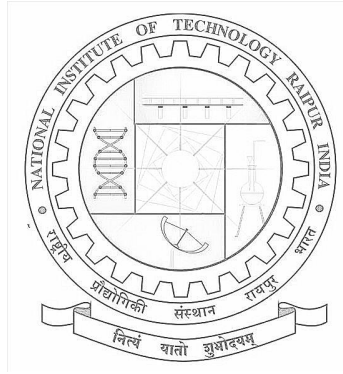
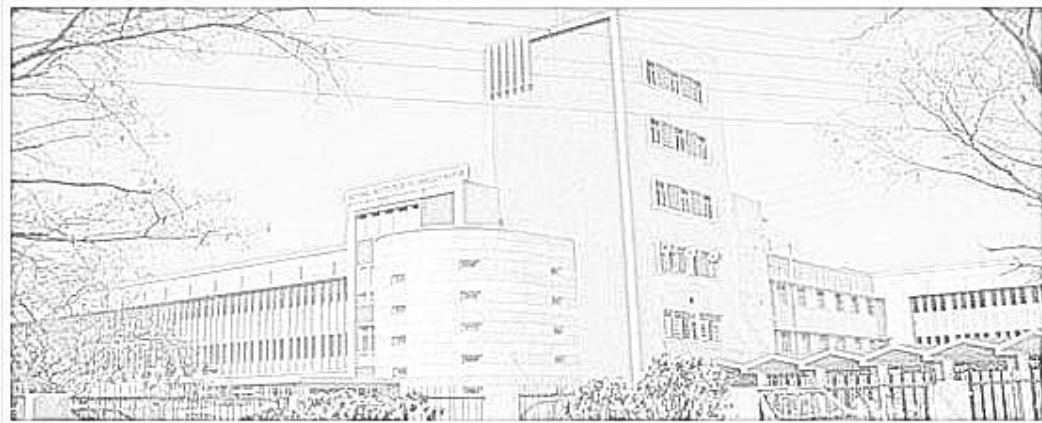




**NATIONAL INSTITUTE OF TECHNOLOGY,
RAIPUR CHHATTISGARH, INDIA**

<http://www.nitr.ac.in>





**NATIONAL INSTITUTE OF TECHNOLOGY
RAIPUR – 492010, CHHATTISGARH**

**Open (Advertised) Tender for Design, Supply, Installation, Testing, Commissioning, and
Maintenance of Data Centre Physical Infrastructure**

Department: Central Computer Center

Enquiry No: NITRR/CCC/HEFAPROJ/DC/2020/150

Date: 11/06/2020

Important Dates

To

Event	Date	Time
Last Date of submission of quotation	14/07/2020	Upto 18:00 Hrs
Technical bid Opening date	16/07/2020	At 16:00 Hrs
Price (financial) bid Opening	To be Informed to technically successful bidder by mail and phone.	

Dear Sir

We intend to purchase the commodities & services specified in this document and invite quotations in accordance with the terms and conditions detailed in the bid document. If you are interested, kindly submit your offer with prices and complete terms within the time mentioned above through our e-tender portal www.tenderwizard.com/NITR. **Tender will be accepted online only & no other mode will be accepted.**

Yours sincerely,

-sd-
Registrar
National Institute of Technology,
Raipur

Enclosed:

- (1) Bid Document - Instructions to bidders - containing detailed terms and conditions.
- (2) Bidder Qualification Criteria-Annexure-1
- (3) Acceptance of terms & conditions of tender-Annexure 2
- (4) List of Equipment's/machines/commodity etc. (Bill of Quantities) - Annexure 3
- (5) Technical Specification – Annexure 4
- (6) Technical Compliance Format- Annexure 5
- (7) Price Bid Format in INR – Annexure 6
- (8) Price Bid Format in of imported items in currency other than INR -Annexure 7
- (9) Deviation statement form - Annexure 8
- (10) Bidder information & check list- Annexure 9

NOTICE INVITING TENDER

National Institute of Technology, Raipur invites bids in two-bid format for **“DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND MAINTENANCE OF DATA CENTRE PHYSICAL INFRASTRUCTURE”** for the Central Computer Centre at its G.E. Road Campus.

Detailed information to the bidders including Instructions, Terms and Conditions, Schedule of Requirements, Specifications and Allied Technical Details, Price Schedule, Contract Form, and some other forms are available in the tender document which may be downloaded from the Institute website <http://www.nitr.ac.in/>

IMPORTANT INFORMATION

Name of Work	DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING AND MAINTENANCE OF DATA CENTRE PHYSICAL INFRASTRUCTURE
Notice Inviting Tender Reference	No. NITRR/CCC/HEFAPROJ/DC/2020/
Tender Form Fee, Non-refundable	1180/- (One Thousand One Hundred Eighty Only)
Earnest Money Deposit (EMD), Refundable	The bidder should furnish, as part of its bid, an Earnest Money Deposit (EMD) of INR 10.00 Lakhs
Max Time Period for sending pre-bid queries	Up to 12:00 P.M. on 19/06/2020
Pre-bid Site Survey & Pre-bid Meeting	2:30 P.M. – 5:00 P.M. on 26/06/2020
Posting of Updates, i.e., Revisions, Amendments, Corrections, Corrigenda, if any	Up to and including 03/07/2020 Pre-bid queries shall be answered by this date.
Last date and time for submission of bids	Up to 06:00 P.M. on 14/07/2020
Date & Time of opening of Techno-commercial Bid Part-A	At 04:00 P.M. on 16/07/2020
Date and Time of opening of Techno-commercial Bid Part-B	Will be communicated to the successful bidders
Venue of Opening Bids through online mode	Store & Purchase National Institute of Technology, G.E. Road, Raipur 492010, Chhattisgarh, However bidders do not need to present at the venue as they can see the details on e-tendering portal i.e. www.tenderwizard.com/NITR .
E-mail ID for tender related queries	cccdc1@nitr.ac.in for technical queries storenpurchase@nitr.ac.in for commercial queries
e-Tendering process related queries (To upload, download, submit the tender documents and Digital Signature related queries)	8305920951, 011-49424365, twhelpdesk466@gmail.com twhelpdesk0571@gmail.com

Important Note:

Bidders shall visit the institute website i.e. www.nitr.ac.in & e-tendering portal i.e. www.tenderwizard.com/NITR regularly for updates, if any, before submitting their bids.

Warning:

There is no channel for a bidder or representative to communicate with an institute representative other than official emails / pre-bid meeting. Failure to comply on part of a bidder or representative shall result in summary disqualification of their bids.

CHAPTER – I: INSTRUCTIONS TO BIDDERS

1. INSTRUCTIONS FOR ONLINE TENDER

Submission of bids: Bidders have to submit their bid through E-tendering mode only at website www.tenderwizard.com/NITR.

IMPORTANT NOTE: Being a Two-Part Tender (techno-commercial and price bids), fax quotations will not be accepted. Please ensure that your offers are received on or before the tender due date and time. Bidder/ Tenderer is requested to download the tender documents from our website (www.nitr.ac.in) & e-tendering portal i.e. www.tenderwizard.com/NITR and submit tender fee of amount 1180/- (inclusive of GST) through online mode in our e-tendering portal i.e. www.tenderwizard.com/NITR. **Kindly note that if any bidder wants to quote for more than one item in the tender then he has to pay the tender fee only once at first and he will be exempted to pay tender fee for later items (the exempted option has to be selected on the payment page). If any vendor pays more than one tender fee for multiple items, then the excess payment will not be reversed, so please be careful while submitting the bid.**

In this particular tender the bidder has to quote for all the items. The L-1 bidder will be decided amongst technically qualified bidders on the grand total price.

Financial Bid (Microsoft Excel File) is to be downloaded from website www.tenderwizard.com/NITR and then is to be filled, saved and uploaded (through digital signature) on the same website and not to be submitted in hard copy at all.

The Financial Bid (after filling the rates) should neither be scanned & uploaded, nor, the hard copy of the same should be submitted to NIT Raipur office

The complete Tender document can be viewed and downloaded only from the website (www.tenderwizard.com/NITR) & www.nitr.ac.in during the tender sale period. The intending bidders should submit the tender documents sale price & Tender Form fee, through e-payment, at the time of making online request.

Complete tender papers, duly accompanied with receipts of e-payment of tender cost, EMD shall be received online as per date and time mentioned. Tender shall be opened through e-tendering system, in presence of bidders or their authorized representatives.

Complete tender documents must be submitted as per schedule **through E-Tendering mode only at website www.tenderwizard.com/NITR.**

Tenderers are advised to complete all submission related work well before the Time and date for submission of tender online. Any request for modification in the time/date of submission of tender due to tenderer's failure to submit his offer, will not be accepted.

To participate in the E-tender, it is mandatory for the bidders to have user ID & password, which has to be obtained by submitting an annual registration charges of Rs. 2000/- +GST @ 18% to ITI, through e-payment. Also it is mandatory for all bidders to have class 3 digital signature certificates from any of the CCA (Controller of Certifying Authority, India) or if any support required on DSC, Please contact Helpdesk No. 011-49424365.

The bid along with the necessary documents should be uploaded only on the www.tenderwizard.com/NITR portal as per guidelines mentioned in the portal. Tender has to be submitted online at <https://www.tenderwizard.com/NITR> . All documents in support of eligibility criteria etc. are also to be scanned and uploaded along with the tender documents. Tender sent by any other mode will not be accepted.

2. This is an open tender enquiry. The bidder has to execute the project on turn-key basis and provide end-to-end solution to the scope of work of this tender. The requirements, necessary design inputs and baseline technical specifications have been provided by the institute in this document. The implementation shall be subject to the supervision and quality control of the institute.
3. Bidders are advised to read and understand the tender document carefully.
4. Submission of the bids against this tender shall be deemed to have been done after careful study and examination of the tender documents with full understanding of the implications thereof.
5. Contracts made under this tender will be governed by the terms and conditions specified in this document.
6. Bids should be submitted in the following two parts: the techno-commercial bid part and the price bid part. The techno-commercial bid is further classified into the following two parts: Techno-commercial bid: Part-A", and "Techno-commercial bid: Part-B"
7. The techno-commercial part comprises of the eligibility criteria of the bidder along with necessary documents in support etc. and technical compliance mentioned later in this chapter. No part of the techno-commercial bid should contain any price or price related information, either explicit or implicit; otherwise the bid will be summarily disqualified.
8. The price bid or the financial bid, indicates item-wise price for all the items and the grand total as mentioned later in this chapter/document.
9. Techno-commercial bid folder shall contain two folders "Techno-commercial bid: Part-A", and "Techno-commercial bid: Part-B"
10. Techno-commercial bid Part-A shall contain eligibility related documents and the forms of Chapter VI.
11. Techno-commercial bid Part-B shall contain duly filled in technical compliance sheets, soft copy of the datasheets, softcopies of other technical literature as mentioned later in this chapter / documents.
12. Bids should be submitted online in the tender wizard portal of the Institute by the authorized representative of the bidder. Scanned copies of the required documents are to be submitted.
13. Bids should be complete in all respects.
14. All the required forms should be submitted with the bids in the prescribed formats.
15. All documents submitted with a bid should be signed by an authorized signatory and bear the company's stamp.
16. All signatures should be done in blue colour using ball point pen.
17. All stamps should be in blue colour ink.
18. Pre-bid clarifications should be sent within the date and time mentioned in the notice inviting tender via e-mail to cccdc1@nitrr.ac.in (technical queries) or storenpurchase@nitrr.ac.in (commercial queries) in the required format given in Form - 9 . Clarifications sought later or not in proper format shall not be considered.
19. Subject line of the e-mail should be "Pre-bid clarification" mentioning the Tender Name, Reference No. and

Date.

20. Scanned copy of the duly filled pre-bid clarification form in PDF format along with an **editable** copy of the table therein in MS Excel © format containing the pre-bid queries and other details should be attached with the mail.
21. Replies to the pre-bid clarifications shall be given within the timeframe stipulated in the notice inviting tender by e-mail or in person during site survey cum pre-bid. Bidders are advised to submit their bids after this.
22. Up to two duly authorized employees of the bidding firm carrying the proper identification, etc. can attend the site survey cum pre-bid. Site survey cum pre-bid is for the bidders to apprise, assess and derive a first-hand idea of the prevailing site conditions before bidding. Bidders should take necessary site measurements during the site survey for the preparation of accurate drawings for bidding.
23. Bids of only those firms will be considered who attend the pre-bid meeting and conduct the site survey. There shall be no exception in this regard.
24. Pre-bid site survey is for the bidder to assess the prevailing site conditions and for taking the necessary measurements for the preparation of accurate drawings.
25. Bidder has to confirm participation in the site survey by sending an email to the project email ID, i.e., cccd1@nitrr.ac.in
26. Before site survey, the bidder's representatives will make an entry in the attendance register placed at the reception desk of the Central Computer Center.
27. The pre-bid site survey is very important for proper understanding of the site conditions and dimensions etc. which will have an impact on the project implementation, costing, etc. Therefore, bids shall only be accepted from those bidders who take part in the pre-bid site survey.
28. The pre-bid meeting shall be held in person after the site survey following necessary precautions in light of the Covid-19 pandemic or it can also be held online depending on the prevailing situation.
29. Revisions / amendments / corrections / corrigenda to the tender, if any, due to pre-bid clarifications or at the institute's own decision shall be posted on the institute website.
30. Information / notices of interest to all bidders and revisions / amendments / corrections / corrigenda to the tender, besides those due to pre-bid clarifications shall also be posted from time to time on the institute website <http://www.nitrr.ac.in>.
31. Bidders are advised to check the institute website regularly for updates on this tender. All updates shall be consolidated and posted as a single file in the tenderwizard portal i.e. www.tenderwizard.com/NITR.
32. Ignorance of information posted on the website shall not be accepted as valid reason for non-compliance with tender terms and conditions or technical specifications, etc.
33. Any updates shall be posted on the institute website and e-tendering system. In case of any inconsistency in the information posted on the website and the e-tendering system, the information available on the website will be treated as final. Therefore, all the bidders are advised in their own interest to visit the institute website regularly for any updates during the time the tender is active.
34. In some of the line items, the bidder has been asked to submit the design details with the technical bid as these items are solution specific and also dependent on the site assessment and measurement by the bidders. The design details shall include the design basis and the calculations, type, rating, proposed make and model, and necessary technical literature. These design details will be considered final on bid submission and will be a

part of the technical documents for evaluation. Bidders may note that their bids can be rejected if the submitted design details

- a) have erroneous design basis reflecting poor understanding of the requirement or missing or wrong calculations
- b) are not aligned with the proposed solution, or,
- c) are not optimal, i.e., underrated or overrated, unreasonably small or large, etc., or,
- d) not aligned with the requirements, or,
- e) appear to have been done in haste without proper application of mind leading to numbers which fall short of or greatly exceed the user requirements etc., or,
- f) if the proposed make and model has not been certified to meet national and international engineering, quality, and safety standards, or,
- g) are found to be otherwise unreasonable or technically unworthy in any other unforeseen way.

h) Bidder is expected to seek clarifications by raising pre-bid queries within the stipulated period and dispel all doubts before submitting the bid.

- 35. Each bidder should submit only one bid. Multiple bids submitted by a bidder will result in disqualification of the bidder.
- 36. Bidders are advised in their own interest to carry out a proper site survey for an estimation of the quantities and work involved before submitting their bids.
- 37. NIT Raipur shall not bear any costs associated with the preparation of the tenders including site survey by bidder, if any.
- 38. The price bid should contain the price quoted by the bidder in the format specified in the Price Schedule.
- 39. Price quoted should be all-inclusive price F.O.R. NIT Raipur.
- 40. Actual quantities of items and jobs work are subject to variation on either side for all components, subject however to a maximum price impact of 10% on the work order value. However, only the indicative ballpark quantities mentioned in the price schedule shall be considered by the bidders for preparing their price bids and by NIT Raipur for award of work. The bidding firms shall not be reassessed due to change in quantities.
- 41. Payment shall be made strictly on the basis of the actual quantities utilized. For the payments, unit prices shall be multiplied by the actual quantities.
- 42. Prices should be quoted in Indian Rupees only.
- 43. In the Price bid, the quoted price shall include all duties and taxes like GST, etc., whichever are applicable. Bidder shall separately mention all the government duty and tax percentages included in the prices so that any variation in these percentages can be accounted for later. In case of an upward variation in the tax/duty percentages between the date of submission of bid and the date of actual supply, the difference will be paid by NIT Raipur. Likewise, in case of a downward variation in these percentages, the bidder must agree to supply the items at the lower prices. Institute has Customs and Excise Duty Exemption Certificate. Same will be provided to the successful bidder at the time of the work order
- 44. Packing and forwarding, freight and insurance are in the contractor's scope, i.e., to be included in the quoted price.
- 45. Warranty required on different items should also be included in quoted price.
- 46. Bidder should extend and include the advantage of discounted pricing for education in the quoted price, if such a discount is being offered by the manufacturer of a certain product.

47. The price quoted shall remain fixed till three months of successful operation of the equipment supplied and installed.
- a. The following should be part of a single folder within the technical bid folder “Techno-commercial Bid: Part-A”.
- (i) **Tender Form Fee** instrument shall be submitted along with Technical Bid
 - (ii) Bid security (EMD) in one of the accepted formats or attested true copy of current DGS&D / NSIC registration
 - (iii) All documents related to bidder’s eligibility including but not limited to
 - a. Attested true copies of the audited financial statement / auditor’s certificate.
 - b. Copies of purchase orders and work completion certificates
 - (iv) Copy of tender with sign of authorized signatory and company stamp on all pages
 - (v) Income tax returns for the last three years and copy of the PAN card of the applicant firms and partners / Directors thereof
 - (vi) Following forms:
 - a. Form for bidder’s self information
 - b. Form for submission of bids
 - c. Form for submission of similar works executed by bidder as proof of eligibility
 - d. Form for Manufacturers’ authorization given to bidder
 - e. Form for information on after sales service centers
 - f. Form for warranty
 - g. Form for statement of deviations from tender conditions
48. The following should be part of a single folder within the technical bid cover “Techno-commercial: Part-B”.
- (i) technical compliance booklet (all product compliance tables filled)
 - (ii) technical literature
 - a. Datasheets (copy of datasheets of all items mentioned in technical compliance sheets is mandatory).
 - b. Unpriced price schedule with make, and model numbers without mentioning the prices (in the format as shown in Chapter-III).
- Softcopy of all technical literature e.g., Datasheet.pdf, AdminGuide.pdf, UserGuide.pdf etc., which shall establish compliance (arranged in appropriately named folders for each line item, e.g., Switches, UTP Cables, FOC Cables, Racks, Servers, etc.).
- Include a README file containing the index (Item Name, S.No., Relevant Specification No., Document File Name, and Page No.) for quick reference (so that it is easy for determining compliance).
49. The copy of the tender with sign of authorized signatory and company stamp on all pages implies acceptance of all terms and conditions of this tender by the bidder. It is taken to mean that the bidder has read and understands the terms and conditions mentioned in the tender document and all implications thereof, is in agreement with the terms and conditions, and agrees to comply with them.
50. Bidders should note that if the date of tender opening is declared a closed holiday by the Government, the tender shall be opened on the next working date.
51. Tender Form Fee is Non-Refundable.
52. Last date & time for submission of bids: As mentioned in the Notice Inviting Tender.
53. Bidders should not send any part / complete bid through post/courier/e-mail / fax.
54. Due Date & Time For Opening:
- a. Part 1: Techno-Commercial Bid: As mentioned in the Notice Inviting Tender
 - b. Part 2: Price/ Financial Bid: Date, time and venue will be informed through email/fax to those bidders only whose technical bids are found qualified.

55. Place of opening of tenders shall normally be as mentioned in the Notice Inviting Tender.
56. Refundable bid security of value mentioned in the Notice Inviting Tender has to be submitted. The Bidder/Tenderer shall furnish, as part of its bid, a bid security (BS). The EMD/Bid security should be submitted online only through e-tendering portal i.e. www.tenderwizard.com/NITR. The EMD amount will be Rs.10 Lakhs.
57. Bid security (EMD) exemption is applicable to bidders registered with DGS&D and NSIC.
58. The bid security should remain valid for a period of forty-five days beyond the bid validity period (180 days from the last day of bid submission).
59. The bid validity should be for a minimum of 180 days from the last day of bid submission.
60. Bid securities of the unsuccessful bidders shall be returned without interest to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.
61. Bids without Tender Form fee and /or bid security shall be summarily rejected.
62. During the process of evaluation of tenders, no queries shall be entertained from the bidders with regard to its status.
63. If the bidder submits false information his bid shall be rejected.
64. The submission of the bid shall be deemed to imply that the bidder fully understands the scope of work involved.
65. Incomplete or technically deviated or commercially deviated or conditional bids shall be rejected.
66. The names and complete postal addresses of the bidding organization should be mentioned on all covers.
67. Evaluation Process: Contract shall be awarded to the lowest evaluated bidder whose bid is found to meet the technical and commercial criteria and who is eligible and qualified to perform the contract satisfactorily as per the terms and conditions of this tender.
68. Following shall be the steps followed for evaluation of the tenders:
 - (i) Techno-commercial bid: Part-A shall be opened first to check the bidder's eligibility which must be submitted as per the format given in condition of contract duly filled in by the bidder.
 - (ii) If bidder is found eligible in (i) above, then Techno-commercial bid: Part-B shall be opened and the compliances shown in the technical compliance booklet shall be verified against the datasheets and supporting technical documents submitted by the bidder.
 - (iii) If bidder is found eligible in (i) and (ii), then his price bid shall be opened and contract will be awarded to the bidder with the overall lowest quoted grand total price for complete end-to-end solution including all supplies, installation and services.
69. Bids received shall be evaluated only in terms of the conditions already incorporated in the bidding documents; no new condition which is not contained in the bidding documents shall be brought in or considered for the evaluation of the bids. Determination of a bid's responsiveness shall be based on the contents of the bid itself without recourse to extrinsic evidence.

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CHAPTER II: CONDITION OF CONTRACT

1. DEFINITIONS AND INTERPRETATION

In the Contract, unless the context otherwise requires:

- (a) “NIT” or “NIT Raipur” would mean the National Institute of Technology, Raipur.
- (b) “CCC” or “CCC NIT Raipur” would mean the Central Computer Centre, NIT Raipur comprising of all its members.
- (c) “Letter of Intent” means the letter / telex / telegram / fax or any memorandum communicating to the bidder the acceptance of his bid and includes an advance acceptance of his bid.
- (d) “*Contract” means and includes the Notice Inviting Tender, Instructions to Bidders, Acceptance of Bid, Conditions of Contract, all amendments and corrigenda, and other conditions (if any) specified in the “Letter of Intent” and includes a formal agreement, if executed.
- (e) The “Contractor” means the person, firm, bidder or company with whom the purchase order is placed and shall be deemed to include the contractor’s successors (approved by the Purchaser), representatives, heirs, executors, administrators and permitted assignees, as the case may be, unless excluded by the terms of the contract. The terms “Contractor” and “Successful Bidder” have been used interchangeably in this bid document.
- (f) “Purchasing Officer” means the officer signing the Letter of Intent and includes any officer who has the authority to execute the relevant contract on behalf of NIT Raipur.
- (g) The “Purchaser” means the National Institute of Technology, Raipur.
- (h) The “Bidder” shall mean a company/firm in its individual right.
- (i) The CCC, NIT Raipur is authorized to take decisions on behalf of NIT Raipur in respect of the implementation of this project and to handle communications and clarifications in respect of this project.
- (j) “Project Manager” in the case of bidder means a designated representative of the Bidder, who is empowered by the authorized signatory of the bidder for delivering the contractual obligations under this contract. He will be the one point interface with NIT Raipur for the technical implementation of the project. The Senior Technical Officer (IT), i.e., the System Administrator, NIT Raipur shall be the “Project Manager” from the Institute side. The project engineers deputed on the site by the bidder shall consult him from time to time for technical and other clarifications related to the project to ensure smooth and timely technical implementation.
- (k) “Service” means all the services to be rendered by the contractor as stated in the contract details
 - (i) In relation to the supply, transportation to the work site, installation, system integration, commissioning, making operational and testing the equipment
 - (ii) In relation to the installation of any accessories like electric wiring, electric boards etc. required to make operational any equipment
 - (iii) In relation to manpower and annual maintenance contract
 - (iv) In relation to system / application software supplied by the bidder
 - (v) Documentation
 - (vi) Training
 - (vii) Development and support
- (l) “Personnel” means Staff, employees, agents, contractors and sub-contractors of either party and also includes the staff, employees, agents and contractors of those subcontractors with qualification, experience and certification.

