INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI

VOLUME I

TECHNICAL BID

HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

NIT NUMBER: IISERT/ENGG/2025-26/05

Index

भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान (आईआईएसईआर) तिरुपति
INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI
शिक्षा मंत्रालय, भारत सरकार का एक स्वायत्त संस्थान श्रीनिवासपुरम, जंगलापल्लि गांव, पंगुरु (जी.पी.), ऐर्पेडु (एम), तिरुपति - 517619
An Autonomous Institution, Ministry of Education, Govt. of India at Srinivasapuram, Jangalapalli Village, Panguru (G.P),
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ई-निविदा आमंत्रित करने की सूचना (ई-खरीद मोड)
NOTICE INVITING e-TENDER (e-Procurement mode)

भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, तिरुपति प्रतिष्ठित एजेंसियों से दो-भाग खुली बोली प्रणाली में ऑनलाइन मद दर बोलियां आमंत्रित करता है, जो नीचे उल्लिखित कार्य के लिए एनआईटी के खंड 2 और 3 में परिभाषित न्यूनतम आवश्यकताओं के अनुसार पात्र पाए गए:

Indian Institute of Science Education and Research, Tirupati invites online item rate bids in two-part open bid system from reputed agencies, found eligible as per the minimum requirements defined in clause 2 & 3 of NIT for the work mentioned below:

निविदा का संक्षिप्त विवरण: /**Brief Details of Tender:**

क्र. सं/ Sr. No	**कार्य का संक्षिप्त विवरण Description of work in Brief**	**बोली लगाने की अनुमानित लागत (रु.) Estimated cost put to bid (Rs.)**	**बयाना राशि (रु.) Earnest Money (Rs.)**	**पूरा होने की अवधि Period of Completion**	**पूर्व-बोली बैठक तिथि और समय Pre bid meeting Date & time**	**तकनीकी बोली प्रस्तुत करने की अंतिम तिथि और समय Last date & time of submission of technical bid**	**तकनीकी बोलियां खोलने का समय और तिथि Time & date of opening of technical bids**
1.	आईआईएसईआर तिरुपति, ऐर्पेडु में एचवीएसी पुनर्गठन जिसमें क्षमता वृद्धि के साथ मौजूदा एयर हैंडलिंग इकाइयों को हटाना और पुनः स्थापित करना, सीलिंग निलंबित एयर कंडीशनिंग इकाइयों का प्रावधान और सहायक बुनियादी ढांचे और आंतरिक साज-सज्जा का कार्य. आईआईएसईआरटी/ईएनजीजी/2025-26/05 **HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.** NIT NUMBER-IISERT/ENGG/2025-26/05	4,57,69,295/-	22,88,464.75/-	90 Days	18/02/2026 11:00 Hrs	25/02/2026 15:00 Hrs	26/02/2026 15:30 Hrs

निविदा दस्तावेज केंद्रीय सार्वजनिक खरीद (सीपीपी) पोर्टल https://eprocure.gov.in/eprocure/app या संस्थान की वेबसाइट www.iisertirupati.ac.in से डाउनलोड किया जा सकता है और निविदा जमा करने की अंतिम तिथि और समय तक केवल ई-प्रोक्योरमेंट पोर्टल के माध्यम से ऑनलाइन जमा की जानी है।

The Tender Document can be downloaded from Central Public Procurement (CPP) Portal https://eprocure.gov.in/eprocure/app or Institute website www.iisertirupati.ac.inand bid is to be submitted online only through the E-procurement portal up to the last date and time of submission of tender.

निविदा की महत्वपूर्ण तिथियां /**Critical Dates of Tender**

क्र. सं. **S.No**	**विवरण /Particulars**	**तारीख /Date**	**समय घंटों में** **Time in Hrs**
1	ऑनलाइन प्रकाशन की तिथि/ Date of Online Publication	14/02/2026	18:00
2	तकनीकी बोली जमा करने की प्रारंभ तिथि/ Technical Bid Submission Start Date	18/02/2026	15:30
3	पूर्व-बोली बैठक/Pre-Bid Meeting	18/02/2026	11:00
4	तकनीकी बोली जमा करने की अंतिम तिथि/ Technical bid Submission Close Date	25/02/2026	15:00
5	तकनीकी बोलियों का खुलना/ Opening of Technical bids	26/02/2026	15:30

No manual bids will be accepted. Bids should be submitted in the E-procurement portal.

Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 0120-4200462, 0120-4001002, 91-8826246593.

1) Information & Instructions for Online Bid Submission:

1.1 This tender document has been published on the Central Public Procurement Portal (URL:https://eprocure.gov.in/eprocure/app)& Institute website www.iisertirupati.ac.in .

1.2 The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal. More information useful for submitting online bids on the CPP Portal may be obtained at: https://eprocure.gov.in/eprocure/app

1.3 The intending bidder must read the terms and condition of NIT carefully. Bidder should submit his bid only if he considers himself eligible and he is in possession of all the required documents.

1.4 Bid documents should be submitted online complete in all respect along with requisite amount of tender fee (cost of bid documents). Complete set of tender documents comprising Volume I, II, III has been made available at e-tender portal (URL:https://eprocure.gov.in/eprocure/app)

1.5 The bidder would be required to register at e-tender portal URL:http://eprocure.gov.in/eprocure/app . For submission of the bids, the bidder is required to have digital Signature Certificate (DSC) from one of the authorized Certifying Authorities.

1.6 Information and instruction for bidders posted on website shall form part of the bid document.

1.7 The bid document consisting of Vol-I – Technical bid, Vol-II- Technical specifications, Vol-III- Tender drawings 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 (URL:https://eprocure.gov.in/eprocure/app) free of cost.

1.8 But the bid can only be submitted after uploading the mandatory scanned documents such as receipt of online payment towards tender fee, in favour of Director, IISER Tirupati, scan copies of other required documents as specified in the NIT. The tender fee should be deposited online with IISER Tirupati within the period of bid submission as specified in the bid document.

1.9 Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online tendering process as per details available on the website. The intending bidder must have valid class-III digital signature to submit the bid.

1.10 On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.

1.11 Contractor can upload documents in the form of JPG format and PDF format.

1.12 Certificate of Financial Turn Over: At the time of submission of bid contractor may upload Affidavit/ Certificate from CA mentioning Financial Turnover of last 3 years or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

1.13 The tender document can be downloaded from http://eprocure.gov.in/eprocure/app and be submitted only through the same website.

2. REGISTRATION of Bidder on e-Procurement Portal

2.1 Bidders are required to enrol on the e-Procurement module of the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link “Click here to Enrol”. Enrolment on the CPP Portal is free of charge.

2.2 As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.

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

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

2.5 Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.

2.6 Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.

2.7 The CPP Portal also has user manual with detailed guidelines on enrolment and participation in the online bidding process. Any queries related to process of online bids or queries related to CPP Portal may be directed to the 24x7 CPP Portal Helpdesk.

2.8 The Institute will not be responsible for any type of technical issue regarding uploading of tender on website. URL:http://eprocure.gov.in/eprocure/app) and any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is **0120-4200462, 0120-4001002, 91-8826246593.**

3. SEARCHING FOR TENDER DOCUMENTS

3.1 There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal.

3.2 Once the bidders have selected the tenders they are interested in; they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

3.3 The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

4. PREPARATION OF BIDS

4.1 Bidder should take into account any corrigendum published on the tender document before submitting their bids.

4.2 Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.

4.3 Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS formats. Bid documents may be scanned with 100 dpi with black and white option.

4.4 To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents.

These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

5. SUBMISSION OF BIDS

5.1 Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

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

5.3 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.

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

5.5 Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

5.6 Kindly add scanned PDF or JPG format files of all relevant documents in a single PDF file of compliance sheet.

6 ASSISTANCE TO BIDDERS

6.1 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.

6.2 Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is **0120-4200462, 0120-4001002, 91-8826246593**.

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER)
TIRUPATI

SECTION I - i) NOTICE INVITING e-TENDERING

1. Indian Institute of Science Education and Research, Tirupati invites online item rate bids in open bid system from reputed construction agencies, found eligible as per the minimum requirements defined in clause 2 & 3 of NIT for the work mentioned below:

Name of work &Location	:	HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.
NIT NUMBER	:	IISERT/ENGG/2025-26/05
Estimated cost	:	Rs. 4.58 Crore
Period of completion	:	90 Days
Tender Fees		Rs. 590/- Inclusive of GST (Five Hundred and Ninety only) – (Non – refundable)
Last Dates & time to fill/upload the tender through e-tendering.	:	up to 15:00 hrs on 25/02/2026.
Pre bid meeting date & Time	:	At 11:00 hrs through hybrid mode on 18/02/2026
Time & date of opening of Technical Bids	:	At 15:30 hrs on 26/02/2026

2. The applicant should be a well-established and reputed Contractor/Authorised Dealer / Manufacturer (OEM) fulfilling following requirement will be eligible to apply.

   a) Should have experience of having successfully completed HVAC works of VRF/VRV systems during the last seven years ending previous day of the last date of submission of tenders

(i) Three similar works each costing not less than Rs. **1.32 Crores** or
(ii) Two similar works each costing not less than **Rs 1.98 Crores** or
(iii) One similar work costing not less than **Rs 2.64 Crores.**

AND

b) Should have experience of having successfully completed Civil works during the last seven years ending previous day of the last date of submission of tenders

(i) Three similar works each costing not less than Rs. **51.42 Lakhs** or
(ii) Two similar works each costing not less than **Rs 77.13 Lakhs** or
(iii) One similar work costing not less than **Rs 1.03 Crores.**

Components of work executed other than those included in the definition in above works shall be deducted while calculating cost of eligibility work. Bidder shall submit abstract of cost of work in support of this.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of receipt of applications for tender.

The eligibility works should be certified by an officer not below the rank of Executive Engineer in Govt. Departments and Superintending Engineer/ Chief Project manager or Equivalent in other organizations.

The main contractor/agency qualifies on similar work criteria in only one of the 2a or 2b, then the Bidder should have MOU/authorization with agencies fulfilling the condition independently and the same need to be submitted along with the bid for meeting the eligibility criteria.

The bidder, in case not being the Original Equipment Manufacturer (OEM), shall submit a specific authorization letter from the OEM(s) of major equipment such as VRV systems and Air Handling Units (AHUs) for this particular NIT. The authorization shall clearly state that the OEM authorizes the bidder to quote, supply, install, test and commission the equipment against this tender and shall also confirm that the OEM shall extend full technical support, after-sales service and ensure availability of spares for a minimum period of 10 (ten) years from the date of commissioning. The authorization letter shall be issued specifically for this work and shall be signed by an authorized official of the OEM not below the rank of Regional Manager / Zonal Head / Business Head. The copy of such authorization letter shall be submitted along with the technical bid, failing which the bid shall be liable for rejection. The format authorisation from the OEM is given in FORM I.

c) Should have had average financial turnover (Gross) of at least Rs **1.37 Crore** on similar works defined above during the immediate last three consecutive years' balance sheets duly audited by Charted Accountant. Year in which no turnover is shown would also be considered for working out the average. No enhancement in the value of turnover for the past years shall be made for bringing them to current turnover level.

d) Should not have incurred any loss (profit after tax should be positive) during the immediate last three consecutive financial years ending 31st March, 2025, duly certified and audited by the Charted Accountant.

e) Should have solvency of **Rs. 1.98 Crore** certified by a Scheduled Bank and obtained not earlier than six months before the date of submission of Bid.

OR

Net worth certificate of minimum of **Rs. 45.77 Lakhs** as on last date of tender. Issued by certificate Charted Accountant with UDIN

3. CONTRACT ELIGIBILITY CRITERIA

Further, the contract eligibility includes the following:

3.1 **Experience on similar type of completed works executed during the last seven years;** and details like monetary value, clients, proof of satisfactory completion.

Similar work means: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works. The works executed only in India will be considered for similar work experience.

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

3.2 In case the similar work done specified as eligibility work is for other than Govt (State, Central, PSU) agency/organisation, the Income tax return statement indicating the necessary details for the same shall be submitted for consideration.

3.3 Documentary evidence of adequate financial standing, Certified by Bankers, Audited Profit & Loss A/c and Balance Sheet, Annual turnover in last three years, access to adequate working capital.

3.4 Information regarding projects in hand, current orders, regarding litigation, exclusion/expulsion or black listing, if any.

3.5 Bidders not meeting the minimum eligibility criteria shall be summarily rejected.

3.6 Copy of the enlistment order and certificates of work experience and other required as specified in the bid documents shall be scanned and uploaded to the e-tendering website within period of bid submission.

3.7 Bidder should not have been blacklisted by any state/Central Departments/PSUs/Sports Authority of India, Autonomous bodies during the last 7 years of its operations. Affidavit shall be made in current date after the date of invitation of the tender as per **Form F** and

shall be furnished on a 'Non-Judicial' stamp paper worth Rs.100/- otherwise the tender shall be rejected.

3.11 Affidavit for not executing the works as back-to-back basis.

3.12 Declaration about site inspection

4 The time allowed for carrying out the work will be **90 Days** from the date of start as defined in schedule 'C' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender.

5 The bid document is Two stage two Envelope e-tendering system can be seen from the Central Public Procurement Portal (URL:https://eprocure.gov.in/eprocure/app)& Institute website www.iiserTirupati.ac.in The contents of Envelope I & Envelope II are specified in the NIT.

6 Submission of Technical Bid Documents

Information and instruction for bidder for e-tendering forming part of bid document uploaded on website. Last date and time of submission of technical bid, Tender fee and other documents as specified in the NIT.

List of Document to be scanned and uploaded within the period of bid submission:

i Transaction Receipt of online deposit of tender fee and EMD declaration remittance proof.

ii Enlistment Order of the Contractor (Attested copy) if required.

iii Certificates of work Experience certificates submitted shall clearly indicate the:

a. Type and nature of work
b. Completion cost
c. Time period, actual completion date.
d. In case, if any of above details are not included in the work done certificates, then such bids will not be considered for opening.

iv Certificate of Registration for GST and acknowledgement of up to date filed return if required.

v **Scanned Copies of all eligibility documents required as per NIT required for Technical Evaluation clause 19 -Annexure –I**

Tender documents should be submitted online complete in all respect along with requisite amount of tender fee (cost of bid document). Complete set of tender documents comprising Volume I, II, III and financial bids has been made available at e-tender portal http://www.eprocurement & www.iiserTirupati.ac.in

7 Director, Indian Institute of Science Education & Research, Tirupati shall be the "Accepting Authority" hereinafter referred to as such for the purpose of this Contract.

8 Bids must be accompanied by tender fee and bid-security/EMD (Earnest Money Deposit) for the work in clause 9 & 10 payable at Tirupati.

9 Tender fee shall be Rs. 590/-, inclusive of GST (Five Hundred Ninety only) non-refundable fee required to be deposited in **IISER Tirupati Bank account** through net banking as detailed below failing which the bid will be declared non-responsive.

a) Bank A/c Details for crediting Tender Fee:

Name: IISER Tirupati
Bank: State Bank of India,
Branch: IIT Tirupati
Account No: **39721824884**
IFSC Code: SBIN0064604

Scanned copy of the net banking transaction receipt towards payment of tender fee shall be uploaded on the e-tendering website within the period of bid submission failing which the bid will be declared non-responsive.

10 **Bid Security/ Earnest Money Deposit (EMD)**: All other bidders should submit an EMD of Rs. 22,88,465/- in the form of DD/ NEFT /RTGS.

a) Bank A/c Details for crediting EMD:

Name IISER Tirupati
Bank: State Bank of India
Branch: IIT Tirupati
Account No: **35029946671**
IFSC Code: SBIN0064604

b) No interest will be paid on the Performance Security deposited/ remitted

11 **Pre-bid meeting**

11.1 The Bidder or his officially authorized representative is invited to attend a pre-bid meeting, which will be through hybrid mode. Bidder/ bidder representative who wish to attend Pre-bid meeting should email to engineering@iisertirupati.ac.in requesting for participation, for the link to be shared if participating online. The Pre-Bid meeting will be held through Hybrid mode on **18/02/2026** at 11:00 AM.

11.2 The purpose of the meeting is to clarify issues and to answer questions on matters that may be raised at that stage.

11.3 The Bidder is requested to submit their questions/ queries/ clarifications in writing or by email/ fax to reach the IISER Tirupati before the meeting. Bidders can send Pre-bid queries on their letter head referring tender number by Speed post on above said address so as to reach IISER Tirupati or on e-mail address engineering@iisertirupati.ac.in **before 18/02/2026** up to 10:00 Hours.

11.4 Minutes of the meeting (MOM), including the text of the questions raised (without identifying the source of enquiry) and the responses given will be uploaded as corrigendum on website (URL:https://eprocure.gov.in/eprocure/app) and www.iisertirupati.ac.in

12 Any modification of the bidding documents which may become necessary as a result of the pre-bid meeting shall be made by the IISER, Tirupati through pre bid MOM and this shall form part of bidding document.

13 IISER Tirupati reserves the right to reject any prospective applicant without assigning any Reason and to restrict the list of technically qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

14 Site visit, availability of site and cost of bidding

14.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the IISER, Tirupati will in no case be responsible and liable for these costs.

14.2 The Bidder should inform the IISER in advance about the proposed site visit.

14.3 The Bidder, at his own responsibility and risk is encouraged to visit, inspect and survey the Site and its surroundings and satisfy himself before submitting his bid as to the form and nature of the Site, the means of access to the Site, the accommodation he may require, etc.

14.4 In general, Bidders 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 claims due to any misunderstanding or otherwise shall be allowed.

14.5 The costs of visiting the Site shall be at the Bidders' own expense. Any report shared at the site, by the IISER is subject to verification by the contractor. Any deviations of information in the report and the actual site will not be the responsibility of the IISER.

14.6 The site for the work is available.

15 Content of Bidding Documents

15.1 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 executed and local conditions and other factors having a bearing on the execution of the works.

15.2 The Bidder shall submit the Bid, which satisfies each and every condition laid down in the bid documents, failing which, the bid is liable to be rejected.

15.3 Notice Inviting e-Tender shall form part of the Contract document.

15.3.1 The documents listed below comprises one set of bid document that are issued to Bidders:

PART – I

Technical Bid Envelope –I

Volume I

a) Notice Inviting Tender (Including eligibility criteria)

b) Tender Form and General Rules and Directions for the Guidance of the Contractor

c) General Conditions of Contract

d) Safety Code for Contract Work

e) Proforma of Schedule A to F

Volume- II: Special Conditions & PARTICULAR SPECIFICATIONS of Contract & Tender Drawings

PART-II

Envelop II – (Financial bid)

Volume –III: Financial bid Schedule of quantity (BOQ).

16 Amendment of Bid Documents

16.1 Before the deadline for submission of bids, the IISER Tirupati may modify the bidding documents by issuing corrigendum.

16.2 Any corrigendum so issued shall be part of the bid documents as well as Contract document and shall be on uploaded website URL:https://eprocure.gov.in/eprocure/app and www.iisertirupati.ac.in. Bidders should take note of the uploaded corrigendum and submit the tenders accordingly.

17 Bid Validity

17.1 The bid submitted shall become invalid if:

i The bidders are found ineligible.

ii The bidder does not deposit Online tender fee with IISER Tirupati before the date and time fixed for opening of the bids.

iii The bidders do not upload all the documents (including GST registration) as stipulated in the bid document.

iv If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest tenderer in the office of tender opening authority.

17.2 The bids submitted shall remain valid for acceptance for a period of 90 days from the date of opening of the technical bids.

18 Technical bid Opening

Online bid documents submitted by intending bidders shall be opened only of those bidders, whose tender fee and EMD declaration form submitted with IISER Tirupati and scanned their scanned copies i/c tender documents scanned and uploaded are found in order.

19 Technical Evaluation of the bids

19.1 The bidder qualifying initial criteria as set out in Para 2 & 3 and the details furnished by bidders in the Proforma 1 and **FORM A to Form I** enclosed as **Annexure-1** of Section II will be evaluated by the IISER Tirupati technical evaluation committee appointed by the competent authority. Performa's listed are elaborated below,

i. Initial bidding capacity Proforma I,
ii. Financial Information **FORM "A"**
iii. Solvency certificates from a scheduled bank - **Form B**
iv. Certificate of net worth from chartered accountant - **Form BI**
v. Details of similar works -- **Form C**
vi. Performance report of works referred to in **Form D**
vii. Organisation structure in **Form E**
viii. PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING- **Form F**
ix. Affidavit for not executing the works as back-to-back basis- **Form G**
x. Declaration about site inspection - **Form H**
xi. Authorization letter from OEM **– Form I (In the OEM letter head)**

The bidders qualifying the initial eligibility criteria as set out in clause no 2 & 3 above will be evaluated based on the information submitted by bidders as per clause no 19.1 after due verification and selection will be made by IISER, TIRUPATI on the basis of the strength of individual applicants. Main consideration will be the ability of the Principal Contractor to fulfil technical, financial, contractual and legal obligations. Special emphasis will be laid on competence to do good quality works within specified time schedule and in close coordination with other agencies over and above the rate structure of the items.

IISER Tirupati reserves the right to waive off minor deviations in the eligibility, if the technical evaluation committee consider that they do not materially affect the capability of the bidder to perform the contract. IISER Tirupati decision in this regard shall be final and binding & conclusive.

20. TECHNICAL EVALUATION CRITERIA:

The bidders qualifying the initial eligibility criteria, as set out in Para 2 & 3 above, will be evaluated for following criteria by the technical committee.

20.1 Evaluation of performance: Evaluation of the performance of the bidders for eligibility shall be done by the committee constituted by the Director, IISER Tirupati. All the eligible similar works executed and submitted by the bidders may be got inspected by a committee which may consists client or any other authority as decided by the competent authority. Performance of Works (Quality) shall be accessed based on this inspection, if inspection is carried out otherwise on the basis of the performance report given by the client department officer not below the rank of Executive Engineer.

20.2 Even though a bidder may satisfy the above requirements, he would be liable for dis-qualification if he has:

(a) Made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the pre-qualification document.

(b) Records of poor performance such as abandoning work, not properly completing the contract, or financial failures / weaknesses etc.

PART II

21 Financial /Price bid

21.1 After technical evaluation of (part I) bids as per clause 2, 3 & 20 above only short listed agencies financial bids shall be opened at the notified date and time.

22. Clarification of Bids

22.1 To assist in the examination and comparison of Bids, the IISER, Tirupati may, at its discretion, ask any Bidder for clarification of his Bid, including breakdown of unit rates. The request for clarification and the response shall be in writing or by email / fax, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the IISER, Tirupati in the evaluation of the bids.

22.2 No Bidder shall contact the IISER, Tirupati on any matter relating to his bid from the time of the bid opening to the time the contract is awarded.

22.3 Any effort by the Bidder to influence the IISER's bid evaluation, bid comparison or contract award decisions, may result in the rejection of his bid.

23. Indian Institute of Science Education and Research Tirupati, does not bind itself to accept the lowest or any other bid, and reserves the right to reject any or all of the tenders received without assigning any reasons. Bids in which any of the prescribed conditions are not fulfilled or any conditions including that of the conditional rebate put forth by the bidder shall be summarily rejected.

24 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer-in-charge or his representative's estimate of the cost of work to be executed under the contract, the IISER, Tirupati may require the Bidder to produce detailed rate analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the implementation/construction methods and schedule proposed.

25 Award Criteria

25.1. IISER Tirupati reserves the right without being liable for any damages or obligation to inform the bidder to:

a) amend the scope and value of the contract to the bidder

b) Reject any or all applications without assigning any reasons

25.2 IISER, Tirupati shall award the contract to the Bidder whose evaluated offer / bid has been determined to be the technically suitable and financially lowest and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to execute the contract satisfactorily. The Board of Governors of IISER reserves

the right to accept or reject any application and to annul the pre-qualification process and reject all applications at any time, without thereby incurring any liability to the affected applicants or specifying the grounds for the Employer's action

26 Contractor whose tender is accepted will be required to furnish Performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Schedule C. This guarantee shall be in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'C'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor and without prejudice to any other right or remedy. The Earnest Money deposited along with tender shall be returned after receiving the aforesaid performance guarantee. 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 the applicable licenses/registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC, and BOCW Welfare Board i/c 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 programme chart (Time and Progress) within the period specified in Schedule F.

27 Bidder shall quote rates for all items in the BOQ of work in the financial bid document. It will be obligatory on the part of the tenderer to sign the tender document for all the components (The schedule of quantities, conditions and special conditions etc.)

28 **Disclosures**

Any change in the constitution of the contractor's firm, where it is a partnership firm, as declared in the prequalification documents submitted by the bidders at the time of submission of prequalification documents, should be disclosed to the IISER, Tirupati, at any time between the submission of bids and the signing of the contract.

SECTION I

ii) ADDITIONAL INFORMATION AND INSTRUCTION TO APPLICANTS

1.0. GENERAL

1.1 STATEMENT OF OBJECTIVES, BRIEF SCOPE & PARTICULARS OF THE WORK

The entire Project will be executed under a Single Point Responsibility system.

HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works per the

relevant standards and CPWD specifications for the applicable items.

Particulars given above are provisional and liable to change and must be considered only as advance information to assist the bidder.

1.2. Letter of transmittal and other forms for pre-qualification are attached (Annexure I)

1.3. All information called for in the enclosed forms should be furnished against the respective columns in the forms. If information is furnished in a separate document, reference to the same should be given against respective columns. Such separate documents shall be chronologically placed at the end of the prescribed application. If information is 'nil' it should also be mentioned as 'nil' or 'no such case'. If, any particulars/query are not applicable in case of the applicant, it should be stated as 'not applicable'. However, the applicants are cautioned that not giving complete information called for in the application forms required, not giving it in clear terms or making change in the prescribed forms or deliberately suppressing the information may result in the applicant being summarily disqualified. Applications made by Fax and those received late will not be entertained.

1.4. References, information and certificates from the respective clients certifying suitability, technical know-how or capability of the applicant should be signed by an officer not below the rank of Superintending Engineer/Chief Project Manager or equivalent.

1.5 The Tenderer is advised to attach any additional information which he thinks is necessary in regard to his capabilities to establish that the applicant is capable in all respects to successfully complete the envisaged work. He is however, advised not to attach superfluous information. No further information will be entertained after pre-qualification document is submitted, unless it is called for by Employer.

1.6 **LETTER OF TRANSMITTAL**

The applicant should submit the letter of transmittal attached with tender document duly signed by the agency.

1.7 INTEGRITY AGREEMENT duly signed by the agency along with letter is required to be submitted by the agency.

LETTER OF TRANSMITTAL

From

To
THE DIRECTOR
INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH (IISER)
Srinivasapuram, Jangalapalli Village,
Panguru (G.P), Yerpedu (M),

Tirupati – 517619**Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF**

Name of work & Location: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu**.**

NIT NUMBER : IISERT/ENGG/2025-26/05

Having examined the details given in press notification and the tender document for the above work, I/we hereby submit the tender documents and other relevant information. I/we agree with all the terms and conditions given in the bid document.

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

2. I/We have furnished all information and details necessary for eligibility criteria and have no further pertinent information to supply. We understand and agree that financial bids of the only short listed agencies selected by IISER Tirupati out of the top ranked technically qualified agencies evaluated and found eligible under clause 20 of the NIT, shall only be opened.

3. I/We submit the requisite certified solvency certificate and authorize the Director, IISER, Tirupati to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/We also authorize Superintending Engineer, Tirupati to approach individuals, employers, firms and corporation to verify our competence and general reputation.

4. I/We submit the following certificates in support of our suitability, technical know-how & capability for having successfully completed the following works.

Name of Work:	Certificate from
1.	1.
2.	2.
3.	3.

Enclosures:

Seal of applicant

Date of submission Signature(s) of applicant(s)

Undertaking to sign the integrity Agreement

To,

……..,
……..,
……..

Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF

Name of work &Location	:	HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.
NIT NUMBER	:	IISERT/ENGG/2025-26/05

Dear Sir,

It is here by declared that IISER 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 Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the bid 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 IISER. Yours

faithfully

Registrar

Forwarding letter for Integrity Agreement

To
INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH (IISER) TIRUPATI
Srinivasapuram, Jangalapalli Village,
Panguru (G.P), Yerpedu (M),
Tirupati – 517619

Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF

Name of work &Location	:	HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.
NIT NUMBER	:	IISERT/ENGG/2025-26/05

I/We acknowledge that IISER is 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 IISER. 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, IISER shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid is accordance with terms and conditions of the tender/bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and the signatory competent / authorised to sign the relevant contract on behalf of IISER

INTEGRITY AGREEMENT

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

BETWEEN

IISER represented through its Registrar, (Hereinafter referred as the '**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)

"**Bidder/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 .....
(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 Bidder(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:

Article 1: Commitment of the Principal/Owner

1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

(a) No employee of the Principal/Owner, 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/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner 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/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

2) If the Principal/Owner 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/Owner 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 / Department 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/Owner's 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.

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 **means a wilful 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 (means 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/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner 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/Owner's 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/Owner 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/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**

2) **Forfeiture of EMD/Performance Guarantee/Security Deposit**: If the Principal/Owner 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/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, 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/Owner 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 IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

4) **Article 4: Previous Transgression**

a. The Bidder declares that no previous transgressions occurred in the last 5 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.

b. If the Bidder makes 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/ Owner.

c. 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/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

1) 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/Pact by any of its Subcontractors/ sub- vendors.

2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority.

Article 7- Other Provisions

1) This Pact is subject to Indian Law, place of performance and jurisdiction is the **Headquarters of the** Principal/Owner, who has floated the Tender.

2) Changes and supplements need to be made in writing. Side agreements have not been made.

3) If the Contractor is a partnership or a consortium, this 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 case of a Company, the Pact must be signed by a representative duly authorized by board resolution.

4) Should one or several provisions of this 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) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this **Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.**

Article 8- 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 any of the provisions covered under this Integrity Pact.

IN WITNESS 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/Owner)

.....
(For and on behalf of Bidder/Contractor)

WITNESSES:

1. .....
(signature, name and address)

2. .....
(signature, name and address)

Place:

Dated:

ANNEXURE 1

PROFORMA '1'

INFORMATION REGARDING INITIAL BIDDING CAPACITY

The information to be filled in by the Bidder in the following pages will be used for purposes of Pre-qualification as provided above.

1. For Individual Bidders

1.1 Constitution or legal status of Bidder (Attach Copy)

Place of registration:

Principal place of business:

(Power of attorney of signatory of Bid)

1.2 (A) Value of work Completed during the last five years (in Rs. Lakh)

Particular	***Year***	***Value***
Total value of Work Executed in the last five years**	2020-2021	
	2021-2022	
	2022-2023	
	2023-2024	
	2024-2025	

** Immediately preceding the financial year in which bids are received. Attach certificate from Chartered accountant.

(B) Existing commitments and on-going works: (format for **clause 3.7)**

Description Of work	***Place & state***	***Contract No.& Date***	***Name & Address of Client***	***Value of Contact (Rs. Lacs)***	***Stipulated period of completion***	***Value of work remaining to be completed***	***Anticipated date of completion (Rs.)***	***Remarks* Information regarding the litigation if any**

FORM 'A'

FINANCIAL INFORMATION

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

Year	2020-21	2021-22	2022-23	2023-24	2024-25
Gross annual turn over					
Profit/ Loss					

Signature of Chartered Accountant with Seal Signature of Bidder(s)

Form 'B'

FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that;

_____

(Name of the individual or the firm)

_____

(Name of the proprietor in case of a sole proprietorship concern or names of partners in case of partnership concern as per bank's record, be indicated)

_____

(Address of the customer as per bank record) is a / are customer(s) of our bank,

is/are respectable and can be treated as good for any engagement up to a limit of

Rs.

(Rupees_____only)

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

Signature of the Manager

Seal of Bank

Note: This certificate should be issued on the letter head and addressed to the DIRECTOR, IISER TIRUPATI Campus, Srinivasapuram, Jangalapalli Village, Panguru (G.P), Yerpedu(M), Tirupati – 517619 in a Sealed Cover

FORM 'BI'

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 and Registered Address of Individual/Firm/Company), as on .....(the relevant date) is Rs..... after considering all liabilities. It is further certified that the Net Worth of the Firm/Company has not eroded by more than 30% in last three years ending on (the relevant date).

Date & Seal:

(Signature of Chartered Accountant)

Name……

Membership No. of ICAI……

NOTE:

(i) In case of partnership firm, certificate should include names of all partners as recorded with the Chartered Accountant.
(ii) The certificate should not be more than 6 months old on the last date of Tender Submission.

FORM 'C'

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST 7 (Seven) YEARS ENDING PREVIOUS DAY OF THE DATE OF SUBMISSION OF TENDER

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

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

SIGNATURE OF BIDDER(S)

FORM D

PERFORMANCE REPORT OF WORKS REFERRED TO IN PROFORMA 'C''

1. Name of the work/ Project & Location.

2. Agreement No.

3. Estimated Cost

4. Tendered Cost

5. Date of Start

6. Date of completion

   (a) Stipulated date of completion.

   (b) Actual date of completion.

7. a) Whether case of levy of compensation for
   Delay has been decided or not? Yes / No

   d) If decided, amount of compensation levied for
   Delayed completion if any?

8. Amount of reduced rate items, if any

9. Performance report

   i Quality of Work: Outstanding /Very Good / Good / Poor

   ii Financial soundness : Outstanding /Very Good / Good/ Poor

   iii Technical Proficiency : Outstanding /Very Good / Good / Poor

   iv Resourcefulness : Outstanding /Very Good / Good / Poor

   v General Behaviour : Outstanding /Very Good / Good / Poor

DATED: **Executive Engineer or Equivalent**

FORM 'E'

STRUCTURE AND ORGANISATION

1. Name and address of the applicant

2. Telephone No./Telex No./Fax No.

3. Legal Status (attach copies of original Document defining the legal status)
   (a) An Individual
   (b) A proprietary Firm
   (c) A Firm in partnership
   (d) A limited Company or Corporation.

4. Particulars of registration with various Government bodies (Attach attested photo-copy)

   a) Registration Number.

   b) Organization / Place of registration

5. Names and Titles 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 bidder, or any constituent partner in case of partnership firm Limited Company/Joint Venture, ever been convicted by the court of law?? If so, give the details.

8. In which field of Civil Engineering Construction, the bidder has specialization and interest?

9. Any other information considered necessary but not included above.

SIGNATURE OF BIDDER(S)

FORM 'F'

PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING

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

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

Signature of Notary with seal

Note:1. The affidavit shall be made in current date after the date of invitation of the tender.

Affidavit shall be furnished on a 'Non-Judicial' stamp paper worth Rs.100/-otherwise the tender shall be rejected

COUNTERSIGNED
Engineer in Charge
IISER Tirupati

Form 'G'

AFFIDAVIT

NAME OF WORK: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

I / we undertake and confirm that eligible similar work(s) has/ have not been got executed through **another contractor on back to back basis**. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in IISER TIRUPATI in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-charge 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.)

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

Name & Signature of Contractor

Form 'H'

Declaration about site inspection

To

The Registrar,

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati

Sreenivasapuram, Jangalapalli Village,

Panguru (G.P), Yerpedu(M), Tirupati – 517619

NAME OF WORK: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

Dear Sir,

It is hereby declared that, I/We _____ inspected and examined the subject site and its surroundings and satisfied myself/ourselves as to the nature of the ground and sub-soil (so far as is practicable), the forms and nature of the site before submitting the bid. I/We have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid.

I/We further declare that the scope of work pertaining to shifting of the existing Air Handling Units (AHUs) and powder-coated ducts from the UG Block has been clearly understood in conjunction with the prevailing site conditions. This includes dismantling of the existing terrace-mounted ducting network and its mandatory reutilization in the Indoor Sports Arena in an efficient, planned and systematic manner, ensuring that there is no compromise on the functional effectiveness, performance standards or operational efficiency of the HVAC system.

I/We also confirm that the sample furniture items kept at IISER Tirupati Campus have been inspected by us, and the same have been noted and understood. The furniture proposed to be procured and supplied under this work shall be strictly in conformity with the approved samples, specifications and makes stipulated in the tender documents as per the directions of the Engineer in charge.

I/We shall be responsible for arranging and maintaining at my/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 me/us implies that I/We have read this notice and all other contract documents and have made myself/ourselves fully aware of the scope and specifications of the work to be done, local conditions and other factors having a bearing on the execution of the work.

Note: Sample for Chairs, Work Stations, are kept at IISER Tirupati Campus.

Representative of IISER Tirupati	Representative of Agency
Name:	Name:
Designation:	Designation:
Contact No.	Contact No.

FORM 'I'

AUTHORIZATION LETTER FROM OEM (In OEM Letter Head)

Sir/Madam,

We, _____ (Name of OEM), having our registered office at _____, hereby authorize **M/s _____** to execute the HVAC Reconfiguration comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati for supply, installation, testing, commissioning of associated HVAC works pertaining to VRV/VRF/AHUs/Fans products under this tender.

This authorization is issued specifically for the HVAC Reconfiguration comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati

I/We hereby confirm and undertake that:

1. I/We shall provide complete technical support to M/s _____ for execution, installation, testing, commissioning, and successful completion of the HVAC systems covered under this work.
2. i/We shall ensure supply of genuine equipment, components, and accessories strictly conforming to the tender specifications and approved submittals.
3. i/We shall provide full service support for this project during execution and throughout the defect liability / warranty period as stipulated in the contract.
4. We commit to ensure availability of spares and service support for this project for a minimum period of ten (10) years from the date of commissioning / handover.
5. During the above period, we shall extend necessary technical assistance, spare parts availability, and after-sales service support to ensure uninterrupted and efficient operation of the installed systems.

This letter is issued at the request of M/s _____ specifically for submission against the above tender.

Date:

Signature of Authorized personnel of OEM with date

CHECK LIST: Details of Enclosures/documents required to be uploaded on website https://eprocure.gov.in/eprocure/appthrough the E-procurement portal up to the last date and time of submission of tender.

Sl. No.	Description of item	Scanned copies Uploaded on website	Not uploaded
1.	Pre-Qualification Documents as per Annexure 1 **Pro forma I , Form A to Form I**		
2.	Power of attorney as required		
3.	Certificate of Registration as required		
4.	Memorandum of Articles of association as required		
5.	C A certificate for Audited Balance Sheet and Profit & Loss statement for the past three financial years		
6.	Supporting certificates for technical and financial capability from relevant authorities.		
7	INTEGRITY AGREEMENT duly signed by the agency along with **letter of Transmittal**		
8	Any other important information.		
9	Scan copies of net banking receipt towards payment of Tender fee and Bid Security Declaration Form		
10	Letter of transmittal duly signed by the bidder.		
11	Uploading of the tender document Vol-I, Vol-II, Vol- III and financial bids		
12	Any other relevant document required to be uploaded on website as per tender conditions.		

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH – IISER TIRUPATI.

Name of work &Location	:	HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.
NIT NUMBER	:	IISERT/ENGG/2025-26/05

SECTION – II

ITEM RATE TENDER & CONTRACT FOR WORKS

SECTION- II

Tender Form Item Rate Tender & Contract for Works

Name of work & Location: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

NIT No.: IISERT/ENGG/2025-26/05

Tender(s) to be submitted online by (time) **15:00 hours on 24/02/2026**
URL:https://eprocure.gov.in/eprocure/app

Tender(s) to be opened 15:30 hours on 25/02/2026 through online by Indian Institute of Science Education and Research, Tirupati

TENDER

I/We have read and examined the notice Inviting Tender, Schedule, Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions &other document 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 of Indian Institute of Science Education and Research Tirupati (IISER-Tirupati) within the time specified in Schedule **75 days viz**, schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to the Conditions of contract and with such materials as are provided for and in respects in accordance with such conditions so far as applicable.

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

A sum of Rs (figure)----------(in words) ----------

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has been deposited in Deposit at call Receipt of a Schedule bank/demand draft of a scheduled bank/bank guarantee issued by a Schedule Bank as earnest money. If I/we, fail to furnished the prescribed

performance guarantee within prescribed period, I/we agree that the said Director Of Indian Institute of Science Education and Research Tirupati (IISER-Tirupati) or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely, if I/we fail to commence work as specified, I/we agree that Director Of Indian Institute of Science Education and Research Tirupati(IISER-TIRUPATI) or his successors in office shell without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely.

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 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 of the state or IISER Tirupati.

Dated ……. Signature of Contractor

Seal

Postal Address

Witness:

Address:

Occupation:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on the Director IISER, Tirupati for sum of

Rs……. (Rupees……
…….).

The letters referred to below shall form part of this contract Agreement: -

(a)

(b)

(c)

For & on behalf of the Director, IISER Tirupati

Signature……..

Dated……. Designation……

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH – IISER TIRUPATI.

Name of work & Location: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

NIT NUMBER: IISERT/ENGG/2025-26/05

SECTION - III

GENERAL CONDITIONS OF CONTRACT

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH TIRUPATI

(i) General Rules & Directions

1. All work proposed for execution by contract will be notified in a form of invitation to tender prominently displayed in public places and signed by the officer inviting tender or by publication in Newspapers as the case may be.

   This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the application, and the amount of the security deposit and performance guarantee to be deposited by successful tenderer and the percentage, if any, to be deducted from bills. Copies of specification, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act' 1952.

3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.

4. Applicable for Item Rate Tender only
   Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. (Applicable for Item Rate Tender only)

   The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paisa and considering more than fifty paisa as rupee one.

   In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, the such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective origin original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer.

If the revised retendered amount (worked out on the basis of quote rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tenderer, among such contractors, shall be decided by draw of lots in the presence of Registrar IISER Tirupati, Engineer in charge lowest contractors those have quoted equal amount of their tenders.

In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted already at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited.

In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the re-tendering process of the work.

If the revised tendered amount of two more contractors received in revised offer is again found to be equal, the lowest tender, among such contractors, shall be decided by draw of lots in the presence of Registrar, IISER, Tirupati, Superintending Engineer, Dy. Registrar(F&A) & the lowest contractors those have quoted equal amount of their tenders.

In case all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each contractor.

Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process of the work.

5. The officer inviting tender or his duly authorized representative will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule I. The earnest money of all unsuccessful bidders shall thereupon be returned to the contractor remitting the same, without any interest.

6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.

7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement of payment to the officer inviting tender and the contractors shall be responsible for ensuring that he procures a receipt signed by the officer inviting tender or a duly authorized cashier/accounts officer.

8. The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.

9. The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.

10. In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below / above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount.
In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.

10 A In case of Percentage Rate Tenders only percentage quoted shall be considered. Any tender for Item containing item rates is liable to be rejected. Percentage quoted by the contractor in Rate percentage rate tender shall be accurately filled in figures and words, so that there is no Tender only discrepancy.

11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer in unable to provide satisfactory explanation, such a tender is liable to disqualified and rejected.

12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word `Rs' should be written before the figure of rupees and word `P' after the decimal figures, e.g. Rs. 2.15 P and in case of words, the word `Rupees' should precede and the word `Paisa' should be written at the end. Unless the rate is in whole rupees and followed by the word `only' it should invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word `only' should be written closely following the amount and it should not be written in the next line.

12 A In Percentage Rate Tender, the tenderer shall quote percentage below /above (in figure as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and same should be written in the figures as well as in Words in such a way that no interpolation is possible. In case of figures, the word 'Rs' should be written before the figure of rupees and word 'P' after the decimal figures e.g. 'Rs 2.15P' and in case of words, the word 'Rupees' should be preceding and the word 'Paisa' should be written at the end.

13. (i) The Contractor, whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in scheduled C. This guarantee shall be in the form of Deposit at call receipt of any scheduled bank/ banker's cheque of any scheduled bank/Demand draft of any scheduled bank /Pay order of any scheduled bank or Government Securities or Fixed Deposit Receipt or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.
(ii) The Contractor, whose tender is accepted, will also be required to furnish by way of Security Deposit for the fulfilment of his contract, an amount equal to 2.50 % of the tendered/accepted value of the work. The Security Deposit will be collected by deductions from the running bills of the contractor at the rates mentioned above and the earnest money deposited at the time of tenders, will be treated as a part of the Security Deposit. The security amount will also be accepted in the shape of
Government Securities. Fixed Deposit Receipt and Guarantee Bonds of a Scheduled Bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.

14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in Charge shall be communicated in writing to the Engineer-in-Charge.

15. GST or any other tax on material in respect of this contract shall be payable by the contractor and IISER Tirupati will not entertain any claim whatsoever in respect of the same.

16. The contractor shall give a list of IISER employees, if any, related to him.

17. The tender for the work shall not be witnessed by a contractor or Contractors who himself/ themselves has/ have tendered or who may and has/ have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.

18. The tender for composite works includes, in addition to building work, all other works such as providing architectural & structural designing services, sanitary and water supply installations, drainage installation, External Façade, Electrical works, Heating ventilation and air conditioning system, Integrated Building Management system, Lifts, roads and path etc. The tenderer apart from being a registered contractor (B&R) of appropriate class, must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage, electrical Heating ventilation and Air conditioning system, Integrated Building Management system, Solar Water Heating system works in the composite tender.

19. The contractor shall submit list of works which are in hand (progress) in the following form:

Name of work	Name of client & particulars of works being executed	Value of work in Rs.	Position of works in progress	Remarks

20. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure
will be a breach of the contract and the Engineer in charge may at his discretion without prejudice to any other right or remedy available in law cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

21. Bidder shall have valid Provident Fund Code Number, GST registration No and bidder shall also ensure compliance of the EPF & MP Act, 1952 by the sub-contractors, if any engaged by the contractor for the said work.

22. The standard publications like General Conditions of Contract, Delhi schedule of rates (for civil), Specifications for Civil and Electrical works and Delhi analysis of rates (for civil) with amendments / correction slips up to the last date of submission of tender can be seen free of cost from the website www.cpwd.gov.in. or www.eprocure.gov.in

23.

a) Contractor must ensure to quote percentage rate of in the financial bid.
b) Tenderer shall quote the percentage rate above or below two places of decimals only.
c) The tenderer shall quote only one over all percentage rate above or below on the designated place, which shall be applicable on both Civil and E&M components.

24. If a tenderer quotes nil rates against each item in item rate tender or does not Quote any percentage above/below on the total amount of the tender or any section/subhead in percentage rate tender, the tender shall be treated as invalid and will not be entertained as lowest tenderer.

25. Contractor shall not divert any advance payments or part thereof for any other purpose other than needed for completion of the contracted work. All advance payments received as per terms of the contract (i.e. mobilization, secured against materials brought at site, secured against plant & machinery and / or for work done during interim stages, etc.) are required to be re-invested in the contracted work to ensure advance availability resources in terms of materials, labour, plant & machinery needed for required pace of progress for timely completion of work.

(ii) CONDITIONS OF CONTRACT

Definitions:

The **contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Director, Indian Institute of Science Education and Research Tirupati and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

1 In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them: -

i). The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.

ii). The **Site** shall mean the land/ or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

iii). The **Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.

iv) The Director, Indian Institute of Science Education and Research Tirupati means his successors also.

v) The **Engineer-in-Charge** means Engineer/Officer either from IISER, Tirupati or consultant notified by The Director (IISER, Tirupati) who shall supervise and be in-charge of work and who shall act on behalf of the Director, IISER for execution of contract.

vi) **IISER** means Indian Institute of Science Education and Research Tirupati, or his authorized representative.

vii) **Accepting Authority** shall mean the authority mentioned in Schedule 'C'.

viii) **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by IISER Tirupati of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to IISER-Tirupati faulty design of works.

ix). **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule `C' to cover, all overheads and profits. Provided that no extra overheads and profits shall be payable on the part(s) of the work assigned to other agency(s) by the contractor as per terms of contract.

x). **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the CPWD Delhi schedule of rates mentioned in Schedule `C' hereunder, with the amendments thereto issued up to the date of receipt of the tender.

xi). **Department** means Indian Institute of Science Education and Research Tirupati. (IISER Tirupati)

xii). **Specifications** means the specifications contained in tender documents, CPWD specifications 2019 Vol I & II with up to date correction slips

xiii). **Tendered Value** means the value of the entire work as stipulated in the letter of award.

xiv) *Date of commencement of work: The date of commencement of work shall be* the date of start as specified in schedule "C" or the first date of handling over the site, whichever is later, in accordance with the phasing if any, as indicated in the tender documents.

2 Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.

3 Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.

4 The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications. Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract

5 The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.

6. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works

.

7. The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General conditions.

7.1. In the case of discrepancy between the schedules of quantities, the specifications and or the drawings, the following order of preference shall be observed.

(i) Description of items as given in Schedule of Quantities.

(ii) Particular Specifications, Special Conditions and Additional conditions, if any.

(iii) Drawings.

(iv) CPWD Specifications.

(v) General conditions of contract for CPWD works.

(vi) Indian Standard Specifications of B.I.S.

(vii) Manufacturers' specifications & as decided by Engineer-in-charge.

(viii) Sound Engineering practices.

7.2. If there are varying or conflicting provision made in any one document forming part of the contract, the Accepting Authority shall be deciding authority with regard to the intention of the documents and his decision shall be final and binding on the contractor.

7.3. Any error in the description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.

8. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall within one month from the stipulated date of start of the work, sign the contract consisting of: -

(i) The notice inviting tender, all the documents including drawings if any, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

(ii) Standard Form Consisting of followings

(a) NIT, Work order
(b) Item rate tender form & Contract for worker.
(c) General Rules and Directions
(d) Condition of contracts
(e) Clauses of contracts, Safety Code, Contractor' Labour Regulations, Model rules for the protection of health, sanitary arrangements for workers employed by IISER or its Contractors.
(f) Proforma of agreement
(g) Proforma of Schedule A to H
(h) Special Condition of contracts
(i) Technical specifications
(j) Tender drawings
(k) Priced Schedule of quantities.
(l) All correspondence between the parties till award of contract

(iii) Till such time contract agreement is signed between the parties, all the documents mentioned Sr. 8 (i), 8 (ii)- (a to l) above shall be binding on the contractor.

(iv) No payment for the work done will be made unless contract is signed by the contractor.

9. <u>Clauses of contract, safety code and contractor's labour regulations.</u>

All the Clauses, safety code, and contractor's labour regulations should be strictly followed as per the General conditions of contract 2023for construction works published by CPWD along with the up to date correction slips and modifications issued.

10. <u>Form of Performance Security (Guarantee)</u>

Bank Guarantee Bond

1. In consideration of the Director IISER Tirupati (hereinafter called "IISER-Tirupati") having offered to accept the terms and conditions of the proposed agreement between----------and---------- (hereinafter called "the said Contractor(s)") for the work ---------- ----------(hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs.---------(Rupees ---------- --------only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

   We ---------- (hereinafter referred to as "the Bank") hereby (indicate the name of the Bank) Undertake to pay to the IISER Tirupati an amount not exceeding Rs----------. (Rupees ----------only) on demand by IISER Tirupati

2. We ----------do hereby undertake to pay the amounts due and payable (indicate the name of the Bank) under this Guarantee without any demure, merely on demand from the IISER Tirupati stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs----------(Rupees----------only)

3. We, the said bank further undertake to pay the IISER Tirupati any money so demanded notwithstanding any dispute or disputes raised by the contractor(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 this bond shall be a valid discharge of our liability for payment there under and the Contractor(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 that it shall continue to be enforceable till all the dues of the IISER Tirupati under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-Charge on behalf of the IISER Tirupati certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. We, ---------- further agree with the IISER Tirupati that the IISER Tirupati (indicate the name of the Bank) shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of
   the powers exercisable by the IISER Tirupati against the said contractor(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 Contractor(s) or for any forbearance, act of omission on the part of the IISER Tirupati or any indulgence by the IISER Tirupati to the said

Contractor(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 Contractor(s).

7. We, ---------- lastly undertake not to revoke this guarantee except (indicate the name of the Bank) with the previous consent of the IISER Tirupati in writing.

8. This guarantee shall be valid up to----------unless extended on demand by the IISER Tirupati. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs---------- (Rupees----------only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.

Dated the ----------day of----------for----------(indicate the name of the Bank)

11. **Proforma of Agreement**

ARTICLE OF AGREEMENT is made at Tirupati on the .... day of.................... 20__ between Indian Institutes Of Science Education and Research Tirupati, (IISER Tirupati) (Herein after referred to as the employer which expression shall include its successors and assigns where the context so admits) of the one part and -----
-- ---

(Hereinafter referred to as the “contractor(s) which expression shall include his/their respective heirs, executors, administrators and assigns where the context so admits) of the other part.

WHEREAS the employer is desirous of getting the work ……………………………… …………………………………………………………………………………………….. done and caused drawings, schedule of quantities, terms and conditions and specification describing the work to be executed and completed maintained. (hereinafter called “the works”) and has accepted a tender of the CONTRACTOR for the execution, completion and guarantee of such works.

AND WHERE AS the contractor has deposited a Sum of Rs. ---

--- With employer as security for the due

performance of this agreement as provided in the said Conditions.

NOW IT IS HEREBY agreed and declared by and between the parties as follows.

(a) In consideration of the payments to be made to him as herein after provided the contractor shall upon and subject to the condition herein contained and the said conditions executed and complete the work shown upon the said drawings and such further detailed drawings which may be furnished to him and described in the said specifications and the said priced schedule of quantities within ----------------- from the date of order to commence the work.

(b) The employer shall pay to the contractor such sum that shall become payable hereunder at the times and in the manner specified in the said conditions.

(c) Time is essence of this agreement and the contractor agrees to pay compensation for delay as per Clause 2 of general Condition of Contract.

(e) The documents mentioned below under (g) shall form the basis of this agreement and the decision Engineer or the Engineers in Charge, in reference to all matters of dispute as to material and workmanship shall be final and binding on both the parties.

(f) The employer through the Engineer-in-Charge reserves to himself the right of altering the drawings and the adding to or omitting any items of works or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not violate agreement.

(g) This agreement comprises the work said above and the entire subsidiary work connected there with, even though work may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.

This agreement contains the following documents in addition to pages of articles of agreement.

(a) NIT/WORK ORDER
(b) Item rate tender form & contract for works.
(c) General Rules and Directions
(d) Condition of contracts
(e) Clauses of contract, safety code and contractor's labour regulations
(f) Proforma of agreement
(g) Proforma of Schedule A to C
(h) Special Condition of contracts
(i) Technical specifications
(j) Tenders drawings
(k) Price Schedule/ Schedule of Quantities
(l) All corresponds between the parties until award of contract.
(m) Prequalification document

In witness whereof the parties hereto have their respective hands the day and the year herein above written.

Signed by for and on behalf of the employer.

Engineer In-Charge Engineer.

Witness (1) ----------

Witness (2) ----------

Signed by the said contractor

Address ----------

Witness (1) ----------

Countersigned

Witness (2) ----------

On Company Letter Head
BID SECURITY DECLARATION

To
The Registrar,
INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati
Sreenivasapuram, Jangalapalli Village,
Panguru (G.P), Yerpedu(M), Tirupati - 517619

Tender No. IISERT/ENGG/2025-26/05
Notice Inviting Tender for HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.

Sir,

We, the undersigned, declare that

1. We understand that, according to tender conditions, bids must be supported by a Bid Securing Declaration.

2. We accept that we will automatically be suspended from being eligible for bidding in any contract with the Institute for the period of **3 years** starting from the bid closing date, if we are in breach of our obligation(s) under the bid conditions, because we:

   (a) Have withdrawn our bid during the period of bid validity specified in the letter of bid; or

   (b) Having been notified of the acceptance of our bid by the institute during the period of bid validity, (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the performance security, in accordance with the tender conditions.

Date:

Authorized Signatory
Name:
Place:
Designation:
Contact No:

APPENDIX (xv) -CLAUSE 25

APPENDIX XV Notice for appointment of Arbitrator [Refer Clause 25]

To
The Chairman
Building and Works Committee IISER Tirupati.
Dear Sir,
In terms of clause 25 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of contract Date of initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to EE for decision
17. Date of receipt of EE's decision
18. Date of appeal to you
19. Date of receipt of your decision.

Specimen signatures of the applicant

(only the person/authority who signed the contract should sign)
I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims.
2. Copy in duplicate to: Engineer in Charge.

Yours faithfully

(v) PROFORMA OF SCHEDULES

(Operative Schedules to be supplied to each intending tenderer)

SCHEDULE 'A'

Schedule of quantities Enclosed as Financial bid document

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any. -- NIL—

SCHEDULE 'E'

Reference to General Conditions of contract. –

Name of work &Location	:	HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.
NIT NUMBER	:	IISERT/ENGG/2025-26/05
Estimated cost put to tender	:	**Rs 4.58 Crore**
(i) Earnest money	:	**Rs 22,88,465/-**
(ii) Performance Guarantee	:	5% of tendered value.
(iii) Security Deposit	:	2.5 % of tendered/accepted value

SCHEDULE 'F'

GENERAL RULES & DIRECTIONS:

Officer inviting tender: Registrar, IISER Tirupati.

Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 (c): See below.

Definitions:

2 (vi) Engineer-in-Charge : Executive Engineer IISER Tirupati.

2(viii) Accepting Authority : Director, IISER Tirupati

2(x) Percentage on cost of materials and labour to cover all overheads and profits: 15%

2(x) (a)Standard Schedule of rates : Delhi Schedule of Rates 2023 Vol I & II

2(viii) Department: Indian Institute of Science Education and Research (IISER) Tirupati

2(ix) Standard contract Form: Item rate contract

Clause 1

(i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance 7days

(ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above 7 days

Clause 2

Authority for fixing compensation under clause 2. The Director Indian institute of Science Education & Research, IISER Tirupati

Clause 5

Number of days from the date of issue of letter of award works for reckoning date of start 7 days

Mile stone(s) as per table given below: -

Time allowed for Execution

S.No.	Description of Milestone	Time allowed in Months (From date of start)	Amount to be withheld in case of Non- achievement of mile stone (% of Tendered Amount)
(i)	Submission of drawings and technical details of the complete scope for approval	7 Days	1%
(ii)	Supply of all the components of the scope including accessories if any	45 days	1.0%
(iii)	Installation of all the items as per the approved drawings	60 days	1.5%
(iv)	Commissioning and handing over of all work as per agreement provisions with all necessary connections, provisions over to the client.	90 days	1.5 %

Authority to decide:

(i) Extension of time : