3ad Link Aggregation with LACP	
		IEEE 802.3x Flow Control	
		IEEE 802.3ab 1000BASE-T	
		IEEE 802.3z Gigabit Ethernet	
		IEEE 802.3ae 10 Gigabit Ethernet	
		IEEE 802.3ba 40 Gigabit Ethernet	
		IEEE 802.1ae	
		RFC 2460 IPv6	
		RFC 2461 Neighbor Discovery for IPv6	
RFC 2462 IPv6 Stateless Address Auto configuration			
RFC 2463 ICMPv6			
Licenses			
49	Licenses	Licenses required to run all the above features must be included from day 1	
Environment			
50	Operating temperature	32 to 104°F (0 to 40°C)	
51	Operating relative humidity	15% to 95%, noncondensing	
Others			
52	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
53	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
54	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
55	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	

56	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
57	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
58	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Data Centre Core Switch	
Item Code		SW02	
Make & Model			
S.No	Feature	Feature Description	Vendor Compliance
1	Architecture	19" Rack mountable .	
		Maximum of 2RU size.	
		Must have Redundancy Power Supply Units (PSUs), Hot-swappable, field-replaceable power supplies, 1:1 power redundancy.	
		Must have N+1 fan module redundancy.	
		All components (including elements such as I/O cards, Expansion Module, power supplies and fans) must be hot swappable with zero disruption to traffic forwarding (Unicast or multicast).	
2	Interfaces Support	Switch must have at least 32 no. of 10/40/100 QSFP form-factor ports capable of providing line rate forwarding.	
3	Port Throughput	Minimum 2.56 Tbps and 720 MPPS processing	
4	Switching Features	Should have 32Mb buffer with Memory Support of 8GB DRAM and 8GB Flash	
		Should support Standard & Extended ACLs using L2, L3 and L4 fields	
		should support Rapid-Per Vlan Spanning Tree protocol, MST, Root Guard, and Bridge Assurance	
		Should support Private VLAN or Equivalent feature.	
		should support LACP: IEEE 802.3ad	
		Should Support line rate ingress and egress ACL filtering: Allow and deny, port filters, VLAN filters, and routed filters, including filters on management port	
		Should support VRRPv3	
		Should support Dynamic Arp Inspection, DHCP Snooping, IP Source Guard, IPv6 Security features like RA Guard and DHCPv6 Snooping	
		Switch should be able to provide security from layer 2 broadcast, multicast and unknown unicast by rate limiting such traffic.	
		Should have support for QoS policies including shaping, weighted random early detection (WRED) or explicit congestion notification (ECN) features.	
		Should support Modular QoS CLI or equivalent mechanism wherein traffic can be segregated into categories and policies created per category, which intern can be applied to ingress/egress interfaces.	
		should support multicast to act as leaf in fabric with flood and learn behavior.	
		Should support BFD	
		Switch must support VXLAN Switching/Bridging and VXLAN Routing without any performance degradation	
Should support VXLAN Routing from Day 1			
Should support VRF Aware VXLAN Routing from Day 1			
Should support VXLAN Network with MP-BGP EVPN Control Plane from Day 1			

		Should support VPC/Multi-chassis LAG with active-active forwarding with VxLAN	
		Should support Standard & Extended ACLs using L2, L3 and L4 fields	
5	Scale	Switch hardware should be capable of supporting at least: 1. 4K multicast routes 2. 128K ipv4 route prefixes 3. 120K host routes 4. 90K MAC addresses 5. 256 VRF's	
6	Monitoring and Management Features	Should have Open APIs or REST APIs to manage the switch through remote-procedure calls (JavaScript Object Notation [JSON] or XML or equivalent) over HTTPS after secure authentication for management and automation purpose.	
		Should support SNMP v2 and v3	
		Should have Control plane Packet Capture functionality for troubleshooting purpose	
		Should support syslog	
		SSH v2 for CLI access with Secure interface login and password	
		Should support configurable telemetry for various device and protocol parameters.	
		Should support Netflow version 9 or sFlow v5	
		Should support Encapsulated Remote SPAN with selective traffic mirroring using ACL or filters	
		Should be able to export real-time flow table entries to monitoring/analytics software's	
		Should be supplied with monitoring software for single point of config management, troubleshooting and monitoring of all proposed switches. Real-time statistics on per interface -> Buffer Utilization -> Queue drops -> Queue depth -> Queue congestion	
7	Software Version	Version of software for supplied switch should be latest release with necessary licenses to support all required features	
8	Licenses	Licenses required to run all the above features must be included from day 1	
9	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
10	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
11	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
12	OEM/Make/Model	All DC switches components and DC NMS must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
13	Compliance Standard	<ul style="list-style-type: none"> ● UL 60950-1 Second Edition ● CAN/CSA-C22.2 No. 60950-1 Second Edition ● EN 60950-1 Second Edition ● IEC 60950-1 Second Edition ● IPv6 Ready logo Certified (or under evaluation) ● EAL/NDPP Certified 	
14	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	

15	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	
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Item Name:		Data Centre Access Switch Type 1 (Fiber)	
Item Code		SW05	
Make & Model			
S.No	Feature	Description	Vendor Compliance
1	Architecture	19" Rack mountable .	
		Maximum of 1RU size.	
		Must have Redundancy Power Supply Units (PSUs), Hot-swappable, field-replaceable power supplies, 1:1 power redundancy.	
		Must have N+1 fan module redundancy.	
		All components (including elements such as I/O cards, Expansion Module, power supplies and fans) must be hot swappable with zero disruption to traffic forwarding (Unicast or multicast).	
2	Interfaces Support	Must have minimum 48 x 10/25G SFP+ natively and 6 X 40/100 G ports.	
3	Port Throughput	Minimum 2 Tbps	
4	Latency	Maximum upto 3 microseconds	
5	Switching Features	Physical standards for Network Device	
		Must support Gigabit Ethernet (IEEE 802.3z, 802.3ab)	
		Must support Ten Gigabit Ethernet (IEEE 802.3ae)	
		Must support 40 Gigabit Ethernet (IEEE 802.3ba)	
		Software based standards for Network Device	
		Should support IPv6 protocol as per the RFC 2460 from day one	
		Must support IEEE 802.1d - Spanning-Tree Protocol	
		Must support IEEE 802.1w - Rapid Spanning Tree	
		Must support IEEE 802.1s - Multiple Spanning Tree Protocol	
		Must support IEEE 802.1q - VLAN encapsulation	
		Must support IEEE 802.3ad - Link Aggregation Control Protocol (LACP)	
		Must support IEEE 802.1ab - Link Layer Discovery Protocol (LLDP)	
		Must support IEEE 802.3x Flow Control	
		Must support auto-sensing and auto-negotiation (Link Speed/Duplex)	
		Must support Static IP routing	
		Must support Open Shortest Path First (OSPF) v2 (RFC 2328) and OSPF v3	
		Must support Protocol Independent Multicast Version 2 (PIMv2) sparse mode, Source Specific Multicast (SSM), Multicast Source Discovery Protocol (MSDP), and Internet Group Management Protocol Versions 2, and 3 (IGMP v2, and v3)	
		Must support Border Gateway Protocol - BGPv4	
Support for up to 1000 multicast routes			
Support for 256 VRF entries			
Virtual Route Forwarding (VRF): VRF-lite (IP VPN); VRF-aware unicast; and BGP-, OSPF- and VRF-aware multicast			
Must support 8-way equal-cost multipathing (ECMP)			
Must have Layer 2 IEEE 802.1p			
Must have 4 hardware queues per port with per port QoS configuration			

		Must have Modular QoS classification compliance	
		Must have per port virtual output queuing or Egress Queuing	
		Must support Jumbo Frame Size (9k)	
		IEEE 802.3ad Link Aggregation or equivalent capabilities	
		Must be able to load balance across a logical bundle using the following algorithms:	
		<i>Source IP</i>	
		<i>Destination IP</i>	
		<i>Source and Destination IP</i>	
		<i>Source MAC</i>	
		<i>Destination MAC</i>	
		<i>Source and Destination MAC</i>	
		<i>TCP Port (destination and/or source)</i>	
		<i>UDP Port (destination and/or source)</i>	
		Switch must support VXLAN (Bridging and Routing) as well as BGP EVPN overlay encapsulation protocol in hardware to support multiple hypervisor deployment in the Data Center	
6	QoS Feature	Must support IEEE 802.1p class-of-service (CoS) prioritization	
		Must have 4 Hardware queues per port	
		Must have Per-Port QoS configuration	
		Must have CoS Trust	
		Must have CoS-based egress queuing	
		Must have Egress strict-priority queuing	
		Must have Modular QoS classification compliance	
		Must have per port virtual output queuing or Egress Queuing	
		Must support Egress port-based scheduling: Weighted Round-Robin (WRR)	
		Must have ACL-based QoS classification (Layers 2, 3, and 4)	
7	Management Feature	Must provide management using 10/100/1000-Mbps management or console ports	
		Must have CLI-based console to provide detailed out-of-band management	
		Must have Configuration synchronization & Configuration rollback	
		Must support Secure Shell Version 2 (SSHv2)/Telnet & SNMPv1, v2, and v3	
		Must support AAA, AAA with RBAC or equivalent, Radius, TACACS+ for user authentication	
		Must support RMON	
		Must support XML or REST API	
		Must have Advanced Encryption Standard (AES) for management traffic	
		Must support Unified username and passwords across CLI and SNMP	
		Must have Switched Port Analyzer (SPAN) or Port mirroring on physical, PortChannel, VLAN	
		Troubleshooting capabilities	
		Must provide Comprehensive bootup diagnostic tests	
		Must have Ingress and egress packet counters per interface	
		Must support SPAN /Port Mirroring on physical, PortChannel or equivalent, VLAN	
		Must have support for Embedded packet analyzer or equivalent internally/Externally	

8	Software Version	Version of software for supplied switch should be latest release with necessary licenses to support all required features	
9	Licenses	Licenses required to run all the above features must be included from day 1	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labour, comprehensive warranty covers software update and upgrades.	
13	OEM/Make/Model	All DC switches components and DC NMS must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
14	Compliance Standard	<ul style="list-style-type: none"> ● UL 60950-1 Second Edition ● CAN/CSA-C22.2 No. 60950-1 Second Edition ● EN 60950-1 Second Edition ● IEC 60950-1 Second Edition ● AS/NZS 60950-1 	
15	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
16	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Data Centre Access Switch Type 2 (Copper)	
Item Code		SW06	
Make & Model			
S.No	Feature	Description	Vendor Compliance
1	Architecture	19" Rack mountable .	
		Maximum of 1RU size.	
		Must have Redundancy Power Supply Units (PSUs), Hot-swappable, field-replaceable power supplies, 1:1 power redundancy.	
		Must have N+1 fan module redundancy.	
		All components (including elements such as I/O cards, Expansion Module, power supplies and fans) must be hot swappable with zero disruption to traffic forwarding (Unicast or multicast).	
2	Interfaces Support	Must have minimum 48 x 10G Copper natively and 4 X 40/100 G ports.	
3	Port Throughput	Minimum 2.160 Tbps	
4	Latency	Maximum upto 3 microseconds	
5	Switching Features	Physical standards for Network Device	
		Must support Gigabit Ethernet (IEEE 802.3z, 802.3ab)	
		Must support Ten Gigabit Ethernet (IEEE 802.3ae)	
		Must support 40 Gigabit Ethernet (IEEE 802.3ba)	
		Software based standards for Network Device	
		Should support IPv6 protocol as per the RFC 2460 from day one	
		Must support IEEE 802.1d - Spanning-Tree Protocol	
		Must support IEEE 802.1w - Rapid Spanning Tree	
		Must support IEEE 802.1s - Multiple Spanning Tree Protocol	
		Must support IEEE 802.1q - VLAN encapsulation	
		Must support IEEE 802.3ad - Link Aggregation Control Protocol (LACP)	
		Must support IEEE 802.1ab - Link Layer Discovery Protocol (LLDP)	
		Must support IEEE 802.3x Flow Control	
		Must support auto-sensing and auto-negotiation (Link Speed/Duplex)	
		Must support Static IP routing	
		Must support Open Shortest Path First (OSPF) v2 (RFC 2328) and OSPF v3	
		Must support Protocol Independent Multicast Version 2 (PIMv2) sparse mode, Source Specific Multicast (SSM), Multicast Source Discovery Protocol (MSDP), and Internet Group Management Protocol Versions 2, and 3 (IGMP v2, and v3)	
		Must support Border Gateway Protocol - BGPv4	
		Support for up to 1000 multicast routes	
		Support for 256 VRF entries	
Virtual Route Forwarding (VRF): VRF-lite (IP VPN); VRF-aware unicast; and BGP-, OSPF- and VRF-aware multicast			
Must support 8-way equal-cost multipathing (ECMP)			
Must have Layer 2 IEEE 802.1p			

		Must have 4 hardware queues per port with per port QoS configuration	
		Must have Modular QoS classification compliance	
		Must have per port virtual output queuing or Egress Queuing	
		Must support Jumbo Frame Size (9k)	
		IEEE 802.3ad Link Aggregation or equivalent capabilities	
		Must be able to load balance across a logical bundle using the following algorithms:	
		<i>Source IP</i>	
		<i>Destination IP</i>	
		<i>Source and Destination IP</i>	
		<i>Source MAC</i>	
		<i>Destination MAC</i>	
		<i>Source and Destination MAC</i>	
		<i>TCP Port (destination and/or source)</i>	
		<i>UDP Port (destination and/or source)</i>	
		Switch must support VXLAN (Bridging and Routing) as well as BGP EVPN overlay encapsulation protocol in hardware to support multiple hypervisor deployment in the Data Center	
6	QoS Feature	Must support IEEE 802.1p class-of-service (CoS) prioritization	
		Must have 4 Hardware queues per port	
		Must have Per-Port QoS configuration	
		Must have CoS Trust	
		Must have CoS-based egress queuing	
		Must have Egress strict-priority queuing	
		Must have Modular QoS classification compliance	
		Must have per port virtual output queuing or Egress Queuing	
		Must support Egress port-based scheduling: Weighted Round-Robin (WRR)	
		Must have ACL-based QoS classification (Layers 2, 3, and 4)	
7	Management Feature	Must provide management using 10/100/1000-Mbps management or console ports	
		Must have CLI-based console to provide detailed out-of-band management	
		Must have Configuration synchronization & Configuration rollback	
		Must support Secure Shell Version 2 (SSHv2)/Telnet & SNMPv1, v2, and v3	
		Must support AAA, AAA with RBAC or equivalent, Radius, TACACS+ for user authentication	
		Must support RMON	
		Must support XML or REST API	
		Must have Advanced Encryption Standard (AES) for management traffic	
		Must support Unified username and passwords across CLI and SNMP	
		Must have Switched Port Analyzer (SPAN) or Port mirroring on physical, PortChannel, VLAN	
		Troubleshooting capabilities	
		Must provide Comprehensive bootup diagnostic tests	

		Must have Ingress and egress packet counters per interface	
		Must support SPAN /Port Mirroring on physical, PortChannel or equivalent, VLAN	
		Must have support for Embedded packet analyzer or equivalent internally/Externally	
8	Software Version	Version of software for supplied switch should be latest release with necessary licenses to support all required features	
9	Licenses	Licenses required to run all the above features must be included from day 1	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessor	All necessary cables - FC, power & accessories should be supplied	
12	Support & Warra	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labour, comprehensive warranty covers software update and upgrades.	
13	Compliance Standard	<ul style="list-style-type: none"> ● UL 60950-1 Second Edition ● CAN/CSA-C22.2 No. 60950-1 Second Edition ● EN 60950-1 Second Edition ● IEC 60950-1 Second Edition ● AS/NZS 60950-1 	
14	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
15	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		LAN Distribution Type 1 (16 port)	
Item Code		SW03	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	Minimum 16 gigabit Ethernet 1/10/25 Gbps Fiber SFP+ Ports	
		Must have scalability to add minimum 2 x 40G Fiber QSFP+ ports from day 1	
		Minimum 480 Gbps Switching bandwidth capacity.	
		Minimum Packet Forwarding Rate of 360 Mpps	
		Minimum 4k VLANs	
		Minimum 8GB Flash Memory and 8GB DRAM/SDRAM	
		Redundant Power Supply	
		Minimum support for 64K MAC address and 4K Multicast routes	
		Minimum support for 16MB buffer size	
		The uplink ports shall support 1/10G BaseLX/LH/SX/ 1G BaseT transceivers	
2	Access Control Features:	Port security, IEEE 802.1x, ipv6 first hop security/ IPv6 ACLs, SPAN /port mirroring, SSH and MacSec-128/256 or overlay tunnels using standard Protocols like GRE	
		Advanced Access Control Lists (ACL), TACACS+ and RADIUS authentication	
		SSHv2 and SNMPv3, DHCP snooping, IGMPv3	
		Multilevel security on console access to prevent unauthorized access	
3	VLAN Features	802.1Q Tagged VLAN	
		Dynamic VLAN Registration	
		Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
4	Protocol and Traffic Features	IEEE 802.1s, IEEE 802.1w, 802.1X support	
		Shaped Round Robin (SRR) or Weighted Round Robin (WRR) scheduling and congestion avoidance or equivalent	
		egress Queues , Strict priority queuing, WRR/SRR, flow based rate limiting or ACLbased rate limiting	
		Traffic segmentation	
		Should support IPv6 protocol as per the RFC 2460 from day one	
5	Management Features	Traffic classification should be based on user-definable application types: Port based, Mac address, IP address, TCP/UDP port number	
		USB or RS-232 console port for management via a console terminal or PC	
		SNMP v1, v2, v3	
		Web-based management, Web GUI traffic monitoring	
		Web management. Should support Netflow or equivalent for traffic monitoring.	
		CLI management support.	
		Layer 2/Layer 3 trace route	
TFTP, Four RMON groups (history, statistics, alarms, and events) support			
		(i)All the LAN (Access, Distribution and Core Switches) Components must have same Operating system architecture	

6	Switches Operating System	(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
7	Operating temperature	32 to 104°F (0 to 40°C)	
8	Operating relative humidity	15% to 90%, noncondensing	
9	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
10	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
11	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
12	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
13	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
14	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		LAN Distribution Type 2 (24 port)	
Item Code		SW04	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	Minimum 24 gigabit Ethernet 1/10/25 Gbps Fiber SFP+ Ports	
		Must have scalability to add minimum 2 x 40 GBe Fiber QSFP+ ports from day 1	
		Minimum 1280 Gbps Switching bandwidth capacity.	
		Minimum Packet Forwarding Rate of 600 Mpps	
		Minimum 4k VLANs	
		Minimum 8GB Flash Memory and 8GB DRAM/SDRAM	
		Redundant Power Supply	
		Minimum support for 64K MAC address and 4K Multicast routes	
		Minimum support for 16MB buffer size	
		Should support IPv6 protocol as per the RFC 2460 from day one	
		The uplink ports shall support 1/10G BaseLX/LH/SX/ 1G BaseT transceivers	
3	Access Control Features:	Port security, IEEE 802.1x, ipv6 first hop security/ IPv6 ACLs, SPAN /port mirroring, SSH, MacSec-128/256 or overlay tunnels using standard Protocols like GRE	
		Advanced Access Control Lists (ACL), TACACS+ and RADIUS authentication	
		SSHv2 and SNMPv3, DHCP snooping, IGMPv3	
		Multilevel security on console access to prevent unauthorized access	
4	VLAN Features	802.1Q Tagged VLAN	
		Dynamic VLAN Registration	
		Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
5	Protocol and Traffic Features	IEEE 802.1s, IEEE 802.1w, 802.1X support	
		Shaped Round Robin (SRR) or Weighted Round Robin (WRR) scheduling and congestion avoidance or equivalent	
		egress Queues , Strict priority queuing, WRR/SRR, flow based rate limiting or ACLbased rate limiting	
		Traffic segmentation	
6	Management Features	Traffic classification should be based on user-definable application types: Port based, Mac address, IP address, TCP/UDP port number	
		USB or RS-232 console port for management via a console terminal or PC	
		SNMP v1, v2, v3	
		Web-based management, Web GUI traffic monitoring	
		Web management. Should support Netflow or equivalent for traffic monitoring.	
		CLI management support.	
		Layer 2/Layer 3 trace route	
TFTP, Four RMON groups (history, statistics, alarms, and events) support			

7	Switches Operating System	(i)All the LAN (Access, Distribution and Core Switches) Components must have same Operating system	
		(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
8	Operating temperature	32 to 104°F (0 to 40°C)	
9	Operating relative humidity	15% to 90%, noncondensing	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
13	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
14	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
15	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 1 (48 port NonPOE)			
Item Code		SW07			
Make & Model					
Sr. No.	Criteria	Feature Description	Vendor Compliance		
1	General Requirements:	i) 48 gigabit Ethernet 10/100/1000Mbps			
		ii) Dedicated uplink module supplied must be able to support minimum 4 x 1/10G Fiber Uplink ports. The fiber port should be populated with 2 x 1G Single mode transceivers			
		iii) Switch should be of 1 RU configuration. Switch should support stacking of minimum 8 switches. Should support IPv4 and IPv6 IP protocol from day one			
		iv) All 48 ports can auto-negotiate between 10Mbps/100Mbps/1000, half-duplex or full duplex and flow control for half-duplex ports.			
		v) Minimum 175 Gbps Switching bandwidth capacity.			
		vi) Minimum Packet Forwarding Rate of 100 Mpps (based on 64-byte packet)			
		vii) Minimum 1000 VLANs			
		viii) Minimum 32K MAC address			
		ix) Minimum 2GB Flash Memory and 4 GB DRAM			
		x) Should have support for dual internal field replaceable redundant AC Power and FAN unit			
		xi) Switch ports should support MDIX (medium-dependent interface crossover) connections			
		xii) Switch should have support for Private Vlan,			
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard. Switch should support stack bandwidth of at least 136 Gbps.(Equal speed to all ports). Required modules/cables for stacking to be provided.			
		The offered switch should support Ether channel/IEEE 802.3ad support			
		Multidomain / multi-user Authentication should be supported			
		(xv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT, 10GBaseSR, 10GBaseLR, 10GBaseER, 10GBaseLRM transceivers			
		2	Performance & QoS Features:	(i) Auto negotiating on all ports that automatically selects half- or full-duplex transmission mode to optimize bandwidth.	
				(ii) Per-port broadcast, multicast, and unicast storm control support	
				(iii) Port Mirroring, Port Trunking and 802.3ad Link Aggregation port trunks	
(iv) IEEE 802.3x flow control for full-duplex mode ports.					
(v) IEEE 802.1D Spanning Tree, IEEE 802.1W RSTP, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)					
(vi) Provision for loop avoidance in case of Unidirectional fiber.					
(vii) Switch should be capable of detecting and disabling port(s) causing spanning tree Protocol loops					
(viii) It should be possible to configure STP on a per VLAN basis.					
(ix) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues					

		(x) IEEE 802.1p CoS and DSCP field classification	
		(xi) Strict priority queuing support, IGMP Filtering	
		(xii) Support for Granular Rate limiting	
3	Access Control Features:	(i) Port security, IEEE 802.1x, ip6 first hop security or equivalent, SPAN Or Equivalent and SSH.	
		(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
		(iii) 802.1x port-based authentication	
		(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3 snooping, IGMP Filtering	
		(v) Spanning Tree Root Guard Support	
		(vi) Multilevel security on console access to prevent unauthorized access	
		MacSec-128/256 or overlay tunnels using standard Protocols like GRE	
4	VLAN Features	(i) 802.1Q Tagged VLAN and port based Vlan, cross stack ether-channel,	
		(ii) Dynamic VLAN Registration	
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
		(v) IEEE 802.1s, IEEE 802.1w and IEEE 802.1ae or overlay tunnels using industry standards	
		(vi) Protocol support for maintaining a separate spanning-tree instance for each VLAN	
5	Protocol and Traffic Features	8 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management , Rate limiting	
		(ii) Multicast filtering per port	
		(iii) Traffic segmentation	
		(iv) Switch should support basic Layer 3 protocols such as OSPF or IS-IS, PBR, VRRP/HSRP etc	
6	Management Features	(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
		(i) USB or RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	
		(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/Layer3 trace route	
(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support			
7	Switches Operating System	(i)All the LAN (Access, Distribution and Core Switches) Components must have same Operating system	
		(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
8	Operating temperature	32 to 104°F (0 to 40°C)	

9	Operating relative humidity	15% to 90%, noncondensing	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
13	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
14	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
15	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
16	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 2 (48 port POE)	
Item Code		SW08	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	i) 48 gigabit Ethernet 10/100/1000Mbps POE+ Based	
		ii) Dedicated uplink module supplied must be able to support minimum 4 1/10G Fiber Uplink ports.	
		The fiber port should be populated with 2 x 1G Single mode transceivers	
		iii) Switch should be of 1 RU configuration. Switch should support stacking of minimum 8 switches.	
		iv) All 48 ports can auto-negotiate between 10Mbps/100Mbps/1000, half-duplex or full duplex and flow control for half-duplex ports.	
		v) Minimum 175 Gbps Switching bandwidth capacity.	
		vi) Minimum Packet Forwarding Rate of 100 Mpps (based on 64-byte packet)	
		vii) Minimum 1000 VLANs	
		viii) Minimum 32K MAC address	
		ix) Minimum 2GB Flash Memory and 4 GB DRAM	
		x) Should have support for dual internal field replaceable redundant AC Power and FAN unit both	
		xi) Switch ports should support MDIX (medium-dependent interface crossover) connections	
		xii) Switch should have support for Private Vlan,	
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard.	
		Should support IPv4 and IPv6 IP protocol from day one	
		Switch should support stack bandwidth of at least 136 Gbps.(Equal speed to all ports)	
		Required modules/cables for stacking to be provided.	
		The offered switch should support Ether channel/IEEE 802.3ad support	
		Multidomain / multi-user Authentication should be supported	
		(xv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT, 10GBaseSR, 10GBaseLR, 10GBaseER, 10GBaseLRM transceivers	
		(i) Auto negotiating on all ports that automatically selects half- or full-duplex transmission mode to optimize bandwidth.	
		(ii) Per-port broadcast, multicast, and unicast storm control support	

2	Performance & QoS Features:	(iii) Port Mirroring, Port Trunking and 802.3ad Link Aggregation port trunks			
		(iv) IEEE 802.3x flow control for full-duplex mode ports.			
		(v) IEEE 802.1D Spanning Tree, IEEE 802.1W RSTP, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)			
		(vi) Provision for loop avoidance in case of Unidirectional fiber.			
		(vii) Switch should be capable of detecting and disabling port(s) causing spanning tree Protocol loops			
		(viii) It should be possible to configure STP on a per VLAN basis.			
		(ix) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues			
		(x) IEEE 802.1p CoS and DSCP field classification			
		(xi) Strict priority queuing support, IGMP Filtering			
		(xii) Support for Granular Rate limiting			
		3	Access Control Features:	(i) Port security, IEEE 802.1x, ip6 first hop security or equivalent, SPAN Or Equivalent and SSH.	
				(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
(iii) 802.1x port-based authentication					
(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3 snooping, IGMP Filtering					
(v) Spanning Tree Root Guard Support					
(vi) Multilevel security on console access to prevent unauthorized access					
(vii) MacSec-128/256 or overlay tunnels using standard Protocols like GRE					
4	VLAN Features	(i) 802.1Q Tagged VLAN and port based Vlan, cross stack ether-channel,			
		(ii) Dynamic VLAN Registration			
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links			
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis			
		(v) IEEE 802.1s, IEEE 802.1w and IEEE 802.1ae or overlay tunnels using standard Protocols like GRE			
		(vi) Protocol support for maintaining a separate spanning-tree instance for each VLAN			
5	Protocol and Traffic Features	8 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management, Rate limiting			
		(ii) Multicast filtering per port			
		(iii) Traffic segmentation			
		(iv) Switch should support basic Layer 3 protocols such as OSPF or IS-IS, PBR, VRRP/HSRP etc			

		(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
6	Management Features	(i) USB or RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	
		(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/Layer3 trace route	
		(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support	
7	Switches Operating System	(i) All the LAN (Access, Distribution and Core Switches) Components must have same Operating system	
		(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
8	Operating temperature	32 to 104°F (0 to 40°C)	
9	Operating relative humidity	15% to 90%, noncondensing	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
13	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
14	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
15	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
16	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 3 (24 port NonPOE)	
Item Code		SW09	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	i) 24 gigabit Ethernet 10/100/1000Mbps	
		ii) Dedicated uplink module supplied must be able to support minimum 4 1/10G Fiber Uplink ports. The fiber port should be populated with 2 x 1G Single mode transceivers	
		iii) Switch should be of 1 RU configuration. Switch should support stacking of minimum 8 switches.	
		iv) All 24 ports can auto-negotiate between 10Mbps/100Mbps/1000, half-duplex or full duplex and flow control for half-duplex ports.	
		v) Minimum 128 Gbps Switching bandwidth capacity.	
		vi) Minimum Packet Forwarding Rate of 90 Mpps (based on 64-byte packet)	
		vii) Minimum 1000 VLANs	
		viii) Minimum 32K MAC address	
		ix) Minimum 2GB Flash Memory and 4 GB DRAM	
		x) Should have support for dual internal field replaceable redundant AC Power and FAN unit both	
		xi) Switch ports should support MDIX (medium-dependent interface crossover) connections	
		xii) Switch should have support for Private Vlan,	
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard.	
		Should support IPv4 and IPv6 IP protocol from day one	
		Switch should support stack bandwidth of at least 128 Gbps	
		Required modules/cables for stacking to be provided.	
		The offered switch should support Ether channel/IEEE 802.3ad support	
		Multidomain / multi-user Authentication should be supported	
		(xv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT, 10GBaseSR, 10GBaseLR, 10GBaseER, 10GBaseLRM transceivers	
2	Performance & QoS Features:	(i) Auto negotiating on all ports that automatically selects half- or full-duplex transmission mode to optimize bandwidth.	
		(ii) Per-port broadcast, multicast, and unicast storm control support	
		(iii) Port Mirroring, Port Trunking and 802.3ad Link Aggregation port trunks	
		(iv) IEEE 802.3x flow control for full-duplex mode ports.	
		(v) IEEE 802.1D Spanning Tree, IEEE 802.1W RSTP, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)	
		(vi) Provision for loop avoidance in case of Unidirectional fiber.	

		(vii) Switch should be capable of detecting and disabling port(s) causing spanning tree Protocol loops	
		(viii) It should be possible to configure STP on a per VLAN basis.	
		(ix) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues	
		(x) IEEE 802.1p CoS and DSCP field classification	
		(xi) Strict priority queuing support, IGMP Filtering	
		(xii) Support for Granular Rate limiting	
3	Access Control Features:	(i) Port security, IEEE 802.1x, ip6 first hop security or equivalent, SPAN Or Equivalent and SSH.	
		(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
		(iii) 802.1x port-based authentication	
		(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3 snooping, IGMP Filtering	
		(v) Spanning Tree Root Guard Support	
		(vi) Multilevel security on console access to prevent unauthorized access	
		MacSec-128/256 or overlay tunnels using standard Protocols like GRE	
4	VLAN Features	(i) 802.1Q Tagged VLAN and port based Vlan, cross stack ether-channel,	
		(ii) Dynamic VLAN Registration	
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
		(v) IEEE 802.1s, IEEE 802.1w and IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
		(vi) Protocol support for maintaining a separate spanning-tree instance for each VLAN	
5	Protocol and Traffic Features	8 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management, Rate limiting	
		(ii) Multicast filtering per port	
		(iii) Traffic segmentation	
		(iv) Switch should support basic Layer 3 protocols such as OSPF or IS-IS, PBR, VRRP/HSRP etc	
		(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
6	Management Features	(i) USB or RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	
		(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/Layer3 trace route	
		(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support	

7	Switches Operating System	(i)All the LAN (Access, Distribution and Core Switches) Components must have same Operating system	
		(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	
8	Operating temperature	32 to 104°F (0 to 40°C)	
9	Operating relative humidity	15% to 90%, noncondensing	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
13	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
14	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
15	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
16	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 4 (24 port POE)	
Item Code		SW10	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	i) 24 gigabit Ethernet 10/100/1000Mbps PoE+ Based	
		ii) Dedicated uplink module supplied must be able to support minimum 4 1/10G Fiber Uplink ports. The fiber port should be populated with 2 x 1G Single mode transceivers	
		iii) Switch should be of 1 RU configuration. Switch should support stacking of minimum 8 switches.	
		iv) All 24 ports can auto-negotiate between 10Mbps/100Mbps/1000, half-duplex or full duplex and flow control for half-duplex ports.	
		v) Minimum 128 Gbps Switching bandwidth capacity.	
		vi) Minimum Packet Forwarding Rate of 90 Mpps (based on 64-byte packet)	
		vii) Minimum 1000 VLANs	
		viii) Minimum 32K MAC address	
		ix) Minimum 2GB Flash Memory and 4 GB DRAM	
		x) Should have support for dual internal field replaceable redundant AC Power and FAN unit both	
		xi) Switch ports should support MDIX (medium-dependent interface crossover) connections	
		xii) Switch should have support for Private Vlan,	
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard.	
		Switch should support stack bandwidth of at least 128 Gbps	
		Required modules/cables for stacking to be provided.	
		The offered switch should support Ether channel/IEEE 802.3ad support	
		Should support IPv4 and IPv6 IP protocol from day one	
Multidomain / multi-user Authentication should be supported			
(xv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT, 10GBaseSR, 10GBaseLR, 10GBaseER, 10GBaseLRM transceivers			
2	Performance & QoS Features:	(i) Auto negotiating on all ports that automatically selects half- or full-duplex transmission mode to optimize bandwidth.	
		(ii) Per-port broadcast, multicast, and unicast storm control support	
		(iii) Port Mirroring, Port Trunking and 802.3ad Link Aggregation port trunks	
		(iv) IEEE 802.3x flow control for full-duplex mode ports.	
		(v) IEEE 802.1D Spanning Tree, IEEE 802.1W RSTP, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)	
		(vi) Provision for loop avoidance in case of Unidirectional fiber.	
		(vii) Switch should be capable of detecting and disabling port(s) causing spanning tree Protocol loops	
		(viii) It should be possible to configure STP on a per VLAN basis.	

		(ix) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues	
		(x) IEEE 802.1p CoS and DSCP field classification	
		(xi) Strict priority queuing support, IGMP Filtering	
		(xii) Support for Granular Rate limiting	
3	Access Control Features:	(i) Port security, IEEE 802.1x, ip6 first hop security or equivalent, SPAN Or Equivalent and SSH.	
		(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
		(iii) 802.1x port-based authentication	
		(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3 snooping, IGMP Filtering	
		(v) Spanning Tree Root Guard Support	
		(vi) Multilevel security on console access to prevent unauthorized access	
		MacSec-128/256 or overlay tunnels using standard Protocols like GRE	
4	VLAN Features	(i) 802.1Q Tagged VLAN and port based Vlan, cross stack ether-channel,	
		(ii) Dynamic VLAN Registration	
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
		(v) IEEE 802.1s, IEEE 802.1w and IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
		(vi) Protocol support for maintaining a separate spanning-tree instance for each VLAN	
5	Protocol and Traffic Features	8 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management , Rate limiting	
		(ii) Multicast filtering per port	
		(iii) Traffic segmentation	
		(iv) Switch should support basic Layer 3 protocols such as OSPF or IS-IS, PBR, VRRP/HSRP etc	
		(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
6	Management Features	(i) USB or RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	
		(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/Layer3 trace route	
		(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support	
7	Switches Operating System	(i) All the LAN (Access, Distribution and Core Switches) Components must have same Operating system	
		(ii) Switches operating system must support providing better network analytics and network visibility to help finding the root cause of issues.	
		(iii) Switches Operating system must support telemetry of system information and real time monitoring to identify and automate the issues resolution.	

8	Operating temperature	32 to 104°F (0 to 40°C)	
9	Operating relative humidity	15% to 90%, noncondensing	
10	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
11	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
12	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
13	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
14	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
15	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
16	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 5 (8 port NonPOE)	
Item Code		SW11	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	(i) 8 gigabit Ethernet 10/100/1000Mbps	
		Dedicated uplink module supplied must be able to support 2 1G fiber and 2 1G copper uplinks	
		The fiber port should be populated with 2 x 1G Single mode transceivers	
		(iv) Minimum 24 Gbps Switching bandwidth capacity.	
		(v) Minimum Packet Forwarding Rate of 17 Mpps (based on 64-byte packet)	
		(vi) Minimum 250 VLANs	
		(viii) Minimum 128 MB Flash Memory and 512 MB DRAM	
		(ix) internal AC Power Supply, 100-240 V AC.	
		(xi) Switch should have support for Private Vlan,	
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard.	
		The offered switch should support Ether channel/IEEE 802.3ad support	
		Multidomain / multi-user Authentication should be supported	
		(xiv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT transceivers	
2	Performance & QoS Features:	(i) Up to eight egress queues per port and strict priority queuing so that the highest priority packets are serviced ahead of all other traffic.	
		(ii) IEEE 802.1D Spanning Tree, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)	
3	Access Control Features:	4 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management , Rate limiting	
		(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
		(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3	
		(v) Spanning Tree Root Guard Support	
		(vi) Multilevel security on console access to prevent unauthorized access	
		(vii) IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
4	VLAN Features	(i) 802.1Q Tagged VLAN	
		(ii) Dynamic VLAN Registration	
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
		(v) IEEE 802.1s, IEEE 802.1w, IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
		(vi) IEEE 802.1p CoS and DSCP field classification	
		(vii) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues	

5	Protocol and Traffic Features	4 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management, Rate limiting	
		(iii) Traffic segmentation	
		(iv) Should support IPv4 and IPv6 IP protocol from day one	
		(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
6	Management Features	(i) USB or RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	
		(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/ Layer 3 trace route	
		(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support	
7	Operating temperature	32 to 104°F (0 to 40°C)	
8	Operating relative humidity	15% to 90%, noncondensing	
9	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
10	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
11	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labor, comprehensive warranty covers software update and upgrades.	
12	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
13	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
14	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
15	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Access Switch -Type 6 (8 port POE)	
Item Code		SW12	
Make & Model			
Sr. No.	Criteria	Feature Description	Vendor Compliance
1	General Requirements:	(i) 8 gigabit Ethernet 10/100/1000Mbps PoE+ Ports	
		Dedicated uplink module supplied must be able to support 2 1G fiber and 2 1G copper uplinks	
		The fiber port should be populated with 2 x 1G Single mode transceivers	
		(iv) Minimum 24 Gbps Switching bandwidth capacity.	
		(v) Minimum Packet Forwarding Rate of 17 Mpps (based on 64-byte packet)	
		(vi) Minimum 250 VLANs	
		(viii) Minimum 128 MB Flash Memory and 512 MB DRAM	
		(ix) internal AC Power Supply, 100-240 V AC.	
		xii) Switch should have support for Private Vlan or equivalent	
		xiii) Switch should have switch hibernation mode or energy efficient Ethernet 802.3az standard.	
		(xiv) The uplink ports shall support 1000BaseLX, 1000BaseLH, 1000BaseSX, 1000BaseT transceivers	
		The offered switch should support Ether channel/IEEE 802.3ad support	
Multidomain / multi-user Authentication should be supported			
(xv) Full IEEE 802.3at (PoE+) with 240W PoE+ capability (30W power on all ports)			
2	Performance & QoS Features:	(i) Up to eight egress queues per port and strict priority queuing so that the highest priority packets are serviced ahead of all other traffic.	
		(ii) IEEE 802.1D Spanning Tree, IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)	
3	Access Control Features:	4 egress Queues per port, Strict priority queuing, WRR/SRR, WTD, flow based rate limiting or ACL based rate limiting	
		(ii) Advanced Access Control Lists (ACL), enhanced TACACS+ and RADIUS authentication	
		(iv) SSHv2 and SNMPv3, DHCP snooping, IGMPv3	
		(v) Spanning Tree Root Guard Support	
		(vi) Multilevel security on console access to prevent unauthorized access	
		IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
4	VLAN Features	(i) 802.1Q Tagged VLAN	
		(ii) Dynamic VLAN Registration	
		(iii) Protocol support for auto negotiation of 802.1Q trunk and encapsulation on all inter-switch links	
		(iv) Protocol support for addition, deletion, renaming of VLANs on a network-wide basis	
		(v) IEEE 802.1s, IEEE 802.1w and IEEE 802.1ae or overlay tunnels using standard Protocols like GRE	
		(vi) IEEE 802.1p CoS and DSCP field classification	
		(vii) IEEE 802.1Q VLAN, IGMP snooping, 802.1p Priority Queues	
5	Protocol and Traffic Features	8 egress Queues per port, Strict priority queuing, WRR/SRR, WTD or congestion management , Rate limiting	
		(iii) Traffic segmentation	
		(v) Should support IPv4 and IPv6 IP protocol from day one	
		(iv) Traffic classification should be based on user-definable application types: TOS, DSCP, Port based, IP address, TCP/UDP port number	
		(i) RS-232 console port for management via a console terminal or PC	
		(ii) SNMP v1, v2, v3	

6	Management Features	(iii) Web-based management, Web GUI traffic monitoring	
		(iv) Web management. Should support Netflow or equivalent for traffic monitoring.	
		(v) CLI management support.	
		(vi) Layer 2/ Layer 3 trace route	
		(vii) TFTP, Four RMON groups (history, statistics, alarms, and events) support	
7	Operating temperature	32 to 104°F (0 to 40°C)	
8	Operating relative humidity	15% to 90%, noncondensing	
9	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied.	
10	Cables & Accessories	All necessary cables - FC, India power cable (5A) & accessories should be supplied	
11	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labour, comprehensive warranty covers software update and upgrades.	
12	OEM/Make/Model	All switches, wireless components must be from same OEM and the OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
13	Compliance Standard	Switch shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	
14	Feature from Day One	All the features asked above should be available from the day one and if any licenses to be added to achieve the same, those should be added as part of the proposals and BOM.	
15	Software Defined Campus Network	Proposed hardware should be capable of supporting SDN.	

Item Name:		Wireless Controller	
Item Code		WLC01	
Make & Model			
S.No	Category	Specifications	Vendor Compliance
1		Wireless controller should support 250 AP and 5000 clients from day 1.	
2	Hardware	The controller shall support deployment flexibility without compromising any features	
		The controller shall support 5 Gbps tunneling capacity	
		The controller shall support 2x 10G/Multigigabit copper or 2x 10G/Multigigabit fiber	
		Wireless Controller shall support link aggregation and load sharing between Access Point to WLC links	
		The controller shall support hardware encrypted data plane between Access Point and Controller	
		The controller shall be proposed with complete feature set including licensed feature	
3	High Availability	High Availability mode shall support controller inline data plane mode or local switching mode/Mesh mode	
		High Availability mode shall allow geographically dispersed installation between Controllers	
		The controller failover shall not trigger client de-authentication and re-association	
		Heartbeat interval shall not be longer than 100msec	
		The controller shall support hot WLC software patching for fixing bugs	
		The controller shall support hot AP software patching for fixing bugs	
		The controller shall support new AP hardware without need for changing controller hardware. Necessary software update licenses if required shall be provided to BHEL at no additional cost	
		The controller shall support rolling AP upgrade	
		The controller shall support new software/ patch upgrade without disturbing the production network	
		The redundant Controller shall sync Access Point and Client Status, including DHCP IP lease status	
		Access Point shall be able to proactively distribute Client connection before and after association and tracking client condition in real time using data packet RSSI	

4	Software	The controller shall support standard-based, secure AP-Controller data&control protocol. OEM to fix any known vulnerabilities associated with this protocol before deployment.A declaration on OEM letter head in this regard will be required	
		The controller shall support Inter-Controller Wireless Roaming	
		The controller shall maintains per-user Application usage and shall be able to export it for network analytic.	
		The controller shall support Multi Languages options from embedded GUI Management	
		The controller shall provide per-Client Connection Scoring and provide reasoning of Client Connection Score	
		Should support IPv4 and IPv6 IP protocol from day one	
		The controller shall support Cellular offload using IPv6 tunneling to Mobile Core network	
5	RF management	The controller shall be able to support multiple RF Management profile per group of APs, including Transmit Power Control and Dynamic Channel Assignment on both <u>2.4GHz</u> and 5Ghz	
		The controller shall be able to identify and avoid interferers with network performance impact analysis report	
		The controller shall support optimized, automatic channel width (20~160Mhz) selection over 5GHz, 802.11ac , 802.11ax	
6	Application Recognition and Control	The controller shall support per-user and per-WLAN based application recognition and control that throttle usage by rate-limiting	
		The contorller shall support new application signatures without upgrading controller software	
7	BYOD & Security	The controller shall provide Device Profiling using mutlple profiling methods to reduce false-detection	
		The system shall provide secure onboarding service for both employee and guest based on standard-based security protocol Proposed system shall not use public cloud as user data repository	
		The controller shall be able to embedded custom web portal page (HTML) to fully customize user experience without additional cost or extra box	
		The controller shall provide rule-based rogue classification and automatically run rogue mitigation action	

		The controller shall be able to detect employee device connection to Rogue Access Point and contain it automatically. It should also support protection from Honeypot or Evil twin.	
		The Controller's image upgrade shall be done through secure, encrypted transport	
		The controller shall be able to provide unique pre-shared keys to the devices that do not support the 802.1x security protocol	
		The controller shall support identification & mitigation of threats inside encrypted traffic	
8	Network	The controller shall support mapping of specific VLANs to single SSID, depending on Access Point location and user	
9	Configuration	The controller shall support automatic VLAN assignment per SSID to load-balance user connection. assigned VLAN pool shall be same as number of available VLAN in the system	
		The controller shall support embedded best practice configuration profile and setup	
10	Compliance Standard	WLC shall conform to UL 60950-1, IEC 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1 Standards.	

Item Name:Indoor access point		
Item Code : WLC03		
Make & Model		
S. No.	Specification	Vendor Compliance
1	Access Points proposed must include radios for 2.4 GHz and 5 GHz with 802.11ac Wave 2, 802.11ax, WiFi6	
2	An access point must include a standard OEM provided Mounting brackets for mounting on Ceiling or Roof top.	
3	Access Point shall support Console port	
4	Should have RJ-45 auto-sensing multigig 1/2.5 Gbps LAN port.	
5	Access Point should have USB port for future requirement.	
6	Must have atleast 4 dBi Antenna gain on each radios	
7	Must support 4x4 MIMO for both radios interface bands (5Ghz and 2.4Ghz)	
8	Must Support minimum data rate of 2.4 Gbps on 5ghz and 400 mbps on 2.4 ghz.	
9	Must support minimum of 23dbm of transmit power in both 2.4Ghz and 5Ghz radios. And should follow the local regulatory Norms.	
10	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.	
11	Must incorporate radio resource management for power, channel and performance optimization	
12	Must have -96 dB or better Receiver Sensitivity.	
13	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.	
14	Must support Management Frame Protection.	
15	Should support locally-significant certificates on the APs using a Public Key Infrastructure (PKI).	
16	Access Points must support Hardware-based encrypted user data and management traffic between controller and Access point for better security.	
17	Must support the ability to serve clients and monitor the RF environment concurrently.	
18	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.	
19	Must be plenum-rated (UL2043).	
20	Must support 16 WLANs per AP for SSID deployment flexibility.	
21	Access Point Must continue serving clients when link to controller is down. It should also have option to authenticate user through Radius server directly from Access Point during link unavailability to controller.	
22	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.	
23	Must support Power over Ethernet and power injectors.	
24	802.11e and WMM	
25	Must support Reliable Multicast to Unicast conversion to maintain video quality at AP level	
26	Must support QoS and Video Call Admission Control capabilities.	
27	Access Point should 802.11 DFS certified	
28	Compliance standard UL 60950-1, CAN/CSA-C22.2 No. 60950-1, UL 2043, IEC 60950-1, EN 60950-1	
29	The access point should be Wi-Fi alliance certified for Wi-Fi6 and WPA3 security	

Item Name:Outdoor access point		
Item Code : WLC04		
Make & Model		
Sr. No.	Specification	Vendor Compliance
1	Must support 4x4 MIMO for 5GHz radio interface band and 2x2 MIMO for 2.4 GHz radio interface band. Access Points proposed must include radios for 2.4 GHz and 5 GHz with 802.11ac Wave 2, 802.11ax, WiFi6	
2	Access Point shall be able to support Multigigabit Ethernet, support up to 2.5 Gbps PHY speed using single Cat5e or above(Cat6, Cat6a, Cat7) cable	
3	Access Point shall be able to powered up using PoE (.af)	
4	Access Point shall have dedicated radio/chipset for spectrum monitoring capabilities, WIPS and off channel RRM without compromising and using the client serving radios.	
5	Access Point should have Bluetooth5 radio to support use cases of location, asset tracking and analytics.	
6	Access Point should have 1x 100, 1000, 2500 Multigigabit Ethernet (RJ-45) – IEEE 802.3bz uplink, and and 1G SFP downlink port.	
7	AP must have standard RJ-45 console port	
8	support omni direction Antenna on each radios	
9	Must Support data rate upto 3 Gbps	
10	Must support minimum of 28 dbm of transmit power on 5Ghz radio and 25 dbm of transmit power on 5Ghz radio . And should follow the local regulatory Norms.	
11	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.	
12	Must incorporate radio resource management for power, channel and performance optimization	
13	Must have -97 dB or better Receiver Sensitivity.	
14	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.	
15	Must support Management Frame Protection.	
16	Should support locally-significant certificates on the APs using a Public Key Infrastructure (PKI).	
17	Must support the ability to serve clients and monitor the RF environment concurrently.	
18	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.	
19	Must support 16 WLANs per AP for SSID deployment flexibility.	
20	Access Point Must continue serving clients when link to controller is down. It should also have option to authenticate user through Radius server directly from Access Point during link unavailability to controller.	
21	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.	
22	802.11e and WMM	
23	Must support QoS and Video Call Admission Control capabilities.	
24	Access point should be wifi 6 certified	
25	The Access point shall be IP67 and NEMA rated	
26	The Access point shall support operating temperature of -40 to 65°C	
27	The equipment shall support up to 100 MPH sustained winds & 165 MPH wind gusts.	
28	The access point should be Wi-Fi alliance certified for Wi-Fi6 and WPA3 security	

Item Name:	Network Admission Control (NAC)	
Item Code	NAC	
Make & Model		
Sr. No.	Features/Specifications	Vendor Compliance
1	Solution should support a highly powerful and flexible attribute-based access control solution that combines authentication, authorization and accounting (AAA), NAC, BYOD, posture, profiling, guest management services and conditional elements on a single platform.	
2	It should allow to authenticate and authorize users and endpoints via wired, wireless and VPN with consistent policy throughout the enterprise and should support variety of authentication methods (802.1X, MAC auth, Web auth etc).	
3	The proposed solution should be scalable upto 10,000 devices from day one for AAA, Guest Management, Device Management and Logging Features (Licenses would be required based on each Unit Mentioned as per BOM)	
4	Solution should Support EAP-FAST, PAP, MS-CHAPv1, MS-CHAPv2, EAP-GTC, EAP-TLS and PEAP-TLS Authentication Protocols	
5	Solution should support to enable administrators to centrally configure and manage profiler, posture, guest, authentication, and authorization services in a single web-based GUI console, greatly simplifying administration by providing consistency in managing all these services, when all services are enabled by licenses	
6	Solution should support the capability to assign services based on the assigned user role, group, and associated policy (job role, location, device type, and so on).	
7	Identity and access management. Solution should have capability to establish user identity, location, and access history, which can be used for compliance and reporting.	
8	Readymade Policies, ability for custom policy creation and enforcement	
9	Solution should support policy for Time Based and location based Access	
10	Policy creation tools: <ul style="list-style-type: none"> • Pre-configured templates • Wizard based interface • LDAP browser for quick look-up of AD attributes • Policy simulation engine for testing policy integrity 	
11	Should Support Visibility into user identities and device types	
12	Guest user self-enrollment	
13	Support for WPA2 secure wireless and wired networks	
14	Workflow for user and device registration	
15	Access control lists – both statically defined filter-ID based enforcement, as well as dynamically downloaded ACLs.	
16	Role based administrative capabilities	

17	<p>The solution Must be an easy-to-deploy hardware platform that utilizes identity based policies to secure network access and includes an integrated set of capabilities bundled under one policy platform</p> <p>a. Built-in guest management and device/user onboarding b. Web based management interface with Dashboard c. Reporting and analysis with custom data filters d. Data repository for user, device, transaction information e. Rich policies using identity, device, health, or conditional elements f. Deployment and implementation tools</p>	
18	Solution must support Non 802.1x technology on assigned ports and 802.1x technology on open use ports day 1	
19	Solution should support Mac Address Bypass (MAB) and can further utilize identity of the endpoint to apply the proper rules for access. Mac Address Bypass is typically used for devices which do not support 802.1x from day 1	
20	Solution should have capability to grant authenticated users with access to specific segments of the network, or specific applications and services, or both, based on authentication results.	
21	Solution should support endpoint access to the network with the Endpoint Protection Service, which enables administrators to specify an endpoint and select an action - for example, move to a new VLAN, return to the original VLAN, or isolate the endpoint from the network entirely - all in a simple interface. This Feature will be required in future upgrades without adding additional Hardware.	
22	Solution should have automatic switch vlan provisions for end device based on pre-defined rule	
23	Solution should support user authentication performed against identity, user credentials, role based access control, or attribute based authentication (location, time, etc.)	
24	Solution should allow only authenticated and managed devices to connect to organisation network	
25	Solution should allow NAC credentials to be stored within a trusted protection module or other secured storage mechanism	
26	<p>Solution should support the following guest networking capabilities:</p> <p>a. automated provisioning of network login credentials b. network access to certain hours of the day c. secured profile control related to the application uses for guest users</p>	
27	Solution should provision guests notification of their login credentials by: email, SMS etc	
28	Provides complete guest lifecycle management by empowering sponsors to on-board guests	
29	<p>Solution should have capability to look at various elements when classifying the type of login session through which users access the internal network, including the following:</p> <ul style="list-style-type: none"> •Client machine operating system and version •Group to which the user belongs •Condition evaluation results (based on applied dictionary attributes) 	
30	Should support full guest lifecycle management, whereby guest users can access the network for a limited time, either through administrator sponsorship or by self-signing via a guest portal. Allows administrators to customize portals and policies based on specific needs of the enterprise	
31	Proposed NAC Solution should be integrated with BHEL's existing SIEM	

32	Should support, Identity, source, sequences which defines the order in which the solution will look for user credentials in the different databases. Solution should support the following databases: a. Internal Users b. Internal Endpoints c. Active Directory d. LDAP e. RSA f. RADIUS Token Servers g. Certificate Authentication Profiles etc	
33	Must incorporate a complete set of tools for reporting (Audit trailing, customizable reporting and data export capabilities), analysis, and troubleshooting. Data from access transactions can be organized by customizable data elements and used to generate graphs, tables, and reports. Must correlate and organize user, authentication, and device information together	
34	Includes a built-in web console for monitoring, reporting, and troubleshooting to assist help-desk and network operators in quickly identifying and resolving issues. Offers comprehensive historical and real-time reporting for all services, logging of all activities, and real-time dashboard metrics of all users and endpoints connecting to the network.	
35	Solution should have the ability to generate reports in different formats such as: HTML or PDF, CSV etc	
36	Solution should support to generate real time and on demand reports	
37	Solution should be capable of Real-Time Monitoring, Management & event Collection	
38	Solution should support alert mechanism like email, sms etc	
39	Solution should be able to monitor, audit and tie incidents to a specific user	
40	Solution should have various inbuilt and customized dashboards like solution health dashboards, concurrent users, logged in users etc	
41	Solution should provide detailed Event co-relation and analysis and also should integrate with other major SIEM tools	
42	Must be able to join multiple Active Directory domains to facilitate 802.1x PEAP authentication.	
43	Must be able to issue certificates using an inbuilt Certificate Authority	
44	Support the following enforcement methods: a. VLAN steering via RADIUS IETF attributes and VSAs b. VLAN steering and port bouncing via SNMP	
45	Encryption of traffic to the wireless and wired network using protocols for 802.1X such as EAP-TLS, EAP-PEAP or EAP-MSCHAP.	
46	Must support Radius for users and TACACS+ for network devices for authentication. Must support RBAC for network devices.	
47	Multivendor equipment support	

Item Name:	Network Management System	
Item Code	NMS	
Make & Model		
S.No	Specification	Vendor Compliance
	Administration and Security	
1	The NMS should product integrate with LDAP/AD (Microsoft Active Directory) to perform authentication using security groups to allow for one username and password	
2	The NMS should integrate with TACACS or RADIUS based authentication sever to define user level access	
3	The NMS should have the ability to establish function-level, role-based permissions (e.g., who can use what functions of the product)	
8	The NMS should support user based roles with different management privileges	
9	Should have the ability to perform changes with a list of command lines (for example, cut-and-paste command line interface commands)	
10	The system shall support Single Sign-On(SSO) authentication	
11	The management system should have a Logging capability and Log Browser Utility should also be provided.	
12	Support of centralized password authentication including complex password acceptance , password dictionary support, Password Storage Encryption should be provided	
13	Alarms/Event Management	
14	NMS should have a centralized, robust Syslog management with filtering capability by severity, facility and device IP address.	
15	NMS should support Device monitoring and SNMP trap support	
16	NMS should list all events and have the capability to generate alarms.	
17	Must support customizable performance and interface thresholds alert management	
18	Must support historical alarm management.	
19	Must support alarm generation rule	
20	The NMS should provide the ability of fault suppression	
21	It should be possible to acknowledge multiple alarms. The timestamp and the user who acknowledged the alarm should be stored in the Management System.	
22	The Management System shall be able to categorize alarms, into different severity levels	
23	Alarm data retention: The retention of alarm data should be kept atleast 1 year	
24	Event history: Event shall be stored with timestamps	
25	Alarm burst protection / mitigation : The Management System should be able to handle a vast amount of alarms/events	
26		
27	The system shall be able to identify the failed compute component and associate it to the relevant failure alarm.	
28	NMS shall be able report severity 0-7 syslog messages for all the devices	
29	The system shall permit the administrator to create faults of specific severity for new MIB notifications	

