INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Name of work

Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur.

BID DOCUMENT

OFFICE OF SUPERINTENDING ENGINEER,

IWD,

INDIAN INSTITUTE OF TECHNOLOGY KANPUR,

July, 2025

Indian Institute of Technology Kanpur

Contents

It is certified that this document contains 111 *pages starting with Page No. i*

Superintending Engineer

1 Notice Inviting e-Tenders

The Superintending Engineer on behalf of Board of Governors of Indian Institute of Technology Kanpur invites online percentage rate tenders from eligible Air conditioning contractor, satisfying the eligibility criteria mentioned in the document.

NIT No: 12/AC/EE/2025

1	Name of work	:	**Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur**
2	Estimated Cost exclusive of GST	:	Rs. **1,04,60,160/-**
3	Earnest Money Deposit (Rs.)	:	**Rs. 209203/-** (In favour of Director, IIT Kanpur)
4	Duration of contract	:	Three (3) months
5	Last Time & date of submission of bids (Up to)	:	As per CPP portal data (https://eprocure.gov.in/eprocure/app)
6	Opening of bids	:	As per CPP portal data
7	Time allowed for submission of requisite documents by lowest bidder	:	Within One week of opening of financial bids

The bid forms and other details may be downloaded from Central Public Procurement Portal (http://eprocure.gov.in/eprocure/app). Aspiring bidders who have not enrolled / registered in e- procurement should enroll / register themselves before participating through web site http://eprocure.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at "Instructions for online bid submission."

Bidders can access quotation / tender documents on the website (for searching in the NIC site), kindly go to quotation search option and type 'IIT'. Thereafter, click on "GO" button to view all IIT quotations. Select the appropriate quotation / tender and fill them with all relevant information and submit the completed Quotation / Tender document online on the website http://eprocure.gov.in/eprocure/app as per the schedule given in the next page.

Note: No manual bids will be accepted. All bids (both Technical & Financial) should be submitted in the e-procurement portal.

Applicants are advised to keep visiting the above-mentioned websites from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.

Superintending Engineer

2 Information and Instructions for Bidders for E-Tendering

The Executive Engineer on behalf of Board of Governors of Indian Institute ofTechnology Kanpur invites online percentage rate tenders from eligible Air conditioning Contractor, satisfying the eligibility criteria mentioned in the document.

2.1 Schedule

1	Name of organization	:	Indian Institute of Technology Kanpur
2	NIT No:		12/AC/EE/2025
	Location		Indian Institute of Technology Kanpur
3	Tender / Quotation type (open / limited / EOI / auction / single)	:	Open
4	Tender / Quotation category (services / goods /works)	:	Works
5	Type of Contract (work / supply / auction / service / buy / empanelment / sell)	:	Work
6	Form of contract (IITK-7/8)	:	IITK-7
7	Work Category (civil/electrical/AC/fleet management / computer systems)	:	AC
8	Is multi-currency allowed?	:	No
9	Date of publishing / issue / start	:	As per CPPP portal
10	Document download start date	:	As per CPPP portal
11	Document download end date	:	As per CPPP portal
12	Date & time of pre-bid meeting	:	As per CPPP portal
13	Venue of pre-bid meeting	:	As per CPPP portal
14	Last date & time of uploading of bids	:	As per CPPP portal
15	Date & time of opening of Technical bids	:	As per CPPP portal
16	Bid Validity Days	:	90 days after opening of technical bid
17	Earnest Money Deposit (EMD)	:	Rs. 2,09,203/-. Scanned copy of the proof of EMD deposition to be uploaded with the tender. The hardcopy of the EMD receipt shall be submitted in the office of Executive Engineer, IWD IIT Kanpur.

18	Non- Refundable Processing Fee (Inclusive of GST @18%)	NIL
19	No. of Bids / Covers (1 / 2 / 3 / 4)	: 2
20	Address for communication	: Office of Superintending Engineer IWD, Indian Institute of Technology Kanpur, Kanpur, U.P. Pin - 208016, Tel: 0512-259-7059
21	e-mail address	: vktiwari@iitk.ac.in rakeshkv@iitk.ac.in

The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

1. Information and instructions for bidders posted on website shall form part of bid document.
2. The bid document consisting of drawings, specifications, schedule of quantities of items to be executed, schedule of stages for payment as applicable and the set of terms & conditions of the contract to be complied with and other necessary documents can be seen and downloaded free of cost from www.eprocure.gov.in
3. But the bid can only be submitted after deposition of proof of submission of EMD.
4. Those contractors not registered on the website mentioned above, are required to get registered beforehand. Only e-bids shall be accepted in CPPP portal through e-tendering processes.
5. The intending bidder must have valid Class-III digital signature to submit the bid.
6. On opening date, the contractor can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.
7. Contractor can upload documents in the form of JPG format and PDF format.

   However, if a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section /sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
8. The “Eligibility/technical Bid” shall be opened first on due date and time as per the evaluation scheme. The “Financial Bid” of bidders qualifying the technical bid shall be opened on a later date as to be announced in CPP portal.
9. The bidders are advised to visit the site before submission of bids to have more clarity about the site conditions and availability of space for execution of the work.
10. All modifications/addendums/corrigendum issued regarding this bidding process shall be uploaded on website only.
11. The department reserves the right to reject any or all bids without assigning any reason thereof and may restrict the list of qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the minimum laid down criteria.

12. The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T&P, wastages, watch and ward, other inputs, all incidental charges, all other taxes (exclusive of GST), cess, duties, levies etc. required for execution of the work.

13. The specialized works shall be in compliance with 3 Star GRIHA rating and as per environmental policies of Institute. Nothing extra shall be payable on this account.

14. If claimed, the enlistment of the contractors should be valid on the last date of submission of bids. In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

15. The description of the work is as follows: "Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur..."

16. The work is estimated to cost Rs. **1,04,60,160/-**. However, this estimate given is mere approximation for guide.

17. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD7 which is available as a Govt. of India Publication and also available on website www.cpwd.gov.in. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

18. The time allowed for carrying out the entire work will be Six (6) months from the date of start as defined in Schedule "F" or from the first date of handing over of the site, whichever is later, in accordance with the phasing as detailed in special conditions of contract in the bid document.

19. The site for the work will be handed over as per the special terms and conditions of the document.

20. An approved programme of completion submitted by the contractor after award of work based on the milestone given in the tender.

21. The bid document consisting of NIT, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website www.eprocure.gov.infree of cost.

22. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

23. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he/she need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

24. Scanned copy of Earnest Money shall be uploaded to the e-Tendering website within period of submission

25. Earnest money can be paid in the form of Treasury Challan or Demand Draft or Pay order or Banker's cheque or Deposit at call receipt or Fixed Deposit Receipt drawn in favor of Director IIT Kanpur along with Bank Guarantee of any Scheduled Bank where applicable.

    A part of earnest money is acceptable in the form of bank guarantee also in such case 50% of earnest money or Rs. 20 lacs, whichever is less, will have to be deposited in shape prescribed above and balance in shape of Bank Guarantee of any scheduled bank.

26. Copy of documents as specified in the bid shall be scanned and uploaded to the e-tendering

website within the period of bid submission.

27. The bid submitted shall be opened at as per the details provided in the CPP portal at IWD office. The date of opening of Financial Bid shall be informed through web site after the opening of financial bid

28. The bid submitted shall become invalid if:

    (i) The bidder is found ineligible.

    (ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.

    (iii) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

29. The contractor whose bid is accepted will be required to furnish performance guarantee of 5% of tendered value within the period specified in Schedule F. This guarantee shall be in the form of Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.

30. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F' including the extended period if any, the contractor shall be suspended for two years and shall not be eligible to bid for IITK tenders from the date of issue of suspension order.

31. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of afore said provisions by the sub-contractors, if any engaged by the contractor for the said work and program chart (Time and Progress) within the period specified in Schedule 'F'.

32. Intending Bidders are advised to inspect and examine the sites and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, making proper arrangements to the site for smooth operation, the accommodation they may require and in general shall themselves obtain all necessary information as to risks,

    contingencies and other circumstances which may influence or affect their bid. Bidder shall be deemed to have full knowledge of the sites whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed**. The bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents.**Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Institute and local conditions and other factors having a bearing on the execution of the work.

33. Intending Bidders are advised to get familiarized with the specifications /rules related (i.e., **Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super**

Computing Mission) at Computer Centre, IIT Kanpur...) to the work as approved by the competent authority and various policies related to C&D waste and other environmental guidelines of the institute pertaining to the. Bidder shall be deemed to have full knowledge of such rules and regulations whether he has read it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. In case of reduction of scope of work or no work is possible to carry out on account of suchissues, no cost shall be payable to them. Submission of a bid by the bidder implies that hehas read this notice and all other documents and has made himself aware of the InstituteRegulations and other factors having a bearing on the execution of the work.

34. The competent authority on behalf of the Board of Governors does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without assigning any reason. Bids in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

35. Canvassing whether directly or indirectly, in connection with bids is strictly prohibited and the bids submitted by the bidders who resort to canvassing will be liable to rejection.

36. The competent authority on behalf of the Board of Governors reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

37. The contractor shall not be permitted to bid for works in the Office of Infrastructure and Planning / Institute Works Department responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer/ staff in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive) in IWD and Office of Infrastructure and Planning. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and whoare near relatives to any Gazetted officer in the Office of Infrastructure and Planning/ Institute Works Department. Any breach of this condition by the contractor would renderhim liable to be removed from the approved list of contractors of this Department.

38. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contractis liable to be canceled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.

39. The bids for the work shall remain open for acceptance for a period of Ninety (90) days from the date of opening of bids. If any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Institute shall, without prejudice to any other right or remedy, be at liberty to suspend the bidder for one year.

40. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 7 days from the stipulated date of start of the work, will sign the contract.

41. The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid

and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto

42. Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.

43. The bid document will include the following components:

    (a) CPWD-7 and CPWD-6 including Schedule A to F for all the components of the work, Standard General Conditions of Contract for CPWD 2023 as amended/modified up to last date of submission of the bid.

    (b) General / specific conditions, specifications applicable to all components of the work.

44. The eligible bidders shall quote percentage rates after considering all the components of the work.

45. After acceptance of the bid by competent authority, the Superintending Engineer shall issue letter of award on behalf of the Board of Governors to the contractor. After the work is awarded, the contractor will have to enter into one agreement with Superintending Engineer. One such signed set of agreement shall be handed over to Engineer-In-Charge as applicable.

46. Entire work under the scope of bid shall be executed under one agreement.

47. The requirement of technical staff given in various specialized works is as per requirements given in clause 32 of NIT document. The actual deployment of these technical staff will be as per execution of work and direction of the Superintending Engineer, IITK. **In case of non-deployment, a penalty of Rs. 25,000/- per month shall be levied from the** contractor.

48. The bill for the work shall be facilitated by Engineer-in-Charge. The bill must be submitted to the Office of Executive Engineer, IIT Kanpur. Payment shall be based on the milestones as per Schedule F.

49. Payment shall be regulated as under

    (a) 75% of the tendered value on receipt of materials on prorata basis listed in BOQ at site be submitted to claim the payment.

    (b) 15% of the tendered value on installation and connection.

    (c) 10% of the tendered value on testing and commissioning.

50. Running bill and final bill for components shall be facilitated by Engineer-in-Charge to the contractor.

51.Drawings/Data required prior to commencement of electrical/air-conditioning works:-

51.1 The following drawings shall be provided by the Engineer-In-Charge of the work:-

1. SLD of cooling system for Data centre and layout of server room with piping and rack positions for integration with BMS and associated works.

51.2 Following drawings shall be furnished by the contractor for the approval of the Engineer-In-charge after detailed design calculation before execution of the above work.

a) SLD & GFC of all the component i.e. Fire alarm System, Fire suppression system, WLD, VESDA, Access Control system, Rodent replant system & BMS, showing all equipment, cable & conduit size, route etc.

b) Detailed I/O summary with provision for future expansion

c) BMS architecture drawing.

d) BMS and EMS software details

e) SOP for BMS integrated systems/equipment

f) Selection/Calculation sheet for Fire Suppression Gas System

52. Completion drawings, documents and license of BMS software:

On completion of works and before issuance of completion certificate, the contractor submits completion drawings in the form of four complete set of originals (reproducible) & BMS, EMS software license in hardcopy and softcopy.

i) As built GA and schematic layout drawings of all the components of BMS, fire safety, WLD, VESDA, Access Control etc. of the Data Centre
ii) Technical literature, test certificates, and operation and maintenance manuals for the entire components.
iii) BMS & EMS lifetime software license
iv) Safety certificate of the Fire Suppression Gas Cylinders with gas

53.Works Inspection and Testing of Equipment:

53.1 Prior to dispatch of the all major equipment's the Institute reserves the right to inspect the same at the manufacturer's works and the contractor shall provide and secure every reasonable access and facility at the manufacturers works for inspection, for witness of all acceptance and routine tests as per relevant Indian/International Standards. Contractor shall give a reasonable notice of about 15 days for the purpose of test, and witness of all major equipment's. The pre-dispatch factory inspection for all major equipment's will be through duly constituted committee by the Institute for this inspection. The expenses shall be borne by the Institute and not to be loaded into the contract. The contractor shall only facilitate the inspection at manufacturing works.

a.) Pre-commissioning test: All routine tests shall be carried out on the electrical & air-conditioning equipment. Protective & measuring devices should be checked for calibration. The checklists and pre-commissioning tests for different equipment's have to be provided by the lowest tenderer

at the time of equipment's specification approval.

53.1.1 The work shall be treated as complete when all the components of the work are complete.

53.1.2 It will be obligatory on the part of bidder to sign the contract document for all components before the first payment is released.

53.1.3 In case of reduction in scope of work no claim on account of reduction in value of work, loss of expected profit, consequential overheads etc. shall be entertained.

53.1.4 A team of officers from Indian Institute of Technology Kanpur may visit the office/ site of work of bidders for establishing their credibility and verification of submitted documents

53.1.5 The mentioned work is urgent as requested by client/Institute and to be completed strictly in given time schedule as per special terms and conditions. The contractor has to deploy the labour and supervisory staff in shifts to meet the targeted completion date. The work may be executed in extended shifts or two shifts. The rates quoted by the contractor will be deemed to be inclusive of any extra expenditures on account of this reason. Nothing shall be paid on this account.

53.1.6 The competent authority on behalf of the Board of Governors reserves the right to terminate the contract if,

53.1.7 Any violation of labour law has been observed.

53.1.8 Any of the construction workers engaged in the works under this contract is found also engaged in Service Contracts of the Institute at the same time.

53.1.9 The competent authority on behalf of the Board of Governors reserves the right to disqualify an agency for

53.1.10 Non-compliance of Institute orders

53.1.11 Violation of Institute policies as established by the Competent Authority in the best interests of the Institute.

53.2 Instructions for Online BID Submission

This tender document has been published on the Central Public Procurement Portal (URL: http://eprocure.gov.in/eprocure/app). The bidders are required to submit softcopies of their bids electronically on the CPP portal, using valid Digital Signature Certificates (DSC). The instructions given below are meant to assist the bidders in registering on the CPP portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP portal.

More information useful for submitting online bids on the CPP portal may be obtained at http://eprocure.gov.in/eprocure/app

2.2.1 Registration

1. Bidders are required to enroll on the e-procurement module of the Central Public Procurement portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link, "click here to enroll". Enrolment on the CPP portal is free of charge
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for the accounts.
3. Bidders are advised to register their valid e-mail address and mobile number as part of the registration process. These would be used for any communication from the CPPP portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (class 2 or class 3 certificates with signing key usage) issued by any certifying authority recognized by CCA India (e.g. Sify / TCS / nCode/ eMudhra etc.) with their profile.
5. Only one valid DSC should be registered by a bidder. Please note that bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
6. Bidder then logs in to the site through the secured log-in by entering their user ID Password and the password of the DSC / eToken.

2.2.2 Searching for tender documents

1. There are various search options built in the CPP portal to facilitate bidders to search active tenders by several parameters. These parameters could include tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP portal.
2. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. The tenders can be moved to the respective "My Tenders" folder. This would enable the CPP portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3. The bidder should make a note of the unique Tender ID assigned to each other; in case they want to obtain any clarification/help from the Helpdesk.

2.2.3 Preparation of bids

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bids. Please note the number of covers in which the bid documents have to be submitted. Any deviations from these may lead to rejection of the bids.
3. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black &white option.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g., PAN card copy, annual reports, auditor's certificates, etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

2.2.4 Submission of bids

1. Bidder should log into the site well in advance for bid submission so that he / she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible forany delay due to other issues.
2. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. A standard BOQ Format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the white colored [unprotected] cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it online, without changing the filename. If the BOQ file is found to be modified by the bidder, the bid will be rejected.

   OR

   In some cases, financial bids can be submitted in PDF format as well (in lieu of BOQ).
4. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
5. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology. Data storage encryption of sensitive fields is done.

6. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
7. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date &time of submission of the bid with all other relevant details.
8. Add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

2.2.5 Assistance to bidders

1. Any queries relating to tender document and the terms and conditions contained therein should be addressed to the tender inviting authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to CPP portal in general may be directed to the 24 x 7 CPP Portal Help Desk.

2.2.6 General instruction to bidders

1. The tenders will be received online through portal https://eprocure.gov.in/eprocure/app. In the technical bids, the bidders are required to upload all the documents in PDF format.
2. Possession of a valid class II / III Digital Signature Certificate (DSC) in the form of smart card / e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://eprocure.gov.in/eprocure/app. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the websitehttps://eprocure.gov.in/eprocure/appunder the link "Information about DSC".

Tenderers are advised to follow the instructions provided in the "Instructions to the tenderer" for the e-submission of the bids online through the Central Public Procurement Portal for e-procurement athttps://eprocure.gov.in/eprocure/app.

Executive Engineer, IWD
Institute of Technology Kanpur

2.3 List of documents to be scanned and uploaded within the period of bid submission

The following mandatory documents to be submitted with online bid submission:

The Online bids (complete in all respect) must be uploaded online in two Envelops as explained here: -

2.3.1 Envelope - 1: Technical Bid

The following mandatory documents to be provided as a single PDF file in the same sequence as listed for evaluation :

1. Scan copy of EMD.
2. GST Registration Certificate or GST Undertaking as per 5.1
3. EPF & ESI Registration
4. Copy of PAN card
5. Affidavit for not being blacklisted/debarred/restrained as per 5.2
6. Performance report of works executed as per 5.3
7. Structure and Organization of the Agency as per 5.4
8. Declaration on Details of the Bidder(s) as per 5.5
9. Details of Similar Nature of Works Completed as per 5.6
10. Declaration about Site Inspection as per 5.7
11. Enlistment Order of the Contractor in appropriate class and category issued by CPWD or others or specialized agencies
12. Tender Certificate as per 5.8
13. Tender Acceptance Letter as per 5.09
14. Letter of Transmittal as per 5.10
15. CPWD- 7 as per 5.11
16. Turnover and Other Financial statement of the Agency as per 5.12
17. Bankers certificate as per 5.13 **Or** Scanned copy of Net Worth Certificate from certified Chartered Accountant as per 5.14.
18. Scanned copy of "A" class Electrical License.
19. Integrity Pact should be signed and scanned copy of the same shall be uploaded along with technical bid. At the time of award of the work the hard copy of the same on a non-judicial Stamp Paper of Rs.100/- shall be submitted which shall be the part of the contract agreement.

The hard copy of **earnest money deposit receipt (EMD) and all the uploaded tender documents (Envelope 1) as mentioned above from Sr.no. 1 to 19** shall be submitted in the office of Executive Engineer Elect & AC, Central office IWD IIT Kanpur before the opening of the technical bid on 25.07.2025 till 3:30 PM. **In absence of the EMD and tender document as per Envelope 1 in hardcopy, the bidder shall be not eligible for opening of their technical bid and shall be rejected.**

2.3.2 Envelope - 2: Financial Bid

Price bid should be submitted in BOQ format

3 Eligibility Criteria

3.1 Eligibility criteria for contractors

Contractors who fulfill the following criteria shall be eligible to apply.

Eligible Bidders
Eligible bidders should satisfy the following criteria for an eligible bid:

1. Average annual financial turn over:

   i. Average annual financial turnover of works should be at least 50% of the estimated cost of work put to tender during the last 3 consecutive financial years by the certified Chartered Accountant.

   Audited turnover statements to be furnished as proof of the same duly certified by chartered accountant along with Profit & Loss Statements.

   ii. Bankers certificate from a commercial bank or Net-worth certificate:

   Bankers certificate of the amount equal to 40% of the Estimate cost put to tender (ECPT) as per 5.14
   Or
   Net-Worth certificate of minimum 10% of the estimated cost put to tender issued by certified chartered Accountant with UDIN as per 5.15

2. Experience :

   Firms/Contractors must have completed satisfactorily :
   i) One similar work of 80% value of the estimated cost put to tender
   Or
   ii) Two similar work of 60% value of the estimated cost put to tender
   or
   iii) Three similar work of 40% value of the estimated cost put to tender

   Works completed during last 7 years ending on date 23.07.2025.
   And
   One completed work of similar nature costing not less than the amount equal to 40% of the estimated cost put to tender with Central Government Department / State Government Department / Central Autonomous Body / Central Public Sector Undertakings/State PSU/State Autonomous Body.

Note: The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of tenders.

Definition of similar work: Similar type of work means “Experience in Data center work with SITC of Building Management System, Fire alarm system, Fire suppression system and associated controls etc.”, done with any Central Government Department / State Government Department / Central Autonomous Body / Central Public Sector Undertakings/State PSU/State Autonomous Body.

Technical datasheet: The bidder's proposed equipment's technical parameter/specification shall be matching with the required parameter/specification by IIT Kanpur as per the Technical Datasheet for all major items as specified.

3. Having valid "A" Class Electrical License

4. **The tenderer shall have to furnish an affidavit on non-judicial stamp paper of Rs. 10.00 as under:**

"I/We undertake and confirm that eligible similar work(s) has /have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the light, then I/We shall be debarred for tendering in IIT Kanpur contracts in future forever. Also, if such a violation comes to light before date start of work, the Superintending Engineer shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee."

5. **INTEGRITY PACT (Annexure-A)**
The contractor shall download the Integrity Pact, which is a part of tender document, affix his signature & seal in the presence of a witness and upload the same while submitting the online bids. In absence of duly signed integrity pact the bids shall not be considered for technical evaluation.

6. Eligible bidders must also satisfy the following conditions and ensure submission of all documents mentioned in 2.3

1. Legal: Unregistered Partnership Firm and Joint Venture or Consortium are not eligible.
2. Registration: Bidder should be registered with the Income Tax Department, Employees Provident Fund (EPF) Organization, Employees State Insurance (ESI) Corporation & GST. Bidders are not eligible in absence of these documents.
3. Office: Bidders have to establish its local accessible office registered with local GSTIN at IIT Kanpur to run the awarded work.

4 Bid Evaluation and Award

The following process will be followed for the Technical and Financial Bids Evaluation:

4.1 Technical Bid Evaluation

- Technical bids received complete in all respects covering the entire scope of work, will only be opened
- The technical bid evaluation is done only for bidders who satisfy the minimum criteria by submitting documentary proof supporting eligibility criteria and the bids of agencies who have not submitted these documents are liable to be rejected without notice

4.2 Financial Bid Evaluation

For financial bids, the following points shall be followed:

- After evaluation of Pre-Qualification Documents, a list of short listed agencies will be prepared.
- Thereafter the financial bids of only the qualified and technically acceptable bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives, if present.
- The bid shall remain valid for Ninety (90) days from date of opening of eligibility bids/Technical bid.

NOTE

The employer reserves the right, without being liable for any damages or obligation to inform the bidder, to:

- Amend the scope and value of contract to the bidder.
- Reject any or all the applications without assigning any reason.

Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

5 Various Forms and Formats

5.1 Undertaking regarding obtaining GST registration

Proforma for Undertaking regarding obtaining GST registration Certificate of The State in which work is to be taken up

(Undertaking to be furnished on a 'Non-Judicial' stamp paper worth Rs.100/) (Scanned copy of this notarized undertaking to be uploaded at the time of submission of bid, if required)

If work is awarded to me, I/we shall obtain GST registration Certificate of the State, in which work is to be taken up within one month from the date of receipt of award letter or before release of any payment by IITK, whichever is earlier, failing which I/We shall be responsible for any delay in payments which will be due towards me/us on a/c of the work executed and/or for any action taken by IITK or GST department in this regard.

.....
(Signature of Bidder(s))

Or

.....
(An authorized Officer of the firm with stamp)

.....
(Signature of Notary with seal)

5.2 Affidavit for not being blacklisted/debarred/restrained

Proforma for AFFIDAVIT for not being blacklisted/debarred/restrained
(AFFIDAVIT to be submitted on a 'Non-Judicial' stamp paper worth Rs.100/)
(Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

I/we undertake and confirm that our firm/partnership firm has not been blacklisted and/or debarred/restrained by any Central Govt./ State Govt. Agency/ Autonomous body of the Central or State govt./ PSU etc. Further that, if such information comes to the notice of the Institute, then I/we shall be debarred for bidding in the Institute in future forever. Also, if such information comes to the notice of the Institute on any day before date of start of work, the competent authority shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

.....
(Signature of Bidder(s))

Or

.....
(An authorized Officer of the firm with stamp)

.....
(Signature of Notary with seal)

5.3 Performance report on work executed

Proforma of Performance report on works referred to in Financial Information

(To be printed in Company's Letterhead)

(Scanned copy of the Performance Reports to be uploaded at the time of submission of bid)

1. Name of work/project & location:
2. Agreement no.:
3. Estimated cost:
4. Tendered cost:
5. Date of start:
6. Date of completion:
7. Stipulated date of completion:
8. Actual date of completion:
9. Amount of compensation levied for delayed completion, if any:
10. Amount of reduced rate items, if any:
11. Performance Report:

    (a) Quality of work: Outstanding / Very Good / Good /Poor

    (b) Technical Proficiency: Outstanding / Very Good / Good /Poor

    (c) Resourcefulness: Outstanding / Very Good / Good /Poor

    (d) General Behavior: Outstanding / Very Good / Good /Poor

Date: Signature of Superintending Engineer or Equivalent

5.4 Structure and Organization of the Agency

Proforma of providing Structure and Organization of the Bidding Agency
(To be printed in Company's Letterhead)
(Scanned copy of the Structure and Organization Document to be uploaded at the time of submission of bid)

1. Name & address of the bidder:
2. Telephone no./Telex no./Fax no.:
3. Email address for Communication.:
4. Legal status of the bidder (attach copies of original document defining the legal status):
   (a) An Individual:
   (b) A proprietary firm:
   (c) A firm in partnership:
   (d) A limited company or Corporation:
5. Particulars of registration with various Government Bodies (attach attested photocopy)

   Organization / Place of Registration No.

   1.
   2.
   3.
6. Names and titles of Directors & Officers with designation to be concerned with this work.
7. Designation of individuals authorized to act for the organization
8. Has the bidder, or any constituent partner in case of partnership firm, ever been convicted by the court of law? If so, give details.
9. Any other information considered necessary but not included above.

(Signature of Bidder(s))

5.5 Declaration on Details of the Bidders

Proforma of Declaration on Details of the Bidders

(To be printed in Company's Letterhead)

(Scanned copy of the Performance Reports to be uploaded at the time of submission of bid)

DECLARATION

I/We, ... hereby declare that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I/we have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification.

Particulars of the bidder as per following details:

1	Name of the firm / organization	:	
2	Type of the firm / organization: Public Ltd. / Private Ltd. / Registered firm	:	
3	Registered address	:	
4	Address of office	:	
5	Contact people	:	
6	Name & Designation	:	
7	Landline & Mobile numbers	:	
8	E-mail IDs	:	
9	PAN No.	:	
10	GST No.	:	
11	EPFO Reg. No.	:	
12	ESIC Reg. No.	:	
13	Copy EMD receipt with signature	:	Yes/ No
14	Has the applicant ever been required to suspend any project for a period of more than six months continuously after Commencement of work?	:	If so, give the name of the project and reasons of suspension of project
15	Has the applicant ever been convicted by a court of law?	:	YES / NO,If yes, give details of the case
16	Details of any litigation in which the applicant is/was involved.	:	
17	All forms submitted as desired in the bid	:	Yes / No

18	Undertaking regarding no subletting of work	:

We further declare that our organization has not been blacklisted /delisted or put to any holiday by any Institutional agency / Govt. Department / Public Sector Undertaking in the last three years.

Date: Signature of Bidder(s) with seal

5.6 Details of Similar Nature of Works Completed

Proforma for submission of Details of Eligible Similar Nature of Works Completed* during the Last Seven Years ending previous day of the last date of submission of tenders

The contractor needs to submit the supporting documents in the following tabular format:

Sl. No.	Name of work/project and location	Owner or sponsoring organization	Cost of work in crores of Rupees	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases pending/in progress	Name and address/telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

*Indicate gross amount claimed and amount awarded by the Arbitrator.

Date: Signature(s) of Bidder with seal

5.7 Declaration About Site Inspection

Declaration about Site Inspection

(By Bidder)

To

The Superintending Engineer

Subject: Submission of Tender for the work of "Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur."

Dear Sir/Madam,

It is hereby declared that as per terms and conditions of this tender document, **I**/ We the bidder inspected and examined the subject site and its surrounding and satisfy myself / ourselves as to the nature of the ground and sub-soil (so far as is practicable), the forms and nature of the site./ ourselves before submitting the bid, the accommodation which may require and all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid have been obtained. I/We the bidder shall have full knowledge of the site and no extra charge consequent upon any misunderstanding or otherwise shall be claimed in later date. I /We bidder shall be responsible for arranging and maintaining at own cost all materials,tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by me/us implies that I / We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

Sincerely

(Duly authorized signatory of the Bidder)

5.8 Certificate for Tender

(To be given on Company Letter Head)

Date: .....

To,
Superintending Engineer
IIT Kanpur-208016

Sub: Certificate of compliance as per Rule 144 (xi) GFR's 2017

Tender Reference No: .....

Name of Tender / Work: .....

1. "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"
2. "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all the requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

5.9 Tender Acceptance Letter

(To be given on Company Letter Head)

To,
Superintending Engineer
IIT Kanpur-208016

Date: .....

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: .....

Name of Tender / Work: .....

Dear Sir,

5.9.1 I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely: .....as per your advertisement, given in the above mentioned website(s).

5.9.2 I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No..... to ..... (including all documents like annexure(s), schedule(s), etc .,), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

5.9.3 The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.

5.9.4 I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.

5.9.5 I / We do hereby declare that our Firm has not been blacklisted/ debarred/ terminated/ banned by any Govt. Department/Public sector undertaking.

5.9.6 I / We certify that all information furnished by our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organization shall without giving any notice or reason therefore or summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

(Signature of the Bidder, with Official Seal)

5.10 Letter of Transmittal

To

The Superintending Engineer
Indian Institute of Technology Kanpur
Kanpur, UP - 208016

Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur.."...

Dear Sir/Madam

Having examined details given in Notice and bid document for the above work, I/we hereby submit the relevant information.

5.10.1 I/We hereby certify that all the statements made and information supplied in the enclosed forms and accompanying statement are true and correct.

5.10.2 I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.

5.10.3 I/We also authorize the Executive Engineer, Indian Institute of Technology Kanpur or his representative(s) to approach individuals, employers, firms and corporation to verify our competence, work experience, and general reputation.

5.10.4 I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible completed works:

Sl. No.	Name of work	Amount	Certificate issued by
1.			
2.			
3.			
4.			

CERTIFICATE

It is certified that the information given in the enclosed eligibility bid are correct. It is also certified that I/We shall be liable to be debarred, disqualified/ cancelation of enlistment in case any information furnished by me/us found to be incorrect.

Enclosures:

Date of submission: Signature(s) of Bidder with seal

5.11 CPWD-7

CPWD-7

PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

Tender for the "Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur."

5.11.1 To be uploaded as per details uploaded in CPP portal at www.eprocure.gov

5.11.2 To be opened in the presence of tenderers who may be present at the time of opening inthe office of Executive Engineer, Institute Works Department IIT Kanpur.

5.11.3 The pre-qualification/Technical bid shall be opened first on due date and time as mentionedabove. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.

TENDER

((To be signed in Company's Letterhead)

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, General Conditions of Contract (For construction works) 2023, CPWD SOP 2024 corrected up to the last date of bid submission, CPWD works manual 2024 corrected up to the last date of bid submission and clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the Board of Governors within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for Ninety (90) days from the due date of its opening and not to make any modification in its terms and conditions.

A sum of Rs. 2,09,203/- is here by forwarded in receipt treasury challan/ Deposit as call receipt of a scheduled bank / Fixed deposit receipt of scheduled bank/ Demand draft of a scheduled bank/ bank guarantee issued by scheduled bank as earnest money deposit. If I/we, fail to furnish the prescribed performance guarantee or fail to commence the work within prescribed period, I/ we agree that the said Board of Governors, IIT Kanpur or his successors in office shall without prejudice to any other right or remedy to be at liberty to forfeit the said earnest money absolutely. Further, if I/we fail of commence the work as specified , I/we agree that Board of Governors , IIT Kanpur or his successor in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to execute all the works referred to the tender documents upon the terms & condition contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in schedule '"F" and those in excess of that limit at the rates to be determined in accordance with the provision contained in clause 12.2 and 12.3 of the tender form.

Further, If I/we, withdraws tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department after the last date of submission of bids, then the Institute shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money

absolutely irrespective of letter of acceptance for the work is issued or not.
Further, I/we agree that in case of forfeiture of earnest money or both earnest money & performance guarantee as aforesaid, I/we shall be debarred for participation in the retendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in Indian Institute of Technology Kanpur in future forever. Also, if such a violation comes to the notice of Indian Institute of Technology Kanpur before date of start of work, the **Superintending Engineer** shall be free to forfeit the entire amount of Performance Guarantee.
I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety & integrity of IIT Kanpur

Date: Signature(s) of Contractor(s) with seal

Address:

Occupation:

Yours Faithfully,

5.12 Financial Information

Proforma for providing Financial Information

(Scanned copy of the completed information sheet to be uploaded at the time of submission ofbid)

Financial Analysis: Details to be furnished duly supported by figures in balance sheet/ profit & loss account for the last three financial years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached).

Financial Years	2021-22	2022-23	2023-24
Gross Annual turnover			
Profit/Loss			

.....
Signature of Chartered Accountant with Seal

.....
Signature of the bidders(s)

5.13 **Banker's** Certificate from a scheduled Bank

Proforma of Banker's Certificate from a Scheduled Bank

(To be printed in Bank's Letterhead)
(Scanned copy of the Certificate to be uploaded at the time of submission of bid)

This is to certify that to the best of our knowledge and information that M/s./Sh..... having marginally noted address, a customer of our bank are/is respectable and can be treated as good for any engagement up to a limit of Rs ..... (Rupees .....). This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

.....
(Signature for the Bank)

NOTE:

1. Bankers certificates should be on letter head of the Bank, addressed to tendering authority.
2. In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

5.14 Net Worth Certificate by certified Chartered Accountant

Proforma of Net Worth Certificate by certified Chartered Accountant

(To be printed in Letterhead of Chartered Accountant)
(Scanned copy of the Certificate to be uploaded at the time of submission of bid)

This is to certify that as per the audited Balance Sheet and Profit & Loss state- ment of the account during the financial year ....., the net worth of M/s./Sh.....(Name & Registered Address of individual/firm/company) as on 31.3.2024 is Rs. .....(Rupees. .....) after considering all liabilities.. It is further certified that the net worth of the company has not eroded by more than 30% in the last three years ending on 31.3.2024.

.....
(Signature of the Chartered Accountant)

.....
(Name of the Chartered Accountant)

.....
(Membership No. of ICAI)

.....
(Date & Seal)

6 Proforma of Schedules

PROFORMA OF SCHEDULES
(Tender)

6.1 SCHEDULE 'A': Schedule of Quantities

Schedule of Quantities : BOQ uploaded separately

6.2 SCHEDULE 'B': Schedule of materials to be issued to the contractor

Schedule of materials to be issued to the contractor: NIL

6.3 SCHEDULE 'C': Tools and plants to be hired to the contractor

Tools and plants to be hired to the contractor: NIL

6.4 SCHEDULE 'D': Extra schedule for specific requirements/document for the work, if any

Extra schedule for specific requirements/document for the work, if any: NIL

6.5 SCHEDULE 'E': Reference to General Conditions of Contract

Reference to General Conditions of Contract	:	General Conditions of Contract 2023 for Construction Works & Maintenance work and as amended / modified up to the last date of submission of Bid.
Name of Work	:	"Fire Safety and BMS work for Data Centre facility under NSM-2 (National Super Computing Mission) at Computer Centre, IIT Kanpur."
Total Estimated cost of work	:	Rs. 1,04,60,160/-
Earnest Money	:	EMD Rs. 209203/-
Performance Guarantee	:	5% of tendered value
Security Deposit	:	2.5% of tendered value will be deducted from bill. Same would be released after successful completion of Two year defect liability period and as mentioned in special conditions of the contract.

6.6 SCHEDULE 'F': General Rules and Directions

GENERAL RULES & DIRECTIONS:

Officer Inviting tender: Superintending Engineer, IWD

6.6.1 Definitions

1 Inviting Authority	:	Superintending Engineer, IWD
2(v) Engineer-in-Charge	:	Executive Engineer
2(viii) Accepting Authority	:	SE/DOIP/DD
2(x) Percentage on cost of materials and Labour to cover all overheads and profits	:	15%
2(xi) Standard Schedule of Rates	:	DSR E & M, 2023 & MR with correction slips up to the last date of Bid
2(xii) Department	:	Institute Works Department, IITKanpur
9(ii) Standard CPWD Contract Form	:	General Conditions of Contract 2023, SOPs 2024, CPWD Form 7 as amended / modified up to the last date of submission of Bid.

6.6.2 Clauses

Clause 1		
i. Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW welfare board or proof of applying thereof from the date of issue of the letter of acceptance	:	7 days
ii. Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the Period provided in (i) above	:	7 days
Clause 1A	:	Applicable. The Defect liabilityperiod shall be Two year from the date of handing over of the assigned works to the user/Institute
Clause 2 Authority for fixing compensation under Clause 2	:	Superintending Engineer, IIT Kanpur
Clause 2A Whether Clause 2A shall be applicable	:	YES

Clause 5	:	
(i): Number of days from the date of issue of letter of acceptance for reckoning date of start	:	07 Days
ii: Milestones	:	Time allowed for execution of work alongwith the amount to be withheld in case of non-achievement of milestone are shown in Tables 6
Clause 6: Computerized Measurement Bill	:	*Applicable*
Clause 7	:	Applicable
Clause 10A	:	Applicable
Clause 10B (ii)	:	Not Applicable
Clause 10B (iii)	:	Not Applicable
Clause 10C	:	Not Applicable
Clause 10CA	:	Not Applicable
Clause 10CC	:	Not applicable
Clause 11	:	CPWD Specifications of all items(CPWD specification vol.1 and vol.2, 2019), with correction Slips issued up to the last date of receipt of tenders and as per NIT for the Works.
Clause 12: Type of work	:	Original Work
Clause 12.2 & 12.3: Deviation limit beyond which clause 12.2 & 12.3 shall apply for Building work	:	NA
Clause 16 Competent Authority for deciding reduced rates: For Civil items and For Electrical items of work	:	As per Table 7
Clause 17 - Defect liability period completion of contract whichever is later	:	Two year and those listed in Special Conditions of Contract
Clause 18 - List of mandatory machinery, tools & plants to be deployed by the contractor at site	:	As per the scope of the work
Clause 32 - Requirement of Technical Representative(s)	:	As per Table 9

If the Contractor commits default in commencing the execution of the work as aforesaid, the performance guarantee shall be forfeited.

Table 6: Major milestones of the project

Sl. No.	Description of mile stone	Period for completion from date of start	Withheld amount for non achievement of mile stone.
1	Submission of SLD , GFC & Technical Datasheets of all the components i.e. Fire alarm System, Fire suppression system, WLD, VESDA, Access Control system, Rodent replant system & BMS architecture, BMS I/O summary, showing all equipment, cable & conduit size, route etc.	10 Days	1 % of the accepted tendered value
2	Delivery of Fire suppression Pipeline, cables, sensors, Fire Alarm sensors and detectors, PA system, Access control system etc.	1 month	1 % of the accepted tendered value
3	Installation of the Fire suppression pipeline, cabling work for WLD, VESDA, rodent replant etc. cabling and conduit work below false flooring and above false ceiling.	1.5 months	1 % of the accepted tendered value
4	Delivery of all the remaining components BMS, FAS, Fire suppression Gas, VESDA, WLD, Access control system, all the controller, sensors etc	2 months	1 % of the accepted tendered value
5	Installation and integration & commissioning of entire system.	3 months	0.5 % of the accepted tendered value

The detailed program chart approved by the engineer-in-charge shall indicate how the resources will be deployed by the contractor to maintain desired progress and for the completion of the work within the specified period. If the submitted program is approved, the milestone shall be redefined accordingly by the Superintending Engineer, IWD Indian Institute of Technology Kanpur. The amount to be withheld in such a case, for non-achievement of milestone(s), shall remain unaltered i.e., 1% of tendered amount.

Time allowed for execution of work: Six (6) months

Table 7: Authority to decide

(i)	Extension of time (EOT)	:	SE, IIT Kanpur
(ii)	Rescheduling of milestones	:	Superintending Engineer, IWD, IIT Kanpur
(iii)	Shifting of date of start in case of delay in handing over of site	:	Superintending Engineer, IWD, IIT Kanpur

Table 8: Materials for which all India Wholesale Price Index to be followed

Sl.No	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base Price (without GST) of Materials, covered under clause 10 CA
1	Portland Pozzolana Cement (PPC)/ Ordinary Pozzolana Cement	Nil	Nil
2	Steel for Reinforcement TMT Fe 500D Primary	Nil	
3	Manufacturer Structural Steel (Primary producers)	Nil	Nil

Table 9: Requirement of Technical staff as per Clause 32

Table 9: Requirement of Technical staff, Clause 32						
Sl No.	**Requirement of Technical staff *Qualification* (Of Major + Minor component)**	***Number***	**Minimum experience in Year**	**Minimum experience in Year**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32**	
					Figures	**Words**
1	Graduate Engineer/Diploma Engineer (ElectricalMechanical)	1	10/20	Project Manager	Rs. 60000/- PM	Rs. Sixty Thousand Only.
2	Diploma Engineer (Electrical/Mechanical)	2	5 & 10	Project Planning/ quality/ billing Engineer (Electrical/Mechanical)	Rs. 15,000/- pm per month per person	Rs. Fifteen Thousand only per month per person

Note: Project/Site Engineer for Electrical/AC/BMS work mentioned must be required from the beginning of the work to meet the date of handover of site as per special terms and conditions.The details of the appointed site engineers have to be verified and approved by Engineer-in- Charge.

7 Scope of work

7.1 Brief of the works

Construction of 1000 TR Water Cooled Central AC plant for Data Centre under NSM-II (2 nos. Screw Chillers each of capacity 500 TR) near IWD AC plant, IIT Kanpur.. In BOQ.

Note: The scope of the works listed above is indicative only. For the details of the works, please refer to the BoQ and the work has to be done strictly as per thespecifications in the BoQ.

7.2 Materials Verification

The contractor shall inform the Engineer in charge in advance, for verifying the measurement of the concealed items like pipes, pipes laying, cable laying etc., done by the contractor on the very day of the above said events.

7.3 TECHNICAL SPECIFICATION

Section 1: BMS & fire Safety System

Section 2: Fire Alarm System

Section 3: Access Control System

Section 4: Fire suppression System

Section 5: Aspiration detection VESDA system

Section 6: Water Leak Detection System

Section 7: Rodent Repellent System

Section 8 : Building Management System

1. – TECHNICAL SPECIFICATION

1 BMS and Fire safety work

Supply and implement Fire safety (Fire alarm system, Aspiration System/VESDA, Water leak detection, Rodent Replant, Public Address system and Fire suppression i.e. NOVEC-1230), physical security (access controls including biometric), and Building Management system (software platform, work station, with DDC controllers, integrator and field devices for monitoring & controlling the parameters of Mechanical systems, Electrical systems, Cooling units, etc to maintain required environmental conditions in Data centre

BMS System:

BMS shall monitor the parameters of the data centre mechanical & Electrical equipment to maintain environmental conditions, such as temperature, pressure, and humidity, within acceptable limits and at optimal energy efficiency. The operation of the system is governed by the Sequence of Operation (SOO), which is based on the mechanical system design. A graphical user interface (GUI) or Human Machine Interface (HMI) needs to provided as a visual representation of local conditions, equipment overrides, set point adjustments, historical trends, Electrical parameters of individual equipments i.e. current, voltage, pf, kwh,kvr etc & monitoring of PUE, Cooling load etc and alarms conditions at the equipment level. The BMS also functions to notify the proper recipients, onsite or offsite, in the event of abnormal operation, and archive historical data for use in troubleshooting and analyzing system operation. BMS software must have web client and should be able to access from any standard Web browser, Web Based Graphical interface software shall have point license of with 5 nos. simultaneous users of web license. Software should include following as minimum.

(1). Alarm manager (2). Trend Manager (3). Graphics manager with 3D graphics library

(4). Report Manger for generation of various reports. (5). Energy Management, Integration of equipments as per I/o summary

The IBMS system shall be a peer-to-peer networked, stand alone, distributed control system with the capability to integrate various technologies and communication protocols such as BACnet/IP,Bacnet SC, RS485, SNMP, OPC/UA Client-Server, HTTP, ODBC, Active X as per well accepted international standards such as the ANSI/ASHRAE Standards in one open, interoperable system for automation of diverse utilities and services such as HVAC, Fire Fighting, Plumbing and electrical systems & ELV system etc. The IBMS software shall be designed and developed to the following standards: •) The a seamless integration of 3rd party systems. Besides, adherence is required to industry standards and certifications such as UL and BTL certification of products and EN compliance. The Automation Level data exchange needs to happen through peer to Peer Communication. The integrator shall supply the complete software environment consisting of –all types of server grade operating systems, client PCs/workstation operating systems, database server suites, anti-virus for servers and PCs/client workstations, IBMS application software, Energy Management Software and GUIs. The entire software environment consisting of the above shall be from established OEMs and shall be original licensed products. All such licenses shall be registered directly in the name of the client or end user at the time of supply itself or shall be transferred in their name before the formal hand-over. The software shall have one thick and 5 concurrent clients thin which shall be used for monitoring and controlling the data of various subsystems as per site requirement.

The specification will include compliance to FIPS 1402 Level-1 Compliance or latest or IEC 19790:2006 or latest and IEC 24759:2017 or latest to ensure protection against unauthorized access to data over the IP Network in addition to the IEC 62443 standard for cyber security. The Integrated Control Platform shall support encrypted password authentication for all web services whether serving or consuming.

Architecture of BMS system shall be of:

- Management Level (BMS Servers/Software)
- Control Level (DDC Controllers)
- Field Level (Field Sensors)
- BMS should have capability to show real time PUE, trends and record historical data of PUE.
- BMS should generate event notifications over emails, data for events based on which uptime and downtime will be calculated.
- BMS should generate alarm signal and tripping signal at abnormal situations.

There should be real-time reporting of

- Component wise and aggregate power consumption
- Temperature and relative humidity in the data centre and UPS room.
- Instantaneous PUE, hourly PUE, daily PUE, monthly PUE and annual PUE.
- Alarm indicators for component failures.
- GUI with SLD, P*ID, Equipment's visuals etc.

There should be real-time monitoring and logging of all parameters of the data centre as per ASHRAE/TGG 2009 Real time energy consumption measurements in data centres guidelines (best practical). There should be facilities for periodic reports (including uptime reports) of all aspects of the data Centre. All the required hardware and software eco-system including storage (High end PC, 32"LCD HD Monitor, Key Board, Mouse etc.) has to be supplied by the bidder.

