**NIT No.: IITH/CMD/ELE/NIT/2024-25/30 (2nd call)**

भारतीय सांकेतिक विज्ञान संस्थ हैदराबाद
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

# NOTICE INVITING TENDER
# (NIT)

**Name of work: Supply, Installation, Testing and Commissioning (SITC) of IoT based Building Management System (BMS) for AD4 Buildings (Chemical, Civil & Mechanical) & Old Dining Hall HVAC system at IIT Hyderabad, Kandi.**

**04.03.2025**
**Executive Engineer - Electrical**
**IIT Hyderabad**

# INDIAN INSTITUTE OF TECHNOLOGY HYDERABAD

## NOTICE INVITING TENDER (NIT)

### NIT No. IITH/CMD/ELE/NIT/2024-25/30 (2nd call)

**The Indian Institute of Technology(IIT) Hyderabad invites on behalf of President of India online bids (e-tenders) in Item rate / ~~Percentage rate~~ in Two-bid system (Technical Eligibility plus Financial) System, from the approved and eligible Electrical contractors of CPWD and those of appropriate list of M.E.S./BSNL/Railways/State P.W.D./Central PSUs/State PSUs/State Govt. departments/Central Govt. Departments or Original Equipment Manufacturer(OEM) of BMS system or the Specialized Agencies authorized from the OEM for the following work as per the stipulated terms and conditions mentioned below.**

**Copy of valid Registration of Firm (ROF) certificate, PAN card, GST Registration certificate & GSTIN should accompany the Technical Bid and those certificates should be valid on the last date of submission of bid.**

| | | |
|---|---|---|
| 1.1 | NIT No.: | **IITH/CMD/ELE/NIT/2024-25/30 (2nd call)** |
| 1.2 | Name of Work: | **Supply, Installation, Testing and Commissioning (SITC) of IoT based Building Management System (BMS) for AD4 Buildings (Chemical, Civil & Mechanical) & Old Dining Hall HVAC system at IIT Hyderabad, Kandi.** |
| 1.3 | Estimated Cost:<br>(*given merely as a rough guide)* | ***Rs. 3,73,05,110/- only*** |
| 1.4 | Earnest Money Deposit (EMD): | ***Rs. 7,46,110/- only*** |
| 1.5 | Period of Completion: | ***60 days*** |
| 1.6 | Date of Online Publication/Download of Tender | ***04/03/2025 @ 17:00hrs*** |
| 1.7 | Last Date for Submission of Bids | ***11/03/2025 @ 17:00hrs*** |
| 1.8 | Date and time of Opening of Technical Bids | ***12/03/2025 @ 17:30hrs*** |
| 1.9 | Date and time of Opening of Financial Bids | **To be decided** |
| 1.10 | Cost of Bid Document: | **NIL** |
| 1.11 | Website | **https://eprocure.gov.in/eprocure/app** |

**Sd/-**

**Executive Engineer-Electrical**

# Instructions to the Bidders for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, preparing 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: https://eprocure.gov.in/eprocure/app.

## REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: https://eprocure.gov.in/eprocure/app) by clicking on the link "Online bidder Enrollment" on the CPP Portal which 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 their accounts.

3) Bidders are advised to register their valid email addresses and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.

4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.,), with their profile.

5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's 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 / e-Token.

## 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. These 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 tender, in case they want to obtain any clarification / help from the Helpdesk.

**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 bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.

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/JPG formats. Bid documents may be scanned with 100 dpi with black-and white option which helps in reducing the size of the scanned document.

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 certificates, etc.) has been provided to the bidders. Bidders can use the "My Space" or ''Other Important Documents'' are 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.

*Note: My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.*

**SUBMISSION OF BIDS**

5) Bidder should log into the site well in advance for bid submission.

6) ion so that they can upload the bid in time i.e., on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

7) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.

8) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.

9) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date and time of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise, the uploaded bid will be rejected.

10) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (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 and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

11) 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.

12) 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. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.

13) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

14) Upon the successful and timely submission of bids (i.e., after Clicking "Freeze Bid Submission" in the portal), 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.

15) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

**ASSISTANCE TO BIDDERS**

16) Any queries relating to the 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.

17) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact details of the helpdesk are 0120-4711508, 0120-6277787, 0120-4001002, 0120- 4001005 and support-eproc@nic.in.

# NOTICE INVITING TENDER

## NIT No. IITH/CMD/ELE/NIT/2024-25/30 (2nd call)

**Technical Eligibility Criteria:**

1. Bidders shall produce definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:

   Experience of having successfully completed similar works during the last 07 years ending the last day of the month previous to the one in which tenders are invited.

   ***Three similar completed works each costing not less Rs. 1,49,22,044/- only or***

   ***Two similar completed works each costing not less than Rs. 2,23,83,066/- only or***

   ***One similar completed work costing not less than Rs. 2,98,44,088/- only***

   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 last date of submission of tender.

   ***"Similar Work" shall mean the work of Supply, Installation, Testing & Commissioning (SITC) of Building Management System (BMS)/Energy Management System(EMS)/Supervisory Control & Data Acquisition system(SCADA) for Operations & Monitoring of Centralized HVAC system and associated equipments or Equivalent MEP services in any Institutional Campus/ Industries/Universities/ Hotels/IT Companies/ Power Plants/ Pharmaceuticals/R&D Laboratories/Data Centers/Banks/PSUs etc.***

   (For private works TDS certificate or Form-26 AS in support of value of work done.)

2. **Turnover:** The Average annual financial turnover of the bidder shall be at least **Rs. 1,11,91,533/-** only during the immediate last three consecutive financial years ending 31st March 2024. The value of annual turnover figures shall be brought to current value by enhancing the actual turnover figures at a simple rate of 7% per annum. The certificate from CA shall be attached with the bid.

3. **Banker's Certificate or Net worth Certificate** (as per the prescribed format given in NIT): The bidder shall submit the Banker's certificate or Net-worth certificate as per the below:

   Banker's Certificate of the amount equal to **Rs.1,49,22,044/-only** issued by any scheduled bank,

   OR

   Net worth certificate of minimum amount **Rs.37,30,511/-only**, issued by certified Chartered Accountant with UDIN.

4. To become eligible, the tenderer shall have to furnish an affidavit as per Form 'J' of the NIT.

5. The bidder shall have Employees Provident Fund (EPF) enlistment and proof of the same shall be attached along with the Technical Bid clearly showing the Provident Fund Code number.

6. The bidder shall submit the Indemnity bond as per the format provided in Annexure-II.

7. The bidder shall submit the authorization certificate from the Approved Original Equipment Manufacturer (OEM) of IoT based BMS system major components i.e., controllers and gateways as per the format enclosed as Annexure- III.

8. Agreement shall be drawn with the successful tenderer on prescribed Form which is available in the website: *https://drive.google.com/file/d/19_LkFZ1IeQb_3BznXQtinslcLISYVdbo/view* **(with up to date correction slips if any)** Tenderer shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

9. The time allowed for carrying out the work will be as stated at para 1 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, if any, indicated in the tender documents.

10. **The site for the work is available.**

11. Tender documents consisting of plans, specifications, the schedule of quantities of the various classes of work to be done and the set of terms & conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen for information at the above-mentioned website.

12. Applicants are advised to keep visiting the above-mentioned website 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 respects including updates thereof, if any. An incomplete application may be liable for rejection.

13. The contractor whose tender is accepted, will be required to furnish a **Performance guarantee of 5% (Five Percent)** of the tendered amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. 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 Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor.

14. The description of the work is as follows:

**Supply, Installation, Testing and Commissioning (SITC) of IoT based Building Management System (BMS) for AD4 Buildings (Chemical, Civil & Mechanical) & Old Dining Hall HVAC system at IIT Hyderabad, Kandi.**

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders 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, 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 tender. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The tenderer 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 tender by a tenderer 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 Government and local conditions and other factors having a bearing on the execution of the work.

15. Tenders with any condition including that of conditional rebates shall be rejected forthwith.

16. Cost of **Bid document cost** and **EMD** may also be remitted to Institute's account number as per bank particulars given below:

| | |
|---|---|
| **Name of the Account Holder** | **: Indian Institute of Technology Hyderabad** |
| **Account Number** | **: 30412797764 (Current Account)** |
| **Name of the Bank** | **: State Bank of India** |
| **Address of the Bank** | **: IIT Kandi, IIT Hyderabad Campus, Kandi, Sangareddy, Telangana - 502284** |
| **Branch code** | **: 14182** |
| **IFSC code** | **: SBIN0014182** |
| **MICR code** | **: 502002528** |
| **SHIFT code** | **: SBININBB762** |

17. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other tender and reserves to itself the authority to reject any or all the tenders received without the assignment of any reason. All tenders in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

18. Canvassing whether directly or indirectly, in connection with tenderer is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.

19. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.

20. The contractor shall not be permitted to tender for works if his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Institute.

21. No Engineer of gazette 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 previous permission of the Government of India in writing. This contract is liable to be cancelled 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 tender or engagement in the contractor's service.

22. The tender for the works shall remain open for acceptance for a period of Ninety (90) days from the date of opening of tenders/Ninety days from the date of opening of financial bid in case tenders are invited on 2/3 envelop system (strike out as the case may be) if any tenderer withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the department,

then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the retendering process of the work.

23. **(A) All taxes, Labor Cess etc., as applicable shall be borne by the contractor himself. The contractor shall quote his rates considering all such taxes including GST on works. Any recovery towards GST is notified by the competent authority, the same shall be effected and no claim what so ever shall be entertained by IITH. The contractor shall quote his rates accordingly.**

**(B) 2% as TDS amount of GST amount payable on the bills will be deducted as per the Govt. of India, Ministry of Finance, Department of Revenue notification vide No.65/39/2018-DOR, dtd: 14-09-2018.**

24. ***GST registration certificate of the state in which the work is to be taken up, if already obtained by the bidder.***

***If the bidder has not obtained GST registration in the state in which the work is to be taken up or as required by GST authorities, then in such a case the bidder shall scan and upload following under taking along with other bid documents.***

***"If the work 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 IIT Hyderabad, whichever earlier, failing which I/We shall 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 IIT Hyderabad or GST department in this regard."***

25. This Notice inviting Tender shall form a part of the contract document. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of :-

a) The Notice Inviting Tender, all the documents including additional conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

b) Standard Contract form (General Conditions of Contract) as posted in the website of the Institute. The bidder is deemed to have gone through and understood the Standard Contract Form and the General Conditions of Contract.

**04.03.2025**
**Executive Engineer - Electrical**
**IIT Hyderabad**

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(Signature of bidder)

**FORM 'J'**

**AFFIDAVIT**

I/we undertake and confirm that our firm/partnership firm has not been blacklisted by any state/Central Departments/PSUs/Autonomous bodies during the last 7 years of its operations. Further that, if such information comes to the notice of the department then I/we shall be debarred for bidding in IIT Hyderabad in future forever. Also, if such information comes to the notice of IIT Hyderabad on any day before date of start of work, the Engineer-in-charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

***NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.100/-***

Signature of Bidder(s) or an authorized Officer of the firm with stamp

Signature of Notary with seal

| Checklist of documents to be submitted along with Technical Bid | | | | |
|---|---|---|---|---|
| **Sl. No.** | **Doc Ref** | **Description of the Document** | **Enclosed Yes/No** | **Remarks** |
| | ***Applicant shall submit the following documents for technical scrutiny*** | | | |
| 1 | Registration of Firm (ROF) | Copy of valid Registration of Firm (ROF) | | |
| 2 | PAN details | Copy of PAN card | | |
| 3 | GST registration details | Copy of GST Registration certificate & GSTIN should accompany the Technical Bid. | | |
| 4 | Details of similar woks executed. *(Detailed statements to be enclosed)* | Not less than Rs. 1,49,22,044/-only of estimated cost (Three similar works) | | |
| | | Not less than Rs. 2,23,83,066/-only of estimated cost (Two similar works) | | |
| | | Not less than Rs. 2,98,44,088/-only of estimated cost (One Similar work) | | |
| 5 | As per Para No. 1.4 of NIT | Cost of EMD of Rs. 7,46,110/- only | | |
| 6 | As per Sl. No.2 of NIT | Average annual financial turnover of the bidder should be at least Rs.1,11,91,533/- only during the immediate last three consecutive financial years ending 31st March 2024. The value of annual turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum. The certificate from CA shall be attached with the bid. | | |
| 7 | As per Sl. No.3 of NIT | The bidder shall submit the Banker's certificate or Net-worth certificate as per the below:<br>Banker's Certificate of the amount equal to Rs.1,49,22,044/-only issued by any scheduled bank,<br>or<br>Net worth certificate of minimum amount Rs.37,30,511/-only, issued by certified Chartered Accountant with UDIN. | | |
| 7 | As per Sl. No.4 of NIT | To become eligible, the tenderer shall have to furnish an affidavit as per Form 'J' of the NIT. | | |
| 8 | As per Sl. No.5 of NIT | The bidder shall have Employees Provident Fund (EPF) enlistment and proof of the same shall be attached along with the Technical Bid clearly showing the Provident Fund Code number. | | |
| 9 | As per Sl. No.6 of NIT | The bidder shall submit the Indemnity bond as per format provided in Annexure-II. | | |

| | | | | |
|---|---|---|---|---|
| 10 | As per Sl. No. 7 of NIT | The bidder shall submit the authorization certificate from the Approved Original Equipment Manufacturer (OEM) of IoT based BMS system as per the format enclosed as Annexure- III. | | |
| 11 | As per Sl.No.25 of NIT | Undertaking for GST registration in the state in which the work is to be taken up | | |

**Note:** ***The above check-list is broad and indicative only. Apart from the above, the bidder shall ensure to submit all the relevant documents along with his technical bid, which are specified in this Notice inviting Tender document and also which are otherwise appropriately required in support of its bid.***

## PROFORMA OF SCHEDULES

**SCHEDULE 'A'**

Schedule of quantities (Enclosed): Part A (Item Rate)

**SCHEDULE 'B'**

Schedule of materials to be issued to the contractor

| Sl. No. | Description of item | Quantity | Rates in figure & words at which the material will be charged to the Contractor | Place of issue |
|---|---|---|---|---|
| ..... **NIL** ..... | | | | |

**SCHEDULE 'C'**

Tools and plants to be hired to the contractor

| Sl. No. | Description | Hire Charges per day | Place of issue |
|---|---|---|---|
| ..... **NIL** ..... | | | |

**SCHEDULE 'D'**

Extra schedule for specific requirements/documents for the work, if any.

--- NIL ---

**SCHEDULE 'E'**

Reference to General Condition of Contract.: *Posted in the website of the Institute.*

| | | |
|---|---|---|
| Name of work | : | **Supply, Installation, Testing and Commissioning (SITC) of IoT based Building Management System (BMS) for AD4 Buildings (Chemical, Civil & Mechanical) & Old Dining Hall HVAC system at IIT Hyderabad, Kandi.** |
| Estimated cost of work | : | ***Rs. 3,73,05,110 /- only*** |
| Earnest money | : | ***Rs. 7,46,110/- only*** |
| Performance Guarantee | : | ***5.0%*** *of the accepted tendered value* |
| Security Deposit | : | **2.5%** *of the tendered value* |

## SCHEDULE 'F'

**GENERAL RULES AND DIRECTIONS**:

| | | |
|---|---|---|
| Officer inviting tender: | : | ***Executive Engineer-Electrical, IITH*** |
| Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses12.2 & 12.3 | : | ***1)Electro-Mechanical works…100%***<br>***2) Civil works…0%*** |