- (m) “Software” means system/ application software to be supplied by the contractor, as stated in the contact details.
- (n) “Specifications” means all the functional, operational, performance or other characteristics required of a Product or Service found in tender document Chapter-IV or any of the annexure or addendum or corrigendum to the tender document.

2. AUTHORIZED SIGNATORY AND ADDRESS OF THE CONTRACTOR

The Authorized Signatory of the Bidder shall be:

- (a) The proprietor in case of “Sole Proprietor” firm or constituted attorney of such sole proprietor.
- (b) One of the partners in the case of a “Partnership” firm, in which case he must have authority to refer to arbitration disputes concerning the business of the partnership either by virtue of the partnership agreement or a power of attorney. In the absence of such authority all partners shall be authorized signatories and will be required to sign the tender.
- (c) A director or the regional head or person of equivalent designation and rank in case of a limited company or in the case of a government organization an official having requisite authority duly authorized for the purpose by a resolution of the board of directors.
- (d) For all purpose of the contract, including arbitration thereafter, the address of the Bidder mentioned in the tender shall be the address to which all communications shall be the addressed.

The contract shall be for the items mentioned in the price bid.

3. BIDDERS ELIGIBILITY CRITERIA (COMMERCIAL)

The bids of the bidders meeting all of the following eligibility criteria shall only be considered

S.No.	Clause	Documents Required
1.	System Integrators of Datacenter Physical Infrastructure are eligible to bid.	Authorization letter from manufacturers to bid /negotiate / conclude the order against this tender must be enclosed with the technical bid, as per format enclosed. Such letter must be provided for all major components including Server and Network Modules, UPS, and DG for the whole DC Solution
2.	Refundable Earnest Money Deposit (EMD) and Non-refundable tender processing fee for the amount mentioned in the Notice Inviting Tender	The tenderer shall be required to submit the Earnest Money Deposit (EMD) online on the tenderwizard portal, www.tenderwizard.com/NITR which is refundable and a non- refundable tender processing fee.
3.	The bidder should be an Indian Company registered under Companies Act and in the IT Business for more than nine (09) years.	Certificate of Incorporation / Memorandum of Association.
4.	The bidder should possess the following: Trade License	Bidder must submit self-attested copies of each of the following License / Registrations along with the technical bid.

	GST Registration Permanent Account Number (PAN)	
5.	PF & ESIC registration	Bidder must submit self-attested copies of PF & ESIC registration along with proof of payment (challans)
6.	Professional Tax Registration	Bidder must submit self-attested copies of Professional Tax registration along with proof of payment.
7.	Income Tax return for last three financial years.	Bidder must submit self attested copies of IT returns for the last three financial years.
8.	Annual Turnover and Profitability for last Three years.	The average annual turnover of the bidder for last three financial years should not be less than Rs. 15.0 Crores (Rupees Fifteen Crores). The bidder must be profitable with an average positive networth for the last three years. The bidder must submit a certificate from the Auditor / Chartered Accountant in this respect.
9.	Experience of the bidder in executing similar Datacenter Physical Infrastructure Projects in India: The bidder should have completed similar turnkey projects within the preceding 7 calendar years ending last day of month previous to the one in which this tender has been published: a. One project costing not less than 375 lakhs, OR, b. Two projects costing not less than 235 lakhs each, OR, c. Three projects costing not less than 188 lakhs Similar projects should indicate bidder's experience in implementation of projects involving integration of Civil, Furnishing, Electrical, UPS, Cooling, Fire &	Bidder to submit detailed self attested order copies confirming the year and areas of activity, along with successful completion/sign-off certificates.

	Security, Racks, Access Control, Surveillance System, Networking, Systems, Monitoring Software Systems components and other related areas. The projects shall encompass at least some key areas (may not be all) related to the present project.	
10.	Power of Attorney	All the documents submitted by the bidder must be signed by Authorized Signatory having valid Power of Attorney or Board Resolution to sign and bind the Company
11.	Bidder's Undertaking	The bidder must submit a Notarised Undertaking that the bidder is not blacklisted, barred from taking part in any tender, as on date of this bid submission. In the last 10 years, the bidder must also not be referred or under BIFR. (This affidavit should be done in Rs. 100/- Stamp Paper)
12.	Bidder's Technical Manpower	a) The bidder must have one Certified Data Center Professional (CDCP) or qualified engineers / professionals (from IT, Electronics, Electrical, Mechanical, and Civil Disciplines) on their pay roll. These professionals may be required to visit the site depending on project requirements. The CDCP / Engineers certificate must be valid as on date of bid submission. b) The bidder should have at least one Electrical Engineer on its payroll having a valid Electrical Supervisory License from any of the State Electrical Licensing Boards. The Valid certificate and undertaking from HR department should be enclosed. c) Total employee strength of the company should be 20 or more. Self attested certificates of the respective employees certified by the HR Department should be submitted, stamped and signed by an HR official of the bidding firm.
13.	Technical Compliance	The bidder must submit a line-item-wise compliance of the technical specifications, as per the compliance tables with reference in the data sheet or any other authentic document of the respective manufacturer.
14.	Bidders Acceptance of the tender	Bidder should submit scanned copies of the tender document, signed and stamped, as a token of acceptance of the tender

	Clauses	clauses. It would be assumed that the bidder has read and understood and shall comply with the tender terms and conditions on submission of this document.
15.	Site Survey cum pre-bid Meeting	Bids shall only be accepted for evaluation from bidders who have attended the site survey cum pre-bid meeting to assess the site conditions and requirements in detail. The date and time of site survey cum pre-bid meeting is mentioned in the notice inviting tender.
16.	Certifications of Bidder	Bidder must have valid ISO 9001:2015 certification Bidder must have valid ISO 27001:2013 certification

4. EARNEST MONEY DEPOSIT (BID SECURITY)

- (a) The firms registered with DGS&D or NSIC, if any, are exempted from payment of Earnest Money Deposit provided the registration is for similar or related work
- (b) All bidders, except those in point (a) above are required to submit EMD along with their bids for this tender.
- (c) **The EMD/Bid security should be submitted online only through e-tendering portal i.e., www.tenderwizard.com/NITR. The EMD amount will be Rs. 10.0 Lakhs.**
- (e) EMD is liable to be forfeited if the bidder withdraws or amends or impairs or derogates from the bid in any respect within the validity of the bid and is open for acceptance whether originally fixed or extended.
- (f) EMD shall also be forfeited if the successful bidder fails to execute performance cum warranty guarantee bond within stipulated time after acceptance of bid is communicated to him. Any bid not accompanied by EMD is liable to be summarily rejected.
- (g) The EMD shall be returned to the successful bidder on submission of the performance cum warranty guarantee bond 5% of the order value in the prescribed format. This shall have to be amended later to match 5% of the actual project cost.
- (h) No interest shall be payable by the Purchaser on the Earnest Money/Bid Guarantee to the Bidder.
- (i) The Earnest Money shall remain deposited with the Purchaser for the validity period as mentioned, from the last date of bid submission. If the validity of the offer is extended, for some reasons, the Earnest Money Deposit extension shall also be furnished failing which the bid after the expiry of the aforesaid period shall not be considered by the Purchaser.
- (j) The Earnest Money of all unsuccessful bidders shall be returned without interest to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.

5. PRE-BID CLARIFICATIONS, OMISSIONS AND DISCREPANCIES, IF ANY, IN THE TENDER DOCUMENT:

- (a) Bidders are expected to go through the tender document thoroughly and carefully. In case a bidder finds any discrepancy or omission in any part of the tender document / has doubts to the meaning /

interpretation thereof, or otherwise wishes to seek further clarity on some aspects, he shall seek clarification from NIT Raipur by sending e-mail with the subject line “Pre-Bid Clarification” and attaching a scanned copy of the duly filled-in Pre-Bid Clarification Form in PDF format and an editable copy of the table therein in MS Excel (c) format to the following project e-mail id: cccdc1@nitrr.ac.in in the period mentioned in the Notice Inviting Tender. The potential bidder shall also bring a copy of these queries with him when he / she come for attending the site survey cum pre-bid meeting. The reply to these queries shall be given through reply mail or taken up in person during the pre-bid meeting. No other mode of communication after publication of the tender is allowed.

If any clarification is of interest to all bidders, NIT Raipur shall post them on the institute website and further any amendments / revisions / corrections / corrigendum etc. shall be issued in the timeframe mentioned in the notice inviting tender. Bidders are advised to submit their bids after this date.

- (b) **Disclaimer:** It shall be understood that while every endeavour has been made to avoid any error which can materially affect the basis of the bid, the successful bidder shall take upon himself and provide for the risk of any error which may subsequently be discovered and shall make no subsequent claim on account thereof.
- (c) The submission of the tender will be deemed to imply that the bidder fully understands the scope of work involved and has read and understood all conditions of the tender document and his liabilities and responsibilities in respect of the tender.

While some building drawings / sketches can be provided, on request and may serve as useful guides, potential bidders must attend the site survey cum pre-bid meeting and are advised to seek to get a detailed first hand understanding of the extent and scope of the work including site measurements that is involved and to arrive at their own estimates.

6. AMENDMENTS TO BID INVITATION

- (a) Amendments / Revisions / Corrections / Corrigenda, if any, is issued for the tender, shall form an integral part of the tender document and will be posted on NIT Raipur’s website (<http://www.nitrr.ac.in>) Bidders are therefore advised to visit NIT Raipur’s website regularly without fail. NIT Raipur will not be responsible for ignorance of any information posted on the website in respect of this tender.
- (b) At any time, prior to the deadline for submission of bids, the institute may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by amendment. The same would also be hosted on the website of the institute and all prospective bidders are expected to surf the website before submitting their bids to take cognizance of all possible amendments. Bidders who have submitted the bids before publishing the amendments may revise their bids incorporating the amendments before the last date of the tender.
- (c) In order to allow prospective bidders reasonable time in which to take Amendments / Revisions / Corrections / Corrigenda into account in preparing their bids, the institute, at its discretion, may host the changes on the website of the institute and extend the deadline for the submission of bids by such a number of days not less than five as in the opinion of NIT Raipur will enable the bidders to revise their bids.

7. PROCESS TO BE CONFIDENTIAL

- (a) After the public opening of the bids, information related to the examination, clarification, evaluation and comparison of bids, and recommendations concerning the award of the purchase order shall be treated

strictly confidential and not disclosed to the bidders or other persons not officially concerned and connected with such process.

- (b) Any effort by the Bidder to influence the purchaser in the process of examination, clarification, evaluation and comparison of bids, and in the decision concerning the award of contract, shall result in outright rejection of his bid.

8. BID OPENING

The sealed bids shall be opened in the presence of such of the bidders or their authorized representatives who may like to be present at the date and time fixed. The representative shall bring the original form of bidder's authorization, the ID card issued by the bidder organization, any photo identity card issued by the Central Government of India. In the absence of any of these documents, the representative may not be allowed to attend bid opening.

NIT Raipur shall have the right to change the date and time of opening of the bid. The changed date and time shall be notified through the website. In the event the bid opening date / last date for tender submission etc. mentioned in the tender document is declared as a holiday the next working day at the institute will be considered as the due date for receiving and opening of tenders. The time shall remain the same.

9. CLARIFICATIONS BY NIT RAIPUR

- (a) To assist in the examination, evaluation and comparison of bids, NIT Raipur may ask the bidder individually for a clarification on his bid including breakdown of unit rates. The request for clarification and the responses shall be in writing / email / fax but no change in price or substance shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by NIT Raipur during the evaluation of bids. Such reply shall be given within the time limit mentioned in the intimation issued by NIT Raipur, failing which NIT Raipur will be at liberty to conclude that nothing further is to be submitted by the bidder on this matter.
- (b) Bidder shall have to arrange for a demonstration of any product if NIT Raipur determines it is in its best interests to do so, during evaluation of the bids.

10. VALIDITY OF THE BID

The validity of the bid must be for a minimum of 180 days from the last day of bid submission. Any subsequent extension of validity shall be for a minimum of 30 days. In this case the bid security will need to be extended by the bidder.

11. RIGHT OF ACCEPTANCE

NIT Raipur reserves the right to reject any or all tenders without assigning any reason to the bidders subject to the relevant guidelines in this context.

12. COMPLIANCE WITH STATUTORY PROVISIONS IN RESPECT OF WORKERS / LABOURERS ENGAGED

- (a) It shall be the sole responsibility of the contractor to abide by the provisions of all relevant labour laws or legislation for the employment of contract labourers / employees which will govern the nature of the contract.
- (b) NIT Raipur shall not be responsible for the payment of wages and or any other emoluments to the personnel /workers deployed by the contractor. It shall be the sole responsibility of the contractor to make payment to the said personnel / workers in time as per the Minimum Wage Act and the contractor shall at all time keep NIT Raipur indemnified against any claim from its personnel / workers in this regard.

- (c) The contractor shall be solely responsible for any cost and consequences on account of any breach and / or non-compliance of any of the provisions of the Labour Laws. The contractor shall indemnify NIT Raipur against any claims / costs / damages and penalties in respect of breach of any of the provisions of the laws in force.
- (d) It shall be the sole responsibility of the contractor to obtain license under different labour laws from the concerned authority(ies).
- (e) The compliance of all statutory laws with respect to the workers or employees engaged by the contractor and their welfare will be the sole responsibility of the contractor.
- (f) It shall be the responsibility of the contractor to comply with all the liabilities arising out of any provisions of Labour Acts / Enactments hitherto in force or enacted from time to time during the execution of this Service Contract.
- (g) All records, documents under various statutory provisions maintained by the contractor shall be open for inspection by an authorized representative of NIT Raipur / 3rd party authorized by NIT Raipur / to any law abiding Government Agency and the contractor shall produce the same as and when required for inspection.
- (h) It shall be the responsibility of the contractor to provide Canteen, Medical and/or Transport Facility to his personnel if required by any enactments.
- (i) It shall be the responsibility of the contractor to pay any compensation or damage for the injury sustained by any contract labour or employee during the performance of their duties. This also applies to any damage or compensation due to any dispute between them.
- (j) Any expenditure incurred by NIT Raipur to handle such situations or those arising out of the conduct of deployed personnel or otherwise shall be deducted from the bills / performance guarantee of the contractor.

13. LOCAL CONDITIONS

It will be the sole responsibility of each bidder to fully acquaint him with all the local conditions and factors, which could have any effect on the performance of the contract and/or the cost.

14. INDEMNITIES AND LIABILITIES

- (a) The contractor shall indemnify and protect the purchaser from and against all actions, suits, proceedings, losses, costs, damages, charges, claims and demands of every nature and description brought against or recovered from NIT Raipur by reasons of any act or omission of the contractor/his agents or employees, in the execution of the works or in the guarding of the same.
- (b) The contractor shall indemnify NIT Raipur against any claims, damages, loss or penalty including costs thereof in case of liability arising out of any accident/incident/theft involving manpower deployed by him.
- (c) NIT Raipur will not be responsible in any way for any injury sustained by contractor's personnel during the performance of its/their duties and also any damage or compensation due to any dispute between the contractor and his employees.
- (d) Any expenditure incurred by NIT Raipur to handle the situation arising out of injury of contractor's personnel during work or the conduct of the personnel deployed by the contractor will be deducted from Security Deposit/Performance Guarantee/Bills of the contractor/Service Provider.
- (e) Contractor shall also indemnify NIT Raipur against enforcement of any acts, laws, rules and/or regulations (including Labour Laws) and amendments enacted from time to time thereto by any Central/State/Local or Municipal Authorities.
- (f) Contractor shall indemnify NIT Raipur against third party claims arising out of equipment malfunctioning /mishandling on the part of employees of the contractor.

- (g) Contractor shall also indemnify to reimburse any loss or damage by his personnel to NIT Raipur personnel or property including machinery, equipment or buildings. In case, any such amount is not deposited/paid to NIT Raipur, the same shall be deducted from Security Deposit/Performance Guarantee/Bills/Future payments due to the contractor.
- (h) Total financial liabilities of the contractor arising out of breach of contractual obligations shall not exceed the value of contract. However, any liabilities arising out of breach of any obligation(s) commonly applicable in Indian or International law or regulation or intellectual property right infringements etc shall not be limited by this agreement and the contractor shall be solely and completely responsible for any such violation on his part and be liable to pay full cost of damage.

15. INSURANCE

NIT Raipur shall not arrange for any “Transit Insurance” and the supplier shall be responsible till the entire goods contracted, arrive in good condition at the destination site. Contractor shall, at his own cost, unconditionally replace / rectify the goods lost / damaged / found defective on inspection to the entire satisfaction of NIT Raipur within 45 days from the date of receipt of intimation from NIT Raipur.

16. EXIT CLAUSE / TERMINATION OF CONTRACT

In case of non-initiation of work or non-performance / breach of the clauses of this contract, NIT Raipur would issue a written notice of 30 days to the party to perform / rectify the breach failing which NIT Raipur shall be at liberty to terminate the Purchase Order / Work Order / Contract by providing 30 days written notice to the party and arrange procurement from alternate sources at the successful Bidder's risk & cost. In such event, the terminated party shall have no right to claim compensation/damages etc from NIT Raipur on account of early termination

17. PRICES

- (a) All Prices shall be in Indian Rupees and no foreign exchange / import license shall be provided. The prices should be all inclusive as mentioned in Chapter-I: Instructions to Bidders.
- (b) However, the bidder is advised to explicitly mention tax and duty rate percentages etc. separately. In case of change in any duty or tax on account of change in rules / legislation by the Government, the actual rates as applicable at the time of supply shall be payable only for taxes and duties which are clearly stated as percentages in the offer and firms will not be reassessed for lowest due to change in taxes.
- (c) Quoted prices shall remain firm for the period of validity of the offer.
- (d) NIT Raipur reserves the right to place order for a part item / combination of the quantity offered. The unit rates offered by the bidders shall be valid for any such part order.

18. FIRM PRICES

The rates quoted by the bidder in the bids shall be fixed for a period of 12 months from the date of submission of bids. The bid price must be quoted in Indian Rupees.

19. ACCEPTANCE OF PURCHASE ORDER

Prior to the expiry of bid validity, the successful bidder shall be notified by post / fax / e-mail. Within 05 working days of the award of the contract the successful bidder shall send his / her acceptance of the purchase order by post / fax / e-mail. The performance cum guarantee warranty bond should be submitted by the successful bidder within a month of issue of the work order. EMD will be released only on receiving performance cum guarantee warranty bond.

20. ONE BID PER BIDDER

Each bidder shall submit only one bid in this tender. Bidder submitting more than one bid shall be disqualified from participating in the tender

21. BIDDING BY CONSORTIUM

Bidding by consortium is not allowed in this tender.

22. ON COMMENCEMENT OF JOB / SERVICES

The contractor shall supply the various items and provide the required service as per the requirement in the schedule of requirements and scope of work section of the tender. The complete responsibility for providing services as per the terms of the tender shall be with the contractor. The contractor shall be solely responsible for the acts and deeds of the personnel deployed by him for the services. NIT Raipur will, in no way, be responsible for violation of any rules / regulations / instructions / laws of the concerned agencies and/ or for any loss or damage caused by the personnel of the contractor, to NIT Raipur and/or third party staff and/or property and any such loss or damage shall have to be compensated/borne by the contractor. The contractor shall be responsible for engaging adequate manpower in accordance with the work defined in the schedule / scope of work so that the continuity of work is maintained and the work is completed within time. Contractor's responsibilities shall include but shall in no way be limited to supervision of personnel provided by the contractor, verification of antecedents of the contractor's personnel, quality and timely completion of work by the contractor's personnel.

23. PROBLEM RESOLUTION METHOD

If the bidder is notified in writing of a problem he shall act appropriately to resolve the same in reasonable time.

24. DELIVERY CONDITIONS

All supply items in the work order must be delivered within 180 days.

NIT reserves the right to change the quantity, locations, delivery schedule for the equipment without imposing LD.

25. LIQUIDATED DAMAGES FOR DELAY IN DELIVERY

Any delay by the contractor in the performance or the delivery obligations shall render him/her liable to any of the following penalties:

- (a) In the event of contractor's failure to supply the said items of acceptable quality and specifications within the original delivery period given in the purchase order, NIT Raipur shall be at liberty to recover liquidated damages to be levied @ 0.5% of the order value per week or part thereof subject to a maximum of 10% of the total order value.
- (b) Forfeiture/encashment of the performance bank guarantee/earnest money.
- (c) Liquidated damages shall be calculated on the total contract value comprising of value of complete equipment and installation & commissioning charges for a site. The supply shall be taken as complete only after the last installment of supply has been made.
- (d) After a delay of more than 8 weeks, NIT Raipur reserves the right to cancel the purchase order and buy the items from any other vendor, at bidder's risk and cost. Any losses caused to NIT Raipur on this account shall be recoverable from bidder.
- (e) In case of delay due to site not ready condition / delay in customs etc. which cannot be reasonably attributable to the system integrator then in such condition LD shall not be imposed. However,

prior information has to be provided for the same.

- (f) If the payment due against a phase extends beyond 30 days for reasons which cannot be reasonably attributable to the system integrator, the period beyond this till realization of payment will not be counted towards imposition of liquidated damages.

26. GUIDELINES FOR REASONABLE UNIFORMITY

Following systems should individually be of the same manufacturer: Racks, Cooling Units, UPS, DG, etc.

27. WARRANTY

All components must carry a 12-months repair / replacement warranty from the date of installation.

28. PERFORMANCE & SLA TERMS

Datacenter facility has to remain operational on a 24 x 7 x 365 basis. Contractor shall make necessary arrangements to ensure power and cooling availability to the Racks. Contractor shall make all possible arrangements to ensure that facility must have a Tier III uptime. DC faults if any have to be attended and rectified within a maximum of 48 hours after which a penalty at the rate of Rs. 1000 per day shall be levied, for every faulty equipment until the equipment is rectified.

29. INCOME TAX

- (a) Income tax shall be deducted at source from all the payments made to bidder according to the Income tax Act, unless the bidder prior to the release of payment submits valid and complete documents for Income tax exemption.
- (b) A certificate shall be provided by NIT Raipur to the bidder for any tax deducted at source.

30. VARIATION OF QUANTITIES

Actual quantities of items and jobs work are subject to variation on either side for all components, subject however to a total price impact of 10% on the work order value. However, only the indicative ballpark quantities mentioned in the price schedule shall be considered by the bidders for preparing the price bids and by NIT Raipur for evaluation of the L1 bid in the tender. The payment for this variation in supply and installation quantities shall be made on a proportional (pro-rata) basis. No separate work order or supplementary order or amendment etc. shall be issued by NIT Raipur for any additional items over and above the initial work order supplied and installed under this contract subject to the ceiling mentioned herein. However, the written approval / concurrence of the CCC through e-mail / hardcopy shall be required before supplying and installing any additional items under this contract.

Bidder must therefore provide values against items whose quantities have been mentioned as “Lot” in the Price Bid, if there are reasons for him to believe that such item may exceed his estimate if he expects proportional payment against that item.

31. BILL SUBMISSION PROCESS FOR REALIZATION OF PAYMENT

Demand notice / bills of the contractor / vendor shall be submitted in triplicate to the Central Computer Centre along with

- (i) Progress report submitted by the contractor along with the expenditure statement
- (ii) Recent photographs of the project indicating the progress.

On successful inspection, the CCC shall forward the bills with appropriate payment recommendation and approvals permitting payment of the bills. This will be sent along with a request letter signed by the Director/Registrar to the bank for disbursement of payment.

32. PAYMENT TERMS AND CONDITIONS

- a) NIT Raipur will not pay any mobilization advance in this project.
- b) Twenty Five percent (25%) of the contract value will be paid in the first stage (100 days after award of work) provided the value of supplies and services at this stage exceeds this amount.
- c) Sixty five percent (65%) of the contract value will be paid in the second stage (200 days after award of work) provided the value of supplies and services at this stage exceeds this amount.
- d) Ten percent (10%) of the contract value will be paid on commissioning and testing. (250 days after award of work)

If the amount payable at any stage does not exceed the percentage payment mentioned in that stage, payment will be made as per actuals.

33. PROJECT COMPLETION AND ACCEPTANCE

The contractor will have to complete the entire work as mentioned in this document to create a fully functional data centre within 250 days from the date of award of work. Project shall be treated as complete and ready for handover on the completion of

- (a) Supply, Installation, Configuration, System Integration, Documentation and Test Reports.
- (b) 10 days satisfactory functioning of the facility
- (c) At the time of handover contractor shall handover:
 - (i) All the printed documentation including all kinds of manuals and guides of all equipment supplied
 - (ii) As built layouts and operational guidelines.
 - (iii) Test reports
 - (iv) All the design documents for cable paths, tranches, air conditioning pipelines, rodent positioning etc which are required for daily maintenance and project up-gradation.
- (d) Standard Operating Procedure Document is handed over
- (e) Technical Personnel have been trained for at least 10 days.

34. SETTLEMENT OF DISPUTES THROUGH ARBITRATION AND JURISDICTION

- (a) NIT Raipur and the contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
- (b) If even after thirty (30) days from the commencement of such informal negotiations, NIT Raipur and the contractor are unable to amicably resolve the dispute, either party may require that the dispute be referred for resolution to The Director, National Institute of Technology, Raipur, as single party Arbitrator in accordance with the Arbitration and Conciliation Act, 1996. Decision of arbitrator shall be final and binding to all parties.
- (c) All Arbitration proceedings shall be held at NIT Raipur, Chhattisgarh, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be in English.
- (d) **Jurisdiction:** The High Court of Chhattisgarh at Bilaspur has exclusive jurisdiction to determine any proceeding or arbitration award in relation to the Contract.

35. FORCE MAJEURE CONDITIONS

If at any time, during the continuance of this contract, the performance in whole or in part by either party or any obligation under this contract shall be prevented or delayed by reason of any war, or hostility, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restriction, strikes, lockouts or act of God (hereinafter referred to as events) provided notice of happenings of any such eventuality is given by either party to the other within 21 days from the date of occurrence thereof, neither party shall by reason of such event be entitled to terminate this contract nor shall either party have any such claim for damages against the other in respect of such non-performance or delay in performance, and deliveries under the contract shall be resumed as soon as practicable after such event may come to an end or cease to exist and the decision of the purchaser as to whether the deliveries have been so resumed or not shall be final and conclusive provided further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reason of any such event for a period exceeding 90 days either party may at his option, terminate the contract provided also that if the contract is terminated under this clause, the Purchaser shall be at liberty to take over from the Successful Tenderer at a price to be fixed by the purchaser with mutual

consent which shall be final all unused, undamaged and acceptable materials bought out components and stores in course of manufacture in possession of the Successful Tenderer at the time of such termination of such portions thereof as the purchaser may deem fit excepting such materials bought out components and goods as the Successful Tenderer may with the concurrence of the Purchaser select to retain.

36. CONTRACT FORM:

- (a) A suitable contract agreement shall be signed before starting the work.
- (b) Successful bidder shall be required to enter into a contract with the Institute after the issue of the work order.
- (c) Submission of the bid against this open tender enquiry by a bidder implies that the bidder is in full agreement with the terms and conditions mentioned in this tender document.
- (d) The successful bidder shall be required to affix his signature and seal on each page of this tender document and submit the same as proof of having accepted the terms and conditions mentioned herein.
- (e) The contract with the successful bidder will be on Rs. 100/- stamp paper and shall contain the terms and conditions mentioned under the different chapters and sections of this tender document and terms related to execution of work. Bidder will have to arrange for the stamp paper of Raipur as soon as work is awarded.

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CHAPTER III: SCHEDULE OF REQUIREMENTS

(Including scope of work)

(Note: This is a tentative list subject to change after pre-bid.)

S. No.	Description of Supplies / Services	Unit	Qty	Make/Model
1	Construction of in-situ cement concrete flooring of 5" thickness suited for light industrial buildings as per IS: 2571-1970 in the entire data center building as per site requirements	Lot	1	
2	Cement concrete floor polishing in the data center building	Lot	1	
3	Anti-skid flooring for ramps and for steps in the data center building from ground to first floor	Lot	1	
4	Construction of wall partition for un-partitioned spaces like UPS room, battery room, network room, telecom room, and any other, as per requirement, in the data center building	Lot	1	
5	Construction of ODU mounting platforms, as per site requirement	Lot	1	
6	Construction of clean water sump / commissioning of RCC water sump of 10kL storage capacity as per approved design and site requirement	Lot	1	
7	Construction of a fountain for pre-cooling of water	Lot	1	
8	Providing 6" skirting for walls and columns	Lot	1	
9	Construction of anti-skid ramp of approved design for the data center outdoor room	Lot	1	
10	Blocking of door areas to create door openings, as per site requirement.	Lot	1	
11	Wall chasing for concealed cable paths, boring holes in walls for cable entries, sealing with fireproof sealants and finishing.	Lot	1	
12	Underground trenching for laying of power cables, as per specifications	Lot	1	
13	Trench finishing, as per site requirement	Lot	1	
14	20 liter stainless steel plain and cold water cooler of standard make	Nos	1	
15	RO & UV water purifier unit for the above water cooler	Nos	1	
16	Installation of cooler and purification units	Lot	1	
17	Plumbing work for water cooler as per site requirements	Lot	1	
18	Drainage work for water cooler as per site requirements	Lot	1	
19	Prefabricated toilet, urinal and bath units with approved design and color as per site conditions and requirements	Lot	1	
20	RCC septic tank for the units above as per site requirements	Nos	1	
21	Overhead 1000L water tank as per site requirements	Nos	1	
22	Electric light fittings for the units above as per site requirements	Lot	1	

23	Plumbing work for the units above with basic approved accessories and fittings of regular standard make, etc. including connection with overhead water tank as per site requirements	Lot	1	
24	Drainage work for the units as per site requirements	Lot	1	
25	Metal doors with frame and glass vision panel (except in external doors) as per site requirement all other necessary hardwares like SS ball bearing butt hinges, lock, SS lever with heavy duty door closer, all complete. S.S. handles, locking device with duplicate keys etc. complete as per layout. The joints between main door frame and partition shall be filled and sealed with silicon sealant.			
26	Size 1500 mm x 2100 mm, Double shutter	Nos.	2	
27	Size 1200 mm x 2100 mm, Single shutter	Nos.	2	
28	Size 1000 mm x 2100 mm, Single shutter	Nos.	2	
29	Installation of above metal doors.	Nos.	6	
30	Size = 1500 x 2100mm (equal double shutter) fire rated (120 min) metal door with frame, fire rated glass vision panels, SS ball bearing butt hinges, lock, SS lever with heavy duty door closer, all complete. Only emergency doors (02 Nos) to be fitted with press-bar.	Nos	5	
31	Size = 1800 x 2100mm (equal double shutter) fire rated (120 mins) metal door with frame, fire rated glass vision panel, SS ball bearing butt hinges, lock, with heavy duty door closer, all complete.	Nos	1	
32	Installation of above fire rated metal doors.	Nos	6	
33	Rolling shutter or metal door for data center building outdoor room of approved type, design and color. Size to be as per site conditions and requirement.	Nos	1	
34	Main entrance sliding gate, of approved type, design and color as per site conditions. Size to be as per site requirement.	Nos	1	
35	Installation of the above shutter and sliding gate	Lot	1	
36	Profile sheet shed for existing and proposed gensets as per approved design and color and site requirement	Nos	1	
37	Installation of the profile sheet shed	Lot	1	
38	Projection over external doors and windows, as per site requirement.	Lot	1	
39	Repair of Sliding windows in safety room, control room and transformer/DG Panel room of DC Building.	Lot	1	
40	Painting of MS railing for steps in the DC building from ground to first floor	Lot	1	
41	Painting of MS Grills in the windows of fire safety room, control room and transformer/DG Panel room of DC building	Lot	1	
42	Enamel Paint over a primer coat, on all remaining metal structures and as per manufacturers recommendations	Lot	1	

43	Finishing of internal walls, columns and ceiling, including application of putty/primer as per site requirement. Wall Putty/Primer over cement plaster. To be done in perfect line and level including finishing off machine cut grooves and chases, edge banding, scaffolding pockets etc. complete as per site requirement.	Lot	1	
44	Internal painting with acrylic paint as per site requirement	Lot	1	
45	Painting of outer walls of the data center building with sunlight reflective coating as per site requirement	Lot	1	
46	Painting of roof top of the data center building with sunlight reflective coating as per site requirement	Lot	1	
47	Installation / labour charges for all wall finishing	Lot	1	
48	Self Standing Table with metal leg & pedestal (1200 X 600) mm 750 mm table-top height, SS wire manager, KBPT, CPU trolley, of approved design and color.	Nos	8	
49	Reception area background wall panelling, signage and spot lighting of approved design and color.	Nos	1	
50	Institute data center building signage as per approved design	Nos	1	
51	Three-seater visitor chair, as per specification and approved design/color.	Nos	2	
52	Floor mount storage unit, 1800 x 1000 x 450 mm, as per approved design and color.	Nos	2	
53	Mesh high back revolving chair, seat finished with fabric, 5-pronged SS legs, castors, lift key, tilt, PU armrests of approved design/color.	Nos	12	
54	White board, as approved	Nos	2	
55	Sun film on windows as approved	Sqft	100	
56	SS wastepaper basket as approved	Nos	12	
57	Installation of the above furnishing items.	Lot	1	
58	Mineral fibre board ceiling 600 x 600 tegular edge in true horizontal level suspended on locking 15mm grid system.	Lot	1	
59	Installation of above false ceiling.	Lot	1	
60	Signage, displays and instruction display charts as per approved design and site requirement.	Lot	1	
61	Door mats, of minimum size 1500 x 800 mm, as per site requirement.	Nos	6	
62	Miscellaneous Brick and Plaster Work	Lot	1	
63	Minor landscaping works, as per site requirement.	Lot	1	
64	Portable security cabin with electric points, socket, light and fan of approved design and color as per site requirement	Nos	1	
65	Basic repair, reinforcement, painting and automation of the retractable bridge connecting data center and computer center buildings as per site requirement	Lot	1	

66	MAIN LT PANEL - Complete design details with calculations to be submitted along with the technical bid. Main LT Panel, cubicle type, made of 16 SWG CRCA sheet steel, totally enclosed, IP-42, free standing, floor mounting, indoor, compartmentalised, powder coated painting suitable for operation on 3 phase and neutral 415V, 50 Hz AC system with bus bars extendable on both sides, interconnections including supply and installation of following items and as per design. Breakers shall be suitable as per load. INCOMER Intelligent multi function digital meter to read V,A, KVA KW, KVAR, PE, Hz etc with communication facility (RS 485 port) and LED display with 3 Nos CTs, 15 VA, class 1.0 and control circuit wiring with HRC control fuses. Indication Lamps, LED type, R.Y.B ad breaker 'ON', 'OFF', 'TRIP' lamps. One no of current transformer Class 0.5 VA for APFC Relay. Suitable surge protectors should be included. BUS BARS OUTGOING FEEDERS	Lot	1	
67	Installation, commissioning and testing of the Main LT Panel	Lot	1	
68	Distribution Boards - Complete design details with calculations to be submitted along with the technical bid. Lighting & Raw Power DB UPS Power DB Emergency Light DB (ELDB) UPS DB (Aux UPS) Raw Power DB (RDB) Cooling DB	Lot	1	
69	Installation, commissioning and testing of above boards	Lot	1	
70	Cabling Design details of cabling with calculations to be submitted with the technical bid. Details must include material, cores and cross-section details, connectivity details with proposed route, length and technical literature. Supply of Cables shall be 1100 volt grade, PVC insulated and armoured, copper or aluminium conductor cables. Aluminium conductor cables to be proposed only where cross-section > 120 sq mm. Rate to include for all necessary hardware cable clamps, M.S. supports and hangers etc.for cables.	Lot	1	
71	Laying of the above cables including all tools and labour charges.	Lot	1	
72	Jointing the ends of the sizes as mentioned above sizes of PVC insulated and armoured cables including supply of brass cable glands, cable sockets and all jointing materials.	Lot	1	

73	Bus trunking for Raw /UPS power feed to server modules. Bus trunking details shall include feeder, suspension brackets, end cover, end feed unit, and tap off units. Design details of bus trunking of cabling with calculations to be submitted with the bid. Details of equivalent cabling may be given in place of busbar.	Lot	1	
74	Installation of Bus Bar	Lot	1	
75	Cable Trays Supply of 2mm thickness wire mesh or perforated GI cable trays with epoxy finish. Rate includes all necessary supporting brackets, clamps, saddles, fixing hardware etc. Design details of cable trays to be submitted with the bid. Details must include tray width and height, proposed route, length and technical literature.	Lot	1	
76	Laying of the above cable trays including all tools and labour charges.	Lot	1	
77	Earthing Supply of pipe earthing, 3.0 metre long earth pipe set with back fill compound, bus for termination, SS bolts, nuts, and washers etc. as per specifications.	Nos.	8	
78	Plate earthing, 600 X 600 X 3 mm copper plate with accessories, as per specifications.	Nos.	4	
79	25 mm x 3 mm GI Strip	Mtrs	100	
80	No. 8 SWG Cu. Wires	Mtrs	200	
81	Copper Earth Busbar with insulators	Nos.	4	
82	Installation & commissioning of the above earthing systems including including excavation, refilling & complete as required, including heavy duty cast iron cover and all associated civil works like construction of chamber and plastering etc.	Nos.	12	
83	Installation of Copper Earth Busbar with insulators	Nos.	4	
84	Lighting and power wiring Wiring to the light points, PVC insulated copper conductor wires drawn in heavy gauge PVC conduit pipes installed on the ceiling or run over the false ceiling with drops to the distribution boards and switch boxes recessed in the walls/partitions. Points to be controlled in groups or individually by means of 6 amps, single pole, flush type modular switches housed in flush mounted G.I. boxes.	Points	10	
85	Points to be controlled in groups of 4 - 6 from the raw power / light DB	Points	10	
86	Points to be controlled individually from the respective switch box / socket- outlets	Points	12	
87	Point wiring for utility & workstations : Wiring with 2 Nos. 6A, 5 Pin Socket and 2 Nos. 6A switch, housed in 6-way modular faceplates of approved color and design mounted either with or without G.I. back-boxes, as per site requirement.	Points	8	

88	Point wiring for 16 amps socket-outlets: Wiring with PVC insulated copper conductor wires drawn through PVC conduit & each point to be complete with 1 No. 16A Switch + 1 No. 16A Socket outlet, housed 4-way modular faceplates of approved color and design mounted with G.I. back-box.	Nos	35	
89	Labour charges for laying / installation of point wiring materials.	Lot	1	
90	Ceiling hanging type LED light fixtures	Nos.	14	
91	Ceiling recessed type LED light fixture, suitable for grid ceiling	Nos.	14	
92	PIR Occupancy Sensors	Nos.	14	
93	Outdoor LED lights.	Nos.	4	
94	Installation and Commissioning of the above light fixtures.	Nos.	43	
95	First Aid Box	Set	2	
96	Danger Plate	Nos.	6	
97	Shock Treatment Chart	Nos	3	
98	Rubber mats	Lot	1	
99	Exhaust Fan (8 inch) with outer flap cover.	Nos	4	
100	Diesel Generator Sets Supply of 200 KVA Diesel Generating set (with AMF) with acoustic enclosure, radiator, fuel tank, heavy duty silencer and exhaust piping and control panel, as per specifications.	Nos	2	
101	Exhaust System Supply and fixing of exhaust piping B class 150mm dia., 2mm thick MS pipe with all support structures, flanges, filer flay gasket, hardware, etc complete. The exhaust piping shall be insulated with mineral wool with chicken mesh bonded and aluminium sheet cladding. All labour, materials, lead, lift, tools, plants etc. complete.	Rmt	20	
102	MS tower structure	Lot	1	
103	Statutory clearance charges from Polution Control Board and others, as req.	Nos	2	
104	Transportation, Loading & Unloading Charge	Nos	2	
105	Installation, testing and commissioning of the above DG Sets including transportation to NITR campus mounting in the specified location including all materials, labour, tools & plants, all lead, lifts, tackles for unloading/ handling of equipments and materials at site, their assembly, sundry items etc. The work should include all labour, aligning the D.G set , fuel tank erection, filling of fuel, oil etc, installing battery assembling, connecting earth connections, testing and commissioning.	Nos	2	
106	Main UPS System 20 KVA Hi-Performance IGBT based Rectifier & Inverter based true On Line double conversion UPS system, 3Ph-3Ph, having DSP control, in N+1 redundancy as per technical specifications provided along with suitable battery banks for 10 mins backup on full load. Accessories like battery connectors and racks to be included.	Nos	9	
107	Installation and Commissioning of the main UPS system.	Nos	9	

108	Supply of battery banks for 10 mins backup on full load for use with existing 10 KVA Hi-Performance DSP Controlled, IGBT based Rectifier & Inverter based On Line UPS system and configurable in N+1 redundancy. Accessories like battery connectors and racks to be included.	Nos	2	
109	Installation and Commissioning of the existing UPS with batteries.	Nos	2	
110	Cooling System - Supply of water chiller plant of suitable rating as per solution - Design details with calculations to be submitted with technical bid	Nos	2	
111	Cooling System - Supply of evaporator tank of suitable volume.	Nos	2	
112	Cooling System - Supply of accessories like pumps, valves, pipes, plumbing accessories, insulation, etc. Design details with calculations to be submitted with technical bid	Lot	2	
113	Cooling System - Supply of direct evaporative coolers - Design details with calculations to be submitted with technical bid	Nos	2	
114	Cooling System - Supply of evaporative heat and mass exchange units for sensible heat removal as per site requirement. - Design details with calculations to be submitted with technical bid	Nos	2	
115	Cooling System - Supply of dehumidification Units - Design details with calculations to be submitted with technical bid	Nos	2	
115(a)	Cooling System - Supply of suitable ductable CWAC/DX units for cooling of auxiliary spaces with all necessary accessories - Design details with calculations to be submitted with technical bid	Nos	2	
116	Cooling System - Supply of artificial intelligence based temperature and humidity controller for the cooling system. Design details to be submitted with the technical bid.	Nos	2	
117	Cooling System -Supply of factory fabricated GSS sheet metal rectangular ducting as per site requirement complete with neoprene rubber gasket elbows, splitter dampers, vanes, hangers, supports, etc.	Nos	2	
118	Cooling System - Installation and commissioning of the above (from chiller plant to ducting)	Lot	2	
119	Cooling System - Supply of 3 HP electric motor pump complete with piping and all necessary accessories for drawing water from the sump and pumping it to different locations within the data center building	Nos	2	
120	Cooling System - Installation of 3 HP electric motor pump complete with piping and all necessary accessories for drawing water from the sump and pumping it to different locations within the data center building	Lot	2	
121	Cooling System - Supply of cooling tower of appropriate size and of approved design and rating as per site requirement. - Design details with calculations to be submitted with technical bid	Nos	1	
122	Installation of cooling tower as per site requirement	Nos	1	

123	Cooling System - Supply of outdoor ambient air mist cooling setup with nozzles, filters, pumps, pipes, etc. - Design details with calculations to be submitted with technical bid	Lot	1	
124	Installation of outdoor ambient air mist cooling setup as per site requirement	Lot	1	
125	Supply of overhead tank of capacity 5000L	Nos	2	
126	Installation of overhead tank of capacity 5000L	Nos	2	
127	Intelligent Addressable Microprocessor based Fire Alarm Panel	Nos.	1	
128	Addressable photo electric type smoke detector with blinking LED.	Nos	16	
129	Addressable heat detectors.	Nos	3	
130	Response indicator with LED.	Nos	6	
131	Addressable control modules	Nos	10	
132	Addressable monitoring modules	Nos	10	
133	Isolator module complete with junction box and mounting accessories.	Nos	10	
134	Manual Pull Station.	Nos	3	
135	Electronic Strobe cum Hooter	Nos	3	
136	1.5 sq.mm copper FRLS cable	RM	400	
137	Installation and commissioning of the above.	No	1	
138	In-panel tube based suppression system: 2 Kg, HFC-236 CA, Fire Extinguisher with Kit. Clean Agent HFC 236fa DLP with Zero Ozone Depletion Potential. Container along with valve assembly.	Nos	1	
139	Pressure Switch to monitor Pressure in the tube, switch point 11 Bars.	Nos	1	
140	Heat Sensor tube for automatic fire suppression system made by special modified Polyamide (PA), Color Black, High grade HR quality, UV Stabilized, Inner diameter 4mm, Outer Diameter 6 MM.	Mtrs	20	
141	End of Line adapter for Pressure gauge fitting for Automatic fire suppression tube used for fitting at the end of the tube for pressurizing and re pressurizing the tube.	Nos	2	
142	End of Line Plug for Automatic fire suppression tube used for fitting at the tube end to terminate the point.	Nos	2	
143	T connection for pressurized tubes, nickel plated material with elastomeric sealings.	Nos	1	
144	2 Core x 1.5 sq. mm flexible cable with conduit as per site requirement	Lot	1	
145	Alarm Kit	Nos	1	
146	Installation of in-panel tube based fire suppression system	Nos	1	
147	Fire suppression pouches and cords as per site requirement for automatic in-board fire suppression	Lot	1	
148	5 Kg, ABC Type Wall Mount Fire Extinguisher	Nos	4	
149	Installation and commissioning of the above.	Nos	4	
150	CCTV system - 2 MP IR fixed dome camera	Nos	20	
151	3 MP varifocal motorized bullet camera	Nos	10	
152	16 channel NVR	Nos	2	

153	2TB surveillance hard disk	Nos	4	
154	43" wall mount LED display	Nos	1	
155	16 port PoE switch	Nos	2	
156	CAT 6 UTP Cable	Box of 305m	3	
157	24 port switch	Nos	2	
158	Cat 6 1mtr Patch Cord	Nos	60	
159	Cat 6 Information Outlet	Nos	30	
160	I/O back Box	Nos	30	
161	Fully loaded 24-port jack panel	Nos	2	
162	9U Wall Mount Rack with Fan , Power supply,	Nos	1	
163	Laying & termination of Cat6 UTP Cable through PVC conduit (All fittings & termination accessories included)	Lot	1	
164	Installation of CCTV system and Accessories	Lot	1	
165	Rodent Repellent System Master Console capable of connecting to 12 Satellites complete with all accessories as per specifications	Nos.	2	
166	Satellite Units complete as per the specification	Nos.	24	
167	Connecting Cables	Rmt	400	
168	Bracket Stand	Set	2	
169	25mm PVC conduit	Mtr.	200	
170	Installation and commisioning of the rodent repellent system.	Lot	1	
171	Data Center Server Module Integrated Rack solution in a self-contained block of 08 racks, along with the following integrated systems and having monitoring capability. The integrated racks should meet the technical specifications as laid out in the RFP. The design should comply with Tier - III standards. Integrated rack solution should include - Integrated and contained rack cabinet, 42U, 600 x1000 mm for housing IT hardware, as per specifications. Provisioning for High-Energy Efficiency Cooling System, in N+N , suitable for the IT load, as per specifications. Integrated fire detection system for the racks. Integrated clean agent based fire suppression system for the racks. Integrated Access Control system for the racks. Integrated Cameras for surveillance. Integrated Water leak detection system. Integrated dual rack PDU's. Integrated Alarm Beacon. Emergency Door Opening. Monitoring capability. Other features as per the technical specifications	Nos	2	
172	Lifting, shifting and Positioning of integrated rack units.	Sets	2	
173	Assembling of all integrated rack solution components, as mentioned above including pairing with the cooling system	Sets	2	
174	Installation & Commissioning of the above systems.	Sets	2	

175	Data Center Network Module Integrated Rack solution in a self-contained block of 06 racks, along with the following integrated systems and having monitoring capability. The integrated racks should meet the technical specifications as laid out in the RFP. The design should comply with Tier - III standards. Integrated rack solution should include - Integrated and contained rack cabinet, 42U, 800 x1200 mm for housing IT hardware, as per specifications. Provisioning for High-Energy Efficiency Cooling System, in N+N , suitable for the IT load, as per specifications. Integrated fire detection system for the racks. Integrated clean agent based fire suppression system for the racks. Integrated Access Control system for the racks. Integrated Cameras for surveillance. Integrated Water leak detection system. Integrated dual rack PDU's. Integrated Alarm Beacon. Emergency Door Opening. Monitoring capability. Other features as per the technical specifications	Nos	1	
176	Lifting, shifting and Positioning of integrated rack units.	Sets	1	
177	Assembling of all integrated rack solution components, as mentioned above including pairing with the cooling system	Sets	1	
178	Installation & Commissioning of the above systems.	Sets	1	
179	UTP Cat 6 patch chord, 3 mtrs	Nos	100	
180	OM3 optic fibre	Mtrs	800	
182	UTP Cat 6 Patch cord - 2 Mtr	Nos	12	
183	Cat 6 Information Outlet	Nos	24	
184	I/O back Box	Nos	12	
185	2-port faceplate	Nos	12	
186	9U Wall Mount Rack with Fan , Power supply	Nos	1	
187	CAT 6 UTP Cable	Mtrs	600	
188	24-port unloaded modular straight jack panel, 1U with rear cable manager	Nos	1	
189	Laying & termination of Cat6 UTP Cable through PVC conduit (All fittings & termination accessories included)	Mtrs	600	
190	Desktops - 9th Gen Intel Core i3-9100 (4-Core, 6MB Cache, up to 4.2GHz), Windows 10 Pro (64bit), Intel UHD Graphics 630 with shared graphics memory, 8GB 1x8GB DDR4 2400MHz, 3.5" 1TB 7200RPM SATA Hard Drive, GDDR5 4GB graphics card, 23.8" HD IPS LED Monitor with Headphone	Nos	2	
191	43" LED display, wall mount, for Control Room	Nos	1	
192	Installation and commissioning of the above.	Nos	1	
193	Supply of heavy duty networked and auto-duplex color printer	Nos	1	
194	Supply of contactless overhead scanner for documents, magazines, newspapers and books	Nos	1	
195	Laptop, Intel Core i3, 10th Gen, 14" display, 4GB RAM, 1 TB HDD	Nos	2	

196	Two shelf table trolley with wheels as per approved design	Nos	1	
197	BMS/DCIM to monitor the module racks and other devices	Lot	1	
198	Project Management Charges	Lot	1	
199	Documentation and Operational Training Charges	Lot	1	
200	Any other items essential for completion of work	Lot	1	
201	Grand Total including Tax(INR)			
	L1 will be decided among technically qualified bidders based on the Grand Total incl Tax (INR) [201] above			

Scope of Work

Bidder has to design, supply, install, commission, integrate, test and maintain the datacenter physical infrastructure including documentation and operational training of all components mentioned in the schedule of requirements table above in accordance with the technical design and specifications elaborated in this tender document.

The bidder has to study the tender document and quote for the total solution of works complete in all respects.

Detailed bill of materials in line with the tender requirements has to be provided by the bidder. A tentative preliminary bill of materials has been included for reference. This bill of materials and associated price bid included in the tender document is subject to change after the pre-bid meeting and site survey and shall be included in the amendment.

Bidder shall include any miscellaneous item essential for completion of work under the appropriate line item. If any item over and above this is required for making the data center functional, it will be the responsibility of the bidders to supply and install the same without NIT bearing the costs for such additional items overlooked by the bidder at the time of bid submission.

The successful bidder shall have the entire responsibility to complete the solution and integrate the same for proper functioning. Any deviation to the technical specification has to be mentioned assigning proper reasons / justifications and acceptance of such reasons / justifications shall be at the sole discretion of NIT Raipur.

This specification covers a modular datacenter physical infrastructure, standalone system design, engineering, manufacture, assembly, testing at manufacturer's works, supply, delivery at site, unloading, handling, proper storage at site, erection, testing and commissioning at site of complete infrastructure to be installed at NIT Raipur as detailed in the specifications, complete with all accessories required for efficient and trouble free operations.

The detailed specifications of the datacenter physical infrastructure shall be broadly on the lines of TIA 942 guidelines and shall be composed of multiple active power and cooling distribution paths, but only one path active.

The datacenter physical infrastructure should essentially include civil and interior furnishing works, a concurrently maintainable electrical distribution system, secondary power generation systems, automatic switching between utility and secondary power, redundant or backup power supplies, environmental controls (e.g., cooling, fire suppression, smoke detection, water leak detection, humidity sensor, etc.), security devices, equipment racks, networking and monitoring capabilities, etc. Critical systems like UPS and cooling systems should be in N+1 or N+N topology. Bidders are requested to go through the detailed schedule of requirements.

The Server Room (1200 Sqft approx) under the Datacenter Physical Infrastructure is proposed to currently accommodate a minimum of 16 42U modular integrated racks, of minimum dimension 600 x 1000 mm. The design and placement of racks inside the room should allow enough free space to add another 16 racks in future along with the associated cooling units. Current usable 'U' space should not be less than 576 U to accommodate IT and Network equipment and devices. The cooling of the racks should be through hot and cold aisle containments. The hot air return to the cooling units should be through hot aisle containment inside the racks.

Cooling system should cater to a total IT load of 80 KVA/80KW in N+1 or N+N topology for total 16 racks and maintain indoor environment as per the latest ASHRAE guidelines for Class 1 data centers and mission critical facilities.

The modules should be equipped with smoke detectors, water leak detection system, temperature and humidity sensors, door sensors, alarm beacon, clean agent based fire suppression for the modules, electronic access control and emergency door opening.

The sensor systems in the modules should have the capability of monitoring and generating SMS alerts through appropriate interface with GSM modem.

32A Vertical Rack mount PDU of type IEC C13 & IEC C19 combination. Each rack shall have two such PDU's – The racks shall be metered.

Electrical power distribution system for the racks with essential MCB/MCCB.

All network and power cables shall run through wire mesh cable trays either suspended from the ceiling or laid in underground cable raceways running below the floor.

The scope of work would include supply, installation, testing, commissioning of all the systems as listed under the Schedule of Requirements including a 12 month comprehensive warranty on all supplies under the project.

Water and electricity used for this work would be supplied by NIT Raipur and the same should not be considered or included by the bidders in the project costing.

Transformer and required power would be provided by NIT Raipur to the Main LT Panel Room of the data center.

The roof of the Data Center shall be painted using a light color sun reflective coating.

Bidder has to arrange for all transportation of materials up to the proposed facility building including unloading, un-packing and mounting.

Important Notes:

The Contractor / System Integrator / Vendor would be provided the site in as-is condition. It would be the responsibility of the contractor to clean up the site prior to start of work. Bidder shall make his own arrangement in the data center for safe storage of the supplied materials.

All bidders are requested to do a proper site survey and quote for the complete solution. Tentative or preliminary bill of materials has been provided.

Bidders are required to elaborate and detail the individual items under the major heads provided with their unit rates etc. at the time of quoting, where necessary for reasons of potential quantity variation.

All bidders should submit detailed line item wise compliance of the technical specifications as per annexure. All bidders should submit authorization from the respective OEM, as per format provided.

All the bidders are to abide with local rules and regulations, specifications laid by government / municipality or any of the concerned authority including the various insurance for man and materials etc, in all the works / sub works. Such rules will over ride / co- exist and will be applicable above any of the scope or specifications given in this document.

The selected bidder shall submit all drawings before start of work for necessary approvals. The as-built drawings shall be separate for each package and shall be submitted in color 3 sets in hard copies and in softcopy on a CD which contains drawings both in AutoCAD and PDF.

All bidders should submit a solution document with the technical bid complying with the requirements as laid out in the scope of works. Bids without such solution document or with non-compliant solutions shall be summarily rejected.

CHAPTER – IV: SPECIFICATIONS AND ALLIED TECHNICAL DETAILS

TECHNICAL SPECIFICATIONS

DATA CENTER SERVER MODULES

	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1.	General Requirements:			
2.	Modular Data Centre Server Module comprising of 8 Nos. of Low Density IT Racks with Primary and Secondary Electronics Cooling Circuits, Fire Detection & Suppression Systems, Environment Monitoring System, Integrated Rack infrastructure.			
3.	Manufacturer shall be responsible for the overall design and optimum functioning of modular data server modules. A certificate / undertaking in this regard shall be submitted from the Manufacturer. The data center modules to be supplied and installed in this project must have the following components (a) Structure (b) Power distribution system (c) ICT racks with rack power distribution units (d) Primary and secondary electronics cooling circuits with free cooling mechanism (e) Module security and safety systems i. Door access control system (for containment and racks) ii. CCTV cameras iii. Fire detection sensors (smoke and heat) and alarm iv. Clean agent based automatic fire suppression system v. Water leak detection system vi. Rodent repellent system (f) Module and Rack Instrumentation			
4.	The data center server module must be full fledged prefabricated Tier III data centers and maintain indoor temperature and humidity as per the latest ASHRAE guidelines for Class 1 data centers and mission critical facilities.			
5.	The detailed specifications of the modular data center server module, shall be in adherence to standard Data Centre guidelines thus shall be composed of two active power and cooling distribution paths, of which only one will be used at any given time.			
6.	The data center server module should be modular and the critical components like cooling, UPS, secondary power should have redundancy. It shall include internal environmental controls, fire detection & suppression, water leak detection, temperature, humidity sensors and security devices.			

7.	The data center server modules shall have the following important characteristics (a) Thermally insulated (b) Dust proof (c) Moisture proof (d) Water proof (e) Sound proof (f) Insect and vermin proof (g) Fire resistant (h) Capable of outdoor operation (if necessary) in harsh hot and humid tropical climates (i) Capable of withstanding direct sunlight, rainfall and strong winds. One or more of the modules may be made functional outdoors during testing phase.			
8.	The number, dimensions and load of the racks in the data center server module shall be as follows (a) Each data center server module shall have 08 server racks. (b) The dimensions of the racks shall be minimum 600mm x 1000mm 42U. (c) Peak design load of server rack shall be 5kW respectively.			
9.	Racks must be accessible from the front and rear.			
10.	The hot and cold aisles should be contained. The containments shall have doors of appropriate dimensions. The containment door on the rack front side should have vision glass.			
11.	Space should be reasonably sufficient to work inside the module and move around the hot and cold aisles.			
12.	Each module shall have its own independent source of uninterruptible power supply of 10 minutes duration in N+1 redundancy.			
13.	The UPS shall have unity power factor and >95% efficiency at 25% load.			
14.	The module shall have busbar trunking or neatly concealed cables based power distribution for the racks.			
15.	An electric panel shall be provided with each module for power terminations for ICT and non-ICT loads in the module.			

16.	The fire suppression system of the module shall be clean agent based with cylinders mounted on a side bay with appropriate arrangement for venting out the agent automatically from the contained areas when discharged.			
17.	Each module shall be equipped with six smoke detectors			
18.	There shall be six cameras in each module providing complete remote view of the inside module.			
19.	Cooling System: High-Energy Efficiency Cooling System to be Paired with the Module. Specifications mentioned separately			
20.	Integrated Racks			
21.	Rack: 42U, 600x1000mm (Width x Depth) standard build.			
22.	Depth Adjustable mounting slots			
23.	Top and bottom panel with ventilation and cable panel			
24.	Powder coated finish with seven tank pre-treatment process meeting all industry standard			
25.	Grounding and Bonding point to be provided			
26.	Construction: CKD(Knockdown)			
27.	Front Door: Lockable perforated construction			
28.	Basic Frame: Steel			
29.	Equipment mounting: DIN standard 10mmsq slots/Direct M6 Tap			
30.	Mounting Angle: 19" Mounting angle made of formed steel			
31.	Standard Finish: Powder Coated			
32.	Top and Bottom Cover: Welded to frame, vented and cable entry/exit cut-outs from top and bottom			
33.	Standard Mounting: Height adjustable levellers or plinth, suit to site conditions.			
34.	Standard colour: Grey & off white or Black or as per institute requirements			
35.	Static load: upto 1250 kgs with plinth			
36.	Filler Panels or Sheets should be provided.			
37.	42U size 600 Server Rack with front & rear perforated door with comfort handle, lock insert, Top cover with cutout with cover plate for cable entry.			
38.	The hot and cold aisle containment shall be part of the data center module			
39.	Blanking arrangement shall be provided.			
40.	Horizontal & vertical cable management system on front and backsides of the racks.. Plastic duct for cable routing between racks.			
41.	Biometric access control system for racks and containment			

	doors.			
42.	Earth Rail of size 15mmx5mm having provision for earthing connection shall be provided in the rack infrastructure.			
43.	Power Distribution System			
44.	Rack PDU 32A with PDU level metering with 20 nos. IEC C13 sockets and 4 nos. of IEC C19 with power cord for PDU input. Zero U installation saving valuable rack space, LED display, Circuit breaker protection, Monitoring in DCIM			
45.	Offered PDU shall be a vertical metered PDU.			
46.	The PDU shall be capable of interfacing with central BMS / DCIM.			
47.	An alarm should be raised in case of potential circuit overloads in the DCIM			
48.	1 nos. of 5 Amp Indian socket PDU with power cord, plug and socket.			
49.	A panel designed considering the load of equipment and as per customer requirements will be included by the manufacturer along with the data center server module.			
50.	Complete single line diagram should be as per OEM and to be approved from engineer in charge.			
51.	Fire Detection and Suppression System			
52.	Fire suppression agent shall be non-toxic clean agent based.			
53.	The entire enclosed volume of the modular data centre server module should be protected with fire detection and suppression system.			
54.	The module fire detection and suppression system will comprise of fire sensors - optical smoke detector (2), heat detector (2) and manual call points along with fire suppression nozzles in each containment.			
55.	For early detection the racks should also be equipped with smoke detectors – 1 nos. each.			
56.	All containments should be flooded with the fire suppressant gas 10s after a clear audible and visual alarm is raised inside the containment			
57.	In the event fire is detected, the alarm would be immediately triggered with a voice announcement in Hindi to vacate the module immediately.			
58.	Access Control System			
59.	Biometric access control system shall be deployed for access of data center modules and racks to authorized persons only.			
60.	Record, report and archive each activity with log formats with 1 TB data storage.			
61.	Fail safe operation in case of no-power condition and abnormal conditions such as fire, loss of access control etc.			
62.	CCTV camera & NVR			

63.	6 nos. 2MP CCTV cameras with night vision capability for monitoring the module with 1 TB data storage.			
64.	Image sensor:1/2.9" two-megapixel progressive scan CMOS			
65.	Lowest illuminance:			
66.	1. Color: 0.5 lux (F2.0)			
67.	2.Black and white: 0.05 lux (F2.0)			
68.	3.0 lux (infrared enabled)			
69.	Video coding format:H.265/H.264/MJPEG			
70.	Wide dynamic range:110 dB or better			
71.	Access control and CCTV systems must be integrated			
72.	Environmental Control System			
73.	Water leak detection system for the proposed containment			
74.	Door sensor for Containment			
75.	Alarm Beacon			
76.	Rodent Repellent system for the modules			
77.	DCIM			
78.	Data Center server modules shall have DCIM monitoring system for all the rack parameters with sensors and notification system.			
79.	Rack Monitoring: Racks shall be equipped with sensors like Temperature, Humidity, Differential Pressure, Air Speed, Smoke Detection, Heat Detection, Water Leak Detection etc. for monitoring the rack microclimate. Monitors rack level intake and outtake temperatures as per ASHRAE guidelines, rack access control, PDU level power monitoring. It should be possible to compute air and heat flow across each rack. DCIM shall be planned for the two modules which will be monitored from the Monitoring room.			
80.	Module Monitoring: Ambient temperature and humidity, temperature and humidity near cooling units to monitor their working state, door opening and closing states			
81.	<u>To be enclosed with technical bid:</u> - Design and drawing of the module - Placement of 2 and 4 nos. of server modules inside the server room - Power and air-conditioning paths within the module - The centralized DCIM shall compute the air flow and heat transfer across a rack based on the monitored parameters. The neat derivation of the corresponding formulae to be enclosed. Any assumptions should be clearly defined. - Model of the module			

DATA CENTER NETWORK MODULE

	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1.	General Requirements:			
2.	Modular Data Centre Server Module comprising of 8 Nos. of Low Density IT Racks with Primary and Secondary Electronics Cooling Circuits, Fire Detection & Suppression Systems, Environment Monitoring System, Integrated Rack infrastructure.			
3.	Manufacturer shall be responsible for the overall design and optimum functioning of modular data server modules. A certificate / undertaking in this regard shall be submitted from the Manufacturer. The data center modules to be supplied and installed in this project must have the following components (g) Structure (h) Power distribution system (i) ICT racks with rack power distribution units (j) Primary and secondary electronics cooling circuits with free cooling mechanism (k) Module security and safety systems vii. Door access control system (for containment and racks) viii. CCTV cameras ix. Fire detection sensors (smoke and heat) and alarm x. Clean agent based automatic fire suppression system xi. Water leak detection system xii. Rodent repellent system (l) Module and Rack Instrumentation			
4.	The data center server module must be full fledged prefabricated Tier III data centers and maintain indoor temperature and humidity as per the latest ASHRAE guidelines for Class 1 data centers and mission critical facilities.			
5.	The detailed specifications of the modular data center server module, shall be in adherence to standard Data Centre guidelines thus shall be composed of two active power and cooling distribution paths, of which only one will be used at any given time.			
6.	The data center server module should be modular and the critical components like cooling, UPS, secondary power should have redundancy. It shall include internal environmental controls, fire detection & suppression, water leak detection, temperature, humidity sensors and security devices.			
7.	The data center server modules shall have the following important characteristics (j) Thermally insulated (k) Dust proof (l) Moisture proof (m) Water proof (n) Sound proof			

	(o) Insect and vermin proof (p) Fire resistant (q) Capable of outdoor operation (if necessary) in harsh hot and humid tropical climates (r) Capable of withstanding direct sunlight, rainfall and strong winds. One or more of the modules may be made functional outdoors during testing phase.			
8.	The number, dimensions and load of the racks in the data center server module shall be as follows (d) Each data center server module shall have 06 network racks. (e) The dimensions of the racks shall be minimum 800mm x 1200mm 42U. (f) Peak design load of network rack shall be 5kW respectively.			
9.	Racks must be accessible from the front and rear.			
10.	The hot and cold aisles should be contained. The containments shall have doors of appropriate dimensions. The containment door on the rack front side should have vision glass.			
11.	Space should be reasonably sufficient to work inside the module and move around the hot and cold aisles.			
12.	Each module shall have its own independent source of uninterruptible power supply of 10 minutes duration in N+1 redundancy.			
13.	The UPS shall have unity power factor and >95% efficiency at 25% load.			
14.	The module shall have busbar trunking or neatly concealed cables based power distribution for the racks.			
15.	An electric panel shall be provided with each module for power terminations for ICT and non-ICT loads in the module.			
16.	The fire suppression system of the module shall be clean agent based with cylinders mounted on a side bay with appropriate arrangement for venting out the agent automatically from the contained areas when discharged.			

17.	Each module shall be equipped with six smoke detectors			
18.	There shall be six cameras in each module providing complete remote view of the inside module.			
19.	Cooling System: High-Energy Efficiency Cooling System to be Paired with the Module – Specifications mentioned separately			
20.	Integrated Racks			
21.	Rack: 42U, 600x1000mm (Width x Depth) standard build.			
22.	Depth Adjustable mounting slots			
23.	Top and bottom panel with ventilation and cable panel			
24.	Powder coated finish with seven tank pre-treatment process meeting all industry standard			
25.	Grounding and Bonding point to be provided			
26.	Construction: CKD(Knockdown)			
27.	Front Door: Lockable perforated construction			
28.	Basic Frame: Steel			
29.	Equipment mounting: DIN standard 10mmsq slots/Direct M6 Tap			
30.	Mounting Angle: 19" Mounting angle made of formed steel			
31.	Standard Finish: Powder Coated			
32.	Top and Bottom Cover: Welded to frame, vented and cable entry/exit cut-outs from top and bottom			
33.	Standard Mounting: Height adjustable levellers or plinth, suit to site conditions.			
34.	Standard colour: Grey & off white or Black or as per institute requirements			
35.	Static load: upto 1250 kgs with plinth			
36.	Filler Panels or Sheets should be provided.			
37.	42U size 600 Server Rack with front & rear perforated door with comfort handle, lock insert, Top cover with cutout with cover plate for cable entry.			
38.	The hot and cold aisle containment shall be part of the data center module			
39.	Blanking arrangement shall be provided.			
40.	Horizontal & vertical cable management system on front and backsides of the racks.. Plastic duct for cable routing between racks.			
41.	Biometric access control system for racks and containment doors.			
42.	Earth Rail of size 15mmx5mm having provision for earthing connection shall be provided in the rack infrastructure.			
43.	Power Distribution System			

44.	Rack PDU 32A with PDU level metering with 20 nos. IEC C13 sockets and 4 nos. of IEC C19 with power cord for PDU input. Zero U installation saving valuable rack space, LED display, Circuit breaker protection, Monitoring in DCIM			
45.	Offered PDU shall be a vertical metered PDU.			
46.	The PDU shall be capable of interfacing with central BMS / DCIM.			
47.	An alarm should be raised in case of potential circuit overloads in the DCIM			
48.	1 nos. of 5 Amp Indian socket PDU with power cord, plug and socket.			
49.	A panel designed considering the load of equipment and as per customer requirements will be included by the manufacturer along with the data center server module.			
50.	Complete single line diagram should be as per OEM and to be approved from engineer in charge.			
51.	Fire Detection and Suppression System			
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55.	For early detection the racks should also be equipped with smoke detectors – 1 nos. each.			
56.	All containments should be flooded with the fire suppressant gas 10s after a clear audible and visual alarm is raised inside the containment			
57.	In the event fire is detected, the alarm would be immediately triggered with a voice announcement in Hindi to vacate the module immediately.			
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60.	Record, report and archive each activity with log formats with 1 TB data storage.			
61.	Fail safe operation in case of no-power condition and abnormal conditions such as fire, loss of access control etc.			
62.	CCTV camera & NVR			
63.	6 nos. 2MP CCTV cameras with night vision capability for monitoring the module with 1 TB data storage.			
64.	Image sensor:1/2.9" two-megapixel progressive scan CMOS			
65.	Lowest illuminance:			

66.	1. Color: 0.5 lux (F2.0)			
67.	2.Black and white: 0.05 lux (F2.0)			
68.	3.0 lux (infrared enabled)			
69.	Video coding format:H.265/H.264/MJPEG			
70.	Wide dynamic range:110 dB or better			
71.	Access control and CCTV systems must be integrated			
72.	Environmental Control System			
73.	Water leak detection system for the proposed containment			
74.	Door sensor for Containment			
75.	Alarm Beacon			
76.	Rodent Repellent system for the modules			
77.	DCIM			
78.	Data Center server modules shall have DCIM monitoring system for all the rack parameters with sensors and notification system.			
79.	Rack Monitoring: Racks shall be equipped with sensors like Temperature, Humidity, Differential Pressure, Air Speed, Smoke Detection, Heat Detection, Water Leak Detection etc. for monitoring the rack microclimate. Monitors rack level intake and outtake temperatures as per ASHRAE guidelines, rack access control, PDU level power monitoring. It should be possible to compute air and heat flow across each rack. DCIM shall be planned for the two modules which will be monitored from the Monitoring room.			
80.	Module Monitoring: Ambient temperature and humidity, temperature and humidity near cooling units to monitor their working state, door opening and closing states			
81.	<u>To be enclosed with technical bid:</u> (f) Design and drawing of the module (g) Placement of 2 and 4 nos. of server modules inside the server room (h) Power and air-conditioning paths within the module (i) The centralized DCIM shall compute the air flow and heat transfer across a rack based on the monitored parameters. The neat derivation of the corresponding formulae to be enclosed. Any assumptions should be clearly defined. (j) Model of the module			

HIGH ENERGY EFFICIENCY COOLING SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1.	The cooling system shall be based on hybrid air conditioning technology			

2.	The temperature and humidity inside the modules should be maintained in the range defined in the relevant ASHRAE guidelines for class A1 mission critical facilities, data centers.			
3.	The hybrid air-conditioning setup shall comprise of a combination of evaporative cooling and cooling / dehumidification based on the vapor compression cycle.			
4.	The multi-stage system shall comprise of a direct evaporative cooling stage followed by an indirect evaporative cooling stage, an on-demand dehumidification stage and a water chiller plant.			
5.	The setup shall have a feedback system for controlling temperature and humidity based on artificial intelligence.			
6.	The cooling system shall have provision for free air cooling. (May be asked for demo during PoC)			
7.	Following are to be submitted with the technical bid (a) Cooling system design with details of different stages (b) Design calculations for system component sizing (c) Thermal performance and energy efficiency analysis (d) Details of AI based control system with analysis			

DCIM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1.	DCIM shall interface with (a) Rack PDUs (b) Main LT panel (c) Electric panels of modules (d) DG sets (e) UPS systems (f) Hybrid air-conditioning system (g) Sensors and systems inside and outside the modules (h) Level sensors in liquid storage tanks			
2.	DCIM shall store sensor data for 3 years.			
3.	DCIM shall be based on open protocol			
4.	Data stored/viewed in DCIM shall be in easily readable format			
5.	<u>To be enclosed with technical bid:</u> (a) DCIM architecture and components (b) Complete list of parameters monitored through DCIM			

20 KVA UPS

S.N	Particular	Specification	Requirement	Compliance (Yes / No)	Deviation, if any	Remarks
1	Capacity	VA/W	20 KVA/ 20kW			
		Backup	10 mins			
		Rectifier Type	IGBT			
2	General	Manufacturer should be ISO 14001 certified	Required			
		Bidder must have a valid authorization certificate from manufacturer	Required			
		Manufacturer must have authorized local service centres in Raipur	Required			
3	Input	Voltage	380/400/415VAC 3-Phase, 4 wire			
		Voltage Range	Single Phase 100VAC - 288 VAC			
		Nominal Frequency	50/60 Hz			
		Frequency Range	40-70 Hz			
		Input Power Factor	≥0.95 for Three Phase			
		Current THD at full linear load (THDi%)	<5%			
4	Output	Output Waveform	Pure Sinewave			
		Nominal Output Voltage	380/400/415 VAC (3-Phase)			
		Voltage Stability	1%			
		Nominal Output Frequency	50/60 Hz			
		Frequency Precision	0.25%			
		Rated Power Factor	Unity			
		Voltage Harmonic distortion	<2% for Linear loads & <5% for Non-linear loads			
		Overload Capacity	Upto 125%, 5min; 125% ~ 150%, 1min; 150%, 200ms, measured at 25°C			
		Split bypass option	Required			
		Crest factor	3:1 Comply with IEC 62040-3			
5	Battery	Battery Type	12V VRLA SMF batteries			
		DC Bus Voltage	>450VDC			
		Battery Charger	Must be able to supply current of 10% the battery AH capacity in Amp			

6	System Parameters & Standards	Conversion Type	Online Double Conversion			
		Parallel Mode	3+1			
		Efficiency	>95%			
		Efficiency at load ranging from 25%-100%	>95%			
		Step Load Performance	100%			
		ECO mode efficiency	Upto 99%			
		Switching Time	0 msec			
7	Alarms	Early Warning of UPS System Status	Required			
8	Environment	Operating Environment	0~50 Deg C			
		Relative Humidity	5-95% RH non-condensing			
		Noise at 1m	≤60 dBA			
9	Features	General and safety requirements for UPS	IEC/EN 62040-1			
		EMC requirements for UPS	IEC/EN 62040-2			
		UPS classification according to IEC 62040-3	VFI-SS-111			
		Integrated Ethernet port for compatibility with HTTP protocol compatibility	Required			
		Power factor correction	Required			
		Lightening and surge protection	Required			
		Automatic and manual self-diagnostic battery testing	Required			
		Energy Star Certification	As per UL Approved			
		ROHS Certification	Required			
		Shipment Certified	Required			
		Seismic Certified	Required			
		High Altitude Certified	Required			
		Compliance with Vehicle carrying test	Required			
		Durability	High			
		Dust Resistant	Required			
		Programmable output outlets/ terminals with cascade protection to protect key devices during heavy load	Required			

		Gravity sense LCD display	Required			
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DIESEL GENERATOR 200KVA**DIESEL ENGINE**

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	The diesel generator set should be in a redundancy mode and total number of units should not exceed two. This should be as per N+1 redundancy requirement. It is proposed to have 200 KVA Silent DG Sets with all necessary accessories.			
2	Scope of work			
	This specification covers the design, manufacture test at works, supply, installation testing and commissioning of 200 KVA Diesel Generating set complete with all accessories like, starting batteries, control panel, interconnecting cable, tank, fuel/coolant/ exhaust pipes, silencer, anti vibration mountings, foundation etc.			
2.1	Silent Diesel General Sets, 02 x 200 KVA, with acoustic enclosure.			
2.2	Loading, Un-loading and mounting of DG Sets on the foundation base.			
2.3	Exhaust piping, as per required height, with insulation.			
2.4	Inbuilt fuel storage tanks.			
2.5	Manual fueling system.			
2.6	Electrical cabling, BMS connectivity			
2.7	Installation, testing and configuration.			
2.8	Load balancing.			
2.9	Pollution clearance.			
2.10	Lube oil, first fill, for testing. Diesel to be provided or cost reimbursed by NIT.			
3	Standard			
3.1	The generating set shall be designed, manufactured and tested in accordance with the latest revision of Indian standards.			
4	General			
4.1	The generating sets shall be robust in construction factory tested and assembled to ensure perfect alignment of Engine and Alternator on a common base frame. The base frame shall be fabricated out of adequate thickness rolled steel sections. The set shall be mounted on anti-vibration mounting to prevent transfer of vibration to the foundation and structures. The equipment shall be suitable for operating at a hot humid and saline atmosphere at an ambient temperature of 45 degree centigrade.			
5	Diesel Engine			

5.1	The engine shall be multi-cylinders, vertical, 4 stroke, Direct Injection, water cooled type, developing the rated horsepower at a speed of 1500 rpm.			
6	Starting			
6.1	The engine starting shall be by means of totally enclosed axial type electric starter suitable for 24 volts DC. The DC supply shall be derived from a heavy duty 24 volts maintenance free battery.			
7	Cooling			
7.1	An engine driven centrifugal pump shall be employed to circulate the coolant through a cooling radiator with an axial blower fan. A temperature gauge shall be provided with contacts for stopping the engine on high temperature.			
8	Lubrication			
8.1	Pressure lubricating oil system with an engine driven pump shall be provided to cover to complete engine, with built in oil coolant heat exchangers. Full foam filters removable elements shall be provided and these shall be located at easily accessible location for ease of maintenance. The supply shall include first filling of lubricating oil. An oil pressure gauge shall be provided to monitor the lubrication oil pressure. The gauge shall be provided with contacts for stopping the engine on failure of lubricating oil flow.			
9	Governor			
9.1	The governor shall be of electronic type suitable for monitoring constant engine speed within the specified limits for auto parallel and auto load sharing operation.			
10	Exhaust			
10.1	The exhaust piping system shall be supplied with a residential silencer. The exhaust piping and the silencer shall be wrapped with rock wool and/or calcium silicate. The outside shall be neatly wrapped with aluminum cladding. The exhaust line shall be extended beyond the height of the utility building roof as required by pollution control norms.			
11	Daily Service Tank			
11.1	The supplier shall supply and install Daily Service Tank of sufficient capacity to enable running of the generator set for 12 hours continuous run. The Daily Service Tank shall be fitted with necessary fuel guage with shut off cocks.			
12	Pipe works			
12.1	All necessary pipes and accessories for cooling water, lubricating oil, fuel, oil and exhaust shall be designed and supplied to suit the standard arrangement for a system, mounted on anti-vibration mountings.			
13	Foundation and Anti-Vibration Footing			
13.1	The generating set shall be mounted on standard size cement concrete foundation with required number of anti-vibration footings to prevent transfer of vibration to the foundation and structure.			

DG ALTERNATOR

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Alternator			
1.1	The alternator shall be 200 KVA 3 phase 0.8 PF 415V, 4 wire 1500 rpm, housed in screen protected drip proof enclosure. The alternator shall be capable of delivering rated output at rated power factor with,			
1.2	a. Terminal voltage differing from the rated value by not more than +/- 5%.			
1.3	b. Frequency differing from the rated value by not more than +/- 0.5%.			
1.4	c. Short circuit capacity of 300% for 10 seconds.			
1.5	d. Over load capacity of 110% for one hour.			
2	Insulation			
2.1	The insulation shall be class H and shall be fully impregnated for use in hot, humid, tropical climate conditions, with an ambient temperature of 45 deg. C.			
2.2	The stator and rotor windings of the alternator and the exciter shall be provided with acid resistant varnish finish.			
3	Bearings			
3.1	The alternator shall be provided with single bearing or two sleeves to ensure perfect alignment under all conditions. The bearing shall be self-lubricating type. Close coupling of single bearing alternator is preferable.			
4	Voltage Regulator			
4.1	A rapid response voltage regulator shall be provided to regulate the generated voltage .The overall regulations from no load to full load, including cold to hot variation and load power factor of 0.8 lag to unity shall be within 2% of the normal voltage. The excitation system shall be designed to promote rapid voltage recovery following sudden application and disconnection of load.			
5	Acoustic Enclosure			
5.1	The acoustic enclosure should be supplied along with DG set from the manufacturer outlet itself as per CPCB norm.			
6	Construction			

6.1	Acoustic enclosure shall be of powder coated and fabricated out of 16 SWG CRCA MS sheet. Powder coating shall be done after seven tank surface preparation process of sheet metal. The canopy shall have four hinged doors, one door with glass window to view proper parameters on the control panel. The canopy and doors shall have inside lining of fire retardant foam/glass wool as acoustic materials.			
6.2	The base frame shall be fabricated in ISMC channel or in sheet metal, with lifting hooks for convenient lifting of complete set i.e. along with canopy, engine and alternator.			
6.3	The sound level shall have less than 75 db (A) at a distance of 1 meter. The allowable temperature raise inside the canopy is 5 to 7 deg. Centigrade. The measurement of noise will be as per ISO 3744/ ISO 8528 (Part 10) standard.			
7	Salient features			
	The canopy shall have the following features.			
	1. Open air installation			
	2. Lockable doors			
	3. External accessible emergency stop button			
	4. Provision for taking out exhaust gases through pipes to prevent any leak pressure on the engine.			

AUTO MAINS FAILURE (AMF)

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	AMF Panel Features			
	The AMF panel to be designed to meet the following requirements of Automatic Operation of D.G. set.			
1.1	i. While the Main supply is normal and the D.G. set is at rest, the load is applied directly from Mains through mains Contactor.			
1.2	ii. When the Main Supply fails or drops below a certain preset value, the automatic system gives starting signal to D.G. set and D.G. set starts.			
1.3	iii. As soon the D.G. set reaches its operational voltage and speed, the D.G. contactor closes and the connected load is supplied from the D.G. set.			
1.4	iv. When the Main supply is restored approximately for at lease one minute, the load gets transferred to mains Contactor and D.G. set will be brought to rest.			
1.5	v. The panel is also to be designed for manual operation of D.G. set through Push Button Start/Stop as required.			

ELECTRICAL LT PANEL

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	The LT panel shall be metal clad, totally enclosed, rigid, floor mounting, air insulated, cubical type for use on 415 volts, 3 phase, 4 Wire 50 cycles system.			
2	The equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions.			
3	The equipment shall be designed for operation in high ambient temperature and high humidity tropical atmospheric conditions.			
4	The equipment shall be designed to confirm to the requirements of Power distribution units.			
5	Indicators should be LED types.			
6	Metering:			
	Combined Meter for Voltage / Ampere / Frequency			
	Combined Meter for kW / Power Factor / kVA			
	Electronic kWh Meter (Counter Display)			
	Current Transformers			
7	All MS sheet steel used in the construction of panels shall be SWG 16 and shall be cut to different sizes and bolted as necessary to provide a rigid support for all components.			
8	Joints of any kind in sheet metal shall be bolted type and not welded type.			
9	All covers shall be properly fitted and square with the frame, and holes in the panel correctly positioned.			
10	Fixing screws shall enter into holes tapped into an adequate thickness of metal or provided with hank nuts. Self-threading screws shall not be used in the construction of panels.			
11	The Panels shall be suitable for IP42 protection.			
12	Knockout holes of appropriate size and number shall be provided in the panel in conformity with the location of incoming and outgoing cables.			
13	Each feeder shall be clearly numbered from left to right to correspond with wiring diagram.			
14	All the switches and feeders shall be distinctly marked with a small description of the service installed.			
15	Terminals: The outgoing terminals and neutral link shall be brought out to a cable alley suitably located and accessible from the panel front.			
16	The current transformer for instruments metering shall be mounted on the terminal blocks.			
17	Circuit Compartment: Each circuit breaker, MCCB and switch fuse units shall be housed in separate compartments and shall be enclosed on all sides.			
18	Wire-way: A horizontal wire way with screwed covers shall be provided at the top to take interconnecting control wiring between different vertical sections.			

19	Cable Compartment: Cable compartment of adequate size shall be provided in the Sub Distribution Boards for easy termination of all incoming and outgoing cables entering from bottom or top.			
20	Adequate proper supports shall be provided in cable compartments to support cables.			
21	All incoming and outgoing switch / MCCB terminals shall be brought out to terminal blocks of adequate capacity in the cable compartment.			
22	Meters: All meters shall be housed in a separate compartment and accessible from front only.			
23	Wiring for meters shall be colour coded and labelled with approved plastic ferrules for easy identification.			
24	Current transformers shall be in accordance with IS: 2705-1964 as amended up to date and cast resin type, tape wound CT's are not acceptable.			
25	Painting: All sheet steel work shall undergo a process of degreasing pickling in acid, cold rinsing, and phosphate, passivation and then sprayed with a high corrosion resistant primer.			
26	The finishing treatment shall be by application of two coats of synthetic enamel paint of approved color and powder coated. The nine tank process shall be adopted.			
27	Labels: Engraved anodized aluminium labels shall be provided on all incoming and outgoing feeder switches.			
28	Circuit diagram showing the control wiring shall be pasted on inside of the panel door and covered with transparent laminated plastic sheet.			
29	The label shall indicate the name of the feeder, the specific area it is feeding, ampere rating and the cable size it is receiving.			
30	The label shall be provided on the backside of the panel in case of back access.			

BUS TRUNKING SYSTEM*

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Minimum 160 Amps Cu, 415 Volts, minimum IP-40 compact bus trunking for Raw and UPS Power feed to the modules.			
2	Busbar and plug-in units should be from a single manufacturer.			
3	CONSTRUCTION:			
4	The busbar trunking enclosure shall be two omega-shaped ribbed sealed section or beamed shaped section and shall fabricated out by 0.8mm, Hot-galvanized sheet steel(Senzimir) . It shall be rigid and robust in construction , compact in size & serves as a protective conductor due to its cross section and electrical continuity.			

5	BUS BARS:			
6	The Busbar shall be made from electrolytic grade copper with purity not less than 99.9%. The Busbars shall be with 4 conductor (3P+N) configurations to suit single phase & three phase supply, the cross-section of neutral bar being equal to the cross-section of the phase bar. The conductors are spaced with plastic insulators reinforced with 20% Glass fibre. The insulators have V1 self extinguishing degree (as Per UL94) and are in compliance with the incandescent wire test as per EN 60695-2-1.			
7	The electrical insulation between the conductors and enclosure to be ensured by suitable air distances maintained by insulators.			
8	PLUG-IN-BOXES:			
9	All tap-off boxes shall have protective conductor which is the first to make an electrical connection when plugged into the outlet, and the last to disconnect when the tap-off is unplugged.			
10	TYPE TEST			
11	The bidder shall furnish two copies of type test certificate issued by LOVAG/ ASTA/ KEMA/ CPRI or any reputed national /International authorities along with the bid for the following: a) Short time Current b) Temperature Rise Test			

*Equivalent power cabling of data center standards can be done through cables in cable troughs or trays in place of busbar

EARTHING

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Electrical installation shall suitably be earthed as per IS: 3043 and with subsequent amendments, as applicable.			
2	All earthing conductors shall be of high conductivity copper or GI as required /specified and shall be protected against mechanical damage and corrosion. The connection of earth continuity conductors to earth bus and earth electrode shall be strong and sound and shall be easily accessible. The earth conductors shall be rigidly fixed to the walls, cable trenches, cable trays or conduits and cables by using suitable clamps.			
3	Main earth bus shall be taken from the main medium voltage panel to the earth electrodes. The number of electrodes required shall be arrived at taking in to consideration the anticipated fault on the medium voltage network.			
4	All the sub-mains and sub-circuits shall be provided with earth continuity conductors as specified and connected to the main earth bus. Earthing conductors for equipment shall be run from the exposed metal surface of the equipments and connected to a suitable point on the sub -main or main earthing bus.			

5	All switch boards, distribution boards and isolators, disconnect switches shall be connected to the earth bus. Earthing conductors shall be terminated at the equipment using suitable lugs, bolts, washers and nuts. All conduits, cable armor, raceways, rising mains, metal boxes, panel boards etc., shall be connected to the earth all along their run by earthing conductors of suitable cross sectional area			
6	Sprinkler pipes, water pipes, steel structural elements, lighting conductors shall not be used as a means of earthing an installation. The electrical resistance of earthing conductors shall be low enough to permit the passage of fault current necessary to operate a fuse / protective device / a circuit breaker and shall not exceed 1 Ohm.			

LIGHT FIXTURES

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Light: The light shall be Power LED type.			
2	All this shall have proper earthing facility to take care for eddy currents. The fixtures to be fixed to the false ceiling shall have a clip-on mechanism for fixing. The fittings shall be mounted with G.I chain fixed with anchor bolt to the ceiling. All the fixture shall be with loop in or loop out wiring facility.			
3	LED Light fixture should be surface mounted (600 mm x 600mm) 2 x 24 watts			
4	Wiring shall be carried out with FRLS wires in conduits. All wires in a conduit shall be drawn simultaneously.			

FALSE CEILING

S. No.	Technical Specification	Compliance (Yes/No)	Deviation, if any	Remarks
1	Type: Grid type, 600 x 600 mm			
2	Material: Mineral Fibre			
3	Surface: Plain/Superfine perforation; Edge: Tegular			
4	Color: White			
5	Grid system : 15 mm			
6	Maintenance: Each tile should be easily replaceable.			
7	Layout: To be submitted with bid.			

FIRE RATED METAL DOORS

S. No.	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
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1	Providing and fixing of Hollow metal fire rated doors as per IS 3614 part-1 & part-2 for stability and integrity. Pressed Galvanized steel confirming to IS 277. Datasheet / catalogue to be enclosed.			
2	Fire door shall have vision panel.			
3	Door frame shall be double rebate KERF frame profile of size 143 x 58mm made out of 1.60 mm (16 gauge) minimum thick galvanized steel sheet.			
4	Door leaf or Single leaf shall be 46mm thick fully flush double skin door with vision lite. Door leaf shall be manufactured from 1.2 mm (18 Gauge) minimum thick galvanised steel sheet.			
5	The infill material shall be resin bonded honeycomb core.			
6	Vision lite or equivalent wherever applicable should be provided as per manufacturer's recommendation with a beading and screws from inside. The glass should be 6mm clear borosilicate fire rated glass of relevant rating of the door.			
7	All doors and frames shall be finished with polyurethane aliphatic grade paint of approved colour. The door leaf and frame shall have passed minimum 250 hours of salt spray test.			
8	The shutter shall be mounted with SS- 304 grade ball bearing butt hinges.			
9	Door Closer shall be heavy duty type.			
10	Doors shall have stainless steel 304 grade, 250mm x 19 mm D type pull handle with rose and necessary screw as required.			
11	Emergency Exit should have panic bar fitted from inside.			
12	Door sizes shall be as per approved layout and bill of material.			

FIRE DETECTION AND ALARM SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Control Panel : The control panel shall be microprocessor based using multiple microprocessors throughout the system providing rapid processing of smoke detector and other initiation device information to control system output functions.			
1.1	There shall be a watchdog circuit, which shall verify the system processors and the software program. Problems with either the processors or the system program the panel shall activate a trouble signal, and reset the panel.			
2	The system modules shall communicate with an RS 485 network communications protocol. All module wiring shall be to terminal blocks.			
2.1	The control panel shall be equipped with four Form C relays for alarm, trouble, supervisory, and programmable output.			

3	Manual call points : Manual call points should be located at key locations and as per best practices. MCP's shall be 'PULL' type and installed with proper signage.			
3.1	Manual stations shall contain the intelligence for reporting address, identity, alarm and trouble to the fire alarm control panel. The manual station communications shall allow the station to provide alarm input to the system and alarm output from the system within less than four (4) seconds.			
3.2	The manual station shall be equipped with terminal strip and pressure style screw terminals for the connection of field wiring.			
4	Smoke detectors : d. The smoke detector shall be an intelligent digital photoelectric detector with a programmable heat detector. Detectors shall be listed for use as open area protective coverage, in duct installation and sampling assembly installation and shall be insensitive to air velocity changes. The detector communications shall allow the detector to provide alarm input to the system and alarm output from the system within four (4) seconds.			
4.1	The detector shall have LED indicator.			
4.2	The detector shall be RoHS-compliant: it shall meet standards for Reduction of Hazardous Substances (RoHS) by reduction in lead content.			
4.3	The detector shall be UL listed for operation in a 95% relative humidity (RH) environment.			
5	Heat Detector : Thermal Detectors shall be rated at 135 degrees for fixed temperature. Detectors shall be constructed to compensate for the thermal lag inherent in conventional type detectors due to the thermal mass, and alarm at the set point of 135 degrees Fahrenheit. The choice of alarm reporting as a fixed temperature detector shall be made in system software and be changeable at any time without the necessity of hardware replacement. The detectors shall be installed according to the requirements of NFPA 72 for open area coverage.			
6	Monitor Module : The two-wire addressable monitor module shall mount in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box or with an optional surface back box.			
7	Control Module : Addressable control modules shall be provided to supervise and control the operation of one conventional devices of compatible, 24 VDC powered polarized audio/visual notification appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay.			

8	Isolator Module : Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on a loop Class A. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the loop segment or branch.			
9	Audible alarms : Electronic sounders shall be fitted with flashing light and adjustable sound outputs.			
10	All manual call points and automatic fire detectors when operated result in the correct text & zone indications at all necessary indicating equipment.			

FIRE SUPPRESSION SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Supply and Installation of In-Panel Tube based fire suppression system for electrical LT panel.			
2	2 Kg, HFC-236 CA, Fire Extinguisher with Kit. Clean Agent HFC 236fa DLP with Zero Ozone Depletion Potential. Container along with valve assembly.			
3	Pressure Switch to monitor pressure in the tube, switch point 11 Bars.			
4	Heat Sensor tube for automatic fire suppression system made by special modified Polyamide (PA), Color Black, High grade HR quality, UV Stabilized, Inner diameter 4mm, Outer Diameter 6 MM.			
5	End of Line adapter for Pressure gauge fitting for Automatic fire suppression tube used for fitting at the end of the tube for pressurizing and re pressurizing the tube.			
6	End of Line Plug for Automatic fire suppression tube used for fitting at the tube end to terminate the point.			
7	T connection for pressurized tubes, nickel plated material with elastomeric sealings.			
8	2 Core x 1.5 sq. mm flexible cable with conduit			
9	Alarm Kit			
10	5 Kg, ABC Type Wall Mount Fire Extinguisher			

ACCESS CONTROL SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
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1	The biometric finger print and proximity card reader shall have a transaction storage capacity.			
2	The biometric reader shall have verification time not be more than 1 second.			
3	The reader should have CE & FCC certifications. UL certifications will be preferred.			
4	Smart Cards compatible with the system shall be provided as per bill of material.			
5	The biometric reader shall be integrated with the BMS/DCIM monitoring system.			
6	All the necessary hardware, software with its cabling are to be supplied and installed.			
7	The access control mechanism must have biometric as well as proximity card readers.			
8	The biometric reader shall have an on-board controller for standalone operation and shall also be network capable.			

RODENT REPELLENT SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	Digital Technology			
2	Safety Compliance as per IRPA Guidelines			
3	Networkable on RS-485 with support of Hardware third party BMS integration via Modbus & potential free NO-NC contacts			
4	Auto & Manual mode of operation			
5	Audible testing of Transducers			
6	Minimum Number of Wave Speed Options: 3			
7	Minimum Number of Wave Density Options: 4			
8	Minimum Number of Wave Frequency Bands: 4			
9	Password protection Controller			
10	Minimum number of Transducers supported: 12			
11	Maximum Power Consumption: 15 Watt			
12	Minimum Area coverage per Controller: 3600 Sqft per dedicated connection			
13	Minimum Area coverage per Transducers: 150 Sqft Above False Ceiling, 300 Sqft below False Ceiling & 150 Sqft below False Floor			
14	Transducers Sound Output: 50 to 110 dB (Verifiable)			
15	Transducers Power Output: 800 mW			
16	UL Listed			

NETWORK CABLING

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	12 Core, OM3 indoor fibre, unarmoured			
1.1	The cable consists of a number of 900µm tight buffered optical fibres reinforced with aramid yarns and sheathed in a flame retardent Low Smoke Zero Halogen compound.			
1.2	Graded Index 50/125um fibre is proven to satisfy Gigabit, 10Gigabit, 40Gigabit (40GBASE-SR4) and 100Gigabit (100GBASE-SR10) Ethernet applications.			
1.3	It should also features a “dry” water blocking system to prevent the flow of water along the cable in the event of sheath breach.			
1.4	Max. Attenuation; At 850 nm: 2.5 dB/km At 1300 nm: 0.7 dB/km			
1.5	Min. Bandwidth; At 850 nm: 2000 MHz/km At 1300 nm: 500 MHz/km			
1.6	Fibre Insulation: Coloured Nylon			
1.7	Reinforcing: Aramid Yarns			
1.8	Sheath: LSZH Black			
1.9	Max. Tensile Strength-Short Term: 0.6kN			
1.10	Crush Resistance-Short Term: 1.0 kN/100mm			
1.11	Core Diameter: 50±2.5µm			
1.12	Cladding Diameter: 125±2.0µm			
1.13	Min G-Ethernet Transmission Distance at 850/1300nm: 970/600m			
1.14	ISO/IEC 11801:2002 - 2nd Edition, Type OM3; AS/ACIF S008; AS/NZS 3080:2003, IEE 802.3ba			
2	24-port, drawer type LIU loaded with multimode SM-SC adapter and SM pigtail			
2.1	Configurable Fibre drawer is a 1U rack mount unit for storing and terminating incoming fibre cable.			
2.2	Configurable. Fits up to four 6 Pak Plates/ Angled 6 pak plates			
2.3	Management rings within system to accommodate excess fibre cordage behind the trough adapters and maintain fibre bend radius.			
2.4	Accommodates single mode and multi mode fibres			
2.5	Adhesive labelling for port identification			
2.6	Sliding drawer for ease of reconfiguring fibres			
2.7	Rugged steel construction finished in attractive			
2.8	Accommodates 2 x 12 fibre Splice Trays			
2.9	Material: Powder coated mild steel			
2.10	Accommodation: 24 Port (Using 6 Pak Plates)			
3	SC-LC, OM3 patch chord, 3 mtrs			
3.1	Optical Fibre Patch Cords are LS0H jacketed as standard.			

3.2	factory –controlled performance in a variety of connector, ISO performance standards			
3.3	100% Factory Tested – Guaranteed performance			
3.4	LS0H Jacket Standard – Reduces toxic/corrosive gasses emitted during combustion.			
3.5	Commercial Standards ISO/IEC 1108:2008, ANSI/TIA/ EIA 568.C.3, ANSI/TIA/EIA-492, TELECORDIA GR-409, ICEA-596			
3.6	Cordage O.D.:2.0mm+/-0.1mm x 4.1mm +/- 0.2mm			
3.7	Buffer Diameter: 900µm			
3.8	Primary Coating : 245µm			
3.9	Strength Member: Aramid Yarn			
3.10	Jacket Material: LS0H IEC 61034-1 & 2, IEC-60332-1, IEC-60754-1 & 2			
3.11	Minimum Bend Radius Install: 3.0cm.			
3.12	Long Term Bend Radius: 2.0cm			
3.13	Max. Attenuation @ 850 nm: 3 dB/Km @1300nm : 1.5 dB/Km			
4	UTP Cat 6 patch chord, 3 mtrs			
4.1	4 Pair 24AWG stranded copper wire with ROHS Compliant			
4.2	Transparent Plug with anti-snag slip on boots			
4.3	RJ45 Plug standard is ISO/IEC 60606-7-4 and FCC 47 Part 68			
4.4	LSZH Sheathe			
4.5	Cross / Star Spine to separate 4Pairs Patch Cords			
4.6	ETL Certified with ANSI/TIA-568-C.2, ISO/IEC 11801 Category 6 standards			
5	Cat 6 Information Outlet			
5.1	Cat 6 jack should designed to maintain clean secure connections. The RJ-45 jack features ‘spring-loaded shutter’ which protects it from dust and contaminants as well as provides tactile feedback –the spring-loaded shutter pops out an improperly seated patch cord–all with single-handed plug-in and removal.			
5.2	200 termination cycles wire terminal			
5.3	750 mating cycles			
5.4	Polycarbonate, UL94V-0 rated or equivalent plastic housing			
5.5	IDC Contact Plating is Tin/Lead Plate			
5.6	ROHS/ELV Compliant			
6	2-port faceplate			
6.1	Colour of the Jack should be visible to identify the application of Data, Voice and Redundant Port			
6.2	White coloured Face Plate			
6.3	Fire Retardant grade			
6.4	Made of PS / ABS Rugged plastic with ROHS Compliant			

6.5	Capable of supporting – UTP Jack, STP Jack, Fiber Coupler and Coax Connector.			
7	CAT 6 UTP Cable			
7.1	Should meet minimum Category 6 requirements			
7.2	4 Pair 23 AWG Solid Copper Conductors with FR Grade			
7.3	Characterised to 600Mhz			
7.4	ETL Certified ANSI/TIA-568-C.2, ISO/IEC 11801 and EN50173-1 Category 6			
7.5	FR-PVC Jacket			
7.6	Separator of Cross / Star Spine to separate 4Pairs UTP Cable			
7.7	Should have Cable Pull Tension Thread inside the UTP Cable			
7.8	UL Listed and ROHS Compliant			
7.9	Outer Dia (+ or - 0.15mm): 6.2 mm			
8	CM Rated - For Horizontal Cabling			
8	24-port unloaded modular straight jack panel, 1U with rear cable manager			
8.1	Individual Compatible RJ45 Jack			
8.2	Material: CRS - Cold Rollrd Steel (Thickness - 1.5mm) with ROHS Compliant			
8.3	19" Width, 1U Height / 1.75Inch			

CCTV SYSTEM

Sn	Technical Specification	Compliance (Yes / No)	Deviation, if any	Remarks
1	2 MP full HD IR fixed dome / bullet camera			
1.1	Image Sensor : 1/2.8" Sony Exmor CMOS			
1.2	Core Processor : ARM9 Architecture			
1.3	Signal System : PAL/NTSC			
1.4	Min. Illumination : Color: 0.01 Lux @(F1.2, AGC ON), B/W: 0.01Lux @(F1.2, AGC ON); 0 Lux with IR			
1.5	Lens : 2.8mm/4mm, Angle of View: 90°/74°			
1.6	Auto Iris : DC drive			
1.7	Day & Night : IR Cut Filter with Auto Switch			
1.8	WDR : 100 dB			
1.9	Video Compression : H.264/MJPEG			
1.10	Max. Image Resolution : 50Hz: 25fps (1920x1080), 25fps (1280 × 720)			
1.11	Frame Rate : 60Hz: 30fps (1920x1080), 30fps (1280 × 720)			
1.12	IVA features : Smart Defog, High Light Compensation, Electronic Image, Stabilizer, ROI (4 Zones), Privacy Masking (4 Zones), Tripwire and Perimeter, corridor mode,			
1.13	System Compatibility : ONVIF (Profile S) , CGI			
1.14	Power Supply : 12 VDC ± 10%, PoE (802.3af)			
1.15	Power Consumption : Max. 4W			

1.16	Impact Protection : IP 66			
1.17	IR Range : Upto 50 m			
1.18	Certification : CE, FCC			
2	16 channel NVR			
2.1	Video Input : 16CH (4096×2160, 2592×1944, 2048×1536, 1920×1080, 1280×960, 1280×720, etc)			
2.2	Video Output : 1 VGA, 1 HDMI			
2.3	Audio Input : 1 Port RCA			
2.4	Audio Output : 1 Port RCA(Linear, 1kΩ) ; 64 kbps			
2.5	Audio Compression standard : G711u,G711a			
2.6	Motion Detection : 16 Channel, MD Zones: 396 (22 × 18)			
2.7	Trigger Events : Recording, Email, FTP, Snapshot, Buzzer and Screen Tips, alarm output			
2.8	HDMI1 : Resolution:4K (3840 × 2160)/30Hz, 4K (3840 × 2160)/30 Hz, 1920 × 1080/60Hz, 1280 × 1024/60Hz, 1280 × 720/60 Hz, 1024 × 768/60Hz			
2.9	VGA : Resolution:1920 × 1080/60Hz, 1280 × 1024/60Hz, 1280 × 720/60Hz, 1024 × 768/60Hz			
2.10	Digital Zoom : Yes			
2.11	OSD : Camera Title, Time, Video Loss, Recording, Motion Detection			
2.12	Video Compression : H.264/H.265			
2.13	Record Rate : NTSC: 4k@8×30fp,5MP@9×30fp,4MP@9×30fp,3MP@9×30fp,1080P@9×30fp, 960P@9×30fp, 720P@9×30fp, D1 @9×30fp			
2.14	Decode Capability : 1CH 4K(3840×2160)@30fps			
2.15	Backup Mode : USB Device / Network			
2.16	Capacity : Upto 6 TB storage			
2.17	USB Interface : 2 USB 2.0 Interfaces			
2.18	Certification : CE, FCC, ISO, BIS			
3	16 port PoE switch			
3.1	802.3af/802.3at PoE : 16			
3.2	10/100BASE-TX PoE Ports : 16			
3.3	10/100/1000BASE-T Ports : 2			
3.4	SFP Fiber port : 1			
3.5	Maximum Frame Size : 9216 bytes			
3.6	MTBF : 1,90,000 hours (21years)			
3.7	PoE Power Output : Per port 54V DC, 300mA. max. 15.4 watts (IEEE 802.3af) Per port 54V DC, 600mA. max. 30 watts (IEEE 802.3at)			
4	IP CCTV for the facility should be designed in a way that all critical areas are adequately covered under surveillance.			

ALLIED TECHNICAL DETAILS

Institute intends to setup a very high energy efficiency tier III data center. The scope shall involve carefully reading and understanding the document, system design including design calculations based on the requirements, specifications, and system descriptions provided in the document, resolution of any doubts through pre-bid queries and site survey for first-hand site measurements, assessment of site conditions etc., supply of components and equipment, their assembly and integration, installation services, testing and commissioning of the data center, required training of technical personnel and providing necessary warranty services as per the document.

Data center modules and artificial intelligence based hybrid air-conditioning are the key technologies which shall be implemented in the institute data center for achieving the goal of very-high energy efficiency. These are described below:

Data Center Modules

The server room of the data center shall be equipped with two server modules having 08 nos. of 42U 600mm x 1000mm server racks each with a provision for placing two additional identical server modules in future with sufficient room for movement. The network and telecom area of the data center shall be equipped with one network module having 06 nos. of 42U 800mm x 1200mm network racks. The racks shall be accessible from the front and rear from inside the modules. The doors shall have vision glass. The average load per rack shall be ~5 kW. The hot and cold aisles shall be contained. The data center modules shall be designed for Tier III, suitable for outdoor operation in harsh tropical environment and be a complete integrated unit comprising of the following:

- (a) Racks with perforated front and rear doors, 2 nos. of vertical metered PDUs, cable management, and blanking arrangement
- (b) Electric power distribution panel
- (c) Rack and module access control – proximity card based door access module, door open and close sensors and alarms
- (d) Fire detection and alarm system – racks to be equipped with 3 nos. Of smoke and heat sensors each. Audio, visual alarms to be provided outside the module. At least 3 mcps per module.
- (e) Automatic fire suppression system – racks to be equipped with 3 nos. of clean agent gas discharge nozzles for automatic fire suppression.
- (f) Water leak detection systems
- (g) Rodent repellent system
- (h) CCTV surveillance – 2 cameras in each aisle – 30 days footage storage
- (i) Environment sensors in the module & racks – temperature, humidity and water leak sensors as per relevant ASHRAE recommendations
- (j) Other sensors – differential pressure across each rack and airspeed.
- (k) Remote interface for monitoring and control – all sensors and systems except surveillance shall interface with the centralized data center infrastructure management.

To be enclosed with technical bid:

- (k) Design and drawing of the module
- (l) Placement of 2 and 4 nos. of server modules inside the server room
- (m) Power and air-conditioning paths within the module
- (n) The centralized DCIM shall compute the air flow and heat transfer across a rack based on the monitored parameters. The neat derivation of the corresponding formulae to be enclosed. Any assumptions should be clearly defined.

Hybrid air-conditioning

The temperature and humidity inside the modules should be maintained in the range defined in the relevant ASHRAE guidelines for class A1 mission critical facilities, data centers. The hybrid air-conditioning setup shall comprise of a combination of evaporative cooling and cooling / dehumidification based on the vapor compression cycle. The multi-stage system shall comprise of a direct evaporative cooling stage followed by an indirect evaporative cooling stage, an on-demand dehumidification stage and a chilled water stage. The setup shall have a feedback system for controlling temperature and humidity based on artificial intelligence.

To be enclosed with technical bid:

- (a) Cooling system design with details of different stages
- (b) Design calculations for system component sizing
- (c) Thermal performance and energy efficiency analysis
- (d) Details of AI based control system with analysis

DCIM shall interface with

- (i) Rack PDUs
- (j) Main LT panel
- (k) Electric panels of modules
- (l) DG sets
- (m) UPS systems
- (n) Hybrid air-conditioning system
- (o) Sensors and systems inside the modules as described
- (p) Level sensors in liquid storage tanks

DCIM shall store sensor data for 3 years.

To be enclosed with technical bid:

- (c) DCIM architecture and components
- (d) Complete list of parameters monitored through DCIM

Remaining supplies and services are relatively simple and their details can be had from the technical specifications and/or the schedule of requirements.

CIVIL & INTERIOR WORKS

Entire Data Centre is logically divided in Zones.

- Zone A** - Comprises of the Server Room which shall host the Data Center Server Modules.
- Zone B** - Includes the Monitoring, Telecom, Network, Staging and the Entrance Rooms.
- Zone C** - This shall include the Electrical & UPS rooms.

Scope of Civil & Interior Work

The scope for civil work in this tender is to furnish the facility area in all aspects. Details are provided in the Schedule of Requirements.

All material to be used shall be of approved quality ISI mark unless otherwise specified. The bidder should adhere to the civil and interior specifications mentioned including compliance. Some key points are discussed.

Trench for cables and pipes

Trench may be required to be made at suitable places for cables to be laid from DG area / Substation to LT panel room and other areas, as per site requirement. Same is in Bidder's scope. Trench shall be minimum 1.5' wide and 3-4' deep as per site requirement. The bed of the trench has to be filled in with sand and brick. The top of the trench should be flushed with the ground level. Trench should be easily serviceable, as and when required. Enough care should be taken not to damage any existing pipes, wires, cables that comes in the way of trench. Any damage done to existing structure has to be repaired and charges borne by the bidder. Cables shall be drawn through PVC ducting / DWC pipes / Cement Hume Pipes of appropriate diameter. The trench routes shall be marked using cable route markers every 5-6 m or so taking special care of turnings etc.

Minor Landscaping

Minor landscaping works around the DC building may be considered, as per site conditions.

Ramps and Steps

All ramps should have MS railings. All MS structures including all existing metal structures in the Data Center to be painted suitably to prevent rusting.

Painting & POP

Anti-dust type, odorless, low VOC painting shall be used for the entire datacenter. Paint color shall have to be duly approved before procurement and application. All brick walls and partitions to be applied with two (02) coats of paint. A third coat may be applied, if required, during final handover.

Gypsum / Plaster of Paris / putty paste of thickness 5 - 8 mm punning over cement plaster /primer shall be provided so as to ensure a level and smooth texture to the exposed walls and columns. The existing surfaces are to be cleaned and scratched and markers kept before the application of punning material. After the material has dried upon application, it is to be smoothened by means of rubbing it with sandpaper. Upon this smoothened surface one coat of primer and two coats of acrylic paint of approved make & shade is to be applied. This will be applicable for all vertical plane surfaces. Server, UPS and Electrical rooms shall additionally include the roof surface. All outdoor walls and roof surfaces shall be painted with sun reflective coating.

Partition Walls

Partition walls, wherever required (battery, UPS, network and telecom rooms shall be full-height and made of brick like other internal walls.

Fire Rated Metal Doors

Fire rated single /double leaf metal doors of required size as per schedule of requirement with 2 hours fire rating, along with the required framework, vision panel, handle, locking system, top patch and bottom patch, hardware, etc as per the technical specifications, to be provided and fixed. Details along with drawings to be submitted with the technical bid.

Fire Exit

A suitable fire exit with panic bar to be provided from the Server Farm area.

Signage

Signage plays an important role in the datacenter physical infrastructure. They communicate with the user and make information visible. Appropriate signage to be designed and fitted in all the server room and associated areas. The signage should be made out of acrylic board with vinyl pasting on both sides. Directional signage shall have proper arrows. Color codes chosen should be as per standards. LED signage should be used in appropriate places. All signage to be hung from the ceiling or fixed to the ceiling grid through proper fasteners. All rooms should have room labels and door signage.

Large format wall mount displays to be mounted at suitable places. Drawings which is generally used to display a system, e.g, Emergency Evacuation Plan, Electrical Distribution System, Fire Detection and Alarm System, etc.

False Ceiling

Required in Monitoring and Entrance Rooms. Bidder can propose in other areas like server room if there is a functional requirement.

False Floor

Bidder can propose a suitable false floor if there is a functional requirement.

Rack Placement

It is proposed to provide minimum 16 Racks in the Server Room in Phase-1 and another 16 Racks in Phase-2 along with all necessary cooling systems. Two rack modules shall comprise of 8 racks each while one would comprise of 6 racks. The units shall have redundant cooling units in N+1 or N+N and both hot & cold aisle containments. The design should be such that each rack module has at least 35kW of cooling without considering redundant units.

ELECTRICAL WORKS

The entire electrical distribution system of the data center physical infrastructure shall be designed for automatic switching (without manual intervention) to ensure a minimum power availability of 99.7 % annually. Sufficient redundancies and switchgear level spares to be incorporated in the design. The system should have sufficient capability to handle various electrical faults as well as surge voltages. Grounding to be done as per datacenter best practices.

The Institute shall be responsible for installing the necessary transformers. The total load of the data center physical infrastructure currently should not exceed 400 kVA. LT Power from the transformer shall have to be drawn by the bidder. The associated cabling along with all necessary switchgears shall be in the scope of the bidder.

For secondary power, we plan to install Silent Diesel Generators of 200 kVA in N+1 configuration.

DG Sizing (Peak Load)

Considering, the current estimated load, the current DG requirement would be 02 x 200 KVA, with one working and one standby which provides N+1 redundancy and operating at 85% load. In future, another 200 KVA DG to be added and synchronized so that they cater to the full DC load and operating as two working and one standby.

Electrical Scope of Work

The electrical work shall include the following:

- Main electrical panel
 - ☐ UPS Output Panel
- Raw & UPS Power Distribution Boards
- UPS point wiring
 - ☐ Light point wiring and light fixtures
- Power cabling for electrical equipments and utility points, etc.
- Separate earth pits for electrical equipments and racks.

The distribution of power from the UPS room to the following shall be considered:

- All proposed component for the environment controls
- UPS Power to the Racks
- Main UPS for the modules in N+1, each of minimum 20 KVA/20 KW with static bypass arrangement.
- Both sets of UPS would be connected in Load Bus Synchronization (LBS) configuration.
 - ☐ Auxiliary UPS in N+1, of minimum 10 KVA
- Sub distribution panels for UPS output.

The bidder is required to maintain two electrical distribution paths (one active & one redundant) for the cabling of Racks inside the server farm area.

Specifications for Electrical Cabling

Cables inside the Server Room shall be fire retardant type of rated capacity exceeding the power requirement of fully blown configuration of the existing and proposed component to be used. PVC insulated cables shall be used in rest of the areas. For expansion needs suitable redundant power points to be provided at suitable locations. All materials used should conform to IS standards as per industry practice.

Bunching of Wires

Wires carrying current shall be so bunched in the conduit that the outgoing and return wires are drawn into the same conduit. Wires originating from two different phases shall not be run in the same conduit.

Drawing of Conductors

The drawing Aluminum / Copper conductor wires shall be executed with due regards to the following precautions while drawing insulated wires in to conduits. Care shall be taken to avoid scratches and kinks, which cause breakages.

Joints

All joints shall be made at main switches, distribution boards, socket outlets, lighting outlets and switch boxes only. No joints shall be made inside conduits and junction boxes. Conductors shall be continuous from outlet to outlet.

Mains & Sub-Mains

Mains & sub-mains wires where called for shall be of the rated capacity and approved make. Every main and sub- main shall be drawn into an independent adequate size conduit. Adequate size draw boxes shall be provided at convenient locations to facilitate easy drawing of the mains and sub-mains. An independent earth wire of proper rating shall be provided. The earth wires shall run along the entire length of the mains and sub-mains.

Load Balancing

Balancing of circuits in three-phase installation shall be planned before the commencement of wiring.

Color Code of the Conductors

Color code shall be maintained for the entire wiring installation, Red, Yellow, Blue for three phases and “OFF” circuit black for neutral and green for earth (or bare earth).

Fixing of the Conduits

Conduits junction boxes shall be kept in position and proper holdfasts shall be provided. Conduits shall be so arranged as to facilitate easy drawing of the wires through them. Adequate junction boxes of approved shape & size shall be provided. All conduits shall be installed so as to avoid steam and hot water pipes. After conduits, junction boxes, outlet boxes & switch boxes are installed in position their outlets shall be properly plugged so that water, mortar, insects or any other foreign matter does not enter into conduit system. Conduits shall be laid in a neat and organized manner as directed and approved. Conductors shall be planned so as not to conflict with any other service pipe lines / ducts.

Protection

To minimize condensation or sweating inside the conductors all outlets of conduit system shall be adequately ventilated and approved by the proper competent authority. All screwed and socketed connections shall be adequately made fully water tight by use of proper jointing materials.

Switch-Outlet Boxes and Junction Boxes

All boxes shall conform to all prevailing Indian Standards. The cover plates shall be of best quality Hylam sheets or ISI grade Urea Formaldehyde Thermosetting insulating material, which should be mechanically strong and fire retardant. Proper support shall be provided to the outer boxes to fix the cover plates of switches as required. Separate screwed earth terminals shall be provided inside the box for earthing purpose.

Inspection Boxes

Rust proof inspection boxes of required size having smooth external and internal Finish shall be provided to permit periodical inspection and to facilitate removal and replacement of wires when required.

Earthing

All electrical components to be earthed by connecting two earth wires / taps from the frame of the component ring will be connected via several earth electrodes. The cable arm will be earthed through the cable glands. Earthing shall be in conformity with provision of rules 32, 61, 62, 67 & 68 of Indian Electricity rules 1956

and as per IS- 3043. The entire applicable data center physical infrastructure in the facility shall be earthed.

Testing of Earth continuity path

The earth continuity conductor including metal conduits and metallic envelopes in all cases shall be tested for electric continuity and the electrical resistance of the same along with the earthing lead but excluding any added resistance or leakage circuit - breaker measured from the connection with the earth electrodes to any point in the earth continuity conductor in the completed installation shall not exceed one mega ohm.

Earthing Conductors

All earthing conductors shall be of high conductivity copper or GI as required /specified and shall be protected against mechanical damage and corrosion. The connection of earth continuity conductors to earth bus and earth electrode shall be strong and sound and shall be easily accessible. The earth conductors shall be rigidly fixed to the walls, cable trenches, cable trays or conduits and cables by using suitable clamps.

- ☐ Main earth bus shall be taken from the main medium voltage panel to the earth electrodes. The number of electrodes required shall be arrived at taking in to consideration the anticipated fault on the medium voltage network.
- ☐ All the sub-mains and sub-circuits shall be provided with earth continuity conductors as specified and connected to the main earth bus. Earthing conductors for equipment shall be run from the exposed metal surface of the equipment and connected to a suitable point on the sub -main or main earthing bus. All switch boards, distribution boards and isolators, disconnect switches shall be connected to the earth bus. Earthing conductors shall be terminated at the equipment using suitable lugs, bolts, washers and nuts. All conduits, cable armor, raceways, rising mains, metal boxes, panel boards etc., shall be connected to the earth all along their run by earthing conductors of suitable cross sectional area. Sprinkler pipes, water pipes, steel structural elements, lighting conductors shall not be used as a means of earthing an installation.

The electrical resistance of earthing conductors shall be low enough to permit the passage of fault current necessary to operate a fuse / protective device / a circuit breaker and shall not exceed 1 Ohm.

LT Panel

LT utility power from the transformers and secondary power from the DG sets shall be terminated in the A & B sides of the LT panel. The A and B side busbars shall be electrically / manually interlocked. The LT Panel shall provide power to further electrical distribution units like the UPS, raw power DB's, precision and comfort AC's.

The LT panel, shall be metal clad, totally enclosed, rigid, floor mounting, air insulated, cubical type for use on 415 volts, 3 phase, 4 Wire 50 cycles system. The equipment shall be designed for operation in high ambient temperature and high humidity tropical conditions. Means shall be provided to facilitate ease of inspection, cleaning and repairs.

Power from the main UPS will be fed to an UPS output DB from where it shall be distributed further to the distribution units of Racks, light, fire & security systems, among others.

Power distribution units

Distribution boards shall be suitable for 230 volts single phase A.C. supply as required. Distribution board shall generally conform to IS: 2675. The power distribution units shall have a main incomer and suitable no of outgoing of appropriate rating. The units shall be wall mounted and flushed with the top cover above the wall surface. Each breaker should have adjacent identification tag for rapid circuit ID identification. Power distribution to the racks shall be through power raceways with endfeed units.

Low Voltage Cables

Low voltage cables shall be copper conductor (unless otherwise specifically mentioned for Aluminum), PVC /XLPE insulated and will be of FR / FRLS type. PVC sheathed and steel wire armored or steel tape armored construction. The conductors of cable from 16sqmm size shall be stranded. Sector shaped stranded conductors shall be used for cables of 50sqmm size and above. The cable shall conform to IS – 1554 part -I in all respects.

The XLPE cables shall be ST HR inner sheathed ST2 - FRLS outer sheathed as per IS – 7098 (Part-1) wire stripped.

Rating: The cable shall be rated for a voltage of 1100 volts.

Core Identification: Cores shall be provided with the following color scheme of PVC insulation.

- ☐ 1 Core: Red/Black/Yellow/Blue OR proper identification with heat shrinkable sleeve at the termination ends and at every 1 meter interval in case of black cables.
- ☐ 2 Cores: Red and Black
- ☐ 3 Cores: Red, Yellow and Blue
- ☐ 3 1 / 2 / 4 Core: Red, Yellow, Blue & Black.

Cables and other items:

- Specifications for XLPE Cables: IS 7098 part-1-1988
- Specification for PVC insulated: IS 1554 -1964 (Heavy duty) electric cables Part - I for voltage up to 1100 Volts.
- Specifications for PVC insulated: IS 694 – 1988 for voltage up to 1100V Part - II With aluminum conductors.
- Code of practice for safety of buildings: IS 1646 -1961 (General) Electrical installation.
- Single phase neutral conductors shall be sized throughout to carry the full design load current and shall not be less than the full size of the phase conductors. Neutral conductors shall not be shared between circuits. All 3 phase neutral conductors shall be rated at 150 % of the phase current. No cable joins are to be used

Cable Trays:

Cables shall be laid on cable trays. The cables laid shall be securely fixed to the Cable trays by means of lockable nylon ties. After laying the cables the cable shall be securely fixed by using 25x3mm GI strips and bolted to the cable tray. The cost of the nylon ties and the overlapping GI strip shall be included in to the laying cost of the cable as no separate payment will be made for the overlapping strip and nylon ties. Cables installed on trays or ladder shall be laid in a single layer, leaving 25% of the tray or ladder width as spare capacity for further use. Single core cables forming part of a three phase circuit shall be run in trefoil formation.

Cable Terminations:

Each termination shall be carried out using brass compressions glands and cable sockets. Hydraulic crimping tool shall be used for making the end terminations. Cable gland shall be bonded to the earth by using suitable size G.I wire / tape.

LIGHTING AND LIGHT FIXTURES

It is proposed to have LED lighting system for the entire datacenter. These should be preferably fitted with proximity detectors to turn the lights on when someone enters an equipment area, and off again when no motion occurs for a predetermined interval. The Server farm should be properly lit. A minimum of 500 lux at 1 meter distance should be maintained. In rooms without false ceiling, light fixtures are to be hung from the ceiling and at 1000 mm above the racks or equipments.

Light fixtures shall be recessed mounted and suitable for installation in grid false ceiling. Following should be taken care of -

- ☐ The fixtures should have proper earthing facility to take care for eddy currents.
- ☐ The fixtures fixed to the false ceiling shall have a clip-on mechanism for fixing.
- ☐ The fittings shall be mounted with G.I chain fixed with anchor bolt to the ceiling.
- ☐ All the fixture shall be with loop in or loop out wiring facility.
- ☐ Not more than two light fixtures should be connected in a single loop.
- ☐ Light fixtures should be non-glaring LED type.

UNITERRUPTED POWER SUPPLY

There shall be UPS systems in the facility to cater to the current IT load and which shall be drawing power from the Main LT Panel. The main UPS system shall cater to the IT load inside the Server Farm only. An auxiliary UPS system should be in place to cater to the UPS power requirement for the workstations, display units, fire and security systems and emergency lighting. The rating of the main UPS system is 20KVA.

The rating of the main UPS has been considered based on the current and future IT loads.

Battery backup of minimum 10 minutes on full load should be available with each UPS. Battery shall be 12V SMF type, as per specification, from reputed manufacturer's only. Common battery banks shall not be approved. The UPS system should ensure a minimum power availability of 99.9 % annually.

Ratings of the auxiliary UPS are 10 KVA. Battery backup of minimum 10 minutes on full load should be available with each UPS. Battery shall be 12V SMF type, as per specification, from reputed manufacturer's only. Common battery banks shall not be approved. The UPS system should ensure a minimum power availability of 99.9% annually.

Both the UPS and batteries should be included for one year comprehensive warranty / support. Service backup by engineer to be provided till system is fully operational.

Diesel Generator

The diesel generator set should be in redundancy mode. This should be as per N+1 redundancy requirement. It is proposed to have 250 kVA Silent DG Sets with all necessary accessories and as per specifications.

Scope of work

This specification covers the design, manufacture test at works, supply, installation testing and commissioning of 200 kVA Diesel Generating sets complete with all accessories like, starting batteries, control panel, interconnecting cable, tank, fuel/coolant/ exhaust pipes, silencer, anti vibration mountings, foundation etc.

- ☐ Silent Diesel General Sets, 200 kVA, with acoustic enclosure.
- ☐ Loading, Un-loading and mounting of DG Sets on the foundation base.
- ☐ Exhaust piping, as per required height, with insulation.
- ☐ Inbuilt fuel storage tanks.
- ☐ Manual fueling system.
- ☐ Electrical cabling, connectivity for monitoring.
- ☐ Installation, testing and configuration.
- ☐ Load balancing.
- ☐ Pollution clearance.
- ☐ Lube oil, first fill, for testing. Diesel to be provided or cost reimbursed by NIT .
- ☐ Comprehensive warranty for 12 months from the date of commissioning.

Standard

The generating set shall be designed, manufactured and tested in accordance with the latest revision of Indian standards.

General

The generating sets shall be robust in construction factory tested and assembled to ensure perfect alignment of Engine and Alternator on a common base frame. The base frame shall be fabricated out of adequate thickness rolled steel sections. The set shall be mounted on anti-vibration mounting to prevent transfer of vibration to the foundation and structures. The equipment shall be suitable for operating at a hot humid and saline atmosphere at an ambient temperature of 45 degree centigrade.

Detailed specifications are listed in the **SPECIFICATIONS & ALLIED TECHNICAL DETAILS** part of this

tender.

DATA CENTER COOLING

The racks shall be kept in a controlled temperature and humidity environment in accordance with the ASHRAE guidelines for Class A1 mission critical facilities. The proposed cooling solution should consider the energy efficiency of the cooling solution and the environmental impact also in terms of greenhouse warming and ozone depletion potential. The cooling has therefore been proposed to be in line with the green data center concept. The cooling system of the modules is accordingly based on a hybrid cooling system. The solution is to be designed in accordance with this requirement.

The work would include supply, installation, testing and commissioning of the hybrid cooling units with the rack module for effective and uniform distribution of cooling.

Cool air fed to the racks shall be from the top of the rack to take full advantage of cooling physics in a fully contained solution. The return air flow shall either be through the contained enclosures or ducts. There will be a minimum of eight (08) racks in a single server module and a minimum of six (06) racks in a single network module. All this ensures high efficiency and compliance with Tier-III requirements of TIA 942 standards.

The cooling units should have provision to be integrated to the DCIM.

The bidder will be required to design, supply, transport, store, unpack, erect and commission the cooling units for the data centre requirement.

The temperature and humidity inside the modules should be maintained in the range defined in the relevant ASHRAE guidelines for class A1 mission critical facilities, data centers. The hybrid air-conditioning setup shall comprise of a combination of evaporative cooling and cooling / dehumidification based on the vapor compression cycle. The multi-stage system shall comprise of a direct evaporative cooling stage followed by an indirect evaporative cooling stage, an on-demand dehumidification stage and a chilled water stage. The setup shall have a feedback system for controlling temperature and humidity based on artificial intelligence.

To be enclosed with technical bid:

- (e) Cooling system design with details of different stages
- (f) Design calculations for system component sizing
- (g) Thermal performance and energy efficiency analysis
- (h) Details of AI based control system with analysis

COOLING OF AUXILIARY SPACES

In the cooling of the auxiliary spaces in the data center we consider energy efficient cooling solution. The cooling system for auxiliary spaces is multi- stage combining an appropriate energy efficient and eco-friendly EC solution wherein a second vapor compression stage is used for handling peak loads only. The solution is to be designed in accordance with this requirement. The design basis and the detailed engineering calculations are to be included with the bid. A ductable CWC/DX solution is to be proposed for these spaces.

FIRE DETECTION AND ALARM

Fire can have disastrous consequences and affect operations of the critical data centre facility. The early detection of fire and employing means for automatic suppression of the fire is important for effective functioning. The critical area shall be divided into number of zones. Whenever fire is detected or sensed in any of the zones, annunciation should be available on the Fire Alarm Control Panel (FACP), and the appropriate suppression system in that particular zone should be deployed / activated immediately on confirmation of a real fire.

Additionally, the integrated IT racks shall have provision for fire detection and suppression. The fire detection sensors i.e., sensitive smoke detectors and gas discharge nozzles shall be mounted inside each rack. If smoke is

detected in a rack, the signal shall be communicated to the FACP which shall then activate visual and audible alarms and send SMS alerts through interface to a GSM modem. The FACP shall notify the Fire Suppression Control Panel (FSCP) which shall turn on the electric valve actuator and trigger the discharge of the gas into the affected zone. Appropriate clean agent gas shall be used for suppression.

Scope of Work

The scope of work for the fire detection and alarm systems would include:

- i) Fire detection and alarm systems with panel, detectors and other accessories for the integrated racks and the rest of the data centre facility.
- ii) Integration with the fire suppression system.

Following systems shall be installed.

1. Clean agent based fire suppression system for server racks
2. Fire detection and alarm systems, with detectors and panel.
3. Access control system.
4. Protected area: The entire enclosed volume of the equipment rack is protected with fire detection and fire suppression system. The front doors are secured by Access Control system.
5. The gas system is designed and installed as per applicable contemporary standards. Approved standards based gas cylinders are mounted on wall using appropriate clamps.

Detailed Specifications are as mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

FIRE SUPPRESSION SYSTEM

The scope shall include, design, supply, installation, testing and commissioning of gas based fire suppression system. The successful bidder shall make detailed working drawings and coordinate them with other agencies at site, if any.

The server racks and the equipments installed in them inside the Server farm should be protected by an automatic fire suppression system using gas. Design of the system shall be in accordance with NFPA guidelines. Appropriate clean agent gas shall be used for suppression.

The scope shall include design, supply, installation, testing and commissioning of piping system & manifold required for the gas based suppression system. ASTM 106, Grade-B, Schedule-40 seamless pipes shall be used for this purpose. All the equipment racks shall be protected by gas based fire suppression system. The gas system is to be designed and installed as per contemporary NFPA standards. Approved standards based gas cylinders are mounted on wall using appropriate clamps.

The bidder shall submit copies of the datasheets of the hardware used in the system. The bidder shall also submit copy of PESO approval letter or test report for the cylinder. These documents shall be attached to the bid.

The bidder shall also submit calculations to evidence the qty of agent considered for the system.

Detailed Specifications are as mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

RODENT REPELLANT SYSTEM Scope of Work

SITC of microprocessor based Master Controller with 16 X 2 LCD DISPLAY capable of operating in 4 ultrasonic frequency band spectrums. The controller should support upto 20 transducers in dedicated connection & 24 transducers in single loop @300 sq.ft each for Room Void Area & 150 sq.ft each for Ceiling & Floor Void each and networkable on RS 485 having facility to support hardwired third party BMS integration via Modbus & potential free NO-NC contacts. The system shall use UL and CE approved transformers for power supply.

Detailed Specifications are as mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

WATER LEAK DETECTION SYSTEM

Water leak detection System shall be designed to protect the critical area where the IT racks shall be installed

and to alert the personnel about the leak in the AC systems. The system shall be capable of interfacing to Water leak detection sensors, condensation sensors & I/O modules.

Events should be clearly reported on LCD/LED display with full English language description of the nature of the fault in the panel.

Detailed Specifications are as mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

INTEGRATED SERVER RACK

It is proposed to provide a minimum of 32 integrated server racks, 42U, (600 x 1000 mm) (16-Current+16 Future) in the server room and six (06) 42U, integrated server / network racks (800 x 1000 mm). The racks shall be integrated type with inbuilt hot and cold aisle containments. It should be possible to walk in these contained areas inside the module. The racks should be placed optimally to create a module of eight / six racks. Each block of eight racks should consist of AC units in N+N configuration.

Detailed Specifications of the integrated rack and its supportive accessories including rack power distribution units are as mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

LOCAL AREA NETWORKING

Entire passive cabling for data and voice in the data centre facility is to be provided in line with the suggested layout. All cables are required to be routed in cable wire baskets running over the racks – suspended from the ceiling. The cable wire ducts or baskets shall be customizable to accommodate large number of wires.

Detailed specifications for all passive cables and components are mentioned in **SPECIFICATIONS & ALLIED TECHNICAL DETAILS**.

ACCESS CONTROL SYSTEM

The access control system of the data centre will work at four (04) levels of physical access security, ensuring highest level of security to the data inside the equipment racks.

Level 1	:	Physical security at main entry.
Level 2	:	Module access control
Level 3	:	Electronic / biometric access control at Rack door level.

Scope:

- The scope of work shall cover supply, installation, testing and commissioning of access control system for the ICT modules and integrated racks, meeting the intent of the specifications.
- Additionally, it should be possible to integrate IP based intelligent locking / digital locking / number locking feature to the racks in future without any modification to the door.
- The system generally covers control of:
 - o Door entry with smart card readers.
 - o Door exit with smart card readers.
 - o Biometric access control for Server Module.
 - o Biometric / electronic access control at equipment racks..
 - o Emergency exit using panic / press bar.
- All access control doors should be provided with magnetic locks. Magnetic locks should be of reputed makes and as per specification. There should be no access control or magnetic locks on fire exits.
- The scope of work shall also cover field training of concerned institute staff representatives for a period of 5 working days or as required on the operation and maintenance of the system during normal and emergency conditions and also include the Annual Maintenance as required.

ACCESS CONTROL SYSTEM

Bidder shall propose access control system for the modules and the racks. Such system shall have a separate control panel and powered by auxiliary UPS power.

Detailed specifications for various components of the proposed access control system are mentioned in **SPECIFICATIONS**.

CHAPTER – V: PRICE SCHEDULE

(Note: This is a tentative list subject to change after pre-bid.)

Detailed Price Schedule

	Description of Supplies / Services	Unit	Qty	Unit Price	GST (%)	Unit Price (incl Tax)	Total Price (incl Tax)
1	Construction of in-situ cement concrete flooring of 5" thickness suited for light industrial buildings as per IS: 2571-1970 in the entire data center building as per site requirements	Lot	1				
2	Cement concrete floor polishing in the data center building	Lot	1				
3	Anti-skid flooring for ramps and for steps in the data center building from ground to first floor	Lot	1				
4	Construction of wall partition for un-partitioned spaces like UPS room, battery room, network room, telecom room, and any other, as per requirement, in the data center building	Lot	1				
5	Construction of ODU mounting platforms, as per site requirement	Lot	1				
6	Construction of clean water sump / commissioning of RCC water sump of 10kL storage capacity as per approved design and site requirement	Lot	1				
7	Construction of a fountain for pre-cooling of water	Lot	1				
8	Providing 6" skirting for walls and columns	Lot	1				
9	Construction of anti-skid ramp of approved design for the data center outdoor room	Lot	1				
10	Blocking of door areas to create door openings, as per site requirement.	Lot	1				
11	Wall chasing for concealed cable paths, boring holes in walls for cable entries, sealing with fireproof sealants and finishing.	Lot	1				
12	Underground trenching for laying of power cables, as per specifications	Lot	1				
13	Trench finishing, as per site requirement	Lot	1				
14	20 liter stainless steel plain and cold water cooler of standard make	Nos	1				

15	RO & UV water purifier unit for the above water cooler	Nos	1				
16	Installation of cooler and purification units	Lot	1				
17	Plumbing work for water cooler as per site requirements	Lot	1				
18	Drainage work for water cooler as per site requirements	Lot	1				
19	Prefabricated toilet, urinal and bath units with approved design and color as per site conditions and requirements	Lot	1				
20	RCC septic tank for the units above as per site requirements	Nos	1				
21	Overhead 1000L water tank as per site requirements	Nos	1				
22	Electric light fittings for the units above as per site requirements	Lot	1				
23	Plumbing work for the units above with basic approved accessories and fittings of regular standard make, etc. including connection with overhead water tank as per site requirements	Lot	1				
24	Drainage work for the units as per site requirements	Lot	1				
25	Metal doors with frame and glass vision panel (except in external doors) as per site requirement all other necessary hardwares like SS ball bearing butt hinges, lock, SS lever with heavy duty door closer, all complete. S.S. handles, locking device with duplicate keys etc. complete as per layout. The joints between main door frame and partition shall be filled and sealed with silicon sealant.	Nos.					
26	Size 1500 mm x 2100 mm, Double shutter	Nos.	2				
27	Size 1200 mm x 2100 mm, Single shutter	Nos.	2				
28	Size 1000 mm x 2100 mm, Single shutter	Nos.	2				
29	Installation of above metal doors.	Nos.	6				
30	Size = 1500 x 2100mm (equal double shutter) fire rated (120 min) metal door with frame, fire rated glass vision panels, SS ball bearing butt hinges, lock, SS lever with heavy duty door closer, all complete. Only emergency doors (02 Nos) to be fitted with press-bar.	Nos	5				
31	Size = 1800 x 2100mm (equal double shutter) fire rated (120 mins) metal door with frame, fire rated glass vision panel, SS ball bearing butt hinges, lock, with heavy duty	Nos	1				

	door closer, all complete.						
32	Installation of above fire rated metal doors.	Nos	6				
33	Rolling shutter or metal door for data center building outdoor room of approved type, design and color. Size to be as per site conditions and requirement.	Nos	1				
34	Main entrance sliding gate, of approved type, design and color as per site conditions. Size to be as per site requirement.	Nos	1				
35	Installation of the above shutter and sliding gate	Lot	1				
36	Profile sheet shed for existing and proposed gensets as per approved design and color and site requirement	Nos	1				
37	Installation of the profile sheet shed	Lot	1				
38	Projection over external doors and windows, as per site requirement.	Lot	1				
39	Repair of Sliding windows in safety room, control room and transformer/DG Panel room of DC Building.	Lot	1				
40	Painting of MS railing for steps in the DC building from ground to first floor	Lot	1				
41	Painting of MS Grills in the windows of fire safety room, control room and transformer/DG Panel room of DC building	Lot	1				
42	Enamel Paint over a primer coat, on all remaining metal structures and as per manufacturers recommendations	Lot	1				
43	Finishing of internal walls, columns and ceiling, including application of putty/primer as per site requirement. Wall Putty/Priimer over cement plaster. To be done in perfect line and level including finishing off machine cut grooves and chases, edge banding, scaffolding pockets etc. complete as per site requirement.	Lot	1				
44	Internal painting with acrylic paint as per site requirement	Lot	1				
45	Painting of outer walls of the data center building with sunlight reflective coating as per site requirement	Lot	1				
46	Painting of roof top of the data center building with sunlight reflective coating as per site requirement	Lot	1				

47	Installation / labour charges for all wall finishing	Lot	1				
48	Self Standing Table with metal leg & pedestal (1200 X 600) mm 750 mm table-top height, SS wire manager, KBPT, CPU trolley, of approved design and color.	Nos	8				
49	Reception area background wall panelling, signage and spot lighting of approved design and color.	Nos	1				
50	Institute data center building signage as per approved design	Nos	1				
51	Three-seater visitor chair, as per specification and approved design/color.	Nos	2				
52	Floor mount storage unit, 1800 x 1000 x 450 mm, as per approved design and color.	Nos	2				
53	Mesh high back revolving chair, seat finished with fabric, 5-pronged SS legs, castors, lift key, tilt, PU armrests of approved design/color.	Nos	12				
54	White board, as approved	Nos	2				
55	Sun film on windows as approved	Sqft	100				
56	SS wastepaper basket as approved	Nos	12				
57	Installation of the above furnishing items.	Lot	1				
58	Mineral fibre board ceiling 600 x 600 tegular edge in true horizontal level suspended on locking 15mm grid system.	Lot	1				
59	Installation of above false ceiling.	Lot	1				
60	Signage, displays and instruction display charts as per approved design and site requirement.	Lot	1				
61	Door mats, of minimum size 1500 x 800 mm, as per site requirement.	Nos	6				
62	Miscellaneous Brick and Plaster Work	Lot	1				
63	Minor landscaping works, as per site requirement.	Lot	1				
64	Portable security cabin with electric points, socket, light and fan of approved design and color as per site requirement	Nos	1				
65	Basic repair, reinforcement, painting and automation of the retractable bridge connecting data center and computer center buildings as per site requirement	Lot	1				

66	MAIN LT PANEL - Complete design details with calculations to be submitted along with the technical bid. Main LT Panel, cubicle type, made of 16 SWG CRCA sheet steel, totally enclosed, IP-42, free standing, floor mounting, indoor, compartmentalised, powder coated painting suitable for operation on 3 phase and neutral 415V, 50 Hz AC system with bus bars extendable on both sides, interconnections including supply and installation of following items and as per design. Breakers shall be suitable as per load. INCOMER Intelligent multi function digital meter to read V,A, KVA KW, KVAR, PE, Hz etc with communication facility (RS 485 port) and LED display with 3 Nos CTs, 15 VA, class 1.0 and control circuit wiring with HRC control fuses. Indication Lamps, LED type, R.Y.B ad breaker 'ON', 'OFF', 'TRIP' lamps. One no of current transformer Class 0.5 VA for APFC Relay. Suitable surge protectors should be included. BUS BARS OUTGOING FEEDERS	Lot	1				
67	Installation, commissioning and testing of the Main LT Panel	Lot	1				
68	Distribution Boards - Complete design details with calculations to be submitted along with the technical bid. Lighting & Raw Power DB UPS Power DB Emergency Light DB (ELDB) UPS DB (Aux UPS) Raw Power DB (RDB) Cooling DB	Lot	1				
69	Installation, commissioning and testing of above boards	Lot	1				

70	Cabling Design details of cabling with calculations to be submitted with the technical bid. Details must include material, cores and cross-section details, connectivity details with proposed route, length and technical literature. Supply of Cables shall be 1100 volt grade, PVC insulated and armoured, copper or aluminium conductor cables. Aluminium conductor cables to be proposed only where cross-section > 120 sq mm. Rate to include for all necessary hardware cable clamps, M.S. supports and hangers etc.for cables.	Lot	1				
71	Laying of the above cables including all tools and labour charges.	Lot	1				
72	Jointing the ends of the sizes as mentioned above sizes of PVC insulated and armoured cables including supply of brass cable glands, cable sockets and all jointing materials.	Lot	1				
73	Bus trunking for Raw /UPS power feed to server modules. Bus trunking details shall include feeder, suspension brackets, end cover, end feed unit, and tap off units. Design details of bus trunking of cabling with calculations to be submitted with the bid.Details of equivalent cabling may be given in place of busbar.	Lot	1				
74	Installation of Bus Bar	Lot	1				
75	Cable Trays Supply of 2mm thickness wire mesh or perforated GI cable trays with epoxy finish. Rate includes all necessary supporting brackets, clamps, saddles, fixing hardware etc. Design details of cable trays to be submitted with the bid. Details must include tray width and height, proposed route, length and technical literature.	Lot	1				
76	Laying of the above cable trays including all tools and labour charges.	Lot	1				
77	Earthing Supply of pipe earthing, 3.0 metre long earth pipe set with back fill compound, bus for termination, SS bolts, nuts, and washers etc. as per specifications.	Nos.	8				
78	Plate earthing, 600 X 600 X 3 mm copper plate with accesories, as per specifications.	Nos.	4				

79	25 mm x 3 mm GI Strip	Mtrs	100				
80	No. 8 SWG Cu. Wires	Mtrs	200				
81	Copper Earth Busbar with insulators	Nos.	4				
82	Installation & commissioning of the above earthing systems including including excavation, refilling & complete as required, including heavy duty cast iron cover and all associated civil works like construction of chamber and plastering etc.	Nos.	12				
83	Installation of Copper Earth Busbar with insulators	Nos.	4				
84	Lighting and power wiring Wiring to the light points, PVC insulated copper conductor wires drawn in heavy gauge PVC conduit pipes installed on the ceiling or run over the false ceiling with drops to the distribution boards and switch boxes recessed in the walls/partitions. Points to be controlled in groups or individually by means of 6 amps, single pole, flush type modular switches housed in flush mounted G.I. boxes.	Points	10				
85	Points to be controlled in groups of 4 - 6 from the raw power / light DB	Points	10				
86	Points to be controlled individually from the respective switch box / socket- outlets	Points	12				
87	Point wiring for utility & workstations : Wiring with 2 Nos. 6A, 5 Pin Socket and 2 Nos. 6A switch, housed in 6-way modular faceplates of approved color and design mounted either with or without G.I. back-boxes, as per site requirement.	Points	8				
88	Point wiring for 16 amps socket-outlets: Wiring with PVC insulated copper conductor wires drawn through PVC conduit & each point to be complete with 1 No. 16A Switch + 1 No. 16A Socket outlet, housed 4-way modular faceplates of approved color and design mounted with G.I. back-box.	Nos	35				
89	Labour charges for laying / installation of point wiring materials.	Lot	1				
90	Ceiling hanging type LED light fixtures	Nos.	14				
91	Ceiling recessed type LED light fixture, suitable for grid ceiling	Nos.	14				
92	PIR Occupancy Sensors	Nos.	14				
93	Outdoor LED lights.	Nos.	4				

94	Installation and Commissioning of the above light fixtures.	Nos.	43				
95	First Aid Box	Set	2				
96	Danger Plate	Nos.	6				
97	Shock Treatment Chart	Nos	3				
98	Rubber mats	Lot	1				
99	Exhaust Fan (8 inch) with outer flap cover.	Nos	4				
100	Diesel Generator Sets Supply of 200 KVA Diesel Generating set (with AMF) with acoustic enclosure, radiator, fuel tank, heavy duty silencer and exhaust piping and control panel, as per specifications.	Nos	2				
101	Exhaust System Supply and fixing of exhaust piping B class 150mm dia., 2mm thick MS pipe with all support structures, flanges, filer flay gasket, hardware, etc complete. The exhaust piping shall be insulated with mineral wool with chicken mesh bonded and aluminium sheet cladding. All labour, materials, lead, lift, tools, plants etc. complete.	Rmt	20				
102	MS tower structure	Lot	1				
103	Statutory clearance charges from Pollution Control Board and others, as req.	Nos	2				
104	Transportation, Loading & Unloading Charge	Nos	2				
105	Installation, testing and commissioning of the above DG Sets including transportation to NITR campus mounting in the specified location including all materials, labour, tools & plants, all lead, lifts, tackles for unloading/handling of equipments and materials at site, their assembly, sundry items etc.The work should include all labour, aligning the D.G set , fuel tank erection, filling of fuel, oil etc, installing battery assembling, connecting earth connections, testing and commissioning.	Nos	2				
106	Main UPS System 20 KVA Hi-Performance IGBT based Rectifier & Inverter based true On Line double conversion UPS system, 3Ph-3Ph, having DSP control, in N+1 redundancy as per technical specifications provided along with suitable battery banks for 10 mins backup on full load. Accessories like battery connectors and racks to be included.	Nos	9				

107	Installation and Commissioning of the main UPS system.	Nos	9				
108	Supply of battery banks for 10 mins backup on full load for use with existing 10 KVA Hi-Performance DSP Controlled, IGBT based Rectifier & Inverter based On Line UPS system and configurable in N+1 redundancy. Accessories like battery connectors and racks to be included.	Nos	2				
109	Installation and Commissioning of the existing UPS with batteries.	Nos	2				
110	Cooling System - Supply of water chiller plant of suitable rating as per solution - Design details with calculations to be submitted with technical bid	Nos	2				
111	Cooling System - Supply of evaporator tank of suitable volume.	Nos	2				
112	Cooling System - Supply of accessories like pumps, valves, pipes, plumbing accessories, insulation, etc. Design details with calculations to be submitted with technical bid	Lot	2				
113	Cooling System - Supply of direct evaporative coolers - Design details with calculations to be submitted with technical bid	Nos	2				
114	Cooling System - Supply of evaporative heat and mass exchange units for sensible heat removal as per site requirement. - Design details with calculations to be submitted with technical bid	Nos	2				
115	Cooling System - Supply of dehumidification Units - Design details with calculations to be submitted with technical bid	Nos	2				
115(a)	Cooling System - Supply of suitable ductable CWAC/DX units for cooling of auxiliary spaces with all necessary accessories - Design details with calculations to be submitted with technical bid	Nos	2				
116	Cooling System - Supply of artificial intelligence based temperature and humidity controller for the cooling system. Design details to be submitted with the technical bid.	Nos	2				
117	Cooling System -Supply of factory fabricated GSS sheet metal rectangular ducting as per site requirement complete with neoprene rubber gasket elbows, splitter dampers, vanes, hangers, supports,	Nos	2				

	etc.						
118	Cooling System - Installation and commissioning of the above (from chiller plant to ducting)	Lot	2				
119	Cooling System - Supply of 3 HP electric motor pump complete with piping and all necessary accessories for drawing water from the sump and pumping it to different locations within the data center building	Nos	2				
120	Cooling System - Installation of 3 HP electric motor pump complete with piping and all necessary accessories for drawing water from the sump and pumping it to different locations within the data center building	Lot	2				
121	Cooling System - Supply of cooling tower of appropriate size and of approved design and rating as per site requirement. - Design details with calculations to be submitted with technical bid	Nos	1				
122	Installation of cooling tower as per site requirement	Nos	1				
123	Cooling System - Supply of outdoor ambient air mist cooling setup with nozzles, filters, pumps, pipes, etc. - Design details with calculations to be submitted with technical bid	Lot	1				
124	Installation of outdoor ambient air mist cooling setup as per site requirement	Lot	1				
125	Supply of overhead tank of capacity 5000L	Nos	2				
126	Installation of overhead tank of capacity 5000L	Nos	2				
127	Intelligent Addressable Microprocessor based Fire Alarm Panel	Nos.	1				
128	Addressable photo electric type smoke detector with blinking LED.	Nos	16				
129	Addressable heat detectors.	Nos	3				
130	Response indicator with LED.	Nos	6				
131	Addressable control modules	Nos	10				
132	Addressable monitoring modules	Nos	10				
133	Isolator module complete with junction box and mounting accessories.	Nos	10				
134	Manual Pull Station.	Nos	3				
135	Electronic Strobe cum Hooter	Nos	3				
136	1.5 sq.mm copper FRLS cable	RM	400				

137	Installation and commissioning of the above.	No	1				
138	In-panel tube based suppression system: 2 Kg, HFC-236 CA, Fire Extinguisher with Kit. Clean Agent HFC 236fa DLP with Zero Ozone Depletion Potential. Container along with valve assembly.	Nos	1				
139	Pressure Switch to monitor Pressure in the tube, switch point 11 Bars.	Nos	1				
140	Heat Sensor tube for automatic fire suppression system made by special modified Polyamide (PA), Color Black, High grade HR quality, UV Stabilized, Inner diameter 4mm, Outer Diameter 6 MM.	Mtrs	20				
141	End of Line adapter for Pressure gauge fitting for Automatic fire suppression tube used for fitting at the end of the tube for pressurizing and re pressurizing the tube.	Nos	2				
142	End of Line Plug for Automatic fire suppression tube used for fitting at the tube end to terminate the point.	Nos	2				
143	T connection for pressurized tubes, nickel plated material with elastomeric sealings.	Nos	1				
144	2 Core x 1.5 sq. mm flexible cable with conduit as per site requirement	Lot	1				
145	Alarm Kit	Nos	1				
146	Installation of in-panel tube based fire suppression system	Nos	1				
147	Fire suppression pouches and cords as per site requirement for automatic in-board fire suppression	Lot	1				
148	5 Kg, ABC Type Wall Mount Fire Extinguisher	Nos	4				
149	Installation and commissioning of the above.	Nos	4				
150	CCTV system - 2 MP IR fixed dome camera	Nos	20				
151	3 MP varifocal motorized bullet camera	Nos	10				
152	16 channel NVR	Nos	2				
153	2TB surveillance hard disk	Nos	4				
154	43" wall mount LED display	Nos	1				
155	16 port PoE switch	Nos	2				
156	CAT 6 UTP Cable	Box of 305m	3				
157	24 port switch	Nos	2				
158	Cat 6 1mtr Patch Cord	Nos	60				
159	Cat 6 Information Outlet	Nos	30				
160	I/O back Box	Nos	30				
161	Fully loaded 24-port jack panel	Nos	2				

162	9U Wall Mount Rack with Fan , Power supply,	Nos	1				
163	Laying & termination of Cat6 UTP Cable through PVC conduit (All fittings & termination accessories included)	Lot	1				
164	Installation of CCTV system and Accessories	Lot	1				
165	Rodent Repellent System Master Console capable of connecting to 12 Satellites complete with all accessories as per specifications	Nos.	2				
166	Satellite Units complete as per the specification	Nos.	24				
167	Connecting Cables	Rmt	400				
168	Bracket Stand	Set	2				
169	25mm PVC conduit	Mtr.	200				
170	Installation and commissioning of the rodent repellent system.	Lot	1				
171	Data Center Server Module Integrated Rack solution in a self-contained block of 08 racks, along with the following integrated systems and having monitoring capability. The integrated racks should meet the technical specifications as laid out in the RFP. The design should comply with Tier -III standards. Integrated rack solution should include - Integrated and contained rack cabinet, 42U, 600 x1000 mm for housing IT hardware, as per specifications. Provisioning for High-Energy Efficiency Cooling System, in N+N , suitable for the IT load, as per specifications. Integrated fire detection system for the racks. Integrated clean agent based fire suppression system for the racks. Integrated Access Control system for the racks. Integrated Cameras for surveillance. Integrated Water leak detection system. Integrated dual rack PDU's. Integrated Alarm Beacon. Emergency Door Opening. Monitoring capability. Other features as per the technical specifications	Nos	2				

172	Lifting, shifting and Positioning of integrated rack units.	Sets	2				
173	Assembling of all integrated rack solution components, as mentioned above including pairing with the cooling system	Sets	2				
174	Installation & Commissioning of the above systems.	Sets	2				
175	Data Center Network Module Integrated Rack solution in a self-contained block of 06 racks, along with the following integrated systems and having monitoring capability. The integrated racks should meet the technical specifications as laid out in the RFP. The design should comply with Tier -III standards. Integrated rack solution should include - Integrated and contained rack cabinet, 42U, 800 x1200 mm for housing IT hardware, as per specifications. Provisioning for High-Energy Efficiency Cooling System, in N+N , suitable for the IT load, as per specifications. Integrated fire detection system for the racks. Integrated clean agent based fire suppression system for the racks. Integrated Access Control system	Nos	1				

	for the racks. Integrated Cameras for surveillance. Integrated Water leak detection system. Integrated dual rack PDU's. Integrated Alarm Beacon. Emergency Door Opening. Monitoring capability. Other features as per the technical specifications						
176	Lifting, shifting and Positioning of integrated rack units.	Sets	1				
177	Assembling of all integrated rack solution components, as mentioned above including pairing with the cooling system	Sets	1				
178	Installation & Commissioning of the above systems.	Sets	1				
179	UTP Cat 6 patch chord, 3 mtrs	Nos	100				
180	OM3 optic fibre	Mtrs	800				
181	UTP Cat 6 Patch cord - 2 Mtr	Nos	12				
182	Cat 6 Information Outlet	Nos	24				
183	I/O back Box	Nos	12				
184	2-port faceplate	Nos	12				
185	9U Wall Mount Rack with Fan , Power supply	Nos	1				
186	CAT 6 UTP Cable	Mtrs	600				
187	24-port unloaded modular straight jack panel, 1U with rear cable manager	Nos	1				
188	Laying & termination of Cat6 UTP Cable through PVC conduit (All fittings & termination accessories included)	Mtrs	600				
189	Desktops - 9th Gen Intel Core i3-9100 (4-Core, 6MB Cache, up to 4.2GHz), Windows 10 Pro (64bit), Intel UHD Graphics 630 with shared graphics memory, 8GB 1x8GB DDR4 2400MHz, 3.5" 1TB 7200RPM SATA Hard Drive, GDDR5 4GB graphics card, 23.8"	Nos	2				

	HD IPS LED Monitor with Headphone						
190	43" LED display, wall mount, for Control Room	Nos	1				
191	Installation and commissioning of the above.	Nos	1				
192	Supply of heavy duty networked and auto-duplex color printer	Nos	1				
193	Supply of contactless overhead scanner for documents, magazines, newspapers and books	Nos	1				
194	Laptop, Intel Core i3, 10th Gen, 14" display, 4GB RAM, 1 TB HDD	Nos	2				
195	Two shelf table trolley with wheels as per approved design	Nos	1				
196	BMS/DCIM to monitor the module racks and other devices	Lot	1				
197	Project Management Charges	Lot	1				
198	Documentation and Operational Training Charges	Lot	1				
199	Any other items essential for completion of work	Lot	1				
200	Grand Total including Tax(INR)						
	L1 will be decided among technically qualified bidders based on the Grand Total incl Tax (INR) [201] above						

Please note that the L1 bidder would be evaluated on the basis of the **Grand Total including Tax (INR)**

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CHAPTER-VI: OTHER FORMS TO BE SUBMITTED**Form 1: BIDDER'S SELF INFORMATION FORM**

S.No.	Information	Detail		
1.	Tender Enquiry No. and Date			
2.	Bidder's Reference No. and Date			
3.	Name of firm			
4.	Address of firm			
5.	Telephone No.			
6.	Fax No.			
7.	E-mail Id:			
8.	Website, if any			
9.	*Permanent Account No:			
10.	*Sales Tax Registration No.			
11.	*Service Tax Registration No.			
12.	*Financial turnover of 2016-17	<i>In INR in figures as well as words</i>		
13.	*Financial turnover of 2017-18	<i>In INR in figures as well as words</i>		
14.	*Financial turnover of 2018-19	<i>In INR in figures as well as words</i>		
15.	Details of the authorized signatory of the bidder including name, designation and Postal address with telephone, mobile, fax and email (Add rows to include all authorized signatories)		(Affix authorized signatory's signature in this space)	(Affix authorized signatory's recent coloured passport size photo in this space)
16.	Details of the officer (Bidder's Project Manager for this project) to whom all references shall be made regarding this tender enquiry including name, designation and postal address with telephone, mobile,		(Affix officer's signature in this space)	(Affix officer's recent coloured passport size photo in this space)
17.	Bid Processing fee Details			
18.	EMD Details			

*Attach Attested Copies

Date:**Signature:****Seal of the company****Name:****Designation:****Place:****Company:**

Form 2: FORM FOR SUBMISSION OF BIDS

NIT Raipur Tender Enquiry No: _____

Due to open on: _____ at _____ (time)_____

Bidder's Ref No:

To
The Registrar NIT Raipur Chhattisgarh, India
Dear Sir

Having examined the conditions of the contract as specified in the Bid Documents and the Specifications and Allied Technical Details including revisions / amendments / corrections / corrigenda Nos. _____ the receipt of which is hereby duly acknowledged, we the undersigned

offer to supply and deliver “TENDER FOR DESIGN, SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND MAINTENANCE OF DATA CENTRE PHYSICAL INFRASTRUCTURE” in conformity with the said drawings, conditions of contract, and specifications for the sum of mentioned in the Price Schedule, or such other sums as may be ascertained in accordance with the schedule of prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted to complete delivery of all the ordered items by us specified in the contract within 8-12 weeks from the date of issue of your Purchase Order. If our Bid is accepted, we will furnish the performance guarantee of a Nationalised Bank for a sum not exceeding 10 percent, of the contract sum. We agree to abide by this Bid for a period of 180 days from the date fixed for Bid opening and it shall remain binding upon us and may be accepted at any time before the expiration of that period. Until a formal Purchase Order or contract is prepared and executed this Bid together with your written acceptance thereof in your notification of award shall constitute a binding contract between us. Bid submitted by us is properly sealed and prepared so as to prevent any subsequent alteration and replacement.

We understand that you are not bound to accept any or all bids you may receive.

Date this day of _____

Signature_____

(Name in Block Letters of the Signatory) In capacity of

Witness

Duly authorised to sign the bid for and on behalf of (**Attach Power of Attorney**)

Address: _____

Signature: _____

Form 3: MANUFACTURER'S AUTHORIZATION TO BIDDER

We M/s Manufacturer's Name are Manufacturers of product name marketed and sold under the brand name.

Our main office in India is located at Indian office address.

We hereby authorise M/s Bidder's Name & Office Address to represent us, to bid, negotiate and conclude the contract on our behalf with you.

Our authorized bidder M/s Bidder's Name shall quote the items mentioned in the list below manufactured by us in Tender No. _____ dated _____ of your organization.

List of Items Manufactured

- 1
- .
- 2
- .
- 3
- .
- 4
- .
- 5
- .

We undertake all of the following:

An authorized representative of the bidding organization and NIT Raipur can log complaints / open support cases directly with us through phone / email / web during the initial and extended warranty periods.

Problems in equipment which cause downtime / degradation of services and resolution of which require development of patches, bug fixes etc. shall be treated by us on urgent basis.

If such equipment has to be taken by us to the factory for repair / replacement we shall arrange an alternative through the bidder, if required, so that service continuity is maintained.

As Manufacturers we shall also be responsible for providing the bidder with necessary products and accessories on time to ensure timely implementation of the project.

We shall ensure that the warranty and service commitments in the tender are met.

We shall ensure the availability of spares for a period of 05 years for the aforementioned items. If applicable, we shall also ensure the availability of software upgrades, if any.

In case of default in execution of the project as per this tender by our authorized bidder M/s Bidder's Name, then we M/s Manufacturer's Name shall provide all necessary assistance for successful completion of this project as per this tender.

Yours
faithfully,
(Name)

For and on behalf of M/s Manufacturer's Name

Signature of Witness

Signature of Manufacturer

Dated:

Dated:

Place:

Place:

Note: This authorization letter should be on the letter-head of the manufacturing concern and should be signed by a person not less than the level of regional head/manager.

Form 4: FORM FOR AFTER SALES SERVICE / TECHNICAL ASSISTANCE CENTRES IN INDIA

The service / technical assistance centres in India listed below are fully functional and equipped with spares and skilled manpower for providing satisfactory after sales services of the equipment supplied by us under this contract.

S.no.	Name of equipment	Name of Manufacturer	Nearest Service Centre address	Service Contact person With tel. no. and E-mail ID
1.				
2.				
3.				

Bidder shall quote only those products whose manufactures have their own after sales service / Technical Assistance centre in India.

Form 5: FORM FOR WARRANTY

We warrant that the equipment to be supplied by us hereunder shall be brand new, free from all encumbrances, defects and faults in material workmanship and manufacture and shall be of the highest grade and equally consistent with the established and generally accepted standards for material of the type ordered shall be in full conformity with the specifications, drawings or samples, if any, and shall operate properly. We shall be fully responsible for its efficient and effective operation. This warranty shall survive inspection of and payment for and acceptance of the goods, but shall expire 6 months (to be called warranty period) from after their successful installation and acceptance by the purchaser or warranty period plus 6 months from the date of completion of supply of material.

We also warrant that the function contained in the system software if any will meet the manufacturer's specification together with any clarifications given by us and that the operation of these firmware will be uninterrupted and error free and all software defects, if any will be corrected by us.

The obligations under the warranty expressed above shall include all costs and taxes relating to labour, spares maintenance (preventive and unscheduled) and transport charges from site to manufacturers works and back and for repair/adjustment or replacement at site of any part of equipment which under normal care and proper use and maintenance proves defective in design, material or workmanship or falls to operate effectively and efficiently or conform to the specifications and for which notice is promptly given by the purchaser to the supplier.

**Signature of the Witness
Bidder**

Signature of the

Date:

Seal of the company

Form 6: FORM FOR STATEMENT OF DEVIATIONS FROM TENDER CONDITIONS

**To
The Registrar
NIT Raipur**

Reference Tender No. Dated.....

Dear Sir,

Following are the deviations and variations from the Technical Specifications of tendered items. These deviations and variations are exhaustive. Except these deviations and variations, the entire work shall be performed as per your specifications and documents.

S. No.	Item Description	Section and Page No.	Clause No.	Deviation	Remarks
--------	------------------	----------------------	------------	-----------	---------

It is understood that the right of accepting or rejecting deviations in part or in whole solely rests with the Institute and we agree to abide by the decision of the Institute in this regard.

Date:

Place:

Signature:

Seal of the bidder

Name:

Designation:

Company:

Form 7: FORM OF BANK GUARANTEE FOR 5% CONTRACT VALUE FOR CONTRACT PERFORMANCE GUARANTEE BOND

Ref..... Date
..... Bank Guarantee No.....

To
Director
National Institute of Technology, G.E. Road, Raipur.

1. Against contract vide Advance Acceptance of the Tender No..... dated covering supply/ installation/commissioning of hereinafter called the 'Contract'), entered into between the Director, National Institute of Technology, Raipur (hereinafter called the NIT Raipur) and (hereinafter called the 'Contractor') this is to certify that at the require of the Contractor we Bank Ltd., are holding in trust in favour of the Director, NIT Raipur, the amount of (write the sum here in words) to indemnify and keep indemnified the Director, NIT Raipur against any loss or damage that may be caused or likely to be caused to or suffered by Director, NIT Raipur by reason of any breach by the Contractor of any of the terms and conditions of the said contract and/or the performance thereof whether any breach of any of the terms and conditions of the said contract and or in the performance thereof has been committed by the Contractor and amount of loss or damage that has been caused or suffered by Director, NIT Raipur shall be final and binding on us and the amount of the said loss or damage shall be paid by us forth with on demand and without demur to Director, NIT Raipur.
2. We, Bank Ltd., further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for satisfactory performance and fulfilment in all respects of the said contract by the Contractor i.e. till (viz. the date up to 3 months after the last date of warranty on goods/services supplied under the contract) hereinafter called the "said date" and that if any claim accrues or arises against us, Bank Ltd., by virtue of this guarantee before the said date, the same shall be enforceable against us Bank Ltd., notwithstanding the fact that the same is enforced within six months after the said date. Payment under this letter of guarantee shall be made promptly upon our receipt of notice to that effect from Director, NIT Raipur.
3. It is fully understood that this guarantee is effective from the date of the said contract and that we, Bank Ltd., undertake not to revoke this guarantee during its currency without the consent in writing of Director, NIT Raipur.
4. We Bank Ltd., further agree that the NIT Raipur shall have the fullest liberty, without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said contract or to extend time of performance by the Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by NIT Raipur against the said Contractor and to forbear or enforce any of the terms and conditions relating to the said contract and We Bank Ltd., shall not be released from our liability under this guarantee by reason of any such variation of extension being granted to the said Contractor or for any forbearance and or omission on the part of NIT Raipur or any indulgence by NIT Raipur to the said Contractor or by any other matter the effect of so releasing us from our liability under this guarantee.
5. We Bank Ltd., further agree that the guarantee herein contained shall not be affected by any change in the constitution of the said Contractor.

Date..... **Signature**
..... Place **Printed**
Name.....

Witness

..... (Designation)

.....

.....

..... (Bank's Common Seal)

Form 8: FORM FOR SUBMISSION OF SIMILAR WORKS EXECUTED BY BIDDER AS PROOF OF ELIGIBILITY

S.No.	Name of the Client Organization	Project Cost (in lakhs)	Nature of Work	Contact Person Of Client Organization with Name, Designation, E-mail and Mobile Number	Remarks	Purchase order & Work Completion Certificate (Yes/No)

Date:

Place:

Signature:

Name:

Designation Company:

Seal:

Form 9: FORM FOR PRE-BID CLARIFICATION

Bidder is required to submit e-mail with subject “Pre-bid Clarification” to cccdc@nitrr.ac.in. Bidder should attach two file attachments with this e-mail

- (i) duly-filled table below in editable MS Excel © Spreadsheet, and
- (ii) a scanned copy of this form

If bidder does not comply with aforementioned, or sends beyond the last date for pre-bid clarification as mentioned, such pre-bid queries shall be ignored.

S.No.	Chapter No.	Section No.	Page No.	Clause	Query	Remark
1.						
2.						
3.						
4.						
5.						

Date and Time (IST):

Signature:

Name:

Company:

Contact Number:

Contact E-mail:

Postal Address:

Seal:

Form 10: PRELIMINARY TEST CERTIFICATE

PURCHASE ORDER NO:

DATED:

Against the above mentioned purchase order. The items detailed below have been received on

_____.

Equipment		Description			
S.No.	Physical Check	Power On Test if possible	Firmware / Software		Remarks

Note: A random sample of the active devices shall be POST tested for payment recommendation at this stage.

However, if any active device is found not working at any stage till issue of commissioning certificate, it shall be replaced by the contractor free of cost. During the warranty period, the item may be replaced / repaired as needed free of cost or in terms of the warranty.

Witnesses:

Bidder's Representatives

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

CCC Committee Members

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

Form 11: FINAL COMMISSIONING CERTIFICATE

Purchase Order No.:

Dated: _____

Project Nomenclature : _____

Name and Address of Contractor: _____

Against the above mentioned Purchase Order, the items detailed below have been successfully commissioned after installation and tested. The manuals, documentation, and training as required have also been provided by the vendor as per specification in the PO.

S.No.	Item Description	Quantity

Witnesses:**Bidder's Representatives**

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				

CCC Members

S.No.	Signature	Name	Designation	Date
1.				
2.				
3.				
4.				
5.				