The BMS system should allow for the monitoring, control, interrogation, alarm handling and routing for the following equipment's but not limited to:

- HVAC equipment–
- UPS and Battery system
- Electrical parameters.
- Energy meters
- Fire Alarm Systems.
- Water Leak detection System.
- Vesda System
- All Sensors
- Adiabatic Dry coolers
- PHE I/O parameters through sensors
- Pumps PLC
- BTU Meter
- Valves and actuators including thermal storage charging, discharging and normal cycle.
- Etc.

Fire Alarm System–

The system and its components shall be Underwriters Laboratories, Inc. listed, and APPROVED under the appropriate testing standard, for fire alarm systems and the installation shall be in compliance with the UL 10th Edition listing. The fire alarm system shall comply with requirements of NFPA 72 (National Fire Alarm and Signaling Code). The system shall be electrically supervised and monitor the integrity of all conductors.

When a fire alarm condition is detected and reported by one of the system indicating the affected devices, the following functions shall immediately occur:

- The System Alarm LED to be flashed.
- System output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm should be executed, and the associated system outputs (notification appliances

and/or relays) to be activated.

- The audio portion of the system should sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.
- Zone identification should be available on BMS system. The publications

listed below are part of this specification. National Fire Protection Association

(NFPA) - USA:

No. 70 National Electric Code (NEC) No. 72-1996

National Fire Alarm Code No. 90A Air

Conditioning Systems

No.92A SmokeControlSystems

No. 92B Smoke Management Systems in Large Areas No. 101 Life

Safety Code

Bidder to consider fire alarm system with audio hooter at different places, in Data center area, battery & UPS area, Reception area.
Supply, Installation, Testing and Commissioning of Intelligent Addressable Fire Alarm System (FM Approved/ UL Listed) which includes Intelligent Addressable Fire Alarm Panel, FM approved Analogue Addressable Heat Type Smoke Detector, Analogue Addressable Multi Criteria Type Smoke Detector with In-built Isolator Base, Addressable Manual Call Point, Sounder (85 Db), Response Indicator (For False Floor Areas), Addressable Control module for activating sounder , Gas release Panel , Access Control De-Activation, Short Circuit Isolator Module, Addressable Monitor Modules, shielded multi strand Armored FRLS cable etc.

SITC of Very Early Smoke Detection System (VESDA):

Provide an air sampling smoke detection system (Very Early Smoke Detection Apparatus) for each server area. Provide a Laser Focus air sampling smoke detection system for areas as per site condition including but not limited to utility area, server area etc. in accordance with manufacturer's recommendations.

The air sampling smoke detection system shall consist of highly sensitive smoke detectors with aspirating fans, air sampling pipe network, filters, networked controllers and a high-level interface to the building Fire Alarm System, as required.

The air sampling detectors shall provide a nominal obscuration level range from .0015 to 6%/ft ., adjustable

through the system operator control interface.

Smoke Detector Assembly: The smoke detector, filter, and aspirating fan shall be housed in a Detector Control Assembly Enclosure and arranged in such a way that air is drawn from the protected area through the filter and detector by the aspirating fan.

The Detector Control Assembly shall house the programmable intelligent controller, which will support air flow/detector supervision, automatic and manual sensitivity adjustment, time delay and remote reset functions. Laser Compact detector shall communicate with the fire alarm control panel.
The system shall provide 3 field-selectable levels of alarm status: Alert Level 1 (.04% obscuration/ft.), Alarm Level 2 (1.06% obscuration/ft.) and Alarm Level 3 (2.6% obscuration/ft.). Actual sensitivity levels will be determined in the field and programmed during system commissioning. Alarm Levels1 and 2 will initiate a Supervisory Condition on the Fire Alarm System, and Alarm Level 3 will initiate the building-wide evacuation sequence.

- Approval–UL&FM
- Event logs required.
- Output signal–5 Relay contact for Fault/Alarm & one analogue output for smoke density
- Large flow rate fan (Max. shut off pressure: at least 350Pa and max)
- flow rate: at least 170 L.min

SITC Rodent Repellent System:

The objective is to protect the entire premises viz. server area, utility area etc., all the voids against rodents. The purpose is to keep the rodents away from the floor by generating very variable high frequency sound waves which are not audible to human ear but irritate rodents. The objective is to protect all the cables below floor, above ceiling & room void from damage caused by rodents. The system proposed is to protect all the equipment's, areas with relevant type of high frequency sound producing device called satellites or transducers. Once powered up these transducers produce very high frequency variable sound waves continuously which irritate the rodents and are forced to evacuate the place. The devices can be tested periodically by means of a test switch provided on Main console.

SITC Water Leak Detection System:

It should include electronic alarm modules, water sensing cable, graphic display map, and auxiliary equipment. The system has to be capable of automatically detecting the presence of water at any point across the length of sensing cable. The system should alarm and locate the point of liquid contact on the digital display. This system should capable of communicating to BMS.

SITC of Fire Suppression System (NOVEC 1230):

Supply, install, test and commission NOVEC 1230 (Fluro Ketone FK-5-1-12) based fire suppression system with NFPA 2011/latest standards and UL listed. It shall be integrated with fire alarm system, The fire suppression system shall include and not be limited to gas release control panel, CCOE approved seamless cylinders, discharge valve (with solenoid or pneumatic actuator) as the case may be, discharge pipe, check valve and all other accessories required to make a complete operation system meeting applicable requirements of NFPA 2011 standards and installed in compliance with all applicable requirements of the local codes and standards.

The bidder should submit method of operation and calculation sheet for Gas, piping, Nozzles required in Data centre, Battery room and in UPS room.

2. FIRE ALARM SYSTEM

The scope of work shall include designing, supplying, installing, testing and commissioning of Intelligent Addressable Fire Detection cum Alarm System for Data Centre. This shall conform to relevant latest standards for fire alarm systems (NFPA72/BS5839 as applicable). The Detectors, other components and accessories required as per the BOQ needs to be installed, tested and commissioned by integrating the same to the fire Alarm Panel.

It shall be possible to trip from the Fire Alarm Panel through the use of Addressable Output modules, individual AHU activated by the fire signal of specified detectors.

Input modules for monitoring Vesda, Water Leak detection, Control modules for tripping Suppression system, PAC, activation of Public address, deactivation of Access control contacts like magnetic door

Data center facility shall have a multi zone panel with each area forming of one or more Software programmed zones. All wiring shall be done using 2c x 1.5mm2 PVC insulated armored / Fire Resistant copper cable (FRLS).

The equipment shall have UL approved system.

2.1. System Description

The Fire Alarm System shall give Audio/Visual Alarm Signals when - the temperature inCase of Heat Detector or smoke density in case of Smoke Detector, exceeds the pre-set limit.

The system shall give exact location of detector / fire with initiating annunciation like sounder, strobe etc.

The system shall have a facility to give signal to PA system in case of Alarm condition to activate automatic announcement.

The system shall have a microprocessor-based control and monitoring facility. It shall be possible to program each loop with up to minimum 125 Detectors/devices.

Fire alarm control panel shall also have inbuilt Annunciation facility and the panel being able to initiate alarm signal for any particular zone. The system shall be fully supervised for all fault conditions with distinctive alarm operated for fault and fire conditions. Test buttons and software features shall be provided to test the electronic circuits and Detector condition/ health.

The Fire alarm control panel shall be programmable so that when a particular Detector or group of detectors gives a fire signal the Fire alarm control panel should be able to trip PAHUs/ Ventilation fans, access door magnetic contacts and send a signal to the BMS.

In case of Fire in an area the Fire alarm control panel shall be able to trigger a relay that shall shut off the air handling units of that zone through an additional contact provided in the PAHU panel by the AC contractor.

The system shall have a facility to receive signal from suppression system in case of Fire condition to activate Suppression system and send a signal to the BMS.

The system shall have a facility to receive signal from VESDA system and alarm in case of early detection of Smoke/fire and send a signal to the BMS.

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The system shall have a facility to receive signal from Water Leak detection system and alarm in case of detection of water and send a signal to the BMS.

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The system shall be based on an open protocol to ensure flexibility.

2.2. Technical Specification

2.2.1. FIRE ALARM CONTROL PANEL (FACP) : This is a microprocessor-based panel which shall be connected to the various detectors / devices by means of 2 wire loops. The Fire alarm control panel shall be able to supervise individual detectors for proper performance as well as to give pinpoint location of fire alarm.

The panel shall have hooter alarm as well as facility for cutting off of AHUs and Ventilation fans the panel shall also have the facility for integrating with BMS directly or 3rd party integration.

The Fire Alarm Control Panel shall be micro processor based fully Intelligent Addressable, Intelligent Control Unit with centralized monitoring which shall control all Intelligent Addressable Detectors, Manual Call Points and Switching Systems (for disconnecting PAHU and power supply) connected with IP card output for communication with other panel and Main control station.

All addressable units shall be connected to the Fire alarm control panel through the Loop Cards and shall be addressed through individual numbers. The Fire alarm control panel shall be able to obtain intelligent value for all detectors in the circuit through a pulsed digitalized current data.

The Fire alarm control panel shall be able to analyse all intelligent inputs from all addressable units, and through its own software and ambient level screening the Fire alarm control panel shall be able to identify fire, possible fire or fault conditions. The unit supervision shall be dynamic and continuous.
All the events occurring anywhere in building shall be captured in the Main Fire alarm panel provided in the IBMS room. Also, the all the events capturing by Main Fire alarm panel should be repeated at repeater panel at security Gate.

The Fire alarm control panel shall also give adequate warning signal whenever there is dust accumulation in detectors. It should be possible to change the level of ambient alarm calibration condition by the use of software program.

Short / Open circuit fault shall also be reported at the Fire alarm control panel. In such cases, the system through the use of fault isolators shall be able to isolate that segment. The missing Detectors/Devices shall also be reported at the Fire alarm control panel with identification of the location.

The Fire alarm control panel shall have the facility to set each smoke sensor sensitivity remotely It shall also be possible to set the sensitivity to a high level or low level based on night or day time (time based sensing).

When an alarm condition is sensed at the Fire alarm control panel from a smoke or heat detector, a delay time/alarm verification period shall be started. If the sensor is still in alarm after the delay time expires, an alarm condition is reported. The delay time shall be adjustable from 0 to 990 sec's.

The Fire alarm control panel shall have the facility to perform walk test. In the walk test mode, the performance of each device is checked out by initiating the device. As each device is placed into alarm the Fire alarm control panel shall print the condition and automatically reset the device. Audible devices shall be initiated, if required at a pre-programmed time. If a zone is inadvertently left in walk test mode, it shall automatically reset to normal after the idle time is exceeded. During the walk test the zones other than the programmed zones shall be under

continuous supervision (normal mode).In case of any alarm initiated by detector/devices the walk test shall get terminated automatically.

Programming functions shall include alarm/trouble type assignment, point descriptor assignment, alarm message assignment, etc. Programming shall be carried out from the Fire alarm control panel keyboard or utilizing the authorized laptop/desktop computer software.

The Fire alarm control panel shall have a Liquid Crystal Display of Alphanumeric type. The display should have high resolution, backlit 168 character. In case of testing of the system from the Fire alarm control panel the Display shall be able to give readouts of intelligent value of all detectors being tested.

The Fire alarm control panel shall also be able to carry out continuous self monitoring when in normal condition.

The Fire alarm control panel shall have either an in-built or external printer coupled to the Fire alarm control panel, which shall log all events with time. The printout shall clearly indicate the event - Fire/Pre Alarm/Fault etc. with the unit address and time.

The Fire alarm control panel shall also be able to discriminate between false alarms and fire conditions.

The Fire alarm control panel shall carry out priority selection of alarm in case alarm activities in two or more remotely located units simultaneously. In such cases, the Manual call Point shall have the highest priority.

The Fire alarm control panel shall also be able to actuate switches automatically in case of Fire condition that of PAHU's and power supply or other systems such as piped pressurized gas supply /Access control doors.

The System shall be fail safe and adequate safe guards should be ensured that in the event of a failure of a part of the System it shall not handicap the complete System.

The agency shall be responsible for preparation and installation of System Software into the Fire Alarm Control Panel. The Software shall be user friendly. The system shall be secured against Software errors.

The system shall have the ability to be upgraded so as to incorporate more features at a later date. The system shall be designed such that it shall be possible to add at least 20% of the Detectors for future expansion without extra cost on the panel.

The Fire alarm control panel shall have its own Battery Backup of a minimum of 48 hours in normal run and then half an hour in alarm condition. The back up time calculation shall be done as per relevant standards and produced for approval. The Battery shall be 2*12V (24V) DC and of sealed lead acid rechargeable maintenance free type, housed inside the FACP.

The voltage rating shall be from 14V DC to 31V DC, though the voltage may be change.

The Fire alarm control panel shall be totally enclosed dust and vermin proof type made of minimum 13 gauge dust inhibited sheet with even baked finish. The Fire alarm control panel shall be of completely solid state

design. The logic circuitry shall be based on high noise immunity solid state hardware employing modular construction. Logic cards shall be of epoxy fibber glass construction.

The Fire alarm control panel shall have UL approval.

The Fire alarm control panel shall have provision for interfacing with the Public Address System. The panel should have the facility to interface with an automatic two channel programmable speech dialler for verbal reporting of fire. Fire alarm control panel shall be able to call four telephone numbers per channel. The programmable speech dialer shall have two alarm inputs and shall provide listen in capabilities through the built-in microphone. The dialer shall have a built-in keypad for easy operation, programming and voice recording.

The fire alarm panel should be provided with IP integration card.

2.2.2. LOOP - A device loop shall mean a 2-wire circuit connecting minimum 125 addressable detectors/devices per loop. The loop card shall have built-in circuit isolator to accommodate Class 'A' wiring. The loop cards shall be of modular construction for future expansion.

2.2.3. ADDRESSABLE DEVICES

Above term indicates the complete group of addressable devices such as detectors, Manual call points, addressable output/input modules etc.

4.2.4 SMOKE DETECTORS

The Detector shall be intelligent addressable and multi sensing smoke and heat combination. The chamber should be easily removable for the purpose of easy maintenance. The address programming shall be done by a Base/detector or from the Fire alarm control panel. The detectors shall have a common base to allow easy interchange of various types of detectors.

All detectors shall be fitted with plug-in system type, from the maintenance and Compatibility point of views. An alarm condition should not affect a detector's good functioning. After resetting the alarm, the detector shall resume operations without readjustment of any kind. The detector shall have a Multi sensor type integrates photoelectric smoke and fixed temperature heat sensing technology. It shall be possible to use a single detector type for both above and below false ceiling applications. The detector shall be capable of detecting fast flaming fires and slow smouldering fires equally well. The detector shall therefore be a multi technology detector or shall be of unique design whereby a single type/model can be used in applications where either ISD/OSD would be normally used.

The detector shall be able to sense incipient fire by detecting the presence of visible and invisible products of combustion. The detector shall be suitable for low voltage (between 13 to 31V DC) two wire supply. The detector shall be provided with Single/Twin LED indication. The sensitivity of the detector shall not vary with change in ambient temperature, humidity, pressure or voltage variation, air currents and should not trigger the false alarm due to the above condition.

The detector shall be suitably protected against dust accumulation/ingress. The detector shall be free from maintenance and functionally tested at periodic intervals. All detectors shall be identical in construction design and characteristic to facilitate easy replacement and interchangeable by suitable programming.

The coverage per smoke detector shall strictly follow relevant standards. It shall be possible to connect Smoke Detector with Heat Detector or Manual Push Button in the same circuit.

The sensitivity of detector shall be set from the Fire alarm control panel to suit the site requirement.

4.2.5 MANUAL CALL POINT

The Manual Call Point shall be addressable type with input modules to define the device/location. The Manual call station shall be breakable type with suitable protection and base box. The device shall be red in colour and suitable for surface or flush mounting. Manual stations shall be interfacable to an addressable input module. The manual station shall have normally open fire alarm and enunciator contacts and these contacts shall close on activation. Contacts shall remain closed until station is manually reset.

The Manual Call Station shall be fully addressable with its own addressable module and operated by digitized signals from the FACP. The voltage range shall be from 13V -31V. It shall have protection as per relevant standard.

4.2.6 OUTPUT MODULE

Output module shall mean addressable points from the Fire alarm control panel with
potential free contacts for tripping of AHUs, power supply etc. as required. The system shall also be able to handle separate modules to interface the speakers of the Public Address System.

4.2.7 INPUT MODULE

The input modules shall be of dual/single point type.The dual channel module shall be selectable for Normally Open or closed.

4.2.7 LOOP ISOLATOR

This unit shall be placed on the loop preferably after every 20 devices and shall be able to isolate electrical short circuit in the wiring. All the other detectors shall remain functional because of the Class A wiring of the loop. The isolator shall not utilize an address and shall be built into the detector / base wherever required.

4.2.8 SOUNDERS

The sounders shall be of addressable type/connected by addressable module. The sounders shall derive power from separate cable with voltage adopter. It shall be capable of being directly mounted on the wall/ceiling or along with the detector. The sounder shall have an output of at least 85 db at 1 meter. The sounder shall be programmed to get activated in event of an alarm from a single detector/device or a group of detectors/devices.

4.2.9 HEAT DETECTOR

Heat detector shall go into the alarm mode when the temperature reaches 34degree Centigrade in normal course. The operator (users) shall have the option of calling up the temperature measured by the specific detector as and when required.

It shall have in-built locking mechanism to check the removal and pilferage of the detector. The quiescent current flow must not exceed 400 micro amps and alarm condition current shall be maximum 40 milli amps.

The heat detector shall be Intelligent Addressable type and be able to send intelligent output to the Fire alarm control panel regarding its condition. It shall be able to communicate with the Fire alarm control panel by the pulses emitted from the Fire alarm control panel. The detector should be addressed through base/detector and address stored in a non-volatile memory within the sensor or by a decade switch.

The base of the Detector shall be electronics free and interchangeable with other smoke or heat detectors. The enclosure shall meet as per the relevant protection grade. The voltage rating shall be between 15V -30V DC though the voltage may be changed depending upon the working voltages of a proprietary FACP.

The Detector shall have UL approval. It shall be possible to test the Detectors working both from the FACP as well as locally. It shall be possible to mount the detectors in Duct Casting Unit for sampling of supplying Air from the AHUs. Secondary response indicators shall be provided for all the Above False Ceiling Detectors.

The detector shall have twin LED's/Single LED for 380/180 degree viewing angle. LED on the detector shall blink each time the sensor is scanned by the Fire alarm control panel. The Fire alarm control panel determines that the sensor is in alarm, the Fire alarm control panel will command the sensor LED to remain on to indicate the same. Each sensor shall be capable of being tested for alarm via command from the Fire alarm control panel each sensor shall respond to Fire alarm control scan with the information about its type for identification.

Strobe

The strobe light should have lamp supported from fire panel. The lamp shall be fixed with reflector. This should be fixed in ceiling and wall as per the site condition.

2.3. BMS Integration

Fire alarm system shall be integrated with BMS for monitoring. Fire alarm system can be integrated either by
1.) Using potential free contacts of Fire Alarm Panels connected to control modules or
2.) Using system driver which gives alarm information on individual sensor level to BOS.
In both the cases alarms are relayed to BOS and shown in the integrated graphical user interfaces. Ventilation is shut down in the area concerned.

Fire Alarm system shall integrate to BMS to be able to communicate all Fault and Fire conditions. Fire Alarm system shall be able to communicate to BMS system to turn off PAHU in case of Fire. Fire Alarm system shall be able to communicate to BMS system to release all Fire Doors, Access controlled doors and emergency exits.

2.4. Installation

2.4.1. Control Equipment

The equipment should be generally accessible on the ground floor next to the entrance to the building to enable the occupier and the fire brigade to quickly identify the zone in fire.
A plan of the building should be displayed close to the control panel showing entrances, escape routes and zones. Operating instructions and logbook should be available.

2.4.2. Power Supplies

The power supply for the control panel should be exclusive to the fire alarm system. This should be secured from unauthorized use and labelled **FIRE ALARM DO NOT SWITCH OFF.**
Upon a mains failure the batteries should continue to power the system for a minimum of 24 hours plus 30 minutes alarm duration after that. For an L category system 24 hour battery backup is sufficient, unless otherwise requested. For unoccupied premises the battery backup should be up to 72 hour plus the 30 minute alarm duration. For over 72 hours the system should be monitored by a central station.

2.4.3. Cabling & Wiring

All cables for the fire alarm system should be fire proof including the mains supply; these are split in to two categories, standard and enhanced. The standard cable should be a soft skinned type cable and the enhanced should be an FP200 or MICC type cable. Please check with the cable manufacturers for compliance with the British Standards.

2.5. Certification

There are a number of certificates required for the fire alarm installation, these are follows:

- Design Certificate
- Installation Certificate
- Commissioning Certificate
- Verification Certificate
- Acceptance Certificate
- Alteration Certificate
- Test Certificate

3. ACCESS CONTROL

The Access Control System shall be used to serve the objective of allowing entry and exit to and from the premises to authorized personnel only.

The system shall authorize entry only after the card read by the card reader is validated with respect to door, time & day of the week. It shall also communicate the validity of the entry to the door network controller for releasing the door lock. For authorizing an exit, the system shall verify the validity of the card read by the card reader and release the door lock.

The Integrated Access Control & Alarm monitoring System shall be a computerized system to operate on real time using highly sophisticated software and hardware. The system shall be capable of TCP lP connectivity & should communicate over TCPIIP LAN.

The system shall be capable to support complete Access Control and Alarm monitoring functions.

The system shall be flexible and expandable, to allow the user to customize parameters to the facility and modify parameters to adapt to changing access control and security requirements.

Modifications of parameters shall be possible with simple menu driven entries.

The software shall be a specially designed for access control applications to provide necessary increased speed and to eliminate time and memory consuming functions required in a commercially available computer system.

The software shall be highly intuitive with interface to maximize operator efficiency. It shall be able to simultaneously open multiple application windows to eliminate repetitive operations.

The system shall be modular in nature to permit expansion of both capacity and functionality through the addition of Intelligent Device controllers and **proximity Card**

Readers.

The response time for the system shall be 1 sec.

Each transaction shall include card holder's name, date, time, location and transaction type. It shall possible to either display or print transactions as they occur.

Each file record of the card holder shall include Number, Name, Address, Department, Designation, Company Name, Qualification, Card Type, Phone Number and Remarks.

It shall be possible to program unique access profiles for each card individually. Systems which only allow defining access profiles by group of cards will not be accepted. It shall be possible for operator to extract and display from the central memory sets of assigned parameters for a single card.

Anti-pass back: The feature is associated with IN / OUT card reader operation. When the user badges his card in an "In Reader" and when a valid transaction occurs the status for the card holder using this reader is changed to "IN". When the cardholder exits his status bit changes to "OUT" card readers can be connected anywhere in the system. The system shall be able to designate certain readers to control only entry / exit and require a cardholder using a card at any reader to subsequently use it at an exit reader before again entering the secured area. This shall prevent "passing back" a card to an unauthorized second user.

Card readers shall be provided at designated areas for guard tour verification. It shall be possible to define any of the readers in the system as part of a guard tour Guard tour management software shall also be incorporated as a part of Access control system.

The system shall have anti-pass back feature to prevent an authorized cardholder passing his card back to an unauthorized user. Once a card is logged as IN on a specific door, the system shall not provide entry to the same card again, unless the card logs OUT. An ENTRY shall be preceded by an EXIT & vice-versa.

This shall be a selectable feature and the user shall have the option of specifying the doors that shall have antipass back.

5.1 DOOR CONTROLLER

Maximum 12 access control points (12 readers) shall have one independent, fully standalone capable intelligent controller that shall have its own power supply & battery back up. These controllers hereinafter referred to as door controllers shall be connected to each other over a network which shall get connected to the Human Machine Interface (HMI) level through suitable interface / gateway / network controller. The HMI Software shall be used for generating Access Control and Attendance Management reports.

