IIMU
भारतीय प्रबंध संस्थान उदयपुर
Indian Institute of Management Udaipur

INDIAN INSTITUTE OF MANAGEMENT UDAIPUR
(An Autonomous Institute under the Ministry of Education, Govt. of India)

TENDER DOCUMENT
FOR
Name of Work:- Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)

Tender No. :IIMU/Tender/350TR-Chiller/2024-25 Dated: 15.10.2024

Estate Officer,
Indian Institute of Management Udaipur
Balicha, Udaipur-313001, Rajasthan
Website: www.iimu.ac.in

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Name of Work: Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)

Notice Inviting Tender (NIT)

Name of Work:- Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)

Indian Institute of Management Udaipur (hereinafter referred to as "Institute" or "IIMU") is an Autonomous Institute under the Ministry of Education (MoE), Government of India. IIM Udaipur is recognized as a premier management institution in the country.

Indian Institute of Management Udaipur invites E-tender (online tender) from approved and eligible contractors, under two part bidding System [Technical Bid & Financial Bid] from enlisted agencies having valid registration with CPWD/Indian Railways/MES/State PWDs/Private Corporate Bodies/PSUs in appropriate class Electrical & Mechanical (E &M)Category on last date of submission of bids for the application of material/compound as specialized item mentioned in tender documents. The bidders should have expertise experience in the similar field for undertaking works related to " **Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)**

Bidders must read the complete 'Tender Documents: This NIT is an integral part of the Tender Document and serves a limited purpose of invitation and does not purport to contain all relevant details for submission of bids. The Bidders must go through the complete Tender Document for details before submission of their Bids.

'The Bidders shall sign and stamp each page of this tender document as a token of having read, understood, and comply with tender, the terms, and conditions contained herein. Manual bid/tender will not be accepted under any circumstances. Incomplete bids/ documents shall be rejected without giving any reason.

Availability of the Tender Document -This tender document containing eligibility criteria, the scope of work, terms and conditions, specifications, and other documents, can be downloaded at/from the Central Public Procurement (CPP) Portal https://eprocure.gov.in/cppp/ or Indian Institute of Management Udaipur website: www.iimu.ac.in .

Clarifications – A Bidder requiring any clarification regarding the Tender Document may ask questions in writing/ electronically from the Office/ Contact Person as mentioned in TIS, provided the questions are raised before the clarification end date mentioned in TIS. This deadline shall not be extended.

Submission of Bids, EMD: - Bids shall be submitted through online mode under the e-procurement system. **No manual Bids shall be made available or accepted for submission**. The bidders have to apply online through E-Procurement portal https://eprocure.gov.in/cppp/ only. **"The original EMD is to be submitted in a sealed envelope to be superscribed this tender name & the name of their agency and must reach the below address before the last date & time for submission of the bid."**

The Chief of Administration
IIM Udaipur,
Balicha, Udaipur-313001,Rajasthan

Check List – List of documents for uploading on the website

Name of work: Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)

The bidder shall upload the following documents **as ticked** of the same mentioning the page no. against each document as required in the NIT.

Sl. No	Particular	Document required as per NIT	Attached as page No.
1	Copy of proof for deposition of EMD in the form of Account payee Demand Draft/ Banker's Cheque/ Fixed Deposit Receipt/ Surety Bond/Pay Order/Bank Guarantee (as prescribed) of any Commercial bank in favor of "Director, Indian Institute of Management, Udaipur, Rajasthan" payable at Udaipur, Rajasthan valid for 6 months.	√	
2	Copy of valid registration certificate of appropriate class as per NIT (Form-6)	√	
3	Integrity agreement	√	
4	Letter of Transmittal	√	
5	Certificate of financial turnover from CA (**Form A**) along with audited balance sheets.	√	
6	Certificate of Net Worth from CA (**Form B1**)	√	
7	Details of all works of similar nature of work, completed during the last seven years (ending upto previous day of last date of submission of online tender) – **Form C**	√	
8	Certificate of completed works duly certified by officer not below the rank of Executive Engineer-Performance report of works referred in Form C-(**Form-D**)	√	
9	Structure & Organization (**Form E**)	√	
10	Site Visit: The bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.	√	
	Note: **Undertaking regarding visit of site of work** to be scanned and uploaded at the time of submission of bid (Form-G).		

11	Self-certified copy of **declaration regarding local contents for preference make in India** on the letter head of the company. (Refer notification ref. no. P- 45021/2/2017-PP (BE-II), dated 4th June 2020 for "Provision of Public Procurement (Preference to Make in India), Order 2017-Revision regarding" notification issued from the Ministry of Commerce and Industry, Institute for promotion of industry and internal Trade (Public Procurement Section), Govt. of India. – (Form H)	√	
12	Undertaking for GST registration Certificate of the State i.e. other than (Rajasthan) (Form I).	√	
13	The agency should not have been blacklisted or banned by any Govt. Institute, Government Organization, PSU, University, Autonomous Institute etc. A notarized certificate duly notarized worth **Rs.500/- on Non-Judicial Stamp Paper** to this fact should be executed. (Form J)	√	
14	Authority for signing the tender document duly notarized to this fact should be executed. **(Form K)**	√	
15.	**To become eligible to bid, the bidders shall have to furnish an affidavit on non-judicial stamp paper worth Rs.500/- as under:** I/We undertake and confirm that eligible similar works(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 Institute, then I/we shall be debarred for bidding in IIM Udaipur in future forever. Also, if such a violation comes to the notice of the Institute before date of start of work, the Estate Officer shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid). **(Form L)**	√	
16	Certificate of registration of **GST**.	√	
17	Certificate of registration of **EPF**. (If not available, an undertaking shall be submitted in prescribed proforma "form -M")	√	
18	Certificate of registration of **ESIC**. (If not available, an undertaking shall be submitted in prescribed proforma "form -N")	√	
19	Copy of **PAN**.	√	
20	Electrical license issued from Electrical Inspectorate in the name of agency or in the name of associating agency.	√	
21	Any other document	√	

INFORMATION AND INSTRUCTIONS TO CONTRACTORS FOR e-TENDERING FORMING PART OF NIT AND TO BE POSTED ON THE WEBSITE

The Director, IIM Udaipur invites **online** percentage rate bid from contractors enlisted in CPWD/Indian Railways/MES/State PWDs/Private Corporate Bodies/PSUs in appropriate class in the Building & Road Category in **two** bid system for the following work:

Sl. No.	Description	Details
1.	NIT No.	IIMU/Tender/350TR-Chiller/2024-25 Dated: 15.10.2024
2.	Name of work & Location	Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)
3.	Estimated cost put to tender	**Rs 1,83,90,444/-** (Rupees One Crore Eighty Three Lacs Ninety Thousand Four Hundred Forty Four only)
4.	Earnest Money	**Rs. 3,67,809/-** should be in the form of Account payee Demand Draft/ Banker's Cheque/ Fixed Deposit Receipt/ Surety Bond/Pay Order/Bank Guarantee (as prescribed) of any Commercial bank in favor of "Director, Indian Institute of Management, Udaipur, Rajasthan" payable at Udaipur, Rajasthan valid for 6 months. **(Being a work contract, no exemption is allowed to any MSME / NSIC registered bidders)**
5.	Tender fee	**Rs.1,500/-** (Non-Refundable) should be in the form of Account payee Demand Draft in favor of "Director, Indian Institute of Management, Udaipur, Rajasthan" payable at Udaipur, Rajasthan valid for 3 months.
1	Period of Completion	150 Days
7.	Date of Pre-bid meeting in Hybrid mode. (This will be held in the Office of Conference Room, 5th Floor, Administrative Building, IIM Udaipur).	24.10.2024

8.	Last date & time of online submission ofbid.	06 Nov 2024 by 1000 hrs
9.	Date & time of online opening ofdocuments (Technical bid)	The eligibility cum technical bid shall be opened first at **06 Nov 2024 at 1100hrs** The Financial bid shall be opened of those tenderers only, who qualify in the eligibility of technical bid. If any change in the the opening of the financial bid arises the timeand date of opening of the financial bid of the eligible tenderer shall be communicated on later date through a notice uploaded on CPP portal in advance of opening of price bid(s). **The institute shall not accept any loss or delay in transit as an excuse for late tendering.**
10.	Help Desk	**Phone – 02942477254** **Email - procurement@iimu.ac.in**

FORM-6

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR e-TENDERING FORMING PART OF BID DOCUMENT AND TO BE POSTED ON WEBSITE
(APPLICABLE FOR INVITING BIDS ON TWO BID SYSTEM)

The Director, IIM Udaipur invites **online** percentage rate bid from contractors enlisted in CPWD/Indian Railways/MES/State PWDs/Private Corporate Bodies/PSUs in appropriate class in the E&M Category in **two** bid system for the following work:

S. No	NIT No	Name of work & Location	Estimated cost put to bid (Rs.)	Earnest Money (Rs.)	Stipulated Period of Completion of work	Last date of online submission of bid, **copy of receipt of deposition of original EMD** and other documents as specified in the bid document.	Time & Date of opening of Technical Bid
1	2	3	4	5	6	7	8
1	IIMU/Tender/350TR-Chiller/2024-25 Dated: 15.10.2024	Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC	Rs. 1,83,90,444/-	Rs. 3,67,809/-	150 days	06 Nov 2024 by 1000 hrs	06 Nov 2024 at 1100 hrs

1.0 GENERAL INSTRUCTIONS:

1.1 For Bidding / Tender Document Purposes, 'Office of the Director, Indian Institute of Management,Udaipur, Rajasthan referred to as 'Client' and the Bidder / Successful Bidder shall be referred to as 'Agency/ Contractor' and / or Bidder interchangeably.

1.2 The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates.

1.3 While all efforts have been made to avoid errors in the drafting of the tender documents, the Bidder is advised to check the same carefully. No claim on account of any errors detected in the tender documents shall be entertained.

1.4 **Each page of the Tender documents must be stamped and signed by the person or persons authorized to submit the Tender in token of his/their having acquainted himself/ themselves and accepted the entire tender documents including various conditions of contract. Any bid with any of the Documents not so signed is liable to be rejected at the discretion of the client.**

1.5 All Bidders are hereby explicitly informed that conditional offers or offers with deviations from the conditions of Contract, the bids not meeting the minimum eligibility criteria, technical bids not accompanied with EMD of requisite amount/format, or any other requirements, stipulated in the tender documents, are liable to be rejected.

1.6 The parties to the Bid shall be referred to as the 'Bidders' /Agency (to whom the work has been awarded) and 'Office of the Director, Indian Institute of Management,Udaipur, Rajasthan' shall be referred to as 'Client'.

1.7 For all purposes of the contract including arbitration there under, the address of the Bidder mentioned in the bid shall be final unless the Bidder notifies a change of address by a separate letter sent by registered post with acknowledgement to the 'Office of the Director, Indian Institute of Management,Udaipur, Rajasthan. The Bidder shall be solely responsible for the consequences of any omission or error to notify change of address in the aforesaid manner.

1.8 **Bidders are advised to visit personally the worksite/place i.e. Indian Institute of Management Udaipur, village Balicha, Udaipur, Rajasthan 313001 to acquaint themselves with site conditions.**

1.9 The requirement/execution of the work is indicative as mentioned in Schedule of Quantity and may deviate or change at the sole discretion of the client upto the permissible deviation limit.

1.10 **Pre- Bid Meeting**:-The purpose of the pre-bid meeting will be to clarify issues and to answer questions on any matter concerning bids that may be raised at that stage or for any clarification in connection with the bid documents. The

bidder may submit any queries in writing or by e-mail, to reach the Estate Officer before such meeting. Proceeding of the pre-bid meeting, including copies of the queries raised and responses given, will be furnished expeditiously to all those attending the meeting (and subsequently to all purchasers of the bidding documents). Any modification of the biding documents which may become necessary as a result of the pre-bid meeting or otherwise shall be made by the Estate Officer through the issuance of an Addendum (or Amendment) to the bid documents and shall form part of the resultant contract.

2. **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-colored (unprotected) cells with their respective financial quotes and other details (such as the 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.**
3. 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.
4. 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.
5. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
6. 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.
7. The bid summary has to be printed and kept as an acknowledgment of the submission of the bid. This acknowledgment may be used as an entry pass for any bid opening meetings.
8. 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.

9. 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.

10. The Agencies are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The **TIA will** not be held responsible for any sort of delay or the difficulties faced during the submission of bid online by the Agencies at the eleventh hour.

11. Not more than one tender shall be submitted by one Agency or Agencies having a business relationship. Under no circumstance will the father and his son(s) or other close relations who have a business relationship with one another (i.e. when one or more partner(s)/director(s) are common) be allowed to tender for the same contract as separate competitors. A breach of this condition will render the tenders of both parties liable to rejection.

12. Bidder who has downloaded the tender from the IIMU website www.iimu.ac.in and Central Public Procurement Portal (CPPP) website https://eprocure.gov.in/eprocure/app **shall not alter/modify the tender form including downloaded price bid template in any manner**. In case if the same is found to be altered/ modified in any manner, tender will be completely rejected and EMD would be forfeited, and Bidder is liable to be banned from doing business with IIMU.

Eligibility Criteria:-

1. Contractors who fulfill the following requirements shall be eligible to apply. **Joint ventures are not accepted.**

(i) Enlisted contractor of appropriate class in the appropriate category.

i. Valid registration certificate of the appropriate class.
ii. EMD of Rs.3,67,809.00 only.
iii. Form:- E to L, Copy of PAN CARD / EPF / ESIC, etc.

(ii) Contractors who have satisfactorily completed the works as mentioned below during the last seven years ending the previous day of the last date of submission of bids.

i) Three similar works of the value not less than 40 % each i.e. Rs. 73,56,178/-.

or

ii) Two similar works of the value not less than 60 % each i.e. Rs. 1,10,34,266/-

or

iii) One similar works of the value of not less than 80% each i.e. Rs. 1,47,12,355/-

Similar work shall means "Supply, Installation, Testing & commissioning of HVAC work which includes SITC of Chilled Water Plant System and Chiller".

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

(c) The bidder should have had an average financial turnover (gross) of at least 50% of the estimated cost, during the immediate last three consecutive years ending **31.03.2024**. Balance sheet duly audited by Chartered Accountant (Scanned copy of certificate from CA/Audited Balance Sheet to be uploaded). The year in which no turnover is shown would also be considered for working out the average. The multiplication factor of 7% per annum simple interest is not applicable on the Annual Turnover figures.

(d) Should not have **incurred any loss (Profit after tax should be positive)** in more than two years during the last five consecutive years ending **31st March 2024, duly audited and Certified by Chartered Accountant.**

(e) Should have **Net worth Certificate** (Form-B) from **Chartered**

Accountant with UDIN
(Scanned copy of original be uploaded).

A part of earnest money is acceptable in the form of Bank Guarantee also. In such case 50% of earnest money or Rs.20.00 Lakh whichever is less, will have to be deposited in shape prescribed above and balance can be accepted in form Bank Guarantee issued by a Commercial Bank having validity for Six months or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The Earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two / three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. shall be returned within 30 days of declaration of result of technical bid evaluation.

Copy of certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission.

Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD is deposited in IIM Udaipur and other documents scanned and uploaded are found in order.

(f) **Should have Electrical license issued from Electrical Inspectorate in the name of agency or in the name of associating agency.**

2. The intending bidder must read the terms and conditions of **Form-6** carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
3. Information and Instructions for bidders posted on the website shall form part of bid document.
4. Every page of the documents submitted by the applicant / firm shall be numbered & bear the stamped and full signature of the legally authorized person of the firm. Authority letters duly notarised are to be submitted along with tender documents.
5. Labour Cess, GST-TDS, etc. or any other taxes as may be applicable shall be borne by the contractor. The tenderer shall quote the percentage rate considering all such taxes and nothing extra shall be paid.
6. The contractor has to submit the GST compliant R.A. & Final Bills showing the work done and the GST component separately. All the invoices must have the same GSTIN as submitted alongwith the bid or updated GSTIN as submitted alongwith 1st R.A. bill.

7. All the statutory recoveries shall be made from the running bills of the contractor like Security deposit, TDS on Income tax, TDS on GST, and Labour welfare cess etc. or any other statutory recovery as per Government of India norms at the prevailing rates and in the manner prescribed by Government of India.

8. The bid document consisting of plans, specifications, 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.iimu.ac.in/tender and https://eprocure.gov.in/eprocure/app

9. The intending bidder must have a valid class digital signature certificate with encryption key (combo type) to perform any operations / transactions on the e-tendering portal / website.

10. On the opening date, the contractor can login and see the bid opening process. After opening ofbids, he will receive the competitor's bid sheets.

11. Contractors can upload documents in the form of **JPG** format and **PDF** format.

12. The contractor must ensure to quote %age above/below/at par on the estimated cost.

13. The technical bid will be opened first on the due date and time as mentioned above. The Financial bid shall be opened of those tenderers only, who qualify in the eligibility of technical bid. If any change in the opening of financial bid arises the time and date of opening of financial bid of the eligible tenderer shall be communicated on later date through a notice uploaded on CPP portal in advance of opening of price bid(s).

14. The contractor whose bid is accepted will be required to furnish a performance guarantee at a specified percentage of the tendered amount as mentioned in **Schedule E** and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks 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. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC, and BOCW

Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work within the period specified in Schedule F.

15. When bids are invited in a two/three stage system and if it is desired to submit a revised financial bid then it shall be mandatory to submit a revised financial bid. If not submitted, then the bid submitted earlier shall be treated as the final bid.

16. The institute reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
    Applicants are advised to keep visiting the 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 respects including updates thereof, if any. An incomplete application may be liable for rejection.

17. Information and instructions for bidders posted on the website shall form part of the bid document. List of documents to be filled by the contractor in various forms as mentioned below, to be scanned and uploaded within the period of bid submission.

18. **List of Documents to be scanned and uploaded within the period of bid submission:**

    i) Valid Registration Certificate- Contractor enlisted in CPWD/Indian Railways/MES/State PWDs/Private Corporate Bodies/PSUs in appropriate class in the Electrical & Mechanical (E &M) Category.
    ii) Copy of proof for deposition of EMD
    iii) Integrity agreement.
    iv) **Letter** of Transmittal
    v) Structure & Organization - **Form 'E'**
    vi) **Site Visit**: The bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.

    Note: Undertaking regarding visit of site of work to be scanned and uploaded at the time of submission of bid (**Form-G)**

    vii) Self-certified copy of **declaration regarding local contents for preference make in India** on the letter head of the company. (Refer notification (**Form H**)

viii) Undertaking for GST registration Certificate of the State i.e. other than (Rajasthan) (**Form I)**.

GST Registration Certificate, if already obtained by the bidder.
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 undertaking along with other bid documents. **"If the work is awarded to me / us, 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 the institute, 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 the institute or GST institute in this regard".**
Applicable only for the bidders who intend to operate an office in Rajasthan and where the value of local supply (material/services procured within Rajasthan) is Rs.20.00 lakh or more.

ix) The agency should not have been blacklisted or banned by any Govt. Institute, Government Organization, PSU, University, Autonomous Institute etc. A notarized certificate duly notarized worth **Rs.500/- on Non-Judicial Stamp Paper** to this fact should be executed. **(Form J)**

x) Authority for signing the tender document duly notarized to this fact should be executed.
(Form K)

xi) Certificate of registration of **GST**.

xii) Certificate of Registration for **EPF** (irrespective of employee strength) ,If not available, an undertaking shall be submitted in prescribed proforma "form -M"

xiii) Certificate of Registration for **ESIC** (irrespective of employee strength)), If not available, an undertaking shall be submitted in prescribed proforma "form -N"

xiv) Copy of **PAN** Card issued by Income Tax Institute.

xv) **Electrical license issued from Electrical Inspectorate in the name of agency or in the name of associating agency.**

xvi) Any other document as specified in the NIT/bid document.

xvii) If any information furnished by the bidder is found incorrect at a later stage, he/they shall be liable to be debarred from bidding/taking up works in IIM Udaipur. The institute reserves the right to verify the particulars furnished by the bidder independently.

19. Net worth Certificate as per **Form 'B'**

20. List of eligible similar nature of work completed during the last seven years ending previous day of last date of submission of bid -**Form 'C'**

(i) If private works are shown in support of eligibility, certified copy of the tax deducted at source certificate (TDS), G.S.T. deposited in the State where the work is executed, shall be submitted along with the experience certificate and the T.D.S. amount shall tally with the actual amount of work done). **However, work will only be awarded after inspection of the work carried out by the competent technical authority of IIM Udaipur. The agency is required to assist the technical authority of IIM Udaipur in carrying out the inspection. Before inspection of the work, the agency has to submit the certified copy (Certified by the client) of the agreement and the final bill paid. The agency has to bear the inspection charges (if any) of the site where the work was carried out.**

(ii) Works executed outside India shall not be considered as eligible works.

21. Certificate of completed works duly certified by an officer not below the rank of Executive Engineer-Performance report of works referred in Form C- **(Form-D).**

22. Structure & Organization - **Form 'E'**

23. Online campus automation system (CAS) registration for Fund transfer through RTGS/ NEFT (**Form-F)**

24. Self-certified copy of **declaration regarding local contents for preference make in India** on the letter head of the company. (Refer notification (**Form H**)

25. The time allowed for carrying out the work will be **150 Days** 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 bid documents.

26. The site for the work is available. The architectural and structural

drawings shall be made available as per approved program of completion submitted by the contractor after award of the work.

27. The bid document consisting of plans, drawings, specifications, 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 except Standard General Conditions of Contract Construction 2023 Form can be seen from websites.

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

29. While submitting the revised bid, the contractor can revise the quoted rates but before last date and time of submission of bid as notified.

30. When bids are invited in three stage system and if it is desired to submit a revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted, then the bid submitted earlier shall become invalid.

31. Earnest money of **Rs.3,67,809/-** by shall be deposited through Demand Draft/ Banker's Cheque/ Pay Order of any nationalized/Scheduled bank in favor of "Director, Indian Institute of Management, Udaipur, Rajasthan" payable at Udaipur, Rajasthan valid for 6 months by all the intending bidders within the time and date of submission as mentioned in 'Information and Instructions for Bidders for e-tendering' of NIT, failing which the bids shall be rejected and uploaded documents shall not be verified. **(Being a work contract, no exemption is allowed to any MSME / NSIC registered bidders)**

A part of earnest money is acceptable in the form of Bank Guarantee also. In such case 50% of earnest money or Rs. 20 Lakh whichever is less, will have to be deposited in shape prescribed above and balance can be accepted in form Bank Guarantee issued by a Commercial Bank having validity for Six months or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The Earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two / three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. shall be returned within 30 days of declaration of result of technical bid evaluation.

Copy of certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website

within the period of bid submission.

Online bid documents submitted by intending bidders shall be opened only of those bidders, whose proof of EMD deposited and other documents scanned and uploaded are received by the prescribed time and date and found in order. Original EMD in physical form must be received on or before the date of opening of the bid.

The technical bid submitted shall be opened at 03.30 PM on 31.10**.2024**.

32. Bids are invited in two bid stage system. The Financial bid shall be opened of those tenderers only, who qualify in the eligibility of technical bid. If any change in the opening of financial bid arises the time and date of opening of financial bid of the eligible tenderer shall be communicated on later date through a notice uploaded on CPP portal in advance of opening of price bid(s).
33. Copy of Enlistment Order and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. Online bid documents submitted by intending bidders shall be opened only of those bidders and other documents scanned and uploaded are found in order.
34. Individual signing the bid or other documents connected with the contract shall indicate the full name with full signature and must specify whether he is signing as:
    i) A sole proprietor of the firm or constituted attorney of the sole proprietor.
    ii) A partner of the firm, in which case he must have authority to represent for arbitration of disputes concerning the business of the partnership firm either by virtue of the partnership agreement or power of attorney.
    iii) Constituted attorney of the firm. Provided that,

    (A) In case of (ii), a copy of the partnership agreement or general power of attorney, in either case, attested by a Notary Public, or affidavit on stamp paper of all the partners admitting execution of the partnership agreement or the General Power of attorney should be furnished.

    (B) In the case of partnership firms, where no authority to refer a dispute concerning the business of the partnership has been conferred on any partner, the tender offer and all other related documents must be signed by every partner of the firm.

    (C) A person signing the tender form or any other documents forming the part of the contract on behalf of another shall be deemed to be warranty that he has the authority to sign, such documents and if, on enquiry, it appears that the person has no authority to do so, the Institute may, without prejudice to other civil and criminal remedies, cancel the contract and make or authorize execution of contract /

intended contract at the risk and cost of such person and hold the signatory liable to the Institute for all cost and damages arising from the- cancellation of the contract including any loss which the Institute may have on account of execution of contract / intended contract.

(D) Individual signing the tender or other documents connected with the contract shall indicate the full name with full signature and must specify the capacity and authority under which he signs such document marked as **Form K** and shall also submit documentary evidence of his authority duly attested by a Notary Public on Rs. 500/- non-judicial stamp paper.

35. The contractor whose bid is accepted will be required to furnish a performance guarantee **as specified percentage of the tendered amount** as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Security Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks 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 the action as per EMD declaration Proforma will be taken by the E-in-C without any notice to the contractor. The Earnest Money deposited along with bid shall be returned after receiving the aforesaid performance guarantee**.** The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses / registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. if applicable and also ensure the compliance of aforesaid 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.

36. **The description of the work is as follows: -**

Supply, Installation, Testing and Commissioning of 350 TR Chiller.

Intending Bidders are advised to inspect and examine the site 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, 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. A bidder 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 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. if any will be issued to him by the Institute and local conditions and other factors having a bearing on the execution of the work.

37. The integrity pact of the bid document shall be signed between Estate Officer and the successful bidder after acceptance of the bid.

38. The competent authority on behalf of the Director, IIM Udaipur 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 the assignment of any reason. All 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.

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

40. The competent authority on behalf of the Director, IIM Udaipur reserves to himself the right of accepting the whole or any part of the bid and the bidder shall be bound to perform the same at the rate quoted.

41. The contractor shall not be permitted to bid for works in IIM Udaipur, if his near relative is working in IIM Udaipur in any capacity. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Officer in the IIM Udaipur. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Institute.

42. The bid for the works shall remain open for acceptance for a period of **90** days from the date of opening of technical bid in case bids are invited on two bids envelop system (strike out as the case may be).

(i) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the institute within 7 days after last date of submission of bids, then the Institute shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money irrespective of letter of

acceptance for the work is issued or not.

(ii) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the institute after expiry of 7 days after 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.

(iii) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidders shall not be allowed to participate in the rebidding process of the same work.

43. This Notice Inviting Bid shall form a part of the contract document. The successful bidder / contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:

i) 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 & negotiation leading thereto.

ii) Standard Form 7 amended up to a date previous to last date of submission of bid.

FORM 7

INDIAN INSTITUTE OF MANAGEMENT UDAIPUR

ESTATE DEPARTMENT

Percentage Rate Tender & Contract for works

(A) **Tender for the work: Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)**

(B) **To be submitted online by 1000 hrs on 06 Nov 2024 through website** www.eprocure.gov.in.

(i) Technical bid To be opened in the presence of tenderers who may be present at 1100 hrs on 06 Nov 2024 in the office of Estate Officer, IIM Udaipur.

T E N D E R

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, Conditions of Contract, 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 Director, IIM Udaipur within the time specified in Schedule 'F', viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings 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 respects in accordance with, such conditions so far as applicable.

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

A sum of **Rs 3,67,809/-** as EMD has been deposited in the prescribed form.

If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said Director, IIM Udaipur or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We

fail to commence work as specified, I/ We agree that Director, IIM Udaipur or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to 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, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on a back-to-back basis. Further that, if such a violation comes to the notice of the Institute, then I/We shall be debarred for tendering in IIM Udaipur in the future forever. Also, if such a violation comes to the notice of Institute before date of start of work, The Estate Officer shall be free to forfeit the entire amount of Earnest Money Deposited / 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 the State.

Dated :.....

Signature of Contractor:

Postal Address:

Witness :
Address:
Occupation :

Signature
.....
.....

SCHEDULE A to F

SCHEDULE 'A' Schedule of quantities (Enclosed)	Page No. ..... to .....
SCHEDULE 'B'	Nil
SCHEDULE 'C'	Nil
SCHEDULE 'D' Extra schedule for specific requirements /documents for the work, if any.	Nil
SCHEDULE 'E' Reference to General Conditions of contract	General Conditions of Contract 2023 (Construction Work. **Correction slips issued up to Circular No. DG/CON/Construction 2023/04 dated 08.12.2023 (To the extent applicable for construction work.**
Name of work **:**	**Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)**
Estimated cost of work	**Rs. 1,83,90,444/-**
(i) Earnest money:	**Rs. 3,67,809/-**
(ii) Performance guarantee:	5% of tendered value.
(iii) Security Deposit	2.5% of tendered Value
SCHEDULE 'F'	
General Rules & Directions: Officer inviting tender.	**Director, IIM Udaipur**
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3.	see below
Definitions: 2(v) Estate Officer	**Estate Officer, IIM Udaipur**
2(viii) Accepting Authority	Director, IIM Udaipur
2(x) Percentage on cost of materials and labour to cover all overheads and profits.	**15% (Fifteen per cent)**
2(xi) Standard Schedule of Rates	Delhi Schedule of Rate 2022 & market rate with correction slips issued up to last date of submission of tender. For item related to the Civil Works:- Delhi Schedule of Rate 2023 & DAR (Civil) 2023 & Market rate with correction slips issued up to last date of submission of tender.

2(xii) Institute	Estate Department, IIM Udaipur.
Clause 1	
(i) Time allowed for submission of performance guarantee, programme chart (Time & Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW welfare board or proof of applying thereof: from the date of issue of letter of acceptance	10 days
(i) Maximum allowable extension with late fee @ 0.1% per day of performance guarantee amount beyond the period as provided in (i) above.	05 days
Clause 2	
(ii) Authority for fixing compensation under clause 2 (liquidated compensation to be imposed on the contractor in case of delay. The compensation is predefined (liquidated) @ 1.5% per month to be computed on per day basis subject to maximum of 10% of the contract value.)	**Director, IIM Udaipur**
Clause 2A	
(i) Whether clause 2A shall be applicable Compensation for delay (up to 25 Lakh)	**No**
Clause 5	
Number of days from the date of issue of letter of acceptance for reckoning date of start Milestone(s) as per table given below:-	10 days.

Table of milestone(s)

Sl. No.	Description of Milestone	Time allowed in Months. (From date of start) for achieving milestone	The amount to be withheld in case of the non-achievement of each milestone.
1.	Total work done of costing 20% of the tendered amount.	80 Days	1.0% of the tendered amount.
2.	Total work done of costing 45% of the tendered amount.	100 Days	1.0% of the tendered amount.
3.	Total work done of costing 60% of tendered amount.	115 Days	1.0% of the tendered amount.
4.	Total work done of costing 80% of the tendered amount.	130 Days	1.0% of the tendered amount.
5.	Total work done of costing 100% of the tendered amount.	150 Days	1.0% of the tendered amount.

Note:
1. Request for rescheduling of milestones shall be made by the contractor, as per Appendix XVI.
2. In case of milestones are not achieved by the contractor, action under clause-5 of the contract will be taken.

Time allowed for the execution of work:	**150 Days**
Authority to decide Extension of time:	**Director, IIM Udaipur**
Rescheduling of the milestone:	**Director, IIM Udaipur**
Shifting of date of start in case of delay in handing over of site.	**Estate Officer, IIM Udaipur**

Scheduling of handing over of site

Part	Portion of site	Description	Time period handing over reckoned from the date of issue of letter of intent.
Part A	Portion of without any hindrance	Complete site	10
Part B	Portion of with	N.A	-

	encumbrance		
Part C	Portions dependent on work ofother agencies	N.A.	-

Clause 6	**Computerized Measurement Book**
Computerized Measurement Book	
Clause 7	**Rs. 25.00 Lakhs**
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.	
Clause 7A	**Yes** (No running Account Bill shall be paid for the work till the applicable GST registration of the same State in which work is to be taken up, requisite licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Estate Officer)
Weather clause 7 A shall be applicable	
Clause 8A	**Estate Officer**
Authority to decide compensation on account if contractor fails to submit completion plans.	
Clause10B (ii) & Clause 10 B (iii)	**Nil**
Whether clause 10B (ii) shall be applicable	
Clause10C	
Component of labour expressed as component Percent of the value of work executed	**Nil**
Clause10CA	**Not Applicable**
Clause10CC	**Not Applicable**
Clause 11	CPWD Specification 2019 Vol.-I & II for Civil works and CPWD General Specification 2023- Part-I (Internal) & Part-II (External), with correction slips upto the submission of bid.
Specifications to be followed for execution of work	
Clause 16	Director, IIM Udaipur
Competent Authority for deciding reduced rates	
Clause 18	**Refer Page No. 50-51 of this NIT.**
list of mandatory machines, tools and plants to be deployed by the contractor at site.	

Note: The list of machinery, tools & plants to be deployed by the contractor at site are minimum. The contractor shall deploy additional machinery, tool & plants in order to maintain the progress of the work without any extra cost to the institute.

Clause 19 C Authority to decide penalty for each default.	**Estate Officer**
Clause 19 D Authority to decide penalty for each default.	**Estate Officer**
Clause 19 G Authority to decide penalty for each default	**Estate Officer**
Clause 19 Authority to decide penalty for each default.	**Estate Officer**
Clause 25 Settlement of Disputes by Conciliation and Arbitration	CoA and Director, IIM Udaipur
Clause 31 Whether clause 31 shall be applicable	**Not Applicable**

Clause 32

"Requirement of Technical Representative(s) and Recovery Rate

S No	**Minimum Qualification of Technical Representative**	**Discipline**	**Designation (Principal Technical / Technical representative)**	**Minimum experience**	**No.**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32.**	
						Figures	Words
1	Degree / Diploma	Electrical / Mechanical	Technical representative	5 years for degree holders & 8 years for diploma holder.	1	Rs.40,000/- per month	Rs. Forty Thousand per month

"Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers."

Diploma holder with minimum 10-year relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Special Conditions & Particular Specification

1. Special Conditions

DEFNITION: In the Contract (as hereinafter defined) the following definitions words and expressions shall have the In the Contract (as hereinafter defined) the following definitions words and expressions shall have the meaning hereby assigned to them except where the context otherwise required.

1. "Annexure" referred to in the Tender document shall mean the relevant annexure appended to the Tender Document and the Contract.

2. "Approved" shall mean approved in writing including subsequent confirmation of previous verbal approval. "Approval" shall mean approval in writing including as aforesaid.

3. "Agreement" the word "Agreement" and "Contract" has been used interchangeably.

4. "Bidder" shall mean the Bidder who submits the tender for the work and shall include the successors and permitted assigns of the Bidder.

5. "Organization" shall mean the Indian Institute of Management located at Udaipur, Rajasthan.

6. "Commencement Date" shall mean the date upon which the Contractor receives the notice to commence the supply of Services.

7. "Competent Authority" shall mean the Director, Indian Institute of Management, Udaipur, Rajasthan.

8. "Competent Officer" shall mean an officer authorized by the Director.

9. "Contract" shall mean the contract for the work and shall include the Tender Documents, the Special Conditions of Contract, the General Conditions of Contract, the Letter of acceptance and the accepted rates, the offer, the Agreement and mutually accepted conditions in the authorized correspondence exchanged between the Contractor and the Competent Officer and any other document forming part of the contract.

10. "Contract Amount" shall mean the sum quoted by the Contractor in his offer and accepted by Competent Authority.

11. "Contractor" shall mean the individuals or firm or company whether incorporated or not, undertaking the contract and shall include legal representatives of such individual or persons composing such firm or unincorporated company or successors of such firm or company as the case may be and permitted assigns of such individual or firm or company. This shall be synonymous with term "Bidder" used in the Detailed Tender Notice and shall mean the successful "Bidder".

12. "Estate Officer" shall mean the Associate Manager-Estate of Indian Institute of Management, Udaipur The Estate Officer, who shall administer the work,

13. Accepting authority shall mean the Director, IIM Udaipur or his authorized representative.

14. Architect shall mean any Architects/consultant, firms or persons as may be appointed by the Institute.

15. Site Engineers shall mean the Jr. Engineer (Electrical) appointed by IIMU

16. "Letter of Acceptance" means the formal acceptance of Bid issued by the Competent Officer.

17. "Owner" shall mean the Director, Indian Institute of Management, Udaipur, Rajasthan.

18. "Prescribed" shall mean as prescribed in the Tender Document.

19. "Specifications" means the specifications referred to in the Tender and any modification thereof or addition or deduction thereto as may from time to time be furnished or approved in writing by the Competent Authority. In case where no particular specification is given, the relevant specification, where one exists, of the Bureau of Indian Standards shall apply.

20. "Tender" means the Contractor's bid offered to the Competent Authority for the supply of the Services and remedying of any defects therein in accordance with the provisions of the Contract, the installation and services as accepted by the Letter of Acceptance.

21. "Time for completion" means the time for completing the supply of services or any part thereof as stated in the Contract calculated from the Commencement Date.

2. **DUTIES & POWERS**:

2.1 Site Engineers:

The duties of the Site Engineer(s) are to watch and supervise the works and the workmanship in connection with the works, and to test and examine any materials to be used. He shall have no authority to relieve the contractor of any of his duties or obligations under the contract, except as expressly provided here under, nor to order any work involving delay or any extra payment by the Institute and to make any variation in the works.

The Estate Officer, from time to time in writing, delegates to the Site Engineer(s) any of the powers and authorities vested in them. Any

written instruction or written approval given by the Site Engineer (s) to the contractor within the terms of such delegation (but not otherwise) shall bind the contractor and the Institute as though it had been given by the Estate Officer provided always as follows:

a) Failure of the Site Engineer (s) to disapprove any work or materials shall not prejudice the power of the Estate Officer to subsequently disapprove such work or materials and to order the pulling down, removal or breaking up thereof.
b) If the contractor is dissatisfied by reason of any decision of the Site Engineer (s), he shall be entitled to refer the matter to the Estate Officer, who shall thereupon confirm reverse or vary such decision.

3. **ASSIGNMENT & SUBLETTING**:

3.1 The contractor shall not assign the contract or any part thereof or any benefit or interest therein or there under without the written consent of the Estate Officer. The whole of the works included in the contract shall be executed by the contractor except where otherwise provided in the contract. The contractor shall not sublet any part of the works without the written consent of the Estate Officer and such consent, if given, shall not relieve the contractor from any liability or obligation under the contract, and he shall be responsible for the acts, defaults and neglects of sub-contractor, his agents, servants or workmen, as if they were the acts, defaults or neglects of the contractor provided always that the provision of labour contracts on a piece work basis shall not be deemed to be a subletting under this clause.

4. **SCOPE OF CONTRACT**:

The contract comprises Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.) and rectification of defects for 12 Months after the completion, and the provision of all labour, materials, constructional plant, equipment and transportation, temporary works and everything, whether of a temporary or permanent nature required in and for such construction, completion and maintenance so far as the necessity for providing the same is specified in or reasonably to be inferred from the contract. The contractor shall make his own arrangements for the safe storage of materials, accommodation for his staff etc. and no claim for temporary accommodation from the contractor shall be entertained.

The contractor shall carry out and complete the said work in every respect in accordance with this contract and as per the directions and to the satisfaction of the Estate Officer. Issue of further drawings and / or

written instructions, detailed directions and explanations which are hereinafter collectively referred to as instructions of the Estate Officer in regard to:

a) The variation or modification of the design, quality or quantity of works or the addition or omission or substitution of any work.
b) Any discrepancy in the Drawings or between the Schedule of Quantities and / or Drawings and / or specifications.

c) The removal from the site of any materials brought thereon by the contractor and the substitution of any other material thereof.

d) The dismissal from the work of any person employed thereupon.

e) The opening up for inspection of any work covered up.

f) Amending / making good of any defects.

The contractor shall forthwith comply with and duly execute any instructions of work comprised in such Estate Officer's instructions, provided always that the verbal instructions and explanations given to the contractor or his representative upon the works shall, if involving a variation, be confirmed in writing by the contractor within seven days and if not dissented in writing within a further seven days by the Estate Officer, such shall be deemed to be instructions of the Estate Officer within the scope of the contract.

5. **CONTRACT DOCUMENT**:

5.1 The several documents, forming the contract, are to be taken as mutually explanatory of one another and in case of ambiguities or discrepancies the same shall be explained and adjusted by the Estate Officer who shall thereupon issue to the contractor its interpretation directing in what manner the work is to be carried out. In case the contractor feels aggrieved by the interpretation of the Estate Officer then the matter shall be referred to the Director and his decision shall be final, conclusive and binding on both parties to the contract.

5.2 The drawing etc. shall remain in the custody of the Institute. Two complete sets of drawings, specification and Schedule of Quantities shall be furnished by the Estate Officer to the contractor in such time, which must not delay the progress of the construction, and the Institute shall furnish copies of any additional drawings, which in their opinion may be necessary for the execution of any part of the work. One complete set shall be kept on the work site and the Estate Officer, and his representatives shall be, at all reasonable times, have access to the

same. The contractor shall study the drawings thoroughly before the commencement of work. In case of any discrepancy, the contractor shall seek clarification before proceeding with the works. Figured dimensions are in all cases to be accepted in preference to the scaled sizes. Large-scale details should take preference over small scale ones.

The contractor shall give adequate notice in writing to the Estate Officer of any further drawings or specification that may be required for the execution of the works or otherwise under the contract.

The Estate Officer shall have full powers and authority to supply to the contractor from time to time during the progress of the work such drawings and instructions as shall be necessary for proper execution and the contractor shall carry out and be bound by the same.

5.3 The successful tenderer shall be required to enter into an agreement with the Institute. The Schedule of Quantities & rates filled by the successful tenderer there in, the General Conditions of Contract 2023 for Construction Works incorporating corrections upto last date of submission of bids, CPWD specifications for Civil & Electrical Works, the Special conditions, additional specifications, minutes of the pre bid conference, negotiation letter and the award letter etc. shall form part of the agreement to be signed by the successful tenderer. The cost of stamp paper and stamp duty required for the agreement shall be borne by the contractor.

5.4 The contractor(s) shall give to the Municipality, police, and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be levied on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.

5.5 The Contractor(s) shall take instructions from the Estate Officer regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. However, if any change is required, the same shall be done with the approval of Estate Officer & no extra payment shall be made on this account. The contractor shall collect & stack the hard rock this will be measured as per the direction of Estate Officer and it may be used in RR masonry and sub base of road, etc as per the direction of Estate Officer.

5.6 Other agencies will 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 etc. as may be required for the electric and other related works and nothing extra shall be payable on this account.

5.7 The contractor shall conduct his 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 Estate Officer and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed, so as not to interfere with the operations of other contractor or he shall 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.

5.8 The contractor shall be fully responsible for the safe custody of materials brought by him at site / issued to him even though the materials may be under double lock and key system. The contractor has to make his own arrangement like shed enclosure etc. for keeping the material, providing security etc. The contractor shall be allowed to make temporary structures for cement godown, installation of batch mixing plant, stores, labs, offices, sheds etc. The contractor shall remove all the structures erected by him necessary for the execution of the work, after completion of the work and clean the site removing all structures and temporary hutments in all respect as per the direction of Estate Officer.

5.9 Contractor(s) shall provide permanent benchmarks, flag tops and other reference points for the proper execution of work and these shall be preserved till the end of the work. All such reference points shall be in relation to the levels and locations, given in the Architectural and other related services drawings.

5.10 On completion of work, the Contractor(s) shall submit at his own cost four set of "as built' drawings printed in A2 size page & soft copy of the drawings shall be shared in AutoCad to the Estate Officer within 6 weeks of completion of the work failing which a recovery of Rs.50,000/- for each item as listed below, to be made as reasonable compensation. These drawings shall have the following information.

1. General Arrangement drawings of the installations.
2. Layout of piping and various control valves, Y-stainers along with sizes.
3. All drawings new electrical installations and services.

5.11 The work shall be carried out in accordance with the Architectural drawings and structural drawings, to be issued from time to time, by the Estate Officer. Before commencement of any item of work the contractor

shall correlate all the relevant architectural and structural drawings, nomenclature of items and specifications etc. issued for the work and satisfy himself that the information available there from is complete and unambiguous. The figure and written dimension of the drawings shall supersede the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Estate Officer before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and/ or incomplete information and no claim whatsoever shall be entertained on this account.

5.12 The Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixing involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Estate Officer.

5.13 The contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, audio-video recording including photographs, slides, audio-videography etc. and nothing extra shall be payable to the contractor on this account.

5.14 The contractor shall be fully responsible for the safe custody of materials brought by him at site/ issued to him even though the materials may be under double lock and key system. The contractor has to make his own arrangement like shed enclosure etc. for keeping the material, providing security etc. The contractor shall be allowed to make temporary structures for cement godown, installation of batch mixing plant, stores, labs, offices, sheds & labour huts etc. The contractor shall remove all the structures erected by him necessary for the execution of the work, after completion of the work, and clean the site removing all structures and temporary hutments in all respect as per the direction of Estate Officer.

6 **SITE INSPECTION**:

Bidders 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 offer. The bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges 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, access facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of bid by a bidder implies that he has read the Bid 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. (if any) will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

The contractor carrying out this work shall strictly abide by the Municipal/State regulations as well as any security regulations imposed by the Institute/Police Authorities/ Local Authorities, from time to time, regarding trans-shipment of equipments, operations, drainage, security etc. wherever applicable.

7 CLEANLINESS OF SITE

The Contractor shall not stack building material / malba / muck/ rubbish on the land or road of the local development authority or on the land owned by the others, as the case may be. So the muck, rubbish etc. shall be removed periodically as directed by the Estate Officer, from the site of work to the approved dumping grounds as per the local byelaws and
regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the Contractor. Nothing extra shall be payable on this account. In case, the Contractor is found stacking the building material / malba as stated above, the Contractor shall be liable to pay the stacking charges / penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and byelaws of such body or authority. The Engineer –in-Charge shall be at liberty to recover, such sums due but not paid to the concerned authorities on the above counts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

8 INSPECTION OF WORK

In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by the senior officers of the Institute in addition of the Estate Officer and his authorized representative. The contractor shall at times during the usual working hours and at all times at which reasonable notices of the intention of the Estate Officer or other officers as stated above to visit the works shall have been given to the Contractor, either himself be present to receive the orders and

instructions or have a responsible Site Engineer duly accredited in writing, to be present for that purpose Senior Officers of Institute Authorities shall be inspecting the on-going work at site at any time with or without prior intimation.

9. **MATERIALS AND WORKMANSHIP**:

All materials used shall conform to the requirements of materials specified in this specification. Where material requirements are not specified, they shall conform to the applicable standards and codes approved by the Institute. All materials shall be new, free from defects and of good quality in all respects as per the prescribed specifications. Parts shall be free from flaws and objectionable imperfections and shall be machined true in a workman like manner. No deviations from the specified materials are permissible. Wherever materials are not specifically called out, they shall be properly selected by the contractor to the best standards for the application and with the prior approval of the Estate Officer.

10. **STANDARDS & CODES**:

The design, manufacture and performance of tendered material/equipment shall comply with all currently applicable statutory regulations and safety codes in the locality where the material/equipment will be installed. The material shall also conform to the requirement of the latest editions of applicable IS/B.S Standards. The contractor shall refer to the relevant sections of this specification for material/equipment standards and codes. Nothing in this specification shall be construed to relieve the contractor of his responsibility.

11. **RATES**:

The rates quoted by the bidder, shall be firm and inclusive of all taxes, and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site i/c temporary constructional storage, risks, overhead charges general liabilities/ obligations and clearance from local authorities. However, the fee to be paid to local bodies/statutory bodies in context with the inspections shall be borne by the Institute.

12. **FREE GUARANTEE PERIODS (Defect Liability Period)**:

Guarantee: All materials/installations shall be guaranteed by the contractor for a period of **12 months** from the date of completion of work/ date of commissioning of system / date of taking over of the installation by the institute, whichever is later, against unsatisfactory performance of

the installations and/or any break down/ failure due to defective design, poor quality of material and/or bad workmanship. The material or equipment or any other part thereof found defective during guarantee period shall forthwith be repaired or replaced free of cost, to the satisfaction of the Estate Officer. In case it is felt by the institute that undue delay is being caused by the contractor in doing so, the same will be got done by the Institute at the risk and cost of the contractor. The decision of the Estate Officer in this regard shall be final & binding.

13. **VALIDITY**:

Bids should be kept open for acceptance for at least **90 days** from the date of opening of technical bids. Those who do not agree for a validity of **90 days** will do so at their own risk and no request for extending the validity is likely to be made from this office. However, if due to any circumstances beyond control, if the bidders are advised to extend the validity, they shall not be permitted to revise their rates, offer any rebate or concession while extending the validity which may materially result in any reduction or increase in the computed prices of their original offer.

14. **TERMS OF PAYMENT**:

(a) 60% payment will be made on the purchase cost of material after submission of Tax invoice, Delivery Challans, Test Certificates, Invoice of Material, Guarantee/warranty certificate, technical catalogue (if any) after initial inspection and delivery of material at the site in good condition on pro-rata basis.
(b) 25 % on completion of pro-rata installation.
(c) 10 % on testing, commissioning.
(d) 5 % after handing over.

15. **DEVIATIONS/VARIATIONS EXTENT & PRICING**

15.1 The client shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing singed by the Estate Officer and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work within the deviation limit of 30% of the original quantities.

15.2 In the case of Extra Item(s) which are not available in BOQ being the schedule items

(Delhi Schedule of Rates items), these shall be paid as per the schedule rate plus cost index (at the time of tender) plus/minus percentage above/ below quoted contract amount.

15.3 Payment of Extra/substitute items in case of non-schedule items (Non-DSR items) shall be made as per the prevailing market rate.

15.4 In the case of contract items, which exceed the limit(s) of quantity (ies) laid down in schedule, the contractor shall be paid rates specified in the schedule of quantities.

15. Recovery of Security Deposit:

The person/persons whose tender(s) may be accepted (herein after called the contractor) shall permit the Institute at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 2.5% of the gross amount of each running bill till the sum will amount to a security deposit of 2.5% of the tendered value of the work. Such deductions will be made and held by the Institute by way of security deposit unless he/they has/have deposited the amount of security at the rate mentioned above in cash or in the form of Government securities or fixed deposit receipt. In case a fixed deposit receipt of any Bank is furnished by the contractor to the institute as part of the security deposit and the bank is unable to make payment against the said fixed deposits receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the institute to make good the deficit.

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from or paid by the sale of a sufficient part of his security deposit or from the interest arising there from or from any sums which may be due to or may become due to the contractor by Government on any account whatsoever and in the event of his security deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or any commercial Banks or Government Securities (if deposited for more than 12 months) endorsed in favor of the Estate Officer, any sum or sums which may have been deducted from or raised by sale of his security deposit or any part thereof. The security deposit shall be collected from the running bills of the contractor at the rates mentioned above.

The security deposit as deducted above can be released against a bank guarantee issued by a scheduled bank which shall be **released on the expiry of the defect liability period/guarantee period of 12 months.**

16 Taxes:

All taxes as per prevailing notification of the Central / State Government shall be recovered from the contractor's bill.

17 GENERAL REQUIREMENTS:

a. **Coordination with other agencies**:

The Contractor shall be responsible to co-ordinate with other agencies working at site. The Contractor will have to carry out changes / modifications, if any, required due to lack of coordination with other agencies at his cost.

b. **Site Supervision**:

The Contractor shall engage sufficient qualified and experienced site staff to execute the works. Registered and licensed trade persons shall be employed under the direct employment of the contractor and shall be full time on site to supervise the works. The decision of the Estate Officer as to what constitutes this necessity shall be final and binding.

c. Inspection at Manufacturer's Works

Owners reserve the right to depute their representative for inspection of the tendered material (Chiller only) for witnessing tests as per relevant standards at manufacturer's works prior to dispatch of the material to site at IIM Udaipur. The contractor is required to offer the material for inspection at the manufacturer's works before dispatch as per the relevant national/international standards along with pre-dispatch routine test results/report. The contractor shall give sufficient advance notice of minimum **10 days** regarding readiness of material and the dates proposed for witnessing required tests and inspections to the Estate Officer or his authorized representative and to facilitate his presence during inspection and testing. The institute at his discretion may depute their representatives to witness such testing and/or inspection. The materials duly inspected by the Estate Officer, or his authorized representative shall be dispatched to site by the contractor after issue of dispatch clearance by the Estate Officer.

Inspections and tests at the works of the manufacturer do not relieve the Contractor of his responsibility for the defects or other failures discovered

/noticed in the material during the execution of the contract .and to meet the contract requirements. The contractor must ensure the supply of material strictly as per the prescribed specifications.

17. Period of Completion: 150 Days.

18 Godown / Worker Accommodation:

The accommodation for workers shall be arranged by the Contractor outside the campus of IIM Udaipur. Storage space shall be arranged by the Institute. The contractor shall construct the stores at his cost, and he shall be responsible for watch and ward of his materials/installations.