**Definitions:**

| | | |
|---|---|---|
| 2(v) Engineer -in- Charge | : | *Executive Engineer-Electrical, Indian Institute of Technology, Hyderabad.* |
| 2(viii) Accepting Authority | : | *Dean (Planning), Indian Institute of Technology, Hyderabad.* |
| 2(x) Percentage on cost materials and Labour to cover all overheads and profit | : | *15% (Fifteen) per cent.* |
| 2(xi) Standard Schedule of Rate | : | *CPWD, Delhi Schedule of Rates (DSR) 2022 E &M, with up to date correction slips.* |
| Standard Contract Form | : | *IITH General Conditions of Contract for Construction Works* |

**Clause 1**

| | | |
|---|---|---|
| i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance, in days | : | *7 (Seven) Days* |
| ii)Maximum allowable extension beyond the period provided in (i) above | : | *7 (Seven) Days* |
| **Clause 1A**<br>Whether Clause 1A is applicable | : | Yes |
| **Clause 2**<br>Authority for fixing Compensation under Clause 2 | : | *Superintending Engineer, Indian Institute of Technology, Hyderabad* |

**Clause 3(VII)**: If the contractor had secured the contract with Government as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement-will be made ineligible.

| | | |
|---|---|---|
| Number of days from the date of issue of letter of acceptance for reckoning date of start | : | 07 *Days from the date of issue of LOA or handing over of site, whichever is later* |
| Milestones | : | Not Applicable |
| Time allowed for execution of work | : | ***60 Days*** |

| | | |
|---|---|---|
| Authority to give fair and reasonable Extension of time for completion of work (Web based hindrance register) | : | *Superintending Engineer, IITH* |
| Rescheduling of mile stones | : | *Superintending Engineer, IITH* |
| **Clause 6:- Measurement Book**<br>Clause applicable, 6 | : | *(i) For works having estimated cost more than Rs 15 Lakh – Clause 6*<br>(ii) *For works having estimated cost Rs. 15 Lakh or less – Contractor's option of Clause 6 or to be exercised at the time of Tender Submission* |
| **Clause 7:**<br>Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment | : | *Rs. 5 Lakhs/-* |
| **Clause 7A:**<br>Whether Clause 7A is applicable | : | *Yes.*<br>*No running account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge.* |
| **Clause 10A:**<br>List of testing equipment to be provided by the contractor at site lab | : | *As given in additional specifications* |
| **Clause 10B (i)- Secured advance on Materials:**<br>Whether Clause 10 B (i) shall be applicable | : | NA |
| **Clause 10C:**<br>Component of labour expressed as percent of value of work | : | *NA* |
| **Clause 10CA** | : | *Not Applicable* |
| **Clause 10CC** | : | *Not Applicable* |
| **Clause 10D** | : | *Applicable* |

**Clause 11:**

| | | |
|---|---|---|
| | | **For ELECTRICAL WORKS** |
| Specification to be followed for execution of work | : | CPWD General Specifications for Electrical works:<br>Part I Internal 2013<br>Part II External 1994<br>Part IV Substations 2013<br>up to date Corrections Slips.<br>General Specifications for Heating, Ventilation & Air-Conditioning (HVAC), with upto date amendments<br>Particular Technical Specifications |
| | | **For CIVIL WORKS** |
| | | CPWD Specifications (Civil) Volume I-2019 & Volume II-2019 with up to date corrections slips |

**Clause 12:**

| | | |
|---|---|---|
| **12.2 & 12.3:** Deviation limit beyond which Clause 12.2 &12.3 shall apply for building work | : | *100% (One hundred per cent)* |
| **12.5** : Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work | : | *100% (One hundred per cent)* |
| **Clause 14:**<br>Whether Clause 14 is applicable | : | *Yes.* |
| **Clause 16**<br>Competent Authority for deciding reduced rates. | : | *Superintending Engineer, IIT Hyderabad up to 5% of tendered amount, beyond which, Director, IITH.* |
| **Clause 18:**<br>List of mandatory machinery, tools & plants to be deployed by the contractor at site | : | *As required for the work.* |

**Clause 25:**
Settlement of disputes by Conciliation and Arbitration:

| | | |
|---|---|---|
| Conciliator | : | *Dean (Planning)* |
| Authority to appoint arbitrator | : | *Director, IIT Hyderabad* |
| Place of arbitration | : | *Hyderabad* |
| Venue of arbitration | : | *IIT Hyderabad* |
| Type of Arbitration Tribunal | : | Sole Arbitrator |

*Note: Provisions of Arbitration and Conciliation Act 1996 with latest amendments in force shall be applicable.*

**Clause 32:** *As required for the work.*

**Clause 38**

| | |
|---|---|
| (i): Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates | *: Not Applicable ,DSR –2023 Civil published by CPWD* |

(ii): Variations permissible on theoretical quantities:

| | |
|---|---|
| (a) Cement | *Not Applicable* |
| (b) Bitumen All Works | *Not Applicable* |
| (c) Steel Reinforcement and structural steel sections for each diameter, section and category | *Not Applicable* |

# Special Conditions of Contract

1. Before tendering, the Agency shall inspect the site of work and shall fully acquaint himself about the conditions prevailing at site, availability of materials, avail- ability of land and suitable location for construction of godowns, stores and camp, transport facilities, the extent of lead and lifts involved in the work (over the entire duration of contract) including local conditions, as required for satisfactory execution of the work and nothing extra whatsoever shall be paid on this account.

2. The Agency shall at his own expense and risk arrange land for accommodation of labour, setting up of office, the storage of materials, erection of temporary work- shops, and construction of approach roads to the site of the work including land required for carrying out of all jobs connected with the completion of the work. In any case. **IIT Hyderabad (Institute) shall not permit setting up of labour camps within its premises**. If during construction it becomes necessary to remove or shift the stored materials shed workshop, access roads, etc. to facilitate execution of any other work by any other agency, the contractor shall do as directed by the Engineer-in-charge and no claim whatsoever, shall be entertained on this account.

3. It shall be deemed that the contractor shall have satisfied himself as to the nature and location of the work, transport facilities, availability of land for setting up of camp etc. The department will bear no responsibility for lack of such knowledge and the consequences thereof.

4. The Agency shall have to make approaches to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-charge. Nothing extra shall be paid on this account.

5. The Agency shall at his own cost submit samples of all materials sufficiently in advance and obtain approval of the Engineer-in-charge. Subsequently, the materials to be used in the actual execution of the work shall strictly conform to the quality of samples approved by the Engineer- in-charge and nothing extra shall be paid on this account. The acceptance of any sample or material on inspection shall not be a bar to its subsequent rejection, if found defective.

6. The contractor shall at his cost, make all arrangements and shall provide necessary facilities as the Engineer-in-charge may require for collecting, preparing, packing forwarding and transportation of the required number of samples for tests for analysis at such time and to such places as directed by the Engineer-in-charge, and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The cost of tests shall be borne by the contractor/Institute in the manner indicated below (except for water):

   a) By the contractor, if the results show that the material does not conform to relevant specifications and BIS codes or any other relevant code for which conformity test is carried out.

   b) By the Institute, if the results show that the material conforms to relevant specifications and BIS codes or any other relevant code for which conformity test is carried out.

7. Materials used on work without prior inspection and testing (where testing is necessary) and without approval of Engineer-in-charge are liable to be considered unauthorized, defective and not acceptable. The Engineer-in-charge shall have full powers to require removal of any or all of the materials brought to site by contractor which are not in accordance with the contract, Specifications or do not conform in character or quality to the samples approved by the Engineer-in-charge. In case of default on the part of the contractor in removing rejected materials, the Engineer-in- charge shall be at liberty to have them removed at the risk and cost of the contractor.

8. The work shall be carried out in such a manner so as not to interfere/or effect or disturb other works being executed by other agencies, if any.

9. Any damages done by the contractor to any existing work or work being executed by other agencies shall be made good by him at his own cost.

10. The work shall be carried out in the manner complying in all respects with the requirement of relevant rules and regulations of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.

11. The contractor shall maintain in good condition all work executed till the completion of the entire work entrusted to the contractor under this contract and nothing extra shall be paid on this account.

12. No payment will be made to the contractor for damage caused by rain, floods and other natural calamities whatsoever during the execution of the works and any damage to the work on this account shall have to be made good by the contractor at his own cost and nothing whatsoever' shall be paid on this account.

13. The Item Rates or ~~Percentage Rates~~ for all items of work, unless clearly specified otherwise shall include the cost of all labour for materials, de-watering and other inputs involved in the execution of the items.

14. No claim whatsoever for idle labour, additional establishments, costs of hire and labour charges for tools and plants etc. would be entertained under any circumstances.

15. For the safety of all labour directly or indirectly employed in the work for the performance of the contractor's part of this agreement, the contractors shall, in addition to the provisions of Safety code and directions of the Engineer-in-charge make all arrangements to provide facility as per the provisions of Indian Standard Specifications (Codes) listed below and nothing extra shall be paid on this account.

(a) IS 3696 Part I Safety Code for scaffolds and ladders

(b) IS 3696 Part II Safety Code for scaffolds and ladders Part II ladders

(c) IS 764 Safety Code for excavation work

(d) IS 4081 Safety Code for Blasting and Drilling operations,

(e) IS4138 Safety Code for working in compressed air.

(f) IS 7293 Safety Code for working with construction machinery

(g) IS 7969 Safety Code for storage and handling of building materials

(h) IS 5216:1982 code of safety procedures and practices in electrical works

16. The contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards and by providing red flags, red lights and barriers. The con- tractor shall be responsible for any accident at the site of work and consequences thereof.

17. Labour Welfare Cess @ 1% shall be deducted at source from the bills of Gross value (which includes the cost of stipulated materials) of the work done and Government shall not entertain any claim whatsoever in this respect in this contract. The Labour cess will be deducted in conformity with the Govt. guidelines for Electrical works and Civil works accordingly.

18. The ESI and EPF Contribution on the part of the employer in respect of the contract shall be paid by the contractor.

19. The contractor shall obtain a valid licence under the contract labour (RA) Act, 1970 and the contract labour (Regulation and Abolition) Central Rules, 1971 before the commencement of the work, and continue to have a valid licence until the completion of the work. The contractor shall also comply with provision of the Inter- State Migrant Women (Regulation of Employment and conditions of service) Act 1979.

20. All tools, tackles, safety equipment and labours required for maintenance and testing works / AMC at all levels and heights shall have to be provided by the tenderer at no extra cost.

21. Spare parts used by vendor should conform to IS specifications as applicable.

22. Any damaged due to mishandling by the person deputed by the vendor shall have to be restored back to its original condition by the vendor at their own cost.

23. **The Defect Liability Period (DLP)/Warranty Period of the executed works shall be minimum 36 (Thirty-Six) months only from the date of satisfactory completion, as recorded by the Engineer-in-Charge. Any additional Warrantee/Guarantee provided by the Manufacturer is also applicable.**

24. **Payment of Running bills**

The running bills shall be submitted by the contractor as per the progress of work done at site. However, the following will be the basis of payment for the items claimed under running bills:

a) Gross Payment to be made on supply of material at site: **70% of quoted rate.**

b) Gross Payment to be made on installation of material at site: **15% of quoted rate.**

c) Gross Payment to be made on satisfactory Testing & Commissioning of material at site: **15% of quoted rate.**

After receipt of the running bill at IITH, the contractor shall get the executed work and claimed quantities in bill checked and verified from the Engineer-In-charge or his authorized Engineer and after satisfactory verification of work executed at site, the payment to the contractor shall be released.

25. **Advance Payment:** If the work is not completed on or before 21st March 2025 with all the final bill and measurements submitted by the contractor then for the balance quantum of work (to be assessed by EE-Electrical), the Advance Payment may be made to the contractor on or before 31st March 2025 for the balance quantum of work, at the discretion of IITH in accordance with the Rule 172(1) of General Financial Rules(GFR) of Ministry of Finance, Govt. of India against advance submission of the Irrevocable Bank Guarantee of equal amount by the contractor to IITH, which will be binding on the contractor. This Advance Payment may be released without Prejudice to the right of Govt. to recover Compensation for delay in the execution (if any) in accordance with the Clause 2 of the General Conditions of Contract (GCC).

# Detailed Scope of Work & Technical Specifications

**Scope of Work:**

The scope of work covers design, supply, installation, testing and commissioning of the IoT based BMS system for the following:

1. The low side HVAC system in Academic Buildings: AD4 Quad i.e., Chemical, Civil & Mechanical Engineering Department buildings at IIT Hyderabad i/c all AHUs/CSUs/any other HVAC equipment as listed in the NIT document.

2. AC Plant-1: AD4 Chilled water circuit Secondary Pumps VFD's commissioning and installation of differential pressure sensor to the AD4 circuit secondary pumps so that the pumps speed varies based on the differential pressure feedback and control and monitoring of pumps by integrating them to the AD4 cloud based BMS system. Also integrating the AC Plant-1 Phase-I installed Chiller Plant Manager (CPM) to the new BMS system installed for AD4 buildings.

3. Old Dining Hall HVAC system control and monitoring including the radiant cooling system pumps in the dining hall.

4. The design of the solution must provide Delta T Chilled water optimization algorithm for the control units considering supply and return air and chilled water input and output temperature on the low side to avoid coil overflow and low Delta T Syndrome to maximize energy savings.

5. The Net minimum guaranteed Energy savings of 15% need to be considered while designing and execution of the solution which shall be invariably demonstrated by the contractor with a minimum of 01month of Trial run of the installed IoT based BMS system.

6. The scope of work also includes the Design and Development of user screen to Monitor, Operate and Control the aforesaid HVAC system with Professional grade graphics as per the direction and upto the satisfaction level of Engineer-in- Charge.

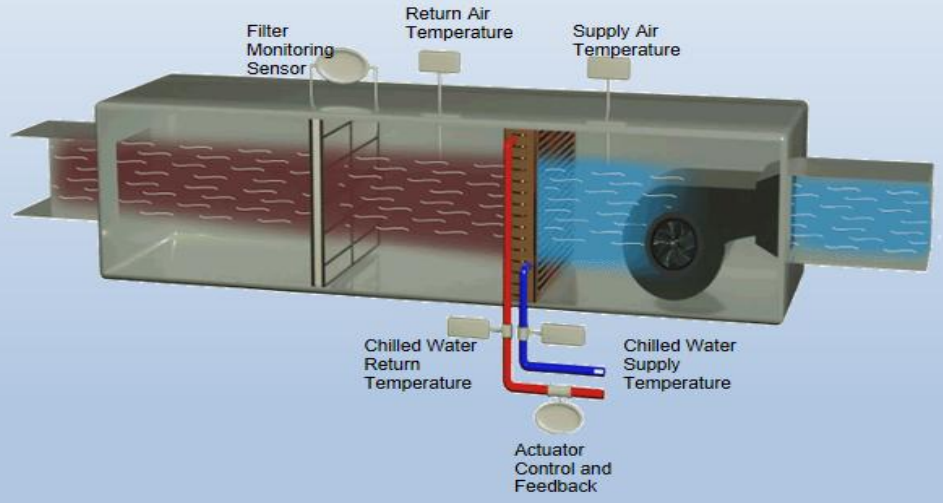
7. The design is for the BMS for HVAC system by opting the wireless technology using the IoT cloud based BMS system using the least possible local wiring for auxiliary power, control, feedback and connectivity of sensors, communication modules with inbuilt gateway sim card based. The device should have inbuilt dual SIM slot and support parallel dual sim operation for network redundancy.

8. The contractor need to comply the I/O Summary specified in the NIT document of each and every equipment proposed to be controlled thru IoT based BMS system.