The door controller at each point shall have the ability to connect maximum of 12 card readers (for any configuration entry and exit). Access controllers of different card reader densities as per the BOO shall be provided for different locations.

It shall also receive input from door position sensors and control door locking devices or barriers. The door controller shall also have the ability to provide an alarm output in case of conditions such as door left open, forced entry, etc.

Each door controllers shall be provided with additional digital inputs of minimum 4 Nos. and maximum as per the requirements applicable for each controller based on site condition to monitor the status of emergency door (fire escape door) and panic buttons in the basement.

The Intelligent door Controller shall be of an Intelligent Controller which integrated with the Security Management System. It shall be fully featured, modular, and easily expandable.

Each controller shall store the data of minimum **50,000 cards** and 5000 history transactions.

It shall also provide 16 time zones, Input/Output linking, output control, timed override, soft in-X-it on a per reader basis and real time reporting capabilities.

In the absence of power, lithium / lead acid battery shall provide power for the real-time clock and RAM for a maximum of 30 days.

Door controllers shall be provided with suitable inputs for deactivating the access for doors during emergency situations such as a fire.

Door controllers shall be provided with 4 output potential free contacts for future use. The contact shall be programmable at site.

In case of failure of the HMI / Network Controller, the individual door controllers shall remain functional. The individual door controllers shall continue to control the entry and exit based on site code & card number validation. Systems that validate cards only based on site code (in offline mode) shall not be accepted.

The system shall provide a roll call facility to know who and how many users are present in the premises at any given point of time. System shall also be able to track the location of any cardholder.

All the controllers shall be housed in Lockable Vandal proof boxes which shall either be floor mounted or wall mounted. These shall be free standing, totally enclosed, dust and vermin proof and suitable for tropical climatic conditions. The protection class of enclosure shall be IP51. The door controller shall have the facility to detect and annunciate door controller tampering at the HMI.

3.2 CARD READERS

The card reader shall be a contact less reader supporting Contact less Card

The reader shall be capable of two way communication with door controller and have bi colored LED indication to indicate access granted / denied status.

The reader shall be sealed in a rugged weatherized polycarbonate enclosure designed to withstand harsh environments as well as providing high degree of vandal resistance for both indoors or outdoors.

The minimum read range shall be 3-4". The reader should be UL listed.

A LED with beeper shall provide audio visual indication after reading 10 of cards.

A self-diagnostic system shall ensure that, on reader power-up, an internal self-test routine checks and verifies the setup configuration, determines the internal or external control of the LED and beeper, and initializes reader operation.

3.3 PROXIMITY CARDS

Proximity cards shall provide contact less access control with a read-range up to 4". The sizes shall meet ISO standards.

RF interference shall be as per ISO/IEC standards.

It shall be possible to print directly to the card with a direct image or thermal transfer printer.

The response time for transaction shall be less than 100milliseconds.

The card shall be passive and no battery designed allowing an infinite number of reads.

3.4 **BIOMETRIC READERS**

The critical areas like Data center, BMS rooms etc. shall be provided with Bio-metric (fingerprint) scanners in combination with proximity card reader as per BOQ.

The reader shall have LED indication & tone signal to indicate access granted / denied status.

The minimum storage of finger prints shall be 3000 prints. The false acceptance & rejection rate shall be less than 0.2%. Verification time shall be less than 2 seconds.

3.5. PALM READER

The critical area like Data center shall be provided with Bio-metric (palm) scanner with ***Part Number*** *HK-2*

Verification time Less than 1 second
Template Size 9 bytes
Power 12-24 VDC or VAC
Memory Retention Up to 5 years via the standard
internal lithium battery.
I.D. Number 1 to 10 digits from keypad or
card reader
Transaction Storage 5120 transactions, buffered
Communications RS-485 (4 wire and 2 wire)
RS-232 Serial Printer Support
or network communications
Baud Rate 1200 to 28.8K bps
User Capacity 512 Users standard
Internally expandable to 32,512
Door Controls Door Lock Output
Sinks 0-24VDC, 100mA max.
Alarm Monitoring
Tamper
Door Switch
Two Auxiliary Inputs
Three Auxiliary Outputs
Sinks 0-24VDC, 100mA max.
Request for Exit
Switch or Keypad
Card Reader Input Proximity, Wiegand, magnetic
stripe, or barcode

Card Reader Emulation Output
Wiegand, magnetic stripe, or barcode
Duress Code 1 digit, user definable
Timezones62 user definable time zones
Unlimited holidays
Selected Options
BB-200 Operational Battery Backup
MD-500 High Speed Internal Modem
EN-200 Ethernet Communications Module
EM-801 Memory Expansion to 9,728 Users
EM-803 Memory Expansion to 32,512 Users
DC-102 Data Converter
KP-201 Auxiliary Keypad
PROX HID Proximity Reader

3.6. MAGNETIC LOCKS

The magnetic lock/door strike shall be provided on all security doors for locking and unlocking the door. It shall be the FAIL OPEN TYPE. When there is no power supplied to the magnetic lock is released and the door is unlocked. When the power is supplied, the magnetic lock locks automatically.

The magnetic lock shall be unlockable by the following methods:

By a valid card transaction through the card reader to which it will be interfaced.

By the operation of egress switch connected directly to lock fitted in a secure area so that security maintenance personnel can unlock the door in case of card reader controller electronics failure or during emergency situations.

The door strike circuit shall be so designed, it can be opened by the operation of an All Door Open Button in the HMI in the IBMS control room in case of emergency.

The magnetic lock/door strike circuits shall have two potential free micro switches provided for signal of open or close door status and signal of lock and unlock door status for interfacing with the alarm monitoring system.

In the case of double leaf doors, double leaf electromagnetic locks shall be provided with one lock for each leaf and the two locks shall be electrically interconnected such that they operate as one unit.

Minimum holding force shall be 600 Ibs. Lock shall be with CE marking and/or UL certified.

3.7. EGRESS KEY SWITCH

This key/egress switch shall be provide for all card reader operated doors(wherever specified in tender drg./as per BOQ) in a location not easily accessible and wherever possible above the false ceiling. The key switch shall be normal in 'ON' position and in case of emergency, the authorized person shall use the key key/egress to switch off the supply to unlock the secured doors.

The key switch shall be of security personnel-maintained type with a common key for operating all secured door key switches, installed in a suitable base unit.

3.8. DOOR MAGNETIC CONTACTS

Magnetic contacts shall be provided for single leaf security doors and double leaf security doors. These shall be integrated with access control and alarm monitoring system to generate door alarm
Magnetic contact for single leaf door shall consist of one magnetic switch and one magnet, whereas magnetic contact for double leaf door consists of two magnetic switches and two magnets.

Magnetic switch shall be fixed to door frame and magnet to the door leaf.

When the door is closed, the distance between magnetic switch and magnet shall be equal or less than 5 mm so that magnetic switch shall have a closed contact.

When the door of the single leaf door or any door of the double leaf door is opened, the magnetic switch shall have an open contact and thus generate an alarm.

3.9. GENERAL FEATURES OF SYSTEM.

The soft ware shall ensure that all the data like exit time, 10 No. etc. shall be available in the operator stations & printout shall be taken any time.

The system shall provide a visual display of all card transactions related to movement of the laptops online.

The software shall allow the user to define names for all doors and detailed information for each card.

The database shall allow adequate number of fields for storing all data relevant to the cardholder. Date & time shall define the validity of each card issued on the system.

The software shall support all features required for maintaining the records as required by the Software Technology Parks of India Ltd. and also the requirement for Special economic zones.

SECURITY MANAGEMENT SPECIFICATION/SOFTWARE FEATURES

3.10. GENERAL FEATURES OF SYSTEM.

The Access software shall include the following:

- Integration with other systems for commonality of HMI functions as defined in Volume 1 B, part 1
- Interlocks with other systems for safety functions.
- Card holder management.
- Assigning time period, zones, access permissions etc.
- Attendance management.

- Visitor management.

3.11. SUB-SYSTEM LOCAL DATABASES:

All controller subsystems shall have distributed intelligence. Normal access control decisions shall be made at the local panel without reference to the host.

In the event of failure in the communication link between a sub-system panel and the server computer, the access control sub-system shall be capable of buffering a minimum of 500 access transactions until communication is re-established with the server computer.
Similarly, the lift/elevator access controller shall be capable of maintaining its access time schedules for securing floors in the event of communication failure with the server computer. The local time schedules shall be uploaded to the server computer once the communication is resumed.

Changes in the server system database shall be capable of being downloaded to the relevant access controllers and the local databases of the connected sub-systems via the same physical communication links. Such downloading of data shall not disrupt normal data communications over the same links.

DISTRIBUTED SYSTEM SERVERS

3.12. CARDHOLDER MANAGEMENT SYSTEM

A method shall be provided to allow geographically separate IBMS servers to manage their own locally connected access controllers while sharing and interchanging data with other IBMS servers that are connected via a Wide Area Network.

Specifically, it shall be possible, within the limits of the configured operator permissions, to view, edit, and download card and cardholder information across a network of geographically distributed IBMS servers.

Card and cardholder holder access details specified from one IBMS server shall be available to remote IBMS servers to allow cardholders appropriate access to buildings and facilities whose access control is managed by the IBMS servers.

3.13. DOWNLOADING

A download of newly entered card or cardholder information shall automatically be initiated on each remote IBMS server when manually initiated on any local IBMS server. Such downloads may include multiple sets of cards or cardholders.

A method shall be provided for reporting of any failed remote download back to the requesting server.
There shall be an Operator Workstation display containing a list of all outstanding local downloads and outstanding locally initiated individual card downloads to remote sites. This display shall be restricted to viewing by operators with appropriate authorization.

Information on the download status of each item shall be available as part of the standard display for each card or cardholder.

3.14. REMOTE SERVER AVAILABILITY

Failure of software or hardware in anyone IBMS server, or loss of communications to anyone geographic location, shall not cause loss of supervisory operations of the system as a whole.

Loss of communications to anyone geographic location shall not impede supervisory operations to the controllers at the unreachable site if communications are still available locally.

It shall be possible to enter access cardholder details at any of the geographically separate IBMS servers, and have that information automatically copied to each other remote site where the cardholder requires access. If access is removed from a site, the local record shall be deleted from that site's server.

The local time of last modification, as well as the site of modification, shall be stored on each card and cardholder.

A flexible and consistent scheme shall be provided for restricting operator permissions to access card and cardholder information at remote sites.

CARDHOLDER MANAGEMENT SYSTEM

The IBMS/access software shall store security related cardholder/passholder information in a relational database such as Microsoft SQL Server.

The cardholder database shall support at least 10000 cardholders. The cardholder database shall be delivered with at least 40 user definable fields for storing data specific to the requirements of different IBMS systems. It shall be possible to increase or decrease this number of user definable fields. Systems without the ability to increase the number of user definable fields shall not be accepted.

3.15. CARDHOLDER DATABASE

It shall be possible to define labels and field types for each of the user definable fields. It shall be possible to define lists of choices for certain user fields to avoid unnecessary typing, for example, defining a list of department names. It shall also be possible to modify the layout of cardholder fields on the display screen to alter the look to particular user's requirements. It shall also be possible to create more complicated calculations between user fields. For example, creating the value of one user field based on the value of two others. It shall be possible to define default values for all user fields, which shall be applied when the cardholder is first added to the system.

3.16. SEARCHING AND SORTING

It shall be possible to define which user fields in the cardholder database are searchable fields. All searchable fields shall be able to be used to call up a list of cardholders who match a certain criteria. In addition, it shall be possible to search on multiple cardholder characteristics at one time, for example, all cardholders in department "X" who have a supervisor of "Y". A list of matching cardholders shall be displayed and an appropriate choice may be made.

3.17. MULTI-SELECTION

It shall be possible for multiple cardholders to be selected and a single edit to be performed on all of these cardholders selected. For example, it shall be possible to select all cardholders in department "X" and change their address to "Z" in a single operation.

3.18. TEMPLATES

The IBMS shall define templates in order to add groups of cardholders with predefined characteristics. A template shall contain all the relevant details for a particular group of cardholders such as all their user fields and access levels. When adding a new cardholder to this group using the template, the cardholder shall be added with the same characteristics as defined in the template.

3.19. CARDHOLDERS AND CARDS

It shall be possible to assign a single cardholder multiple cards for use in the IBMS. Multiple cards assigned to a single cardholder shall be able to be in different states. For example, it shall be possible for a single cardholder to have both an "active" card assigned and an "inactive", "lost" or "stolen" card assigned.

It shall also be possible to support different technologies of access control cards in the one system. For example, a single cardholder may have a proximity card, a magnetic stripe card and a biometric template assigned to them.

Cards may be created and assigned to cardholders separately. It shall be possible to "return" a card when a cardholder no longer requires it, and then reassign it to another cardholder without having to delete and recreate the card.

When cardholders or cards are deleted or expired, or when a card is returned from use by a cardholder, the system shall automatically download this to the field controllers so that these cards no longer provide access.

ACCESS PERMISSIONS, TIME PERIODS AND ZONES

TIME PERIODS

The IBMS shall support a minimum of 256 time periods.

The operator shall be able to access a summary display listing all time periods and their descriptions. From this display the operator shall, if the operator is configured for the time period's area code, be able to go to a time period detail display showing the time periods configurable parameters.

Once the changes have been saved the operator will be required to download the new data before it is enabled in the Access Control System. This shall allow operators to make a number of changes but only be required to download once.

Each time period detail display containing changed data that has not been downloaded shall clearly indicate this to the operator via a flashing warning message. Download of this data shall cause the warning message to disappear.

3.20. ZONES

The IBMS shall support up to 1024 zones. Each zone shall consist of the following:

- Description
- Area code.
- Up to 128 card readers or floor points.

The operator shall be able to access a summary display listing all zones and their descriptions. From this display the operator shall, if the operator is configured for the zones area code, be able to go to a zone detail display showing the zone configurable parameters.

Zones shall be automatically created when card readers are configured in the system. Zones are defined by the card readers, which allow entry to the physical space, which the zone represents. One reader may only be defined as entering one zone. Each reader will indicate the zone it allows entry to and optionally the zone from which one has exited.

3.21. ACCESS PERMISSIONS

The IBMS shall support up to 1024 access permissions. Each access permission shall consist of the following:

- Description
- Area code.
- Up to 256 zone and time period pairs.

The operator shall be able to access a summary display listing all access permissions and their descriptions. From this display the operator shall, if the operator is configured for the access permission's area code, be able to go to an access permission detail display showing the access permission's configurable parameters.

Once the changes have been saved the operator will be required to download the new data before it is enabled in the Access Control System. This shall allow operators to make a number of changes but only be required to download once.

Each access permission detail display containing changed data that has not been downloaded shall clearly indicate this to the operator via a flashing warning message. Download of this data shall cause the warning message to disappear.

3.22. SECURITY :

Managing cardholders shall only be available to operators who are at a certain security level. Both cardholders and cards shall also confirm to standard IBMS Operator Security features such as area assignment.

It shall be possible to define an operator as only a cardholder administrator. All other functions in the IBMS will be restricted to this operator except for cardholder administration functions.

3.23. ASSIGNING ACCESS TO CARDHOLDERS:

Cardholders may have up to 8 different access levels assigned to them. Each of these access levels may define a separate set of readers and times that will allow the cardholder access. Operators shall be presented with a list of all access levels already assigned to the cardholder and all access levels that are currently unassigned.

3.24. DELETING CARDHOLDERS:

Cardholders may be deleted but retained in the database for future reference if required. It shall then be possible to "undelete" the cardholder should this be required. It shall also be possible to permanently delete the cardholder record in order to prevent unnecessarily large databases from developing.

3.25. CARD/CARDHOLDER EXPIRY :

Cardholder and card expiry dates may be defined down to a resolution of date and time in minutes.

It shall be possible to assign cardholders and cards separate expiry dates, enabling a card assigned to a cardholder to expire before the cardholder expires. However, it shall not be possible for the card expiry date to exceed the cardholder expiry date of the cardholder to which a card is assigned.

Expiry dates may be set up by default to be a particular given date, or a relative period from the time the cardholder was created (e.g. 1 year).

It shall be possible to assign a cardholder a commencement date and have their assigned cards automatically become active on this commencement date.

3.26. CARDHOLDER ALARMS :

It shall be possible to specify that the cardholder generate an alarm when they use their card. This setting may override the alarm setting of the reader to which a cardholder may be presenting their card.

3.27. CARDHOLDER EVENTS :

All changes to cardholders in the system shall be logged in the event summary and shall list the new value of the cardholder field. Similarly, any time a cardholder accesses a card reader; an event will be listed in the event summary. It shall be possible to automatically view all the events generated for a particular cardholder directly from the cardholder displays without having to run a separate report.

3.28. USES BEFORE EXPIRY :

It shall be possible to define the number of times that a cardholder may use their cards. This number shall be decremented every time the cardholder uses their card at a reader until the number is 0, when the cardholder shall no longer have access.

3.29. PHOTO IDENTIFICATION BADGES :

It shall be possible to capture portraits and signatures for all cardholders and then create photo identification badges using these images.

Image capture and printing of photo identification badges must be fully integrated into the IBMS system and must use the same database. Any system, which uses a separate photo badging system or separate database, will not be acceptable.

Capture devices must include Video Capture cards, Digital Cameras, scanners and signature tablets and capture facilities must support the MCI, TWAIN or WinTab standards for image capture. Devices may be connected directly via PC boards or through serial or USB ports. If using a Video Capture card for image capture, a live preview facility must be provided. Import and export facilities for images shall also be available.

The IBMS system must provide a tool for the creation of photo badging card layouts. This must allow the incorporation of standard display creation facilities such as image import, a variety of fonts and text effects, a variety of tools for drawing objects and a facility for linking to the cardholder database and any user fields within this. This tool shall be the same tool as used for the creation of custom graphics in the IBMS system so as to reduce training and maintenance requirements for the system.

In addition, it shall also be possible to incorporate bar codes and automatic magnetic stripe encoding facilities into the photo badging system.

3.30. BIOMETRIC SUPPORT :

The IBMS shall provide the ability to use biometric devices such as hand geometry readers for high security access control. These devices shall be fully integrated into the IBMS system allowing centralised template management of biometric templates. The IBMS system shall be the master database for all cardholder information including biometric templates. The IBMS shall allow for hand geometry changes over time by automatically uploading validated hand templates and downloading them automatically to those hand readers to which the user has access rights.

3.31. VISITOR MANAGEMENT SYSTEM :

The IBMS shall provide a facility to manage and track visitors to the facility. This shall include both visitors who are given access control cards and visitors who are merely escorted by employees. It shall be possible to store information that defines who the visitor is, what company they represented and whom they were visiting in the facility. This information shall be displayed on a different display to that of a standard cardholder so that operators can enter visitor information easily and without the distraction of all the standard cardholder user fields.

All information about when a visitor arrived and when a visitor departed shall be recorded in the standard ISMS event summary.

For visitors who are assigned access control cards, it shall be possible to automatically expire their cards after 1 day to prevent visitors from removing valid cards from the facility.

Also photo badge & visitor cards may be issued to the visitors, the software shall support taking photos with web cameras & printing the same.

3.32. CARDHOLDER APPLICATION PROGRAMMING INTERFACE :

It shall be possible to provide an Application Programming Interface (API) to allow controlled access to the cardholder database. The purpose of this is to allow third party applications to be able to read and write to the cardholder database in a secure and controlled way.

CARDHOLDER MANAGEMENT SUBSYSTEMS :

5.2 SHIFT MANAGEMENT :

The ISMS shall be capable of managing the access control of teams of cardholders assigned to shifts on a per team basis. It shall be possible to assign appropriate access levels for each team for each shift e.g. day shift, night shift, other and no shift. The ISMS shall automatically reassign cardholders' access levels to the pre-configured level when the cardholders change their current working shift.

5.21 DATA EXCHANGE WITH ENTERPRISE MANAGEMENT SYSTEMS :

The IBMS shall be capable of exchanging cardholder information with Human Resources modules of Enterprise Management Systems such as SAP and PeopleSoft. Cardholder information shall be sent from the EMS to the ISMS on a regular basis and automatically imported into the IBMS in order to ensure that the Human Resources module and the ISMS cardholder database have the same information.

SOFTWARE FUNCTIONS:

5.22 REPORT MANAGEMENT :

The system shall support a flexible reporting package to allow easy generation of report data. The reports provided shall include pre-configured standard reports for common requirements such as Alarm Event reports and custom report generation facilities that are configurable by the user.

5.23 STANDARD REPORTS :

The following pre-formatted reports shall be available on the system:

- Door History
- Group Card Trail
- Cardholder List
- Occupancy
- Access Data Import & Export
- Card Usage

- Access Permissions
- Time Period
- Zone Information
- Cardholder Details
- Cardholder Zone
- Asset tracking reports

Door History Report
A report shall be provided to list all cardholders who presented a card at any specified door or group of doors monitored by the IBMS within a specified time period. The time period may be specified as an absolute start and end date and time, or as a period relative to the current time. The report shall contain the time and date and card number for each card presentation.

Group Card Trail Report
A report shall be provided so that when requested, the report shall search the database for cards corresponding to specified search criteria based on any cardholder field. It shall then show all doors accessed by these cardholders in a specified time period. The time period may be specified as an absolute start and end time, or as a period previous to the current time. The report shall contain the date and time of access and the point identifier of each door accessed.

Cardholder List Report
A report shall be provided to produce a comprehensive listing of cards and cardholders.
It shall be possible to provide searching and filtering criteria based on any cardholder field. The cardholder details on which the report is based shall allow details to be specified as a range, or as matching or partially matching as applicable.

Occupancy Report
A report shall be provided so that when requested, the report shall determine which cardholders are in a specified zone at that time. Listing the Doors accessing the area for both the IN and OUT directions shall specify the area. It shall be possible to include only certain cardholders in this report, as defined by the specified search criteria based on any cardholder fields.

Access Data Import/Export Report
A report shall be provided to create a file containing cardholder related details in an ASCII format ready to be exported from the IBMS into a third party database package. It shall also be possible to import ASCII files into the IBMS to update the IBMS from information from other third party database systems. The following information shall be able to be configured for import or export in the report:

- Cardholder Details
- Zones
- Time periods

- Access permissions

In order to reduce duplication and report file size, the operator shall be able to choose to only include cardholders that have been modified since a particular date.

It shall be possible to configure the report such that after an import operation, a download to the field devices shall take place automatically.

Card Usage Report
A report shall be provided which calculates the total number of access movements (including no movements) for cardholders over a given period of time. The time period may be specified as an absolute start and end date and time, or as a period relative to the current time. This report shall provide the ability to search by cardholder fields as defined by the specified search criteria based on any cardholder field.

Access Permissions, Zone, and Time Period Information Reports
A number of reports shall be provided which lists configuration information for access permissions, zones and time periods. These reports shall allow the system administrator to check and confirm the configuration of the access control parts of the system.

Cardholder Details Report
A report shall be provided to produce a comprehensive listing of cardholders that match a set of search criteria. It shall be possible to provide searching and filtering criteria based on any cardholder field. The cardholder details on which the report is based shall allow details to be specified as a range, or as matching or partially matching as applicable.

Cardholder Zone Information Report
A report shall be provided which lists zones in the facility to which cardholders have access. This report is to allow system administrators to check which parts of their facility are accessible by which cardholders.

Electronic register for laptops - report

Complete report of assets like **in** time, out time etc. shall be possible. Also reports of persons who carry laptops shall be possible.

4. FIRE SUPPRESSION SYSTEM - NOVEC-1230

This specification outlines the requirements for a “Total Flood” Clean Agent Fire Suppression System with automatic detection and control as specified in BOQ. The work described in this specification includes all engineering, labour, materials, equipment and services necessary, and required, to complete and test the suppression system.

4.1. Applicable Standards

A. The design, equipment, installation, testing and maintenance of the Clean Agent Suppression System shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards

1) NFPA No. 2001 - Clean Agent Fire Extinguishing Systems
2) NFPA No. 70 - National Electrical Code
3) NFPA No. 72 - Standard For Protective Signaling
4) Factory Mutual Approval Guide
5) UL Listings
6) Requirements of the Authority Having Jurisdiction (AHJ).