19. **Supply of Material**:

Merely a provision in the Schedule of Quantities does not require the contractor to supply the item. The contractor has to supply the quantity of material actually required for use on work after getting it approved the Estate Officer. If at any point of time it comes to the notice that any of the items supplied by the contractor & paid by the Institute is not required for use on work, the amount shall be recovered suo-moto, and no claim shall be entertained on this account.

Make in India: Self-certified copy of declaration regarding local contents for preference make in India on the letter head of the company. (Refer notification ref. no. P-45021/2/2017-PP (BE-II), dated 4th June 2020 for "Provision of Public Procurement (Preference to Make in India), Order 2017-Revision regarding" notification issued from the Ministry of Commerce and Industry, Institute for promotion of industry and internal Trade (Public Procurement Section), Govt. of India.

20. **SAFETY, HEALTH AND ENVIRONMENT**

a) The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards during day and night, speed limit boards, red flags, red lights and providing barriers hoarding written in English and Hindi. He shall be responsible for all damages and accidents caused to existing/new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work. In case of any accident of labour / contractual staff the entire responsibility will rest on the part of the contractor and any compensation under such circumstances if becomes payable the same shall be entirely born by the contractor and institute shall have no role on this account.
b) The contractor is required to follow the CPWD Safety code as

prescribed in the General condition of the contract 2023.

c) The contractor shall assign to his workmen, tasks commensurate with their qualification, experience and state of health for driving of vehicles, handling and erection of materials and equipments. All lifting equipments shall be tested certified for its capacity before use. Adequate and suitable lighting at every work place and approach there to, shall be provided by the contractor before starting the actual operations at night.

d) Hazardous and / or toxic materials such as solvent coating or thinners shall be stored in appropriate containers.

e) All hazardous materials shall be labeled with the name of the materials, the hazards associated with its use and necessary precaution to be taken.

f) Contractor shall ensure that during the performance of the work, all hazard to the health of personnel, have been identified, assessed and eliminated.

g) Appropriate personal protective equipment such as helmets, gloves, goggles, aprons, safety belts etc. shall be provided to the workers employed at the work site as per the requirement and exposure to the hazardous materials or locations.

h) The contractor has to follow the model rules for the protections of the Health and sanitary arrangement for the workers as provided in the **General condition of contract for CPWD works 2023 for Construction works with correction slips upto Circular No. DG/CON/Construction 2023/03 dated 06.12.2023 (To the extent appliable for contract)**

i) The contractor shall provide first aid facilities, drinking water facilities, washing facility, Latrines and urinals, shelter during rest, crèches, canteens, anti-malarial precautions, preventive action for communicable diseases, proper drainage, sewerage, etc. in compliance of model rules for the protection of Health and Sanitary arrangement for the workers.

j) The wages of the labour shall be paid as per the guidelines provided in the CPWD contractor labour regulations.

k) The contractor has to keep a record of all the workers employed at site, make daily attendance along with the location of the work and follow the CPWD contractor's labour regulation. All the labour record shall be made available for inspection and verification to the Estate Officer or his authorized representative as and when required.

l) Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. In case the same are to be removed and diverted, the same shall be payable to the contractor. The contractor shall work out the cost and the same shall be approved by Estate Officer. The contractor

shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

21. The Contractor shall be responsible for the watch and ward / guard of the material brought and the installation carried out by the contractor provided by him/ supplied to him against pilferage and breakage during the period of installations and thereafter till the entire work as per agreement is physically handed over to the institute. No extra payment shall be made on this account.

22. **SITE:**

The contractor shall ensure that all the top soil excavated during construction works is neatly stacked and is not mixed with other excavated earth. The -contractor shall take the clearance of the Estate Officerbefore any excavation. Top soil should be stripped to a depth of 20 cm (centimeters)from areas to be disturbed, for example proposed area for building, roads, paved areas, external services and area required for construction activities etc. it shall be stockpiled to a maximum height of 40 cm in designed areas, covered or stabilized with temporary seeding for erosion prevention and shall be re applied to the site during plantation of the proposed vegetation or as directed by the Estate Officer Top soil shall be separated from subsoil, debris and stones larger than 50 mm (millimeter) diameter. The stored top soil may be used as finished grade for planting areas.

The contractor should follow the construction plan as proposed by the Estate Officerto minimize the site disturbance such soil pollution due to spilling. If required use of staging and spill prevention and control plan to restrict the spilling of the contaminating material on site needs to be restored. Protection of top soil from erosion by collection storage and reapplication of top soil, constructing sediment basin, contour trenching, mulching etc., may also be directed by the Estate Officer

No excavated earth shall be removed from the campus unless suggested otherwise by Estate Officer All subsoil shall be reused in back filling/landscape, etc. as per the instruction of Estate Officer The surplus excavated earth shall be disposed of by the contractor as per the direction of Estate Officerat his own cost for reuse.

The contractor shall not change the natural gradient of the ground unless specifically instructed by the Estate Officer This shall cover all natural features like water bodies, drainage gullies, slopes, mounds, depressions, etc. Existing drainage patterns through or into preservation area shall not be modified unless specifically directed by the Estate Officer

The contractor shall not carry out any work which results in the blockage of natural drainage.

The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Estate Officer.

Contractors shall reduce pollution and land development impacts from automobiles use during construction.

Overloading of trucks in unlawful and creates the erosion and sedimentation problems, especially when loose materials like stone dust, excavated earth, sand etc. are moved. Proper covering shall be used by the contractor. Also, no overloading shall be permitted.

23. **CONSTRUCTION PHASE AND WORKER FACILITIES:**

a. The contractor shall specify and limit construction activity in pre-planned /designated areas and shall start construction work after securing the approval for the same from the Estate Officer This shall include areas of construction, storage of materials, and material and personnel movement.

b. Preserve and protect Landscape during Construction

c. The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damaged to roots. These shall be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash and protected from oil, paint, and other materials detrimental to plant health. These activities shall be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree, is not at all permitted.

d. The contractor shall take steps to protect trees or saplings of any identified for preservation within the construction site using tree guards of approved specification.

e. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by the Estate Officer

f. The contractor shall avoid cut and fill in the root zones, through delineating and fencing the dripline (the spread limit of canopy projected on the ground) of all trees or group of trees. The zones of movement of heavy equipment, parking, or excessive foot traffic shall be separated from the fenced plant protection zones.

g. The contractor shall ensure that the maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

h. The contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfill and incinerators, if required, and adopt a construction waste management plan to achieve these goals. A project- wide policy of "Nothing leaves the site" shall be followed. The contractor's ingenuity is especially called towards meeting this prerequisite/credit (as per IGBC LEED India, New Construction v1.0 & GRIHA, MNRE) and may consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation, designating a specific area(s) on the construction site for segregated or commingled collection of recyclable material, and track recycling efforts throughout the construction process, identifying construction haulers and recyclers to handle the designated materials at his cost. The diversion may include donation of materials to charitable organization and salvage of materials on- site.

i. Contractor shall collect all construction waste generated on site. He may consider at segregating wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

j. The contractor shall provide potable water and other amenities for all workers as per the contract.

k. The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site as described in CPWD General Conditions of contract. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable provisions. Adequate toilet facilities shall be provided for workmen within easy access of their place of work. The total no. to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be made as soon as

practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling object. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided and natural or artificial illumination shall also be provided.

l. The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and leads of dusty materials, wheel –washing facility, gravel pit, and water spraying. Contractor shall also ensure the following activities to prevent air pollution during construction.

m. Clear vegetation only from areas where work will start right away.

n. Vegetate/mulch areas where vehicles do not ply.

o. Apply gravel/landscaping rock to the areas where mulching/paving is impractical.

p. Identity roads on-site if applicable that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base and add surface gravel to reduce source of dust emission to limit amount of fine particles (smaller than 0.075 mm) to 10-20%.

q. Water spray, through a simple hose for small projects, to keep dust under control. Fine mist should be used to control fine participation. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged.

r. Water spraying shall be done on:

s. Any dusty materials before transferring, loading and unloading.

t. Area where demolition work is being carried out.

u. Any unpaved main haul carried out.

v. Areas where excavation or earth moving activities are to be carried out.

w. The contractor shall ensure that the speed of vehicles within the site is limited to 10 km/hr.

x. All material storage should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust/participate emissions.

y. Spills of dirt or dusty materials will be cleaned up promptly, so the spilled material does not become a source of fugitive dust and also to percent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained /cleaned up immediately before they can infiltrate into the soil/ground for runoff in nearby areas.

z. Provide dust screens, sheeting or netting to scaffold along the perimeter of the building at his cost.

aa. Cover stock piles of dusty material with impervious sheeting before they leave the site at his cost.

bb. Cover dusty load on vehicles by impervious sheeting before they leave the site at his cost.

cc. Contractor shall be required to provide an easily accessible area that services the entire building and is dedicated to the separation, collation and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminum can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program.

dd. The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground. Adequate precautions will be taken to safeguard against this including reduction of wasteful curing process, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction area sand material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).

ee. Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

ff. The contractor shall comply with the safety procedure, norms and guidelines (as applicable) as outlined in the document part 7 Constructional practices and safety, 2005 National Building code of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first- aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first aid shall be available at work site to render and direct first-aid to causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and taken thereon shall be forwarded to the competent authorities.

gg. The contractor shall ensure the following activities for construction workers safety, among other measures at his cost.

i. Guarding all parts of dangerous machinery.
ii. Precautionary sign for working on machinery.
iii. Maintaining hoists and lifts, lifting machines, chains, ropes, and lifting tackles in good condition.
iv. Durable and reusable formwork system to replace to timer framework and ensure that formwork where used is properly maintained.
v. Ensuring that walking surface or boards at height are of sound construction and are provided with safety rails or belts.
vi. Ensuring that walking surfaces or boards at height are of sound construction and provided with safety rails or belts.
vii. Provide protective equipment, helmets etc.
viii. Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the prone area and elsewhere.
ix. Provide sufficient and suitable light for working during nighttime.

24. The storage of material shall be as per standard good practices as specified in Part 7, Section 2- Storge, Stacking and Handling practices, NBS 2005 and shall be to the satisfaction of the Estate Officer to ensure minimum wastage and to prevent any misuse, damage, inconvenience, or accident. Watch and ward of Constrictor's materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment's with proper access and proper maneuverability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components, and equipment's at different stages of

construction shall be considered.

25. The contractor shall provide for an adequate number of garbage bins around the construction site and the workers' facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers' facilities are kept litter free. Separate bins should be provided for plastic, glass metal, biological and paper waste and labeled in both Hindi and English with suitable symbols.

26. The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

27. The contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, Agri fiber, linoleum, wheat board, strawboard and cork etc.

28. Where possible, the contractor shall select materials/vendors, harvested and manufacture regionally a 800-km radius of the project site.
29. Contractors shall adopt an IAQ (Indoor Air Quality) management plan to protect the HVAC system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.

30. The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

31. The contractor shall make efforts to reduce the quantity of indoor air contaminants that are odorous or potentially irritating and harmful to the comfort and well- being of installer and buildingoccupants. The contractor shall ensure that the VOC (Volatile Organic Compounds) content of paints, coatings and primers used must not exceed the VOC content limits mentioned below in case items are/is available in schedule of quantities.

32. Paints
    a. Non-flat-150 g/L, Flat (Mat)-50, g/L Anti corrosive/anti rust-250

g/L

b. Coatings/Clear wood finishers

c. Varnish-350 g/L, Lacquer-550 g/L, Floor coating -100 g/L, sealers stains-250 g/L.

33. The VOC (Volatile Organic Compounds) content of adhesives and sealants used if prescribed in the schedule of quantities must be less than VOC content limits mentioned: Architectural Application VOC Limit (g/l less water).

34. Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with IGBC LEED India New Construction v1.0 or GRIHA program standards and guidelines, towards meeting the aforementioned building environmental rating standards(s) expert assistance shall be provided to him up on request.

35. Water use during construction: Contractor should spray curing water on concrete structure and shall not allow free flow of water. The concrete structure should be kept covered with thick cloth/gunny bags and water should be sprayed on them. The contractor shall do water ponding on all sunken slabs using cement and sand mortar.

36. The contractor shall remove from site all rubbish and debris generated by the works and keep the works clean and tidy throughout the contract period. All the serviceable and non-service (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitably covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during the day. In case of poor visibility artificial light may be provided.

37. The contractor shall provide O&M manuals wherever applicable.

38. The contractor shall make himself conversant with the site waste management program manual and actively contribute to its compilation by estimating the nature and volume of waste generated by the process/installation in question.

39. **MATERIALS & FIXTURES FOR THE PROJECT:**

The contractor has to comply as per MoEF issued notification 8.0.763(E) dated 14th Sept. 1999 containing directive for greater flyash utilization.

Every construction agency engaged in the construction of buildings within a radius of 50 km radius of a Thermal Power Plant, have to use of 100 %fly ash-based bricks/block in their construction.

The contractor shall ensure that all paints, polishes, adhesives, and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Estate Officer before the application of any such materials.
All plumbing and sanitary fixtures installed shall be as per the prescription of the Estate Officer and shall adhere to the minimum LPM (liters per minute) and LPF (liters per flush) mentioned. The contractor shall employ 100% zero ODP (ozone depletion potential) insulation; HCFC (hydro-chlorofluorocarbon)/ CFC (chlorofluorocarbon) free HVAC and refrigeration equipment's and halon-free fire suppression and fire extinguishing systems.
The contractor shall ensure that all composite wood products/agro-fiber products used for cabinet work, etc. do not contain any added urea formaldehyde resin.

40. RESOURCES CONSUMED DURING CONSTRUCTION:

The contractor shall ensure that the water and electricity is not wasted during construction. The Estate Officer can bring to the attention any such wastage and the contractor will have to ensure that such bad practices are corrected.

The contractor shall install necessary meters and measuring devices to record the consumption of water, electricity and diesel on a monthly basis for the entire tenure of the project.

The contractor shall ensure that all run-off water from the site, during construction is collected and reused to the maximum.

No light shall be turned on during the period between 6:00 AM to 6:00 PM, without the permission of the Estate Officer

41. CONSTRUCTION WASTE

Contractor shall ensure that wastage of construction material is within 3%.

a) All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type and measures employed to segregate the waste on site into inert, chemical, or hazardous wastes.

b) All construction debris shall be used for road preparation, back filling, etc, used if described in the schedule of quantities and as per the instructions of the Estate Officer, with necessary activities of sorting, crushing, etc.

c) No construction debris shall be taken away from the site, without the prior approval of the Estate Officer

d) The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.

e) If and when construction debris is taken out of the site, after prior permissions from the Estate Officer, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

42. **EQUIPMENT:**

To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed shall be subject to approval and as per the specifications of the Estate Officer

The contractor is expected to go through all other conditions of the LEED & GRIHA rating stipulations.

Failure to adhere to any of the above-mentioned items, without approval of the Estate Officer, shall be deemed as a violation of contract and the contractor shall hold liable compensation as per terms of the agreement.

43. **WATER POLLUTION:**

The contractor will take all precautionary measures to prevent the wastewater during construction accumulating anywhere.

The wastewater arising from the project is to be disposed off in the manner that is acceptable to the Estate Officer and conforming to Pollution Control norms.

44. **AIR AND NOISE POLLUTION**

Contractors will use dust screens and sprinkle water around the site to arrest the spreading of dust in the air and surrounding areas.

The contractor will ensure that all vehicles, equipment, and machinery are used for environmental emission standards/norms.

For controlling the noise from Vehicles, Plants and Equipments, the Contractor will conform the following:

All vehicles and equipment used in construction will be fitted with exhaust silencers.

Servicing of all construction vehicles and machinery will be done regularly and checked and if found defective will be replced Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 db (A).

As per the Standards/Guidelines for control of Noise Pollution from Stationary Diesel be less then 94+10 log 10 (KVA). The standards also suggest construction of acoustic enclosure around the DG set and provision of proper exhaust muffler with insertion loss of minimum 25dg(A) as mandatory.

Ambient noise levels should conform to residential standards both during day and night.

Adequate measures to reduce air and noise pollution during construction keeping in mind CPCB norms on noise limits.

45. **RISK FROM ELECTRICAL EQUIPMENT**:

The contractor will comply the relevant industrial electrical safety legislations.

The contractor will take adequate precautions to prevent danger from electrical equipment i.e. no material will be so stacked or placed as to cause danger or inconvenience to person or the public.

All necessary fencing and lights will be provided to protect the public.

All electric machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Estate Officer.

In case of any breach of the above provisions, the electric supply given for the work shall be disconnected & the contractor shall only be responsible for the loss/slow progress of the work.

46. **PLANTATION/ PRESERVATION / CONSERVATION MEASURES**:

The contractor will take reasonable precaution to prevent his workmen

and employees from removing and damaging any flora (plant/ vegetation) from the project area.

All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest, discovered on any project location during excavation / construction shall be property of the Government, and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof official instructions of Estate Officer for dealing with the same, till then all work shall be stopped.

47. **PROGRESS REPORT:**

If the work is carried out in more than one shift or during the night, no claim on this account shall be entertained. The contractor has to take permission from the Estate Officer if required for work during night hours. No claim / hindrance on this account shall be considered if work is not allowed during night time. The requisite supervision shall be made available by the institute along with the necessary issue of material under joint custody.

Existing drains, pipes, cables, overhead wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. In case the same are to be removed and diverted, the same shall be payable to the contractor. The contractor shall work out the cost and the same shall be approved by the Estate Officer. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

The Contractor shall be responsible for the watch and ward / guard of the building's safety, fittings and fixtures & protection of flooring doors & windows etc. provided by him/ supplied to him against pilferage and breakage during the period of installations and thereafter till the entire work as per agreement is physically handed over to the institute. No extra payment shall be made on this account.

48. **QUALITY ASSURANCE**:

The contractor shall establish, document and maintain and effective quality assurance system as outlined in the specifications and various codes and standards.

The bidder shall understand the scope of the balance work, drawing, specifications and standards etc. attached with the tender or to be followed and shall seek clarification, if any before submission of the tender.

The quality assurance system plans / procedures/method statement to be followed shall be furnished in the form of a quality assurance manual. It should cover quality assurance, plan procedure, specifications, frequency of the inspection, testing, acceptance criteria, method of sampling, testing etc to be followed for quality and the details of the personal responsible. It is obligatory on the bidder to obtain the approval of every quality assurance documents with Estate Officer before he start using particular document for execution of work.

The approval of quality assurance by Estate Officer does not absolve the contractor of the contractual obligations towards executing the work as per the laid down the specification of the work.

The contractor shall produce the quality control, records, on the formats approved by Engineer-in-charge in the quality assurance plan.

The contractor shall ensure towards the enforcement of quality assurance plan by his all specialized agencies as approved by the Estate Officer.

The Estate Officer reserve the right to inspect / witness, review any or stages of the work at shop / site as deemed necessary for quality assurance and / or timely completion of work.

The contractor has to ensure the deployment of quality assurance and quality control engineer(s) depending upon the quantum of work. This QA/QC group shall be fully responsible to carry out the work as per standards and all codes requirements. In case Estate Officer feels that contractor's QA/Q Engineer(s) are incompetent or insufficient, contractor has to deploy other experiences Engineer(s) as per site requirement and to the full satisfaction of Estate Officer

The contractor is required to review the quality assurance program at all appropriate stages to ensure the quality, completion of activities in time etc. and if required should deploy additional manpower and resources to ensure the quality and timely completion of the project.

If the contractor fails to deploy the quality assurance team, the necessary recovery shall be made from the contractor's bill as per the rates provided for in the schedule – F (Clause 36(i)) of the agreement.

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 and key system.

The contractor shall procure the required materials in advance so that there is sufficient time for testing of the materials and clearance of the same before use in the work. The contractor shall provide at his own cost suitable weighing and measuring arrangements at site for checking the weight / dimensions as may be necessary for execution of work. The sealed samples are to be handed over to the approved testing lab by contractor at his own cost.

49. **Tool & Plants**

The contractor shall, at his own cost and risk, provide and operate all the required equipment, T&P and machinery as required at site. The contractor shall, however, be required to provide and operate following minimum equipment, T&P & machinery at Site:

Sl. No.	Name of Equipment	Nos.
1	Drilling machine	1
2	Welding machine	1
3	Ladders required upto 20 Ft	1
4	Electrical Chase Cutter	1
5	Electrical hammer Drill Machine	1
6	Insulation Testing Megger of all rating and earth test	1
7	Hydraulic Crimping Machine	1
8	Temperature Guage for measuring Temperature	1
9	Spanner Set	1
10	Goti Pana Set	1
11	Adjustable Wrench	1
12	Heavy Duty Screw Drivers	1
13	Pliers	1

These equipment/T&P/machinery shall be the mandatory requirement over and above fo execution work. Nothing extra whatsoever shall be payable on this account. All the equipment, T&P and machinery shall be kept in good condition. In case the requirement at any stage exceeds that

given above the same shall be arranged as per need by the contractor at his own cost.

50. Scaffolding, if required, shall be arranged by the agency at their cost, nothing extra shall be paid separately.

51. **Dispute Resolution:**

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

i) **First Level disposal by CAO, IIMU:** At the first level, any issues of the contractor relating to the work contract awarded to him by the institute, shall be reported within a period of 30 days of the date on which such dispute may have arisen and brought before the **CAO, IIMU** through Estate Officer, who shall be presenting the report with the relevant facts of the case to **CAO, IIMU**. After perusal of the said case of the contractor, the CAO may pass an order as deem necessary.

ii) **Second Level disposal by the Dispute Redressal Committee (DRC**): If a contractor is aggrieved by an order passed by the CAO above, the same may be reported to the Dispute Redressal Committee (DRC) within a period of 30 days of the date of receipt of order by the contractor. The power to constitute a DRC vest with Director, IIM Udaipur which shall be constituted as per rule. The DRC so constituted shall pass an order with detailed reasoning within a period of 90 days from the date of constitution of DRC.

iii) **Third Level disposal by the Building Committee:** If the contractor is aggrieved by the order of DRC, an appeal shall lie within a period of 30 days from the date of receipt of order of DRC by the contractor, before the Building Committee (BC) of the Institute which is a statutory authority constituted under Statute 3 read with Statute 9 of the First Statutes of IIM Udaipur. The BC shall pass an order as deem necessary within a period of 90 days from the date on which the meeting of BC was last

convened, after the receipt of the Appeal against the order of DRC by the contractor.

iv) The report of the BC shall be reported to the Finance Committee of the Institute and thereafter to the Director (BoG) of the Institute for approval. The final order as approved by the BoG shall be final and binding on the contractor.

Note: The aforesaid time limit of reporting the case / time limit for appeal may be condoned by the competent authority to which it lies, if the said authority is satisfied that the contractor has reasonable cause for such delay.

v) **Final jurisdiction by Hon'ble Courts**: After exhausting all the aforesaid remedies of dispute settlement, all disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in Udaipur and only Courts in Udaipur / Jodhpur (Raj.) shall have jurisdiction to determine the same.

52. **Particular specifications for Civil Work:**

a. Except for the items, for which particular specifications are given or where it is specifically mentioned otherwise in the description of the items in the schedule of quantities, the work shall generally be carried-out in accordance with the relevant "CPWD Specifications, (with up to date correction slips as on submission of bid (Hereinafter to be referred to as CPWD Specifications) and instructions of Estate Officer. Whenever CPWD Specifications are silent, the latest IS Codes / Specifications shall be followed.

b. The Contractor shall have to engage highly experienced skilled labour, deploy modern T & P and other equipments to execute the work.

c. Samples of all material and fittings to be used in the work in respect of brand, manufacture and quality shall be got approved from the Estate Officer, well in advance of actual execution and shall be preserved till the completion of the work. Articles bearing IS certification mark shall only be used unless no manufacturer has got ISI mark for that particular material. Any material / fitting whose sample has not been approved in advance and any other unapproved material brought by the contractor shall be immediately removed as soon as directed failing which the Estate Officer shall have the power to remove the same at cost of the contractor.

d. Unless otherwise specified in the schedule of quantities, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, floors including terrace, leads and depths and nothing extra

shall be payable on these accounts.

e. The contractor shall give a performance test of the entire installation(s) executed under this agreement as per the standing specifications before the work is finally accepted and nothing extra what-so-ever shall be payable to the contractor for the test.

f. The Contractor shall bear all incidental charges for cartage, storage and safe custody of materials issued by institute/arranged by the contractor.

15.3 Measurement

As per CPWD specifications.

15.4 Tolerances

As per CPWD specifications.

TECHNICAL SPECIFICATION OF EQUIPMENTS

1. Water Cooled Rotary Screw Water Chilling Machine With VFD

1.1 Scope of Work

The specification for chilling machine covers the general design, materials, constructional features, supply, installation, testing, commissioning & carrying out performance test at site. Chilling machines specified in this section is of the water cooled, Rotary Screw chillers with single / multiple compressor on 415 V motor, VSD Capacity control mechanism, Air-cooled VSD starter (chiller mounted / free standing) with active harmonic filters so as to meet IEEE 519 Guidelines.

1.2 Codes & Standards

The design, materials, manufacture, inspection, testing & performance of Water Cooled Rotary Screw chilling machine shall comply with all currently applicable codes, regulation & standards in the locality where the equipment is to be installed. Following codes & standards (Not Limited To) shall be followed:-

ARI 550/590 - Air Conditioning and Refrigeration Institute.Standard for Rotary Screw Water Chilling Packages (General Specifications, Testing and Rating).

ARI 575 - Air Conditioning and Refrigeration Institute. Standard Method of Measuring Machinery Sound Within Equipment Rooms (Basis of all data presented or field testing of equipment, with relation to sound requirements).

ASME CODE - American Society of Mechanical Engineers. Code for
Unfired Pressure Vessels - Section VIII (Design, construction, testing and certification of pressure vessels)

- American National Standards Institute. Safety Code for Mechanical Refrigeration (overall general safety Requirements, relief device sizing, etc.)