30	The management system shall provide an aggregated view of the alarms from multiple deployed instances	
31	API Support	
32	The NMS product should support Inbound/Outbound Application Programming Interfaces (API's)	
33	Northbound and Southbound Interfaces, The Management System shall be able to forward alarms to other systems.	
34	The Management System should offer Standard based API's	
35	The Management System shall have the interfaces/integrations to third-party systems to provide the Fault and Performance Management facilities	
36	Architecture	
37	NMS should be available as a physical appliance including the licenses as per the unit wise requirement	
38	The NMS should support upto 50 concurrent client sessions	
39	The System must be run on latest Windows/ Linux platform	
40	The system should support integrated management of network devices, hosts. Besides, it should be able to analyze and manage interactions between IT resources, and support a unified monitoring policy, unified alarm policy and view management.	
41	The system should provide a one-page summary view of business operation.	
42	The system should support SNMP v1, v2, v2c and V3.	
43	The product should support IPFIX (NetFlow v10)	
44	The Management System shall support local authentication	
45	The NMS should support a CLI / GUI interface	
46	The product should support data collection across multiple management servers.	
47	The product should support distributed deployment architecture	
48	The product should support local and geographic redundancy.	
49	The product should have the ability to detect, configure, manage, troubleshoot and provide reporting for managed, connected devices and clients, which have IPv6 addressing only.	
50	Shall support concurrent multi-user access to the management system, enabling multiple read-write access to different areas of the management domain	
51	If the product supplied is available in VM, all necessary license and hardware to be provided	
52	Assurance	
53	Management software should be able to monitor network's bandwidth and should be able to transfer to users as real time graphical data	
54	The format and type of traffic, the source of the traffic, the service which is using traffic,	
55	and destination of traffic should be listed based on source, the device that the traffic passing	
56	through, the service which is using to traffic and/or destination.	
57	Shall be able to monitor and analyze WAN traffic and to categorize based on source,	

58	destination, port, service, application and user. Also it should be able to transfer statistical data graphically.	
59	The software should be configured for desired applications and protocols. It should be able to monitor the traffic of any desired application.	
60	Automated Deployment	
61	NMS should support Automated configuration deployment and automated staging capability.	
62	The system shall be capable of pre-provisioning with base lined configuration & image	
63	Change and Compliance Management	
64	The system should embed networking best practices to proactively identify suboptimal configuration settings such as peer not recognized, port duplex mismatch, VLAN, IPSLA, QoS, PBR, misconfigurations, and others?	
65	The product should come with pre-defined, out-of-the-box compliance reports	
66	The product should have the ability to log configuration changes and the associated users	
67	The product should have the ability to detect configuration changes via manual request	
68	The product should have the ability to detect configuration changes via real-time external events - Syslog messages	
69	It shall be possible to schedule network device configuration and software image upgrade changes	
70	The product shall have a provision to monitor the scheduled network device configuration and software image upgrade changes for failure	
71	The product shall have a provision to re-schedule the failed network device configuration and software image upgrade tasks.	
72	The product should allow for comparison of baselined device configurations with the current running configuration at defined intervals	
73	Configuration Management	
74	Must support device configuration backup and restore feature	
75	Must support device configuration backup in manual or scheduled basis.	
76	Must support device configuration management in per device or batch mode operation	
77	Must support device configuration comparison feature between two specified configures, and the configuration changes will be highlighted in different color.	
78	Must support software management.	
79	Should have the ability to compare configuration versions using a side-by-side, split-screen display to highlight differences between current captured configuration	
80	The tool should have the ability to highlight differences in textual configuration files	
81	Should have the ability to highlight differences in modeled configuration attributes (e.g., ACL, VLAN)	
82	Should have the ability to update individual configuration attributes (rather than uploading entire configuration files to update one attribute)	

83	Should have the ability to remediate a device back into compliance and roll back to a previously saved configuration by automatically prompting the user	
84	Should have the option to schedule a change to be executed during a planned maintenance activity window	
85	The product should have the ability to perform changes with scripts to handle more-complex configuration changes to network devices	
86	The product should have the ability to perform a textual configuration search using regular expression pattern matching	
87		
88	The product should have the ability to store multiple versions of configurations	
89	The management system shall support the regional structure for the Configuration Management	
90	The management system shall support automatic configuration of Wi-Fi AP	
91	The NMS should support both wired and wireless access devices.	
92	Discovery	
93	Must support discovery of devices through route table, arp table and network number.	
94	The system shall be IPv4 compliant	
95	The system shall be IPv6 compliant	
96	The Management System should be able to automatically discover the network elements as well as their current status and status change with no manual intervention using Different MIBs	
97		
98	The management system shall use various mechanisms to monitor the managed devices	
99	Group Management	
100	NMS should support Device management capability using device groups	
101	The NMS should have the ability to organize each device into a physical, location-specific group (device can only belong to that single group) for the purpose of change management, configuration updates and reporting	
102	The NMS should have the ability to organize devices into arbitrary logical groupings — for example, by organization, department, IT service (device can belong to multiple logical groups) — for the purposes of change management, configuration updates and reporting	
103	It shall be possible to group devices based on location, and to do so in the context of a hierarchy of location groups.	
104	The management system shall allow for aggregation of wireless APs in to groups	
105	High Availability	
106	The system must be capable of delivering 99.999% service availability.	
107	The NMS should Active/ Standby redundancy, also called High Availability(HA) for disaster recovery. Both local and geographic redundancy can be configured for HA deployments.	
108	The secondary server should be able to take over the role of Active within three minutes of the failure of the primary.	
109	Inventory Management	

110	The product should have the ability to push/pull update software on network devices	
111	NMS should provide Interface inventory, display switch ports and connected device's IP addresses.	
112	NMS should support Device inventory displaying detailed hardware components of all managed devices	
113	The product should have the ability to create and manage custom/manual attributes per device (e.g., asset ID#, street address, state, etc.)	
114	The product should perform automatic proactive vulnerability discovery for the platforms it manages (i.e. PSIRT, bugs, hardware lifecycle management	
115	The NMS should have the ability to search by hardware and software attributes	
116	Monitoring	
117	The system should have a default monitoring policy. The system provides a recommended monitoring policy, which can be modified as required.	
118	The system should support replication of policies and apply replicated policies to other monitored objects to improve the deployment efficiency.	
119	The system should support formulation of resource policies in batches, that is, the system can add objects with the same monitoring policy in batches.	
120	The NMS should provide drill-down capability to quickly show different collection metrics	
121	The NMS should be able to collect data about bandwidth utilization, store it and present it via GUI.	
122	The management system shall support for QoS Profiles - Different Classes - Exceed, violate and conform statistics, Policing statistics, Classification statistics, Queuing statistics	
123	The management system shall be capable of monitoring the impact of QoS class on the application performance and support QoS configuration changes	
124	The product shall be capable of analyzing the network and report on network devices offering application visibility	
125	The product shall enable the user to create profiles for application visibility for varied features	
126	The product shall have an interface to search specific network devices/interfaces & assess the application visibility of the device's interface	
127	The management system shall provide the user a means of viewing the status of the network in a summary view for both wired and wireless devices	
128	The product shall provide graphical indicators to the Key Performance Indexes (KPI) of monitored network devices and interfaces	
129	Network Visualization	
130	The system should support topology customization using devices and pictures provided by the system.	
131	The system should support nodes to be deployed using icons or symbols of devices. These icons and symbols are also available for resources and sub networks.	
132	The proposed system shall have ability to map network devices and locations based on geo coordinates (longitude and latitude)	

133	The system shall indicate the associated fault information of network devices on the discovered topology	
134	The network map of management system shall visually indicate the link status of associated devices	
135	The system shall indicate the end point information of the links in the network maps	
136	Performance Management	
137	The system should support component extensions such as traffic analysis, log monitoring, and script monitoring to facilitate integrated monitoring of the operation and maintenance of IT resources.	
138	The system should support the NetFlow and IPFIX protocols by using Flow technologies.	
139	The system should support viewing traffic based on multiple dimensions, such as applications, sources, purposes, and sessions.	
140	The system should provide complete traffic analysis functions, including real-time monitoring of network traffic, alarming for traffic overload, analyzing traffic	
141	The system should provide traffic flow direction analysis, monitors TCP sessions, and provides the matrix view for TCP sessions to present the statistics for traffic of all network nodes and sessions.	
142	The system must support historical port utilization and performance report for up to last 180 days	
143	The system should provide User-defined index such as the real-time connection and traffic of the network adapter, and the packet loss rate, utilization, and transmission rate of the network port.	
144	IP SLA data collection & processing : The Management System shall be able to collect IP SLA data from probes and store them and furthermore processing and presentation	
145	Jitter : The Management System shall be able to monitor jitter via IP sla or probe	
146	Delay: The Management System shall be able to monitor delay via IP sla or probe	
147	Latency : The Management System shall be able to monitor latency via IP sla or probe	
148	The product shall be capable of reporting various performance statistics such as CPU, Memory, Bandwidth, TopN statistics, threshold-based alarming etc.	
149	The product shall be able to monitor & report performance metrics for different QoS classes.	
150	The monitoring system shall provide for monitoring the performance indicators of WAN links	
151	The management system shall monitor Key Performance Indicators for virtual elements	
152	Provisioning / Template Management	
153	NMS should Support configuration device templates and should be able to push the templates to device groups.	
154	NMS should have the Ability to roll back to a last known good configuration,	
155	NMS shall perform all Security Gateway configuration tasks like NAT and VPN	

156	The NMS should support workflow based configuration templates.	
157	The Management System shall be able to apply templates to network elements groups with predefined alarm element, thresholds etc.	
158	Reporting	
159	The system should have various built-in report templates of multiple dimensions and angles, including resource report templates, analysis report templates, trend report templates, TOP N report templates, and fault report templates.	
160	The system must support creation, modification, deletion, online viewing, import, export, periodical generation of reports.	
161	The system should allow users to update or define new reports	
162	The management system shall show a variety of at least 20 reports with brief descriptions; ensure items below are represented:	
163	i. Show variety of “hours of operation” reporting/alerting; 6am-6pm, etc.	
164	ii. Detail the flexibility of designing custom reports.	
165	iii. What granularity options are there for reports; minute, hourly, daily, weekly, etc.	
166	iv. Combine In and Out data for Utilization, conversations, applications etc.	
167	viii. TopN reports; highest utilization, worst errors, most discards, etc.	
168	Management system shall have the capability to export the graphical reports for key performance indicators that are monitored	
169	Proposed NMS should support multi vendor equipment for Managing and Monitoring	
	Specification	
	Network Monitoring System	
	Section-B : Data Centre Networking	
S.No.	Specification	
1	Solution must be supplied with a Central management appliance and associated licenses for managing, monitoring and provisioning the Data Center Network from Day-1.	
2	Solution must provide a single GUI tool for centralized management system with role based access control.	
3	Solution shall come with an initial license for 25 managed network devices and has to be provided as per the unit wise requirement	
4	Solution shall provide management of fabric with VxLAN EVPN Architecture or VxLAN IS-IS Architecture.	
5	Solution shall be hardware Based appliance or x86 based server from the OEM and must run in redundancy to provide high availability. Server provided shall have minimum configuration of 64 GB RAM, 500 GB hard drive, 64bit 4 CPU cores, 1G Ethernet port.	
6	Solution shall support VXLAN topology to enable the visibility in the Overlay and Underlay topologies.	
7	Solution shall provide dynamic, policy-based configuration for underlay, overlay, and interfaces.	
8	Solution shall provide Fabric Builder for easy underlay bring-up and deployment.	
9	Solution shall provide per-switch configuration deployment history of underlay, overlay, and interface configurations.	
10	Solution shall provide Overlay network provisioning for leaf and borders switches, including external connectivity.	
11	Solution must provide necessary report for compliance and audit.	
12	Solution must provide device inventory of the Fabric as well as current network topology of the fabric.	

13	Solution must integrate with VMware vCenter compute for topology view (virtual machines, vSwitch/DVS, port group, vNIC, VMNIC)	
14	Solution must provide OS management like upgrade/degrade of fabric (SPINE/Leaf).	
15	Solution shall provide troubleshooting capability up to port level on the entire fabric.	
16	Solution shall provide topology view showing VXLAN tunnel endpoint (VTEP) status and VXLAN Network Identifier (VNI) status on a per-switch basis.	
17	Solution shall provide topology, Endpoint Visibility and Network Health Monitoring.	
18	Solution shall enable integration with third-party or custom orchestration tools. shall support orchestration through REST API.	
19	Solution shall provide views of configurations, events, and traffic.	
20	Solution shall provide detailed visibility into real-time and historical performance statistics of the fabric.	
21	Solution shall provide insight into port and bandwidth use, error count, traffic statistics, etc.	
22	Solution shall provide reports using predefined templates, including inventory, use, and health reports.	
23	Solution shall provide easy-to-schedule reports that can be exported or sent by email.	
24	Solution shall allow following network automation :- a. Patch deployment on switches b. Policy deployment c. OS Deployment d. Rollback e. Switch configuration f. Configuration Management	
25	All the DC components shall be from same OEM.	

Item Name:	3G/4G Router	
Item Code	RO01	
Make & Model		
S.No.	Specifications	Vendor Compliance
1	General requirements	
1.1	Router should be ruggedized modular in nature with IP41 or above certification . The bidder also have an option to provide an external ruggedized box meeting the same certifications.	
1.2	Should support Firewall, IPSec features without impacting the overall performance for router.	
2	Hardware and interface requirements	
2.1	Routers should support LAN and WAN connectivity options including Gigabit Ethernet and 3G and 4G Wireless. Router also should have built-in internal / external WiFi functionality.	
2.2	Router should have minimum 4x10/100/1000 GE ports	
2.3	Router should have minimum 2 GB SDRAM/DRAM memory.	
2.4	Router should support minimum 2 GB flash memory.	
3	WiFi	
3.1	WiFi can be provided internally or externally (using an industrial grade access point)	
3.2	20- and 40-MHz channels	
4	IP Features	
4.1	Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2)	
4.2	Generic routing encapsulation (GRE) and multipoint GRE (MGRE)	
4.3	Open Shortest Path First (OSPF) & Border Gateway Protocol (BGP)	
4.4	Standard 802.1d Spanning Tree Protocol	
4.5	Network Address Translation	
4.6	Dynamic Host Configuration Protocol (DHCP) server, relay, and client	
5	Security features	
5.1	Routers should have AAA using RADIUS or TACACS feature.	
5.2	Routers should support Tunnels (GRE, IPSec)	
5.3	VRF and IPsec	
5.4	Routers should support Network address translation (NAT) from day one	
5.5	Secure Sockets Layer (SSL) VPN for secure remote access	
5.6	NAT transparency	
6	IPv6	
6.1	IPv6 translation: Transport packets between IPv6-only and IPv4-only endpoints (NAT-PT)	
6.2	Internet Control Message Protocol Version 6 (ICMPv6)	
7	Environmental Conditions	
7.1	Router should have an minimum operating temperature range from 0°C to 45°C	

Item Name:		DSLAM	
Item Code		DS01	
Make & Model			
S.No	Description	Features	Vendor Compliance
Hardware & Standards			
1	Uplink UTP Interfaces	Minimum 2 Nos. 100/1000BaseTX Ports	
2	Uplink Fiber Interfaces	Minimum 2 Nos. SFP based Fiber uplink Gigabit Interface. 1 no. MM SFP transceiver to be supplied	
3	Subscriber Line Interfaces	24 Ports VDSL with integrated POTS Splitter	
4	VDSL	It should support the recommendations G.993.2, G994.1 and G.997.1	
Protocol Support			
5		IP Host and gateway support	
6		Port Security/ Static and dynamic MAC address binding	
7		QoS (IEEE 802.1P, 8 priority queues)	
8		Port-based and tag-based (IEEE 802.1Q) VLAN	
9		Link aggregation (IEEE 802.3ad)	
10		IGMP snooping /Proxy	
11		Multicast VLAN registration	
12		IPv6	
13		VDSL2 bonding	
14		ADSL2+ fallback & bonding	
15		G.INP (G.998.4)	
16		Vectoring (G.993.5)	
17		DHCP Relay	
18		PPPoA to PPPoE Interworking	
19		RADIUS Authentication	
Management			
20		Manageable through CLI, telnet, SNMP, Web Interface, remote firmware upgrade, Web management	
Other Requirements			
21	Rack Mount	Should be Rack Mountable, Rack Mount Kit should be provided	
22	Misc	Should come with necessary manuals, cables for ADSL input/POTS output and CDs, 230V internal power supply.	
23	Software Updates	Software updates should be bundled for the entire contract period.	
Certifications			
24		RoHS,K.20/K.21, ETSI300-019, EN60950-1, CSA60950-1, IEC60950-1, FCC Part 15 Class A, EN55022 Class A,ETS 300-386	
Operating Environment			
25		Temperature: 0°C to 65°C (32°F to 149°F)	
26		Humidity: 10% to 95% (Non-condensing)	
Storage Environment			
27		Temperature: -0°C to 70°C (-40°F to 158°F)	
28		Humidity: 5% to 95% (Non-condensing)	
Hardware Specifications			
30		Should have Power Redundancy	

Item Name:		CPE	
Item Code		CPE	
Make & Model			
S.No	Description	Features	Vendor Compliance
1	WAN Interface	1 No. RJ11 for VDSL	
2	LAN Interface	1 No. RJ45 10/100BaseTX	
3	POTS Splitter	Built-in or External POTS Splitter to be provided	
4	ADSL/ADSL+ Standards	G.994.1, G.997.1, G.992.1, G.992.2, G.992.3, G.992.5	
5	Standards Support	Routing/ Bridge Support	
6		Transparent Bridge Support	
7		RIP1 and RIP2	
8		DHCP Relay/Server/Client	
9		802.1p	
10		PPPoA, PPPoE, PAP/CHAP Authentication	
11	Security	NAT, Ingress/Egress Packet Filtering, MAC Filtering, Stateful Packet Inspection	
12	Management	Manageable through CLI, telnet, SNMP, Web Interface	
13	Syslog	Syslog Support	
14	Misc	Should come with necessary manuals, cables and CDs, 230V internal/external power supply.	
15	Software Updates	Software updates should be bundled for the entire contract period.	

Item Name:		WAN Router	
Item Code		RO02	
Make & Model			
S. No.	Feature	Description	Vendor Compliance
1	Make & Model		
2	Chassis	Router may have modular chassis or fixed platform	
		Router must have atleast 2 expansion ports to house either Ethernet or Serial or G.703	
		Should be provided with internal dual power supply. Single unit should be able to handle the load of full equipment	
		Should be based to perform the routing as core function and associated licenses must meant for Routing functions	
3	Router Architecture and Memory	Should have minimum 4GB of DRAM and flash storage of 4GB. Must have option to upgrade DRAM in future if needed.	
		Router should have latest supported OS	
4	Port	4 X Giga ports WAN ports	
		Must have option to add atleast 1 Nos of 10G LAN Port in future	
		Must support Link Aggregation	
	IPv4 Routing Protocols	Should support Static Routing, Default Routing, RIPv2, OSPFv2, BGP	
		Should support BGP4 routing protocol with CIDR and should have all necessary licenses to enable full features of BGP protocol	
		Must support 500K IPv4 routes and 500K IPv6 routes from Day 1	
		Should support Ipv4 NAT & NAT64 from day one	
6	IPv6 Routing Protocols	Should support Static Routing, Default Routing, RIP for IPv6, OSPFv3, BGP for IPv6	
		Should have all necessary licenses for to enable full features of BGP protocol for IPv6	
		Router should have full support for dual stack IPv6 on all interfaces and Ipv6 over Ipv4 tunnelling	
		Router should support Dual stack, NAT64. All software licenses should be included from day 1	
7	Multicast	Should have PIM-SM, PIM-DM, PIM-Sparse-Dense mode, Bidirectional PIM, PIM-SSM for IPv4	
		Should have PIM-SM, PIM-DM, PIM-Sparse-Dense mode, Bidirectional PIM, PIM-SSM for IPv6	
		Should support DVMRP or IGMP for BGP	
		The router should have full support for dual stack IPv6 on all interfaces and IPv6 over IPv4 tunnelling.	
8	QoS Support	<p>The router should support Access Control List to filter traffic based on Source & Destination IP Subnet, Source & Destination Port, VLAN, Protocol Type (IP, UDP, TCP, ICMP etc) and Port Range etc.</p> <p>The Router shall support QoS for Traffic Management ,class based policing, shaping , CBWFQ,WRED and 802.1p, HQOS (All Ethernet ports)</p> <p>The router protect the shall support Control Plane Policing to router CPU from attacks.</p>	

9	WAN Protocols	<p>The Router should have WAN protocols like PPP,ML PPP, and HDLC</p> <p>The router should have at the minimum MPLS features like Layer 2 VPN, Traffic engineering with RSVP-TE, Fast Reroute and Virtual Route Forwarding (VRF) and Layer-3 MPLS-VPN , VRF Lite</p> <p>MPLS and Firewall features should be supported simultaneously.</p> <p>QOS on VPN tunnel must be supported from day 1</p> <p>The Router shall be MPLS Aware and shall work with Service provider provided MPLS services. However In case of BHEL wants to build their own MPLS services, Router should have all necessary license and hardware to act as Customer edge, Provider core and Provider Edge device</p>	
10	Router Performance	Should have at least 1 Gbps of aggregate throughput with all the slots operating at non-blocking mode	
11	Encryption	<p>Router should support advance generation security protocols (IKEV1/V2 and Suite B encryption) to ensure data confidentiality and integrity.</p> <p>Router should support IPsec Encryption</p> <p>Router must support QOS on VPN Tunnels</p> <p>The proposed solution should provide at least 2000 IPsec tunnels.</p> <p>In case of external VPN box, bidder should propose the hardware with necessary two 1 Gbps interface and redundant power supply.</p> <p>All software licenses should be included from day 1.</p>	
12	Regulatory Compliance	Router shall conform to EN 55024, EN300-386, EN55032 standards	
15		The Router should be capable to upgrade to support SD-WAN without replacing hardware in future.	
16	Software Version	Version of software for supplied switch should be latest release with necessary licenses to support all required features	
17	Licenses	Licenses required to run all the above features must be included from day 1	
18	Mounting	Switch must be rack mountable. Rack mounting kits and accessories should be supplied to fit into 1U rack space	
19	Cables & Accessories	All necessary cables - FC, power & accessories should be supplied	
20	Support & Warranty	OEM's Premium 24x7 support for throughout the contract period should include remote and onsite support, labour, comprehensive warranty covers software update and upgrades.	
21	OEM/Make/Model	The OEM should be in leaders quadrant of the latest Gartner's report for Wired and Wireless LAN Access Infrastructure.	
22	Compliance Standard	<ul style="list-style-type: none"> ● UL 60950-1 ● CAN/CSA-C22.2 No. 60950-1 ● EN 60950-1 ● IEC 60950-1 	

Item Name:		Link Load Balancer	
Item Code		LLB	
Make & Model			
S.No	Technical Specification	Minimum Requirements	Vendor Compliance
1	Architecture	The solution should be a rack mountable appliance-based solution with purpose-built hardware for high performance & support link load balancing functions. The appliance should have dual Hot Swappable Power supply from Day 1.	
		Should have atleast 4 x 1 GbE RJ45 (Copper) ports & 2 x 1/10 GbE Fibre SFP/SFP+ ports. (Equipment to be supplied pre-loaded with all necessary modules)	
		Should provide minimum 8Gbps throughput from day 1 with all functionalities enabled.	
		Should support minimum 4Million Concurrent L4 TCP connections scalable up to 8Million connections without additional cost to BHEL.	
		Should support –	
		a) Static Routing. b) Dynamic routing protocols like OSPF, etc.	
2	Load Balancing	Minimum support for 4 internet links	
3	Features	Should have the ability to load balance between multiple internet links in Active-Active and Active-Standby / Active-backup mode.	
		Should provide Load balancing for inbound & outbound internet traffic.	
		Selection of shortest path to destination based on load/Hops/response time	
		Should support following load balancing algorithms-	
		a) Round Robin	
		b) Response Time /Latency	
		c) Least amount of Bytes / Connections	
		d) Least number of users/ session.	
		e) Cyclic.	
		f) Weighted Cyclic	
g) Based on parameters like BW utilization of link, etc.			
		Should provide automatic change over (fail over safe) to another available link in case of failure of one link. The device should detect and failover to other link within 30 seconds of failure of the first link.	
		Should support Static & Dynamic Network / Port Address Translation (NAT / PAT).	
		Should have the ability to act as an authoritative DNS server and support creation of A record.	
4	Link Management	Should be able to redirect traffic based on Source/Destination IP & port	
5	Feature	Should have an option to define inbound/outbound Kbps / Mbps limit of throughput of any given link	
		Should provide details of client routed to each link with IP & port details	
		Should provide individual health check for each link	

6	Health Monitoring	Should do health check on protocols which include, but are not limited to, HTTP, SMTP, POP3, DNS, Ping, and FTP.	
		Should provide AND, OR mechanism between health check	
		Shall have the ability to adjust health check interval and frequency.	
7	Redundancy	Should support deployment of devices in High Availability (HA) mode or in N+1 clustering mode.	
		Should support transparent seamless failover between Units in HA pair (or in Cluster).	
		Should provide stateful replication of all sessions between units in a pair (or in Cluster).	
		Should have the ability to go Active automatically upon loss of communication with the peer unit.	
8	Support for Bandwidth Management	Should support bandwidth management based on any layer-3 to layer-7 (L3-L7) information	
		Should support Classification policies to allow bandwidth limitations to be applied to Domain Name/FQDN, TCP port number, UDP, UDP port number	
		Should support Minimum & Maximum bandwidth allocation limit for traffic shaping	
		Should support Two-Way bandwidth management	
		Should support traffic classification on the basis of layer-3 to layer-7 information	
		Should Support Application session capping and Application Bandwidth Control	
		Should also support to define policy to define bandwidth limitations for any set of frames, that specify the maximum, best effort, and minimum guaranteed bandwidth rates.	
		Should provide GUI-based real-time monitoring of utilisation (bandwidth, connections, sessions, etc.) per ISP link and across all links.	
9	IPV6	Should be fully IPv6 Compliant from Day 1	
		Should support the following methods of IPv6 implementation:	
		a) Native Implementation	
		b) Dual Stack Implementation	
10	Security	c) IPv6 Only to IPv4 Only Translation, NAT66, NAT64, NAT46	
		Should have the ability to detect and prevent the following types of attack from the Internet and this functionality should be available from Day 1:	
11	Specifications	a) SYN Flood/TCP SYN Flood	
		Should have DDoS prevention module which must provide real time DoS protection and should be able to generate historical & real-time reports of such attacks/attacks prevented.	
		Must have feature of IP Intelligence or equivalent from day 1 to prevent traffic from malicious IPs and this feature must be enabled for BHEL at no additional cost for the entire contract period.	
		Should support the feature of SSL decryption offloading.	

12	Device Management & Reporting	Should provide GUI interface for configuration & reporting	
		Should provide SSH & HTTPS interface for management & configuration.	
		Should provide different user levels for web-based management access.	
		Should provide GUI based real time monitoring of (each) Interface Utilization details.	
		Should have the ability to send out warning and error messages via syslog, SNMP/SMTP.	
		Should have the ability to save device configuration settings on a file and to use the file again for reloading of backed up settings.	
		Should have the ability to configure remote SYSLOG server to log events of the device.	
		Should have the ability to configure a port for replying to ICMP Ping requests.	
		Should support automatic device date and time synchronization through remote NTP server.	
		Should provide live and historic reporting like Bandwidth usage on all Available links and interfaces.	
		Should support SNMP protocol.	
13	Support & General Requirement	Support Portal access shall be provided for case management, knowledgebase, new version information, tools etc.	
		The vendor shall provide 24x7 support for three years from the date of installation of the appliances. This support includes both hardware and software. The software support should take care of all updates and upgrades during the entire contract period.	
		The vendor shall ensure 24x7 Next Business Day (NBD) support from OEM for the entire support period of three years.	
		All appliances supplied by the bidder shall be new. Bidder shall submit the Newness certificate of the appliances in this regard.	
		The product supplied should be from the leading OEM and the OEM of the product should have TAC based in India.	

Item Name:		Next Generation Firewall	
Item Code		FW	
Make & Model			
S/N	Technical Specifications	Minimum Requirements	Vendor Compliance
1	Industry Certifications and Evaluations	Firewall solution offered from OEM must be rated as 'leaders' or 'Challengers' in the latest Magic Quadrant for Next Generation Firewall published by Gartner.	
		OEM should have TAC in India.	
2	Hardware Architecture	The appliance based security platform should be capable of providing firewall, application visibility, and IPS functionality in a single appliance.	
		The appliance should support atleast - a) 4 * 1 G SFP/ports. B) 8 * 1G Cu ports.	
		The appliance hardware should be a multicore CPU architecture with a hardened 64 bit operating system to support higher memory, and to protect & scale against dynamic latest security threats.	
3	Performance & Scalability	Should support atleast 6 Gbps of stateful firewall throughput.	
		NG Firewall should support atleast 1.2m concurrent connections.	
		NG Firewall should support atleast 12,000 new connections per second.	
		NG Firewall IPSEC throuput 1Gbps	
		NG Firewall + IPS Throughput to be minimum 3 Gbps	
		NG Firewall should support atleast 500 VLANs.	
4	High-Availability Features	Should come in a failover cluster. Should be capable of active/active or active/standby failover.	
		Firewall should support Stateful Failover of Firewall and VPN Sessions (if any).	
		Firewall should have multiple FANs.	
5	NGFWFirewall Features	Solution must be capable of passively gathering information about network hosts and their activities, such as operating system, services, open ports, client applications and vulnerabilities to assist with multiple activities, such as intrusion event data correlation, elimination of false positives, and policy compliance.	