B. The standards listed, as well as all other applicable codes, standards, and good engineering practices shall be used as "minimum" design standards.

The Suppression System installation shall be made in accordance with the drawings, specifications and applicable standards. Should a conflict occur between the drawings and specifications, the specifications shall prevail.

4.2. System Description

Detectors shall be Cross-Zoned detection requiring two detectors to be in alarm before release. Automatic operation of each protected area shall be as follows:

1) Actuation of one (1) detector, within the system, shall:
   a) Illuminate the "ALARM" lamp on the control panel face.
   b) Energize an alarm bell and/or an optional visual indicator.
   c) Transfer auxiliary contacts which can perform auxiliary system functions such as:
   i) Operate door holder/closures on access doors,
   ii) Transmit a signal to a fire alarm system, iii) Shutdown HVAC equipment.
   d) Light an individual lamp on an optional Annunciator.

2) Actuation of a 2nd detector, within the system, shall:
   a) Illuminate the "PRE-DISCHARGE" lamp on the control panel face.

b) Energize a pre-discharge horn or horn/strobe device.
c) Shut down the HVAC system and/or close dampers.
d) Start time-delay sequence (not to exceed 60 seconds).
e) System abort sequence is enabled at this time.
f) Light an individual lamp on an optional Annunciator.

3) After completion of the time-delay sequence, the Novec-1230 Clean Agent system shall discharge and the following shall occur:
a) Illuminate a "SYSTEM FIRED" lamp on the control panel face.
b) Shutdown of all power to high-voltage equipment
c) Energize a visual indicator(s) outside the hazard in which the discharge occurred.
d) Energize a "System Fired" audible device. (Optional)

4) The system shall be capable of being actuated by manual discharge devices located at each hazard exit. Operation of a manual device shall duplicate the sequence description above except that the time delay and abort functions shall be bypassed. The manual discharge station shall be of the electrical actuation type and shall be supervised at the main control panel.

4.3. Materials and Equipment

The Clean Agent System materials and equipment shall be standard products of the supplier's latest design and suitable to perform the functions intended. When one or more pieces of equipment must perform the same function(s), they shall be duplicates produced by one manufacturer. All devices and equipment shall be UL Listed and/or FM approved.

4.3.1. AGENT STORAGE AND DISTRIBUTION

Each system shall have its own supply of clean agent. The system design can be modular, central storage, or a combination of both design criteria. Systems shall be designed in accordance with the manufacturer's guidelines. Each supply shall be located within the hazard area, or as near as possible, to reduce the amount of pipe and fittings required to install the system.
The clean agent shall be stored in PYRO-CHEM Agent Storage Containers. Containers shall be super-pressurized with dry nitrogen to an operating pressure of 360 psi @ 70 oF (24.8 bar at 20 oC). Containers shall be of high-strength low alloy steel construction and conform to NFPA 2011.
Containers shall be actuated by a resettable electric actuator with mechanical override located at each agent container or connected bank of cylinders. Non resettable or explosive devices shall not be permitted.
Each container shall have a pressure gauge and low pressure switch to provide visual and electrical supervision of the container pressure. The low-pressure switch shall be wired to the control panel to provide an audible and visual "Trouble" alarms in the event the container pressure drops below 247 psi (17 bar). The pressure gauge shall be color coded to provide an easy, visual indication of container pressure.

Each container shall have a pressure relief provision that automatically operates before the internal pressure exceeds 750 psi (51.7 bar).
Engineered discharge nozzles shall be provided within the manufacturer’s guidelines to distribute the Novec 1230 agent throughout the protected spaces. The nozzles shall be designed to provide proper agent quantity and distribution.

a) Nozzles shall be available in 3/8 in. through 2 in. (BPS 10 mm through 50 mm) pipe sizes. Each size shall be available in 180o and 360o distribution patterns.

b) Ceiling plates can be used with the nozzles to conceal pipe entry holes through ceiling tiles.

Distribution piping, and fittings, shall be installed in accordance with the manufacturer's requirements, NFPA 2011 and approved piping standards and guidelines. All distribution piping shall be installed by qualified individuals using accepted practices and quality procedures. All piping shall be adequately supported and anchored at all directional changes and nozzle locations.
All piping shall be reamed, blown clear and swabbed with suitable solvents to remove burrs, mill varnish and cutting oils before assembly.
All pipe threads shall be sealed with Teflon tape pipe sealant applied to the male thread only.

4.3.2. CONTROL PANEL

The control panel shall be a GAS releasing panel supplied by suggested manufacturer. The control system and its components shall be UL listed and FM approved for use as a local fire alarm system with releasing device service. The control system shall perform all functions necessary to operate the system detection, actuation and auxiliary functions. The control system shall include battery standby power to support 24 hours in standby and 5 minutes in alarm. The control system shall be microprocessor based utilizing a distributed processing concept. A single microprocessor failure shall not impact operation of additional modules on the system. The control system shall be capable of supporting Cross Zoned Detection.

4.3.3. DETECTORS

The detectors shall be spaced and installed in accordance with the manufacturer's specifications and the guidelines of NFPA 72. The Ionization detector shall be of suggested model, or equal in quality, performance and features. The Photoelectric detector shall be of suggested model, or equal in quality, performance and features.

4.3.4. MANUAL RELEASE (Electric)

The electric manual release switch shall be a dual action device which provides a means of manually discharging the Suppression System when used in conjunction with the control system.
The Manual Release switch shall be of suggested model, or equal in quality, performance and features.
The Manual Release switch or Manual Pull station shall be a dual action device requiring two distinct operations to initiate a system actuation.
Manual actuation shall bypass the time delay and abort functions shall cause the system to discharge and shall cause all release and shutdown devices to operate in the same manner as if the system had operated automatically.
A Manual Release switch shall be located at each exit from the protected hazard.

4.3.5. ABORT STATION

The optional Abort Station shall be the "Dead Man" type and shall be located next to each manual switch. The Abort Station shall be of suggested model, or equal in quality, performance and features. The Abort Station

shall be supervised and shall indicate a trouble condition at the control panel, if depressed, and no alarm condition exists."Locking" or "Keyed" abort stations shall not be permitted.

4.3.6. AUDIBLE and VISUAL ALARMS

Alarm audible and visual signal devices shall operate from the control panel. The Alarm Bell, Alarm Horn and Horn/Strobe devices shall be of suggested model, or equal in quality, performance and features. The visual alarm unit shall be of suggested model Strobe device, or equal in quality, performance and features. A Strobe device shall be placed outside, and above, each exit door from the protected space. Provide an advisory sign at each light location

The work listed below shall be provided by others, or under other sections of this specification:

A. 220 VAC power supply to the system control panel.

B. Interlock wiring and conduit for shutdown of HVAC, dampers and/or electric power supplies, relays or shunt trip breakers.

C. Connection to local/remote fire alarm systems, listed central alarm station(s) or sprinkler pre -action /deluge valve actuation.

4.4. Quality Assurance

4.4.1. MANUFACTURER

- The manufacturer of the suppression system hardware and detection components shall be ISO 9000 registered.
- The name of the manufacturer shall appear on all major components.
- All devices, components and equipment shall be the products of the same manufacturer.
- All devices, components and equipment shall be new, standard products of the manufacturer's latest design and suitable to perform the functions intended.
- All devices and equipment shall be U.L listed and/or FM approved.
- Locks for all cabinets shall be keyed alike.

4.4.2. SUBMITTALS

The installing contractor shall submit the following design information and drawings for approval prior to starting work on this project:

- Field installation layout drawings having a scale of not less than 1/8" = 1'- 0" or 1:100 detailing the location of all agent storage tanks, nozzles, pipe runs including pipe sizes and lengths, control panel(s), detectors, manual pull stations, abort stations, audible and visual alarms, etc.
- Auxiliary details and information such as maintenance panels, door holders, special sealing requirements and equipment shutdown.
- Separate layouts, or drawings, shall be provided for each level, (i.e.; room, under floor, and above ceiling) and for mechanical and electrical work.

- A separate layout or drawing shall show isometric details of agent storage containers, mounting details, proposed pipe runs and sizes, and symbol legend.
- Electrical layout drawings shall show the location of all devices and include point-to-point conduit runs and a description of the method(s) used for detector mounting.
- Provide an internal control panel wiring diagram which shall include power supply requirements and field wiring termination points.
- Separate drawing providing symbol legend to identify all symbols used.
- Annunciator wiring schematics and dimensioned display panel illustration shall be provided. (Optional device.)
- Complete hydraulic flow calculations, from a UL listed computer program, shall be provided for all engineered Clean Agent systems. Calculation sheet(s) must include the manufacturers name and UL listing number for verification. The individual sections of pipe and each fitting to be used, as shown on the isometrics, must be identified and included in the calculation. Total agent discharge time must be shown and detailed by zone.
- Provide calculations for the battery stand-by power supply taking into consideration the power requirements of all alarms, initiating devices and auxiliary components under full load conditions.
- A complete sequence of operation shall be submitted detailing all alarm devices, shutdown functions, remote signaling, damper operation, time delay and agent discharge for each zone or system.

Submit drawings, calculations and system component data sheets for approval to the local fire prevention agency, owner's insurance underwriter, and all other authorities having jurisdiction before starting installation. Submit approved plans to the architect/engineer for record.

4.5. BMS Integration

System shall work automatically incase of Fire detection by smoke sensors as well as manually by manual release and Abort switch in case of emergency. System shall be fully integrated with BMS to monitor and control the system 24x7. Gas release panel shall be integrated with BMS system to monitor status of the system 24 x 7. All pressure valve and system status shall be monitored through BMS system. System fault and alarm conditions shall be monitored and controlled by BMS systems. Fire condition and pre alarm before the gas release shall be monitored through BMS and Abort operation could possible in case of emergency through BMS

4.5.1. CAUTION and ADVISORY SIGNS

Signs shall be provided to comply with NFPA 2001 and the recommendations of the FM-200 equipment supplier.
1) Entrance sign: (1) one required at each entrance to a protected space.
2) Manual discharge sign: (1) one required at each manual discharge station.
3) Flashing light sign: (1) one required at each flashing light over each exit from a protected space.

4.6. Testing and Documentation

4.6.1. SYSTEM INSPECTION and CHECKOUT

After the system installation has been completed, the entire system shall be checked out, inspected and functionally tested by qualified, trained personnel, in accordance with the manufacturer's recommended procedures and NFPA standards. All containers and distribution piping shall be checked for proper mounting and installation. All electrical wiring shall be tested for proper connection, continuity and resistance to earth.

The complete system shall be functionally tested, in the presence of the owner or his representative, and all functions, including system and equipment interlocks, must be operational at least five (5) days prior to the final acceptance tests.

Each detector shall be tested in accordance with the manufacturer's recommended procedures, and test values recorded.

All system and equipment interlocks, such as door release devices, audible and visual devices, equipment shutdowns, local and remote alarms, etc. shall function as required and designed.

Each control panel circuit shall be tested for trouble by inducing a trouble condition into the system.

4.6.2. TRAINING REQUIREMENTS

Prior to final acceptance, the installing contractor shall provide operational training to each shift of the owners personnel. Each training session shall include control panel operation, manual and (optional) abort functions, trouble procedures, supervisory procedures, auxiliary functions and emergency procedures.

4.6.3. OPERATION and MAINTENANCE

Prior to final acceptance, the installing contractor shall provide complete operation and maintenance instruction manuals, four (4) copies for each system, to the owner. All aspects of system operation and maintenance shall be detailed, including piping isometrics, wiring diagrams of all circuits, a written description of the system design, sequence of operation and drawing(s) illustrating control logic and equipment used in the system. Checklists and procedures for emergency situations, troubleshooting techniques, maintenance operations and procedures shall be included in the manual.

4.6.4. AS-BUILT DRAWINGS

Upon completion of each system, the installing contractor shall provide four (4) copies of system "As-Built" drawings to the owner. The drawings shall show actual installation details including all equipment locations (i.e.: control panel(s), agent container(s), detectors, alarms, manuals and aborts, etc.) as well as piping and conduit routing details. Show all room or facilities modifications, including door and/or damper installations completed. One (1) copy of reproducible engineering drawings shall be provided reflecting all actual installation details.

5. ASPIRATION SMOKE DETECTION SYSTEM- VESDA

Aspiration Smoke Detection Laser- based system shall be installed throughout the areas nominated on the drawings. The system shall consist of highly sensitive LASER-based Smoke Detectors with aspirators connected to a network of pipe. When required, an optional Display unit shall be provided to monitor each detector, and a Programmer shall be supplied to configure the system as specified in BOQ.

Approvals

The Aspiration Smoke Detection System must be of a type submitted to, tested, approved and/or listed by local codes and standards

Codes, Standards or Regulations

The entire installation shall be installed to comply with local Standards

5.1. System Description

The system shall consist of a highly sensitive LASER-based smoke detector, aspirating fan, and filter. It shall be modular, with each detector optionally monitored by a Display featuring LEDs and visual indicators. The system shall allow programming of four smoke threshold alarm levels; time delays; Faults including airflow, detector, power and filter as well as an indication of the urgency of the fault; seven configurable relay outputs for remote indication of alarm and fault conditions. It shall consist of an air sampling pipe network to transport air to the detection system.

Optional equipment may include the addition of intelligent remote annunciation display panel(s) and/or interface with building fire alarm system, or dedicated VESDA System Management (VSM) graphics package or equivalent.

The system shall be approved to provide very early smoke detection and provide four output levels corresponding to Alert, Action, Fire 1 and Fire 2. These levels should be able to be set at sensitivities ranging from 0.0015-6% obsc/ft. It Shall report any fault on the unit by using configurable fault output relays. The system shall be self-monitoring for filter and detector contamination.

Submit product data and shop drawings that include pipe layout operational calculations and performance criteria.

Supply one copy of the manufacturer's installation, operation and maintenance manuals immediately upon completion of installation.

Supply completed system commissioning data (in format and per the instructions provided by the manufacturer) within 30 days of completion of the installation.

5.2. Quality Assurance

The manufacturer shall have a minimum of 10 years experience in the manufacturer and design of high sensitivity aspiration-type smoke detection systems. The manufacturer shall be certified as meeting ISO 9002 for manufacturing,.

Both Light Scattering and Particle Counting shall be utilized in this device as follows: The Laser Detection Chamber shall be Light Scattering and capable of detecting a wide range of smoke particle sizes. A particle counting method shall be solely employed for the purpose of monitoring contamination (dust & dirt, etc.) to prevent nuisance alarms and to automatically alert when maintenance is required.

NOTE: The particle counting circuitry shall be used only for monitoring of contamination in the filter and detection chamber and not for the purposes of smoke detection. Similar systems utilizing particle counting technology for the purpose of smoke detection shall be deemed as unacceptable.

The equipment supplier shall be authorized and trained by the manufacturer to calculate/design, test and maintain the air sampling system and will be able to produce a certificate stating such on request.

5.3. Technical Specification

The Aspirating smoke detection system shall comply with the following

DETECTOR ASSEMBLY

The detector, filter and aspirator shall be housed in a mounting box and shall be arranged in such a way that air is drawn from the fire risk area through the Dual Stage Filter and Detector by the Aspirator. The detector shall be LASER-based type and shall have an obscuration sensitivity range of 0.0015%/ft - 6%/ft

The Detector shall also incorporate facilities to transmit detector fault and air flow fault conditions.

The filter must be a two stage disposable filter unit. The first stage shall be capable of filtering particles in excess of 20 microns from the air sample. The second stage shall be ultra clean, filtering particles in excess of .03 microns and routed across the detector chambers receiving optics creating a clean wash to prevent contamination and increase reliability.

The aspirator motor shall be a purpose-built rotary vane air pump. It shall be capable of allowing for multiple sampling pipe runs up to 300 ft. each, with a response of less 120 seconds.

The Assembly must contain relays for alarm and fault conditions. The relays shall be software programmable to the required functions specific to the Customer.

The Assembly shall be able to be surface mounted to a wall or recessed in the wall cavity. The Assembly shall have built-in data and event logging, including smoke levels and fault monitoring at user specified time intervals, with up to 18,000 events of storage per detector (zone).

DISPLAYS AND PROGRAMMERS

When required, a detector Display and/or Programmer shall be supplied that is able to be located within the detector mounting box, a mounting box or rack remote from the detector. The Displays could alternately be mounted in a cabinet specifically designed for this purpose and located as nominated in the Drawings. The system Programmer could alternately be located in a portable hand-held box.

Each Display shall have the following minimum features:

- A 20 segment bar graph display
- Four independent field programmable alarm thresholds with corresponding outputs.
- 0 - 60 second adjustable time delays for each alarm threshold
- Test, isolate, reset, and silence/scan front panel switches that when operated incorporate lights and audible test, remote reset capability, fire zone isolation
- Digital read-out of real time % per foot smoke obscuration level.
- Digital read-out of Fire 1 Smoke sensitivity setting.
- Monitoring for Detector fault and air flow fault and associated delay facilities.
- Monitoring for system fault, zone fault, minor and urgent fault.
- Ability to distinguish faults in a fire zone from faults in the smoke detection system.
- Optionally include relays for alarm and fault conditions when mounted remotely from a detector.

Each Programmer shall have the following minimum features:

- Microprocessor based.
- Able to program any device in the system
- Able to view the status of any device in the system.
- Able to record an event log for later viewing.
- Able to adjust the sensitivity of the nominated detector.
- Incorporate multi-level password control
- Programmable latching or non-latching relay option
- Programmable high and low flow fault settings for comprehensive air flow supervision.
- Programmable aspirator speed control
- Programmer maintenance controls
- Have the ability to automatically self configure the system's features and functions to suit the current environment
- Facilities for referencing with time dilution compensation.

DEVICE NETWORKING REQUIREMENTS

The devices in the smoke detection system shall be capable of communicating with each other via twisted pair RS485 cable. The network shall be able to support up to 255 devices.

DIGITAL COMMUNICATION PORT

Shall comply with EIA RS485 Protocol

DETECTION ALARM LEVELS

The laser based aspirating detection system shall have four (4) independently programmable levels of alarm. The four alarm levels shall be used as follows:

- Alarm Level 1 (Alert)

  Activate a visual and audible alarm n the fire risk area.

- Alarm Level 2 (Action)

  Activate the electrical/electronic equipment shutdown relay and activate visual and audible alarms in the Security office or other appropriate location.

- Alarm Level 3 (Fire 1)

  Initiates an alarm condition in the Fire Alarm Control Panel to call the Fire Brigade and activate all warning systems

- Alarm Level 4 (Fire 2)

  Activate a suppression system and/or other suitable countermeasures.

NOTE: The alarm level functions as listed are possible scenarios. Consideration should be given to the best utilization of these facilities for each application and requirements by the local Authority Having Jurisdiction (AHJ).

Initial settings for the alarm levels shall be determined by the requirements of the fire zone. However, the setting for Fire 1 shall always appear as 100% on the bar graph scale.

Initial (factory default) Alarm Delay Thresholds Initial (factory default) settings for the alarm delay threshold shall be:

Alarm Level 1 (Alert) - 10 seconds
Alarm Level 2 (Action) - 10 seconds
Alarm Level 3 (Fire 1) - 10 seconds
Alarm Level 4 (Fire 2) - 10 seconds
Fault - 10 seconds

FAULT ALARMS

The Detector Fault relay shall be connected into the appropriate alarm zone on the Fire Alarm Control Panel in such a way that a Detector Fault would register a fault condition on the Fire Alarm Control

Panel (Check regional Codes, Standards or Regulations to determine whether compliance with this set-up is required)

POWER SUPPLY AND BATTERIES

Operational system power shall be from a regulated 18-30 VDC supply. The battery charger and battery shall comply with the relevant Codes, Standards and Regulations and provide 24 hours of standby battery backup followed by 5 minutes of alarm mode. After the 24 hour period, the battery charger shall be capable of recharging the batteries to full rated voltage within 48 hours There are three (3) acceptable methods to provide power:

- From any UL 1481 Listed fire alarm power supply, provided the power supply and standby batteries have been appropriately sized/rated to accommodate the system's power requirements.
- Building Power Supply (120/220 VAC): The system shall be connected to a dedicated AC power source per article 760 of the NEC. The system shall be provided with an automatic standby battery power. in case of AC power loss, the system shall automatically transfer to the standby battery power and annunciate a fault condition on the fire alarm panel. The batteries and battery charger shall be sealed, lead acid type.
- Telecommunication Central Office Power Supply: The system shall operate on negative 48 VDC (provided continually from the telephone central office power source), converted to 24 VDC.

SAMPLING PIPE DESIGN

The sampling pipe network shall be arranged to provide optimum efficiency. The response time for the least favourable sampling point in the system shall not exceed 90 seconds and the system shall be balanced so that the volume of air drawn from the last sampling point shall not be less than 70% of the volume from the first sampling point. The Contractor shall submit: details of the pipe work design showing the proposed layout and this design shall be supported by computer-generated calculations showing response times, suction pressures and balance details of each sampling point.

5.4. BMS Integration

VESDA system shall be fully integrated with BMS system. All Faults, pre alarm and Alarm conditions shall be monitored through BMS.

VESDA panel shall be fully integrated to BMS system for monitoring and controlling the panel functions in case of Fault and Alarm condition.

5.5. Installation

The Detection System

The contractor shall install the system in accordance with the manufacturer's installation and instruction manual.

Sampling Pipe Network

The main sampling pipes shall be non-metallic or metallic (metallic - if required by user or AHJ), be or 3/4 or

1 inch diameter (normally is 3/4 inch) and shall be identified as a Fire Detection Sampling Pipe at intervals not exceeding the end user's specification or NFPA guidelines for labelling pipe.
The far end of each trunk or branch pipe shall be fitted with an end cap and drilled with a hole appropriately sized to achieve the performance as specified and as calculated by the system design.
All joints shall be air tight and made by using solvent cement, except at entry to detector mounting box.
All pipe shall be supported at not less than 5 ft centers.

Sampling Point Network

Sampling Holes of at least 5/64 inch diameter shall be separated by intervals not more than 30 ft. intervals along the length of the pipe. These intervals may vary according to calculations.
Each Sampling Point shall be identified in accordance with NFPA Standards
Consideration shall be given to local regulations, and manufacturer's recommendations in relation to the number of Sampling Points and the distance for the Sampling Points from the ceiling or roof structure and forced ventilation systems.

Capillary Sampling Network

Where false ceilings are installed, the sampling pipe shall be installed above the ceiling, and Capillary Sampling Points shall be installed on the ceiling and connected by means of a capillary tube. The tube shall be Vision Systems Part Number E700-TUBE or equivalent. The minimum internal diameter of the Capillary tube shall be 3/8 in, the maximum length of the Capillary tube shall be 12 ft unless the manufacturer in consultation with the engineer have specified otherwise. The Capillary tube shall terminate at a Ceiling Sampling Point. The system shall be Vision Systems Part Number E700-SP or equivalent. The performance characteristics of the Sampling Points shall be taken into account during the system design A conventional tee fitting with a 1/2 inch NPF female port shall be provided in the main sampling pipe for each capillary sampling point.

Air Sampling Pipe Network Calculations

Air Sampling Pipe Network Calculations shall be provided from a sampling pipe aspiration modeling program such as VESDA ASPIRE (v1.9 or later) or equivalent.

5.6. Commissioning Tests

The contractor shall allow for the manufacturer's representative to commission the entire installation in the presence of the owner and/or its representative.
All necessary instrumentation, equipment, materials and labour shall be provided by the Contractor.

The Contractor shall record all tests and system calibrations and a copy of these results shall be retained on site in the System Log Book.

Visually check all pipes to ensure that all joints, fittings, bends, sampling points, etc. comply with the specification.
Check the system to ensure the following features are operational and programmed in accordance with the specification.