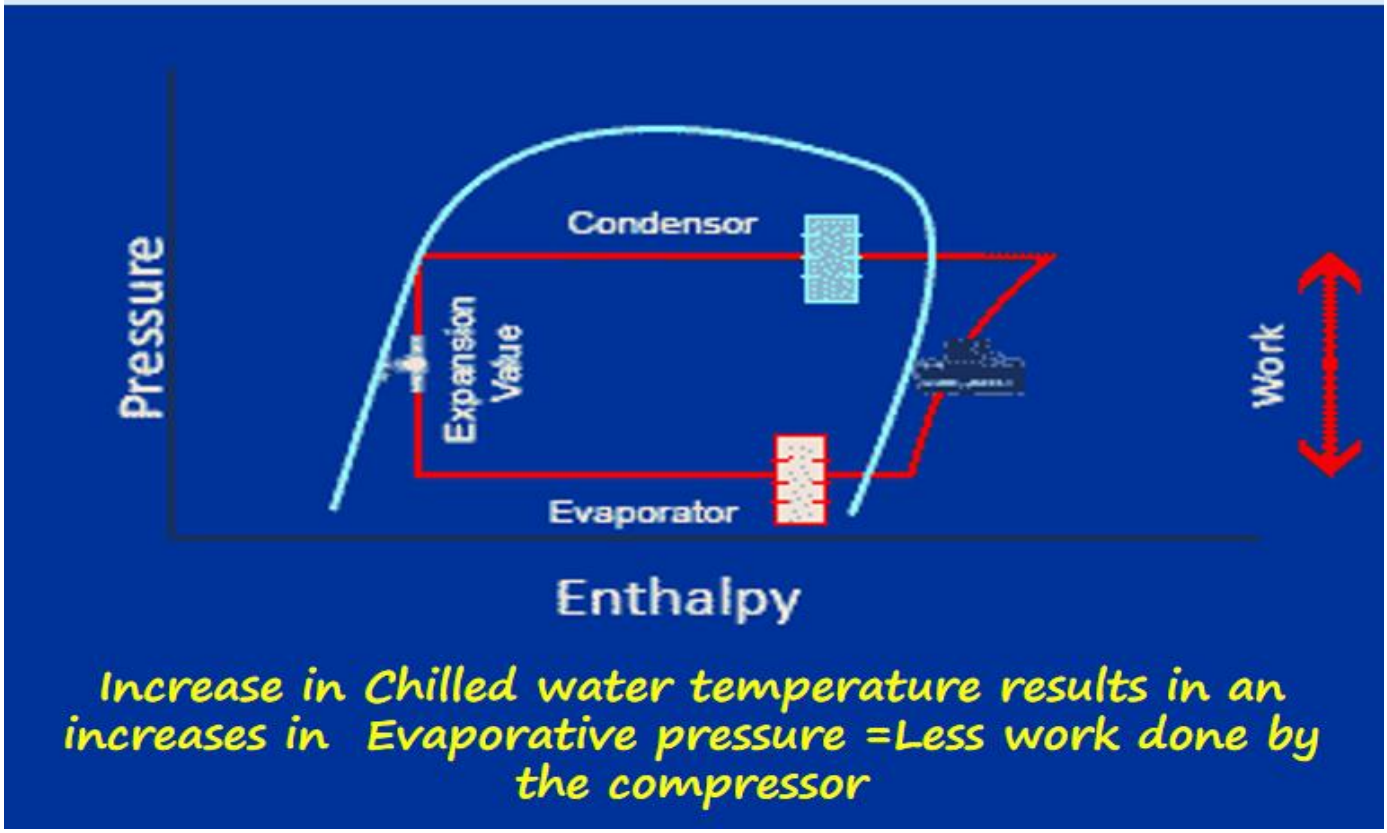
**Brief Description of Delta T Algorithm:**

The Delta T feature through multiple sensors for supply & return temperatures for chilled water and Air on the low side (AHUs), the system throttles down the chilled water consumption substantially, raises the Delta T for the return chilled water that leads to higher COP and thus efficiency of the chilled. This, along with lower demand and reduced pumping of the chilled water through the secondary pumps leads to a very attractive savings on energy consumed on the high side.

## Typical CHW HVAC Control & Monitoring Module




## ΔT Manager On AHU For Energy Saving on the Chiller




Increase in Chilled water temperature results in an increases in Evaporative pressure =Less work done by the compressor

**System Overview:**

- **Wireless IoT-Based BMS**: The system will primarily rely on wireless communication with cloud based integration.
- **Minimal Local Wiring**: Only essential auxiliary power and control connections will be hardwired.
- **Cloud Connectivity**: The BMS will use an IoT cloud platform for remote monitoring and control.
- **Built-in Communication Module**: The device will feature an integrated gateway with wireless SIM-based communication.

**Key Hardware Features:**

- **Integrated Communication Gateway**:
    - Supports **dual SIM slots** with **parallel operation** for network redundancy.
    - 4G/5G or LPWAN (NB-IoT/LTE-M) connectivity.
    - Optional **Wi-Fi and Ethernet** fallback.
- **Wireless Sensor Network**:
    - LoRa, Zigbee, BLE, or Wi-Fi-based sensors for control and monitoring.
    - Low-power IoT sensors for energy efficiency.
- **Power System**:
    - Low-power design with auxiliary power supply (minimal wiring).
    - Optional battery backup for resilience.
- **Edge Processing Capability**:
    - Local processing for critical operations.
    - AI/ML-based anomaly detection.

**System Connectivity**

- **Cloud-Based Operation**:
    - IoT platform for remote access and control.
    - Edge-to-cloud communication via MQTT, HTTP(S), or CoAP.
- **Local Control & Feedback**:
    - Wireless sensors relay data to the cloud via the gateway.
    - Actuators (HVAC) operate based on cloud or edge commands.

**Security Considerations**

- **End-to-End Encryption**: Secure communication between sensors, gateway, and cloud.
- **Dual SIM Redundancy**: Ensures uptime by automatically switching networks.
- **Firmware Over-the-Air (FOTA)**: Remote software updates.

The scope also consists of design and SITC of BMS for logic control operation and monitoring for the following equipment/systems:

a. AC Plant-1: 3 no's Secondary Pumps of AD4 Circuit
b. AC Plant-1: Phase-I installed cooling towers 3 no's and all the Fans motors of these 3 no's cooling towers.
c. AC Plant-1: Integration of Phase-I installed CPM system to this new BMS.
d. Equipment details location wise and the quantities are mentioned requirements are tabulated in Table-1

**Table 1**

| S.No. | Location | Equipment | UOM | Qty |
|---|---|---|---|---|
| 1. | Chemical, Civil & Mechanical | Single Motor: AHU's /CSU's | Each | 157 |
| 2. | Chemical, Civil & Mechanical | Dual Motor single unit: AHU's /CSU's | Each | 88 |
| 3. | Chemical, Civil & Mechanical | Fume Hood/Toilet Exhaust system/ Pressurization system/ FCUs | Each | 89 |
| 4. | Old Dining Hall | Single Motor: AHUs/ Fresh Air Units/Exhaust system | Each | 8 |
| 5. | Old Dining Hall | Toilet Exhaust system | Each | 4 |
| 6. | AC Plant-1 | Secondary pumps control and monitoring including differential pressure system | Each | 3 |
| 7. | AC Plant-1 | Phase-I installed Cooling Towers, supply and installation which includes fan motors. | Each | 3 |
| 8. | AC Plant-1 | Phase-I installed CPM to be integrated to the new BMS system | Each | 1 |

e. Old Dining Hall Radiant Cooling System pumps 4 no's also covered in this work scope.

1. The required I/O summary for all **AHU's/CSUs with single motor** control and monitoring with all the required sensors, equipment and accessories.

a. AHU Start / Stop Command.
b. AHU Run Status Monitoring.
c. AHU Auto / Manual/Bypass Status Monitoring.
d. AHU Trip Status Monitoring.
e. Filter Status Monitoring.
f. Supply Air Temperature Monitoring.
g. Return Air Temperature Monitoring.
h. 2 Way Modulating CHW Valve control.
i. 2 Way Modulating CHW Valve Feedback monitoring.
j. VFD Speed Command & Feedback monitoring
k. DUCT PRESSURE TRANSMITER

2. The required I/O summary for all **AHU's/CSUs with double motor** control and monitoring with all the required sensors, equipment and accessories.

a. AHU Start / Stop Command.
b. AHU Run Status Monitoring.
c. AHU Auto / Manual/Bypass Status Monitoring.
d. AHU Trip Status Monitoring.
e. Filter Status Monitoring.
f. Supply Air Temperature Monitoring.
g. Return Air Temperature Monitoring.
h. 2 Way Modulating CHW Valve control.
i. 2 Way Modulating CHW Valve Feedback monitoring.
j. VFD Speed Command & Feedback monitoring
k. DUCT PRESSURE TRANSMITER

3. The required I/O summary for all **FCU's/Terrace Fume Hoods/Pressurization units/ Toilet Exhaust System** control and monitoring with all the required sensors, equipment and accessories.

a. FAN Start / Stop Command.
b. FAN Run Status Monitoring.
c. FAN Auto / Manual/Bypass Status Monitoring.
d. FAN Trip Status Monitoring.

4. The required I/O summary for all **Radiant Cooling System (RCS) pumps** switch controller and status module control and monitoring with all the required sensors, equipment and accessories.

a. Pump Start / Stop Command.
b. Pump Run Status Monitoring.
c. Pump Auto / Manual/Bypass Status Monitoring.
d. Pump Trip Status Monitoring.

5. The required I/O summary for all **COOLING TOWER FANS STATUS MONITORING SYSTEM of AC Plant-1** control and monitoring with all the required sensors, equipment and accessories.

a. Pump Start / Stop Command.
b. Pump Run Status Monitoring.
c. Pump Auto / Manual/Bypass Status Monitoring.
d. Pump Trip Status Monitoring.

6. The scope of BMS system also consists of commissioning of existing VFDs of the AD4 circuit secondary pumps in AC Plant-1, includes Supply, Installation, Testing and Commissioning (SITC) of the differential pressure sensor/transmitter for effective control operation of the AD4 circuit secondary pumps i,e. motor speed regulates when increase or decrease in line pressure of AD4 circuit through VFD, based on the control/feedback from differential pressure sensor/transmitter. Which need to be installed at critical points in the existing piping system.

7. The required I/O summary for all **Secondary Pump of AD4 circuit in AC Plant-1** control and monitoring with all the required sensors, equipment and accessories.

a. Differential Pressure Transmitter
b. RS485 Port.
c. 0-10V Output to control VFD
d. Secondary Pump on Status
e. Secondary Pump Trip Status

8. SITC of the Smart Communication Manager Console with Gateway wireless inbuilt with Dual sim slot to communicates with all the modules collects the data and Transfers the data to the Server with all the required equipment, wiring and accessories.

    a. For AHU's/CSUs in AD4 Buildings & Old Dining hall : Quantity not less than 36 no's .
    b. For Energy Meters / Load Managers (not less than 10 points per Meter) in AD4 buildings and AC Plant-1 including Auxiliary panel: Quantity not less than 5 no's.
    c. For Breaker Status Monitoring in Electrical panels (not less than 8 Breakers per Panel) in AD4 buildings and AC Plant-1 including Auxiliary panel: Quantity not less than 7 no's.

9. SITC of portable UPS systems with all required mounting accessories for each Gateway not less than 650 VA for input power source.

10. Integration (soft with RS485/BACnet/Modbus) of Chiller Plant manager of AC Plant-1 to the new BMS of AD4 buildings.

11. All required cables for Power, communication and signal connections between the Module and the AHU/CSU/FCU or other devices and its panel along required PVC conduits/flexible as required and PVC cable trays as required to the controller/gateway system, with all required accessories, termination, dressing, etc.

12. The Cloud charges should be considered for 3 years for the BMS in all the AD4 building system, Old Dining hall system, AC Plant-1 system and should be applicable from date of handover for 3 Years.

13. SIM card charges for each Gateway (2 No's SIM Cards for each Gateway) for 12 months for all the Gateways installed for the BMS in all the AD4 building system, Old Dining hall system, AC Plant-1 system is included.

14. Integration (soft with RS485/BACnet/Modbus) of Chiller Plant manager of AC Plant-1 with all mounting accessories and enclosures.

15. The Cloud based software details to be submitted for Prior approval of Engineer-In- Charge before any procurement on site.

16. The Controllers (Smart Edge Control Devices) should have inbuilt ML and AI Algorithm for Delta T of chilled water Optimization. (**Definition:** The actual temperature difference (delta T) between the chilled water supply and return to be lower than the designed delta T for the chiller system. )

17. The design of the solution must provide Delta T Chilled water optimization algorithm for the control units considering supply and return air and chilled water input and output temperature on the low side to avoid coil overflow and low Delta T Syndrome to maximize energy savings.

18. The system should also use Dew point temperature as reference point -to control and maximize savings during high humidity conditions.

19. The system should be able to recognize and Avoid the following to reflect on significant energy saving:
    - Improper valve operation
    - Dirty coils in air handling units
    - Improper Chilled water temperature.
    - Oversized equipment, causing poor heat transfer at partial loads and adjust the system as per the load requirement.
    - Avoid Coil Over flow.
      All the above results in energy saving.
    - Increased energy usage due to excessive pump operation
    - Reduced chiller efficiency

20. The sensors should be CMOS type sensors to eliminate need for regular calibration.

**Technical Specifications for SMART WIRELESS SWITCH CONTROLLER**

- **Technology:** Microprocessor-Based Wireless Control System
- **Wireless Frequency:** 865-867 MHz
- **Encryption:** AES-128 bit key for secure communication
- **Communication Protocol:** Modbus
- **Wireless Cross Talk Protection:** Yes

**Electrical Specifications**

- **Power Supply:** Single Phase 230V AC ±10%, 50Hz
- **Power Consumption:** 2 Watts (Operating), 5 Watts (Maximum)
- **Real-Time Clock:** With battery backup
- **Memory:** Configuration storage capability

**Inputs & Outputs**

- **Digital Inputs:** 8 optically isolated digital inputs to read status
- **Digital Outputs:** 4 potential-free contacts for control
- **Relay Contact Ratings:** 250V AC, 5 Amps

**Wireless Communication**

- **Frequency:** 865-867 MHz
- **Output Power:** Not less than 20 dBm
- **Bandwidth:** 125 kHz
- **Antenna Gain:** 3 dBi
- **Wireless Range:** Indoor: 300 meters**,** Outdoor: 1000 meters

**Data & Alerts**

- **Data Encryption:** AES-128 bit key for integrity & security
- **Data Upload Time:** Programmable from 10 min to 20 min
- **Live Data Upload Time:** Programmable from 1 min to 3 min
- **Alerts:** Trip alerts

**Mechanical & Environmental Specifications**

- **Operating Temperature:** -20°C to +85°C
- **Enclosure:** Metal Powder Coated / Plastic

**Specifications for SMART WIRELESS HVAC CONTROLLER**

- **Power Supply**: 230 V AC ±10%, 50 Hz
- **Operating Temperature**: -40°C to 85°C
- **Power Consumption**: Average ≤5 W, peak 10 W
- **Enclosure Rating**: IP51
- **Installation**: Wall mount

**Hardware**

- **Microcontroller**: Intel Microcontroller with 3 MB Flash and 512 kB RAM, FPU
- **Serial Port**: 1 fully isolated RS485 interface
- **Analog Outputs**: 2 optically isolated (0-10 V DC / 2-10 V DC / 4-20 mA / 0-20 mA)
- **Digital Outputs**: 2 potential-free contacts
- **Analog Inputs**: 7 optically isolated
- **Digital Inputs**: 4 optically isolated

**Sensor Specifications**

- **Temperature**:
  - **Resolution**: 0.1°C
  - **Accuracy:** ±0.2°C
  - **Range**: -20°C to +125°C
  - **Type**: CMO Sense

- **Pressure**:
  - Resolution: 1 Pa
  - Accuracy: ±1 Pa
  - Range: 0-500 Pa
  - Type: MEMS Thermal

**Communication:**

**Wireless**:

- Frequency: 865-867 MHz, Power: 29 dBm
- Antenna: 3 dBi Gain
- Range: Indoor 300 m, Outdoor 1000 m
- Bandwidth: 125 kHz
- Co-channel interference mitigation