Firewall should support creating access-rules with IPv4 & IPv6 objects simultaneously.	
Firewall should support operating in routed & transparent mode.	
Should support Static, RIP, OSPF, OSPFv3 and BGP routing protocols.	
Firewall should support manual NAT and Auto-NAT, static nat, dynamic nat, dynamic pat.	
Firewall should support Nat66 (IPv6-to-IPv6), Nat 64 (IPv6-to-IPv4) & Nat46 (IPv4-to-IPv6) functionality from day 1.	
Firewall should support Multicast protocols like IGMP, PIM, etc.	
Should support security policies based on security group names in source or destination fields or both.	
Should support capability to limit bandwidth on basis of applications / groups, Networks , Ports, etc.	
Should be capable of dynamically tuning IDS/IPS sensors (e.g., selecting rules, configuring policies, updating policies, etc.) with minimal human intervention.	
Should be capable of automatically providing the appropriate inspections and protections for traffic sent over non-standard communications ports.	
Should be able to link Active Directory and/or LDAP usernames to IP addresses related to suspected security events.	
Should be capable of detecting and blocking IPv6 attacks.	
Should support the capability to quarantine end points.	
The solution must provide IP reputation feed that comprised of several regularly updated collections of poor reputation of IP addresses determined by the proposed security vendor.	
Solution must support IP reputation intelligence feeds from in-house / third party and custom lists of IP addresses including a global blacklist.	
Should support URL and DNS threat intelligence feeds to protect against threats.	

		Solution must be capable of passively gathering details unique to mobile devices traffic to identify a wide variety of mobile operating systems, mobile applications and associated mobile device hardware.	
		Should support atleast 1000 application layer and risk-based controls that can invoke tailored intrusion prevention system (IPS) threat detection policies to optimize security effectiveness.	
		NGFW OEM must have its own threat intelligence analysis center and should use the global footprint of security deployments for more comprehensive network protection.	
		The detection engine should support capability of detecting and preventing a wide variety of threats (e.g., malware, network probes/reconnaissance, VoIP attacks, buffer overflows, P2P attacks, etc.).	
		Should be able to identify attacks based on Geo-location and define policy to block on the basis of Geo-location.	
		The detection engine should support the capability of detecting variants of known threats, as well as new threats.	
8	Management	The management platform must be accessible via a web-based interface and ideally with no need for additional client software	
		The management platform must provide a highly customizable dashboard.	
		The management platform must be capable of role-based administration, enabling different sets of views and configuration capabilities for different administrators subsequent to their authentication.	
		Should support REST API for monitoring and config programmability	
		The management platform must provide multiple report output types or formats, such as PDF, HTML, and CSV.	
		The management platform must support multiple mechanisms for issuing alerts (e.g., SNMP, e-mail, SYSLOG).	

	<p>The management platform must provide robust reporting capabilities, including a selection of pre-defined reports and the ability for complete customization and generation of new reports.</p>	
	<p>The management platform must risk reports like advanced malware, attacks and network</p>	
	<p>The management platform must include an integration mechanism, preferably in the form of open APIs and/or standard interfaces, to enable events and log data to be shared with external network and security management applications, such as Security Information and Event Managers (SIEMs), and log management tools.</p>	

Item Name:		Web Security Appliance	
Item Code		WSA	
Make & Model			
SI	Technical Specification	Minimum Requirements	Vendor Compliance
1	General Requirement	The Web Security solution offered from OEM must be rated as 'leaders' or 'Challengers' in the latest Magic Quadrant for Secure Web Gateways published by Gartner. OEM should have TAC in India.	
2	Appliance Requirement and Functionality	The solution should provide hardened Web Proxy, Caching, Web based Reputation filtering, URL filtering, Antivirus/Anti-malware appliance/appliances. No part of the solution should be VM based functionality and should not be a part of any UTM solution.	
		Anti Malware functionality of the solution should be able to scan HTTP, HTTPS and FTP traffic for web based threats, that can range from adware, browser hijackers, phishing and pharming attacks to more malicious threats such as rootkits, Trojans, worms, system monitors and Keyloggers and as defined by the organizations policy. For better security, it should support dual Anti Virus (AV) engines. The OEM of the AV must also feature in latest Gartner Magic Quadrant for End-point Protection Platforms (EPP).	
		The web proxy appliance should not allow end users connections directly to the internet. The appliance should maintain user connections & initiate connections to the internet on behalf of end clients.	
		The appliance based Solution should be provided with hardened Operating System and standard rack mountable device.	
		The underlying operating system and hardware should be capable of supporting atleast 2000 users from day one with licenses & scalable upto 3000 users, and should support atleast 2000 concurrent users.	
		The operating system should be secure from vulnerabilities and hardened for web proxy functionality.	
3	Hardware	The solution should provide provision to keep and view, in real time, on-line logs and audit trails. Solution should provide minimum 20 TB storage for keeping the logs backup in off-line mode. Each appliance must have the following from day 1- a) 64 GB RAM, and b) minimum one (1) dedicated management interface, c) minimum 4 nos 10G Cu/Fibre interfaces, or a combination of minimum 2 nos. 1G Cu/Fibre interfaces & 2 nos. 10G Cu/Fibre interfaces. Should have the ability to proxy, monitor, and manage IPv6 traffic from day 1.	
4	Power Supplies /Hard Drives	Appliance should support redundant power supplies & hot swappable hard drives from day one.	
5	Forward proxy mode	The solution should support explicit forward proxy mode deployment in which client applications like browsers are pointed towards the proxy for web traffic.	
6	Forward proxy mode - Single and Dual IP configuration	The forward proxy mode deployment should support single IP proxy configuration and dual IP proxy configuration where one IP will be of local LAN and another IP will be of DMZ.	
7	Transparent mode	The solution should also support transparent mode deployment.	

8	Pac File support	The appliance should support hosting proxy auto-config files that defines how web browsers can automatically choose the appropriate web proxy for fetching a URL.	
9	Support multiple deployment options	The solution should allow to deploy the appliance in explicit proxy as well as transparent mode.	
10	Proxy Chaining	The solution should support proxy configuration in a Chain. The Lower end proxies at spoke locations should be able to forward the request to an Higher end proxies at Hub Location forming a Chain of Proxies	
11	DNS Splitting	The solution should support configuration to use Split DNS. It should be able to refer to different DNS for Different Domains e.g. (root dns for all external domains and internal DNS for organization domain	
12	IP Spoofing support in transparent mode deployments	The solution should have facility to do IP spoofing. When enabled, requests originating from a client should retain the client's source address and appear to originate from the client instead of the appliance. This is useful in scenarios where policies are based on original IP and logging/reporting is required to track activity of individual IP basis.	
13	High Availability	The solution will be deployed at two different locations, each deployment should be capable of handling full load. Provision of High Availability in Active-Active / Active-Standby mode or in N+1 clustering is required. The solution shall be deployed at two different HUBs (Delhi & Hyderabad), each deployment should be capable of handling full load. Provision of High Availability in Active-Active / Active-Standby mode or in N+1 clustering is required within each locations.	
14	Proxy support	The proposed solution should be a Fast Web Proxy and should support HTTP, FTP and HTTPS proxy.	
15	HTTPS Decryption	The solution should support HTTPS decryption. The solution should be cabale enough to cater to SSL load, assuming 60% of all Internet traffic will be SSL based.	
16	HTTPS decrypted traffic scanning	The solution should support scanning of the https decrypted traffic by the on-board anti-malware and/or anti-virus engines.	
17	HTTPS decryption controls	The solution should provide the flexibility of deciding whether to decrypt https traffic or not to the solution administrator. The solution should allow decryption based on at least following aspects: 1) URL category based decryption. 2) Web Reputation based decryption. 3) Default action for the specific policy. 4) Based on Client IP.	
18	HTTPS decryption policy	HTTPS decryption should provide flexibility to have multiple decryption policies and should not be just a Global action.	
19	Protocol Tunneling	Should support the functionality to block applications that attempts to tunnel non-HTTP traffic on ports typically used for HTTP traffic. Should support the functionality for blocking non-SSL traffic on SSL ports & should also support the functionality to tunnel the transaction.	
20	Native FTP protection	The solution should act as an FTP proxy and enable organizations to exercise granular control, including: allow/block FTP connections, restrict users/groups, control uploads/downloads, and restrict sent/received files to certain types or sizes.	

21	File download and size restrictions	The solution should be capable of blocking specific files downloads and based on size and per user group basis. It should also provide option to block object using MIME File types.	
22	IP based Access Control	The solution should allow administrator to define access to internet based on IP addresses, range of IP addresses, subnet and CIDR basis. It should also support to be forced for Authentication from Specific IP addresses, Subnet or CIDR's	
23	User based Access Control	The solution should support integration with active directory and/or LDAP. This should allow administrator to define user or group based access policies to Internet	
24	Multiple Authentication Server Support	The solution should support Multiple Auth Servers / Auth Failover using Multi Scheme Auth (NTLM and LDAP). It should also support authentication exemption and Should support multi-authentication mechanism like local User database, AD, LDAP, etc.	
25	Application and Protocol Control	The solution should support granular application control over web eg. Facebook controls like block file upload, block posting text, enforcing bandwidth limits on application types.	
26	Layer 4 Traffic Monitoring	Should detect Phone Home attempts occurring from the entire Network. It should also detect the PC's that are already infected with Malware in the Networks that attempts to bypass port 80.	
27	Layer 4 Traffic Monitoring	Solution should support scanning of traffic to match against domain names & IP addresses against entries in it's own database table which should be continuously updated.	
28	Layer 4 Traffic Monitoring	It should support actions to allow traffic to & from known allowed & unlisted addresses & block traffic to & from known malware addresses & should support monitoring suspected malware addresses.	
29	Bandwidth restrictions	The solution should support providing bandwidth limit/cap for streaming media application traffic.	
30	Malware Protection	The AV/Malware engines should protect atleast against the following types of malware/threats: Adware, Browser Helper Object, Commercial system monitor softwares, Dialer, Generic spyware, Hijacker, Phishing URL, potentially unwanted applications, Trojan downloader, virus, worm and Malicious code detection and filtering etc.	
31	File Analysis for Unknown threats	The solution should support allow for file analysis of files such as but not limited to pdf, excel and other Microsoft office files, exe files for unknown threats.	
32	Web Reputation	The solution should provide Web Reputation Filters that examine every request made by the browser (from the initial HTML request to all subsequent data requests) – including live data, which may be fed from different domains to assign a web based score to determine the likelihood that it contains url-based malware.	

Item Name:		6 KVA UPS	
Item Code		UPS02	
Make & Model			
S.No	Specification		Compliance
1.	Technology	True online double conversion technology UPS system with IGBT based rectifier / inverter	
2.	Capacity	6 KVA / 4.8 KW	
3.	Input Parameters:		
a.	Voltage	230 VAC, 1 Phase 3 Wire	
b.	Voltage Range	175 V to 300 VAC at full load, 120 to 300 VAC at 0 to 50 % load	
c.	Frequency	50 Hz (46 to 54 Hz)	
d.	Power Factor at rated load	0.99 at full load	
e.	Current Harmonic Distortion	Less than 10% at full load and nominal input voltage	
f.	OVCD	Required (builtin)	
g.	Isolation Transformer	Required (builtin) at input side	
4.	Output Parameters:		
a.	Voltage	220/230/240 VAC +/- 1%, 1 Phase	
b.	Frequency	50 Hz +/- 0.25 Hz (in Battery Mode) +/- 5% (in Sync)	
c.	THD v	< 3 % for Linear Load ; < 5 % for Non Linear Load	
d.	Overload rating	105 to 110 % for 3 min ; 111 to 130 % for 30 sec	
e.	Output waveform	Pure sinewave	
f.	Crest Factor	3 : 1	
g.	Power Factor	0.8 PF	
h.	Over all Efficiency	>= 90 %	
i.	Frequency Slew Rate	1 Hz / Sec	
5.	Battery Parameters:		
a.	Type of Battery Chemistry	SMF VRLA(Sealed Maintenance Free-Valve Regulated Lead Acid Battery)	
b.	Battery Container/Cover Material	Poly propylene container	
c.	Make	Exide / Amarraraja	
d.	End cell voltage	10.5 V per Battery	
e.	DC Voltage	240 VDC	
f.	Backup Time	240 minutes	
g.	VAH	min 24000 VAH	
h.	Battery Rack & Connectors	Powder coated battery rack / stand to be provided	
i.	Charger	Constant Current / Float Charging with Temperature Compensated	
j.	Charging Capacity	10 % of the Battery AH Capacity Mandatory	
h.	Transfer time	0 ms	
6	Cables		
a.	Input, Output Cable	3 Meters UPS cable from Power Point to UPS Shall Be provided as per OEM Recommended standard	
7.	Other Features:		
a.	Static Bypass	Inbuilt	
b.	Transfer time	< 4 ms in Sync Mode	

c.	Bypass parameter configurable via front panel	Required	
8.	Other Features:		
a.	LCD Display	Input Voltage, Frequency	
		Output Voltage, Frequency, Load level	
		Battery Voltage, Level in %, Remaining backup time	
		Fault Information	
		MIMIC Information	
b.	LED Indication	Bypass, Line, Battery and Fault	
c.	Protection	Input High / Low, Over Load, Short Circuit, Over Temperature, Battery Over Charge, Surge Protection, UPS Input MCB	
d.	Audible Alarm	Battery Mode, Low Battery, Fault, Over Load, Bypass Mode	
e.	Cold Start	Required	
f.	Auto Restart	Required	
g.	Intelligent Fan Operation	Required	
h.	Generator Compatibility	Required	
i.	Features should be available	CVCF, 200 / 208 VAC Output	
j.	Connections	Input & Output : Terminal	
k.	EPO	Required	
l.	Communication Port	RS 232, USB	
m.	SNMP	Provision should be available	
n.	Noise Level	< 55 dB at 1 meter distance	
o.	Operating Temperature	0 to 45 Deg C	
p.	Humidity	upto 95 %	
q.	Altitude	< 1000 meters	
r.	Test Report / Certificate	CE (Safety : IEC / EN 62040-1 & EMI / EMC : IEC / EN 62040-2)	
		The product quoted by the bidder should be BIS Certified for safety for proposed model with Inbuilt Isolation Transformer. BIS : IS 16242 Part 1 : 2014 (Manufacturing address of offered model should be in India - Refer Make in India policy)	
		PeP Certification For Proposed Model to be provided Mandatory	
		Performance test report from any Central Gov Lab / NABL Approved Lab	
		Manufacturer -> ISO 9001, ISO 14001, OEM Plant should have water & air pollution control clearance certificate from respective govt. agency. UPS OEM should have registered office in India from last 15 years (certificate of incorporation and Pollution Control clearance Certificate to be provided)	
9	Warranty :		
a.		5 years for Both UPS and Batteries should include repair or replacement	
b.		Batteries need to be replaced during 30 th Month and 60 th Month Mandatory	

Item Name:	2 KVA UPS	
Item Code	UPS01	
Make & Model		
S.No	Specification	Compliance
1.	Technology	True online double conversion technology UPS system with IGBT based rectifier / inverter
2.	Capacity	2 KVA / 1600 Watts
3.	Input Parameters:	
a.	Voltage	230 VAC, 1 Phase 3 Wire
b.	Voltage Range	175 V to 300 VAC at full load, 120 V to 300 VAC at 0 to 60 % load
c.	Frequency	50 / 60 Hz (40 to 70 Hz)
d.	Power Factor at rated load	>=0.99 at full load
e.	Current Harmonic Distortion	Less than 10% at full load and nominal input voltage
f.	OVCD	Required (builtin)
g.	Isolation Transformer	Required (builtin) at input side
4.	Output Parameters:	
a.	Voltage	220/230/240 VAC +/- 1%, 1 Phase
b.	Frequency	50 Hz +/- 0.25 Hz (in Battery Mode) +/- 5% (in Sync)
c.	THD v	< 3 % for Linear Load ; < 5 % for Non Linear Load
d.	Overload rating	105 - 110% : 10 min 111 - 130% : 1min 131 - 150% : 3s
e.	Output waveform	Pure sinewave
f.	Crest Factor	3 : 1
g.	Power Factor	0.8 PF
h.	Over all Efficiency	> 85 %
5.	Battery Parameters:	
a.	Type of Battery Chemistry	SMF VRLA(Sealed Maintenance Free-Valve Regulated Lead Acid Battery)
b.	Battery Container/Cover Material	Poly propylene container
c.	Make	Branded Reputed Made in India Manufactured Confirming to JIS C 8702
	End cell voltage	10.5 V per Battery
d.		
e.	DC Voltage	72 or 96 VDC
f.	Backup time	120 mins
g.	VAH	min 5400 VAH
h.	Battery Rack & Connectors	Powder coated battery rack / stand to be provided
i.	Charger	Constant Current / Float Charging with Temperature Compensated
j.	Charging Capacity	10 % of the Battery AH Capacity Mandatory
h.	Transfer time	0 ms
6	Cables	
a.	Input, Output Cable	3 Meters UPS cable from Power Point to UPS Shall Be provided as per OEM Recommended standard
6.	Other Features:	
a.	Static Bypass	Inbuilt
b.	Transfer time	< 4 ms in Sync Mode

c.	Bypass parameter configurable via front panel	Required	
7.	Other Features:		
a.	LCD Display	Input Voltage, Frequency Output Voltage, Frequency, Load level Battery Voltage, Level in %, Remaining backup time Fault Information MIMIC Information	
b.	Protection	Input High / Low, Over Load, Short Circuit, Over Temperature, Battery Over Charge, Surge Protection	
c.	Audible Alarm	Battery Mode, Low Battery, Fault, Over Load, Bypass Mode	
d.	Cold Start	Required	
e.	Auto Restart	Required	
f.	Intelligent Fan Operation	Required	
g.	Generator Compatibility	Required	
h.	Features should be available	ECO Mode, CVCF, 200 / 208 VAC Output	
i.	Connections	Input : Terminal ; Output : 6 Nos 6 A Indian Socket ; Battery : ANEN 2 Poles connector	
j.	Communication Port	RS 232 & USB	
k.	SNMP	Provision should be available	
l.	Noise Level	< 50 dB at 1 meter distance	
m.	Operating Temperature	0 to 40 Deg C	
n.	Humidity	upto 95 % RH Non Condensing	
o.	Altitude	< 1000 meters	
8	Test Report / Certificate	CE (Safety : IEC / EN 62040-1 & EMI / EMC : IEC / EN 62040-2)	
		The product quoted by the bidder should be BIS Certified for safety for proposed model with Inbuilt Isolation Transformer. BIS : IS 16242 Part 1 : 2014 (Manufacturing address of offered model should be in India - Refer Make in India policy)	
		PeP Certification For Proposed Model to be provided Mandatory	
		Performance test report from any Central Gov Lab / NABL Approved Lab	
		Manufacturer -> ISO 9001, ISO 14001, OEM Plant should have water & air pollution control clearance certificate from respective govt. agency. UPS OEM should have registered office in India from last 15 years (certificate of incorporation and Pollution Control clearance Certificate to be provided)	
9	Warranty :		
a.		5 years for Both UPS and Batteries should include repair or replacement	
b.		UPS batteries need to be replaced during 30 th Month and 60 th Month Mandatory	

Annexure-V

Passive Components Specification

INTRODUCTION:

In order to integrate the various departments and upcoming new workshops in BHEL R.C Puram Hyderabad a plant wide data network (PWN) along with a State- of- the-Art Network Control Centre is

The proposed network shall be Convergence Ready Enterprise LAN based on open standards, Agile, Secure, scalable based on IPv4/ IPv6 dual-stack compliant TCP/IP Ethernet network on fiber optics backbone. For this, a TCP/IP based 1 Gigabit Ethernet LAN is proposed for plant wide networking. The architecture of plant wide networking shall be a machine and OS independent open system. The system architecture shall provide functionalities for seamless, real-time integration of automation and information systems, with production process, secured remote and web based information access. The network will be fully capable of supporting Mobility, virtualization, high-definition video, rich-media collaboration tools, and

Scope of work

The broad scope of work of the successful bidder shall include, but not limited to the following:

Design, manufacture, configure, testing at works, packaging, transportation, supply, storage, handling at site, installation, laying, erection, testing, integration, training, acceptance, commissioning of Ethernet networks and Network Control Centre, as applicable along with associated equipment's, hardware, software on a turnkey basis. Bidder shall provide all the latest hardware including networking equipment and software at the time of detailed engineering stage, which is proven. All related hardware/software shall

Plant Wide Network (PWN):

2.1.1 Structured communication network comprising of Fiber Optics (FO) Cable, UTP Cat 6A cables, switches, router, modem, light interface unit, patch panels, connectors, information outlets , intermediate junction boxes, racks, etc. for communication with servers/ PCs/ computers/ network printers and any other

2.1.2 Two nos. of core switches shall be installed at two different locations. Both core switches shall be connected with each other using 6/12/24 core OFC cable(Anti Rodent Fiber cable) through GI/HDPE pipes

2.1.3 Both core switches shall work in active-active mode connected over Optical Fiber link to form a virtual

2.1.4 There shall be Distribution/Area switches at different locations. Each distribution switch shall be connected to both the core switches with 10Gbps single

mode fiber via different route. Redundancy of network up to distribution switch level shall be taken care.

2.1.5 Layer-2 managed switches shall be supplied at all edge switches level. All distribution and core switches shall be managed Layer-3 switch. All layer-2 edge switches shall have 10g uplink port. However, based on the requirement, 1G Lx / 10G LR modules shall be populated.

2.1.6 All switches (irrespective of core, distribution and edge switches) shall support IEEE 802.3ad Link Aggregation Protocol. All necessary licenses required to enable the features/ functionality are required to be supplied along with networking/Security equipment.

2.1.7 The star backbone between core & distribution switches shall be based on 10 bps Single Mode Fiber Optics cable. There shall be no cascading in the edge network.

2.1.8 There shall be no duplication of network resources and for security requirement multiple VLANs can be created to separate different type of traffic. Exact VLAN details shall be worked out during engineering

2.1.9 Servers along with Operating system software, IT System Management Software, Antivirus Software, and client PCs for BHEL-R.C Puram as per detailed specification given.

2.1.10 All network switches shall be supplied from same make. i.e. All core , Distribution and Access

2.1.11 Necessary cables including power cable and accessories including earthing as may be required for smooth and reliable operation of networking equipment, servers and client PCs.

2.1.12 The main Admin Building shall be equipped with managed wireless access points with proper security. For this purpose, sufficient nos. of managed wireless access points with Wireless Controller shall be provided in the Admin building.

Scope of Work of Passive Components

3.0 Racks for mounting of network equipment and servers including dressing of cables with proper marking

3.1. All Passive components including information outlet, patch panels, splicing enclosures, patch cords, connectors etc. required for completion of structured cabling. All the passive components namely cable, connectors, patch chord (UTP & Fiber), LIU, I/O, Faceplate etc shall be supplied of same make i.e. from

3.2 All pipes & cable laying including termination, accessories including HDPE pipes, GI pipes, PVC conduits/channels, DP boxes, cable trays, supporting structures, clamps, route markers, identification tags, ferules etc. required for laying of cables.
3.3 All cable laying inside and outside the buildings including any excavation work Storage of equipment in proper environment condition in identified space by BHEL Security of the material will be in scope of BHEL.
3.4 Supply of all spares required during erection, testing, commissioning and warranty maintenance.
3.5 Supply of all consumables required during erection, testing and successful commissioning of the
3.6 Bidder shall supply all special tools, tackles, etc. required for erection, testing, commissioning and warranty maintenance of the system.
3.7 Preparing/ making test plan & procedures and getting approval from purchaser/consultant
3.8 Carrying out supplier's benchmark test, if any certification for passive networking components and guarantee for minimum five years from OEM. Minor civil works such as chipping/ cutting of floors for making grooves, making holes/ opening through walls, ceiling or floors, drilling of holes through steel structures and frames, grouting of frames, hooks on walls/ceiling etc. required for execution of work. After erection, surface shall be made good by plastering/painting to their original shape and finish. Bidder shall coordinate with the contractors of ED works building where main data center is envisaged and other area shop offices where second core switch and remaining area switches are planned to be installed, for PVC conduit laying and installation of other network equipment so that that civil work as mentioned above can be minimized. Bidder has to align the civil work along with construction of such buildings as per approved drawings.
A. PASSIVE COMPONENTS :
1. CAT6 Components
a. CAT6 UTP Cable
b. CAT6A U/FTP Cable
c. CAT6 Information Outlet
d. CAT6A Information Outlet-STP
e. Dual Face plate
f. Quad Face plate
g.24- Port Unloaded Patch panel h.48- Port Unloaded Patch panel
i. CAT6 Patch chord 3Ft,7Ft.
j. CAT6A Patch chord 3Ft,7Ft.
2. Fiber Components
2a. Single Mode OS2 Fiber 9/125 Outdoor Cable-6 Core,12 Core , 24 core ,
2b. Multimode OM4 Fiber 50/125 Outdoor Cable-6 Core,12 Core, 24 core
2c. 24 Port,48 Port Loaded Fiber LIU
2d. Fiber Patch chord LC-LC ,3Ft , 7Ft., 10 Ft
Structured Cabling for DATA System
1.1 Scope
This document defines the cabling system and subsystem components to include cable, termination supporting hardware, and miscellany required to supply, and to install a complete cabling infrastructure supporting voice and video. The intent of this section is to provide pertinent information to allow the vendor to bid the labor, supervision, tooling, materials, and miscellaneous installation hardware and consumables to install a complete system. However, it is the responsibility of the vendor to propose any, and, all items required for a complete system whether or not it is identified in the specification, drawings and bill of
1.2 Applicable Documents:
REFERENCE STANDARDS
Design, manufacture, test, and install data distribution systems per manufacturer's requirements and in accordance with NFPA 70 (National Electric Code), state codes, local codes, requirements of authorities having jurisdiction, and particularly the following ANSI/TIA/EIA Standards.
1) This Technical Specification and Associated Drawings
2) ANSI/TIA/EIA/568-C.1, Commercial Building Telecommunications Cabling Standard – 2009

3) ANSI/TIA/EIA 568-2.D, Copper Cabling Components Standard
4) ANSI/TIA/EIA 568-C.3, Optical Fiber Cabling Components Standard
5) ANSI/TIA/EIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces
6) ANSI/TIA/EIA-606-A, Administration Standard for the Telecommunications Infrastructure of Commercial
7) ANSI/J-STD-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for
<i>The Contractor is responsible to determine and adhere to the most recent edition of these standards when developing</i>
<i>their responses</i>
1.3 General
The function of the backbone wiring shall be to provide interconnections between telecommunications
The backbone wiring shall consist of the transmission media, intermediate and main cross connects, and mechanical terminations for interconnection of telecommunications closets, equipment rooms and entrance facilities. The backbone wiring shall include transmission media in the building.
The backbone wiring shall use the star topology wherein each telecommunications closet shall be wired to a main patch panel .
One of the following types of cables shall be used for backbone wiring as defined in schedule of quantities.
1. 100-ohm (Impedence) Unshielded/Shielded four pair horizontal cable.
2. 50 / 125 um OM3/OM4 optical fiber cable.
3 9/125 um optical fiber cables
The contractor has to assure that cross talk coupling between individual, unshielded twisted-pairs shall not affect the transmission performance of multi-pair cables.
<u>Bonding and Grounding Considerations</u>
Bonding and Grounding system shall be an integral part of the telecommunications wiring system. In addition to helping protect personnel and equipment from hazardous voltages, the Bonding and grounding system shall reduce the effect of electromagnetic interference ((EMI) to and from the telecommunications
Special Points for Passive Components
<input type="checkbox"/> All Copper & fiber components should be from the same OEM.
<input type="checkbox"/> All Passive Components should be RoHS (Restriction of Certain Hazardous Substances) complied. RoHS Compliant should clearly be mentioned on datasheets of each Passive Components (Copper).
<input type="checkbox"/> There should be minimum 25 year extended product warranty and Application Assurance for complete
<input type="checkbox"/> Cat 6A performance even when termination is within 15 meters thus ensuring eliminating short
<input type="checkbox"/> All Single Mode FO Cables, Patch cords and Pigtails should be made up of Bend Insensitive Fibers.
<input type="checkbox"/> Copper & fiber components should be Make in India
<input type="checkbox"/> All quoted Copper & fiber components part numbers should be available on OEM official web site
<input type="checkbox"/> OEM should have a manufacturing presence with 30 Years in India. Proof of Incorporation should be
<input type="checkbox"/> Only Premium Brand and No Class B Products should be quoted (w.r.t. OEM having two product lines / brand under one company)
<input type="checkbox"/> OEM should have manufacturing plant in India
CAT6A Copper Tender Specification
Channel Performance
a) The Category 6A / Class EA U/FTP SCS shall comply with the following standards
b) ISO/IEC 11801 : 2010
c) ANSI/TIA-568-C
d) IEC 60603-7-4 f) IEEE 802.3 applications as outlined in section 2
The Category 6A/ Class EA U/FTP system should support the following IEEE Ethernet applications

- a) 802.3e - 1BASE5
- b) 802.3i - 10BASE-T
- c) 802.3u - 100BASE-TX, 100BASE-T4
- d) 802.3y - 100BASE-T2
- e) 802.3z - 1000BASE-X f) 8023ab - 1000BASE-T
- f) 802.3at - Power Over Ethernet Enhancements (30 W)

Additionally the Category 6A/ Class EA U/FTP SCS shall be capable of supporting the following Fibre Channel Applications Standards, per Technical Committee 11 of INCITS:

It is critical that guaranteed worst-case values are provided to ensure the SCS can support 10G transmission without risk. "Average value" or "Typical Value" is not acceptable as they do not account for lower performance channels. The proposed Category 6A UTP SCS, when configured as a worst-case 100 meter channel shall provide

The SCS must consist of individual components provided by the same manufacturer. "Mix and Match" products are not allowed as there is no guarantee that the overall permanent link will meet Category 6A Permanent link requirements if constructed with components from different vendors.

The Category 6A cable and Category 6A components shall be manufactured by a single manufacturer. The manufacturer shall warrant the Category 6A on permanent link :cable, components, and applications for a period The 25 year warranty shall be for product performance and has component replacement policy incase of

Horizontal Cable

The Cable should meet ANSI/TIA 568C.2 CAT6 & Category 6A U/FTP Specifications as per mentioned in Table 2 The cable should consist of Eight wires of 23 AWG copper conductors.

The Cable should be round in shape

The length of the cable box of 500mtrs of CAT6A U/FTP & 305 mtrs of CAT6 and the weight should not be less than 30kgs for CAT6A & 13.6kgs for CAT6 UTP LSZH Cable.

The CAT6A cable should support the Storage temperature of -20°C to +75°C & Operation: -20°C to +60°C

In CAT6 & CAT6 A cables CCA (copper clad aluminium) is not acceptable

The CAT6A cable shall be available in Low-Smoke, Zero Halogen (LSZH) compatibility and The LSZH version must comply with the following Fire Safety standards:

- 1) ISO/IEC 60332-1
- 2) ISO/IEC 60754-2: Acidity
- 3) ISO/IEC 61034-2: Smoke Density

Category 6A - 10Gigabit outlets

The 8-pin modular (RJ-45) jacks shall comply with IEC 60603-7-4

The Category 6A outlets shall be backward compatible with Category 6 and 5E cords and cables.

The Category 6A outlets shall be of a universal design supporting T568 A & B wiring.

The information outlet shall have a Current Rating of 1.5 A at 20°C

ETL / UL Verification test certificates should be provided.

The 8-pin modular (RJ-45) jacks shall comply with IEC 60603-7-4.

The information outlet will have insertion life of 750 cycles minimum.

Modular RJ45 Patch Cords

SCS must support patch cord lengths of 1 meter minimum and equipment cords of 2 meter minimum and The Patch cords shall be available in Stranded construction with 24AWG for CAT6 & CAT6A with 26- 28 AWG.

Cords shall be equipped with 8-pin modular plugs on each end.

All cords shall be round, and consist of copper conductors, tightly twisted into individual pairs.

Nominal cordage diameter shall not exceed 6.5 mm for CAT6A & CAT6 should be 5.9mm.

Plugs shall be designed with an anti-snap latch to facilitate easy removal during move, add change processes.

The LSZH version must comply with the following Fire Safety standards: ISO/IEC 60332-1 ISO/IEC 60754-2: Acidity ISO/IEC 61034-2: Smoke Density

UL / RoHS verification of the Fire Safety/ Environmental tests listed above must be provided as part of the bid

Information Outlets support IEEE 802.3at PoE of 30W for VoIP, IEEE 802.11ac Wi-fi, and IP cameras. Supplier to provide detailed test reports and third party approvals.

The cordage shall be UTP components that do not include internal or external shields, screened components or drain

The patch cords will have insertion life of 750 cycles minimum.

24Port Patch Panel

The ganged adapter style patch panel will utilize increments of six RJ-45 style jacks in a common moulded

The ganged adapters shall have RJ45 jack in the front and Insulation Displacement Connector (IDC) at the rear of

Cable managers must be provided with the panel. These cable managers provide proper pair positioning, control, and strain relief features to the rear termination area of the panel.
ETL/ UL test certificate shall be provided.
The patch panel type shall be a 1U panel capable of supporting 24 unshielded modular 8-pin connectors compliant
Information Outlets support IEEE 802.3bt PoE of 30W for VoIP, IEEE 802.11ac Wi-fi, and IP cameras. Supplier to provide detailed test reports and third party approvals.
The panel shall be available in 24-port and 48-port configurations with universal A/B labeling and 110 connector terminations on rear of panel allowing for quick and easy installation of 22 to 24 AWG cable
The panel shall be equipped with a removable rear mounted cable management bar and front and rear labels
The panel shall be UL Listed
Operating Temperature Range = 14°F to 140°F (-10°C to 60°C)
Storage Temperature Range = -40°F to 158°F (-40°C to 70°C)
Insertion Life = 750 minimum insertions of an FCC 8-Position Telecommunications Plug
The termination of the cables at the rear should be done through the managers for fast, secured and accurate
RoHS Compliant

Cat6 Copper Cabling system- Technical Specifications	
Standard Compliance	Compliance (Yes/No)
The Category 6/Class UTP system shall comply with the following standards :	
ISO/IEC 11801	
EN 50173	
ANSI/TIA 568C.2	
IEC 60603-7-4	
IEEE 802.3 applications	
The Category 6/ Class UTP system should support the following IEEE Ethernet applications	
802.3e - 1BASE5	
802.3i - 10BASE-T	
802.3u - 100BASE-TX, 100BASE-T4	
802.3y - 100BASE-T2	
802.3z - 1000BASE-X	
802.3ab - 1000BASE-T	
802.3at - Power Over Ethernet Enhancement's (30 W)	
Channel Performance	
It is critical that guaranteed worst-case values are provided to ensure the SCS can support 1G transmission without risk. "Average value" or "Typical Value" is not acceptable as they do not account for lower performance channels. The proposed Category 6 UTP SCS, when configured as a worst-case 100 metre channel shall provide performance headroom over limits specified by Cat6	
The SCS must consist of individual components provided by the same manufacturer. "Mix and Match" products are not allowed as there is no guarantee that the overall channel will meet Category 6 Channel requirements if constructed with components from different vendors.	
The Category 6 cable and Category 6 channel components shall be manufactured by a single manufacturer. The manufacturer shall warrant the Category 6 channel cable, components, and applications for a period of 25 Years.	
The 25 year warranty shall be a transferable warranty and has component replacement policy in case of manufacturing defect	
Should support a minimum of 4 connector Channel with a minimum 6 db guaranteed NEXT over and above the standard ANSI/TIA-568.2-D	
Should support 2/4/6 connector Channel	
The Delay Skew on the 100 meter channel shall not exceed 45ns	
SCS must support patch cord lengths of 1 meter minimum and equipment cords of 1 mtr / 2meter minimum	
Horizontal Cable, Cat6 UTP Cable	
The Cable should meet ANSI/TIA-568.2-D Category 6 Specifications	
4-pair, Cat 6 U/UTP Cable, Channel performance up to 250 MHz or more, Category-6 U/UTP with ETL 4 connector channel test report as per ISO/IEC 11801, 23 AWG bare solid copper. Copper Clad Aluminum or any other combinations are not allowed.	
The weight of the cable box of 1000 Feet should not be less than 13.6kgs	
The nominal Jacket thickness should be 0.55mm	
The nominal Outside diameter should be 6.1mm	
The cable should support the installation temperature: 0 to 60° C	
It should support Operating temperature of -10 to 60 ° C	
Should be ETL verified to 2nd Edition EIA/TIA 568.2-D	
The LSZH Cable should support the following standard to qualify	
ISO/IEC IEC 60332-3-22	
ISO/IEC 60754-2 Acidity	
ISO/IEC 61034-2 Smoke Density	

The cable and cordage shall be CAT6 LSZH UTP Cable & components that do not include internal or external shields, screened components or drain wires.	
Worst Case Cable Skew: 30 nsec/100 meters @ 250 MHz, Characteristic Impedence: 100±6 Ω@ 1-250 MHz or as per ANSI/TIA-568.2-D, DC Resistance Max: 7.61 Ohms/100m, LSZH	
Insulation Material- Polyolefin, Separator Material-Polyolefin, PAIRS with Standard Color Code & length: 305 Mtrs. (1000 ft.).	
Category 6 Information Outlets	
All Category 6 outlets shall meet or exceed Category 6 transmission requirements for connecting hardware, as specified in TIA/EIA 568-B.C.2 Commercial Building Telecommunications Cabling Standard and ISO/IEC 11801:2002 Second Edition.	
The Category 6 outlets shall be backward compatible with Category 5E, 5 and 3 cords and cables.	
The Category 6 outlets shall be of a universal design supporting T568 A & B wiring.	
The Category 6 outlets shall be capable of being in a modular patching situation or as a modular telecommunication outlet (TO) supporting current 10BASE-T, Token Ring, 100 Mbps TP-PMD, 155 Mbps ATM, 622 Mbps ATM using parallel transmission schemes and evolving high-speed, high-bandwidth applications, including Ethernet, 1000BASE-T and 1.2 Gbps ATM.	
The Category 6 outlets shall be capable of being installed at either a 45° or a 90° angle in any modular faceplate, frame, or surface-mounted box avoiding the need for special faceplates.	
The Category 6 outlets shall have improved pair splitters and wider channel for enhanced conductor placement. The outlet shall also have a low-profile wire cap, which protects against contamination and secures the connection. Multicolored identification labels shall be available to assure accurate installation.	
Cat 6 UTP Jacks should be available in different colors for easy identification.	
The modular jack (RJ-45) shall be capable of being installed at either a 90 or a 45 degree angled in any modular faceplate, frame, or surface-mounted box avoiding the need for special faceplates.	
The Cat 6 Jack may have Low-profile rear protective strain relief cap, protects against contamination and secures the connection	
Fully supports the safe delivery of power over LAN cabling described by IEEE 802.3bt (Type 4) and complies with the unmating under electrical load requirements prescribed by IEC 60512-99-002	
General specifications:	
a. Meets or exceeds the mechanical, electrical, and clearance specifications in FCC Rules and Regulations, Part 68, Subpart F	
b. Meet or exceed the Category 6 requirements in ISO/IEC 11801, CENELEC EN 50173, and TIA/EIA568B	
C. Certifications: UL Listed	
The 8-pin modular (RJ-45) jacks shall comply with IEC 60603-7-4.	
The information outlet shall have a Current Rating of 1.5 A at 20°C	
The information outlet will have insertion life of 750 cycles minimum.	
The information outlet must be able to accept termination of solid conductors with nominal diameter of between 0.40 mm to 0.64 mm (26 to 22 AWG).	
The Outlets should support 1.5Amp current further to support the PoE and PoE+ applications	
CAT6 Modular RJ45 Patch Cords	
Category 6 Equipment cords (Length – 1mtr, 2mtr, 3 Mtrs, 5mtr & 10 mtr)	
Cords shall be equipped with 8-pin modular plugs on each end.	
All cords shall be round, and consist of copper conductors, tightly twisted into individual pairs.	
Nominal cordage diameter shall not exceed 5.92 mm.	
Plugs shall be designed with an anti-snap latch to facilitate easy removal during move, add and change processes.	

The cordage shall be available in Low-Smoke, Zero Halogen (LSZH) compatibility.	
The LSZH version must comply with the following Fire Safety standards:	
IEC 60332-1	
ISO/IEC 60754-2: Acidity	
ISO/IEC 61034-2: Smoke Density	
UL /RoHS the Fire Safety/ Environmental tests listed above must be provided as part of the bid response.	
The cordage shall be UTP components that do not include internal or external shields, screened components or drain wires.	
The patch cords will have insertion life of 750 cycles minimum.	
The Patch cords shall be available in Stranded and solid core construction	
24Port CAT6 & CAT6A Patch Panel	
24-port, Modular Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2	
Should be straight in shape for better cable management	
Should include Cable management bar to protect the terminations	
Each port should be individually replaceable	
ETL/ UL certificate shall be provided.	
Should be compatible with downward and upward i.e, cat5e and Cat6a	
Should accept UTP Information outlets	
Should be available in 24-port and 48-port configurations	
Labeling and identification for each port	
Face Plates	
Shall be Single Port/Dual Port (RJ45) or Quad square plate type	
The face plate should not have shutters as the spring shutter on the face plates malfunctions and causes operational issues in patch cords termination & also the face plate should be available 4 colors (as optional).	
Dimensions should be square shaped (86x86mm)	
It shall provide 1-, 2-, or 4-ports in a flat design	
Shall have Write on labels in transparent plastic window along with the plate	
Should be compatible with both UTP and STP Information outlets and also compatible with Cat5e, Cat6 & Cat6A Information outlets	
Warranty	
Owner seeks warranty for the installed cable plant from the OEM equipment supplier. Bidder shall ensure that the OEM norms for supply, installation, testing and documentation as specified by the OEM supplier shall be adhered to, provided those are in line with TIA / EIA standards and Owner requirement specifications. The warranty shall be provided by the OEM vendor to Owner and shall be administered in India. The duration of the warranty shall be for a minimum of 25 Years and shall cover the system performance, application assurance and the costs of the supply of components and installation.	

Cat6A Copper Cabling system- Technical Specifications	
Category 6A U/UTP Cable	Compliance (Yes/No)
Category 6A 4 pair U/UTP LSZH cable shall be compliant with ANSI/TIA-568.2-D	
The Category 6a UTP (Unshielded Twisted Pair) cable shall be a rounded overall cable geometry twisted in pairs with conductor separator, separated with cross isolator, wrap with a finned inner jacket surface and 4 pairs of 23 AWG solid bare copper insulated with polyolefin material	
The Category 6a UTP (Unshielded Twisted Pair) cable shall be constructed without metallic shielded tape to avoid EMI interference impacting cable performance due to poor grounding and bonding issue	
The Category 6a UTP cable shall be available in (LSZH) Low Smoke Zero Halogen jacket, comply with IEC 60754-2, IEC61034-2 and IEC 60332-3-22 test method	
ETL report of Full Cat6A Channel/Performance Test should be enclosed along with the technical bid.(4 connector channel)	
The manufacturer shall provides minimum Guaranteed Performance Specifications for 4-connection CAT6A U/UTP channel specified in document on electrical parameter - NEXT @ 3dB of guaranteed margin to Cat6A/Class EA industry standards.	
Shall guarantee significant channel margin over the entire swept frequency range, from 1 to 500 MHz.	
The Category 6A cables shall meet or exceed the following characteristics:	
The cable shall have a round cable jacket and shall features small cable nominal diameter O.D of not more than 7.24 mm which improves density by 54% compared to the industry standard - 6.3 cables per square inch with a 40% fill ratio versus only 4.1 cables in standard size	
Conductor: Solid Copper	
Conductor Size:23 AWG	
Insulator: Polyolefin	
Jacket/ Sheath Type: LS0H (Low Smoke Zero Halogen)	
The LSZH Cable shall meet or exceed the Category 6A/Class EA attenuation and NEXT requirements in the latest ISO/IEC 11801, CENELEC EN 50173, ANSI/TIA-568 standards and IEEE 802.3 where applicable	
The cable shall be composed of solid copper conductors insulated with non-halogen high-density polyethylene and jacketed with a low smoke zero halogen compound. The Cable LSZH jacket shall be compliant with CPR Class Dca as minimum. The solution shall fully comply with Local/National Codes and Regulations.	

<p>"Category 6A Cable Specifications Nominal Outer Jacket OD 0.285 in. (7.24 mm) Nominal Outer Jacket Thickness: 0.05 in. (1.27 mm) Maximum Pulling Tension: 25 lbs (11.3 kg) Nominal Cable Weight: 36.90 lbs/kft (54.7 kg/km) Operating Temperature: -4°F to 140°F (-20°C to 60°C) Installation Temperature: 32°F to 140°F (0°C to 60°C) Conductor gauge: 23 AWG Jacket Material: CPR Rating Low Smoke Zero Halogen, Minimum Dca compliant ETL Type IEC Verified: IEC 60332-3-22 Nominal Velocity of Propagation: 66% Maximum DC Resistance: 7.61 Ohms/100 m Maximum DC Resistance Unbalanced: 4% Maximum Mutual Capacitance at 1 KHz: 6.0 nF/100 m</p>	
Category 6A Information Outlets	
<p>Category 6A Unshielded Jack shall be Electrical performance guaranteed to meet or exceed the channel specifications to ISO/IEC 11801 Class EA and ANSI/TIA-568-C.2 Category 6A</p>	
<p>Support network line speeds up to at least 10 gigabits per second</p>	
<p>All information outlets for 22-24 AWG copper cable shall: Use insulation displacement connectors (IDC)</p>	
<p>The modular jack (RJ-45) shall have crossing of straddling pair contacts enables efficient alien crosstalk reduction in the channel</p>	
<p>The modular jack (RJ-45) shall also have a low-profile rear protective strain relief cap, which protects against contamination and secures the connection.</p>	
<p>The modular jack (RJ-45) shall be capable of being installed at either a 90 or a 45 degree angled in any Starandard modular faceplate, frame, or surface-mounted box avoiding the need for special faceplates.</p>	
<p>The modular jack shall fully supports the safe delivery of power over LAN cabling described by IEEE 802.3bt (Type 4) and complies with the unmating under electrical load requirements prescribed by IEC 60512-99-002</p>	
<p>568A/B configuration</p>	
<p>Color options in jacks should be available.</p>	
<p>The jack should be UL certified.</p>	
<p>Material type Copper alloy High-impact, flame retardant, thermoplastic</p>	
<p>Termination Contact Plating Nickel</p>	
<p>Minimum Plug Intersions 750times</p>	
<p>The 8-pin modular (RJ-45) jacks shall comply with IEC 60603-7-4.</p>	
CAT6A Modular RJ45 Patch Cords	
<p>Category 6A Equipment cords, Low Smoke Zero Halogen (Length – 1mtr, 2mtr, 3 Mtrs, 5mtr & 10 mtr)</p>	
<p>Cords shall be equipped with 8-pin modular plugs on each end.</p>	

Nominal cordage diameter shall not exceed 7.24 mm.	
Plugs shall be designed with an anti-snap latch to facilitate easy removal during move, add and change processes.	
Cordage shall have a round overall cable geometry twisted in pairs with conductor separator, separated with cross isolator, wrap with a finned inner jacket surface and 4 pairs of 24 AWG solid bare copper insulated with polyolefin material	
The patch cords have a unique plug design featuring a distinctive aqua sled for easy and rapid field identification.	
The patch cords shall incorporate an anti-snap feature that provides maximum protection from snagging during moves and re-arrangements. Fully compatible with intelligent patch panels	
The LSZH version must comply with the following Fire Safety standards: ISO/IEC 60332-3-22: Vertical Flame Spread ISO/IEC 60754-2: Acidity ISO/IEC 61034-2: Smoke Density	
3rd Party verification of the Fire Safety/ Environmental tests listed above must be provided as part of the bid response.	
Information Outlets support IEEE 802.3bt PoE of 55W for VoIP, IEEE 802.11ac Wi-fi, and IP cameras. Supplier to provide detailed test reports and third party approvals.	
The cordage shall be UTP components that do not include internal or external shields, screened components or drain wires.	
Patch Cord Jacket: The jacket of the patch cord must be LSZH	
Temperature range: -20°C to +60°C	
The patch cords will have insertion life of 750 cycles minimum	
24Port CAT6 & CAT6A Patch Panel	
24-port, Modular Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2	
Should be straight in shape for better cable management	
Should include Cable management bar to protect the terminations	
Each port should be individually replaceable	
ETL/ UL certificate shall be provided.	
Should be compatible with downward and upward i.e, cat5e and Cat6a	
Should accept UTP Information outlets	
Should be available in 24-port and 48-port configurations	
Labeling and identification for each port	
Face Plates	
Shall be Single Port/Dual Port (RJ45) or Quad square plate type	
The face plate should not have shutters as the spring shutter on the face plates malfunctions and causes operational issues in patch cords termination & also the face plate should be available 4 colors (as optional).	
Dimensions should be square shaped (86x86mm)	
It shall provide 1-, 2-, or 4-ports in a flat design	
Shall have Write on labels in transparent plastic window along with the plate	
Should be compatible with both UTP and STP Information outlets and also compatible with Cat5e, Cat6 & Cat6A Information outlets	
Warranty	

Owner seeks warranty for the installed cable plant from the OEM equipment supplier. Bidder shall ensure that the OEM norms for supply, installation, testing and documentation as specified by the OEM supplier shall be adhered to, provided those are in line with TIA / EIA standards and Owner requirement specifications. The warranty shall be provided by the OEM vendor to Owner and shall be administered in India. The duration of the warranty shall be for a minimum of 25 Years and shall cover the system performance, application assurance and the costs of the supply of components and installation.

Single Mode OS2 Technical Specifications

Sr No.	Details	Specification	Compliance
Single Mode FO Cable- 6 & 12Fiber			
General Specifications			
1	Cable Type	Stranded loose tube	
2	Construction Type	Armored, Gel-Free (Dry Core)	
	Loose Tube Construction	Multi tube, 6F Per tube max	
4	Cable Weight	108.0 kg/km 72.0 lb/kft	
5	Diameter Over Jacket	11.50 mm 0.45 in	
Construction Materials			
	Fiber Type Solution	Single Mode Fiber 9/125/250µm	
	Jacket Material	MDPE	
	Total Fiber Count	6 or 12	
	Armor Type	Corrugated steel	
	Jacket Color	Black	
	Jacket UV Resistance	UV stabilized	
	Rip cords	2	
Physical Specifications			
1	Max. Bending Radius (during installation)	20 X Overall diameter	
2	Max. Bending Radius (during full load)	10 X Overall diameter	
3	Max. Tensile Strength-Long Term	800N	
4	Max. Compression ((as per IEC 60794-1 E3)	440N/CM	
5	Mode field Diameter	9.0 µm	
6	Cladding Diameter	125.0 µm	
7	Coating Diameter (Colored)	245 +/-5.0 µm	
8	Loose Tube/Tight Buffer	Loose Tube	
9	No. of tubes	1 or 2	
10	Loose tube colors	Blue & Orange	
11	Fiber identification	Blue, Orange, Green, Brown, Grey, White	
12	Loose Tube filling	Water Swelable Threads (Gel free)	
Optical Specifications, Wavelength Specific			
1	Standards Compliance	ITU-T G652 D & ITU-T G.657A1 Bend Insensitive	
2	Attenuation, maximum	0.34 dB/km @ 1310 nm 0.22 dB/km @ 1550nm 0.31 dB/km @ 1385nm 0.27 dB/km @ 1490nm	
3	Index of Refraction	1.467 @1310nm	
24 & 48 Core optical Fiber Armored Single-Mode OS2			
Single Mode FO Cable- 24 & 48Fiber			
General Specifications			
1	Cable Type	Stranded loose tube	
2	Construction Type	Armored, Gel-Free (Dry Core)	
	Loose Tube Construction	Multi tube, 6F Per tube max	
4	Cable Weight	108.0 kg/km 72.0 lb/kft	
5	Diameter Over Jacket	13 to 15.0 mm (Max)	
Construction Materials			
	Fiber Type Solution	Single Mode Fiber 9/125/250µm	
	Jacket Material	HDPE	

	Total Fiber Count	24 or 48	
	Armor Type	Corrugated steel	
	Jacket Color	Black	
	Jacket UV Resistance	UV stabilized	
	Rip cords	2	
Physical Specifications			
1	Max. Bending Radius (during installation)	20 X Overall diameter	
2	Max. Bending Radius (during full load)	10 X Overall diameter	
3	Max. Tensile Strength-Long Term	800N	
4	Max. Tensile Strength-Short Term	2700N	
5	Max. Compression ((as per IEC 60794-1 E3)	440N/CM	
6	Mode field Diameter	9.0 µm	
7	Cladding Diameter	125.0 µm	
8	Coating Diameter (Colored)	245 +/-5.0 µm	
9	Loose Tube/Tight Buffer	Loose Tube	
10	No. of tubes	4tubes/6Fibers each for 24Fiber Multitube FO	
11	Loose tube colors	Blue,Orange,Green,Brown,Slate,White,Red &	
12	Fiber identification	Blue, Orange, Green, Brown, Grey, White	
13	Loose Tube filling	Water Swelable Threads (Gel free)	
Optical Specifications, Wavelength Specific			
14	Standards Compliance	ITU-T G652 D & ITU-T G.657A1 Bend Insensitive	
15	Attenuation, maximum	0.34 dB/km @ 1310 nm 0.22 dB/km @ 1550nm 0.31 dB/km @ 1385nm 0.27 dB/km @ 1490nm	
16	Chromatic dispersion	between 1285-1330nm < 3.5 ps/nm.km	
17	RoHS Compliant		
Commercial Standards			
18	EN 50173; ISO/IEC 11801		
19	ITU-T G652 D		
20	ITU-T G.657.A1		
21	RoHS 2011/65/EU		
Rack Mounted Fiber Optic Patch Panel specifications (LIU) Fully loaded			
	Fiber optic patch panel	FMS Fiber Optic Termination/Splice Panel, 1U, 19 in,	
	Height	1 U, 1.75 inches	
	6 Fiber LIU should consists	3 duplex S/m/m LC couplers/6 Pigtails and splice tray loaded for 6 Fiber LIU	
	24 Fiber LIU should consists	12 duplex S/m/m LC couplers/24 Pigtails and splice tray loaded for 24 Fiber LIU	
	48 Fiber LIU should consists	24 duplex S/m/m LC couplers/24 Pigtails and splice tray loaded for 24 Fiber LIU	
	All the panels should be 1U	Should be expandable upto 48F in 1U configuration	
	Splice Tray	Should be part of the LIU, should be able to splice 12/24 Cores. Splice Tray should be from the same	
	Color of Fiber Shelf	Black	
	Enclosure Material type	CRCA, Powder coated	
	Cable Management	Fiber guides, radius controls and secure ties should be provided	
	Pigtail Type	LC-Style, Simplex, 1.5 mtr length	
	Operating temperature	-25 Degree C to +70 Degree C	
	Durability & Colour		
	MM LC connectors	Aqua, as per Industry standard	
	Insertion Loss, Maximum for MM OM4	0.3dB	

	Return Loss Minimum for MM OM4	20dB	
	SM LC connectors	Yellow, as per Industry standard	
	Insertion Loss, Maximum for SM	0.3dB	
	Return Loss Minimum for SM	45dB	
	Dimensions	1.75in x 19in x 12.52 in	
	ROHS Compliant	OEM Certificate to be provided for ROHS	
	Warranty	25Years Bandwidth Based Warranty from OEM	
Cable assemblies - Fiber Patch Cords			
Single Mode OFC Patch Cords 9/125 Micron			
1	Type of connectors	SC or LC LSOH Jacket - Reduces toxic / corrosive	
2	Length	Minimum 1 or 3 meters	
3	Polishing	100% Factory polished and tested, must be Made	
4	Insertion Loss	Less than 0.35dB per connector	
5	Attenuation	0.4dB/km over 1310nm to 1625nm	
6	Standards	ROHS Compliant	
7	Jacket colour	Industry Standard Colour - OS2-Yellow, OM4-	
8	Make and Type	SC to LC Duplex Fiber Optic Patch Cord 9/125	
9	Cable Sheath	LSZH	
10	Cable Diameter	2 mm	
11	Ferrule	Ceramic	
12	Buffer	Tight buffered	
13	Temperature Range	.-40 Degree C to +85 Degree C	
14	Buffer Diameter:	900µm	
15	Primary Coating :	245µm	
16	Strength Member:	Aramid Yarn	
17	Jacket Material:	LSOH IEC 61034-1 & 2, IEC-60332-1, IEC-60754-	
Singlemode LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Low Smoke Zero Halogen (LSZH)			
1	Type of connectors	SC or LC LSOH Jacket	
		LC/UPC to LC/UPC	
2	Length	Minimum 1 meters or 3 mtrs	
3	Fiber type	G.652.D G.657.A1, Single Mode	
4	Insertion Loss	Less than 0.34dB Maximum	
5	Return Loss	50dB minimum	
6	Standards	ROHS Compliant	
7	Jacket colour	Industry Standard Colour SM-Yellow	
8	Make and Type	SC to LC Duplex Fiber Optic Patch Cord 9/125	
9	Cable Sheath	LSZH	
10	Cable Diameter	1.6mm	
11	Ferrule	Zirconia	
12	Buffer	Tight buffered	
13	Temperature Range	.-20 Degree C to +60 Degree C	
14	Buffer Diameter:	900µm	
15	Primary Coating :	245µm	
16	Strength Member:	Aramid Yarn	
17	Jacket Material/Flame test method	IEC 60332-1-2, IEC 60332-3, IEC 60754-2, IEC	

Optical Multi-Mode (OM3) Technical Specifications

Sr No.	Details	Specification	Compliance (Yes/No)
Outdoor Unitube Single Sheathed Armoured 50/125µm OM3 Type			
1	Cable Feature	Cable containing upto 4 - 12 optical fibres in water blocked loose tube,	
Construction type			
2	Number of elements	6 & 12 core	
3	Fibre/Tube Identification :	Colour coded	
4	Fibre protection(Tubes) :	Polybutylene Terephthalate (PBT)	
5	Central Strength Member:	Fibre Reinforced Plastic(FRP)	
6	Water Blocking :	Thixotropic Gel (Tube) Petroleum Jelly (Interstices)	
7	Armouring :	Corrugated Steel Tape Armour (ECCS Tape) Thickness > 0.125mm	
8	Sheath :	UV Stabilised	
Dimensions and Mass			
9	Overall Cable (Nominal) :	9 mm	
10	Mass (Nominal) :	80 kg/km	
Standards			
11	ISO.IEC 11801 - 2nd Edition, type OM3; AS/ACIF S008; AS/NZS 3080 TIA-492-AAAD		
Machanical characteristics			
12	Min. Bending Radius (short term)	20D ; D is OD	
13	Min. Bending Radius (long term)	10D	
14	Max. Tensile Strength-Short Term	1500 N	
15	Max. Crush Resistance-Short Term	2000N/10 cm	
16	Operating Temperature range	-40°C -+70°C	
Optical characteristics			
17	Core Diameter @ 1310nm :	50 + 2.5 µm	
18	Cladding Diameter :	125 + 1.0 µm	
Technical Specifications			
19	Max. Attenuation;		
	At 850 nm :	3.0 dB/km	
	At 1300 nm	1.0 dB/km	
20	Min. Bandwidth(EMB);		
	At 850 nm :	2000MHz*km	
	At 1300 nm	500MHz*km	
24 core Outdoor Loose Tube Armoured 50/125µm OM3 Type Optical Cable			
1	Cable Feature	Cable containing 6 optical fibres in water blocked loose tubes and solid	
Construction type			
2	Number of elements	6	
3	Fibre/Tube Identification :	Colour coded	
4	Fibre protection(Tubes) :	Polybutylene Terephthalate (PBT)	
5	Central Strength Member:	Fibre Reinforced Plastic(FRP)	
6	Water Blocking :	Jelly in Tube & Polyester Tape	
7	Armouring :	Corrugated Steel Tape Armour (ECCS Tape) Thickness > 0.150 mm	
8	Sheath :	UV Stabilised	
Dimensions and Mass			
9	Overall Cable (Nominal) :	10.8 mm	
10	Mass (Nominal) :	110 kg/km	
Standards			
11	ISO.IEC 11801 - 2nd Edition, type OM3; AS/ACIF S008; AS/NZS 3080, EIA/TIA 568-C.3		

Mechanical characteristics		
12	Min. Bending Radius (short term)	20D ; D is OD
13	Min. Bending Radius (long term)	10D
14	Max. Tensile Strength-Short Term	3500N & Long term as 2500N
15	Max. Crush Resistance-Short Term	4400N/10 cm
16	Operating Temperature range	-40°C - +70°C
Optical characteristics		
17	Core Diameter @ 1310nm :	50 + 2.5 µm
18	Cladding Diameter :	125 + 1.0 µm
Technical Specifications		
19	Max. Attenuation;	
	At 850 nm :	3.0 dB/km
	At 1300 nm	1.0 dB/km
20	Min. Bandwidth(EMB);	
	At 850 nm :	1500MHz*km
	At 1300 nm	500MHz*km
Rack Mounted Fiber Optic Patch Panel specifications (LIU)		
The 1U Multi-Function Fibre Enclosure is a configurable rack mount unit for storing and terminating incoming		
The fibre enclosure has been designed to accommodate various termination types of adapter plates & must		
The enclosure must, have a sliding drawer for ease of reconfiguring fibres, incorporates a heavy duty ball bearing		
The Splicing Cassettes must be an interchangeable front plate which can facilitates upgrades as & when required		
The enclosure/LIU must have Adhesive labelling for port identification		
LIU should be 1U rack & rack mount unit for storing and terminating incoming fibre cable		
LIU must accommodate Modular Splice Cassette for managing vulnerable optical fibres, which should help		
The LIU must be upgradable up 96 ports LC Style or 48 SC Style		
The dimension should be 483mm W x 318mm D x 45mm H(must be Rackmount) & weight should be minimum		
LIU must be Powder coated Mild Steel		
Rugged steel construction in graphite finish		
Rear, side & base access for Incoming / Outgoing fiber cables		
Cable assemblies - Fiber Patch Cords		
Multi Mode OFC Patch Cords OM3		
1	Type of connectors	SC or LC LSOH Jacket - Reduces toxic / corrosive
2	Length	Minimum 1 meters or 3 mtrs
3	Polishing	100% Factory polished and tested
4	Insertion Loss	Less than 0.3dB per connector
5	Attenuation	3.5dB/km @ 850 nm & 1.5dB/km @ 1300nm
6	Standards	ROHS Compliant
7	Jacket colour	Industry Standard Colour - OS1-Yellow, OM3/OM4-Aqua
8	Make and Type	SC to LC Duplex Fiber Optic Patch Cord 50/125 Micron
9	Cable Sheath	LSZH
10	Cable Diameter	2 mm
11	Ferrule	Ceramic
12	Buffer	Tight buffered
13	Temperature Range	.-40 Degree C to +85 Degree C
14	Buffer Diameter:	900µm
15	Primary Coating :	245µm
16	Strength Member:	Aramid Yarn
17	Jacket Material:	LSOH IEC 61034-1 & 2, IEC-60332-1, IEC-60754- 1 & 2
Cable assemblies - Pigtailed and Patch Cords		
1	The Pigtail shall be assembled with 50 µm multimode fiber (OM3) for MM fiber cabling System	

2	The pigtail shall be assembled using 900 micron buffered fiber	
3	The pigtails shall be terminated with MM LC-style connector for MM cabling systems	
4	The LC connector on the pigtail shall meet Optical Components Standard ANSI/TIA- 568-C.3. please	
5	The Patch cord proposed shall be duplex, 2.0 mm jacketed, and shall be of 50 µm multimode fiber (OM3	
Warranty		
The Extended Product Warranty should cover all passive SCS components (i.e., cable and		
In addition to product warranty the Application Assurance shall cover the SCS compliant channels to support		
The system integrator responding to this RFP should a certified partner of the manufacturer.		
The warranty shall be for a minimum of 25 Years.		

Optical Multi-Mode (OM4) Technical Specifications

Sr No.	Details	Specification	Compliance (Yes/No)
6/12 Fiber Outdoor Unitube Single Sheathed Armoured, FRLSZH 50/125µm OM4 Type			
1	Cable Feature	6Fiber/12Fiber Multimode OM4 Unitube Dry core Single sheath	
Contruaction type			
2	Number of elements	6 & 12 core	
3	Fibre/Tube Identification :	Colour coded	
4	Fibre protection(Tubes) :	Polybutylene Terephthalate (PBT)	
5	Central Strength Member:	Fibre Reinforced Plastic(FRP)	
6	Water Blocking :	Dry Core, Water blocking yarn	
7	Armouring :	Corrugated Steel Tape Armour (ECCS Tape) Thickness > 0.15mm	
8	Sheath :	FR LSZH	
Dimensions and Mass			
9	Overall Cable (Nominal) :	10mm	
10	Mass (Nominal) :	100 kg/km (Nominal)	
Standards			
11	EN 50173; ISO/IEC 11801, ANSI/TIA-568-C.3, Telcordia GR-409		
Machanical characteristics			
12	Min. Bending Radius (short term)	20D ; D is OD	
13	Min. Bending Radius (long term)	10D	
14	Max. Tensile Strength-Short Term	1200 N	
15	Max. Crush Resistance-Short Term	3000N/10 cm	
16	Operating Temperature range	-20°C -+70°C	
Optical characteristics			
17	Core Diameter	50 + 2.5 µm	
18	Cladding Diameter :	125 + 1.0 µm	
19	Coating	250um	
Technical Specifications			
19	Max. Attenuation;		
	At 850 nm :	2.7 dB/km	
	At 1300 nm	0.7 dB/km	
	Cabled Fiber Attenuation @850nm	3.0 dB/Km (Max)	
	Cabled Fiber Attenuation @1300nm	1.0 dB/Km (Max)	
20	Max. Link Length for 10GB/s		
	At 850 nm (10GB-SR & SW)	550Meters	
	At 1300 nm (10GB-LX4)	300Meters	
24 core Outdoor Loose Tube Armoured 50/125µm OM4 Type Optical Cable			
1	Cable Feature	24C Multimode OM4 50/125micron Multitube Dry Tube HDPE sheath	
Contruaction type			
2	Number of elements	4	
3	Fibre/Tube Identification :	Colour coded	
4	Fibre protection(Tubes) :	Polybutylene Terephthalate (PBT)	
5	Central Strength Member:	Fibre Reinforced Plastic(FRP)	
6	Water Blocking :	Dry Core	
7	Armouring :	Corrugated Steel Tape Armour (ECCS Tape) Thickness > 0.150 mm	
8	Sheath :	UV Stabilised	

Dimensions and Mass		
9	Overall Cable (Nominal) :	13mm (Nominal)
10	Mass (Nominal) :	190 kg/km (Nominal)
Standards		
11	EN 50173; ISO/IEC 11801, ANSI/TIA-568-C.3, Telcordia GR-409	
Mechanical characteristics		
12	Min. Bending Radius (short term)	20D ; D is OD
13	Min. Bending Radius (long term)	10D
14	Max. Tensile Strength-Short Term	3500N & Long term as 2500N
15	Max. Crush Resistance-Short Term	440N/CM
16	Operating Temperature range	-20°C -+70°C
Optical characteristics		
17	Core Diameter	50 + 2.5 µm
18	Cladding Diameter :	125 + 1.0 µm
19	Coating	250um
Technical Specifications		
19	Max. Attenuation;	
	At 850 nm :	2.7 dB/km
	At 1300 nm	0.7 dB/km
	Cabled Fiber Attenuation @850nm	3.0 dB/Km (Max)
	Cabled Fiber Attenuation @1300nm	1.0 dB/Km (Max)
20	Max. Link Length for 10GB/s	
	At 850 nm (10GB-SR & SW)	550Meters
	At 1300 nm (10GB-LX4)	300Meters
Rack Mounted Fiber Optic Patch Panel specifications (LIU) Fully loaded		
	Fiber optic patch panel	FMS Fiber Optic Termination/Splice Panel, 1U, 19 in, 24 LC/UPC,
	Height	1 U, 1.75 inches
	6 Fiber LIU should consists	3 duplex SM/MM LC couplers/6 Pigtails and splice tray loaded for 6 Fiber LIU
	24 Fiber LIU should consists	12 duplex SM/MM LC couplers/24 Pigtails and splice tray loaded for 24 Fiber LIU
	48 Fiber LIU should consists	24 duplex SM/MM LC couplers/24 Pigtails and splice tray loaded for 24 Fiber LIU
	All the panels should be 1U	Should be expandable upto 48F in 1U configuration
	Splice Tray	Should be part of the LIU, should be able to splice 12/24 Cores. Splice Tray should be from the same OEM
	Color of Fiber Shelf	Black
	Enclosure Material type	CRCA, Powder coated
	Cable Management	Fiber guides, radius controls and secure ties should be provided
	Pigtail Type	LC-Style, Simplex, 1.5 mtr length
	Operating temperature	-25 Degree C to +70 Degree C
Durability & Colour		
	MM LC connectors	Aqua, as per Industry standard
	Insertion Loss, Maximum for MM OM4	0.3dB
	Return Loss Minimum for MM OM4	20dB
	SM LC connectors	Yellow, as per Industry standard
	Insertion Loss, Maximum for SM	0.3dB
	Return Loss Minimum for SM	45dB
	Dimensions	1.75in x 19in x 12.52 in
	ROHS Compliant	OEM Certificate to be provided for ROHS compliant
	Warranty	25Years Bandwidth Based Warranty from OEM
Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Low Smoke Zero Halogen (LSZH)		

1	Type of connectors	SC or LC LSOH Jacket - Reduces toxic / corrosive	
		LC/UPC to LC/UPC	
2	Length	Minimum 1 meters or 3 mtrs	
3	Polishing	100% Factory polished and tested	
4	Insertion Loss	Less than 0.24dB Maximum	
5	Return Loss	27dB minimum	
6	Standards	ROHS Compliant	
7	Jacket colour	Industry Standard Colour OM4-Aqua	
8	Make and Type	SC to LC Duplex Fiber Optic Patch Cord 50/125 Micron	
9	Cable Sheath	LSZH	
10	Cable Diameter	1.6mm	
11	Ferrule	Zirconia	
12	Buffer	Tight buffered	
13	Temperature Range	.-20 Degree C to +60 Degree C	
14	Buffer Diameter:	900µm	
15	Primary Coating :	245µm	
16	Strength Member:	Aramid Yarn	
17	Jacket Material/Flame test method	IEC 60332-1-2, IEC 60332-3, IEC 60754-2, IEC 61034-2, IEEE	

SUMMARY OF BHEL LOCATIONS

Annexure-VI

SI No	Unit	Address	Contact Person	Email Id
1	Piping Centre Chennai			
2	Haridwar			
3	Ranipet			
4	Corporate R&D Hyderabad			
5	Trichy			
6	Noida			
7	CDT Asiad			
8	Thirumayam			
9	SSBG			
10	PSWR Nagpur			
11	PSNR			
12	Bhopal			
13	HPEP			
14	ROD HQ			
15	PSSR			
16	Jhansi			
17	Jagadishpur			

UNDERTAKING ON AUTHENTICITY OF DEVICES

Annexure - VII

{to be filled by the bidder (On Rs. 100/- Non-judicial stamp paper)}

To,
{Procuring Entity},

Reference: Tender No.: _____ Dated: _____

This has reference to the items being supplied/quoted to you vide bid ref. no. _____ dated _____.

We hereby undertake that all the components/ parts/ assembly/ software used in the devices supplied shall be genuine, original and new components/ parts/ assembly/ software from respective OEMs of the products and that no refurbished/ duplicate/ second hand components/ parts/ assembly/ software are being used or shall be used. In respect of licensed operating system, we undertake that the same shall be supplied along with the authorized license certificate with OEM name/logo. Also, that it shall be sourced from the authorized source for use in India.

In case, we are found not complying with above at the time of delivery or during installation, for the device/ equipment already billed, we agree to take back the equipment already supplied at our cost and return any amount paid to us by you in this regard and that you will have the right to forfeit our Bid Security/ SD/ PBG for this bid or debar/ black list us or take suitable action against us.

Authorized Signatory

Name:

Designation:

Annexure-VIII(a)

UNIT WISE REQUIREMENTS - ACTIVE COMPONENTS

S.No	Item	UNIT WISE QUANTITY																Total Quantity	
		Piping Centre Chennai	Haridwar	Ranipet	Corporate R&D Hyderabad	Trichy	Noida	CDT Asiad	Thirumayam	SSBG	PSWR Nagpur	PSNR	Bhopal	HPEP	ROD HQ	PSSR	Jhansi		Jagdishpur
1	LAN Core Switch		2		2	2			2					2					10
2	Data Centre Core Switch		2			2								2					6
3	Data Center Access Switch -Type 1 (Fiber)		3											4					7
4	Data Center Access Switch -Type 2 (Copper)		11		1			2						16					30
5	LAN Distribution Switch - Type 1 (16 port)		12						2					7					21
6	LAN Distribution Switch - Type 2 (24 port)	2	17		6	11		4	3					4					47
7	Access Switch -Type 1 (48 port NonPOE)		68	30	10			33		1		4		13	2			2	163
8	Access Switch -Type 2 (48 port POE)		40		7	70					6			58					181
9	Access Switch -Type 3 (24 port NonPOE)		63	10	8			11						0	3	5		10	110
10	Access Switch -Type 4 (24 port POE)		40		15	225	2		30		4			31			6		353
11	Access Switch -Type 5 (8 port NonPOE)		8	30				2						20					60
12	Access Switch -Type 6 (8 port POE)		12	5		25		2	12					37					93
13	3G4G Router		2										2						4
14	Wireless Controller		2			2		1						2					7
15	Wireless Controller Licenses		40			40		20						150					250
16	Indoor Access Point		75			25		10						90					200
17	Outdoor Access Point		40			10							2	40		2	2		96
18	NAC Licenses		3200		400	8500			430			4000	4000						20,530
19	NAC Hardware		2		1	2			1			2	2						10
20	NMS Licenses		395	150	53	600			48					500					1,746
21	NMS Hardware		1	1	1	1			1					1					6
22	40G SM Fiber Module		30			10								16					56
23	40G MM Fiber Module		38																38
24	10G SM Fiber Module		12	10		60			18					234			4		338
25	10G MM Fiber Module		82	30			8	12											132
26	1G SM Fiber Module		237	6	60				150			36		155			20		664
27	1G MM Fiber Module		52	30			12	84						88		5		25	296
28	1G UTP Transceivers		213	10	30														253
29	DSLAM 24 port		2		1														3
30	CPE		40		10														50
31	WAN Router								1						2	4			7
32	Link Load Balancer							2											2
33	Firewall					2								2		1			5
34	Web Security Appliance							2											2
35	L1 Engineer		1			3			1					3		1	1	1	11
36	L2 Engineer		1			1			2					1			1		6
37	Office Boy		2			6								1			1		10
38	6 KVA		15		5				5					10				4	39
39	2 KVA		155		30				5		5			27				10	232

Annexure-VIII(b)

UNIT WISE REQUIREMENTS - PASSIVE COMPONENTS

PASSIVE COMPONENTS			Haridwar	Corporate R&D Hyderabad	Thirumayam	PSWR Nagpur	Bhopal	Hyderabad	PSSR	Jhansi	Jagadishpur	Total Qty
Sr. No.	Description	UoM										
	Supply, Installation, Testing, Labelling and Documentation of Cat 6 U/UTP Cable & Components as per the following BOQ:-											
1	CAT6 U/UTP LSZH Cable, 305 Meter	Reel	68		5		70	100	1	31	20	295
2	Single Port Face Plate without shutter - Square Type	Nos			0			100		100	40	240
3	Dual Port Face Plate with Shutter - Square Type	Nos			50			200		50	30	330
4	Quad Face Plate with Shutter- - Square Type	Nos			0			100				100
5	Cat 6 U / UTP Information Outlet	Nos			100			400	50	190	100	840
6	24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos	34		0			100			8	142
7	48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos			0			40			2	42
8	Cat 6 U / UTP Patch Cord, 3 Feet	Nos	70		50		300	400		90		910
9	Cat 6 U / UTP Patch Cord, 7 Feet	Nos			50		300	400	50	100	200	1100
10	24 Port loaded UTP Jock Panel 1U Height	Nos			5		50			6		61
11	Cat 6 U / UTP Patch Cord, 0.5M	Nos	80		0		2000					2080
12	Cat 6 U / UTP Patch Cord, 0.5M	Nos	80		0							80
13	RJ 45 UTP Connector	Nos			500		5000				300	5800
14	RJ 45 STP Connector	Nos			0		250					250
15	Cat 6 U / UTP Patch Cord, 15 Feet	Nos	100		10		200		50			360
16	F/UTP Cat-6 Cable	Reel	10		0		10					20
	Supply, Installation, Testing, Labelling and Documentation of Cat 6A U/FTP Cable & Components as per the following BOQ:-											
1	CAT6A U/FTP Cable, 500Meter, LSZH (500 mtr reel)	Reel	15					20		5		40
2	Single Port Face Plate without shutter- White- Square Type	Nos						0				
3	Dual Port Face Plate with Shutter- White - Square Type	Nos						50				50
4	Quad Face Plate with shutter, White - Square Type	Nos						0				
5	Cat 6A Information Outlet	Nos						200				200
6	CAT6A 24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos	10					20				30
7	CAT6A 48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos						10				10
8	Cat 6A Patch Cord, 3 Feet	Nos	100					50				150
9	Cat 6A Patch Cord, 7 Feet	Nos	100					50				150
	Supply, Installation, Testing, Labelling and Documentation of Cat 6A Shielded Cable & Components as per the following BOQ:-											
1	CAT6A U/FTP Cable, 500Meter, LSZH (500 mtr reel)	Reel	5				5					10
2	Single Port Face Plate with shutter, White - Square Type	Nos	50									50
3	Dual Port Face Plate - with shutter, White - Square Type	Nos										
4	Quad Face Plate - with shutter, White - Square Type	Nos										
5	Cat 6A Shielded Information Outlet	Nos	100									100
6	CAT6A 24 Port Unloaded Patch Panel - Straight with rear cable manager	Nos	10									10
7	CAT6A 48 Port 2U Unloaded Patch Panel - Straight with rear cable manager	Nos										
8	Cat 6A Patch Cord, 1 Mtrs, LSZH	Nos	50				200					250
9	Cat 6A Patch Cord, 2 Mtrs, LSZH	Nos	50				100					150

PASSIVE COMPONENTS			Haridwar	Corporate R&D Hyderabad	Thirumayam	PSWR Nagpur	Bhopal	Hyderabad	PSSR	Jhansi	Jagadishpur	Total Qty
Sr. No.	Description	UoM										
2	24 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtailed, Splice kit / Splice Trays and Accessories	Nos										
3	48 Port Loaded Fiber LIU for Multimode Mode with OM4 Modular Cassettes with Pigtailed, Splice kit / Splice Trays and Accessories	Nos										
4	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 10 ft	Nos										
5	Multimode OM4 LC to LC, Fiber Patch Cord, 1.6 mm Duplex, Riser, aqua jacket, 15 ft	Nos										
Testing:-												
1	Testing of all the Copper Ports by using DTX 1800	Port	230	100				2200		190		2720
2	Testing of all the Fiber Cores by using OTDR	Core	120	72				700		72		964
Supply, Installation, Testing, Labelling and Documentation of Racks & Accessories as per the following BOQ:-												
1	Standard Racks with Accessories - 6U, with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos						10		10	3	23
2	Standard Racks with Accessories - 12U, , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos	28			4	20	3		5	3	63
3	Standard Racks with Accessories - 15U , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos					10	6				16
4	Standard Racks with Accessories - 24U, , with 1 PDU, 1 Fan, 1 Horizontal Cable Manager and Mounting Hardware	Nos	10									10
5	Standard Racks with Accessories - 800 x 800, 42U, - Perforated doors metal, 1Ph, 230V, 32A, Zero U standard Vertical rack mount power distribution unit with 12 X Indian Round Pin 5/15A, (Inlet Plug Not Installed, Recommended IEC30932A 2P +E), 16A MCB X 2 Circuits- PDU Rating 7.3KVA/Bottom feed- 3Mt/ Black, Horizontal Cable Manager	Nos						2				5
Supply & Installation of GI Raceways:-												
1	50 x 50 mm GI Raceway with Cover Threaded Rods Flats	Mtr						1666		250		1916
2	100 x 50 mm GI Raceway with Anchor Bolts & Nuts	Mtr						167		25		192
3	200 x 50 mm GI Raceway with Cover	Mtr						167				167
4	300 x 50 mm GI Raceways with cover	Mtr										
Supply & Installation of PVC Conduits:-												
1	25 mm PVC conduit with the accessories	mtr					2000	1600		2000	500	6100
2	50 mm PVC conduit with the accessories	mtr						800		200		1000
3	1" PVC conduit with the accessories	mtr										
4	1.25" PVC conduit with the accessories	mtr	4500									4500
5	1.5" PVC conduit with the accessories	mtr										
Supply & Installation of Casing & Capping:-												
1	25 mm casing & capping with the accessories	mtr						320		200	500	1020
2	50 mm casing & capping with the accessories	mtr						200		200		400
3	1" casing & capping with the accessories	mtr										
4	1.25" casing & capping with the accessories	mtr	4500									4500
5	1.5" casing & capping with the accessories	mtr										
Supply & Installation of HDPE Pipes:-												
1	25 mm HDPE PLB Pipe with the accessories	mtr			300		10000	5000		2000	500	17800
2	40 mm HDPE PLB Pipe with the accessories	mtr		1500			6000	4000				11500

PASSIVE COMPONENTS			Haridwar	Corporate R&D Hyderabad	Thirumayam	PSWR Nagpur	Bhopal	Hyderabad	PSSR	Jhansi	Jagadishpur	Total Qty
Sr. No.	Description	UoM										
3	50 mm HDPE PLB Pipe with the accessories	mtr	2200					4000				6200
4	80 mm HDPE PLB Pipe with the accessories	mtr						4000				4000
Trench Work:-												
1	100 cm depth x 30 cm width Soft Soil Trenching in meters	mtr	1100	1500				10000		200	100	12900
2	100 cm depth x 30 cm width Hard Soil Trenching in meters	mtr	1099					2000		200	100	3399
Chambers & Splice Enclosures:-												
1	Construction of Chambers 100 cm dia x 100 cm depth for joining the OFC cables	mtr						50		10		60
2	Installation of Readymade concrete chambers for joining the OFC cables	mtr						50		10		60
3	Splice Enclosure - 48F	Nos						40		2		42
4	Splice Enclosure - 24F	Nos					20					20
5	Splice Enclosure - 12F	Nos			5		30					35
Supply & Installation of GI Pipes:-												
1	25 mm GI Pipes with the accessories	mtr						150		100		250
2	40 mm GI Pipes with the accessories	mtr						150			300	450
3	MS 25 mm	Mtr	3200									3200
4	50 mm GI Pipes with the accessories	mtr		25				100				125
Civil Works:-												
1	Road Cutting & refilling with Concrete as per the standards of Customer	mtr	1100	40				100		100	250	1590
2	Road Cutting & refilling with Asphalt / Bitumen as per the standards of Customer	mtr	932					100		100		1132
3	Wall Chipping for the Raceway Installation	CM						2000		300		2300
4	Core Cutting for the Conduit Installation	Nos						200				200

Annexure-X

Annual Turnover Of Bidder

S.No	Financial Year	TurnOver (in Crores)
1	2021-2022	
2	2020-2021	
3	2019-2020	

ANNEXURE-XI

NO DEVIATION CERTIFICATE

This is to certify that our offer is exactly in line with your tender enquiry no Ref. no.: _____ dated _____ . This is to expressly certify that our offer contains no deviation either Technical or Commercial in either direct or indirect item.

Signed by:

Name : -----

Designation: -----

Organisation:-----

Date & place:-----

Phone/Fax/Mobile/Email:-----

Stamp & Seal :-----



HY/ FIN/CM/ 2017-18

DATE: 08/06/2017

BANK ACCOUNT DATA FOR RTGS/NEFT MODE OF PAYMENT

1. Party Code

2. Option : RTGS/NEFT

3. Beneficiary Details:

A) Name of Beneficiary : BHARAT HEAVY ELECTRICALS LIMITED
B) Address : RAMACHANDRAPURAM, HYDERABAD- 502032.
C) Bank Name : STATE BANK OF INDIA
D) BRANCH NAME : BHELTOWNSHIP, HYDERABAD- 502032.
E) Account No. : 62048154115
F) Account type : Current A/c
G) Bank IFSC Code : SBIN0020075
H) Bank MICR Code : 500002370

Signature of Party : 
Name : (D.SRINIVASA RAO)
Designation : Sr. Accounts Officer/Cash Mgmt.

डी. श्रीनिवास राव
D. SRINIVASA RAO
सुपरीक लेखा अधिकारी/ वित्त एवम लेखा
अधीक्षक/ Officer / Finance & Accounts
बी.एच.ई.एल. हैदराबाद BHEL, HYD-32

TO WHOM SO EVER IT MAY CONCERN

*Certified that the above particulars are found to be correct and matching with our records in respect of the above Beneficiary. This account is utilized for the purpose of collections through **RTGS /NEFT** only and the account is not having a valid **Cheque Facility**.*

(Signature of the Bank Manager)
Seal of Bank:



INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.



Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.



- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.



Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.