Chiller Design Duty

a) Water Chilling Unit shall be of rotary screw type & shall produce actual refrigeration capacity of 350 TR, cooling 840 US GPM of chilled water from 54.0 to 44.0 °F when supplied with 1400 US GPM of condenser water at 90°F. The bidder shall submit performance characteristics of chillers for both specified conditions as above and at ARI conditions.

b) The bidder shall submit printout of computerized selection of chillers duly stamped and signed by authorized representative of the chiller manufacturer from factory along with the tender.

c) The cooler shall be selected for 0.00050 (fps units) fouling factor. Water side shall be designed for minimum 150 psig working pressure. The condenser shall be selected for 0.00100 (fps units) fouling factor. Water side shall be designed for minimum 150 psig working pressure.

d) Power shall be supplied to the chiller at 415 volts — 3 phase - 50 Hertz. The chiller shall use R-134a refrigerant.

e) The cooling capacity specified shall be the net cooling capacity of the chiller produced excluding the cooling requirement for the motor heat rejection. The chiller efficiency shall be calculated based on the net chiller capacity (excluding the cooling capacity required for motor cooling) and the total chiller input power plus any additional power required for the motor cooling.

f) VSD starter should be air-cooled IP 54 (NEMA 12) enclosure type with active harmonic filter to reduce harmonic distortions. The chiller should have THDi (current) less than 5% at equipment level. The VSD panel should display the current distortion so that low THDv (voltage) is achieved at PCC (Point of common coupling) at grid level. Manufacturer to provide PC based software for communication with the VSD, fault logging and analysis.

g) The chiller must have Building Management System(BMS) Compatibility.

1.3 Screw Compressor

The Rotary Screw Water chilling machine shall consist of single / multiple Mono / Twin, Horizontal / Vertical, Hermetic / Semi -hermetic / Open, Direct driven low speed helical rotary compressors, refrigerant / air cooled motor, oil separator, evaporator, condenser, factory mounted

microprocessor based panel, interconnecting refrigerant piping, electronic expansion valve, controls and accessories to make it compact & efficient unit. The capacity control shall be achieved by use of slide valve to provide fully modulating control from 100 % to 20 % of the full load. The cost of starter is to be included in the cost of unit.

1.4 Microprocessor Control Panel

Factory mounted microprocessor-based control panel must be provided with at least the following features:

1. Automatic shutdown protection with manual reset for

a. Low evaporator refrigerant temperature and pressure,
b. High condenser refrigerant pressure,
c. Loss of condenser water flow,
d. High motor temperature,
e. Low oil flow,
f. Electrical distribution faults such as Phase reversal, phase loss, Phase imbalance, motor current overload,
g. High compressor discharge temperature.
h. _Oil Temperature Sensor
i. Chiller Supply Temperature
j. Chiller return temperature

2. Critical sensor or detection of circuit fault in

a. Starter transition failure.
b. External or local emergency stop.

3) Automatic shutdown protection with automatic reset when condition is corrected for loss of chilled water and condenser water flow, high compressor discharge temperature, under / over voltage and momentary power loss.

The monitoring system should be provided for early detection and warning of refrigerant loss. Microprocessor based chilled water reset based on return water is necessary & must be provided.

The unit control panel should be capable of avoiding unit shut down due to transient abnormal operating conditions associated with low evaporator refrigerant temperature, high condensing temperature and motor current overload. If the abnormal operating condition persists and the protective limit is reached, the machine will be shut down. The microprocessor-based panel should be compatible to building management system & the chiller shall have interface card.

Evaporator

Evaporator will be of the shell-and-tube, flooded type designed for 180 psig

working pressure on the refrigerant side and 150 psig on waterside. The heat exchanger shall be hydrostatically tested at 1.5 times the design pressure. Shell will be fabricated from minimum 10 mm thick rolled carbon steel plates with fusion welded seams; have carbon steel tube sheets, drilled and reamed to accommodate the tubes; and intermediate tube supports spaced no more than four feet apart. The refrigerant side will be designed, tested and stamped in accordance with applicable Pressure Vessel Code.

Tubes shall be copper of 19 mm dia O.D. and minimum 0.71 mm wall thickness high efficiency, internally and externally enhanced type having plain copper lands at all intermediate tube supports to provide maximum tube wall thickness at the support area. Each tube will be roller expanded into the tube sheets providing a leak-proof seal, and be individually replaceable. Water velocity through the tubes will not exceed 12 fps. Two liquid level sight glasses will be located on the side of the shell to aid in determining proper refrigerant charge. Aluminium mesh eliminators will be located above the tube bundle to prevent liquid refrigerant carryover to the compressor. The evaporator will have a refrigerant relief device sized to meet the requirements of ASHRAE 15 Safety Code for Mechanical Refrigeration.

The Evaporator shall be horizontal, shell and tube type, provided with the following connections and accessories.

i. Refrigerant inlet and outlet pressure gauges.
ii. Water inlet and outlet connections.
iii. Drain and vent connections with stop valves.
iv. Pressure gauges & transducers / Temperature gauges & thermisters on water inlet and outlet connections.
v. Desealing valves.

Evaporator shall be factory insulated with multi-layer minimum 19 mm thick / or equivalent thermal insulation as per manufacturers standard with vapor barrier, thermal insulation material. The insulation shall be set in hot asphalt or any other compound applied to 100% of insulation contact surface recommended by the insulation manufacturer and shall be applied in layers staggering and sealing the joints.

Condenser

The condenser shells shall be of rolled carbon steel plate with fusion welded seams. Removable compact water boxes of cast iron or welded steel with stub-out water connections shall be provided to permit access for tube cleaning and replacement. The tubes shall be finned from outside having spiral ridges from inside, roller expanded into the tube sheets providing a leak proof seal. The tube material will be copper. Intermediate steel tube supports should be provided at intervals not

exceeding 1200
mm. Two sets of electrical rotary shaft type tube cleaners shall be provided for cleaning of condenser tubes.

The condenser shall be horizontal, shell and tube type. The condenser shall be complete with the following accessories:

vi. Refrigerant inlet and outlet pressure gauges.
vii. Water inlet and outlet connections.
viii. Drain and vent connections with stop valves.
ix. Pressure gauges & pressure transducers, and temperature gauges & Thermisters on water inlet and outlet connections.
x. Descaling valves.

Installation

The chilling machine shall be installed over a cement concrete platform and shall be adequately isolated as per manufacturer's recommendations against transmission of vibrations to the building structure by use of spring packages. For open type, special attention shall be paid to the alignment of the drive and driven shafts; final alignment shall be checked at site in presence of the Contractor or his authorised representatives,

using a dial indicator. Compressor and motor sole plates, anchor bolts and sleeves and necessary vibration isolation pads shall be included.

Painting

Screw water chilling machine shall be finished with durable epoxy/enamel paint. Shop coats of paint that have become marred during shipment or erection, shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with enamel paint to match the finish over the adjoining shop-painted surface.

Performance Rating

The unit shall be selected for the lowest operating noise level. Capacity ratings, and power consumption with operating points clearly indicated, shall be submitted and verified at the time of testing and commissioning of the installation. Capacity shall be ascertained by measurements of chilled water flow rate and temperature of chilled water in and out of the chilling unit.

Power consumption shall be computed from measurements of incoming voltage & input current to the chilling machine. Power consumption of chillers shall be maximum 0.61 KW / TR (At Given Condition) at 100%

load &COP shall be minimum 5.5 when tested according to ARI 550/590-1998. The chiller capacity shall be 350 TR at given condition in BOQ & not at ARI Condition.

Performance Testing

Prior to shipment, chilling machines shall be subjected to inspection and witness of performance tests by Department or his authorized representative / Consultant to verify various performance parameters as confirmed by contractor earlier at the time of award of contract. The contractor shall include the charges for all stage wise inspection(s) and performance testing(s). The charges shall also include airfare, boarding & lodging of a maximum of three persons of Department or his representative / Consultant / Architect for each of the inspection(s) and performance testing(s).

Chiller of each type / capacity shall be factory Performance tested in the presence of Department or his representative / Consultant :

Under simulated conditions of design parameters at full load (100%) & at 3 part load points (75%, 50%, 25%) at constant condenser water entering temperature of 90 deg F in an Euro vent/ARI-accredited test facility.

The manufacturer shall supply certified test reports to confirm performance as specified. The manufacturer shall provide proper ARI/Eurovent certification documents for the test bed with submittals for inspection. The performance test shall be conducted in accordance with ARI Standard 550/590-98 /Eurovent procedures and tolerances.

The equipment will be accepted if the test procedures and result are in conformance with Eurovent/ARI standard 550/590-98. If the equipment fails to perform within the allowable tolerances, the manufacturer will be allowed to make one revision to his equipments and retest as required. The contractor shall pay all associated expenses resulting from retesting. In the event that this revision does not achieve submitted performance, Employer reserves the right to reject the equipment or accept with a penalty.

The contractor shall pay a penalty to Department of Rs. 5,00,000/- per chiller for excess of each input KW at full load or NPLV as compared to his tender submission and input KW measured during testing carried out at manufacturer's work as per ARI condition or/and tender design condition. The Department reserves the right to accept Chillers after recovery of penalty for all chillers whether tested at works or not.

END OF ROTARY SCREW CHILLER SPECIFICATION2.

2 Cooling Tower (CTI Certified)

2.1 Scope of Work

This specification covers the design requirement, materials, constructional feature, manufacture & supply, installation, testing, commissioning of CTI Certified FRP Cooling Towers.

2.1.1 Codes & Standards

The design, materials, manufacture, testing & performance of cooling tower shall comply with all currently applicable codes, regulation & standards in the locality where the equipment is to be installed along with CTI certification. The cooling tower shall also conform to the latest application of International Standards & shall meet ASHRAE 90.1-2004 performance standards.

2.1.2 Types & Capacity of Cooling Tower

The cooling tower shall be induced draft, cross / counter flow type conforming to their respective specification & of rectangular / square profile. Each cooling tower actual capacity shall be as specified in BOQ.

2.1.3 Constructional Feature of Cooling Tower

The induced draft cross / counter flow FRP cooling tower shall be complete with FRP casing, fil1, internal supporting structure, drift eliminators, fan, fan motor, hot water distribution system & cold water basin. All steel components including assembly hardware shall be hot dip galvanized. Suitable access shall be provided for the inspection & maintenance of fan. The design of louvers, fill & drift eliminators shall ensure minimum resistance to flow of air. The induced draft propeller fan of the cooling tower shall be direct driven by TEFC squirrel cage motor located outside the moist air stream. The fill sheet includes both louvers and drift eliminators & the louvers should prevent water from escaping the fill sheets to assure proper & efficient heat transfer throughout wide variations in the airflow. Drift losses for the cooling tower should not be more than 0.02% of the circulated water. Suitable screens between the side of the cold-water basin & the base of the fill should be provided to prevent foreign materials in the circulating water flow & should be easily removable. The fan motor shall be suitable for 415 volts +10%, 3 phases, 50 Hz + 5%, AC supply conforming to IP -65.

Cold Water Basin

The cold-water basin shall be a deep fibre glass reinforced sump on which cooling tower structure shall be supported Basin fittings shall have the following.

i. Bottom Outlet.

ii. Screened suction assembly fixed to the basin.

iii. Drain at under side of suction, suction side sheet.

iv. Overflow fixed to inside of casing side sheet.

v. Ball type automatic make-up water valve.

vi. Equalizing connection & balancing valves for multiple CTs as required. Quick Fill arrangements.

vii. Ball cock floating valve arrangement needs to be provided for water ovflow from the CT Basin.

Mechanical Equipment

The cooling tower shall be provided with low speed, low noise, and acoustically treated fans running at lower RPM through direct driven motor. Fan speed shall not be more than 750 RPM. Fan shall be of the propeller type lightweight rotor fitted with multiple aerofoil blades. The entire fan assembly shall be statically and dynamically balanced. Fan shall be driven by TEFC motor suitable for 415 volts +10%, 3 phases, 50 Hz + 5%, AC supply conforming to IP65. Fan motor shall be energy efficient motor weatherproof construction, designed and selected to operate in humid air stream. Fan guard shall be provided to prevent birds from nesting during idling periods. G.S.S canopy shall be provided over the fan motor for protection against rainwater. Care shall be taken that fan air is not restricted. Motor terminal box shall be made watertight.

Fillings:

The Fillings shall be made of corrosion proof and rigid film in cross fluted design and arranged in square / rectangular form and shall be elevated from the floor of the cold water basin to facilitate cleaning and easy replacement. They shall be arranged in such a manner to ensure negligible resistance to airflow and to eliminate backwater spots and prevent fouling trough scales that may form. In order to reduce carry-over losses through entrapment of water droplets in air stream, PVC drift eliminators shall be installed.

Distribution Header

Hot water distribution system shall comprise of header and branch arms system.

2.1.4 Accessories

The cooling tower basin shall be provided with automatic float valve with a stop valve for continuous make up water flow, quick fil1 arrangement with stop valve, over-flow and drain connections with stop valves. A hot water bleed connection to the drain line through a stop valve shall be provided. It shall be connected to the drain line below the drain stop valve. Steel ladders shall be provided in such a manner and location as necessary to give safe and complete access to all parts of tower requiring inspection. Each ladder shall be made of iron sides and 16 mm straps and shall be bolted to the tower on the top and grouted in masonry at the bottom end. All Hardware used shall be of stainless steel. All pipe connections shall be hot dip galvanized and double flanged.

2.1.5 Painting

All exposed steel surfaces shall be given two coats of epoxy paint & the colour finish of cooling tower shall as per Architect's decision.

2.1.6 Performance Data:

The complete performance ratings and power consumption as per CTI certification at varying outdoor wet bulb temperatures shall be submitted and verified at the time of testing and commissioning of the installation. The Capacity of the cooling tower shall be computed. The performance required for cooling tower is minimum 38.2 GPM/HP when tested according CTI ATC-105 procedure.

2.1.7 Testing:

Cooling tower being critical equipment for proper functioning of chillers, strict quality control is required. Capacity of the cooling tower shall be computed from the measurements of water flow, incoming/outgoing water temperatures and ambient air wet bulb temperature using accurately calibrated thermometers. Computed ratings shall conform to the specified capacities and quoted ratings. Power consumption for cooling towers shall be computed from measurements of incoming voltage and input current.

END OF COOLING TOWER SPECIFICATION

3. Pumps

3.1 Scope Of Work

This section deals with supply, erection, testing and commissioning of water Vertical Inline Pumps conforming to general specification and suitable for the duty selected as indicated in Technical Requirement of Equipment. The type, capacity and size of pumps shall suit the parameters given under. The Pumps selected should have high efficiency, which should be supported by selection charts and curves.

3.2 Horizontal/ vertical Pumps Sets (As mentioned in BOQ)

Horizontal/Vertical end suction/ split casing (as mentioned in BOQ) Centrifugal Pump shall be selected for chilled / condenser water re-circulation duty. The pump casing shall have heavily ribbed construction, suction and discharge connection shall be flanged of the same size and shall be drilled and tapped for seal flush and gauge. The impeller made of bronze shall be double shrouded, single entry, radial flow type. It shall be hydraulically balanced to minimize axial thrust. The stuffing box shall be factory fitted with mechanical seal.

The construction of Pumps shall be as follows and as per IS 1520

Duty	Chilled / Condenser Water
Casing	Cast Iron
Impeller	Bronze
Pump Shaft Bearings	Stainless Steel Grade 416 Ball / Journal Bearing
Speed (Synchronous)	1500 RPM
Motor	TEFC
Mechanical seal	Factory fitted

The impellers of pumps shall be statically and dynamically balanced.

3.3 Motor Capacity

The capacity of motor shall be 10% in excess of BHP requirement of pump & shall be as per Standard Specifications. The tenderer shall provide detailed calculation for selection of pumps.

The contractor as per manufacturer recommendations shall carry out the installation of pumps. After installation of the complete system and before testing, the pump shall be lubricated in strict accordance with the manufacturer's instructions. The pumps shall be installed in a manner that would allow maintenance without causing damage to the insulation.

After completion of installation and testing, the pumps shall be painted as specified in tender document.

END OF PUMP SPECIFICATION

4 Variable Speed Pumping System

4.1 Scope of Work

This section deals with supply, erection, testing and commissioning of variable speed pumping system for chilled water conforming to general specification and suitable for the duty selected as indicated in Technical Requirement of Equipment. The type, capacity and size of pumps shall suit the parameters given under. The Pumps selected should have high efficiency, which should be supported by selection charts and curves. This package shall consist of the following:

1. Pump, Motor, Base Frame, Coupling
2. Pump Control Panel
3. Adjustable Frequency Drive
4. Sensor Transmitters
5. Sequence of Operation
6. Connection drawings and wiring diagrams to be supplied with the pumping package.

4.2 References

ANSI	- American National Standards Institute
NEMA	- National Electrical Manufacturers Assoc.ciation
UL	- Underwriters Laboratories Inc.
ETL	- Electrical Testing Laboratories

CSA	- Canadian Standards Assoc.ciation
NEC	- National Electrical Code
ISO	- International Standards Organization
IEC	- International Electro technical Commission

4.3 Submittals

Submittals shall include the following related to this project only & not general:

1. System summary sheet
2. Sequence of operation
3. Shop drawing indicating dimensions, required clearances and location and size of each field connection
4. Power and control wiring diagrams
5. System profile analysis including variable speed pump curves and system curve. The analysis shall also include pump, motor and AFD efficiencies, job specific load profile, staging points, horsepower and kilowatt/hour consumption.
6. Pump data sheets

4.4 Quality Assurance

1. The pump manufacturer shall assemble the pumping package. An assembler of pumping systems not actively engaged in the design and construction of centrifugal pumps shall not be considered a pump manufacturer. The manufacturer shall assume "Unit Responsibility" for the complete pumping package. Unit responsibility shall be defined as responsibility for interface and

   successful operation of all system components supplied by the pumping system manufacturer.

2. The manufacturer shall have a minimum of 10 years experience in the design and construction of variable speed pumping systems.

3. The local supplier of Chilled Water Variable Speed Pumping System (VSPS) Must have relevant expertise in all aspects of design, application engineering, Installation, programming, interfacing, commissioning and after sales service.

4. The manufacturer shall be fully certified by the International Standards Organization per ISO 9001. Proof of this certification shall be furnished at time of submittal.

5. Manufacturer shall be listed by Underwriter's Laboratories as a manufacturer of packaged pumping systems.

6. Bidders shall comply with all sections of this specification relating to packaged pumping systems. Any deviations from this specification shall be bid as a voluntary alternate clearly defined in writing. If no exceptions are noted, the supplier or contractor shall be bound by these specifications.

4.5 Manufactured Units

4.5.1.1 Furnish and install as shown on the plans a Variable Speed Pumping System as manufactured by approved make.

4.5.1.2 The control system shall include as, a minimum, the programmable logic pump controller, adjustable frequency drive(s) and remote sensor/transmitters as indicated on the plans. Additional items as specified or as required to properly execute the sequence of operation shall be supplied & installed.

4.5.1.3 The variable speed pump logic controller, adjustable frequency drive(s) and remote sensor/transmitter(s) shall ship as individual components to the jobsite.

4.5.1.4 Pump logic controller, adjustable frequency drives, sensor/transmitters and related equipment shall be installed by the AC contractor as shown on the plans.

4.5.1.5 Line voltage power wiring shall be installed by the electrical expert hired by the AC contractor as shown on the field connection drawings and wiring diagrams supplied with the pumping package.

4.5.1.6 Low voltage (24 VDC and 115 VAC) wiring shall be installed by the controls expert hired by the AC contractor as shown on the field connection drawings and wiring diagrams supplied with the pumping package

4.5.2 Components

A) Pump Logic Controller

1. The pump logic controller assembly shall be listed by and bear the label of Underwriter's Laboratory, Inc. (UL). The controller shall be specifically designed for variable speed pumping applications. Pump Logic Controller shall be suitably interfaced with one Adjustable Frequency Drive housed within same enclosure.

2. The controller shall function to a proven program that safeguard against damaging hydraulic conditions including:

a) Pump flow surges
b) Hunting
c) End of curve
d) Motor overload

3. The pump logic controller shall be capable of receiving up to two discrete analog inputs from zone sensor/transmitter as indicated on the plans. It will then select the analogue signal that has deviated the greatest amount from

its set point. This selected signal will be used as the command feedback input for a hydraulic stabilization function to minimize hunting. Each input signal shall be capable of maintaining a different set point value. Controller shall be capable of controlling up to three pumps in parallel.

4. The pump logic controller shall be capable of accepting an additional analog input for a flow sensor. This input shall serve as the criteria for the end of curve protection algorithm.

5. The hydraulic stabilization program shall utilize a proportional-integral-derivative control function. The proportional, integral and derivative values shall be user adjustable over an infinite range.

6. The pump logic controller shall be self-prompting. All messages shall be displayed in plain English. The operator interface shall have the following features:

a. Multi-fault memory and recall last 10 faults and related operational data.
b. Red fault light, yellow warning light, and Green power on light
c. Soft-touch membrane keypad switches.

7. The display shall have four lines, with 20 characters on three lines and eight large characters on one line. Actual pump information shall be displayed indicating pump status.

8. The following communication features shall be provided to the BAS:

a. Remote system starts / stops non-powered digital input.
b. Failure of any system component. Output closes to indicate alarm condition.

c. One 4-20 mA output with selectable output of:

1. Frequency.
2. Process variable
3. Output current
4. Output Power

B) Variable Frequency Drive

1. The variable frequency drive(s) shall be pulse width modulation (PWM) type, microprocessor controlled design.

2. The VFD, including all factory-installed options, be tested to UL Standard 508. The VFD shall also meet C-UL and be CE marked and built to ISO 9001 standards.

3. The VFD shall be housed in a NEMA 1 IP 55 enclosure.

4. The VFD shall employ an advanced sine wave approximation and voltage vector control to allow operation at rated motor shaft output speed with no de-rating. This voltage vector control shall minimize harmonics to the motor

to increase motor efficiency and life. Power factor shall be near unity regardless of speed or load.

5. The VFD shall have balanced DC link reactors to minimize power line harmonics. VFD's without a DC link reactor shall provide a 3% impedance line reactor.

6. Automatic motor adaptation (AMA) algorithm shall be utilized. This feature shall allow for automatically optimized drive performance and efficiency leading to additional energy savings.

7. Input and output power circuit switching can be done without interlocks or damage to the VFD.

8. The following customer modifiable adjustments shall be provided:

a. Acceleration time.
b. Deceleration time.
c. Minimum frequency.
d. Maximum frequency.

9. RS-485 communication for Johnson Controls N2 and Landis and Staefa FLN.

10. An automatic energy optimization selection feature shall be provided. This feature shall reduce voltages when lightly loaded and provide a 3% to 10% additional energy savings.

11. The VFD shall be suitable for elevations to 3300 feet above sea level without de-rating. Maximum operating ambient temperature shall not be less than 110 degrees F. VFD shall be suitable for operation in environments up to 95% non-condensing humidity.

12. The VFD shall be capable of displaying the following information in plain English via a 40 character alphanumeric display:

a. Frequency
b. Voltage
c. Current
d. Kilowatts per hour
e. Fault identification
f. Percent torque
g. Percent power
h. RPM

C) Sensor / Transmitters

Provide field mounted differential pressure sensor transmitter(s) as indicated on the plans. Unit shall transmit an isolated 4-20mA dc signal indicative of process variable to the pump logic controller via standard two wire 24 DC system. Unit

shall have stainless steel wetted parts with two 0.25" male NPT process connections. It shall be protected against radio frequency interference and shall have a watertight, NEMA 4 electrical enclosure capable of withstanding 2000 PSI static pressure with a 0.5" NPT conduit connection. Accuracy shall be within 0.25% of full span.

Minimum two numbers of differential pressure sensors located at strategic location with substantial flow demand or remoteness at each zone served by secondary pumping shall be provided.

D) Sequence of Operation

1. The system shall consist of a pump logic controller, multiple pump/VFD sets, with manual and automatic alternation and pump staging.

2. The pumping system shall start upon the closure of customer's contact when the pump logic controller Mode of Operation selector switch is in the REMOTE position.

3. When the pump logic controller selector switch is in the LOCAL position, and start command on controller is given via operator interface, the pumping system shall operate automatically.

4. Sensor/transmitters shall be provided as indicated on the plans.

5. Each sensor/transmitter shall send a 4-20mA signal to the pump logic controller, indicative of process variable condition.

6. The pump logic controller shall compare each signal to the independent, engineer/user determined set points.

7. When all set points are satisfied by the process variable, the pump speed shall remain constant at the optimum energy consumption level.

8. The pump logic controller shall continuously scan and compare each process variable to its individual set point and control to the least satisfied zone.

9. If the set point cannot be satisfied by the designated lead pump, the pump logic controller shall initiate a timed sequence of operation to stage a lag pump.

10. The lag pump shall accelerate resulting in the lead pump(s) decelerating until they equalize in speed.

11. Further change in process variable shall cause the pumps to change speed together.

12. When the set point criteria can be safely satisfied with fewer pumps, the Technologic pump logic controller shall initiate a timed de-stage sequence and continues variable speed operation [wherever applicable].

13. As the worst case zone deviates from set point, the pump logic controller shall send the appropriate analog signal to the AFD to speed up or slow down the pump/motor.

14. In the event of an VFD fault, the pump logic controller automatically initiates a times sequence of events to start the redundant pump/AFD set in the variable speed mode. The redundant variable speed system shall be started through the pump logic controller.

15. Upon VFD fault(s), the pump controller shall display an alarm condition through a plain English message.

16. VFD fault indication shall be continuously displayed on the operator interface of the pump until the fault has been corrected and the controller has been manually reset.

17. In the event of the failure of a zone sensor/transmitter, its process variable signal shall be removed from the scan/compare program. Alternative zone sensor/transmitters, if available, shall remain in the scan/compare program for control.

18. Upon sensor failure a plain English warning message shall be displayed on the operator interface of the pump logic controller.

19. In the event of failure to receive all zone process variable signals, a user selectable number of VFDs shall maintain a user adjustable speed; reset shall be automatic upon correction of the zone failure.

END OF VSPS SPECIFICATION

5 ANTI - FOULING CONDENSER SYSTEM/AUTOMATIC TUBE CLEANING SYSTEM

5.1 Ball Trap:

The ball trap shall be mounted between two flanges - (BS Table 10 E) Grade B, 15 days 100 lbs capacity, at the outlet line of the condenser. The casing shall be made from a MS material of IS2062 Grade B. The Ball trap shall have epoxy based finished paint. The screen inside is made from stainless steel SS304L perforated metal sheet.

The Ball Trap should have pressure drop of less than 800 mm of WC. The body of the Ball trap shall be of size as nozzle or flange size or the pipeline size in which Ball trap must be installed. For example, if the pipeline size is 10 inches the Ball trap body should be of 10 inches.

The Ball Trap shall have Race Face Flange with gasket on only inner dial of pipe and should not be on the entire flange dia to avoid leakage.

5.2Ball Collector:

The ball Collector shall be made of suitable size capable of storing all the sponge balls required and should be made from MS material of IS2062 Grade B. The Ball collector should have epoxy based finished paint. The Ball Collector should have a sight glass for monitoring the balls. Toughened glass should be used and should be mounted by Allen key fasteners or SS nut bolt.

5.3Skid with Pumps & Valves:

The Common Skid should have pipe and flanges of MS material IS2062 Grade B. All welding of Skid shall be performed by Argon weld. The Skid frame should be of MS material of same IS2062 grade B. The Skid valves should be of diaphragm type or equivalent with all joints to be flanged and bolted. The valves used for injection and collection from respective chillers shall be of actuator type with minimum IP54 protection and less tan 10s running time for open or close function with NEMA –II protection. The valve should be suitable to work in high humid environment up to 95% (Non-condensing) RH. All fasteners shall be of high-tension grade 9.8, 10.9, 12.9. Pumps shall be from reputed makes like Grundfos/Xylem/Amstrong. Motorized Valves shall be from reputed makes like Belimo/Siemens/Honeywell or as specified in the Approved Make list.

5.4Control Panel:

The Control Panel should be PLC based with LCD depiction of injection and collection cycle. The touch display should show system wise running along with pump running and off condition. The alarms and faults shall be indicated on the screen in case of any issue in operation. Display must be Touch type, graphical presentation, and with multi-level security passwords with defined functional authorities. The PLC Panel should have IOT Ready Option & system manufacturer should have digital platform (App Based) for demonstration of key parameters of chiller efficiency for Future Scalability

5.5 Working Principle - Activity Sequence

The operation is based on the circulation of the sponge ball through the condenser tube. The sponge ball must be pushed to the condenser inlet in **not more than 5 seconds** by a **high flow of water (min. 7 L/S)** which can be produced by a high-pressure source **at least 2bar** higher than the injection point at the condenser inlet. The source can be obtained by a single water injection pump in water injection system. Water injection system will be operated by a PLC controller which is pre-programmed to execute the cleaning process in two consecutive steps. There shall be ball injection cycle and ball collection cycle. The proposed system should be manufactured and complied with ISO 14001:2015, ISO 9001:2015. The system must be CE + RoHS compliant and in accordance with UL standards.

a**) STEP 1:**

The PLC shall activate the cleaning process by detecting the on/off status of the corresponding chiller (or condensing water isolating valve). If the chiller is on, the PLC shall command the control valves to open to manage the injection. The check

valves shall be installed in the location as shown on the scheme above and as close as possible to the collector to ensure correct water flow direction during the injection cycle and the collection cycle.

b) STEP 2:
The injection cycle, the PLC shall command the injection control valve to open for couple of seconds (the collection control valve kept closed in the cycle) and then close. The water pressure from the pump shall be used to push the water inside the injector to the collector and force all balls in the collector to the condenser.

c) STEP 2:
The cycle shall be completed until the ball passing through the condenser where it should clean all the deposits on internal surface of the tubes. After leaving condenser the balls shall be trapped inside the ball trap unit.

d) STEP 2:
After the injection cycle is finished, the PLC shall command the collection control valve to open for couple of seconds (the injection control valve kept closed in the cycle) and then close. The negative pressure shall let the ball return from the ball trap unit back to the collector where the rinsing of the balls is carried out and then water is discharged to the outlet header of Condenser which goes to cooling tower. The ball shall wait in the collector until the next injection cycle. The time of the collection cycle is normally pre-set at 27 minutes.

a) single pump should be on skid and shall be running during injection and collection cycles.

b) The pressure drop across ball trap shall not be more than 800mm.

c) The Valves shall give feedback to Control PLC of functioning.

d) The Control PLC shall raise an alarm in case of any malfunctioning of system

e) The total time of the whole cycle (injection and collection cycle) shall be 3 - 4 minutes.

f) A maximum number of 4 Condensers should be controlled by single skid and Control Panel. If the number of Condenser increases beyond 4, additional Skid with Control Panel should be considered and should be followed consequently.

Testing: The Manufacturer shall have Hydrostatic Test Bed Facility to Witness Factory Acceptance Test for Hydrostatic Testing of machine at 10 Bar Pressure.

END OF ATCS SPECIFICATION

6 TECHNICAL SPECIFICATION FOR ELECTRICAL ITEMS

6.1 Electrical Motors

6.1.1 Scope of Work

The scope of this section comprises the supply, installation, testing & commissioning of all types of motors used for HVAC Units conforming to these specifications and in accordance with Schedule of Quantities. The motor installation, wiring & its control shall be carried out in accordance with the specifications as detailed below.

6.1.2 Motors

The motor shall be of the following design and should run at all loads without any appreciable noise or hum.

Totally enclosed fan cooled Sq. Cage.

Enclosure and type of motor shall depend upon duty and usage unless otherwise specified.

6.1.2.1 The winding of motors shall be class 'B' insulation and suitable for local conditions. The insulation of motors shall confirm to IS:325/1978.

6.1.2.2 All motors shall comply with IS:325, IEC-34.1 or BS — 2313, IEC-72.1 for foot mounted motors.

6.1.2.3 The rating of the motor shall be as indicated in the Schedule of Quantities. The motors shall be selected on the basis of ambient temperatures and allowable maximum temperature rise.

6.1.2.4 Motor above IHP shall be three phase unless otherwise specified.

6.1.2.5 All motors shall be rated for continuous duty as per IS:325. Motor shall be suitable for operation on 415 volts + 10% volts, 50 + 5% Hz three phase AC supply (or 230 + 10% volts, 50 + 5% Hz for single phase AC supply).

f) Motors shall be provided with cable box to receive Aluminum conductors, PVC insulated, PVC sheathed and armored cables.

g) All motors shall be provided with combination of 'Ball and Roller Bearing'. Suitable grease nipples for regreasing the bearing shall be provided.

h) Motors above 0.25 HP shall be provided with overload protection. Motors above 100 HP shall be provided with thermal protection and thermistor detector in the stater winding.

i) The starter current and the type of starter to be used shall be as follows (unless otherwise specified)

Type of motor	**Starting Current**	**Starting method**
a) Sq. Cage motor up to 7.5 HP	600% of full load current	D.O.L
b) Above 7.5 HP up to 60 hp	250% of full load current	Star / Delta
c) 75 HP & above	200% of full load current	Closed transition Star / Delta or Double Star

6.1.3 Motor Starters

6.1.3.1 All starter shall confirm to IS: 13947. The starter shall be enclosed in sheet metal enclosure, which would be dust vermin proof.

6.1.3.2 All starter should have suitable range of voltage and frequency.

6.1.3.3 All starter shall have integral stop/start push button of international colour code.

6.1.3.4 Contactor shall have number of poles as required for appropriate duty. Contacts should be made of solid silver faced & shall be suitable for at least 40 contacts per hours.

6.1.3.5 In event of power failure, the starter should automatically disconnect.

6.1.3.6 All starters shall be provided with thermal over load relay.

6.1.3.7 All star delta starters shall have adjustable timers.

6.1.3.8 Terminal blocks with integral insulating barrier shall be provided for each starter.

6.1.3.9 All starters shall be provided as specified in Schedule of Quantities. All starter shall be compatible to the drive and driven equipment.

6.1.3.10 Extra contact for interlocking purpose shall be provided in the starter.

6.1.3.11 All starter shall be compatible for Auto / Manual operation (BMS Compatible)

6.1.3.12 All starter shall have separate single phasing preventer.

6.1.4 Installation of Motors

6.1.4.1 The motor and drive machine shall be fixed on slide rails to facilitate belt and other adjustments.

6.1.4.2 Vibration isolation arrangement shall be provided.

6.1.4.3 The installation of motor shall be carried out as per IS:900.

6.1.4.4 The motor with driving equipment shall be mounted on foundation and connected to each other with flexible coupling with guard in condenser & chilled water pumps.

6.1.4.5 All motor shall be wired as per specifications. Earthing of motor frame shall be done with GI strips as specified in 'Schedule of Quantities'.

6.1.4.6 All motors shall be tested at manufacturer's works as per I.S. standard and test certificates shall be furnished.

6.1.4.7 All motors after AC contractor shall test installation at site for vibrations, heating and electrical insulation resistance.

END OF ELECTRICAL MOTORS SPECIFICATION

6.2 Motor Control Centre, Ventilation Sub Panel, Power & Control Cabling, Earthing etc.

6.2.1 Scope of Work

The scope of this section comprises the supply, installation, testing & commissioning of Motor Control Centre, Ventilation Panels, AHU Sub Panel, power / control cabling & earthing work shall be carried out as per the specification given below and in accordance with Schedule of Quantities. All work shall confirm to Indian Electricity Act (amended up to date), I.S. code of practices, local rules and regulations etc. The codes & standard to be followed shall be as given below:-

- BIS 13947 (Part 4) - AC contactors up to 1000V
- BIS 13947 - AC Circuit Breakers
- BIS 2705 - Current Transformers
- BIS 3156 & 4146 - Potential Transformers
- BIS 4064 - Air break switches for voltage not exceeding 1000V
- BIS 13947 - Control switches
- BIS 1822 - Motor duty Switches
- BIS 12021 - Specification for control transformer
- BIS 8623 - Factory built assembly of switchgear & control gear
- BIS 13947 (Part I) - Degree of protection for enclosure
- BIS 3842 - Specification for electrical relays for AC system
- BIS 13707 - Specification for HRC fuses
- BIS 5082 - Wrought Al. and Aluminium alloys, bars, rods, tube and sections for electrical purposes
- BIS 13947 (Part 1) - General requirement for switchgear & control gear for voltage not exceeding 1000V
- BIS 3231 - Electrical relays for power system protection

6.2.2 Motor Control Centre / Ventilation Sub-Panel

Motor control centre shall be floor mounted extendable type bolted construction & Ventilation sub-panel shall be wall mounted type. The sheet steel (CRCA) used for fabrication shall be of 2.0mm for load bearing members and 1.6mm for non-load bearing members. The panels shall be supplied with required base channels. These panels shall be cubical sectionalized type, totally enclosed dust & vermin proof. Gaskets shall be provided in all joints to prevent dust to reach the internals of the panels to make it completely dust proof. The degree of protections for panels shall be IP 52 for indoor applications and IP 65 for outdoor applications as per IS:2147.

These panel (MV) shall be suitable for voltages up to 500 volts, three phase 50 Hz, 4 wire supply capable of functioning satisfactorily in temperature ranging up to 45 to 50 degree centigrade and rupturing capacity suitable for connected load & design should be type tested for 42 KA fault level. All joints of panels shall be welded and braced as necessary to provide a rigid support for all components. The base channel provided in the floor mounted MV panel shall be l00mm x 50mm x 6mm & a clear space of 200mm between the floor and the bottom most part of the unit shall be provided. The panel shall be correctly positioned. Self- threading screws shall not be used in the

construction of control panels. Appropriate knock-out holes of proper sizes shall be provided for incoming and outgoing cables. The facility for bottom or top entry of cables in the panels shall be provided. Necessary cables clamps shall provided for holding the cables in position.

All power/control wiring inside the panel shall be colour coded and control wiring ferruled for identification purpose. All labeling shall be provided in engraved anodized aluminum strips on the front face of the panel.

Each circuit breaker shall be housed in separate compartments. It shall have steel sheets on top and bottom of compartment. The steel sheet hinged door shall be interlocked with the circuit breaker on the “ON” position. When the breaker is on the “ON” position, suitable preventive measures shall be provided, such as interlocks, to prevent the breaker from being drawn out. When the breaker is in “ON” position steel sheet shall be provided between the tiers in the vertical section. The door of this compartment shall not form part of the draw out arrangements.

6.2.3 Bus-Bars

The bus-bar and its connections shall be aluminum Electrolytic grade E-91 as per IS: 5082 and shall be of rectangular section. These should be suitable for fullload current for phase bus-bar and neutral bus-bar shall be of half rated current capacity. The bus- bar should have provision on either side for extension. The bus-bar should be sleeved with colour coded heat shrinkable PVC sleeve. Bus-bar supports shall be of fibre glass reinforced thermosetting polyester having in built and tracking barriers to break the path of conducting dust through moulded ribs.

In panels bus-bar connections shall be done by drilling holes with cadmium coated bolts and nuts. Extra cross section shall be provided to compensate drilling of the holes. Insulated aluminum strips of suitable size of full rated current capacity shall be used for interconnecting bus-bar and breaker.

A horizontal / vertical wire way shall be provided for interconnecting control wiring between different vertical sections.

The terminal blocks shall be used for outgoing terminals and neutral link at a suitable located place in the control panel. Separate compartments for outgoing and incoming cable shall be provided. The current transformers of all instruments shall be mounted with terminal blocks.

All live parts including incoming and outgoing link / terminals should be totally shrouded by means of non hygroscopic and fire retardant material.

6.2.4 Air Circuit Breakers

The circuit breaker shall be capable of making and breaking the specified fault currents without straining or damaging any part of the switchgear. The breakers shall be air break, motorized / manually operated as specified in BOQ and draw out type. All feeders of rating 800A and above shall be ACB and of fully draw out type. The circuit breaker shall be stored energy closing type, manual/electrically operated with

tripping mechanism. The circuit breaker shall be provided with 4 NO + 4 NC of auxiliary potential free contacts required for indication, control, interlocking and other purposes. All contacts shall be wired to a terminal block. Circuit breakers with stored energy closing mechanism shall be capable of making the rated short-circuit current, when the stored energy is suitably charged by a spring. It shall also be capable of closing on no-load without suffering undue mechanical deterioration. The maximum make- time shall also not be exceeded.

The direction of motion of the handle, for manual spring charging shall be marked. A device indicating when the spring is charged fully shall also be provided. Motors and their electrically operated auxiliary equipment for charging a spring shall operate satisfactorily between 85% and 110% of the rated supply voltage. The breaker operating mechanism should store energy for O-C-O operation and shall not, in any case, get stuck in closed position during this cycle. After failure of power supply to the motor, at least one open-close-open operation of the circuit breaker shall be possible. The breaker operating mechanism shall be electrically and mechanically trip-free in all positions.

All ACBs shall be provided with microprocessor based trip unit for protection against overload, short circuit and earth faults. The releases shall be communicable to other systems on an open communication protocol. The Communication Port shall be provided in front/back. The circuit breakers shall be suitable for locking in fully isolated condition.
Following interlocks and features shall be provided so that

6.2.4.1 Truck can be moved within panel only when CB is off.

6.2.4.2 CB can be closed only when the test (or) service limit switches permits.

6.2.4.3 Breaker compartment door cannot be opened when the CB is in Service/test position.

6.2.4.4 Breaker cannot be put in to service position with compartment door open.

6.2.4.5 Earth slide beyond the test position till trolley is drawn out.

Closing and tripping coil shall operate satisfactorily under the following conditions of supply voltage variation:

6.2.4.5.1 Closing coils — 85% to 110% of rated voltage..

6.2.4.5.2 Trip coils — 70% to 110% of rated voltage.

6.2.5 Moulded Case Circuit Breakers

The MCCBs shall confirm to the latest applicable standards. MCCBs in AC circuits shall be of four pole construction arranged for simultaneous four pole manual closing and opening. Operating mechanism shall be quick-make, quick-break and trip free type. The ON, OFF and TRIP positions of the MCCB shall be clearly indicated and visible to the operator. Operating handle for operating MCCBs from door of board

shall be provided. MCCB terminals shall be shrouded and designed to receive cable lugs for cable sizes relevant to circuit ratings. MCCBs shall incorporate time delay devices to ensure that it will tolerate harmless transient overload unless this is well in excess of 25% of its rated value for a sustained period. The circuit breaker shall be provided with 2 NO + 2 NC of auxiliary potential free contacts required for indication, control, interlocking and other purposes. All contacts shall be wired to a terminal block. The breaking capacity of MCCB's shall be as per the design requirements.

6.2.6 Miniature Circuit Breakers

Miniature Circuit Breaker shall comply with IS-8828-1996/IEC898-1995. Miniature circuit breakers shall be quick make and break type for 230/415 VAC 50 Hz applications with magnetic thermal release for over current and short circuit protection. The breaking capacity shall not be less than 10 KA at 415 VAC. MCBs shall be DIN mounted. The MCB shall be Current Limiting be type (Class-3). MCBs shall be classified (B,C,D ref IS standard) as per their Tripping Characteristic curves defined by the manufacturer. The MCB shall have the minimum power loss (Watts) per pole defined as per the IS/IEC and the manufacturer shall publish the values. The housing shall be heat resistant and having a high impact strength. The terminals shall be protected against finger contact to IP20 Degree of protection. All DP, TP and TPN miniature circuit breakers shall have a common trip bar.

6.2.7 Rotary Switch / Selector Switch / Switches / HRC Fuses / Starters / Single Phase **Preventers / Toggle Switch**

These shall be of approved make and conforming to relevant ISI standard. The rupturing capacity of HRC fuses should not less than 80 KA and in case of switches it should be 60 Amps maximum.

6.2.8 Current Transformer

The current transformers shall have accuracy of class I and 5P10 / 10P10 and suitable VA burden for operation of the connected meters and relays.

6.2.9 Overload Relays

All the motors shall have overload relay protections conforming to relevant IS.

6.2.10 Time Delay Relays

These shall be adjustable type with time delay adjustments of 0-180 or as per manufacturers standards.

6.2.11 Indicating Lamps And Metering

These shall confirm to BS37 & BS39. All meters shall be flush mounted and draw-out type. The indicating lamp shall be filament type and with very low burden & economy resistor.

6.2.12 Voltmeter And Ammeters

Motor Control Centre (MV Panel) shall have flush type voltmeter & ammeter of size 96 x 96 mm.

6.2.13 Push Button Stations

These shall be suitable for panel mounting and accessible from front without opening. These shall be provided for manual starting and stopping of motors/equipments as per normal practices. The contacts shall be suitable for 6AMP current capacity.

6.2.14 Name Plate

Suitable anodized Aluminium name plate of 1.2 mm thick shall be provided on all the Switchboards and individual compartments.

6.2.15 Conduits

These shall be preferable made of mild steel, stove enameled from inside and outside with minimum wall thickness of 1.6 mm for conduits up to dia of 25mm and 2 mm for conduits above 25 mm diameter.

6.2.16 Cables

Cable shall be supplied inspected, laid, tested and commissioned in accordance with drawings, specifications, relevant Indian Standards Specifications and cable manufacturer's instructions. The cable shall be delivered at site in original drums with manufacturer's name clearly written on the drum.

The cables shall comply with the latest edition of the following standards

- BIS: 7098 (PART-I) - XLPE Cables - LT
- BIS: 8130 - Conductors for insulated electric cables & flexible cords.
- BIS: 3975 - Mild steel wires, strips & tapes for armouring of cables.
- BIS: 10418 - Wooden drums for electric cables.
- BIS: 10810 (PART 58) - Oxygen Index test The material of cable shall be as

follows:-

6.2.16.1 The MV power cable of 660/1100 V. grade shall be XLPE insulated Aluminium conductor armoured cable.

6.2.16.2 The MV control cables shall be PVC insulated copper conductor armoured stranded cable.

6.2.16.3 The HT power cable of 415 V grade shall be XLPE insulated Aluminium conductor armoured cable.

6.2.17 Laying Of Cables

These shall be laid as Indian Standard code of practice. All cables shall be laid on 16G GI Perforated U shaped Channel 40mm x 20mm cable trays. In case more than one cable is running, then proper space in between the two cables shall be provided to avoid loss of current carrying capacity. While cables are running on walls, proper saddles must be provided.

6.2.18 Wire Sizes

Single stand PVC-copper conductor wires shall be used inside the control panel for interconnecting different components. All wires shall be neatly dressed and coloured beads shall be provided for easy identification in control wiring. The minimum size of control wiring shall be 1.5sq.mm. Testing of panels as per code of practice shall be done at works by Employer / Architect before inspection & dispatch to site.

6.2.19 Drawings

Necessary drawings of all control panels and wiring of equipment etc., shall be submitted by the contractor for approval of the Engineer in Charge. On final completion of job and before handing over of AC System As Built Drawings shall be submitted to the Department.

6.2.20 Testing

All equipment and components supplied may be subjected to inspection and tests by the client / consultant or his authorized representatives during manufacture, erection / installation and after completion. No tolerances shall be allowed other than the tolerances specified or permitted in the relevant approved Standards, unless otherwise stated. If the guaranteed performance of any item of equipment is not met and / or if any item fails to comply with the specification requirement in any respect whatsoever at any stage of manufacture, test or erection, the client / consultant may reject the item, or defective component thereof, whichever he considers necessary.

The complete electrical installation shall be tested in accordance with relevant IS codes in presence of Electrical Supervisor of the client before commissioning of plant.

6.2.21 Painting Of Panels

All sheet metal enclosures shall be powder coated only after de-rusting & hot-dip phosphating degreasing etc. at works only.

NOTE: Rubber mats of 1100 volts shall be laid in front of all switch boards.

6.2.22 Sizes Of Power Cabling:-

The following size of power cabling shall be used only:

	HP of Motors	Cable size
6.2.22.1	Up to 5 HP	3c x 4sq.mm aluminium conductor armoured cable.
6.2.22.2	5 to 7.5 HP	3c x 6sq.mm aluminium conductor armoured cable.
6.2.22.3	10 to 15 HP	2no. 3c x 6sq.mm aluminum conductor armoured cable.
6.2.22.4	20 to 25 HP	2 Nos.,. 3 x 16sq.mm aluminum conductor armoured cable.
6.2.22.5	30 to 35 HP	2 Nos.,. 3c x 25sq.mm aluminum conductor armoured cable.
6.2.22.6	40 to 50 HP	2 Nos.,. 3c x 35sq.mm aluminum conductor armoured cable.
6.2.22.7	60 HP	2 Nos.,. 3c x 50sq.mm aluminum conductor armoured cable.
6.2.22.8	75 HP	2 Nos.,. 3cx 70sq.mm aluminum conductor armoured cable.
6.2.22.9	100 HP	2 Nos.,. 3cx 95sq.mm aluminum conductor armoured cable.
6.2.22.10	125 HP	2 Nos.,. 3cx 120sq.mm aluminum conductor armoured cable.

6.2.23 Capacity Of Relays And Contacts

The following capacity relays and contacts shall be used for various rating of motors:

Type of Starter Contactor Overload Relay

		Contactor	**Phase Relay Range**
a) 50/60 HP Motor	Star Delta Starter	70 Amp.	30 - 50 Amp.
b) 40 HP Motor	Star Delta Starter	45 Amp.	20-33 Amp.
c) 30 HP Motor	Star Delta	45 Amp.	20-33 Amp.

	Starter		
d) 25 HP Motor	Star Delta Starter	32 Amp.	14-23 Amp.
e) 20 HP Motor	Star Delta Starter	32 Amp.	14-23 Amp.
f) 15 HP Motor	Star Delta Starter	25 Amp.	9-15 Amp.
g) 10 HP Motor	Star Delta Starter	16 Amp.	6-10 Amp.
h) 7.5 HP Motor	D.O.L. Starter	16 Amp.	9-15 Amp.
i) 5 HP Motor	D.O.L. Starter	16 Amp	6-10 Amp.

6.2.24 Earthing

The earthing of all equipments shall be carried out by Copper strips / wires as mentioned in Bill of Quantities. All panels / three phase motors shall be earthed with two number distinct and independent Copper strips / wires of the following sizes:

1. Motor upto 5.5 KW	3 sq. mm Copper Wire	4 mm dia GI Wire
2. Motor 7.5 to 18.75 KW	4 sq. mm Copper Wire	6 mm dia GI Wire
3. Motor 18.75 to 50 KW	25x3 mm Copper Strip	25x6 mm GI Strip
4. Motor 51 to 89 KW	25x6 mm Copper Strip	32x6 mm GI Strip

The earthing connections shall be connected to main earth station or main earth grid. The earth connections shall be connected to equipments after removal of paint, grease etc.

END OF MCC, SUB PANEL, POWER & CONTROL CABLING, EARTHING SPECIFICATION

6.3 Piping Work

6.3.1 Scope of Works

The scope of this section comprises supply, installation, testing & commissioning of chilled water / condenser water / drain water pipes, pipe fittings and valves etc. as detailed below in specifications. All pipes, fittings and valves etc. shall conform to relevant Indian standards.

6.3.2 Water Piping

The pipes, fittings and valves shall be of approved make given in the tender & shall be designed for 16 Kg/cm ^{2} test pressures.

Chilled / Condenser pipes shall be "Heavy" Class “C” M.S. Black pipes up to 150 mm and MS ERW Black Pipes above 150 mm and it shall conform to IS:1239 (Part 1) -1991 & IS:3589 — 1991 Grade 330 with latest amendments. The wall thickness of"Heavy" Class M.S. Black pipes & MS ERW Black Pipes shall be as follows:-

S.No.	Nominal Pipe Dia (in mm)	Wall Thickness of Pipe (in mm)
1	25	4
2	32	4
3	40	4
4	50	4.5
5	65	4.5
6	80	4.8
7	100	5.4
8	125	5.4
9	150	5.4
10	200	6
11	250	6
12	300	6
13	350	6
14	400	6
15	450	6
16	500	6
17	600	8
18	700	8
19	900	8

Nominal Drain water / make up water pipes shall be "B" Class GI Pipe & shall Conform to IS: 4736. The pipes shall be sized for individual liquid flow & shall ensure smooth noiseless balanced circulation of fluid.

All piping and their steel supports shall be thoroughly cleaned and primer coated before installation.

6.3.3 Pipe Fittings

The pipe fittings for screwed piping shall be malleable iron and for piping with welded joints shall of weldable quality. Also the fittings shall be suitable for same pressure ratings as for the piping system.

All bends up to sizes 150 mm dia shall be ready made of heavy duty wrought steel of appropriate class.

All bends in sizes 200 mm and above shall be fabricated from the same dia and thickness of pipe in at least four sections and having a center in radius of at least 1.5 times diameter of pipes. Fittings such as tees, reducers etc. shall be fabricated from the same pipe and its length shall be at least twice the diameter of the pipe.

The dead ends shall be formed with flanged joints & shall have 6mm thick blank between flange pair for 150 mm and over.

6.3.4 Flanges

All flanges shall be of mild steel as per IS : 6392 / 71 (with latest amendments) & shall be slip on type welded to the pipes. Flanged thickness shall be to suit Class II pressure. 3 mm thick gasket shall be used in between the flanges.

Flanged pair shall be used on all such equipments which are required to be isolated or removed for service for example condenser / chilled water pumps, chilling m/c, AHU etc.

6.3.5 Piping Installation

The drawings attached with this tender indicate schematically the sizes, location of pipes & vertical shafts. The contractor, on award of the work, shall prepare detailed shop drawings based on tender drawings, showing the cross-section, longitudinal sections, details of fittings, locations of isolating and control valves, drain and air valves, and all pipe supports.

Piping shall be properly supported on, or suspended from, stands, clamps, springs, hangers as specified and as required at site. The contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers and shall be responsible for their structural sufficiency. A set of piping support calculations shall be submitted for structural engineer review and approval before site installation wherever critical & required.

All pipes in HVAC plant room shall be supported with engineered supports structures made of pipes and channels from floor only with necessary high density PUF pipe supports and engineered vibration / noise isolators.

Pipe supports shall be of steel, adjustable for height and primer coated with rust preventive paint and finish coated black. Where pipe and clamps are of dissimilar

materials, a gasket shall be provided in between. Spacing of pipe supports shall not exceed the following:

Pipe Sizes	Spacing Between Supports	Rod Size
Up to 12 mm	1.2 Meter	8 mm
15 to 25 mm	1.8 Meter	8 mm
32 to 150 mm	2.4 Meter	12 mm
Above 150 mm	3.0 Meter	As Per Approved Drg.

Vertical pipes passing through floors shall be plumb and parallel to wall. Pipes shall be supported on all floors. MS cleats shall be welded on pipes and rest on MS channel placed on the floor with 15 mm thick resistoflex pads between the cleat and channel. U clamps with resistoflex sheet shall be provided to keep the pipe in position.

T heading in water piping shall be avoided.

Pipe sleeves at least 3 mm thick, 50 mm / 100 mm larger in diameter than condenser / chilled water pipes respectively shall be provided wherever pipes pass through retaining wall and slab. Annular space shall be filled with fibre glass and finished with retainer rings welded on the ends of the sleeve. All pipes passing through the retaining wall shall be provided with suitable water proofing compound.

Wherever pipes pass through the brick or masonry / slab openings, the gaps shall be sealed with fire sealant.

Insulated piping shall be supported in such a manner as not to put undue pressure on the insulation. 20 gauge metal sheets shall be provided between the insulation and the clamp, saddle or roller, extending at least 15 cm on both sides of the clamp, saddles or roller.

All piping work shall be carried out in a workmen like manner & shall be coordinated with other services running in the building, The entire piping work shall be organized, so that laying of pipes, supports, and pressure testing for each area shall be carried out in one stretch.

The AC Contractor shall make sure that the clamps, brackets, clamp saddles and hangers provided for pipe supports are adequate. Piping layout shall take due care for expansion and contraction in pipes and include expansion joints where required.

All pipes shall be accurately cut to the required size in accordance with relevant BIS Codes, edges beveled and burrs removed before laying. Open ends of the piping shall be closed as the pipe is installed to avoid entrance of foreign matter. Where reducers are to be made in horizontal runs, eccentric reducers shall be used for the piping to drain freely. In other locations, concentric reducers may be used.

All buried pipes shall be cleaned and coated with zinc chromate primer and bitumen paint, and placed on concrete blocks with PUF saddles dipped in bitumen at every 2 meters and wrapped with three layers of fibre glass tissue, each layer laid in bitumen.

Auto purge valves shall be provided at all highest points in the piping system for venting air. Air valves shall be 15 mm pipe size with screwed joints. Discharge from the air valves shall be piped through an equal sized mild steel or galvanized steel pipe to the nearest drain or sump. These pipes shall be pitched towards drain points.

6.3.6 Butterfly Valves

Butterfly valves shall be of PN 16 rating as per IS 13095 preferably with fixed linear design to suit duty and flanges as per IS 6392 Table "E". Valves of sizes 32 mm and above diameter shall be made of cast iron close end body, cast iron epoxy coated disc, Nitrile Seat and SS 410 Stem with tefflon bush. Valves up to l50mm NB shall be with detachable hand lever operation whereas valves above 150 mm NB shall have warm gear operation.

These valves shall be installed in condenser / chilled water lines, make up / drain water piping lines. All valves shall be supplied with factory test reports and the manufacturer must have test facilities at their works.

6.3.7 Non-Return Valve (Duct Plate Check Valves)

The dual plate check valves shall be used for horizontal / vertical run of pipes & shall conform to PN 16 rating .The valve design shall confirm to API 594 and tested as per ANSI SERIES.

The valves shall have cast iron body, and SS 410 plates, SS 410 Shaft & Nitrile Seat. All valves shall be supplied with factory test reports and the manufacturer must have test facilities at their works.

6.3.8 Y-Strainer & Pot Strainer

The Y-strainer shall be fabricated out of MS 'Heavy' class pipe two size higher than that of strainer pipe size. Flanges as per BS 10 shall be provided at inlet & outlet of connections. The body shall be pressure tested at 16 Kg/Sq. cm and shall be hot dip galvanized. Permanent magnet shall be provided in the body of the strainer to arrest MS particles. Filter element shall be of nonmagnetic 20 gauge SS sheet with 3 mm perforation. Strainer shall be provided at inlet of each AHU & chilled water pumps,

Pot Strainer body shall be fabricated out of MS plate IS 226. Thickness of sheet shall be as per size of the strainer chamfered pipes with flanges shall be provided at inlet / outlet connections of the strainer. The tangential entry of water shall create a centrifugal action and due to velocity shall separate sediments and deposit on the inner surface of filter element and at bottom of the Strainer.

Butterfly valves shall be provided at inlet/ outlet connections as shown in drawing and included in BOQ. The strainer body shall have two separate chambers properly sealed to avoid mixing of filtered and unfiltered water. A powerful magnet shall be provided in the body to arrest MS particles. Filter element of Pot Strainer shall be of non magnetic 18 gauge

GSS sheet properly reinforced to avoid damage of the element. A cone with sufficiently large drain pipe with butterfly valve shall be provided at the bottom chamber to flush- out foreign particles. This arrangement shall avoid frequent opening of Pot Strainer for cleaning of filter element. Gauge connection shall be provided at inlet and out let connection.

A set of MS flanges with tongue and groove arrangement and neoprene rubber gasket shall be provided on the top cover and Pot Strainer flange with sufficient bolts and nuts to make the joint water tight. Bearing loaded lope cover lifting and swinging arrangement shall be provided. The pot strainer body shall be properly de-rusted and epoxy coated from inside and outside. Manufacturers Test Certificate shall be provided with each Pot Strainer.

Size of various Pot Strainer, Filter Element and Thickness of MS sheet shall be as under.

Pipe Size	Pot Dia	Pot HT	Element Dia.	Element HT	MS Plate Thickness
50		400	200	240	
80		450	250	250	
100		500	300	280	
125		600	330	340	
150		700	360	390	
200		815	400	470	
250		955	550	510	
300		1105	750	580	

350	1300	895	678
400	1500	1020	785
450	1700	1060	890
500	1800	1100	900
600	2200	1500	1160
700	2400	1600	1300

The Y-Strainer & Pot Strainer confirming to SSPL 107 & SSPL 106 shall have cast iron body and factory tested at works at 16 Kg/sq. cm pressure. The screen shall be made out of 3 mm perforated stainless steel sheet. It should be easily removable when required to be cleaned. Isolating butterfly valves at either end of the pot strainer shall be provided.

6.3.9 Balancing Valves

The balancing control and shut off valves with built in pressure drop measuring facility shall be provided in return water lines for air-handling units, chillers, condensers as given in the tender drawings.

The valves of sizes 32 mm to 65mm dia. shall be of gun metal / cast iron construction with screwed ends angular design digital hand wheel with locking facility. Whereas valves of sizes 75mm and above shall be of cast iron construction with internal parts of SS 410 and EPDM / nitrile seat with flanged ends. The test cocks should be long enough to protrude out of valve insulation.

The valves shall be designed for PN 1.6 and tested for the seat at 1.1 times the design pressure and 1.5 times the design pressure for the shell. All valves shall be supplied with test certificates and the manufacturer must have test facilities at their works.

6.3.10 Air-Vents

Automatic Air vents made of brass material for purging of air trapped in piping system shall be provided at the highest point with Globe valves.

6.3.11 Pressure Gauges / Thermometers Pressure Gauges

Burden type pressure gauges of l00mm dia of suitable range shall be provided at the following locations:

6.3.11.1	Chiller / Condenser / Cooling coils of AHU	- Inlets and outlets. -Suction& discharge
6.3.11.2	All pumps	

The water pressure gauge shall be made of stainless steel grade SS304. The dial plate shall be powder coated with white colour base & the calibration shall be done in black colour. All the pressure gauges shall be complete with ball valves & SS Siphon and confirming to IS:3624.

Please indicate the Pressue range.

Thermometer

Direct reading V form type thermometer alcohol filled of suitable range / length shall be provided at the following locations:

a) Condenser / Chiller / Cooling coil — Inlets and outlets in separate wells of Brass / Gun metal.

The V form thermometer shall be made of aluminium die casting with golden colour anodizing. The thermometer shall have a V groove in the body to protect the refill from the damages during the installation. The refill shall be filled with blue colour mercury. The thermometer shall be complete with brass well & the calibration of temperature shall be in Celsius & Fahrenheit. Please indicate the temperature range.

6.3.12 Testing Of Pipe System

During construction the AC Contractor shall properly cap all lines, so as to prevent the entrance of sand, dirt, etc. Each system of piping shall be flushed thoroughly after

completion for the purpose of removing dirt, grit, sand etc. from the piping and fittings.

All piping shall be tested to hydrostatic test pressure of at least one and half times the maximum operating pressure, but not less than 16 kg per sq. cm gauge for a period of not less than 24 hours. All leaks and defects in joints found during the testing shall be rectified, retested and gotten approved.

Piping repaired subsequent to the above pressure test shall be re-tested in the same manner.

Piping may be tested in sections and such sections shall be securely capped, then retested for the entire system.

The AC Contractor shall provide temporary pipe connections to initially by-pass condenser/chiller and circulate water through condenser/chilled water pipe lines for minimum 8 hours. Water should be drained out from the lowest point. The temporary lines shall be removed and blanked with dead flanges. Pot strainers and Y strainers shall be cleaned and fresh water filled in the circuits.

The AC Contractor shall make sure that proper noiseless circulation of fluid is achieved through all coils. If proper circulation is not achieved due to air bound connection, the Contractor shall rectify the defective connections. He shall bear all expenses for carrying out the above rectifications.

After the piping has been installed, tested and run for at least three days of eight hours each, all insulated exposed piping in plant room shall be given two finish coats, 3 mils each of approved colour, conforming to relevant BIS Codes. The direction of flow of fluid in the pipes shall be visibly marked with identifying arrows.

The AC Contractor shall provide all materials, tools, equipment, instruments, services and labour required to perform the test. Also test certificate of the same must be submitted to the institute.

6.3.13 Balancing

After completion of the installation, all water system shall be adjusted and balanced to deliver the water quantities as specified or required.

All balancing valves, Automatic control valves and two-way diverting valves shall be set for full flow condition during balancing procedure. Each water circuit shall be adjusted thru balancing valves provided for this purpose. These shall be permanently marked after balancing is completed, so that they can be restored to their correct positions, if disturbed.

Complete certified balancing report should be submitted for evaluation by the consultant or his authorized representatives. Upon endorsement three copies of the balancing report shall be submitted with the as-built drawings and completion documents.

END OF PIPING WORK SPECIFICATION

7 PAINTING WORK

This section deals with painting of various equipment / material supplied under this contract. It gives basic guidance for painting as specified below:-

Application : The original colour of all equipments like water chilling machines, air-handling units etc. which if get damaged during transportation or during installation shall be painted in original shade with the two coat of paint to give a final finish.

All chilled water pipes shall be painted as per standard code of practice and arrows shall be marked to indicate direction of flow of water.

7.1 Colour Scheme For the Materials

Description	Standard color & refence	Lettering colour
Chilled water pipe	Jade Green	Black
Condenser water pipe	Light Green	Black
Valves and pipe line fittings	White and black handle	Black

PERFORMA OF TECHNICAL DATA TO BE FILLED UP BY THE AC CONTRACTOR

Contractor should furnish technical data as mentioned below, of the equipment and accessories offered by him as per scheme, specification, bill of quantities given in the tender.

1. Water-cooled Rotary Screw Water **Chilling Machine (AHRI** Certified)

Kindly Attach the Following.

a) Computer Selection of the Unit Along With Part Load Performance at Constant Condenser Water Inlet

b) Details of safeties and protection.

c) Detailed functions of Microprocessor Controller

d) Compressor

e) Manufacture Name

f) Model

g) Type of Compressor

h) Hermetic/ Semi-hermetic / Open

i) No. of Compressor per Machine

j) Nominal Capacity of Each Compressor in TR

k) Nominal Capacity of Chilling Machine

l) Operating Conditions

m) Saturated Suction Temperature Deg. C.

n) Saturated Discharge Temperature Deg. C.

o) Max. RPM

p) Mode of start

q) Refrigerant used
r) Qty. of Refrigerant used
s) Power consumption IKW/TR
At Full Load 100 %
90 %
80 %
70 %
60 %
50 %
40 %
30 %
20 %

t) NPLV of the M/C

u) Type of capacity control

v) Range of capacity variation

w) Monitoring Devices

x) Type of bearings

2. Motor (Compressor)

a) Make of Motor

b) Type of Motor

c) Motor KW

d) Class of Insulation

e) R.P.M.

f) Type of starter (Star Delta or Part Winding)

g) Electrical characteristics Voltage / Frequency Fluctuations permissible

j) Full load current (Amp)

k) Starting current (Amp)

l) Type of Vibration

3. Condenser

a) Manufacture Name
b) Model
c) Number of Condensers
d) Fouling Factor MKS.
e) Heat rejection capacity Kcal / hr.
f) Pressure Drop Mts.
g) Water flow rate (LPM)
h) No. of passes
i) Water temperature in °C
j) Water temperature out °C

4. Chiller

a) Manufacturer Name
b) Model
c) Type of chiller
d) Water Flow LPM
e) No. of Passes
f) Water Temperature Out °C
g) Water Temperature In °C
h) Pressure Drop in Mt. of water
i) Cooling Capacity Kcal / Hr.
j) Fouling factor MKS

3.4.2 Overall Size of Water Chilling Machine

a) Overall dimension MM

b) Operating Wt. Kg.

c) Service Clearance required in mm

5. Water Chilling Machine

a) Operating Conditions

b) Actual Capacity of water Chilling machine at above Operating conditions

6. Cooling Tower

a) Make of cooling Tower

b) Type of cooling Tower

c) Model of cooling Tower

d) Capacity of Cooling Tower

e) Approach of cooling tower

f) Wet Bulb (Design)

g) Fan Motor (Type & Rating)

h) Fan Diameter (Each)

i) Fan Capacity (Each)

j) Material of casing & basin

k) Overall dimension in MM

l) Dry weight KG

m) Operating weight

n) Water flow rate USGPM

o) No. of fans

p) R.P.M. of Motor

q) Drift loss

r) Evaporation loss

s) Total Water Loss in LPH

t) Type of drive

7. Chilled Water Primary Pump Sets

a) Make

b) Type

c) Model

d) Discharge (LPM)

e) Head (Mt)

f) Efficiency

g) Brake Horse Power

h) Horse power of motor

i) Make / Type of motor

j) Impeller Diameter (MM) & Material

k) Material of Bearing / Seal

l) Type of Bearing / Seal

m) Speed (RPM)

n) Material of Shaft

8. Condenser Water Pump Sets

a) Make

b) Type

c) Model

d) Discharge (LPM)

e) Head (Mt)

f) Efficiency

g) Brake Horse Power

h) Horse power of motor

i) Make / Type of motor

j) Impeller Diameter (MM) & Material

k) Material of Bearing / Seal

l) Type of Bearing / Seal

m) Speed (RPM)

n) Material of Shaft

9. Secondary Chilled Water Pump Sets

a) Make

b) Type

c) Model

d) Discharge (LPM)

e) Head (Mt)

f) Efficiency

g) Brake Horse Power

h) Horse power of motor

i) Make / Type of motor

j) Impeller Diameter (MM) & Material

k) Material of Bearing/ Seal

l) Type of Bearing / Seal

m) Speed (RPM)

n) Material of Shaft

10. Variable Speed Pumping System

a) Make

b) No. of Adjustable Frequency Drives Suitably interfaced with other system Components. Hand / Auto macro Designed for pumping system

c) Capacity of AFD

d) No. of Pump Logic Controller

e) Pumping Software duly downloaded

f) DP Sensor / Transmitter

g) Interfacing amongst all components & compatibility of I/O signals

11. ATC System technical data must be submitted in above format.
12. Othe low side Items technical data must be submitted in above format.

Note-The Technical submittals of All items can be submit in above format or in tabler format or in manufacturer format however, all relative parameter must be mentioned.

END OF TECHNICAL DATA TO BE FILLED BY AC CONTRACTOR

ADDITIONAL SPECIFICATIONS

1. GENERAL

1 The order of preference in case of any discrepancy as indicated in condition No. 8.1 under"Conditions of Contract" give in standard CPWD contract form may be read as the following:

i) Nomenclature of items as per schedule of quantities.
ii) Particular specification and special condition, if any.
iii) CPWD specifications.
iv) Architectural Drawings
v) Indian standard specifications of B.I.S.
vi) Sound Engineering Practice

1.1 Wherever any reference to any Indian Standard Specifications of BIS or other international standards of ASTM / BS / EN occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued there-to or revisions thereof, if any, up to the date of receipt of tenders.

1.2 The contractor shall work according to the programme of work as approved by the Estate Officer, for which purpose, the contractor shall submit a programme of the work within 7 days from the stipulated date of start of the work based on computer software mutually agreed or in other format decided by Estate Officer and as per clause 5 of GCC 2023 shall update the same every fortnight. The contractor must submit:-

(i) Progress photographs, in colour, of the various items/components of the work done upto date, to indicate visually the actual progress of the work.

(ii) Videography at various stages of construction right from the day of start of work to date of completion/occupation, covering all major events, inspections, visits by dignitaries etc.

1.5 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions / instructions including issue of identity cards to all persons authorized by him to do work / visit the work site and nothing shall be payable on this account.

1.6 The contractor shall conduct his 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 Estate Officer and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed, so as not to interfere with the operations of other contractors, or he shall 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 Estate Officer. The contractor shall be responsible for any damage due to hindrance caused by him.

1.7 Stacking of materials and excavated earth including its disposal shall be done as per the directions of the Estate Officer. Double handling of materials or excavated earth ifrequired at any stage shall have to be done by the contractor at his own cost.

1.8 No claim for idle establishment & labour, machinery & equipment, tools & plants and the like, for any reason whatsoever, shall be admissible during the execution of work as well as after its completion.

1.9 Work shall be carried out in professional manner with finished product serving the intended purpose with specified strength, durability and aesthetics.

1.10 Work activities shall be executed in well thought out sequences such that consequent activities not adversely affecting previously done work. Nothing extra shall be payable to protect the works already done.

1.11 The contractor shall prepare all the needed shop drawings well in advance and get them approved before placing the order and execution of the item.

1.12 The contractor shall not store /dump construction material or debris on the metalled road.

1.13 The contractor shall get prior approval from Estate Officer for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic / inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.

1.14 The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purposes / or are carrying construction material like Pipes, machinery, cement, sand and other allied material are fully covered. The contractor shall take every necessary precautions that the vehicles are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air / contaminate air.

1.15 The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of

dust particles.

1.16 The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.

1.17 The contractor shall ensure that C&D waste is transported to the C & D waste site only and due record shall be maintained by the contractor.

1.18 The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines, 2010 or amended thereafter.

1.19 The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 kmph. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.

1.20 The agency is permitted for erect the site office, store yard and ground water extraction facility (if permitted by the statutory authorities) temporarily near the place of construction free of cost only after getting specific approval of Estate Officer. Contractor shall remove such structures on completion of work.

1.21 Entry to the campus may be restricted from particular entrance gate and agency has to follow security rules of the campus & nothing extra shall be payable on this account.

1.22 The contractor shall make necessary arrangement to follow the guidelines / instruction issued by the concerned government authority for controlling and containing the spread of COVID-19 like situation and nothing shall be paid extra in this regard.

ADDITIONAL SPECIFICATIONS
(For Internal & External Electrical Work)

1.0 All the works shall be carried out as per CPWD General Specifications for Electrical Works Part-I (Internal) 2023 & Part-II (External) 2023, amended up to the last date of submission of tender.

2.0 **Conformity to IE act, IE Rules, and standards:**
All electrical works shall be carried out in accordance with the provisions of Indian Electricity Act, 1910 and Indian Electricity Rules, 1956 amended up to the last date of submission of tender unless specified otherwise. A list of rules of particular importance to electrical installations under these General Specifications for internal works is given for reference.

3.0 General requirements of components:

3.1 **Quality of material:** All materials and equipment supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the rated conditions of operation and to withstand the environmental conditions at site.

The model of equivalent make shall be approved by Engineer – in- charge on producing relevant paper of the model and equivalent make shall be equal or more rich specification.

3.2 **Use of quality materials**: Only quality materials of reputed make as specified in the tender will be used in the work.

3.3 Samples of all materials, fittings and other materials/articles required for execution of the work shall be got approved from the Estate Officer. Materials / articles manufactured by the firms of repute as indicated in tender documents and approved by the Estate Officer shall

only be used. **The date of manufacturing of all the equipment and materials shall not be more than Six months old from the date of award of work**.

All the materials and equipment shall be procured directly from the manufacturer or authorized dealers only.

3.4 Even ISI marked materials shall be subjected to quality test at the discretion of the Estate Officer besides testing of other materials as per the specifications described for the item/material. Whenever ISI marked, materials are brought to the site of work; the contractor shall, if required by the Estate Officer, furnish manufacturers test certificates to establish

that the materials procured by the contractor for incorporation in the work satisfy the provisions of IS codes relevant to the material and/ or the work done.

3.5 The MCB should be 10 KA breaking Capacity and of same make as that of MCB DBs.

3.6 The fan box cover shall be made from 3mm thick phenolic laminated sheet as per CPWD specification.

3.7 The contractor shall provide junction boxes/looping boxes with cover of required sizes even in PVC conducting and such boxes shall be measured as a part of conduit/wiring without any extra payment.

3.8 The junction boxes & looping boxes shall be covered with approved makes of phenolic laminated sheet. For telephone, television & fire alarm system shall be provided at all the floors within scope of work without any extra cost as per requirement & layout approved by Estate Officer

4.0 Ratings of components:

4.1 All components in a wiring installation shall be of appropriate ratings of voltage, current and frequency, as required at the respective sections of the electrical installations in which they are used.

4.2 All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current, which will normally flow through them, without their respective ratings being exceeded.

5.0 Conformity to standards:

5.1 All components shall confirm to relevant Indian Standard Specifications wherever existing. Materials with ISI certification mark shall be preferred.

5.2 Relevant Indian Standards including amendments or revisions thereof up to the last date of submission of tender shall be applicable in the respective contracts for respective items, firm to ensure its compliance.

5.3 The connections of switches, sensors, earthing conductors & interconnections cables shall be made by adequate rating thimbles of approved standard makes only and nothing extra on this account shall be paid.

5.4 Material to be used in the work shall be ISI marked. The make of material have been indicated in the list of acceptable makes. No other make will be acceptable. The material to be used in the work shall be got approved from the Estate Officer before its use at site. The Estate Officer shall

reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

5.5 Modular type switches / sockets / telephone outlets / TV sockets are to be provided wherever indicated in the items. The same shall be of only one make. The modular plates of switches, sockets, telephone & TV sockets etc. shall be in two parts i.e. plates with frames within quoted rates.

6.0 **Interchangeability:**

Similar parts of all switches, lamp holders, distribution fuse boards, Switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

7.0 Inspection of materials and equipment:

7.1 Materials and equipment to be used in the work shall be inspected by the instituteal officers. Such inspection will be of following categories:

a) Inspection of materials / equipment to be witnessed at the Manufacturer's premises in accordance with relevant BIS / Agreement Inspection Procedure.

b) To receive materials at site with Manufacturer's Test Certificate(s)

c) To inspect materials at the authorized dealer's godown to ensure delivery of genuine materials at site.

d) To receive materials after physical inspection at site.

7.2 Adequate care to ensure that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall ensure that:

a) Material will be ordered & delivered at site only with the prior approval of the institute to ensure timely delivery.

b) As and when the order is placed for the fittings / fixtures, cables, switchgears, poles, rising main, other main items etc, its copy shall be endorsed to the Estate Officer.

c) The firm will be required to procure material like exhaust fans, MCB's & DB's, switches & sockets, wires & cables, conduits and switchgears etc directly from the manufacturer/ authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the institute.

d) Inspection at factory or at godown of the manufacturer, as required,

shall be arranged by the firm for a mutually agreed date. Certificate for genuineness of the fittings shall have to be provided duly signed by the manufacturer's officer not below the rank of Regional Manager.

e) Delivery of material shall be taken up only with the consent of institute, after clearance of the material.

f) Institute shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.

7.3 Similarly, for fabricated equipment, the contractor will first submit dimensional detailed drawings for approval before fabrication is taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control.

7.4 The contractor shall give a trial run of the equipment and machinery for establishing its capability to achieve the specifications within laid down tolerances to the satisfaction of the Estate Officer before commencement of work.

8.0 Workmanship:

8.1 Good workmanship is an essential requirement to be complied with. The entire work of manufacture/fabrication, assembly and installation shall confirm to sound engineering practice.

8.2 **Proper supervision/skilled workmen**: The contractor shall engage suitably skilled/licensed workmen of various categories for execution of work duly supervised by technical representative having appropriate qualification and experience to ensure proper execution of work. They will carry out instruction of Estate Officer and his authorized representatives during the progress of work.

8.3 **Fabrication in reputed workshop:** Switch boards and LT panels shall be fabricated in a factory/workshop having modern facilities like quality fabrication, seven tank processes, powder / epoxy paint plant, proper testing facilities, manned by qualified technical personnel. These shall be as per make / item approved.

8.4 The contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work.

9.0 **Provisions for services and proper planned work**:-

9.1 The main contractor shall leave such recesses, holes, openings, etc., as may be required for the electric, air conditioning and other related works. The main contractor has also to fix inserts, sleeves, brackets, conduits, base plates, insert plates, clamps etc if any at the time of casting of

concrete, stonework & brick work. These inserts, sleeves, brackets, conduits, base plates, insert plates, clamps etc shall be arranged by the contractor and shall be paid accordingly if these are not the part of equipment for which it is being provided.