- Alarm levels and Indicators

- Set clock function to local time
- Time delays
- Bar graph display
- Air flow fault indicators
- Detector status test and indicator
- Detector test and indicator
- Isolate/Reset buttons
- Set day/night sensitivity and offset if applicable

Check to ensure that all ancillary warning devices operate as specified.
Check interconnection with Fire Alarm Control Panel to ensure correct operation

Introduce Smoke into the Detector Assembly to provide a Go/No-Go Test. Introduce smoke to the least favourable Sampling Point in each Sampling Pipe. Response time is not to exceed one hundred and twenty seconds.

If more than two bar graph divisions illuminate under normal conditions (no smoke test), monitor the event log for two (2) weeks from the date of commissioning and make appropriate adjustments to the alarm and delay thresholds.

Activate the appropriate Fire Alarm zones and advise all concerned that the system is fully operational. Fill out the log book and commissioning report accordingly

6. WATER LEAK DETECTION SYSTEM

Provide a complete leak detection system including electronic alarm modules, water sensing cable, graphic display map, and auxiliary equipment. The system shall capable of automatically detecting the presence of water at any point along the continuous length of sensing cable. The system shall sound an alarm and locate, with a digital display, the point of liquid contact within 1 ft per 1000 feet of the total connected sensing cable length. No more than 1 foot of liquid, in contact with a sensing cable at a depth of 1/16 inch, shall be required to cause an audible alarm at the electronic alarm module.

The system shall be UL listed, FM approved.

The system manufacturer shall have at least five years of experience with leak detection and location technology, including both sensing cable and the associated alarm electronics. The manufacturer shall provide written verification of current ISO:9001 registration.

6.1. System Description

The WLD system is shall be used in critical areas of the datacenter rack area, UPS room and MMR room.

6.2. Technical Specification

The alarm and locating module shall be housed in a NEMA 12 enclosure and have a 4 line x 20 character backlit LCD display which provides status and alarm data. It shall be capable of monitoring up to 5000 feet (1500 m) of sensing cable. The alarm and locating module shall continuously monitor all sensing cable for liquid contact. Contact with liquid shall result in an audible alarm, illumination of a “leak” LED, actuation of an output relay, and digital display of the distance to the liquid location. The electronic alarm module shall continue to monitor the sensing cable after detection of liquid. It shall re-alarm if the liquid spreads, or if a second leak is detected, more than a specified distance from the original location. The complete system shall be continuously monitored for electrical continuity. The loss of continuity in any of the wires shall result in an audible alarm, illumination of a “fault” LED, and actuation of an output relay. The electronic alarm modules shall require no operator programming and shall automatically calibrate whenever power is applied. Test, silence, and reset functions shall be activated from the front panel upon user command. The alarm module shall have a security password. It shall report, date and time stamp, and record to non-volatile memory, all alarm events into an events history log. The alarm module shall be capable of digitally communicating to host systems via RS-232 orRS-485, at the user’s option. It shall also provide a 4-20 mA analog interface signal. The alarm module shall be tested and found to comply with the limits for a Class B digital device, pursuant to FCC, Part 15. The alarm module shall operate on 120VAC, 60 Hz, single phase power. Each module will require a dedicated 15 amp, 120VAC circuit.

The water sensing cable shall be resistant to corrosion. It shall detect the presence of water based liquids but shall not detect hydrocarbons. The cable shall be constructed of two sensing wires and two insulated wires embedded in a fluoropolymer carrier rod. The sensing wires shall be jacketed with a conductive fluoropolymer. The cable shall be constructed with no metal parts exposed to the environment. Sensing cable shall dry within 15 seconds of removal from free water; sensing cable which is braided in construction is not acceptable. The sensing cable shall have a breaking strength of 160 pounds. It shall have an abrasion resistance of >65 cycles

per UL 719. The sensing cables shall be capable of accommodating any number of branches using branching connectors.

Jumper cable shall be available to interconnect sensing cables or to facilitate remote mounting of the electronic alarm module. Jumper cable may not add more than 0.01% of additional length to the leak detection circuit.

All sensing and jumper cable shall pass UL 910, Test Method for Fire and Smoke Characteristics of Electrical and Optical-Fiber Cables Used in Air-Handling Spaces, and shall be Class 2 plenum cable per NEC 725-51 (a).

All sensing cable, jumper cable, and system components shall be provided by the manufacturer in modular lengths with electrical connectors which have been pre-installed and tested at the factory. Field splicing is not acceptable.

A portable test box shall be provided to the leak detection system installer. It shall become the property of the owner, upon system acceptance, for use in the ongoing preventive maintenance of the leak detection system.

6.3. Installation

All system components shall be installed in accordance with the manufacturers installation instructions, NEC, and local code requirements. The sensing cable shall be installed after all piping, air conditioning, raised flooring, and other mechanical work has been completed. The subfloor sensing cable path shall remain clear of water, oil, solder, flux, dirt or other materials which may soil the sensing cable.
The sensing cable shall be installed beneath the raised flooring, around the perimeter of all rooms, a maximum of 3 feet from the outside wall. Route sensing able a minimum distance of 3 feet beyond the perimeter of all A/C units. In addition, lay the cable in a serpentine pattern on 4 - 8 foot minimum centers to protect interior surface areas where water sources are found, such as A/C unit and CPU piping, floor drains, chillers, etc. The sensing cable should be installed under the center of floor tiles to facilitate access to, and visual location of, leaks. Sensing cable shall be secured to the sub floor with plastic hold-down clips on approximately 6 foot intervals.
The sensing cable installer shall be responsible for installation of the sensing cable, functional testing, and mapping of the system.
Upon completion of the system installation, a factory pre-connectorized 5 foot long water sensing cable shall be temporarily installed at the far end of the each leak detection circuit. The sensing cable shall be immersed in approximately 1 foot of water, at a depth of 1/8 inch, to confirm that an audible alarm is generated at the alarm module and that the appropriate distance to the leak is displayed. The installer shall perform and certify the tests in the presence of the owner's representative.

A graphic display map prepared from "as built" drawings shall be furnished upon completion. The map shall indicate the location of the sensing cables, landmarks such as equipment, A/C units, walls, floor drains, change of cable direction, and cable distance readings. The map shall be mounted next to the alarm and locating module.

6.4. BMS Integration

WLD system shall be fully integrated with BMS system. All Faults, pre alarm and Alarm conditions shall be monitored through BMS.

WLD panel shall be fully integrated to BMS system for monitoring and controlling the panel functions in case of Fault and Alarm condition. All necessary modbus / necessary accessories needs to considered to communicate to BMS Software.

7. RODENT REPELLANT SYSTEM

Standalone Ultrasonic Pest Repellent are electronic transmitters of high frequency sound waves (well above the 20 KHz frequency which is the upper limit of the hearing range of the human ear.) They emit intensive sound at high decibel levels (sound pressure) that is audible and painful to pests, but is inaudible and harmless to humans. The pests usually leave the area being protected by ultrasound. They do not get killed.

7.1. System Description

Ultrasonic Pest Repellent is a system of one Controller and accessories that include twelve transducers, 300 yards of cables and a pair of stand bracket. The Controller is installed in the main control room/ server room and the Transducers in the problematic areas i.e. above and below false ceiling and below false flooring.

The Aspiration Smoke Detection System must be of a type submitted to, tested, approved and/or listed by local codes and standards

7.1.1. Codes, Standards or Regulations

The entire installation shall be installed to comply with local Standards

7.2. Technical Specifications

CONTROLLER
The Controller generates variable high frequency electronic signals that are Ultrasonic in nature (20 KHz to 50 KHz). The signals are transmitted to the Transducers via cables for emission all around. It needs a power connection of 5 A electrical plug point and comes equipped with a 3-pin power supply cord of 2.5 meters.

TRANSDUCER

Each Transducer covers an open area of 300sq. ft. when the average height of the ceiling is 10 ft. But if installed in the false ceilings or false floorings, it will cover an approximate area of 150 sq. ft. The whole system (12 nos.) will accordingly cover an open area of approximately 3,600 sq. ft. And if installed in false ceilings and false floorings, the area covered will be considerably less. Each Transducer occupies a maximum space of 8 cubic inches and is aesthetically designed to match your décor. Being monopolar in nature they can be installed in any sensitive area as there is zero risk of sparking.

The Transducers can withstand high temperatures in the false ceilings, and low temperatures in cold storages and air locks. The Transducers do not need a power connection. The Transducers can be tested on an audible range with the help of a self-testing facility.

CABLES
2 core, flexible (14/40) SWG, specially coated CT wires of 300 yards for connectivity between the Transducers and the Controller.

STANDS & BRACKET
Powder coated Al. accessory for mounting of the Controller.

7.3. Installation

The system of one NETWORKING Controller, 12 Transducers, 3 bundles of cable each measuring 91.3 Mtrs. (100 yards. approx.) for connecting the Transducers to the Controller and a rack with a pair of brackets for mounting the Controller.
Select an open area in the electrical room or AHU room and fix the rack with the brackets and mount the Controller on it. Adequate ventilation for the NETWORKING Controller IS A MUST.
Provide a 5 A electrical plug point within two feet from the rack. Check proper grounding/ earth before connecting the NETWORKING Controller. Also check the proper A.C. voltage i.e. 220/230 V.
Select the problematic area i.e. main room / false ceiling / false flooring to be covered. A Single satellite will cover only an area of 150 sq. feet if installed within in the false flooring / ceiling and 150sq. feet in the main room. No power points are required for the Transducers.

The Transducers have to be fixed at a height of ten feet from the ground level, in the main room, and the distance between two Transducers should be at least ten feet. The Transducers are to be fixed at the correct angle for covering maximum area with maximum bounce. Install the Transducers as per the markings on the floor plans.

The Satellite comprises of 2 parts, pry open the bottom lid of the Satellite to connect the cables with the help of the screws provided. The bottom lid of the Satellite is to be fixed to the wall and the top part of the Satellite is to be press fit to the bottom lid.

The Transducers in the main room / ceiling should face the floor wall and not open areas such as open doors, windows etc. so that maximum bouncing effect is attained.

Every satellite will have an independent cable, terminating at the rear side of the NETWORKING Controller as shown in figure ‘B’ to be connected to the terminal in parallel.

Only 12 Transducers are to be connected to one NETWORKING Controller and the cables are to be encased in a PVC / G.I. conduit pipe. Make sure every conduit pipe contains only twelve satellite cables.

As far as possible use only bends and not elbows to ensure smooth laying / pulling of satellite cables.

Feruling to be done at satellite end and NETWORKING Controller end; and the same to be marked on the floor plan.
Continuity test to be done for all cable wires from transducers to console.
All conduting to be done as per approved shop drawing.

8. BUILDING MANAGEMENT SYSTEM

The specifications described in this tender for Building Automation/Management System is a guide to the type of system and features are to be taken on a minimum requirement. The features offered over and above those mentioned in the tender shall be given due weightage

The Building Automation System (BMS) manufacturer shall furnish and install a fully integrated building automation system, and energy management software, incorporation direct digital control (DDC) for energy management, equipment monitoring and control, and subsystems as herein specified. Complete temperature control system as specified herein. The installation of the control system shall be performed under the direct supervision of the controls manufacturer with the shop drawings, flow diagrams, bill of materials, component designation or identification number and sequence of operation all bearing the name of the manufacturer. The installing manufacturer shall certify in writing, that the shop drawings have been prepared by the equipment manufacturer and the equipment manufacturer has supervised their installation. In addition, the equipment manufacturer shall certify, in writing, that the shop drawings were prepared by their company and that all temperature control equipment was installed under their direct supervision.

All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed specially for this project. All systems and components shall have been thoroughly tested and proven in actual use for at least two years.

BMS manufacturer shall be responsible for all BMS and Temperature Control wiring for a complete and operable system. All wiring shall be done in accordance with all local and national codes.

Note - If other systems are integrated to the BMS, add the following:

The IBMS supplier shall integrate all equipment and systems specified herein.

Main IBMS Software to cater to Integrate Seamlessly with :

A.BMS System integration to includes
- Cooling Distribution Units
- Pump logic controllers
- Pumps & Valves
- RDHX units
- UPS system
- Adiabetic Dry cooler
- Multifunction meters of electrical panels

B. Fire Safety System
C. Access Control system

All Necessary Hardware to be considered to Integrate on Modbus on open Protocol with Other 3rd Party Devices.

Main DDC Controller with necessary Housing Panels which will sit on LAN directly / Network interface unit with necessary housing panels etc.

General Requirements

The system should include, but not be limited to the following:

End-to-end Internet Protocol based communication between field devices, BMS server and client software.

Event-driven event reporting from field devices, with system health check facilities.

Capability to interface with all assets irrespective of vendor or asset type.

Consolidation of maintenance related data for assets spread over the data center, thereby enabling maintenance tasks to be managed either centrally or in a distributed manner through global access. Users are able to monitor and control all assets from all locations from a single login to the BMS server.

Built-in local controls that are configurable remotely via the IP network providing Boolean and Scheduled output control capabilities.

Built-in trending tools to display Alarm events and analogue data in real-time, charting tools for analyzing historical data, and metering tools remote metering.

User configurable SMS and email alerts with escalating and recurring alert capabilities.

Built-in reporting and statistical analysis tools that automatically compute Key Performance Indicators (KPIs) in real time based on System Availability, Failure Count and Down Time indices.

Field devices shall be fully embedded and operate independently without the need for any fixed public IP addresses or PCs.

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Scalable architecture, with the capability for future upgrades to extend the number of monitored assets

Extent of Works

The works in this Tender is for the supply, delivery, installation, testing and commissioning of an e-Maintenance system that includes the following:-

Upgrading specified M&E equipment supplied under this tender (by others) with embedded IP Gateway devices thereby enabling them to communication over the IP network.

Upgrading specified M&E equipment supplied (by others) with Slave devices where necessary.

Network cabling between Gateways and Slaves

Access to BMS central server application software based on an Application Service Provider (ASP) or Hosted Data Acquisition Services model.

Telecommunication cabling to connect Gateways to the Public Switched Telephone Network and/or existing Local Area Network hub/switch or other means of Internet connectivity as specified.

Server-based mobile messaging system for delivery of alerts from the system to authorized users.

Supply and installation of all sensors required for the proper functioning of the entire system.
Documentation and training

Work by others
Mechanical contractor installs all wells, valves, taps, dampers, flow stations, etc. furnished by BMS manufacturer.

Electrical Contractor provides:
230V power to all BMS and/or temperature control panels
Wiring of all power feeds through all disconnects starters to electrical motor.
Wiring of any remote start/stop switches and manual or automatic motor speed control devices not furnished by BMS manufacturer

Quality assurance
The BMS system shall be designed and installed, commissioned and serviced by manufacturer employed, factory trained personnel. Manufacturer shall have an in-place support facility within 100 kilometers of the site with technical staff, spare parts inventory and necessary test and diagnostic equipment. Distributors or licensed contractors are not acceptable.

Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.
The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation and Servicing). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

Submit all shop drawings for review before proceeding with procurement or site specific software development and according to a schedule to be established with the owner's/Consultants.
Submit Shop Drawings for all equipment to be provided, including but not limited to:

- Software packages
- Management station central equipment
- Specification data sheets of each hardware component or software module.

- Schematic diagrams showing system configuration and interconnection of management stations and all field panels in accordance with the specified level 1 and level 2 networks.

- Schematic diagrams for all building systems showing control devices, instrumentation, product interconnection, panel wiring, interlocking and component tag identification as well as written sequence of operation. Show panel spare capacity.

- Descriptive data of all operating, user and application software including complete operators manuals, programmers manuals, and alphanumeric mnemonic point name convention sheet.

- Other drawings as appropriate. General advertising type literature is only acceptable as additional support information.

Submit 6 sets of final as-built documentation including the above items and complete with troubleshooting procedures.
Provide final documentation to serve the diverse needs of personnel concerned with instruction, operation, procurement, installation and maintenance.
Shop drawings and final documentation will be reviewed to ensure that such documents are in keeping with the intent of this specification and fully meet the requirements in terms of content and format. Make all required changes to this documentation at no additional cost.
Delivery of the final approved documentation, in hardcover 2-ring or 4-ring binders with index page and index tabs, is required before the Certificate of Substantial Completion will be issued.
Maintain a complete and current copy of all reviewed Shop Drawings at the job site.

Reference standards
Provide electrical material and installation in accordance with the appropriate requirements, and in accordance with applicable sections of the current edition of the applicable local codes for electrical work and signalling systems. Install wiring in conduit or approved totally enclosed raceways. Do not use cable raceways or troughs. Approved ceiling plenum cable is acceptable where permitted by the local Authorities.

Provide electrical and electronic equipment, which meets the CE conformity requirements as defined in CE directive 89/336/EEC Low voltage directive 73/23/EEC.

Provide an BMS system which allows future support of the ANSI/ASHRAE BACnet Standard 135

Provide Terminal Unit Controls, which is Lon Mark compliant.

Modem interfacing provisions shall meet EIA RS232C. Modems shall comply with the local required communication protocol with minimum transmission rate of 28,800 baud.

All equipment and systems installed under this Contract shall meet following specifications on electromagnetic compatibility:

Interference immunity according to EN50082-2
Emitted interference according to EN50081-1

Provide equipment which functions and meets all detailed performance criteria when operating in the following minimum ambient condition ranges:

Operating Temperature - 0 to 50 deg C [32 to 122 deg F] (Class 3K5 to IEC 721)
Relative Humidity 10% to 85% non –condensing (Class 3K5 to IEC 721)
Electrical power service of single phase, 230V AC +/- 10%, 50 Hz nominal
The limits above are minimums and shall not take precedence over ranges detailed in this or the manufacturers specification.

7.5 Technical Submittals

The successful tenderer after award of work shall furnish technical submittals for various items incorporating complete technical details prior to procurement of equipment/materials, for the approval of the Engineer-in-charge. The submittals for items mentioned in the tender document but not restricted to the following:

a.	DDC Controllers, Integrator and Field Devices/ Sensors
b.	Work station for BMS and Access Control system
c.	Fire Suppression system with release panel, pipe, nozzles and other devices
d.	Fire Alarm System with fire panel, loop panel, field devices i.e. detectors, RIs, Modules & relays
e.	Water leak detection system with WLD panel, sensors, cables etc.
f.	Rodent Replant system, panel & transducers
g.	VESDA system
h.	All BMS components i.e. Hardware & software, cables & conduits etc.
i.	Input/ output summary including provision for future expansion
J	Access control system i/c reader, biometric readers, door modules, door magnet etc.

Test certificates for various items shall also be submitted by the contractor.

7.6 GUARANTEE PROFORMA

Guarantee For BMS, Safety and Security System Installation

We hereby guarantee the year round performance for BMS, Fire suppression system, Safety and Security system which we have installed in the building described below:

BUILDING - Data Center

LOCATION - Kanpur

For a period of **2 year (Two year)** from the date of acceptance of the total installation & start of operation. WE AGREE TO repair or replace free of cost to the satisfaction of the owner, any or all such work that may prove defective in workmanship, equipment or materials within that period, ordinary wear and tear and unusual abuse or neglect excluded, together with any other work, which may be damaged or displaced in so doing.

Signature of Contractor

Date Seal

7.7 List of approved Makes for HVAC Installation Works (as applicable).

MAKE OF MATERIALS

Sl no.	ITEM	MAKE
FIRE ALARM SYSTEM:		
1.	Intelligent Addressable Fire Alarm Control panel and Software	Honeywell / Notifier / Johnson Controls/Niagra
2.	Repeater Panel (At Security Gate)	Honeywell / Notifier / Johnson Controls/Niagra
3.	Intelligent Addressable Multi-sensor detector	Honeywell / Notifier / Johnson Controls/Niagra
4.	Intelligent Addressable Duct sensor detector	Honeywell / Notifier / Johnson Controls/Niagra
5.	Intelligent Addressable Heat type Smoke Detector	Honeywell / Notifier / Johnson Controls/Niagra
6.	Addressable Break Glass type Manual Call Point	Honeywell / Notifier/ Johnson Controls/Niagra
7.	Response Indicator	Local
8.	Sounder cum Strobe	Honeywell / Safeway / Johnson Controls/Niagra
9.	Control Modules	Honeywell / Notifier / Johnson Controls/Niagra
10.	Control Modules	Honeywell / Notifier /Johnson Controls/Niagra
11.	Fault Isolator Module	Honeywell / Notifier /Johnson Controls/Niagra
12.	Monitor Module	Honeywell / Notifier / Johnson Controls/Niagra
13.	Cables	Neolex/ Varsha/ Teleflex/ Fenolex/Polycab
14.	Fire Extinguishers	Safex /Excellent Fire
ACCESS CONTROL SYSTEM :		
15.	Main Controller	Honeywell/Cardkey/Nexwatch/Johnson Controls
16.	Proximity Card Readers	HID/Nexwatch/Honeywell
17.	Biometric Reader	Bioscrypt/Nexwatch/Honeywell/HID
18.	Proximity Cards	HID/Nexwatch/Honeywell
19.	Electromagnetic Lock	BELL/ Dafikas/ Sprint/Trimec
20.	ACS Operator Workstation PC	Dell /HP/ IBM
21.	Access Software Module	Honeywell / Johnson Controls
22.	Cables	Neolex/ Varsha/ Teleflex
23.	Conduits	BEC / V.I.P./ Precision
VESDA SYSTEM :		
24.	VESDA Laser Plus Panel	Xtralis / System Sensor
25.	Capillary Tube	Xtralis / System Sensor
26.	Sampling Point	Xtralis / System Sensor
27.	Programming Software	Xtralis / System Sensor
28.	Conduit	BEC / V.I.P./ Precision

CCTV SYSTEM :		
29.	IP CMOSDome Camera	Hikvision/Tyco/Bosch
30.	ScandomePTZ Dome Camera	Hikvision/Tyco/Bosch
31.	Digital Video Recorder	Hikvision/Tyco/Bosch
32.	LED Colour Monitor	Dell/HP/IBM
33.	Power supply	Sanstar, Micrologic
34.	Cables	Neolex/ Varsha/ Teleflex/ Fenolex /Polycab
35.	Conduits	BEC / V.I.P./ Precision
PUBLIC ADDRESS SYSTEM:		
36.	Ceiling Mount Speakers	Bosch/ Philips
37.	Wall Mount Speakers	Bosch/ Philips
38.	Microprocessor based Plena System	Bosch/ Philips
39.	CD Player	Bosch/ Philips
40.	Power Amplifier	Bosch/ Philips
41.	Cables	Neolex/ Varsha/ Teleflex/ Fenolex/Polycab
NOVAC Fire Suppression Gas System:		
42.	Seamless Cylinder, Valves assembly, supervisory switch connection, Solenoid valves, Pressure Monitor, Pressure gauge.	UTC/Tyco/ Kidde
43.	NOVAC Fire Suppression Gas	3M/ UTC/Tyco/ Kidde
44.	Master cylinder kit, electrical control head (solenoid valve), manual actuator, flexible discharge hose, master cylinder adapter.	UTC/Tyco/ Kidde
45.	Slave cylinder kit with pneumatic actuator, flexible discharge hose, actuation hose.	UTC/Tyco/ Kidde
46.	Manifold with check valve	UTC/Tyco/ Kidde
47.	Discharge Nozzles	UTC/Tyco/ Kidde
48.	Cylinder Straps	Zindal
49.	Discharge Pressure Switch	UTC/Tyco/ Kidde
50.	Seamless Piping	Zindal
51.	Abort Switch	UTC/Tyco/ Kidde
52.	Release Switch	UTC/Tyco/ Kidde
53.	Gas Release Panel	UTC/Tyco/ Kidde
WATER LEAK DETECTION SYSTEM:		
54.	Water Leak Cable	Sontay/Jayfire
55.	Water Leak Detection Panel	Saini / DSC

56.	Alarm modules	Sontay/ Jayfire
57.	Buzzer	Sontay/Jayfire
58.	Cables	Neolex/ Varsha/ Teleflex/Fenolex/Polycab
RODENT REPLELLANT SYSTEM :		
59.	Main Console	Maser/ C systems
60.	Transducers	Maser / C systems
61.	Wire Bundles (From Each Satellite to Console)	Maser/ C Systems
62.	Stand Brackets	Local
BUILDING MANAGEMENT SYSTEM :		
63.	BMS Operator Workstation PC	Dell /HP/ IBM
64.	Main BMS Software with EMS software	Honeywell / Johnson Controls /Siemens/Schneider
65.	DDC Controller with necessary Housing Panels	Honeywell / Johnson Controls /Siemens/Schneider
66.	Room Type Temperature + RH Sensor	Honeywell / Greystone / Johnson Controls / Siemens/Schneider
67.	DP Switch (For Run Status)	Honeywell / Greystone / Johnson Controls/Schneider
68.	Cables	Neolex/ Varsha/ Teleflex/ Fenolex/Polycab

Air-Conditioning Approved Make List :

S. No.	Items	Makes
1	Air handling unit/ Treated Fresh Air Unit	System Air/Flaktwood/ Zeco/Edgetech
2	Exhaust Air Unit	System Air/Flaktwood/ Zeco/Edgetech/Zair
3	Pipe (MS & GI)	Tata/Jindal(Hissar)/QST/Jindal(Star)
4	Blower	Nicotra/Comferi/ Kruger
5	Cooling coil	Zeco/Edgetech/ AHRI Certified
6	Hepa Filter	Thermadyne /Anfilco/ Dyna Air Filtration
7	Fan Coil Units	Cruise/Zeco/Edgetech/Kubic Midea/Trane
8	Duct (factory fabricated)	Rola Star / Techno Fabri-duct/Zeco/Ductofab
9	Water strainers (Y- strainer/pot strainer)	Emerald/Sant/D.S. Engineering / Maharaja Casting/Advance
10	Proportional thermostat	Siemens /Honeywell/Johnson
11	3 Way Motorized/ Mixing / Diverting valves	Siemens /Honey-well/Johnson/ Danfoss/Advance
12	Pressure gauges for water line/Refrigerant	Emerald / Fiebeg/ H. Guru
13	Thermometers	Emerald/ Japsin
14	V-Belts	Fenner India/ Dunlop
15	Fibre glass wool	UP Twiga /Ownes Corning

16	Nitrile Rubber insulation (Open/close cell) with specification as per BOQ.	Armacell/ K-flex/ A-flex/ Supreme/Aerolam
17	Fire retardant flexible duct connection	Air flow / Twiga/ATCO/GP spira/caryaire
18	Gasket for ducts	Prima Kool / Nuprine
19	Anchor Fasteners	Hilti / Fischer
20	Extruded Aluminum grilles & diffusers Fresh air louvers/Dampers	Caryaire/ Ravi Star/ Air Flow/Air master/Titus/System air
21	Fire damper	Ravi Star/Air Flow/ Mapro/System air/Ruskin Titus/Greenheck
22	Duct attenuator	AirFlow/Ravi Star/ Continental/Mahajan
23	Vibration isolators	Resistolex /Gerb / Base/ Dunlop
24	Motors	Siemens/Crompton/ABB/Bharat Bijlee
25	Fuse switch unit/switch fuse unit/HRC fuse	Larsen Toubro / Siemens / Schneider (MG)/Havells
26	Humidistat	Honeywell/Danfoss/Penn
27	Condenser/ Chiller	Trane/Carrier/York/Daikin
28	Polyurethane Foam (PUF)	Malanpur/ Lloyd /Best Opuf
29	Thermocole	Pioneer/Styrin
30	Chemical Reagent	Antiscalant/ Descalant / Antifungal Hibird / amacid/ Maic
31	VFD with sensors	ABB/DANFOSS/ Siemens
32	Cooling Tower	Paharpur/Flow air-tech Pvt.Ltd/Bell/Advance
33	Cooling Tower PVC Fills	Paharpur/Bell/Advance/Flow air tech
34	Window/Split Air conditioner/ Hi-wall split AC	Voltas/Hitachi / Carrier/Panasonic/Blue star/ Toshiba/Daikin
35	Dosing pump	M/s Ion Exchange (I) Ltd/ Milton Royal
36	Tower AC units	Voltas/Hitachi / Carrier/Panasonic/Blue star/ Toshiba/Daikin
37	Inverter VRF system	Voltas/Hitachi/ Carrier/Panasonic/Blue star/ Toshiba/Daikin/ Mitsubishi Electric
38	Hi wall type chilled water FCU	Cruise/Zeco/Edgetech/Kubic Midea/Trane
39	Wet scrubber	Zeco/Edgetech/ZAIR
40	Air washer (Evaporative cooling unit)	Carryaire/Zeco/Zair/Edgetech/Airflow
41	Pre-Insulated Pipe	Permapipe/Urecon/Sevenstar/Eurotube
42	VAV Boxes	Ruskin Titus/Honeywell/Trox/Trane/Johnson Controls/Tristar
43	Self-Cooled PAC server Rack	Schneider/Emersion/ Flakt
44	Victaulic coupling	Sevcon/Victaulic/Smith Copper
45	Dehumidifier	Bry-Air/Munters/Bri
46	PICV valve	Advance/Siemens/Denfoss/Honeywell
47	Axial Fans	Krugar/Nicotra/Comefri/Green Deck/Airflow
48	Spiral Flat Oval Duct (with GSS sheets of preferred make)	Dustech/GP spira/Spiral Tubes/Western air ducts/ Ductofab/Seven star

49	Silicone flexible duct connector	Easyflex/Airflow//Resistoflex/Dustech
50	Motorized butterfly valve/ Modulating Valve/Solenoid valve	Advance/Danfoss/Belimo/Johnson Control/Zoloto/Tyco/Victaulic/Honeywell
51	Expansion Bellow	Easyflex/Resistoflex/Cori
52	Fire rated vane Axial/Fire rated tube Axial/Vane Axial/Tube Axial Fan	Nicotra/Comferi/Kruger/Greenheck/Airflow/system air/Zair
53	Inline Fan	Nicotra/ Kruger/Greenheck/Airflow/system air
54	Propeller fan	Nicotra/ Kruger/Caryaire/Crompton/GE
55	Butterfly valve	Audco / Advance / C&R/Honeywell/ Kirloskar
56	Check Valve (Non return valve)	Audco/SKS/Advance/ Zoloto/ Honeywell
57	Balancing valve	Advance /Audco/ Honey- well/Danfoss
58	Centrifugal pump / Monobloc Pump	Grundfoss/Armstrong/Willo/Xylem
59	Water Softening Plant	Ion Exchange Ltd. / Milton Royal
60	Pressure switch	Indfoss / Honewell Indfoss / Honey- well
61	Bronze ball valve	Emerald/ Zolto / Leader/ Sant
62	Bronze ball valve with Y strainer	Emerald / Rapid control/ BAP
63	Suction guide	Anergy instrument Pvt.Ltd./Johnson/Pump OEM make
64	Water cooled screw chilling unit	Trane/Carrier/York/Daikin
65	Chemical reagent	Eco friendly bio clean pond clarifier/Volga
66	Sand filter	M/s Ion Exchange (I) Ltd / Pentair
67	Compressor	Emerson/Tecumsheh/Bohn/Danfoss
68	Cold room/Deep freezer	Danfoss/Blue Star/Bohn
69	Air-cooled ductable split/ceiling mounted Cassette type air-conditioning unit	Voltas/Hitachi / Carrier/Panasonic/Blue star/ Toshiba/Daikin
70	PVC water tank	Syntex/ Polycon
71	Water Cooler	Blue Star/Usha/Sidwal/Voltas
72	Control cables	CCI/ Fort Gloster/ Universal/ Incab/ Havells/KEI
73	Modular type Variable Refrigerant Flow/ Variable Refrigerant Volume air cooled Out- door units with specification as per BOQ	Voltas/Hitachi/carrier/Panasonic/Blue star/Daikin/Mitsubishi Electric
74	High static pressure VRF/VRV ceiling mounted ductable type Indoor Unit with specification as per BOQ.	Voltas/Hitachi/carrier/Panasonic/Blue star/Daikin/Mitsubishi Electric
75	Copper refrigerant piping with specification as per BOQ	Mandev/Rajco/ Maxflow
76	uPVC plumbing drain pipe with specification as per BOQ.	Supreme /Finolex
77	Fabricated GSS/GI Sheet with specification as per BOQ.	Jindal/Tata/SAI/Bhushan
78	80Amp, 4P, 300 Ma Weather proof RCB with specification as per BOQ.	L&T, Schneider, ABB

79	XLPE Class-O tubular insulation with specification as per BOQ.	Supreme / K-Flex/ A-Flex/Aerolam
80	PAC Unit with specification as per BOQ	Schneider (Uniflair)/StulzChspl (In- dia) Pvt.Ltd /Emerson Climate Technologies/ Bluebox
81	Electrical Panel with specification as per BOQ.	Siemens /L&T/Schneider / Le grand/Tecnic / ABB/ C&S/Neptune Milestone switchgear/Tricolite/ Essaar/Morden switch gear/Adlec
82	Portable type dehumidifier with Specification as per BOQ.	White Westinghouse/Power Pye Electronics/Bryair/Munter
83	GI volume control duct damper with specification as per BOQ.	Airmaste Equipment Emirates/Omega/Airflow
84	Soft duct (Fabric Duct)	Duct Sox/Prihoda
85	Smoke cum fire damper (Bare Damper)	Dynacraft/Mapro/Servex/Ruskin
86	Smoke cum fire damper (Actuator)	Belimo/Joventa/Honeywell/Siemens
87	Automatic Pressurization cum expansion tank	Flamco/Reflex/ IMI Hydronics/Ballandgosset
88	Dirt separator	Flamco/Reflex/ IMI Hydronics/Spirotech

Any other item not covered in the above list shall be ISI marked and as approved by Engineer In Charge.

8.Special Conditions of Contract

8.1 Timely Completion

1. The work included in this tender is of urgent nature.
2. The work of all components must be started simultaneously and has to be delivered togetheror early within the given time schedule.
3. The contractor has to deploy the labor and supervisory staff in shifts to meet the targetedcompletion date. The work may be executed in extended shifts or two shifts.
4. Number of days from the date of issue of letter of acceptance for reckoning date of startshall be as per Schedule. *If the Contractor commits default in commencing the executionof the work as aforesaid, the performance guarantee shall be forfeited.*
5. The detailed program chart approved by the engineer-in-charge shall indicate how the resources will be deployed by the contractor to maintain desired progress and for the completion of the work within the specified period. If the submitted program is approved, the milestone shall be redefined accordingly by the Superintending Engineer,IITK. The amount to be withheld in such a case, for non-achievement of milestone(s), shall remain unaltered. Any delay in achieving the milestone must be compensated within the limitations of time imposed in the Contract document
6. The contractor shall procure the required materials in advance so that there is sufficienttime for testing of the materials and approval of the same before use in the work, as required.

8.2 Rates

8.2.1 Unless otherwise provided in the schedule of quantities of the work the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building (Exclusive of GST) and nothing extra shall be payable to him on this account.

8.2.2 The rates for all items of work shall, unless clearly specified otherwise, include cost of all labours, materials and other inputs involved in the execution of the item irrespective of whether they have been specifically mentioned in the tender document or not.

8.2.3 In case the same item (s) appear more than once in the schedule of work / BOQ under the same sub head or among the different subhead of works, the lowest rate quoted for that item (s) shall be considered for the particular item(s) wherever appeared in any partof BOQ / Schedule of works for the purpose of tender evaluation although web generatede-price bid may incorporate different quoted rate for same item(s) as per the quoting pattern of the tenderer. The tendered amount thus worked out shall be final &shall be binding on the contractor.

8.2.4 The rates quoted by the contractor will be deemed to be inclusive of any extra expenditure of this reason. The contractor has to increase the manpower or other tools etc. to do the work as per requirement of the work at his own expenses. Nothing shall be paid on this account.

8.2.5 The contractor shall provide at his own cost suitable weighing, surveying and leveling and measuring arrangements as may be necessary at site for checking. All such equipment shall be got calibrated in advance from laboratory, approved by the Engineer-in-Charge.Nothing extra shall be payable on this account.

8.2.6 Other agencies may also simultaneously execute and install the works and the contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be available as specified elsewhere in the contract) and the contractor shall fix the same at the time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

8.2.7 All material shall only be brought at site as per program finalized with the Engineer-in- Charge. Any pre-delivery of the material not required for immediate consumption shall not be accepted and thus not paid for.

8.2.8 Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to approved manufacturers specifications where CPWD Specifications are not applicable. The contractor should get the materials (fixtures/fittings) tested from approved labs wherever required at his own cost.

8.2.9 The contractor shall be responsible for the watch and ward / guard of the buildings, safetyof all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the client department. No extra payment shall be made on this account.

8.2.10 The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, establishment of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, preparatory works, working during monsoon, working at all depths, height, lead, lift and location etc until / unless specified otherwise and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

8.3 Quality and Workmanship

8.3.1 The contractor shall be entirely responsible and answerable for all the works done by him regarding quality, adherence to the laid down specifications, terms and conditions, defect liability period

8.3.2 /guarantee etc. and he shall be liable to bear any compensation that may be levied by the department under any of the clauses of the agreement.

8.3.3 The materials having ISI mark shall have precedence over the one conforming to IS Specifications.

8.3.4 The proposed is for Institute premises and quality of work is paramount importance. Contractor shall have to engage well experienced skilled labour and deploy modern T & Pand other equipment to execute the work.

8.3.5 Samples of all materials and fittings to be used in the work in respect of brand manufacturerand quality shall be approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work.

8.3.6 All materials used in the work shall be new and of good quality, conforming to the relevant specifications as per good engineering practice. All the materials proposed to be used inthe work should be approved from Engineer in Charge before use in work.

8.3.7 Articles bearing BIS certifications mark shall only be used unless no manufacturer has got BIS/ISI mark for the particular material. Any material/fitting whose sample has not been approved in advance and any other unapproved material brought by the contractor shallbe immediately removed as soon as directed. Where the make of any particular materialis not specified in the Contract document, the material shall be supplied as per makes desired by the engineer-in-charge.

8.3.8 It will be the responsibility of the contractor / bidder to ensure use of genuine materials in the work. The department reserves the right to get (any / all materials / components) inspected by the manufacturer or their authorized representatives at any stage of the execution of work. If any of the materials, supplied and used in work is found spurious atany stage, then the department reserves the right to ask the contractor to replace it by genuine one and make suitable recovery till it is done, even if any payment against that material is already made.

8.3.9 The contactor should get the make/TDS documents approved before procuring any materialat site. The TDS/Make once approved shall not be changed without any valid recorded reasons. No material to be brought and used at site without the prior knowledge & approval of Engineer-in-Charge.

8.3.10 The department may ask for any valid document like manufacturer's test certificate, document for purchase of the material, document for import/shipment of imported materials etc. as deemed fit by the engineer-in- charge to ascertain genuinely of material supplied by/used in the work by the contractor. The contractor shall remain bound to submit all such documents to the department failing which payment may not be made or if alreadypaid may be recovered/ withheld from subsequent running account payment.

8.3.11 All equipment and their components, and all the materials to be used in the work shall be suitable for the environmental conditions at the location of the work.

8.3.12 The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance programme within two weeks of the award of work. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.

8.3.13 The contractor shall get the source of all other materials, not specified elsewhere in the document, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it.

8.3.14 Other Laboratories: The contractor shall arrange carrying out of all tests required underthe agreement through the laboratory as approved by the Engineer-in-Charge and shallbear all charges in connection therewith including fee for testing. The said cost of tests shall be borne by the contractor/department in the manner indicated below.

8.3.15 By the contractor, if the results show that the test does not conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

8.3.16 By the department, if the results conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

If the tests, which were to be conducted in the site laboratory, are conducted in other Laboratories for whatever the reasons, the cost of such tests shall be borne by the contractor.

8.3.17 Sample of building materials fittings and other articles required for execution of work shall be got approved from the Engineer-in-Charge. Articles manufactured by companies of repute and approved by the Engineer-in-Charge shall only be used. Articles bearing BIS certification mark shall be used in case the above are not available, the quality of samples brought by the contractor shall be judged by standards laid down in the relevant BIS specifications. All materials and articles brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-Charge which shall be preserved till the completion of the work.

8.3.18 The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-Charge.

8.3.19 BIS marked materials except otherwise specified shall be subjected to quality test atthe discretion of the Engineer-in-Charge besides testing of other materials as per the specifications described for the item/materials. Wherever BIS marked materials are brought to the site of work, the contractor shall if required, by the Engineer-in-Charge furnish manufacturers test certificate or test certificate from approved testing laboratoryto establish that the material produced by the contractor for incorporation in the work satisfies the provisions of BIS codes relevant to the material and/or the work done.

8.3.20 The contractor shall procure all the materials at least in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.

8.3.21 All materials brought by the contractor for use in the work shall be got checked from the

Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.

8.3.22 The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.

8.4 Natural calamity:

No payment will be made to the contractor for any damage caused by rain, snow fall, floods, dampness, fire, sun or any other natural cause whatsoever during the execution of work. The damage to the work due to above reason, if any, shall have to be made good by the contractor at his own cost and no claim on this account shall be entertained.

8.5 Stocking and Disposal of Materials & Debris

8.5.1 The contractor shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, compound wall, services etc. are to be constructed.

8.5.2 After completion of work the agency shall remove materials and debris etc. from site as per the direction of Engineer-in-Charge, at no extra cost.

8.5.3 Contractor's job will also include removing of all malba and debris arising in the process of painting including washing of floor to remove stains of paint, at no extra cost.

8.5.4 The contractor shall conduct work so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Chargeand shall as far as possible arrange his work and shall place and dispose of the materialsbeing used or removed so as not to interfere with the operations of other contractor or heshall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

8.5.5 For construction/renovation works which are likely to generate malba/rubbish to the tuneof more than a tempo/truck load, contractor shall dispose of malba, rubbish & other unserviceable materials and wastes at their own cost to the notified/specified dumping ground and under no circumstances these shall be stacked/dumped, even temporarily outside the construction premises.

8.5.6 Dismantled but useful materials/components/equipment, if any, should be returned to the Institute as per the direction of Engineer-in-Charge.

8.6 Safety and Security

8.6.1 The contractor has to follow all safety norms as laid down in National Building Code of India. All the workers shall be equipped with the required safety gadgets while working at site such as ISI marked helmets, Shoes and safety belts, gumboots, gloves etc.

8.6.2 The contractor, the authorized representative(s), workmen etc., shall strictly observe orders pertaining to fire precautions prevailing in the area.

8.6.3 The contractor shall be fully responsible for the safe custody of materials brought by him/ issued to him even though the materials may be under double lock key system.

8.6.4 Contractor will arrange proper metal ladders, M.S. double scaffolding (for working, painting,etc. at higher levels) at his own cost and will take all safety measures like double harnesssafety belt, mechanized electrically operated platform etc. If it is observed that work is proceeding without adequate safety precautions, work may be stopped by Engineer-in- charge and in such cases, contractor will be solely responsible for delay and its consequencesthereof.

8.6.5 The contractor shall be responsible for the watch and ward/guard of the buildings, safetyof all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.

8.6.6 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night speed limit boards red flags, red lights and providing barriers. He shall be responsible for all dangers and incidents caused to existing / new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work.

8.6.7 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.

8.6.8 The Institute shall not have any responsibility or liability in case of any accident injury to the personnel to the contractor at work site or to the general public at the work site due to mishandling equipment by the personnel of the contractor or any other similar reason. The responsibilities and liabilities for such accidents and incidents shall be borne by the contractor.

8.7 Approach to Site

8.7.1 The tenderer shall see the approaches to the site. In case any approach from main road is required at site or existing approach is to be improved and maintained for cartage of materials by the contractor, the same shall be provided, improved and maintained by thecontractor at his own cost.

8.7.2 Contractor shall take all precautionary measures to avoid any damage to adjoining property. All necessary arrangement shall be made at his own cost.

8.8 Water and Flooding

8.8.1 The contractor shall have to arrange water of desirable quality for the construction purpose for which he may have to install water purifier at site or might have to bring/ purchase water from outside as per decision of Engineer-in-charge. Nothing extra shall be paid on this account.

8.8.2 For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required the contractor shall do it and nothing extrashall be paid except otherwise provided in the items of schedule of quantities.

8.8.3 In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained not withstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any.

8.8.4 The water charges (for water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the Institute or any other statutory body, the consequent sewerage charges shall be borneby the contractor.

8.9 Acts and Laws

8.9.1 The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector / MC etc. and any other statutory bodies shall be adhered to, by the contractor,during the execution of work.

8.9.2 The Contractor shall also adhere to all traffic restrictions notified by the local authorities.

8.9.3 All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges, as applicable) payable to suchauthorities for carrying out the work, shall be borne by the Contractor.

8.9.4 The Contractor shall arrange to give all notices as required by any statutory / regulatoryauthority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Institute and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself/herself or by his/her employees or his/her authorized representatives. Nothing extra shall be payable on these accounts.

8.9.5 The fee payable to statutory authorities for obtaining the various permanent service shallbe borne by the Institute.

8.10 Labour and Laws

8.10.1 The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc. under various labour laws and other regulations applicable to the works, at his site office.

8.10.2 Huts for labour are not permitted within the premises of the Institute. No extra cost shallbe payable even if the contractor provides such accommodation at a place as is acceptableto the local body.

8.11 Nondisclosure Agreement

8.11.1 The Agency shall take all precautions not to disclose, divulge and/or disseminate to any third party any confidential information, proprietary information on the Institute business or security arrangements (including but not limited to the Assignment instructions, Schedules and other subsequent Arrangements) and/or business of the Institute. The obligation is not limited to any Scope and the Agency shall be held responsible in case ofbeach of the confidentiality of Institute's information.

8.11.2 If the Agency receives enquiries from Press/Media/Radio/Television or other bod-ies/persons, the same shall be referred by the Agency to Institute immediately on receiptof such queries.

8.12 Indemnification:

8.12.1 The agency shall be directly responsible to indemnify the Institute against all charges, dues, claims, etc. arising out of the disputes relating to the dues and employment of the personnel deployed and further for any claim/compensation against all damages andaccidents caused due to negligence on the part of the agents, employees and other personnelof the agency.

8.12.2 That the contractor shall keep the IITK indemnified against all claims whatsoever in respect of the employees deployed by the contractor. In case any employee of the contractor so deployed enters in dispute of any nature whatsoever, it will be the primarily responsibilityof the contractor to contest the same. In case IITK is made party and is supposed to contest the case, IITK will be reimbursed for the actual expenses incurred towards Counsel Fee and other expenses which shall be paid in advance by the Contractor to IITK on demand. Further, the contractor shall ensure that no financial or Any other liability comes on IITK in this respect of any nature whatsoever and shall keep IITK indemnified in thisrespect.

8.13 Force Majeure:

If at any time, during the continuance of this contract, the performance in whole or in part by either party of any obligation under this contract is prevented or delayed by reasons of anywar, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosion, epidemics quarantine restriction, strikes, lockouts or acts of god (hereinafter referred to as events) provided notice of happenings of any such event, is served by party seeking concession to the other as soon as practicable, but within 21 days from the date of occurrence and termination thereof. Provided the Party satisfies Institute adequately of the measures taken by it. Neither party shall, by reason of such event, be entitled to terminate this contract, nor shall either party have any claim for damages against the' other in respect of such non-performance or delay in performance. Further, the services under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist and the decision of Institute as to whether the services have to resume or not shall be final and conclusive, provided further, that if the performance in whole or in part of any obligation under this contract is prevented or delayed by reason of anysuch event for a period exceeding 60 days, Institute may at his option, terminate the contract.

8.14 Dispute resolution

8.14.1 The institute reserves the right to amend rules whenever and wherever considered necessary and appropriate. The same shall be intimated to the agency in due course.

8.14.2 Any dispute arising out of and in relation to this agreement shall be referred to the arbitration by sole arbitrator to be appointed by Director of the Institute. The arbitration would be conducted and governed by and under the provisions of Arbitration Act, 1996 and its amendments. Any legal dispute will be subject to jurisdiction of Kanpur Courts only and no other court shall have the jurisdiction.