For & On behalf of the Principal

(Office Seal) कडे

Ajay Pekde

Place उप महा प्रबंधक / सी एम एम - क्रय

Date Dy. General Manager / CMM - Purchase

बी.एच.ई.एल. हैदराबाद, BHEL, HYD-32

Witness: _____

(Name & Address) _____



अधीनस्थ - बी. बिस्वास
B. Biswas
अपर महा प्रबंधक / सी एम एम - क्रय
Addl General Manager / CMM - Purchase
बी.एच.ई.एल. हैदराबाद, BHEL-IP:EP-HYD-32

For & On behalf of the Bidder/ Contractor

(Office Seal)

Witness: _____

(Name & Address) _____

Clause on IP in the tender**“Integrity Pact (IP)**

- (a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

SI	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

- (b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.
- (c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

(1)
 Name: Ajay Pekde
 Deptt: CMM Purchase
 Address: BHEL Hyderabad
 Phone: (Landline/ Mobile)
+91 040 2318 2410
 Email: ajaypekde@bhel.in
 Fax: _____

(2)
 Name: Biswajit Biswas
 Deptt: CMM Purchase
 Address: BHEL Hyderabad
 Phone: (Landline/ Mobile)
+91 040 2318 5182
 Email: biswajitbiswas@bhel.in
 Fax: _____

(Attachment to Enquiry No. XXXXXXXXXX Due on Date XX.XX.XXXX for submission by 11.00 hrs to open from 14.00 hrs.)			
INSTRUCTIONS TO BIDDER (ITB)			
NOTE: Bidder to confirm in affirmative by typing "YES" or "Applicable Data" in the response column. Deviations , if any shall be recorded in deviations/comments column (Separate sheet can be attached if needed). Non deviatable clauses are indicated as "NON DEVIATABLE".			
Sl. No.	DETAILED TERMS & CONDITIONS	VENDOR RESPONSE (YES/NO)	DEVIATIONS / COMMENT
1	SCOPE OF SUPPLY:		
	Signed & Sealed offers are invited for the Scope of Supply of goods and Services or both as detailed in the enquiry. Relevant enclosures/supporting documents / catalogue, if any shall be enclosed to the technical offer. Bidder can also submit offer through email at their own risk. The offer is to be submitted in two parts. Technical offer to be submitted to mail ID technicalbid_hyd@bhel.in , and price bid to be submitted to mail ID pricebid_hyd@bhel.in as an attachment only. Interchanging the information in the mails may lead to rejection of the offer. Supplier shall have no claim on e-mail offers sent on any other e-mail ID. In case of e-mail offers, the mail subject should contain Enquiry No. Due date and Supplier name, Supplier address including contact details shall be mentioned in the content of the mail. Without these details offer is liable for rejection.		
2	GENERAL INSTRUCTIONS:		
A	The quotation should be neatly typed and free from over writing/ erasures. Any correction or addition must be authenticated. The offer including annexures and brochures should be submitted in English / Hindi. All Pages of Techno Commercial Bids (Main Pages), ITB should be signed and Stamped. If there is a conflict in case of bilingual submission, the submission in English will be final.		Non Deviatable
B	In case of Single-Part bid Tender, the complete bid shall be submitted in a single sealed cover super subscribing the Tender number and due date. Incomplete offers are liable for rejection. E mail bids shall be sent to mail ID pricebid_hyd@bhel.in as an attachment only.		Non Deviatable
C	Bidders to please note that the Terms & conditions contained in this document and Special conditions, if any, are to be read fully before submission of quotations.		Non Deviatable
D	Vendors are advised to comply with specific conditions of the enquiry, Should there be any deviations (where deviations are permitted), it shall be entered in the deviation column. BHEL reserves the right to reject such offers or load the bid suitably for evaluation.		Non Deviatable
E	Offers shall be submitted directly, only by the vendor or by their authorized representative / agent and the offer should be in line with the regulatory guidelines (i.e A valid Agency agreement between principal vendor and agent / representative shall be attached and the agreement shall cover the scope of services rendered by Agent, Agency Commission and any other information called for as per the regulatory guidelines). OEM / Mill details shall be provided if supplier is not a manufacturer. Bid envelopes shall bear the name of Supplier. In case of submission through authorized representative/agent, the name of representative/agent should also be mentioned apart from supplier name.		Non Deviatable
F	Offer received after the specified time and date of submission shall be rejected. No further correspondence shall be entertained.		Non Deviatable
G	Unsolicited offers shall not be considered.		Non Deviatable
3	OTHER PARTICULARS (Please indicate applicable data)		
A	Name of the Bid currency (freely tradable foreign currency for imports and Indian Rupees for indigenous purchase).		
B	Name of the Port of loading and Port of Discharge (applicable to imports).		
4	BID SUBMISSION PROCEDURE:		
A.	For Single Part Bids: Offers addressed to DGM/CMM, Vendor Complex, BHEL, Hyderabad must be sent in a sealed cover on which tender enquiry number and the due date shall be super subscribed and sent by appropriate mode to above address or dropped in tender box located at vendor complex on or before the specified time and date of submission of offers, preferably in the bidder's envelope. For e-mail offers please follow the procedure mentioned in 2 (B).		Non Deviatable
B.	For two-Part Bids:		

i	<p>Two part bid consisting of</p> <p>i) Techno-commercial Bid - (Part-I), with all technical specification & scope including bill of material etc., EMD (where applicable) and unpriced bid with all applicable Commercial Terms and Conditions, rates of agency commission , duties, taxes and other charges, <u>except the price.</u> super scribing enquiry No. (Techno-Commercial Bid) and due date Signed and Stamped ITB and special conditions of contract, if any is required to be attached along with Techno-commercial Bid - (Part-1) AND</p> <p>ii) Price Bid (Part-II), containing ONLY the price (including agency commission, if any) and the applicable duties/taxes/other charges shall be kept in a separate sealed cover super subscribing Enquiry no. (Price bid) & due date. Both these covers shall be kept in a Third cover super subscribing Enquiry no. & due date. All techno commercial terms & conditions mutually agreed prior to price bid opening shall prevail and supersede any terms and conditions specified otherwise in price bid.</p>		Non Deviatable
ii	Techno-commercial Bid will be opened on the assigned date .Only the price bids of vendors whose techno commercial bids are accepted will be opened later on a specified date.		Non Deviatable
iii	The bidders whose bids are techno commercially not accepted will be informed & EMD (Earnest Money Deposit) shall be returned wherever submitted.		
iv	Bidders will be allowed to submit the impact on their quoted prices due to changes in technical scope, specifications, and commercial terms/conditions as specified in NIT which in the opinion of BHEL warrant changes in prices.		Non Deviatable
v	Bids shall be opened on due time and date in the presence of bidders who may like to be present. Only one representative of each bidder shall be permitted to attend the bid opening.		Non Deviatable
5	Delivery Instructions		
A	Indigenous Purchase		
	Goods shall be delivered on FOR Destination basis to the named destination(s) or as specified in the enquiry, Insurance in the scope of supplier.		
B.	Imports		
	The goods shall be delivered on CIP-basis to port of discharge as mentioned in the purchase order.		
6	Documentation:		
A	Indigenous Purchase		
	<p>Seller shall arrange to send to BHEL, Hyderabad along with all the required documents as detailed in Purchase Order, such as, Tax Invoice (Original for Recipient, Duplicate for Transporter), consignee copy of LR, Packing list , Pre-dispatch Inspection report, Test/ Guarantee/ Warranty certificate/ O&M manuals (as applicable) etc. immediately on dispatch of the goods. Any addition/ exclusion to such documents shall be as specified in the Purchase Order.</p> <p>In case of dispatches from vendor works to site, material receipt certified by site office / Customer shall be provided.</p> <p>Softcopies of the above documents shall be uploaded in Pradan portal https://web.bhelhyd.co.in/mm/ immediately after dispatch of the material</p>		Non Deviatable
B	Imports		
	<p>i) Seller shall inform the purchaser the readiness of material along with packing details well in 30 days advance from the date of delivery. Seller shall also upload soft copy of the dispatch documents consisting of BL / AWB, Invoice, Shipping list & Test certificates and other documents as specifically indicated in the Purchase Order in PRADAN Portal (https://web.bhelhyd.co.in/mm/) within 3 days from the B/L date for sea shipment and 1 day from AWB date for Air shipment.</p> <p>ii) In case of CIP shipments, seller shall also inform purchaser the information about discharge port agent details and ship arrival information within 7 working days from the date of Shipment.</p> <p>iii) In case the material shipped in Full Containers(FCL), Seller shall ensure that the Bill of Lading should clearly spell out the following</p> <ol style="list-style-type: none"> 1. Port of discharge -- "Nhavaseva"/chennai 2. Place of Delivery / Final Destination - "ICD Sanath Nagar". 3. For air consignment the port of discharge will be Hyderabad, India and consignee shall be BHEL. 		
	iv) In case of Air shipment, the following dimensions of single package may be noted.		
a).	Dimension of the cargo(ODC) -- > 125" x 88" x 63"		

b).Weight of the cargo -- >3.5 MT.

If any package dimension or weight crosses the above set limits, it will be treated as Over Dimension Cargo (ODC) or Over Weight Cargo and seller shall inform BHEL well in advance of 20 days prior to the delivery date to enable BHEL to finalize the freight forwarder

(v). Recovery charges for non-submission of documents : -

Seller shall submit all the required documents to BHEL as prescribed in the Purchase order and NIT.

If BHEL incurs any charges such as Penalty, demurrage, container detention, wharf age, storage, Ground rent etc., due to non - compliance / non - submission of documents prescribed in Purchase Order/Tender Document/Letter of credit , the same shall be recovered from the seller as under:

1. EUROPE/USA/Black Sea/ Far East/Middle East/South East sector

A. For EX-WORKS / FCA/ FAS / FOB Sea Consignments:-

Penalty for late submission / negotiation of documents beyond 14 days shall be as under:

Sl. no	Period (From Date of Bill of Lading)	Recoverable Charges	Recoverable Charges per day per container	
		LCL per week/ Break bulk cargo per day	20FT Container	40FT Container
i	Upto 14th day	Nil	Nil	Nil
ii	15th day onward	USD 10	USD 50	USD 105

B. For CIF / CFR / CIP / CPT Sea Shipments:-

For CIF / CFR / CIP / CPT Sea Shipments, Vendor shall provide rates for detention charges after free period at the time of offer itself in case of engagement of 20FT Container and 40FT category. In case of late presentation of documents to the bank recovery will be effected from the Vendor as per the rates quoted by the Vendor at the time of offer in this regard.

In case of Break bulk cargo and LCL Demurrage/storage charges shall be recovered at rate of USD 10 per day and storage charges rate of USD 10 per week respectively shall be charged as late presentation charges.

(vi) Description of items in invoice, packing list, BL / AWB or LR shall be same as PO item description. Vendors shall ensure that invoice shall contain PAN nos. of both seller and buyer along with other tax related numbers. BHEL PAN AAACB4146P and BHEL TAN HYDB00086C

Any other additional documents sought by the statutory authorities, the same shall be produced by the seller on priority basis.

(vii) Seller shall provide package details including number of packages, gross weight, net weight etc.

(viii) The seller shall provide the following documents at the time of submission of offer :-

- a) No Business Connection in India declaration issued by the seller as per the format specified. (or)
- b) (i) No Permanent Establishment in India declaration issued by the seller as per the format specified.
(ii) Tax Residence Certificate issued by the seller's tax authorities.
(iii) Form 10F issued by the supplier.
- c) In case the seller has a Business Connection in India as per Section 9 of Income Tax Act or

Permanent Establishment in India as per Article 5 of Double Taxation Avoidance Agreement between India and the seller's country, the seller shall provide a withholding tax order issued by the Indian Income Tax authority for recovery of applicable tax.

7	Delivery Schedule		
A	<p>The tendered goods shall be delivered within the period stipulated in PO . Delivery at BHEL can be accepted at the earliest, 30 days prior to delivery date as mentioned in the Purchase order. Delivery earlier than 30 days of contractual delivery date may be accepted with the written permission of BHEL -Purchase department.</p> <p>Goods arriving after the delivery date will be accepted only with the prior written permission of BHEL otherwise they will not be allowed inside the factory. BHEL reserves the right to reject the material, if not delivered by scheduled Purchase Order Delivery Date.</p> <p>(In case of imports , the final entry date of Import General Manifest (IGM) will be reckoned as delivery completion date)</p>		Non Deviated
B	<p>Documents such as TC,GCs Inspection reports are to be submitted within 10 days of dispatch of these materials. C note date or Date of submission of documents whichever is later shall be considered as delivery date incase documents are not submitted within 10 days from the dispatch of the material. Supply of plant/ equipment/ stores shall not be considered complete until they have been inspected and accepted at the place and destination specified for delivery by the time stipulated under the terms & conditions of the Order/ Contract. Mere payment by itself shall not constitute acceptance of the goods or materials in any manner, whatsoever.</p>		
8	Pricing Terms		
	Prices once quoted shall remain firm and valid during the execution of PO. Offers with PVC will be rejected outright except in cases where specifically called for in the NIT.		Non Deviated
9	PRICE VALIDITY :		
	<p>Unless otherwise specified, offer shall be valid for a period of 90 days from the date of bid opening (Technical bid /part-I in case of two part bid).</p> <p>However the prices quoted for spare parts of the Main equipment shall be kept valid for a period of 1 year from the date of Placement of PO for the main equipment.</p>		
10	Taxes & Duties (RATE TO BE INDICATED by the bidder against the space provided)		
A	Indigenous Purchase		
	The Taxes as applicable shall be quoted in the following manner.		
i	Vendor to indicate HSN of Goods or SAC of Services.		
ii	IGST/CGST/SGST/UTGST: Rate of Tax to be quoted as extra in %		
	<p>NOTE: Bidders to ensure correct applicability of IGST/CGST/SGST/UTGST based on the Inter / Intra state movement of goods.</p> <p>Taxes prevalent on the contractual delivery date or the actual delivery date (in case of delay) which ever is lower shall be applicable paid. In case Bidder has opted for GST Composition Scheme, the same may be stated explicitly both in their technical and price bids.</p>		
iii	Any other taxes & duties not covered anywhere above may be indicated separately.		
iv	<p>Taxes deducted at source:</p> <p>TDS as per the extant statute shall be recovered. In case vendor does not provide PAN details/concessional certificates, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.</p>		Non Deviated
B.	Foreign Purchase (Imports)		
i	The offered price shall be inclusive of all the Taxes and duties as applicable in country of bidder / country of dispatch for the quoted CIP price.		Non Deviated
ii	<p>Taxes deducted at source:</p> <p>TDS as per the extant statute shall be recovered. In case vendor does not provide PAN details/concessional certificates, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.</p>		Non Deviated
11	Payment Terms: Unless otherwise specified in Special Conditions, following shall be the terms of Payment.		

A	<p>Indigenous: 100% payment along with taxes, freight & insurance will be made within 75 days from the date of receipt of complete documentation as per PO. However payment would be done only after receipt of original documents, including site/ Customer acknowledgement on LR (MRC - Material Receipt Certificate at site) / GR clearance at BHEL Stores. For MSEs (covered under MSME Act) which are registered and periodically renewed with BHEL, this period will be 45 days* as prescribed in the relevant act. Adherence to the above time schedule of payment is contingent upon Vendor complying with GST provisions and availment of Input Tax Credit by BHEL before the date of payment. *The taxes and duties that are reimbursed would be the ones applicable as on the contractual Purchase Order delivery date or the amount actually paid whichever is less. In case GST credit is delayed/ denied to BHEL, due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST Law for availing such ITC, or any other reason not attributable to BHEL, GST amount shall be recoverable from Vendor along with interest levied/ leviable on BHEL.</p>		
B	<p>Imports:- i) 100% payment (less Indian Agency Commission, if any) shall be paid through "Usance Letter of Credit / Cash Against Documents (CAD) / Wire Transfer" with a credit period of 60 days ii) LC will be opened after successful completion of pre dispatch inspection prior to the scheduled / agreed delivery date LC will be opened within 7 working days from the date of request.</p>		
C	<p>Note: 1) No advance payment is acceptable. However, in exceptional/rare cases, BHEL at its discretion, may consider advance payment against Bank Guarantee valid up to receipt of material at BHEL for 110% of advance amount issued / confirmed by any of the BHEL consortium banks. 2) Wherever EMD (Earnest Money Deposit) is applicable, it may be noted that no interest will be paid on EMD and the EMD will be paid back to unsuccessful bidders within fifteen days after award of the contract. Successful bidder's EMD will be converted to SD (Security Deposit). Tender Cost wherever applicable is not refundable.</p>		Non Deviatable
D	<p>No interest shall be payable by BHEL on earnest money or security deposit or any money due to the contractor by BHEL.</p>		
12	<p>Penalty clause: In the event of delay in supply of goods, penalty of 0.5% per week or part there of shall be levied on the undelivered portion subject to a maximum of 10% of the order value. Penalty amount so determined along with applicable GST thereon shall be recovered.</p>		
13	<p>Excess materials supplied beyond tolerance limit as specified in PO, will not be accounted for.</p>		Non Deviatable
14	<p>Rejected materials, if any, shall be collected by the vendor within 90 days of such communication to the vendor .Beyond 90 days a ground rent of 0.25 %of the value of the material per week will be levied for a maximum period of two weeks.. Beyond this period the supplier forfeits their right to the materials.</p>		Non Deviatable
15	<p>Guarantee / Warranty Period : (Deviation to this clause is not acceptable.) Wherever required, and so provided in the specifications/Purchase Order, the seller shall guarantee that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance. If within the guarantee period, the delivery is found to be non-complaint, the seller shall on his own account, replace repair, or re-execute the delivery at Purchaser's discretion on the purchaser's first request or within the mutually agreed period, without prejudice to Purchaser's other legal rights. If the seller continues to default on their obligations, purchaser has the right to proceed to replace, repair or re- execute the order at the seller's expense, with or without help from third parties. Purchaser shall notify the seller of the exercise of this right in advance where ever possible. Unless otherwise specified, guarantee period shall be 12 months from the date of commissioning or 18 months from the date of supply/replacement whichever is earlier. For bought out packages which are intended to be incorporated in installations or systems the guarantee period shall not start until the time the installations or systems are commissioned, provided always that the period ends not later than 30 months after the date of supply of the goods. The guarantee period shall be extended by the period during which the goods are not in compliance. A guarantee period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery.</p>		Non Deviatable

NOTE: Deviations (Commercial as well as Technical) from the tender specifications and conditions are generally not acceptable. However, deviation if any, shall be brought out clearly with proper justification in the offer. The deviation, if considered by BHEL, shall be loaded for comparison, while evaluating the offer. If a bidder unconditionally withdraws any deviation before price bid opening, the same shall not be loaded. Loading criteria in respect of major commercial conditions where deviations if any are accepted shall be as per clause No.16.

The Vendors may specifically note the following.

16	Evaluation and Loading Criteria:
A	Evaluation of prices shall be done item-wise unless otherwise specified in the enquiry. Evaluation shall be on the basis of delivered cost, i.e. "total cost to BHEL" w.r.t the finalized technical scope and commercial conditions (after considering incidence of applicable taxes and duties and loading). For evaluation, exchange rate (TT selling rate of State Bank of India) as on the date of bid opening (Part-I, in case of two-part bids) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.
B	In case of foreign bidders, the quoted CIP price shall be loaded by the following factors to arrive at the Delivered Cost:
i	- Import duty as applicable at the time of Technical/ Part-I bid opening .
ii	- Port handling/ clearing charges & inland freight and insurance: @ 5% of CIP value (10% for plates, pipes & structurals).
iii	In other cases subject to acceptance by BHEL, loading for various factors (in addition to above) as the case may be will be done as follows: 0.5% for unloading at Port of Destination Marine Freight 4% and Marine Insurance 1% (9% and 1% towards Freight and Insurance respectively for Plates, Pipes, Rounds & Structurals)
C	Incase of Indigenous Bidders, Ex-works offers received (as against FOR Destination mentioned in enquiry) shall be loaded by 4% of Ex-works value (9% for plates, pipes, rounds & structurals) unless otherwise mentioned in enquiry.
D	Deviated Penalty: Any loading on penalty clause shall be 10% or to the extent to which the vendor has opted for deviation.
E	Deviated Payment Terms: Terms: In case BHEL considers any deviation in payment terms, the bids shall be loaded with 18% interest per annum to the extent of deviation.
17	Procurement directly from the manufacturers/ suppliers shall be preferred. However, no agent shall be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from both from the manufacturer/ supplier and the agent, bid received from the agent shall be ignored.
18	RIGHT OF REJECTION /NON- PLACEMENT OF PO: BHEL reserves the right to accept or reject any or all bid/s in full or part without assigning any reason whatsoever.
19	INTEGRITY PACT Vendors shall have to enter into Integrity Pact with BHEL as per attachment - for order value of rupees five crores and above and shall be signed by the competent authority before the issue of purchase order, failing which vendor's offer will be rejected.
20	Public Procurement
A	Make in India For this Procurement , the local content to categorize a supplier as a Class I local supplier / Class II local supplier / Non-Local supplier and purchase preference to Class I local supplier , is as defined in Public Procurement (Preference to Make in India) , Oct 2017 dated 04.06.2020 issued by DPIIT . In case of subsequent orders issued by the nodal ministry , changing the definition of local content for the items of the NIT , the same shall be applicable even if issued after issue of this NIT , but before opening of Part – II bids against this NIT Proforma for self certification for minimum local content and auditor's certification is given in Annexure III .
B	Any Bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with competent authority . https://www.mea.gov.in/ to be referred for latest details of competent authority and exemptions . Proforma for self certification for compliance is given in Annexure IV
21	Benefits earmarked for Purchase from Micro & Small Enterprises (MSEs) – Indigenous Purchase
21	All Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy are exempt from Paying earnest money deposit .
A	NSIC registered unit bidders shall submit NSIC Certificate along with bid documents. Date to be reckoned for determining the deemed validity will be the last date of Technical bid submission. Non- submission of such document will lead to consideration of their bid, at par with other bidders and MSE status of such bidders shall be shifted to Non- MSE Category till the supplier submits these documents
21	In tender,if MSEs quoting price within price band of L1+15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply up to 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately. Out of these 25% minimum 3% shall be earmarked for MSEs owned by women and 6.25% for MSEs owned by SC/STs who submit the bid along with relevant documents . This is applicable in case of item-level evaluation tenders and divisible tenders .
21	If an enterprise falling under MSME category as defined in the Act, graduates to a higher category from its original category or beyond the purview of the Act, it shall continue to avail all non-tax benefits of its original category notified by the Ministry of Micro, Small and Medium Enterprise for a period of three years from the date of such graduation to the higher category.
21	BHEL HPEP is registered with RXIL (TReDS) platform. MSE bidders are requested to get registered with RXIL (TReDS) platform to avail the facility as per the GOI guidelines
D	

22	<p>Startups :</p> <p>For Startups Medium Enterprises, Condition of prior turnover and prior experience in Public Procurement may be relaxed subject to meeting of Quality and Technical Specifications . Startups are exempt from paying earnest money deposit.</p>
23	<p>For Claiming Payments for goods received at BHEL works / Site from Vendors' Works)</p> <p>a. Original of Invoice marked as ORIGINAL FOR RECIPIENT</p> <p>b. Duplicate of Invoice marked as DUPLICATE FOR TRANSPORTER</p> <p>c. Packing List - clearly showing number of packages, gross weight and net weight.</p> <p>d. Warranty/Guarantee certificates (If applicable as per PO terms)</p> <p>e. Insurance certificate</p> <p>f. Third Party Inspection Certificates.</p> <p>g. LR Copy signed & stamped by Site incharge / Customer for site deliveries)</p> <p>(For material received at BHEL payment will be made against GR for accepted quantity)</p>
24	<p>Inspection Measuring and Test Equipment (IMTE) whether used by the Seller/ Contractor or sub-contractor shall be calibrated, maintained and controlled. Calibration shall be valid and IMTE maintained in sound condition during usage.</p>
25	<p>ISO-9001, ISO14001 and OHSAS 18001 shall be complied</p>
26	<p>Applicable Conditions :These General conditions of Contract for Purchase apply to all enquiries, tenders, request for quotations, orders and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliverables") to Bharat Heavy Electricals Limited, Ramachandrapuram , Hyderabad (hereinafter referred to as "BHEL" or the Purchaser) or its projects/customers.</p> <p>Any deviations from or additions to these General conditions of contract for Purchase' require Purchaser's express written consent. The general terms of business or sale of the Seller shall not apply to Purchaser.</p> <p>Orders, agreements and amendments thereto shall be binding if made or confirmed by the Purchaser in writing. Only the Purchasing department of the Purchaser is authorized to issue the Purchase order or any amendment thereof.</p>
27	<p>Being PMD Vendor, if you are not quoting against this tender enquiry, please send your regret letter positively for our reference with valid reasons for not participating in the tender enquiry. Repeated lack of response on the part of bidder may lead to deletion such PMD vendor from BHEL's approved vendor list</p> <p>Vendor shall ensure that PAN details are available/updated with BHEL, else Vendor shall attach PAN details with enquiry failing which offer shall be liable for rejection.</p>
28	<p>Kindly quote your prices in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 Status</p>
29	<p>Any discount / revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.</p>
30	<p>The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned after finalization of contract. EMD shall be forfeited in the event of bidder opting out after tender opening.</p>
31	<p>In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / equivalent market price at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. Nonperformance of contract attracts penal provisions inline with BHEL's Suspension of Business dealings.</p>
32	<p>Any other terms and conditions of the bidder attached / referred against the tender enquiry will not be considered.</p>
33	<p>All drawings as also all patterns and tool supplied by BHEL or made at BHEL's expense are BHEL's property. These cannot be used or referred to any other party and must only be used in the execution of BHEL's orders.</p>
34	<p>Any amount payable by the consignor / supplier under any of the condition of this contract shall be liable to be adjusted against any amount payable to the consignor / supplier under any other work / contract awarded to him. This is without prejudice to any other action as may be deemed fit by BHEL.</p>
35	<p>The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, shall be rejected. The list of firms banned by BHEL is available on BHEL web site www.bhel.com</p>
36	<p>Definitions</p>
<p>Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.</p>	
36 A	<p>Purchaser' means BHEL-HPEP, Ramachandrapuram, Hyderabad-502 032 of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the companies Act having its registered office at BHEL House, Siri fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.</p>
36 B	<p>'The seller' means the persons, firm, company or organization on whom the Purchase order is placed and shall be deemed to include the seller's successors, representatives, heirs, executors and administrator as the case may be. It may also be referred to as Contractor, supplier or vendor.</p>

36 c	<p>'Contract' shall mean and include the Purchase order incorporating various documents viz., tender/offer, letter of intent/acceptance, the General Conditions of contract and special conditions of contract for Purchase, specifications, inspection/quality plan, schedule of prices and quantities, drawings, if any enclosed are to be provided by the Purchaser or his authorized nominee and the samples or patterns if any to be provided under the provision of the contract.</p> <p>In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be Purchase Order, LOI/LOA followed by specific conditions, special conditions of contract and general conditions of contract for commercial conditions; and specific agreement on technical conditions, special technical conditions and general technical conditions, tender/offer.</p>
37	<p>'Parties to the contract' shall mean the seller and the purchaser as named in the main body of the Purchase Order.</p>
38	<p>Ordering and confirmation of order</p>
	<p>The seller shall send the order acceptance in Toto within one week from the date of LOI/Purchase order or such other period as specified/agreed by the Purchaser. Purchaser reserves the right to revoke the order placed if the order confirmation differs from the original order placed. Purchaser shall only be legally bound if agreed explicitly in writing to be in agreement with the deviation. The acceptance of deliverables or supplies by Purchaser as well as payments made in this regard shall not imply acceptance of any deviations.</p> <p>The Purchaser order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified /agreed by the Purchaser) from the date of P.O.</p> <p>Purchaser, is at liberty to send signed P.O. through electronic media such as e-mail and the receipt of which shall be treated as receipt of order.</p>
39	<p>Execution</p>
	<p>The whole contract is to be executed in the most workman like manner, substantial and approved as per the contracted terms.</p>
40	<p>Progress Report</p>
	<p>The seller shall render such report as to the progress of work and in such form as may be called for by the Purchaser from time to time. The submission and acceptance of such reports shall not prejudice the rights of the purchaser in any manner. Seller shall communicate to BHEL immediately, change of address, ownership, contact person(s), the mobile numbers and e-mail of the dealing person concerned.</p> <p>Milestones shall be periodically updated by vendor/subcontractor through PRADAN Portal (https://web.bhelhyd.co.in/mm/). Non update will adversely affect service rating of vendor performance.</p>
41	<p>Product information, Drawings and documents / Non-disclosure and Information Obligations</p>
	<p>Drawings, technical documents or other technical information received by one party shall not without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are confidential and binding only to the extent that they are by reference expressly included in the contract.</p> <p>The seller shall, as per agreed date/s but not later than the date of delivery, provide free of charge any information and/or drawings which are necessary to permit the Purchaser to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in the number of copies agreed upon or at least three copies of each.</p> <p>All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the contract shall continue to be the property of the submitting party.</p> <p>The seller shall provide Purchaser with all information pertaining to the delivery in so far as it could be of importance to Purchaser. The seller shall not reveal confidential information to its own employees not involved with the tender/contract and its execution and delivery or to third parties, unless Purchaser has agreed to this in writing beforehand. The seller shall not be entitled to use the Purchaser's name in advertisements and other commercial publications including website without prior written permission from Purchaser.</p> <p>In the event of violation of the confidentiality as agreed, BHEL will take legal action as deemed fit. Non disclosure agreement to be entered as per Annexure- II wherever applicable.</p>
42	<p>Inspection and Testing</p>
42 A	<p>The goods and stores shall be manufactured by approved quality system and each part/component may be inspected and tested by the Purchaser prior to shipment and shall fully comply with relevant requirements of Purchaser.</p> <p>Purchaser has the right to inspect at any stage during manufacture/ delivery. In the event of rejection, Purchaser shall inform the seller accordingly and Purchaser shall be entitled to replacement or repair at his discretion or may proceed to terminate or cancel the agreement. All this, does not affect Purchaser's right to recover compensation.</p>

42 B	<p>Purchaser or his authorized representative shall be entitled at all reasonable times during execution to inspect, examine and test at the seller's premises the material and workmanship of all stores to be supplied under the contract, and if the part of the stores are being manufactured at other premises, the seller shall obtain for purchaser or his authorized representative permission to inspect, examine and test as if the said stores are being manufactured at the seller's premises. Such inspection, examination and testing, if made shall not release the seller from any obligation under the contract.</p> <p>For indigenous suppliers all costs related to first inspection request shall be borne by the purchaser and the cost of subsequent inspections due to non-readiness of material/rework/ rejections shall be borne by the seller. In case of imports all inspection charges including third party inspections if any shall be borne by the seller. The cost of inspection staff/third party specified by the Purchaser shall be borne by seller unless otherwise specifically agreed. Whether the contract provides for tests on the premises of the seller or any of his sub-contractor/s, seller shall be responsible to provide such assistance, labor, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently.</p> <p>Cost of any type test or such other special tests shall be borne by the seller unless otherwise specifically agreed in the contract. The Seller shall give the authorized representative of the purchaser reasonable notice in writing of the date on and the place at which any stores will be ready for inspection/ testing as provided in the Contract. Annexure - I may be strictly be complied with for the time lines. Any delay in submission of the documents by the vendor will not alter the delivery date.</p>
43	Quality and Condition of the Deliverables
	The seller shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to his products, packaging and raw and ancillary materials.
44	Packaging and Dispatch
	<p>The seller shall package the deliverables safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by sea/air/rail/road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures/hooks and sling marks as may be required for easy and safe handling by mechanical means. Special packaging conditions/ environmental conditions as defined in the enquiry shall be fully complied.</p> <p>Each package must be marked with consignee name, P.O. number Package No. gross weight & net weight, dimensions (LxBxH) and seller's name. The packing shall allow for easy removal and checking of goods on receipt and comply with carrier's conditions of packing or established trade practices. Packing list of goods inside each package with P.O. item No. & quantity must also be fixed securely outside the box to indicate the contents. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols/instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.</p>
45	Delivery:
	Except as otherwise indicated in the Purchase order, delivery shall be FOR (Destination) for indigenous orders and CIP for imported orders. The delivery date (s) or delivery period (s) as stipulated in the agreement shall be firm and binding and shall apply to the entire delivery for each P.O. item. Partial shipments may however, be permitted by the purchaser on prior intimation from the Seller. Unless specifically agreed otherwise, transit insurance coverage will only be within India for imported consignments by BHEL. Accordingly, the seller shall send an intimation to the Purchase officer/Manager giving Purchase Order No., shipping particulars, Invoice value etc., immediately on dispatch of goods.
46	Penalty
	<p>The time or period of delivery as stipulated in the schedule of delivery shall be deemed to be the essence of the contract. Should circumstances arise whereby the deadline for an agreed delivery date(s) or period(s) is expected to be exceeded, the seller shall inform Purchaser hereof without delay. If delay in delivery is caused by any of the circumstances mentioned in clause 54 (Force Majeure) or which are caused exclusively by the acts of Purchaser, the Purchaser shall extend the time for delivery by a period which is reasonable having regard to all the circumstances in the case.</p> <p>If the Seller delays beyond any agreed delivery date(s) or period(s), Purchaser shall levy penalty for such delay @ 0.5% per week (7 days) or part thereof on delayed portion of the order value subject to a maximum of 10% of the value of the Purchase Order. However, penalty for delayed delivery will be calculated on 100% of the purchase order value if the material supplied cannot be put to intended use.</p> <p>The penalty will be charged on the value of the purchase order excluding statutory levies, freight and insurance wherever not included in the price. Penalty amount so determined along with applicable GST thereon shall be recovered.</p> <p>Imposition, recovery or settlement of this penalty shall not affect Purchaser's right to performance, compensation and termination of the agreement.</p> <p>For delay analysis, period referred in Annexure-I will be considered as standard time lines for various major activities.</p>
47	Transfer of Ownership and Risk
	The risk for the delivery remains with the seller until the goods are delivered at the agreed place. However ownership shall get transferred as per terms of purchase order in line with INCOTERMS.
48	Price, invoicing and payment
	<p>The agreed prices are fixed prices in the currency as specified in the Purchase Order. They shall include packing, forwarding , loading and carriage to the place specified by the purchaser and are exclusive of all applicable taxes, duties etc., except for those specifically agreed by the Purchaser. Invoices shall be submitted bearing the Purchase Order number & date, item number/s and supporting documents as called for in the Purchaser order.</p> <p>The direct payments (including LC/documents through Bank on collection basis), shall be made by E-payment mode and not by cheque /bank drafts except in special circumstances. Vendors shall furnish the E-payment particulars in the prescribed formats duly authenticated by their respective Bankers, If not got registered earlier with the Buyer.</p> <p>- Invoice has to be raised quoting HSN Code of Goods or Accounting Code of Services. Invoice should mention BHEL-HPEP-HYDERABAD GSTIN: 36AAACB4146P1ZG or GSTIN of BHEL Nodal Agency as mentioned in PO.</p>

	<p>Indian Agency commission if payable and so specified in the Purchase order shall be paid in Indian Rupees, considering the SBI TT selling exchange rate prevailing on the date of tender opening (part 1 in case of two part bid), after successful completion of the contract.</p> <p>If so stipulated in the order, the seller shall furnish, on receipt of the Purchase Order or along with order acknowledgement, the billing break-up of prices (BBU) for approval by the purchaser in respect of the major items/components going into the equipment. This BBU is required by the Purchaser for admitting the claims of the seller if part shipments are contemplated and also to facilitate custom clearance after payment of duties in case of imports.</p> <p>In case of delay in receipt of supporting document details, consequential demurrage/wharf age /detention charges shall be to the account of the seller.</p> <p>Payment does not imply in any respect whatsoever a waiver of Purchaser's right to performance of the agreement. Purchaser is entitled to set off claimable debts against claimable liabilities with the seller by means of a setoff Note.</p>
49	<p>Contract variations; Increase or decrease in the scope of supply</p>
	<p>Purchaser may vary the contracted scope during execution due to exigencies of project requirement.</p> <p>If the seller is of the opinion that the variation has an effect on the agreed price or delivery period, Purchaser shall be informed of this immediately in writing along with technical details, and in the event of additional work, submit a quotation with regards to the price and period involved, as well as the effect this additional work will have on the other work to be performed by the seller. Provided, that if unit rates are available in the contract, the same shall be applied to such additional work. The seller shall not perform additional work before purchaser has issued written instructions/amendment to the purchase order to that effect. The work which the seller should have or could have anticipated in terms of delivering the service (s) and functionality (ies) as described in this agreement should be executed by the vendor without any price implication.</p>
50	<p>Short shipments/ warranty/guarantee replacements</p>
	<p>In case of any short shipment during initial supply which is subsequently dispatched by the seller or any guarantee / warranty replacements shall be dispatched on "DDP-Delivered duty paid BHEL stores" basis for imported items and "FOR-BHEL Stores/designated destination" basis for indigenous items. Taxes, if any paid by indigenous vendor for short supply, guarantee /warranty replacement, repair activity shall be to vendor's account only. Vendor has to raise a credit note for short supplied quantity as per GST provisions.</p>
51	<p>Rejection/Replacement</p>
	<p>The seller shall arrange replacement / repair under its obligation under the contract within one month from the date of intimation or mutually agreed period. The rejected goods shall be taken away by the seller and replaced on DDP/FOR-BHEL Stores/designated destination basis within such period. In the event of the seller's failure to comply. Purchaser may take appropriate action including disposal of rejections, at the cost and risk of the seller. Vendor has to raise a credit note for rejected quantity as per GST provisions.</p> <p>In case defects attributable to seller are detected during processing of the goods at purchaser's / his subcontractor works, the seller shall be responsible for replacement /repair of the goods as required by the purchaser at seller's cost.</p>
52	<p>Export Administration Regulations</p>
	<p>If a delivery includes such technology and / or supply that is subjected to the export regulations the seller shall obtain due permissions, approvals, license etc.</p>
53	<p>Cancellation / Termination of contract and risk purchase</p>
	<p>Purchaser shall have the right to completely or partially terminate the agreement by means of written notice to that effect without prejudicing their other rights in the event that :</p> <ul style="list-style-type: none"> -The seller is declared bankrupt, its business has been shut down or liquidated, a substantial part of its assets have been attached/destroyed, or the business has been transferred to a third party. -Any misrepresentation or hiding of material fact if detected at a later stage. -The delivery is rejected after inspection or re-inspection. -In the event of termination, the risk of the items already delivered but not of use to Purchaser, as determined by purchaser, remains with the seller. The items shall then be at the seller's disposal and they are to be collected by the seller. The seller shall refund any payments made by purchaser in terms of the terminated agreement immediately, not later than 30 days, - In the event of Cancellation/ termination of contract, BHEL reserves the right to procure the items which are not delivered as per PO and charge the excess cost from the defaulting seller. Incase the excess cost is not repaid by or recovered from the defaulting seller within 30 days, apart from legal recourse for effecting such recoveries, Penal action in line with BHEL's Suspension of Business dealings will be taken.
54	<p>Force Majeure</p>
	<p>The supplier shall not be considered in default if delay occurs due to causes beyond their control such as Acts of God, Natural calamities, Fire, Frost, Flood, Civil War, civil commotion, riot, Government Restrictions.</p> <p>Only those causes that have duration of more than seven days shall be considered cause of force majeure. Notification to this effect duly certified by local chamber of commerce/statutory authorities with supporting documents shall be given by the supplier to BHEL by registered letter/courier service immediately without loss of time.</p> <p>In the event of delay due to such causes the delivery schedule shall be extended for a length of time equal to the period of Force Majeure or at the option of BHEL the order may be cancelled. Such cancellation would be without any liability whatsoever on the part of BHEL.</p> <p>In the event of such cancellation the supplier shall refund any amount advanced or paid to the supplier by BHEL and deliver back any material issued to him by BHEL and release facilities, if any provided by BHEL.</p>
55	<p>Non-waiver of Defaults</p>
	<p>If any individual provision of the contract is invalid, the other provisions shall not be affected.</p>

56	Settlement of Disputes
	<p>(i) Except as otherwise specifically provided in the contract, all disputes concerning questions of the facts arising under the contract, shall be decided by the Purchaser, subject to written appeal by the seller to the purchaser, whose decision shall be final.</p> <p>(ii) Any disputes of differences shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration</p> <p>(iii) The seller shall continue to perform the contract, pending settlement of disputes(s).</p>
57	Conciliation clause
	<p>CONCILIATION CLAUSE FOR CONDUCTING CONCILIATION PROCEEDINGS UNDER THE BHEL CONCILIATION SCHEME, 2018: The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding, penalty deduction, time extension), which the Parties are unable to settle mutually, arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.</p> <p>The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Procedure in http://www.bhel.com/index.php/story_details?story=2454 . The Procedure together with its Formats will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this ITB</p>
	ARBITRATION (WITH SOLE ARBITRATOR)
	<p>Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the Parties, in respect of any dispute or difference; arising out of the formation, breach, termination, penalty deduction, validity or execution of the Contract; time extension, or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration . Sole arbitrator to be appointed by Head of the Unit - BHEL , HPEP .</p>
	The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the Parties.
	<p>Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause.</p> <p>The seat of arbitration shall be Sangareddy / Hyderabad, Telangana. The language of arbitration shall be English and the documents shall be submitted in English.</p>
	The cost of arbitration shall initially be borne equally by the Parties subject to the final apportionment of the cost of the arbitration in the award of the Arbitrator.
	<p>Subject to the arbitration in terms of clause 57, the courts at Sangareddy, Telangana State shall have exclusive jurisdiction over any matter arising out of or in connection with this contract.</p> <p>Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Contractor shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.</p>
	ARBITRATION FOR CONTRACT WITH PUBLIC SECTOR ENTERPRISE (PSE) OR A GOVERNMENT DEPARTMENT
	In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE 0M No 4(1)/2013-DPE(GM/FTS 1835 dated 22-05-2018
58	Applicable Laws and jurisdiction of Courts
	This agreement shall be construed and interpreted in accordance with the laws of India and shall have exclusive jurisdiction of Sangareddy/Hyderabad courts, Telangana, India.
59	BHEL-Fraud prevention policy shall be adhered to.
	The Bidder along with its associate/ Collaborators/ Sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention policy displayed on BHEL Website http://www.bhel.com and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.
	Fraud prevention policy and list of nodal officers is hosted on BHEL Hyderabad website web.bhelhyd.co.in
60	Suspected Cartel Formation
	The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding , whether formal or informal with other Bidder(s) . This applies in particular to prices , specifications ,certifications ,subsidiary contracts,submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case , the Bidder is found having indulged in above activities , suitable action shall be taken by BHEL as per extant policies / guidelines .

Note: Purchase officer has to fill Annexure-I while sending enquiry

Annexure-I			
Major Activity timelines shall be considered for indigenous purchases			
S No	Activity	Agency	Timeline
1	PO acknowledgement	Vendor	_____ days from PO
2	Submission of Drawings and QP	Vendor	_____ days from PO
3	Approval of Drawings and QP	BHEL/Customer	_____ days from PO
4	Raising of Inspection Call	Vendor	_____ days from PO
5	Inspection completion	Self/BHEL/Third party inspection agency	_____ days from inspection call date
6	Despatch Instructions	BHEL	_____ days from inspection report
7	Receipt of Material	Vendor	_____ days from Despatch instructions

Above is illustrative only. Purchase department can add more activities depending on nature of product/contracts

However absence of this annexure in NIT will entail non processing of delivery extension cases in case of delay in supplies of goods owing to reason attributable to BHEL.

(To be executed on Non- Judicial Stamp Paper for an appropriate value.
To be stamped as an agreement)

(For Suppliers on Unit's / Division's PMD)

ANNEXURE-II

Framework Confidentiality Agreement Cum Undertaking

This Agreement made on this the _____ day of (month) _____ 20 ____ (“Effective Date”) by and between M/s. BHARAT HEAVY ELECTRICALS LIMITED, having registered office at “BHEL House”, Siri Fort, New Delhi – 110049 (India), acting through its _____ Unit (hereinafter may be referred to as “BHEL” or “the company”).

And

M/s. _____ (address) _____
represented by authorized representative Sri _____ (herein after referred to as the “Supplier”).

The supplier and the company may, unless the context otherwise requires, hereinafter be collectively referred to as “Parties” or singly as the “Party”.

RECITALS

Whereas, BHEL is engaged in the design, engineering, manufacturing, construction, testing, commissioning and servicing of a wide range of products, systems and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable energy, Oil & Gas and Defence and providing associated services to varied customers in relation to which BHEL / its affiliates own valuable information of a secret and confidential nature.

Whereas the Company may, in connection with contract(s) (as defined hereunder) placed or to be placed upon the supplier, or otherwise, from time to time, make available, Technical Information as is defined hereunder.

And Whereas BHEL is willing to provide such Technical Information to the Supplier from time to time and the Supplier understands and acknowledges that such Technical Information is valuable for the Company and as such is willing to protect confidentiality of such information, subject to the terms and conditions set out hereunder.

Now therefore, in view of the foregoing premises and in consideration of the mutual covenants and agreements hereinafter set forth, the parties agree as under:

1. Definitions:

Unless the context so requires, in this Agreement, the following terms will bear the meaning ascribed to the said term in this clause.

- A. **“Contract”** means the contract entered into with a supplier and includes a Purchase Order, or a Work Order for procurement of any goods or for provision of any services.
- B. **“Effective Date”** means the date of this Agreement as mentioned in the preamble of this Agreement.
- C. **“Supplier”** includes a Contractor or a Vendor of the Company whether for supplying of goods or for providing any services under a Contract or both.
- D. **“Technical Information”** includes Drawings, and / or Product Standards and / or Specifications and / or Corporate / Plant Specifications and / or Technological Process Sheets and / or Technical Data Sheets and / or Jigs & Fixtures and / or Pattern & Dies and / or Special Gauges and / or Tools etc. Belonging to or wherein the Company has acquired from a third party a right of user and includes any improvement thereto from time to time whether carried out by the Company or by the Suppliers.
- E. **“Intended Purpose”** means the purpose for which the Technical Information is provided to the supplier under or in connection with a contract.
- F. **“Improvement”** includes any modification made to, or adaptation of, the Technical Information which enhances or is calculated to enhance the performance (Whether in terms of effectiveness or in terms of efficiency or both) of the product and / or the service to be provided by the Supplier under a Contract.

2. This Agreement shall come into force / deemed to have come into force, as the case may be, on the Effective Date; or, on the first date when the Technical Information or any part thereof is provided by BHEL to the supplier; whichever is earlier.

3. **Agreement deemed to be incorporated in each contract:** Unless and to the extent otherwise stipulated in the Contract, the conditions of this Agreement are deemed to be incorporated in all Contracts which may be entered into between the Company and the Supplier. Further, unless otherwise stipulated, the obligations under this Agreement are and will be independent of the obligations under the Contracts and such obligations of the Supplier hereunder will remain of full effect and validity notwithstanding that the period of validity of the Contract has expired by efflux of time stipulated therein; or, the contract has been discharged by performance or breach; or, the termination of the Contracts for any reason whatsoever.

4. **Ownership:**

4.1 The Company may, from time to time, make available to the Supplier, Technical Information on a non-exclusive basis by way of loan.

4.2 The Supplier acknowledges and agrees that all Technical Information and copies thereof that are or may be provided by the Company to the Supplier, are and shall remain the property of

BHEL or that of the concerned entity from whom BHEL has obtained the Technical Information and such Technical Information are and shall constitute trade secrets of the BHEL. Nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any patent, copyright or design or any other intellectual property rights of whatsoever description that subsists or may hereinafter exist in the Technical Information. Furthermore, nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the supplier any license or right of use of such patent, copyright or design or any other intellectual property rights of whatsoever description which may now or hereafter exist in the Technical Information except for use of the Technical Information strictly in accordance with this Agreement and the contract and / or as directed in writing by the Company, solely for the Intended Purpose under the Contract.

4.3 Neither party is obligated by or under this Agreement to purchase from or provide to the other party any service or product and that any such purchase / sale of any product and / or service by one party to the other party will be governed by the Contract if any, that may be entered into by and between the Company and the Supplier.

4.4 The Supplier is / has been made well aware and acknowledges that the Technical Information being / which may be shared with it by the Company has been either generated by the Company by incurring huge investment and cost or obtained from foreign collaborators under Technical Collaboration Agreement (TCA) with stringent confidentiality conditions.

4.5 The supplier agrees and undertakes to adhere to confidentiality requirements as applicable to BHEL under a TCA and also ensure that the confidentiality requirements are adhered to by all its concerned employees or sub-contractors /suppliers (where permitted to be engaged by BHEL). Any damages, losses, expenses of any description whatsoever, arising out of or in connection with a breach of the confidentiality requirements under a TCA owing to any act or omission on the part of the supplier or its employees or sub-contractors / suppliers that is claimed by a foreign collaborator from the Company shall be wholly borne by the Supplier and it shall keep BHEL fully indemnified in this behalf. The demand by the Company shall be conclusive upon the Supplier who shall thereupon forthwith pay to the Company without demur, dispute or delay the amount as demanded without demanding any further proof thereof.

4.6 The Supplier agrees and undertakes that unless so decided and advised by the Company in writing all rights / title to any Improvement to the Technical Information shall vest in the Company. The Supplier undertakes and agrees to inform forthwith to the Company of any such Improvement made to the Technical Information and transfer all drawings / documents or other materials connected with such Improvement to the Company and also agrees to fully cooperate with the Company for protecting the Company's interests in such Improvements

in the Technical Information including but not limited to obtaining necessary protection for the intellectual property rights in such improvement, if so desired by the Company. If a question arises whether a modification amounts to improvement to the Technical Information, the same shall be decided by the Company and such decision shall be final and binding upon the supplier.

5. Use and Non – Disclosure:

5.1 Unless otherwise stipulated by the Company, all Technical Information made available to the supplier, by the Company shall be treated as Confidential irrespective of whether the same is marked or otherwise denoted to be Confidential or not.

5.2 The Supplier undertakes and agrees that the Technical Information in its possession shall be held in strict confidence and will be used strictly in accordance with this Agreement and solely for the Intended Purpose under the Contract. Use of the Technical Information for any other purpose other than Intended Purpose is prohibited.

5.3 In particular, the Supplier shall not use Technical Information or any Improvement in its possession for the manufacture or procurement of the product(s) or components or parts thereof or use the Technical Information or any portion thereof or any modification or adaptation thereof in any form to provide any product and / or service to any third party, without the prior written consent of the Company.

5.4 The Supplier shall not disclose any of such Technical Information to any third party without the prior written consent of the Company. The Supplier agrees that without prior written consent of the Company, the supplier shall not disclose to a third party about the existence of this Agreement, or of the fact that it is / was in possession of or has experience in the use of any Technical Information nor shall the Supplier share in any manner whatsoever, with a third party, the name or details of any Contract(s) awarded by the Company to it or performed by the Supplier or the scope of work thereof or share any document or correspondence by and between the Company and the supplier in or in connection with this Agreement or such Contract(s). Notwithstanding what is stated elsewhere, the overall responsibility of any breach of the confidentiality provisions under this Agreement shall rest with the Supplier.

5.5 This Supplier undertakes and agrees not to make copies or extracts of and not to disclose to other any or all of the Technical Information in its possession, except as follows:

(a) The Supplier may disclose the Technical Information to such of its officers and employees strictly to the extent as is necessary for such officer or employee for the Intended Purpose, provided that the Confidential Information (or copies thereof) disclosed shall be marked

clearly as the confidential and proprietary information of Company and that such officers and employees shall similarly be bound by undertakings of confidence, restricted use and non-disclosure in respect of the Technical Information. The Supplier shall be responsible for any breach of such confidentiality provisions by such officers and employees.

- (b) With the prior written consent of Company, the supplier may disclose for the Intended Purpose such Technical Information as is provided for in such consent to such of its professional advisers: consultants, insurers and subcontractors who shall be similarly bound by undertakings of confidence, restricted use and non-disclosure in respect of such Technical Information.
- (c) The Supplier shall not be prevented to make any disclosure required by (i) order of a court of competent jurisdiction or (ii) any competent regulatory authority or agency where such disclosure is required by law, provided that where the supplier intends to make such disclosure, it shall first consult Company and take all reasonable steps requested by it to minimize the extent of the Technical Information disclosed and to make such disclosure in confidence and also shall cooperate with the Company in seeking any protective order or any other remedy from proper authority in this matter.

6. Exceptions:

The Obligations of the Supplier pursuant to the provisions of this agreement shall not apply to any Confidential Information that:

- a) was / is known to, or in the possession of the Supplier prior to disclosure thereof by the Company;
- b) is or becomes publicly known, otherwise than as a result of a breach of this agreement by the Supplier.
- c) is developed independently of the Disclosing party by the Supplier in circumstances that do not amount to a breach of the provisions of this Agreement or the Contract;
- d) is received from a third party in circumstances that do not result in a breach of the provisions of this Agreement.

- 7. The Obligation of maintaining confidentiality of the Technical Information on each occasion, shall subsist for the entire duration during which the Technical Information / equipment is in possession of the Supplier and shall thereafter subsist for a further period of _____ years from the date when the complete Technical Information has been returned in portions on different dates, the period of ____ years will be reckoned from the date when the last portion of the Technical Information has been returned. Notwithstanding the expiry of the confidentiality obligation, the obligation of the Supplier under clause 5.4 shall continue to subsist for a further period of _____ years.

8. Warranties & Undertakings:

- a) The Supplier undertakes to ensure the due observance of the undertakings of confidence, restricted use and non-disclosure by its persons to whom it discloses or releases copies or extracts of the Technical Information.
- b) The Supplier shall keep the Technical Information or improvement made therein properly segregated and not mix up the same with any other material / documents belonging to him / it or to any other third party.
- c) The Supplier further undertakes that he / it shall not hypothecate or give on lease or otherwise alienate or do away with any of the Technical Information and / or equipment of the Company, made available to him / it, and undertakes that he / it shall hold the same as a trustee, in capacity of custodian thereof and use / utilise the same solely for the purpose of executing the contract awarded by the Company.
- d) The Supplier further undertakes that he / it shall return all the equipment and / or Technical Information as far as practicable in the same condition in which the same was made available to him / it by the Company together with any Improvement thereon and the documents connected with such Improvement, to the Company forthwith upon completion of the scope of work or contract for which such Technical Information was provided by the Company to it or as directed by the Company together with a confirmation by way of an affidavit or in such manner as directed by the Company that it has not retained any equipment and / or Technical Information / improvement thereof. In case any such equipment and / or Technical Information or thereof shall remain in his possession or is not capable of being returned, the retention and use of such Technical Information or improvement thereto shall continue to be governed by this Agreement.
- e) The Supplier undertakes to indemnify the Company for all the direct, indirect and / or consequential losses, damages, expenses whatsoever including any consequential loss of business, profits suffered by the Company owing to breach by the Supplier of its obligations under this Agreement and / or the confidentiality requirements, if any, contained in the Contract and that the Supplier hereby agrees that the decision of the Company in all such or any such matter/s shall be final and binding on the Supplier. On mere written demand of the Company, the Supplier shall forthwith and without demur or delay pay to the Company any such sum as determined by the Company as the amount of loss or damage or expense which has been suffered by the Company. The Supplier agrees that the Company shall be entitled to withhold and appropriate any amount payable to the Supplier under any Contract then existing between the Company and the Supplier, in case the Supplier fails to make payment, in terms of the written demand, within 7 days thereof. Without prejudice to the forgoing actions, in respect to any breach of this Agreement, the Company shall be entitled to take

any other action against the Supplier as per applicable laws, the Contract, Company's applicable policies, guidelines rules, procedures, etc.

9. Without prejudice to any other mode of recovery as may be available to the Company for recovery of the amount determined as due as per Clause 9 (f) hereinabove, the Company shall have a right to withhold, recovery and appropriate the amount due towards such losses, damages, expenses, from any amount due to the Supplier in respect of any other Contract (s) placed on him / it by any department / office / unit/ division of the said Company.

10. Arbitration & Conciliation:

1. Except as provided elsewhere in this contract, in case amicable settlement is not reached between the parties, in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the contract; or, in any manner touching upon the contract, then, either party may, by a notice in writing to the other party refer such dispute or difference to the sole arbitration of an arbitrator appointed by head of the BHEL unit issuing the contract.

The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties.

Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause, the seat of arbitration shall be at Hyderabad.

The cost of arbitration shall be borne as per the award of the Arbitrator.

Subject to the arbitration in terms of clause 55, the courts at Sangareddy, Telangana State shall have exclusive jurisdiction over any matter arising out of or in connection with this contract.

Notwithstanding the existence or any dispute or differences and / or reference for the arbitration, the contractor shall proceed with and continue without hindrance the performance of its obligations under this contract with due diligence and expedition in a professional manner except where the contract has been terminated by either party in terms of this contract.

In case of contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the contract, such dispute or difference shall be referred by either party for arbitration to the sole arbitrator in the Department of Public Enterprises to be nominated by the secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law and

justice, Government of India. Upon such reference the dispute shall be decided by the Law secretary or the special Secretary or Additional secretary when so authorized by the Law secretary, whose decision shall bind the parties hereto finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the arbitrator.

2. INTEREST CLAUSE:

In order to bring uniformity in all the contracts / agreements entered between BHEL and its contractors / vendors / suppliers / service providers etc., it is hereby advised to incorporate the following clause in all tenders and agreements.

“No interest shall be payable by BHEL on earnest money or security deposit or any money due to the contractor by BHEL.”

11. Governing Law & Jurisdiction:

This agreement shall be construed and interpreted in accordance with the laws of India and shall have exclusive jurisdiction of Sangareddy/Hyderabad courts, Telangana, India.

SIGNATURE

WITNESSES

1

Name:

Address:

2

Name:

Address:

Annexure - III

Proforma for self-certification by Supplier for minimum local content on their letter head for tender value less than Rs 10 Crore

"We _____ (Name of Manufacturer) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. _____ (to be filled as notified in the policy) for claiming Purchase Preference linked with Local Contents under the Govt. policy against tender no. _____."

Auditor's certification with respect to minimum local content on the letter head of Statutory Auditor for tender value above Rs.10 crore

"We _____ the statutory auditor of M/s _____ (name of the bidder) hereby certify that M/s _____ (name of manufacturer) meet the mandatory Local Content requirements of the Goods and/or Services i.e. _____ (to be filled as notified in the policy) quoted vide offer No. _____ dated _____ against BHEL's tender No. _____ by M/s _____ (Name of the bidder)."

Annexure - IV

Proforma for self-certification by Supplier for Compliance to Clause No 20 (B)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and I certify that M/s.... (Name of firm) is **not from such a country/is from such a country** (delete whichever is NOT applicable) and has been duly registered with the Competent authority (delete if NOT applicable) . I hereby certify M/s fulfills all requirements in this regard and is eligible to be considered . (where applicable , valid registration by the competent authority shall be attached)

Sd/-

Authorised Signatory with Stamp

Annexure-XV

AMC Percentage for 6th and 7th year

S.No	Year	AMC Percentage
1	6 th Year	
2	7 th Year	