**Wired**:

- RS485:
  - Fully isolated with three levels of protection.
  - 4KV protection per GB/T 17626.5-2008 standard.
  - Communication parameters: 9600, 8-1-N.
- I2C
- SPI
- 1-Wire Communication

**Specifications for GATEWAY**

- **Power Supply**: 230 V AC ±10%, 50 Hz
- **Operating Temperature**: -40°C to 85°C (90% Condensating)

- **Power Consumption**: Average 2 W
- Enclosure Rating: IP51
- Installation: Wall mount
- Microcontroller: Intel Microcontroller with 3 MB Flash and 512 kB RAM, FPU
- 4G Module
- LAN/BACNET Port (optional)

**Communication:**

**Wireless:**
- Frequency: 865-867 MHz, Power: 29 dBm
- Antenna: 3 dBi Gain
- Range: Indoor 300 m, Outdoor 1000 m
- Bandwidth: 125 kHz
- Co-channel interference mitigation
- Data Encryption: Wireless AES-128 bit key
- GPRS (General Packet Radio Service) communication for internet connectivity with
- dual service provider.
- Protocol: TCP/UDP/PPP/NITZ/PING/FILE/MQTT/NTP/HTTP/HTTPS/SSL/FTP/FTPS/
- CMUX/MMS
- Bandwidth: 1.4/3/5/10/15/20 MHz
- Antenna: 2 dBi Gain
- Data Encryption: GEA-3 and KASUMI

**Wired Communication**:
- RS485:
  - Fully isolated with three levels of protection.
  - 4KV protection per GB/T 17626.5-2008 standard.
  - Communication parameters: 9600, 8-1-N.
  - Protocol: Modbus

**<u>Specifications for WIRELESS FAN CONTROLLER</u>**

- **Wireless Communication**
- **Frequency**: 865-867 MHz
- **Transmission Power**: 29 dBm
- **Encryption**: AES-128 bit key for data integrity and protection
- **Bandwidth**: 125 kHz
- **Range**:
  - Indoor: 300 m
  - Outdoor: 1000 m

**Wired Communication**
- **Protocol**: RS-485 (Modbus, TCP/IP, DHCP supported)

**Processor**
- **Type**: Intel Microcontroller or equivalent

**Inputs & Outputs**
- **Inputs**: 4 digital inputs (optically isolated)
- **Outputs**: 2 digital outputs (potential-free contacts)

**Relays Contact Ratings**

- **Voltage**: 250 V AC
- **Current**: 5 Amps

**Programmable Parameters**

- **Cycle Time**: 15 sec to 3 min
- **Data Upload Time**: 10 min to 20 min
- **Live Data Upload Time**: 1 min to 3 min

**Power Supply**

- **Input Voltage**: Single-phase 230 V AC ±10%, 50 Hz

- **Power Consumption**:
  - Continuous: 2 Watts
  - Burst (3 seconds): 3 Watts

**Operating Conditions**

- **Temperature**: -20 °C to +85 °C (90% Condensation)

**Enclosure**

- **Material**: Metal powder-coated or plastic
- **Antenna Gain**: 3 dBi

**Alerts**

- Status, Feedback, and Trip

**Real-Time Clock**: Battery backup included
**Co-Channel Interference**: Mitigation enabled

**Specifications for SMART WIRELESS CHILLER PLANT SECONDARY PUMP CONTROL AND MONITORING**

1. **Wireless Communication**:
   - Frequency Range: 865-867 MHz
   - Encryption: AES-128 bit key for data integrity and protection
   - Transmission Power: Not less than 20 dBm
   - Range: Indoor: 300 meters, Outdoor: 1000 meters
   - Bandwidth: 125 kHz
   - Co-channel interference mitigation
2. **Wired Communication**:
   - Interface: RS-485
   - Protocol: Modbus, TCP/IP, DHCP
3. **Inputs and Outputs**:

- **Inputs**:
  - 1 Analog input
  - 4 Digital inputs (optically isolated)
  - Differential Pressure Transmitter (0-200 Psi)
- **Outputs**:
  - 2 Analog outputs (0-10 V DC/2-10 V DC/4-20 mA/0-20 mA)
  - 2 Digital outputs (potential-free contacts)

4. **Control Capabilities**:
   - VFD Modulation and On/Off Control
   - VFD Control Algorithm: Modulation based on pressure
5. **Real-Time Data Handling**:
   - Cycle Time: Programmable from 15 seconds to 3 minutes
   - Data Upload Time: Programmable from 10 minutes to 20 minutes
   - Live Data Upload Time: Programmable from 1 minute to 3 minutes
   - Trip alerts

6. **Power Specifications**:
   - Supply Voltage: Single Phase 230 V AC ±10%, 50 Hz
   - Power Consumption: 2 Watts (5 Watts for the entire system)
   - Battery Backup: For real-time clock
7. **Expandability**:
   - Expandable up to 20 sub-modules

**Environmental Specifications**

- **Operating Temperature**: -20 °C to +85 °C
- **Storage Temperature**: -20 °C to +125 °C
- **Enclosure**: Metal Powder Coated/Plastic
- **Antenna**: 3 dBi Gain

**Performance Parameters:**

1. **Resolution**:
   - Temperature: 0.1 °C
   - Pressure: 1 Psi
2. **Accuracy**:
   - Temperature: ±0.2 °C
   - Pressure: ±1 Psi
3. **Range**:

- Temperature: -20 °C to +125 °C
- Pressure: 0-200 Psi

**Relay Specifications**

- Contact Ratings: 250 V AC, 5 Amps

**Sensors**

1. **Temperature**:
   - Type: 2 Nos, CMO Sense Type
2. **Pressure**:
   - Type: 1 No, MEMS Thermal Type

**<u>Specifications for Cloud-Based Server Software</u>**

1. **Centralized Remote Operation and Control:**

- Interactive dashboard for centralized monitoring and control of Energy and Utilities like Air Handling Units (AHUs), Pumps, Fans, HVAC Equipment, Chillers, Exhaust Fans, VFDs, IAQ Etc.
- Built-in, user-friendly Graphical User Interfaces (GUIs) for easy operation.
- Data analytics and reporting capabilities.

2. **Interactive Dashboard:**

- Real-time display for monitoring and controlling Utilities.
- Centralized access to system data, alarms, and configurations.
- Intuitive navigation for acquired data with real-time graphs.

3. **Reports Generation:**

- Real-time logging and recording of system activities.
- Advanced analytics displayed directly on the dashboard.
- E-records can be exported to portable file formats for documentation and
- compliance.

4. **Remote Set-point Configuration:**

- Set-point functionality for temperature and differential pressure.
- Configurations can be applied to individual areas via the dashboard.

5. **Real-Time Monitoring and Alarms:**

- Hardware modules (controllers) integrated with the software for:
  - Real-time monitoring.
  - Scheduling.
  - Alarm handling.
  - Point trending and adjustments.
- Alarm notifications for AHU OFF/TRIP conditions.

6. **Audit Trail:**

- Detailed logs including:
  - Username.
  - Date and time.
  - Terminal ID.
  - User actions and reasons.

  Records alarm acknowledgments, log-ins, log-outs, and point adjustments.

7. **Sampling Frequency:**

- Configurable data sampling and logging frequencies, starting from 10 minutes and above.

8. **System Scheduling:**
   - Scheduling capabilities for operations such as night setbacks and morning warm-ups.

9. **Security and Access Control:**
   - Data and operator access secured via User ID and Password.
   - Configurable, level-based access privileges.
   - Automatic log-off after a pre-set inactivity period.

10. **Viewing and Printing:**
    - Supports viewing and printing of all relevant e-records.
    - Provides options to export data to portable file formats.

11. **Data Archiving**
12. **Security Mechanisms:**
    - Prevents unauthorized access and ensures data integrity.
13. **Login Connectivity:**
    - Accessible from anywhere with an internet connection using valid credentials.

**<u>System Specifications</u>:**

**Interactive Dashboard:**

- Easy navigation and graphical data representation.

**Real-Time Data Monitoring:**

- Online graphs and live data display.

**Alarm Handling:**

- Configurable alarm settings and immediate notifications.

**Idle Safe Dashboard:**

- Adjustable inactivity timer to enhance security.

## List of Approved Makes

| S.No. | Equipment/Item | Approved Makes |
|---|---|---|
| 1. | Wireless Gateway | Protech/Wenalytics/Macnman or Approved Equivalent |
| 2. | Smart HVAC Controller | Protech/Wenalytics/Macnman or Approved Equivalent |
| 3. | Smart FAN Controller | Protech/Wenalytics/Macnman or Approved Equivalent |
| 4. | Module for Chiller | Protech/Wenalytics/Macnman or Approved Equivalent |
| 5. | Cables for Power, communication and signal connections | Belden /Polycab/ Panduit/Finolex or Approved Equivalent |
| 6. | PVC Cable Tray | Phoenix/ Maruthi/Legrand/Bina or Approved Equivalent |
| 7. | Smart RCS PUMP switch controller | Protech/Wenalytics/Macnman or Approved Equivalent |
| 8. | Differential Pressure Transmitter | Protech/Wenalytics/Macnman or Approved Equivalent |
| 9. | UPS | APC/Vertiv/Socomec/Legrand or Approved Equivalent |
| 10. | Workstation/Client PC/LED Monitor | HP/Dell/Lenovo or Approved Equivalent |
| 11. | PVC Glands | Comet/Dowells/Jainsons/HMI or Approved Equivalent |
| 12. | PVC conduit | Polycab/Precision/BEC Plast or Approved Equivalent |

**Note:** ***Any other item if not specified in the NIT then the same has to be got approved from the Engineer- in-Charge (EIC) before any procurement on site. The contractor shall also take prior TDS and sample approval from the Engineer-in-Charge before any procurement of material at site.***

# Annexures

## Annexure-I

### On non-judicial stamp paper of minimum Rs. 100

**Guarantee offered by Bank to IITH in connection with the execution of contracts) Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance/ Refund of milestone with held amount**

1. Whereas the Executive Engineer …… (name of division)…… , IITH on behalf of the President of India (hereinafter called "The Government") has invited bids under (NIT number)…….. dated …… for …… (name of work)…… The Government has further agreed to accept irrevocable Bank Guarantee for Rs. …….. (Rupees …… only) valid up to …… (date)*…as Earnest Money Deposit from …….. (Name and address of contractor) (hereinafter called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the saidNIT.

   OR**

   Whereas the Executive Engineer …….. (name of division)…… , IITH on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number…….. with ……..(name and address of the contractor)……(hereinafter called "the Contractor") for execution of work …… (name of work) …….. The Government has further agreed to accept an irrevocable BankGuarantee for Rs. …….. (Rupees …… only) valid upto …….. (date)…… as Performance Guarantee/Security Deposit/Mobilization Advance/Refund of mile stone withheld amount from the said Contractor for compliance of his obligations in accordance with the terms and conditions ofthe agreement.

2. We, ……. (indicate the name of the bank)…… (herein after referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees……..only) on demand by the Government within 10 days of the demand.

3. We, ……(indicate the name of the Bank)……, do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating thatthe amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any suchdemand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. ……..(Rupees only).

4. We, …… (indicate the name of the Bank)…… , further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending On non-judicial stamp paper of minimum Rs. 100 before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have noclaim against us for making such payment.

5. We, …… (indicate the name of the Bank)……, further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to varyany of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the

powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension beinggranted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, …… (indicate the name of the Bank)…… , further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. We, …….. (indicate the name of the Bank)…… , undertake not to revoke this guarantee except with the consent of the Government in writing.
9. This Bank Guarantee shall be valid up to…… unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs…….. (Rupees…… only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date .....

Witnesses:

1. Signature…… Authorized signatory
   Name and address
   Name
   Designation Staff code no.
2. Signature …….. Bank seal
   Name and address

* Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance/Refund of mile stone withheld amount, as the case may be.

**ANNEXURE-II**

**INDEMNITY BOND (VIOLATION OF LAWS, NORMS, ACCIDENTS, DAMAGES ETC)**
**(On Non-Judicial Stamp Paper of Rs.100/-only)**

**Name of work:**

KNOW all men by these presents that I/We _____ (Name of Contractor with address) do hereby execute Indemnity Bond in favour of Indian Institute of Technology (IIT) Hyderabad having their office at Kandi, Sangareddy-502284, Telangana, India and for the project …….. IIT Hyderabad under consideration.

On this day of ……..2025

THIS DEED WITNESSETH AS FOLLOWS:

I/We, (Name of Contractor) hereby do indemnify and save harmless IITH having their office at Kandi-502284, Sangareddy, Telangana, India from the following: -

1. Any third party claims, civil or criminal complaints/liabilities/material/life loss during site mishaps and other accidents such as snake bites etc or disputes and/or damages occurring or arising out of any mishaps at the site due to faulty work, negligence, faulty construction and/or for violating any law, rules and regulations in force, for the time being while executing/executed civil works by me/us.

2. Any damages, loss or expenses due to or resulting from any negligence or breach of duty on the part of me/us or any sub-Contractor/s if any, servants or agents.

3. Any claims by an employee of mine/ours or of sub-Contractors if any, under the workman compensation act and employers' Liability act, 1939 or any other law rules and regulations in force for the time being and any acts replacing and/or amending the same or any of the same as may be in force at the time and under any law in respect of injuries to persons or property arising out of and in the course of execution of the Contract work and/or arising out of and in the course of employment of any workman/employee.

4. Any act or omission of mine/ours or sub-Contractor/s if any, our/their servants or agent which may involve any loss, damage, liability, civil or criminal action.

IN WITNESS WHEREOF THE HAS SET HIS/THEIR HANDS ON THIS DAY OF SIGNED AND DELIVERED BY THE AFORESAID IN THE PRESENCE OF WITNESSES:

1.
2.

**ANNEXURE-III**

**Proforma for Authorization certificate from Approved OEM**

REF.No._____ Dated _____

To,
The Executive Engineer-Electrical,
Indian Institute of Technology (IIT) Hyderabad
Kandi-502284, Sangareddy, Telangana, India

Dear Sir,

We _____ who are established and reputable manufacturers/Technology Providers of _____having factory/ factories at_____ (*address of factory)* do hereby authorize M/s _____ *(Name and address of bidder)* to submit a bid, negotiate and receive the order from you against your Tender enquiry no. IITH/CMD/ELE/NIT/2024-25/XX.

Name of work:

We ensure that we shall support/ facilitate the M/s _____on regular basis with technology/product updates for up-gradation / maintenance/repairing/servicing of the BMS at IIT Hyderabad (if awarded) as per the terms and conditions mentioned in this tender document on direct payment basis from the successful bidder.

We hereby extend our full guarantee for the services offered by the above firm.

Yours faithfully,

(Name of Authorised signatory with signature)

(Name of manufacturer with stamp)

**Note:** This letter of authority should be on the **letter-head of the OEM** and should be signed by an authorised person. It should be enclosed by the Bidder with the tender documents.

**ANNEXURE-IV**

**FORM OF BANKERS' CERTIFICATE" FROM A SCHEDULED BANK**

To
The Executive Engineer -Electrical,
Construction and Maintenance Division,
IIT Hyderabad.

This is to certify that to the best of our knowledge and information that Ms./Shri…… ……. 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 with seal of Branch Manager)

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For the Bank NOTE: (1) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

2. The bankers certificate should be on letter head of the bank

**ANNEXURE-V**

**FORM FOR CERTIFICATE OF NET WORTH FROM CHARTERED ACCOUNTANT**

It is to certify that as per the audited balance sheet and profit & loss account during the **financial year 2023-24** the Net Worth of M/s _____( Name & Registered Address of contractor/ Individual/firm/company), as on _____(the relevant date) is Rs._____after considering all liabilities. It is further certified that the Networth of the company has not eroded by more than 30% in the last three years ending on **31st March 2024.**

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No. of ICAI

Date and Seal