9.2 The contractor shall ensure quality construction in a planned and time bound manner. Any substandard material or work which is not within permissible tolerance limits shall be summarily rejected by the Estate Officer.

9.3 The contractor shall make sample as per the timeline mentioned in the milestone given of this tender document using all approved materials, for approval of Estate Officer before commencement of execution of mass scale work.

9.4 Check nuts shall be provided while terminating the M.S. conduits in switchboard boxes for which nothing extra shall be paid.

9.5 All distribution boards shall be marked with circuits controlling the rooms/area/SDB controlled.

9.6 While deciding the size of switch boxes for light points / fan point / exhaust fan point, two extra modules shall be provided for each fan point for fixing of regulator (fan regulator is to be provided under different item). Wherever extra modules are available, the same shall be provided with blanking plates without any extra cost.

9.7 Contractor will not provide any ceiling rose/connector/looping box etc wherever false ceiling is being provided. The point wiring in that case will be extended up to the fitting/fan etc. directly without provisions of any termination arrangement in between. The wire from the end points up to the fixture shall be considered to be included in the point wiring. Nothing extra shall be paid for the same.

9.8 Wherever providing rigid conduits is not possible, flexible conduit pipe shall be provided for drawing/running the wires. However, such arrangement has to be kept minimum and only with the prior approval of Estate Officer or his authorized representative.

9.9 Earthing and all items of work that cannot be checked later on are to be got approved from Estate Officer or his authorized representative before proceeding further.

9.10 The firm shall use only electrically operated chase cutting machine for cutting the chases in the wall for recessed conduit wiring.

9.11 The contractor shall follow the shortest route for circuits, sub main, point wiring etc.

9.12 Colour coding as per specification shall be adopted in the wiring system.

9.13 Tinned copper earthing lugs / Thimbles / ferrules shall be provided for termination of earth wire to all Metallic outlet boxes / fittings / fixtures / fan regulator / MCB DB / switch board / Meter board etc., properly crimped / brazed / soldered for which nothing extra shall be paid.

9.14 A suitable brass / tinned copper neutral link shall be fixed at suitable place in the Metallic Outlet boxes of all sizes to terminate neutral wire properly. Nothing extra shall be paid on this account.

9.15 To facilitate drawing of wires 16 / 18 SWG GI fish wire shall be provided along with laying of recessed conduit. Nothing extra shall be paid on this account.

9.16 All hardware items such as screws, thimbles, connectors, earth / neutral terminals, wires etc. which are essentially required for completing any item as per specifications will be deemed to have been included in the item even when the same have not been specifically mentioned.

9.17 All hardware material such as nuts / bolts / screws / washers etc. to be used in the work shall be zinc / cadmium plated iron. The galvanised boxes of modular switch / sockets etc. shall be of the same make as of switch / socket etc.

9.18 While laying conduit, suitable minimum number of junction boxes shall be left for pulling the wires. These shall be placed in such a way that the same do not remain noticeable.

9.19 The ceiling roses, wherever required to be provided are included in the scope of work without extra payment and the same shall also be of modular type & of the same make as that of switches & sockets along with earthing provision.

10.0 **Testing:**

All tests prescribed in this General Specification to be done before, during and after installation shall be carried out, and the details of test results shall be submitted to the Estate Officer in approved format, that shall form part of the completion certificate of this component.

11.0 **Commissioning on completion:**

After the work is completed, it shall be ensured that the installation is tested and commissioned.

12.0 Completion plan and completion certificate along with guarantee:

12.1 The main contractor through his associate shall submit completion plan as required vide General Specifications for Electrical works (Part-I internal) 2023 and (Part-ll External) 2023 as applicable within time as stipulated in milestones.
In case, the main contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent as stipulated in clause–8B of General Condition of Contract – 2023 amended up to last date of submission of tender.

12.2 Three sets of completion plan as well as in soft copy drawn to a suitable scale indicating the following shall also be submitted:

(i) General layout of the building.
(ii) Locations of main switchboard and distribution boards, indicating the circuit numbers controlled by them.

(iii) Position of all points and their controls.

(iv) Types of fittings, viz. fluorescent, pendants, brackets, bulkhead, fans, exhaust fans etc.

(v) Name of work, job number, tender reference, actual date of completion, names of Division/Sub-division and name of the main contractor and associate both who executed the work with their signature.

12.3 Guarantee:

The complete installation will be handed over to the institute after necessary testing and commissioning. The installation will be guaranteed against any defective design / workmanship. Similarly, the materials supplied by the contractor will be guaranteed against any manufacturing defect, inferior quality. The guarantee period will be for a period of 12 months from the date of handing over of installation to the institute. Installation/ equipment or components thereof shall be rectified/ repaired to the satisfaction of the Estate Officer. Guarantee on material/equipment given by the manufacturer whatsoever have to be submitted by the main contractor and his associate to the institute.

LIST OF APPROVED MATERIALS for the Work

Note :

1. Unless otherwise specified, the brand/make of the material as specified in the item nomenclature or in the particular specifications or in the list of approved materials attached in the tender, shall be used in the work.
2. The Contractor shall obtain prior approval from the Estate Officer before placing order for any specific material/ Brand/ Make.
3. Whenever the specified brand of material is not available then the Estate Officer may approve any material equivalent to that specified subject to proof being offered by the Contractor for its equivalence and its non-availability to his satisfaction.

S.No	Description of Item	Makes
1	CHILLER	Carrier/Trane/Dunhumbush / York/ DAIKIN
2	PRIMARY/ SECONDARY PUMP/ CONDENSER PUMP/ TERTIARY PUMP	Armstrong/ Grundfos/ Xylem
3	COOLING TOWER	Delta/ Bell/ Paharpur/ Advance/ Flow Tech
4	ATC SYSTEM	ENERGEO/ McClean/CQM
5	VFD	Danfos/ABB/Siemens
6	MS-PIPE	Jindal (Hissar) / Tata / Sail
7	BUTTERFLY VALVE/ Motorized	Advance / Zoloto/Audco
8	BALANCING VALVE	Advance / Zoloto/Audco
9	NRV	Advance / Zoloto/Audco
10	BALL VALVE	Advance / Zoloto/Audco/ Castle/Leader
11	Y STRAINER	Sant/ Emerald/ SM
12	AUTO AIR VENT VALVE	Anergy/ Castle/ Emerald/Zoloto/Leader
13	BELLOW	Esyflex/ Resistoflex
14	FLOW SWITCH	Honeywell/ Siemens/ Belimo
15	PRESSURE GAUGE	H Guru /Fiebig
16	TEMPERATURE GAUGE	H Guru /Fiebig
17	DRAIN PIPE	AJAY/ASHIRWAD/ASTRAL/SUPREME/Miraj
18	DUCT/ PIPING NITRILE INSULATION	Supreme/ A Flex/ Armaflex
19	POWER & CONTROL CABLING	Polycab/Havells/RR/Grandlay/Finolex/KEI
20	CABLE TRAY	Indeana/ MEM
21	Synthetic Enamel Paint	Apcolite of Asian Paint, Luxol of Burger Paint and Dulux Paint.
22	CPVC Pipes & Fittings	Astral, Ashirvad, Prince, Supreme, Finolex,VECTUS , Prayag
23	FRL PVC insulated	R.R. Kabel /Finolex / Polycab/ KEI / LAPP/Havells (All with ISI Marked)

Note: 1) In case approved make for any material/item is not specified in the NIT, the decision of finalizing a particular brand shall rest with Estate Officer, IIM Udaipur or his successor there off.

2) In case of non-availability of a particular material/item from specified manufacturers/makes, the decision of Estate Officer, IIM Udaipur or his successor there off in selection of alternate manufacture/ make is final.

Declaration of Transparency

To,
……,
……,
……

Sub: NIT No.: **……**

Dear Sir,

It is here by declared that IIM Udaipur is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Tenderer will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/Tenderer will stand disqualified from the tendering process and the bid of the Tenderer would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the IIM Udaipur.

Yours faithfully,

Chief Of Administration
IIM Udaipur

Declaration of Acceptance of NIT

To,
The Director, IIM Udaipur
Balicha, Udaipur,

Sub: Submission of Tender for the work of "**Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)"**

Dear Sir,

I/We acknowledge that we are committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by IIM Udaipur. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, IIM Udaipur shall have unqualified, absolute and unfettered right to disqualify the tenderer/Tenderer and reject the tender/bid is accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Tenderer)

To be signed by the Tenderer and same signatory competent / authorised to sign the relevant contract on behalf of IIM Udaipur.

INTEGRITY AGREEMENT

This Integrity Agreement is made at ..... on this .....day of ..... 20.....

BETWEEN

Director, IIM Udaipur, (Hereinafter referred as the, IIM, Udaipur 'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

..... (Name and Address of the Individual/firm/ Company) through ..... (Hereinafter referred to as the (Details of duly authorized signatory)

"Tenderer/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No.) (hereinafter referred to as **"Tender/Bid"**) and intends to award, under laid down organizational procedure, contract for **Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)** (Name of work) hereinafter referred to as the **"Contract**".

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Tenderer(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as **"Integrity Pact"** or **"Pact"**), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as

under:

Articles

Article -1: Commitment of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Principal, personally or through any of his/her family members, will in connection with the Tender, or the execution of the 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 Principal will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.

(c) The Principal shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures .

Article 2: Commitment of the Bidder(s)/Contractor(s)

1. It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government *I* Institute all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.

2. The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:

(a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit

which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.

(b) The Bidder(s)/Contractor (s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

(c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/ PC Act. Further the Bidder(s)/ Contract(s) will not use improperly , (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

(d) The Bidder(s)/Contractor (s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly, Bidder(s)/Contractor (s) of Indian nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

(e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

(f) Bidder(s) *I* Contractor(s) who have signed the Integrity Pact shall not approach the courts while representing the matter to IEMs and shall wait for their decision in the matter.

3. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

4. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice, willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing

damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.

5. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use coercive practices (which shall include the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property) to influence their participation in the tendering process.

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the principal under law or the contract or its established policies and laid down procedures, the principal shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the principal absolute right:

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal after giving 14 days' notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor (s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the principal. Such exclusion may be forever or for a limited period as decided by the principal.
2. Forfeiture of Earnest Money Deposit Performance Guarantee/Security Deposit: If the Principal has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal apart from exercising any legal rights that may have accrued to the Principal, may in its considered opinion forfeit the entire amount of Earnest Money Deposit Performance Guarantee and Security Deposit of the Bidder/Contractor.
3. Criminal Liability: If the Principal obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an

associate of a Bidder or Contractor which constitutes corruption within the meaning of PC Act, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the tender process.
2. If the Bidder makes an incorrect statement on this subject, he can be disqualified from the tender process or action can be taken for banning of business dealings/holiday listing of the Bidder/Contractor as deemed fit by the principal.
3. If the Bidder/Contractor can prove that he has resorted/recouped the damage caused by him and has installed a suitable corruption prevention system, the principal may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

4. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement by any of its Subcontractors/sub- vendors.
5. The principal will enter into pacts on identical terms as this one with all Bidders and Contractors.
6. The principal will disqualify Bidders who do not submit the duly signed Integrity Pact between the Principal and the Bidder along with the Tender or violate its provisions at any stage of the Tender process.

Article 6- Duration of the Pact

This Integrity Pact begins when both the parties have legally signed it. It expires for the Contractor 12 months after the completion of work under the contract or expiry of defect liability period or last payment made under the contract, whichever is later and for all other bidders, 6 months after the Contract has been awarded.

If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this Integrity Pact as specified above, unless it is discharged/determined by the competent authority of institute.

Article 7- Other Provisions

1. This Integrity Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal, who has floated the tender.
2. Changes and supplements as well as termination notice need to be made in writing.
3. If the Contractor is a partnership or a consortium, this Integrity Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In the case of a Company, the Integrity Pact must be signed by a representative duly authorized by board resolution.
4. Should one or several provisions of this Integrity Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.
5. Issues like Warranty /Guarantee etc. shall be outside the purview of IEMs.
6. It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Pact, any action taken by the principal in accordance with this Integrity Pact or interpretation thereof shall not be subject to arbitration.
7. In view of the nature of integrity pact, the Integrity Pact is irrevocable and shall remain valid even if the main tender/contract is terminated till the currency of the integrity pact.
8. If any complaint regarding violation of IP is received directly by the principal in respect of the contract, the same shall be referred to the IEM for comments/recommendations.

Article 8 -Independent External Monitor (IEM)

(1) The principal appoints a competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission (Names and address of IEMs are as mentioned in Schedule-F). The task of the Monitor is to review independently and objectively whether and to what extent the parties comply with the obligations under this agreement.

(2) The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all contract documents, whenever required. It will be obligatory for him/her to treat the information and documents of the Bidders *I* Contractors as confidential.

(3) The Bidder(s)/Contractor(s) accepts that the IEM has the right to

access without restriction to all project documentation of the principal including that provided by the Contractor, The Contractor will also grant the IEM, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same applicable to sub- contractors.

(4) The IEM is under contractual obligation to treat the information and documents of the Bidder{s}/Contractor(s)/ Sub-contractor(s) with confidentiality. The IEM has also signed 'Non- Disclosure of Confidential Information' and 'Absence of Conflict of Interest'. In case if any conflict of interest arising at a later date, the IEM shall inform the Estate Officer and recuse himself *I* herself from that case.

(5) As soon as the IEM notices, or believes it to notice, a v i o l a t i o n of t h i s agreement, he/she will inform the Management of the Principal and request the Management to discontinue or take corrective action , or to take other relevant action. The IEM can in this regard submit non-binding recommendations. Beyond this, the IEM has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

(6) The IEM will submit a written report to the Director within 8 to 10 weeks from the date of reference or intimation to him by the principal and, should the occasion arise, submit proposals for correcting problematic situations.

(7) If the IEM has reported to the Director, a substantiated suspicion of an offence under relevant IPC/PC Act, and the Director concerned has, within a reasonable time, not taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the IEM may also transmit this information directly to the Central Vigilance Commissioner.

(8) The principal will provide the IEM sufficient information about all meetings among the parties related to the project provided such meetings could have impact on contractual relations between the principal and the contractor. The parties will offer to the IEM the option to participate in such meetings.

(9) The word IEM or monitor would include both singular and plural.

Article 9- Legal and Prior Rights

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard to any of the provisions covered under this Integrity Pact.

INWITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

(For and on behalf of Principal) (For and on behalf of Bidder/Contractor) WITNESSES:

1

(signature, name and address)

2

(signature, name and address)

Place: Dated:

Note: To be signed by the Bidder and the Chief of Administration.

DRAFT AGREEMENT

AGREEMENT made this day of Two Thousand___between the Indian Institute of Management Udaipur incorporated as Institutions of National Importance through its Director IIM Udaipur (hereinafter referred to as "The Institute and M/s_____(Hereinafter referred to as "The Contractor") which expression shall include his/their respective heirs, executors, administrators and assigns of the other part.

WHEREAS the Institute is desirous for "_____" and has caused drawings and specifications describing the work to be done and WHEREAS the said drawings as per list attached, the specifications, the priced Schedule of Quantities the conditions of tender and the conditions of contract have been signed by or on behalf of the parties hereto AND WHEREAS the contractor has agreed to execute upon and subject to the condition set forth (herein after referred to as 'the said conditions') the work shown upon the said drawings and described in the said specification and the said priced Schedule of Quantity 'at the respective rates mentioned in the priced Schedule of Quantities.

AND WHEREAS the contractor has deposited by Cash / FDR a sum of Rs._____/- (Rupees _____ only), with the Institute for the due performance of this agreement.

NOW IT IS HEREBY AGREED AS FOLLOWS:

1. In consideration of the payments to be made to the contractor as herein after provided the Contractor shall upon and subject to the said conditions execute and complete the works shown upon the said drawing and such further detailed drawings as may be furnished to him by the said Institute and described in the said specification, and the said priced Schedule of Quantities.

2. The Institute shall pay the contractor such sums as shall become payable hereunder at the time and in the manner specified in the said conditions.

3. Time is the essence of the agreement. In the event of the Contractor failing to comply with this condition, he shall be liable to pay compensation as per clause 2 of the condition of the contract as decided by the competent authority of the Institute in writing which shall be final and binding on the contractor.

4. The Drawings, specifications and priced Schedule of Quantities above mentioned shall form the basis of this contract and the decision of the Director or Arbitrator or Umpire as mentioned in the conditions of the Contract in reference to all matters of disputes as to material, workmanship or account and as to the intended interpretation of the clause of this agreement or any other document attached here to shall be final and binding on both parties and may be made a rule court.

5. The said contract comprises the work above mentioned, and all the subsidiary work connected therewith the same site all may be ordered to be done from time to time by the institute even though such works may not be shown on the drawings or described in the said specifications or the priced Schedule of Quantities.

6. The institute reserves the right altering the drawings and nature of the work and of adding to or omitting any items of work or of having portions of the same carried out instituteally or otherwise and such alterations or variations shall not vitiate this contract.

7. The said conditions and appendix there to shall be read and construed as forming part of this agreement and the parties here to will respectively abide by and submit themselves to the conditions and stipulations and perform the agreement on their parts respectively in such conditions contained.

8. All other disputes and differences except those excluded specifically as per applicable GCC shall be dealt with as per provision at "**Dispute Resolution" under particular specifications and special conditions**

9. All disputes arising out of or in any way connected with this agreement shall be deemed to have arisen in Udaipur and only courts in Udaipur shall have jurisdiction to determine the same.

10. The several parts of this contract have been read to us and fully understood by us. In witness whereof the parties hereto have set their respective hands the day and the year herein above written.

Chief Of Administration

In the presence of:
1.

For and on behalf of the Director

2.

Contractor

On Non-Judicial Stamp Paper of minimum Rs. 100 (Guarantee offered by Bank to Institute in connection with the execution of contracts)
Form of Bank Guarantee for Earnest Money Deposit / Performance Guarantee / Security Deposit

PROFORMA OF PERFORMANCE BANK GUARANTEE

1 In consideration of the Director IIM Udaipur (hereinafter called "IIM UDAIPUR") having offered to accept the terms and conditions of the proposed agreement between IIM, UDAIPUR and .....(hereinafter called "the said organization (s) for the work of "..... ....." ....(hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rupees..... only) as a security/ guarantee from the organization (s) for compliance of his obligations in accordance with the terms & conditions in the said agreement.

2 We ..... (hereinafter referred to as the "Bank") do hereby undertake to pay amounts due and payable (indicate the name of the Bank) under this Guarantee without any demur, merely on a demand from the IIM, UDAIPUR stating that the amount claimed is required to meet the recoveries due or likely to be due from the said organisation (s). Any such demand made by the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this Guarantee we shall be restricted to an amount not exceeding Rs..... (Rupees... .....)

3 We, the said Bank, further undertake to pay to the IIM, UDAIPUR any money so demanded not withstanding any dispute or disputes raised by the organisation (s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under bond shall be a valid discharge of our liability for payment thereunder, and the organisation (s) shall have no claim against us for making such payment.

4 We..... further agree that the Guarantee herein contained shall (indicate the name of the Bank) remain in full force and effect during the period that would be taken for the performance of the

said agreement, and it shall continue to be enforceable till all the dues of the IIM UDAIPUR under or by virtue of the said agreement have been fully paid, and its claims satisfied or discharged, or till the Chief Administrative Officer, IIM Udaipur on behalf of the IIM UDAIPUR, certifies that the terms & conditions of the said organisation (s), and accordingly discharges this guarantee.

5 We .....further agree with the IIM UDAIPUR that the IIM UDAIPUR (indicate
the name of the Bank) shall have the fullest liberty without our consent , and without effecting in any manner our obligations hereunder, to vary any of the terms & conditions of the said agreement or to extend time of performance by the said organization (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the IIM UDAIPUR against the said organization (s) 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 being granted to the said organization (s) or for any forbearance, act of omission on the part of the IIM UDAIPUR or any indulgence by the IIM UDAIPUR to the said organization (s) 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 This Guarantee will not be discharged due to the change in the constitution of the Bank or the organization (s).

7 We..... lastly undertake not to revoke this Guarantee except with (indicate the name of the Bank) the previous consent of the IIM UDAIPUR in writing.

8 This guarantee shall be valid up to.....unless extended on demand by
IIM UDAIPUR.

Notwithstanding anything contained hereinabove:

a) Our liability under this Guarantee shall not exceed Rs..... (Rupees. ..... Only).

b) This Bank Guarantee shall be valid up to.....and

c) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before
..... . All yours rights under the said guarantee be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Dated the ..... day of ..... for .....

(Indicate the name of the Bank)

*Date to be worked out on the basis of validity period or 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, as the case may be.

INFORMATION REGARDING ELIGIBILITY
LETTER OF TRANSMITTAL

From:

To

The Director
IIM Udaipur

Subject: Submission of Bid for the work
"**.....**."

Sir,

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

1. I / we hereby certify that the statement made and information supplied in the enclosed forms **A to J** and accompanying statement are true and correct.

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

3. I / we submit the requisite certified Solvency Certificate and authorize the IIM Udaipur to approach the bank issuing the Solvency Certificate to confirm the correctness thereof. I / We also authorize Estate Officer, IIM, Udaipur to approach individuals, employers, firms & Corporation to verify out competence and general reputation.

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

Name of work	Certificate From

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 / cancellation of enlistment in case of any information furnished by me / us found to be incorrect.

Enclosures: Seal of bidder

Seal of bidder

Date of submission:

Signature(s) of Bidder(s)

FORM 'A'

FINANCIAL INFORMATION

I. **Financial Analysis** – Details to be furnished duly supported by figures in Balance Sheet / Profit &Loss Account for 5 (five) years duly certified by the Chartered Accountant, as submitted by the applicant to the Income-Tax Institute (Copies to be attached).

Note: The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive years' balance sheets, duly audited and certified by the Chartered Accountant. **(The balance sheet in case of Pvt./ Public Ltd. company means its standalone finance statement and consolidated financial statement both).**

Financial Years
(In lakh)

Sl. No	**Details**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
		2023-24	2022-23	2021-22	2020-21	2019-20
i)	Gross annual turnover in works.					
ii)	Profit / Loss					

II. Financial arrangements for carrying out the proposed works.
Note: Attach additional sheets, if necessary

Signature of Chartered Accountant with seal Signature (s) of Bidder(s)

FORM 'B'

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

_____, the Net worth of M/s_____(Name & Registered Address ofindividual / firm/company), as on____(the relevant date) is Rs. _____after considering allliabilities. 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 (the relevant date)"

Signature of Chartered Accountant	
Name of Chartered Accountant	
Membership no. of ICAI	
Date and seal	

FORM 'C'

Details of eligible similar nature of **works completed** during the last seven years. (Ending up to previous day of last date of submission of online tender)

Sl. No.	*Name of work / Project and location*	*Owner or Sponsoring organisation*	*Cost of work (in crores)*	*Date of commencement as per contract*	*Stipulated date of completion*	*Actual date of completion*	*Litigation Arbitration pending / in progress with details* *	*Name and Address/ Telephone number of officer to whom reference may be made.*	*Whether the work was done on back-to-back basis Yes / No*
1	2	3	4	5	6	7	8	9	10

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

Supporting documents to be attached.

Signature of Tenderer(s)

FORM 'D'

Performance Report Of Works Referred In Form 'C' – M/s .....

(Furnish this information for each individual work from the employer for whom the work was executed)

1. Name of work / Project & Location.
2. Agreement No.
3. Estimated Cost
4. Tendered Cost
5. Actual value of work done
6. Date of start
7. Date of completion
   a) Stipulated date of completion
   b) Actual date of completion
8. (a) Whether case of levy of compensation for delay has been decided or not **Yes/No**
   (b) If decided, amount of compensation levied for delayed completion, if any
9. Performance report
   i) Quality of work — Outstanding/ Very good /Good/ Poor
   ii) Finance Soundness — Outstanding/ Very good /Good/ Poor
   iii) Technical Proficiency — Outstanding/ Very good /Good/ Poor
   iv) Resourcefulness — Outstanding/ Very good /Good/ Poor
   vi) General behavior — Outstanding/ Very good /Good/ Poor

Executive Engineer or Equivalent (Seal of the organisation)

Date

FORM 'E'

Structure & Organization

1.	Name and address of Tenderer	
2.	Telephone No. / Fax No. / email address	
3.	Legal status of the Tenderer (Attach copies of original document defining the legal status). The applicant is: a) An individual b) A proprietary firm c) A Firm in partnership d) A limited company or corporation	
4.	Particulars of registration with various Govt. bodies (Attach attested photocopies) a) Registration Number b) Organization / Place of registration c) Date of validity	
5.	Name and title of Directors and officers with designation to be concerned with this work.	
6.	Designation of individuals authorized to act for the organization.	
7.	Has the Tenderer or any constituent partner in case of partnership firm Limited Company/Joint Venture, ever been convicted by the court of law? If so, give details.	
8.	In which field of HVAC /Electrical Installation, the Tenderer has specialization and interest?	
9.	Any other information considered necessary but not included necessary but not included above.	

Signature of Tenderer(s)

Form 'G'

FORMAT FOR UNDERTAKING FOR SITE INSPECTION

To
The Estate Officer,
IIM Udaipur

I/we hereby give an undertaking for the given work as follows:

Sub: NIT No.: **.....**

I/we have inspected and examined the site and its surroundings is / are satisfied before submitting our bid 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 I/we may require and in general shall myself / ourselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid. I/we shall be deemed to have full knowledge of the site whether I/we inspect it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. I/we shall be responsible for arranging and maintaining at our 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 I/we implies that I/we have read this notice and all other contract documents and has made myself / our self-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 us by the Government and local conditions and other factors having a bearing on the execution of the work.

Place:
Date:

Yours faithfully
(Signatures of
Bidder(s))

Form 'H'

Declaration regarding local contents for preference make in India.

It is hereby clarified that I will follow the DIPP order No. P45021/2/2017-PP(BE-II) dated 28.05.2018 regarding PPP-MI and MEITY notification number 33(1)/2017-IPHW dated 14.09.2017, wherein it is the policy of the Government of India to encourage "Make in India" and promote manufacturing and production of goods and services in India with a view to enhancing income and employment. Therefore, convergence with other existing centrally sponsored and missions such as Make in India etc. shall be ensured during the designing and production.

Seal & Signature of the bidder(s)

Form 'I'

Undertaking for GST registration Certificate of the State i.e. other than (Rajasthan)

"lf 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 the institute, 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 the institute or GST institute in this regard".

Seal & Signature of the bidder(s)

Form 'J'

CERTIFICATE & DECLARATION

It has been certified that all information provided in tender form is true and correct to the best of my knowledge and belief. No forged / tampered document(s) are produced with tender form for gaining unlawful advantage. We understand that IIM, Udaipur is authorized to make enquiry to establish the facts claimed and obtain confidential reports from clients.

In case it is established that any information provided by us is false / misleading or in the circumstances where it is found that we have made any wrong claims, we are liable for forfeiture of EMD/SD and or any penal action and other damages including withdrawal of all work / purchase orders being executed by us. Further IIM, Udaipur is also authorized to blacklist our firm/company/agency and debar us in participating in any tender/bid in future.

I / We assure the Institute that neither I / We nor any of my / our workers will do any act/s which are improper / illegal during the execution in case the tender is awarded to us.

Neither I / We nor anybody on my / our behalf will indulge in any corrupt activities / practices in my / our dealing with the Institute.

Our Firm/ Company/ Agency is not blacklisted or banned by any Govt. Institute, PSU, University, Autonomous Institute or Any other Govt. Organization.

Date Signature of the Tenderer

Place Stamp

Note: This certificate should be executed on duly notarized Rs.500/- Non-Judicial Stamp Paper.

Form 'K'

Authority for signing the tender document.

Name of work: .....

NIT No.: .....

I,..... (***Name & Designation of owner/proprietor/authorized person***)

of Firm (**M/s .....**

..... (***Name & Complete address of the agency / company/ firm),***

hereby authorize **.....**

(authorised signatory, *Designation*) to sign the tender document for the above cited work.

Sign. of the tender signing person

Attested by

Sign. of the authorised signatory of the firm

Note : This certificate should be executed on duly notarized Rs.500/- Non-JudicialStamp Paper.

FORM 'L'

Furnish an affidavit on non-judicial stamp paper worth Rs.500/-

I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on **back-to-back basis.** Further that, if such aviolation comes to the notice of Institute, then I/we shall be debarred for bidding in IIM Udaipur in future forever. Also, if such a violation comes to the notice of the Institute before date of start of work, the Estate Officer shall be free to forfeitthe entire amount of Earnest Money Deposit / Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid).

Signature of Notary with seal

Signature of bidder or an Authorized person of the firmwith stamp

Note: Affidavit to be furnished on a 'non-judicial' stamp paper of Rs.500/-.

(Scanned copy of the notarized affidavit to be uploaded at the time of submission of bid.

Form - M

Undertaking for EPFO registration Certificate

"lf work is awarded to me, I/we shall obtain EPFO registration Certificate within one month from the date of receipt of award letter or before release of any payment by the institute, 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 the institute in this regard".

Seal & Signature of the bidder(s)

Form - N

Undertaking for ESIC registration Certificate

"lf work is awarded to me, I/we shall obtain ESIC registration Certificate within one month from the date of receipt of award letter or before release of any payment by the institute, 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 the institute in this regard".

Seal & Signature of the bidder(s)

Schedule of Quantities					
S. No.	**Item description**	**Qty**	**Unit**	**Rate**	**Amount**
1.00	**Water cooled Chiller**				
1.0	Supply, installation, testing, and commissioning of microprocessor controlled variable speed screw type water chilling machine having actual capacity of 350 TR complete with Horizontal Twin screw type compressor in semi-hermetic construction suitable for HFC-134A refrigerant, complete with semi hermetic refrigerant cooled motor, suitable for 400/415 + 10 % volts, 3 phase50 Hz AC supply, with insulated shell & tube type flooded chiller, expansion device, capacity control mechanism, controls, wiring, accessories, with safeties to make a complete smoothly working water chilling machine, operating solely through its complete range. The chiller Shell shall be duly insulated with 19 mm thick closed cell nitrile rubber insulation (Local/ site made insulation is not acceptable) at OEM premises along with OEM supplied VFD starter and HARMONIC FILTER complete with all accessories housed in a cubicle panel in standard fitted condition at OEM premises. Chiller should be BMS compatible. Chillers require performance testing on AHRI certified bed at 100% load of the machine at manufacturer works on AHRI certified test bed and performance should be in accordance with AHRI 550-590. If new foundation/modification in the existing foundation is required, the same is included in the scope of work, nothing extra shall be paid on this account.	1	No.	₹ 92,20,967	₹ 92,20,967
	Chilled Water IN & OUT:- 54 Deg F/ 44 Deg F				
	Fouling Factor :- 0.0005FPS				
	CHILLED WATER CIRCULATION:- 840 USGPM				
	CONDENSER WATER IN & OUT :- 90Deg /97.5 Deg F				

	Fouling Factor :- 0.001FPS				
	WATER CIRCULATING RATE ;-1400US GPM				
	IPLV SHALL NOT EXCEED:- 0.4 KW/TR				
	C.O.P NOT LESS THEN :-5.8				
	PRESSURE DROP ACROSS CONDENSER LESS THEN -6 M				
	Fouling Factor (MKS) - 0.0001				
	As per CPWD HVAC specifications 2017				
	Inpur KW/ Tr shall not exceed 0.61				
2.00	Supply, installation, testing, and commissioning of Horizontal End suction condenser water centrifugal pump set with bronze impeller for condenser water recirculation complete with TEFC (IE3) Sq. Cage induction motor with class "F" insulation, base plate, coupling guard, SS Shaft Grade 316, bronze impeller, factory fitted mechanical seal, flexible pipe connector at the inlet and outlet, etc. conforming to technical specification & as per following parameters. If a new foundation/modification in the existing foundation is required, the same is included in the scope of work, nothing extra shall be paid on this account.	1	No.	₹ 4,97,914	₹ 4,97,914
	Condenser Water Pumps Set				
	Capacity of Pump 1400 USGPM				
	Pump Head-25 Mtr				
	Motor rating- 37 Kw approx.				
	Pump Efficiency (Min)-80%				

3.00	Supply, installation, testing, and commissioning of Horizontal End suction Top discharge Primary chilled water centrifugal pump set with bronze impeller for chilled water recirculation complete with TEFC (IE3) Sq. Cage induction motor with class "F" insulation, base plate, coupling guard, SS Shaft Grade 316, bronze impeller, factory fitted mechanical seal, flexible pipe connector at inlet and outlet, etc. conforming to technical specification & as per following parameters. The chilled water pumps shall also include the cost of thermal insulation. If a new foundation/modification in the existing foundation is required, the same is included in the scope of work, nothing extra shall be paid on this account.	1	No.	₹ 2,38,945	₹ 2,38,945
	Primary Chilled Water Pumps Set				
	Capacity of Pump 840 USGPM				
	Pump Head-15 Mtr				
	Motor rating- 11 Kw approx.				
	Pump Efficiency (Min)-80%				

4.00	Supply, installation, testing, and commissioning of Horizontal Split casing Secondary chilled water centrifugal pump set with bronze impeller for chilled water recirculation complete with TEFC (IE3) Sq. Cage induction motor with class "F" insulation, base plate, coupling guard, SS Shaft Grade 316, bronze impeller, factory fitted mechanical seal, flexible pipe connector at the inlet and outlet, etc. conforming to technical specification & as per following parameters. The chilled water pumps shall also include the cost of thermal insulation. The pumps shall be suitable for operation on variable frequency drives & conforming to the specifications of the variable speed pumping system including Supply, installation, testing and commissioning of OEM-suppliedVariable Speed Pumping system for of 1 Nos 45.0 Kw or as per the final selection of secondary pump motor Kw variable frequency drive (VFD) having IP-54/55 enclosure with heat sink suitably interfaced with other system components, hand / auto macro designed for pumping application, 01 no. dedicated microprocessor based pump logic controller, parallel pumping software duly downloaded, 02 No. Differential Pressure Sensor / Transmitters, interfacing amongst all components and compatibility of I/O signals etc complete with other accessories as required. If a new foundation/modification in the existing foundation is required, the same is included in the scope of work, nothing extra shall be paid on this account. **Secondary Chilled Water Pumps Set** Capacity of Pump 840 USGPM Pump Head -46 Mtr Motor rating- 45 Kw Pump Efficiency (Min)-75%	1	No.	₹ 14,26,314	₹ 14,26,314
5.00	**TERTIARY VARIABLE PUMPING SYSTEM WITH VFD**				

	Supply, installation, testing, and commissioning of Split Coupled Vertical Inline Chilled water centrifugal pump sets (including required supports) with bronze impeller for chilled water recirculation complete with outside type mechanical seal TEFC Squirrel Cage induction motor (IE3) with class "F" insulation, coupling guard, etc. conforming to technical specification & as per following parameters. The chilled water pumps shall also include the cost of thermal insulation and aluminum cladding.Secondary chilled water pumps shall be suitable for operation on adjustable frequency drives & conforming to the specifications of variable speed pumping system (OEM Assembled & Factory Fitted) including Supply, installation, testing and commissioning of Variable Speed Pumping system consisting of 1 Number 18.5 KW variable frequency drive (VFD) integrated with motor for sensorless / wireless operations) and shall show flow and head for optimized commissioning suitably interfaced with other system components, manual/auto adjustable mechanism suitable for pumping application, parallel pumping software duly downloaded, interfacing amongst all components and compatibility of Input/Output signals etc complete with other accessories as required. Water flow rate- 800 USGPM Head- 25 mtr, PN-16 rated Motor rating 18.5 KW/PUMP	1	No.	₹ 6,33,656	₹ 6,33,656

6.00	Supply, installation by OEM, testing and commissioning of CTI Certified FRP Induced draft, cross/counter flow, suitable cooling fan, direct driven, site erected cooling tower of capacity as mentioned below based on the parameters given below and complete with FRP Cold Water Basin with additional sump in the bottom of the basin on every outlet point to avoid vortex formation in the condenser water pipe line, high efficiency PVC cross fluted design Fills, Louvers, high efficiency Drift Eliminator, Weather Proof IP 55 TEFC Motor (IE3), axial flow aerofoil design fan, Hot dip galvanised Steel Ladder, MS Base frame, header & branch arm type gravity flow water distribution system, all pipe connection hot dip galvanised, Stainless Steel hardware including nut, bolt, washer, overflow, automatic make up water, equalizing & quick fill arrangement & connection etc. The cooling tower shall conform to technical specifications given in the tender. The maximum allowable sound power at a distance of 3 M from the cooling Tower shall be less than 75 dB. The tower fan motor shall be suitable for VFD operation and operation of VFD system shall be based on approach of cooling tower. The scope of work is inclusive of excavation of the soil for the foundation of the cooling tower. The item is inclusive of making required RCC foundation in confirmation to OEM drawing/standards inclusing required excavation of soil, nothing extra shall be paid on this account. Cooling Tower model shall be CTI certified & as per conditions given below. **RCC foundation and excavation work in contractor scope.** **Note: All Cooling Towers have to be CTI CERTIFIED with CTI logo on Nos. towers and the submittals must be accompanied with the vendor's CTI certification / Re - validation letter along with relevant selection matrix.** Water Flow - 1400 GPM (4 GPM / TR)	1	No.	₹ 12,42,884	₹ 12,42,884

	Designed Wet Bulb Temperature - 28.3 °C Water Inlet / Outlet Temperature - 36.38 °C / 32.22 °C Nos. of Cell -One Nos. of Fan - Two Fan Motor approx.- 7.5 Kw Heat Rejection- 13,25,100 Kcal/Hr to 13,25,800 Kcal/Hr				
7.00	**Powered Automatic Tube Cleaning System** SITC of Anti Fouling Condenser System Upto 4# Chillers Max, the Common Skid for the required number of chillers shall include 4.3" Touch Screen Graphical PLC, one injection/collection pump, motorized valves and complete with all accessories and Low side activities of piping connections from Ball traps to Ball collectors and Chillers all with standard fitted construction of OEM at OEM premises. The motorized valve shall give signals to PLC of their functioning and all process of injection and collection should be shown on the PLC while in operation. The manufacturer should have IOT Ready Contoller & digital platform (App Based) for demonstration of key parameters of chiller efficiency as an option if required for Future Scalability. The Common Skid piping, Ball Trap to suit chiller capacity and chiller quantity requirement as per the project. The Manufacturer shall have Hydrostatic Test Bed Facility to Witness Factory Acceptance Test for Hydrostatic Testing of machine at **10 Bar** Pressure. Chiller Capacity : **200 TR x 3 Nos. and 350 TR x 1 No.**	1	Set	₹ 14,05,311	₹ 14,05,311
8.00	Supplying, fixing, testing and commissioning of condenser water pipes of following sizes of MS 'C' class along with necessary clamps, vibration isolators and fittings such as bends, tees etc.. But excluding valves, strainers, gauges etc. adequately supported on rigid supports duly painted/buried in ground				

	excavation and refilling etc. as per specification and as required complete in all respect.				
	Note:-The Pipes size 150 mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150 mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35 mm thick M.S. Sheet for pipes up to 350 mm dia. and from minimum 7mm thick MS sheet for pipes of 400 mm dia and above.				
8.10	50 mm dia pipe (Drain)	10	Rmt	₹ 1,092	₹ 10,920
8.20	200 mm dia pipe	55	Rmt	₹ 5,526	₹ 3,03,930
8.30	250 mm dia pipe	35	Rmt	₹ 6,653	₹ 2,32,855
9.00	**Motorised Butterfly Valves**				
	Supplying, fixing, testing and commissioning of following sizes Motorized Butterfly Valve Flanged end with CI Body, SS Disc, O - ring and minimum PN-16 pressure rating, conforming to BS 5155, IS 13095, with IP-55 actuator, capable of accepting up to 10V DC , and up to 20 mA electric signal and providing similar transduced feedback output to control system as required.				
9.10	250 mm dia for New Chiller connetion	1	Nos.	₹ 72,308	₹ 72,308
9.20	200 mm dia for existing Chiller connetion	3	Nos.	₹ 55,307	₹ 1,65,921
10.00	**Manual Balancing Valves**				
	Supply, installation, testing, and commissioning of manual flanged end balancing valves with pressure test cocks only in SS-410stem, EN-3 Disc EPDM sealing disc in return chilled and condenser water line of Nos. chiller, condenser, and cooling tower as per tender specification & of following sizes:				
10.1	250 mm dia (For Condenser Out, Cooling Tower In)	2	Nos.	₹ 1,58,309	₹ 3,16,618
	Valves & Strainer				

11.00	Supply, installation, testing and commissioning of following valves in condenser water line as per specification given in the tender.				
	BUTTERFLY VALVE (MANUAL- Flanged end) with CI body SS disc nitrile sheet & O - ring & PN 16 pressure rating as specified.				
11.10	50 mm dia	1	Nos.	₹ 3,393	₹ 3,393
11.20	200 mm dia	4	Nos.	₹ 14,156	₹ 56,624
11.30	250 mm dia	6	Nos.	₹ 25,885	₹ 1,55,310
12.00	**Y-strainer** of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation.				
12.10	250 mm dia	1	Nos.	₹ 58,097	₹ 58,097
12.20	200 mm dia	3	Nos.	₹ 49,724	₹ 1,49,172
13.00	Supply ,Installation ,Testing and Commissioning of Flexible connector for following Dia. pipe suitable for PN 16 pressure rating to be installed at pump and chiller suction and discharge .				
13.10	250 mm dia	4	Nos.	₹ 24,837	₹ 99,348
14.00	**NON - RETURN VALVE** Cast Iron to IS 210 Gr. FG 260 Body, ASTM A 217 Gr. CA-15 (SS-410) Plates, SS-410 Hinge/Stop Pin, SS-316 Spring(s), Buna-N Seal for chilled / hot water circulation. Valves shall be insulated with same as Pipe.				
14.10	250 mm dia	1	Nos.	₹ 29,911	₹ 29,911
15.00	**Thermometer**				
	Providing & fixing in position the mercury in glass industrial type thermometers with shut off valve complete as required.	2	Nos.	₹ 1,043	₹ 2,086

16.00	**Pressure Gauges**				
	Providing and fixing in position the industrial type pressure Gauge with gun metal / Brass Valves complete required.	4	Nos.	₹ 1,196	₹ 4,784
17.00	**Chilled / Hot Water Piping With Insulation (Indoor / Outdoor)**				
	Supplying, laying/ fixing, testing and commissioning of following nominal sizes of chilled/hot water piping inside the building (with necessary clamps, vibration isolators and fittings but excluding valves, strainers, gauges etc.) duly insulated with Closed Cell Nitrile rubber having 45 kg/cum density and thermal conductivity of 0.02W/mK at 20 deg. C, Class O applied suitable adhesive and repairing of damage building etc. as per specifications and as required.				
17.10	200 mm MS C Class black pipe as per IS: 3589 (32 mm Nitrile Insulation)	40	Meter	₹ 6,242	₹ 2,49,680
18.00	**Motorised Butterfly Valves**				
	Supply, installation, testing and commissioning of motorised on / off butterfly valves with modulating motor in return chilled & hot water line of Nos. chiller & Hot Water Generator operated through BMS & of following sizes. Butterfly valve rating shall be PN-16, Cast Iron to IS 210 Gr. FG 260 Body, Ductile (SG) Iron Disc with Nylon Coated, SS-431 Shaft, EPDM integrally moulded liner. Valves shall be insulated with same as Pipe.				
18.10	300 mm dia (existing header- Hostel side)	1	Nos.	₹ 1,00,436	₹ 1,00,436
18.20	200 mm dia (For new Chiller connection and existing headers-A & C Block)	3	Nos.	₹ 55,307	₹ 1,65,921
18.30	150 mm dia (For existing header- B Block+ Chiller existing connetion)	4	Nos.	₹ 42,877	₹ 1,71,508
18.40	125 mm dia (For existing header- C Block)	1	Nos.	₹ 42,508	₹ 42,508

19.00	**Manual Balancing Valve**				
	BALANCING VALVE WITH BUILT IN MEASURING FACILITY with Cast Iron body flanged construction, SS-410 Stem, EN-3 Disc and EPDM Sealing Disc Rating PN-16 for chilled / hot water circulation as specified. Valves shall be insulated with same as Pipe.				
19.10	200 mm dia (For Chiller)	1	Nos.	₹ 69,603	₹ 69,603
20.00	**Ball Valve**				
	SITC of Brass Ball with Steel Lever without Y Strainer with Nitrile Insulatiom same sa on MS Pipe.				
20.10	20 mm dia	9	Nos.	₹ 1,686	₹ 15,174
21.00	**BUTTERFLY VALVE (MANUAL Flanged end)** shall be PN-16 rating, Cast Iron to IS 210 Gr. FG 260 Body, Ductile (SG) Iron Disc with Nylon Coated, SS-431 Shaft, EPDM integrally moulded liner with hand lever operated up to 150mm and 200mm and above Gear Operated. Valves shall be insulated with same as Pipe.				
21.10	200 mm dia	6	Nos.	₹ 15,661	₹ 93,966
22.00	**NON - RETURN VALVE** Cast Iron to IS 210 Gr. FG 260 Body, ASTM A 217 Gr. CA-15 (SS-410) Plates, SS-410 Hinge/Stop Pin, SS-316 Spring(s), Buna-N Seal for chilled / hot water circulation. Valves shall be insulated with same as Pipe.				
22.10	200 mm dia	2	Nos.	₹ 14,492	₹ 28,984
23.00	Supply ,Installation ,Testing and Commissioning of Flexible connector for following Dia. pipe suitable for PN 16 pressure rating to be installed at pump and chiller suction and discharge .				
23.10	200 mm dia	6	Nos.	₹ 14,879	₹ 89,274

24.00	**Pressure Gauges**				
	Providing and fixing in position the industrial type pressure Gauge with gun metal / Brass Valves complete required.	16	Nos.	₹ 1,196	₹ 19,136
25.00	**Thermometer**				
	Providing & fixing in position the mercury in glass industrial type thermometers.	12	Nos.	₹ 1,043	₹ 12,516
26.00	**Auto Air Vent**				
	Supply, installation, testing and commissioning of auto air vent valve of Brass construction with Isolating Ball Valve of following sizes and complying with tender specification.				
26.10	20 mm dia auto air vent valve with Ball Valve	16	Nos.	₹ 2,666	₹ 42,661
	Power & Control Cabling				₹ 0
27.00	Supplying, Laying and fixing of one number aluminium stranded conductor, XLPE insulated, PVC sheathed armoured power cable of 1.1 kV grade as per IS 7098(Part-1)1988 including tying with PVC cable ties/GI wire at a distance of maximum 300 mm of following size on cable tray complete as required.				
27.10	2 x 3C x 300 Sq. mm (Rate For Single Run)	45	Rmt	₹ 2,848	₹ 1,28,160
27.20	2 x 3C x 25 Sq. mm (Rate For Single Run)	130	Rmt	₹ 559	₹ 72,670
27.30	3C x 16 Sq. mm (Rate For Single Run)	60	Rmt	₹ 500	₹ 30,000
27.40	2 x 3C x 6 Sq. mm (Rate For Single Run)	60	Rmt	₹ 441	₹ 26,460
28.00	Supplying, Laying and fixing of one number aluminium stranded conductor, XLPE insulated, PVC sheathed armoured power cable of 1.1 kV grade as per IS 7098(Part-1)1988 of following size on on wall surface as required.				
28.1	3C x 16 Sq. mm (Rate For Single Run)	120	Rmt	₹ 328	₹ 39,360

29.0	Supplying, Laying and fixing of one number aluminium stranded conductor, XLPE insulated, PVC sheathed armoured power cable of 1.1 kV grade as per IS 7098(Part-1)1988 of following size in the existing masonry open duct as required.				
29.1	2 x 3C x 300 Sq. mm (Rate For Single Run)	10	Rmt	₹ 2,691	₹ 26,910
29.2	2 x 3C x 25 Sq. mm (Rate For Single Run)	20	Rmt	₹ 558	₹ 11,160
29.3	3C x 16 Sq. mm (Rate For Single Run)	70	Rmt	₹ 499	₹ 34,930
29.4	2 x 3C x 6 Sq. mm (Rate For Single Run)	10	Rmt	₹ 440	₹ 4,400
30.00	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
30.10	3 X 300 sq. mm (70mm)	4	each	₹ 1,165	₹ 4,660
30.20	3 X 25 sq. mm (25mm)	8	each	₹ 275	₹ 2,200
30.30	3 X 16 sq. mm (25mm)	4	each	₹ 270	₹ 1,080
30.40	3 X 6 sq. mm	4	each	₹ 257	₹ 1,028
31.00	Supplying, Laying and fixing of following PVC insulated Copper conductor of 1.1 KV Grade IS 7098(Part-1)1988 including tying with PVC cable ties/GI wire at a distance of maximum 300 mm of following size on cable tray/Syrface complete as required.				
31.10	3C x 1.5 Sq. mm	150	Rmt	₹ 208	₹ 31,200
31.20	2C x 1.5 Sq. mm	300	Rmt	₹ 175	₹ 52,500
32.00	Earthing Strip / Wires Rubber Mat as per specs.				
32.10	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	20	Rmt	₹ 244	₹ 4,880

32.20	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required	250	Rmt	₹ 42	₹ 10,500
	Cable Tray, Bends, Tee & Reducer				
33.00	**Cable Tray**				
	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
33.10	150 mm wide x 50 mm depth x 1.6 mm thickness.	30	Rmt	₹ 716	₹ 21,480
33.20	300 mm wide x 50 mm depth x 1.6 mm thickness.	10	Rmt	₹ 963	₹ 9,630
33.30	450 mm wide x 50 mm depth x 2.0 mm thickness.	50	Rmt	₹ 1,325	₹ 66,250
33.40	600 mm width X 50 mm depth X 2.0 mm thickness	30	Rmt	₹ 1,790	₹ 53,700
34.00	**Cable Tray Bends**				
	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
34.10	150 mm wide x 50 mm depth x 1.6 mm thickness.	2	Nos.	₹ 1,270	₹ 2,540
34.20	300 mm wide x 50 mm depth x 1.6 mm thickness.	6	Nos.	₹ 1,852	₹ 11,112
34.30	450 mm wide x 50 mm depth x 2.0 mm thickness.	2	Nos.	₹ 2,683	₹ 5,366
34.40	600 mm width X 50 mm depth X 2.0 mm thickness	2	Nos.	₹ 3,774	₹ 7,548

35.00	**Cable Tray Tee**				
	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
35.10	300 mm wide x 50 mm depth x 1.6 mm thickness.	1	Nos.	₹ 3,141	₹ 3,141
35.20	450 mm wide x 50 mm depth x 2.0 mm thickness.	1	Nos.	₹ 4,446	₹ 4,446
36.00	**Cable Tray Reducer**				
	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Reducer" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
36.10	300 mm wide x 50 mm depth x 1.6 mm thickness.	2	Nos.	₹ 2,823	₹ 5,646
36.20	450 mm wide x 50 mm depth x 2.0 mm thickness.	2	Nos.	₹ 3,721	₹ 7,442
37.00	**Repairing work**				
	Supplying, laying, fixing, testing and commissioning of following thickness closed cell elastrometric nitrile rubber of class 'O' applied by suiatable adhesive, as per specifications and as required complete in all respect including the work of removing the tornout/damaged existing insualtion, scratching the adhesive.				
37.10	32 mm thick	100	Sqmtr	₹ 1,419	₹ 1,41,900

38	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Estate Officer.**Hard rock (blasting prohibited)**	90	Cum	₹ 1,433	₹ 1,28,966
39	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Estate Officer. **40 mm nominal dia Pipes**	15	Rmt	₹ 703	₹ 10,544
Total Amount (Rs.)					**₹ 1,83,90,444**
(in words Rupees One Crore Eighty Three Lacs Ninety Thousand Four Hundred Forty Four Only)					

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Percentage BoQ

Tender Inviting Authority: The Director IIM Udaipuur

Name of Work: Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.)

Contract No: IIMU/Tender/350TR-Chiller/2024-25

Name of the Bidder/ Bidding Firm /	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER	TEXT *	NUMBER	TEXT *	NUMBER	NUMBER *	TEXT *
Sl. No.	Item Description	Quantity	Units	Estimated Rate in Rs. P	TOTAL AMOUNT With Taxes	TOTAL AMOUNT In Words
1	2	3	4	5	54	7
1.01	Augmentation of the existing Water-cooled Chiller Plant at the Indian Institute of Management, Udaipur. (SH:- SITC of 350 TR Chiller.) as per technical specifications and SOQ mentioned in the tender document.	1	Nos	18390444	18390444.00	INR One Crore Eighty Three Lakh Ninety Thousand Four Hundred & Forty Four Only
Total in Fig					18390444.00	INR One Crore Eighty Three Lakh Ninety Thousand Four Hundred & Forty Four Only
Quoted Rate in Figures			Select		0.00	INR Zero Only
Quoted Rate in Words					INR Zero Only	

Chiller Plant Layout