8.14.3 Any dispute arising out of and in relation to this agreement shall be referred to the arbitration by sole arbitrator to be appointed by Director of the Institute. The arbitration would be conducted and governed by and under the provisions of Arbitration Act, 1996. Any legal dispute will be subject to jurisdiction of Kanpur Courts only and no other court shall have the jurisdiction.

8.15 Arbitration

8.15.1 Except as otherwise provided anywhere in this Agreement, if any dispute, difference, thequestion of disagreement or matter, whatsoever, arises between the parties, as to the meaning, operation or effect of the Agreement or out of or relating to the Agreement or breach thereof, the same shall be referred to a Sole Arbitrator, to be appointment by theDirector of the Institute at the time of the dispute.

8.15.2 If the Arbitrator, to whom the matter is originally referred, dies or refuses to act or resigns for any reasons from the position of arbitration, it shall be lawful for the Director of the Institute to appoint another person to act as Arbitrator in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was leftby its predecessor, provided both the parties consent to this effect, failing which, the arbitrator shall be entitled to proceed on the matter de- novo.

8.15.3 It is a term of the Agreement that the party invoking the arbitration shall specify all disputes to be referred to arbitration at the time of invocation of arbitration under the clause.

8.15.4 It is a term of the contract that the cost of arbitration shall be borne by the parties themselves.

8.15.5 The place of the arbitration shall be Kanpur Nagar, Uttar Pradesh, India.

8.15.6 Subject as aforesaid, the provisions of the Arbitration and Conciliation Act, 1996 and anystatutory modifications, amendments or re-enactment thereof and rules made thereunder and for the time being in force, shall apply to the arbitration proceeding under this clause.

8.15.7 Except as otherwise provided anywhere in this Agreement, the Arbitration proceedings shall be conducted in English and the Agreement shall be constructed, interpreted and governed by the law of India, for the time being in force.

8.16 Jurisdiction of Courts

The court(s) at Kanpur Nagar, Uttar Pradesh, shall have the exclusive jurisdiction to try any asall the disputes(s) between the parties arising out this Agreement.

8.17 Other Terms & conditions

8.17.1 In interpreting the specifications, the following order of decreasing importance shall befollowed in case of contradictions:

8.17.1.1 Schedule of quantities

8.17.1.2 Technical specifications of the NIT

8.17.1.3 Approved Drawing (If any)

8.17.1.4 CPWD General specifications Part-I (Internal) 2014, BIS Codes amended up to date, practices.

8.17.1.5 CPWD General Specifications for Electrical Works Part-II (External), 2014 amended up to date.

8.17.1.6 Relevant IS or other international code in case IS code is not available.

8.17.1.7 Indian Electricity Act 2003 and Indian Electricity Rules 1956 amended up to date.

8.17.1.8 Local Fire Regulations applicable at the place of installation. Relevant and applicable foreign standards and specifications amended up to date.

8.17.1.9 Any other relevant act or rules and local by-laws.

8.17.2 contractor will identify one of the supervisors for taking care of implementation of Safetysystems.

8.17.3 Smoking is strictly prohibited at workplace.

8.17.4 Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on. Drivers, helpers and operators are no exception.

8.17.5 No one is allowed to work at or more than three meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level.

8.17.6 No one is allowed to work without adequate foot protection.

8.17.7 Usage of eye protection equipment shall be ensured when workmen are engaged for grinding,chipping, welding and gas-cutting. For other jobs as and when site safety co-coordinator insists eye protection has to be provided.

8.17.8 All safety appliances like Safety shoes, Safety gloves, Safety helmet, Safety belt, Safety goggles etc. shall be arranged before starting the job. .

8.17.9 All excavated pits shall be barricaded & barricading to be maintained till the backfilling isdone. Safe approach to be ensured into every excavation.

8.17.10 Adequate illumination at workplace shall be ensured before starting the job at night.

8.17.11 All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.

8.17.12 Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work platforms.

8.17.13 Material shall not be thrown from the height. If required, the area shall be barricaded and one person shall be posted outside the barricading for preventing the trespassers from entering the

area.

8.17.14 Other than electricians no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.

8.17.15 All electrical connections shall be made using 3 or 5 core cables, having a earth wire.

8.17.16 Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.

8.17.17 A tools and tackles inspection register must be maintained and updated regularly.

8.17.18 Debris, scrap and other materials to be cleared from time to time from the workplace andat the time of closing of work every day.

8.17.19 All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.

8.17.20 No children shall be allowed to enter the workplace.

8.17.21 All the lifting tools and tackles shall be stored properly when not in use.

8.17.22 Clamps shall be used on Return cables to ensure proper earthling for welding works.

8.17.23 Return cables shall be used for earthling.

8.17.24 All the pressure gauges used in gas cutting apparatus shall be in good working condition.

8.17.25 Proper eye washing facilities shall be made in areas where chemicals are handled.

8.17.26 Connectors and hose clamps are used for making welding hose connections.

8.17.27 All underground cables for supplying construction power shall be routed using conduit pipes.

8.17.28 Spill trays shall be used to contain the oil spills while transferring / storing them.

8.17.29 Tapping of power by cutting electric cables in between must be avoided. Proper junction boxes must be used.

8.17.30 All the E & M works shall be carried out as per direction and to the satisfaction of the Engineer-in-charge.

8.17.31 If the specifications for any item or its component are not available in the CPWD specifications cited above, relevant BIS specification as amended up to date shall be followed, whether or not the specific reference of a particular BIS specification has been made in this specification/ tender document.

8.17.32 Wherever any reference to any Indian Standard specification occurs in the document relating to this contract the same shall be inclusive of all amendments issued there to or revisions thereof, if any, upto the date of opening of tenders.

8.17.33 All materials should conform to relevant BIS specifications wherever the same exists in absence of stipulation in this tender document.

8.17.34 Where manufacturers furnish specific instructions / recommendations relating to the ma- terials used in this job and/or their installation, covering points not specifically mentioned in these documents, these instructions shall be followed in all cases and shall be deemed to be included in the schedule of work whether they have been specifically mentioned or not.

8.17.35 All chase cuttings in the wall, for recessed conduits & boxes and drilling the holes shall be done

with power operated machines only. No chase shall be allowed to be cut manually with the use of hammer & chisel.

8.17.36 All cuttings in cement plaster and brick shall be made good by using cement mortar 1:3 (1 part cement, 3-part coarse sand) The cut surfaces shall be repaired by an experiencedmason only so as to match the repaired plaster with the original. All such repaired surfaces shall be cured for 3 to 4 days to keep the surfaces wet, using water spray machine (hand/motor operated) and avoid unnecessary flooding of the area.

8.17.37 The structural and architectural drawings shall at all times be properly co-related before executing any work.

8.17.38 For the purpose of recording measurements and preparing running account bills, the abbreviated nomenclature indicated in the publications Abbreviated Nomenclature of Items of DSR 2022 shall be accepted. The abbreviated nomenclature shall be taken to cover all the materials and operations as per the complete nomenclature of the relevant items in the agreement and relevant specifications. In case of items for which abbreviated nomenclature is not available in the aforesaid publication and also in case of extra and substituted items for which abbreviated nomenclature are not provided for in the agreement, full nomenclature of item shall be reproduced in the measurement books and bill forms for running account bills. For the final bill, however, full nomenclature of all the items shall be adopted in preparing abstract in the electronic measurement books and in the bill forms.

8.17.39 The following drawings must be submitted to Office of Executive Engineer within seven days of award of work.

8.17.39.1 G.A and schematic drawings of chilled water headers with pumps, pumps drawings with associated valves etc. showing material and size of sheet steel, technical data sheet, test certificate and make and ratings etc.

8.17.39.2 Pump selection and design datasheet along with the performance curves, Pipe materials, control valve technical data sheet to be submitted.

8.17.39.3 Along with the submission of TDS of pumps for approval, the agency shall submit warranty undertaking from the OEM of the pump.

8.17.40 On completion of works and before issuance of completion certificate, the contractor submit completion drawings in the form of three complete set of originals (reproducible).

8.17.40.1 G.A and schematic drawings of chilled water headers with pumps, pumps drawings with associated valves etc. showing material and size of sheet steel, technical data sheet, test certificate and make and ratings etc.

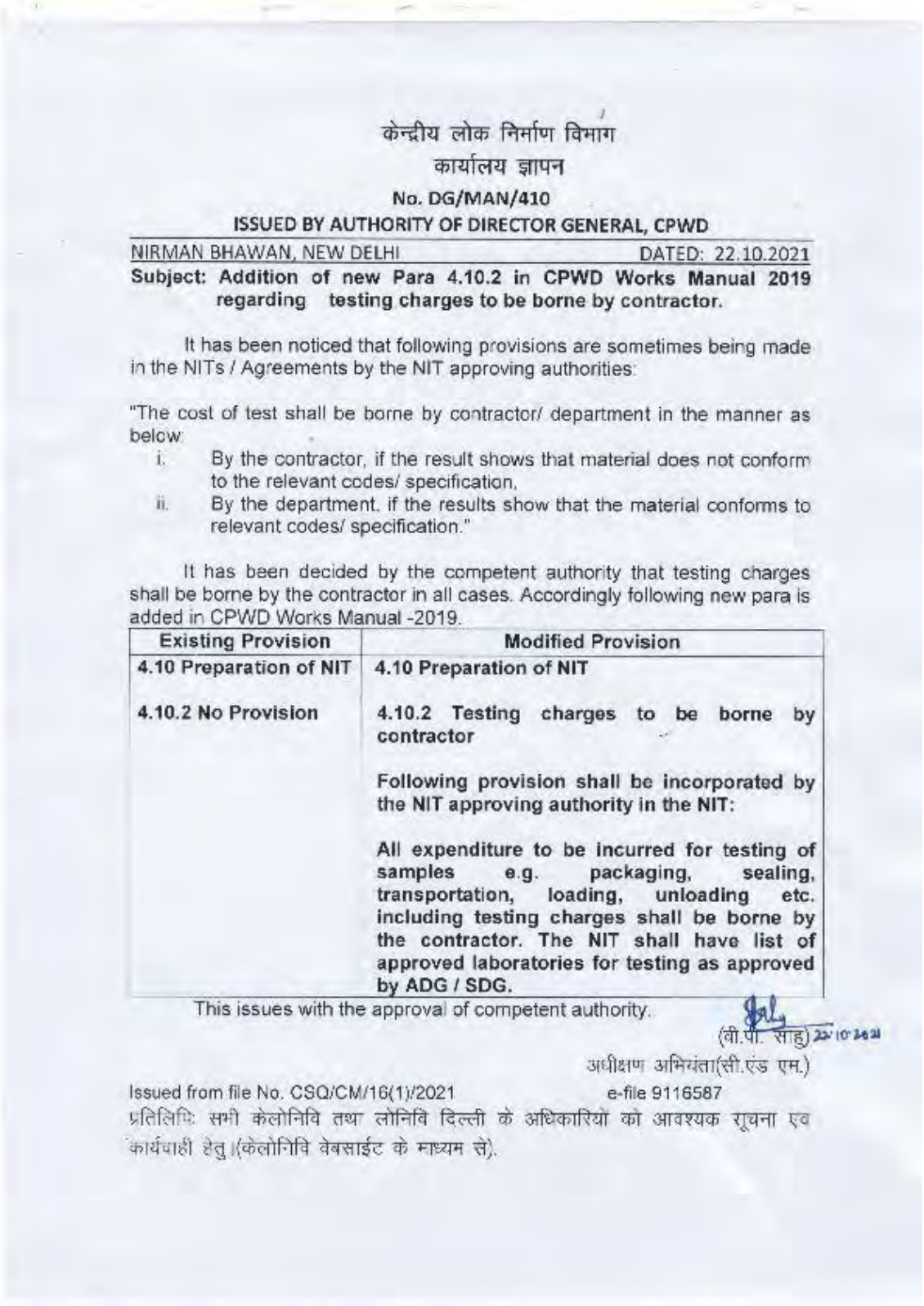
8.17.40.2 Pump selection and design datasheet along with the performance curves, Pipe materials, control valve testing and commissioning reports.

8.17.40.3 Technical literature, test certificates and operation and maintenance manuals required

8.17.41 Works Inspection and Testing of Equipment (If applicable): Prior to dispatch of equipment the Institute reserves the right to inspect for testing of the pumps as per relevant applicable standards or other items, the same at the manufacturer's works and the contractor shall provide and secure every reasonable access and facility at the manufacturers works for inspection, for witness of all acceptance and routine tests as per relevant Indian Standards. Contractor shall give a reasonable notice of about 15 days for the purpose of test, and witness of all major equipment.

8.17.42 Pre-commissioning test: All routine tests shall be carried out on the electrical equipment. Protective & measuring devices should be checked for calibration of MCCB's/MCB's, network

rack panel & cable meggaring, earthing measurements etc.



केन्द्रीय लोक निर्माण विभाग

कार्यालय ज्ञापन

No. DG/MAN/410

ISSUED BY AUTHORITY OF DIRECTOR GENERAL, CPWD

NIRMAN BHAWAN, NEW DELHI DATED: 22.10.2021

Subject: Addition of new Para 4.10.2 in CPWD Works Manual 2019 regarding testing charges to be borne by contractor.

It has been noticed that following provisions are sometimes being made in the NITs / Agreements by the NIT approving authorities:

"The cost of test shall be borne by contractor/ department in the manner as below:

i. By the contractor, if the result shows that material does not conform to the relevant codes/ specification,

ii. By the department, if the results show that the material conforms to relevant codes/ specification."

It has been decided by the competent authority that testing charges shall be borne by the contractor in all cases. Accordingly following new para is added in CPWD Works Manual -2019.

Existing Provision	Modified Provision
4.10 Preparation of NIT	**4.10 Preparation of NIT**
4.10.2 No Provision	**4.10.2 Testing charges to be borne by contractor** **Following provision shall be incorporated by the NIT approving authority in the NIT:** **All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor. The NIT shall have list of approved laboratories for testing as approved by ADG / SDG.**

This issues with the approval of competent authority.

(वी.पी. साहु) 22/10/2021

अधीक्षण अभियंता(सी.एंड एम.)

Issued from file No. CSQ/CM/16(1)/2021 e-file 9116587

प्रतिलिपि: सभी केलोनिवि तथा लोनिवि दिल्ली के अधिकारियों को आवश्यक सूचना एवं कार्यवाही हेतु।(केलोनिवि वेबसाईट के माध्यम से).

Figure 1: Modified provisions in CPWD works manual 2019 regarding testing charges to be borne by contractor.

Pre-Contract Integrity Pact

(Applicable for all tenders of the value above Rs.1 Crore)

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on ____ day of the month of _____ 202__.

BY AND BETWEEN

The Indian Institute of Technology Kanpur represented through **"The Registrar"**, having its office located at G.T. Road, Kalyanpur, Kanpur, Uttar Pradesh – 208016 (hereinafter called the **"BUYER",** which expression shall mean and include, unless ***the*** context otherwise requires, his successors in office and assigns) of the **First Party**;

AND

M/s_____a company incorporated under the Companies Act, 2013 through its representative/authorized signatory (insert name and designation of the officer) vide resolution dated _____ passed by the Board of Directors, having its registered office at_____

_____

(hereinafter referred to as **"The Bidder(s)/Contractor(s)"** which terms or expression shall, unless excluded by or repugnant to the subject or context, mean and include its successor-in-office, administrators or permitted assignees) of the **Second Party**;

WHEREAS, the Institute/Buyer has floated the Tender bearing No. _____ _____ (hereinafter referred to as **"Tender/Bid"**) and intends to award, under laid down organization procedures, contract(s) for _____ _____ (Name of the work/goods/ services). The Institution values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and/or Contractor(s).

AND WHEREAS, the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a body corporate and has been established under the provisions of the Institutes of Technology Act, 1961.

AND WHEREAS, in order to achieve these goals, in consultation with the CVC, the Govt. of India, Ministry of Education has appointed Independent External Monitors (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

NOW, THEREFORE, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDERs to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Section 1: Commitments of the BUYER

1. The BUYER commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

   (a) No employee of the BUYER, personally or through family members, shall in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

   (b) The BUYER shall treat all Bidder(s) with equity and reason during the tender process. The BUYER shall, in particular, before and during the tender process, provide to all Bidder(s) the same information and shall not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in the tender process or the contract execution.

   (c) The BUYER shall exclude from the process all known persons having conflict of interest.

2. If the BUYER obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the BUYER shall inform the Chief Vigilance Officer, IIT Kanpur and in addition shall initiate disciplinary proceedings.

Section 2: Commitments of BIDDERs

1. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-

   (a) The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organisation or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

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(b) The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the contract or any other contract with the Government.

(c) The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign entity or associates, if any. Further details as mentioned in the "Guidelines of Indian Agents of Foreign suppliers" shall be disclosed by the Bidders(s)/Contractor(s). Further, as mentioned in the Guidelines all payments made to the Indian Agent/representative have to be in Indian Rupees only.

(d) BIDDERs shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.

(e) The BIDDER further confirms and declares to the BUYER that the BIDDER is the original manufacturer/integrator/authorised government sponsored export entity of the defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

(f) The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

(g) The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

(h) The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

(i) The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

(j) The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

(k) The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

(l) If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of filing of tender. The term 'relative' for this purpose would be as defined in Section 2(77) of the Companies Act, 2013.

(m) The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

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

1. If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put their reliability or credibility in question, the Institute/Buyer is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take action as per the procedure mentioned in the "Guidelines on Banning of Business Dealing".

2 Any violation of Integrity Pact would entail disqualification of the bidder(s) and exclusion from future business dealings, as per the existing provisions of GFR-2017, PC Act, 1988 and other Financial Rules/Guidelines etc. as may be applicable to the organization concerned.

Section 4: Compensation for Damages:

1. If the Institute/Buyer has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Institute/Buyer is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

2. If the Institute/Buyer has terminated the contract according to Section 3, or if the Institute/Buyer is entitled to terminate the contract according to Section 3, the Institute/Buyer shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5: Previous Transgression

1. THE BIDDER(S) to disclose any transgressions with any other public/government organization that may impinge on the anti-corruption principle. The date of such transgressions, for the purpose of disclosure by the BIDDER(s) in this regard, would be the date on which cognizance of the said transgression was taken by the competent authority. The period for which such transgression(s) is/are to be reported by the bidders

shall be the last **three years** to be reckoned from date of bid submission. The transgression(s), for which cognizance was taken even before the said period of three years, but are pending conclusion, shall also be reported by the BIDDERS.

2. The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6: Equal Treatment of all Bidders/Contractors/Sub-Contractors:

1. In the case of sub–contracting, the principal/main Contractor shall take the responsibilities of adoption of the Integrity Pact by the Sub-contractor.

2. The BUYER will enter into agreements with the identical conditions as this one with all bidders and Contractors.

3. The BUYER will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7: Criminal Charges against violating Bidder(s)/Contractor(s)/Sub-Contractors:

1. If the Buyer obtains knowledge of the conduct of a Bidder, Contractor or Sub-contractor, or of an employee or a representative or an associate of a Bidder, Contractor or Sub-contractor which constitutes corruption, or if the Institute/Buyer has substantive suspicion in this regard, the Institute/Buyer will inform the same to the Chief Vigilance Officer, IIT Kanpur.

Section 8: Sanctions for Violations

1. Any breach of the aforesaid provisions by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the following actions, wherever required: -

   (i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

   (ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason, therefore.

   (iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

   (iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of a BIDDER from a country other than India with interest thereon at 2%. higher than the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection

with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER, in order to recover the payments already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with the BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of the Institute for a minimum period of two years, which may be further extended at the discretion of the BUYER.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

2. The BUYER will be entitled to take all or any of the actions mentioned at para 9.1 (i) to (x) of this Pact also on the Commission by the BIDDER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal Code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

3. The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

Section 9: Fall Clause

1. The BIDDER undertakes that it has not supplied/is not supplying similar product/systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India or PSU and if it is found at any stage that similar product/systems or sub-systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the BIDDER to the BUYER, if the contract has already been concluded.

Section 10: Independent Monitors

1. The IEMs have been appointed by the Ministry of Education in consultation with the Central Vigilance Commission. The details of the IEMs are as follows:

   (a) Mr. Ranvir Singh, IEM1@iitk.ac.in
   (b) Mr. P.V.V. Satyanarayana, IEM2@iitk.ac.in

2. The task of the Monitor shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

3. The Monitor shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

4. Both the parties accept that the Monitor has the right to access all the documents relating to the project/procurement, including minutes of meetings.

5. As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

6. The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

7. The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

8. The Monitor will submit a written report to the designated Authority of BUYER within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. A person signing the IP Pact shall not approach the Court while representing the matter to IEMs and shall await the decision in the matter.

10. The IP would be implemented through a panel of Independent External Monitors (IEMs), appointed by the Ministry. The IEM would review independently and objectively whether and to what extent parties have complied with their obligations under the Pact on receipt of any complaint by them from the Bidder(s).

11. Integrity Pact (IP), in respect of a particular contract, shall be operative from the date IP is signed by both parties. The IEMs shall examine all the representations/ grievances/complaints received by them from the bidders or their authorized representatives related to any discrimination on account of lack of fair play in modes of procurement and bidding systems, tendering method, eligibility conditions, bid

evaluation criteria, commercial terms & conditions, choice of technology/specifications etc.

12. For ensuring the desired transparency and objectivity in dealing with the complaints arising out of the tendering process, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an examination, and submit their joint recommendations to the Management. In case the full panel is not available due to some unavoidable reasons, the available IEM(s) will conduct examination of the complaints. Consent of the IEM(s), who may not be available, shall be taken on the records.

13. In the event of any dispute between the management and the contractor relating to those contracts where Integrity Pact is applicable, in case, both the parties are agreeable, they may try to settle dispute through mediation before the panel of IEMs in a time-bound manner. If required, the organization may adopt any mediation rules for this purpose.

    In case, the dispute remains unresolved even after mediation by the panel of IEMs, the organization may take further action as per the terms & conditions of the contract.

    The fees/expenses on dispute resolution shall be equally shared by both parties.

14. If the Monitor has reported to the Management of the BUYER a substantiated suspicion of an offense under the relevant IPC/ PC Act, the Management of the BUYER will take action after examination of the veracity of the intent of the action.

15. The word **"Monitor"** would include both singular and plural.

Section 11: Facilitation of Investigation

1. In case of any allegation of violation of any provisions of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents, including the Books of Accounts of the BIDDER, and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

Section 12: Law and Place of Jurisdiction

1. This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER i.e., Kanpur Nagar.

Section 13: Other Provisions

1. The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

2. Changes and supplements, as well as termination notices, need to be made in writing. Side agreements have not been made.

3. In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of sub-contracting, the principal contractor shall be solely responsible for the adherence to the provisions of IP by the sub-contractor(s).

4. Issues like Warranty/Guarantee etc. shall be outside the purview of the IEMs.

5. This Integrity Pact is deemed as part of the contract.

Section 14: Validity

1. The validity of this Integrity Pact shall be from the date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including the warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

2. Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement with their original intentions.

IN WITNESS WHEREOF, the parties hereunto set their hands and seals and executed this Integrity Pact as of the date/month/year first above written in the presence of following witnesses:

For & on behalf of
The Indian Institute of Technology Kanpur
(First Party)
Signed, Sealed and delivered by

Name: **Vishwa Ranjan**
Designation: **Registrar,**
Address: **IIT Kanpur**
(Authorized Signatory)

विश्व रंजन / Vishwa Ranjan
कुलसचिव / Registrar
भारतीय प्रौद्योगिकी संस्थान कानपुर
INDIAN INSTITUTE OF TECHNOLOGY KANPUR
कानपुर - 208 016 (उ.प्र.) भारत
KANPUR - 208 016 (U.P.) INDIA

For & on behalf of
The M/s .....
(Second Party)
Signed, Sealed and delivered by

Name: .....
Designation: .....
Address: .....
(Authorized Signatory vide resolution dated ..... passed by the Board of Directors)

***In the presence of Witness*:**

1. .....(Indenter)
2. .....

1. .....
2. .....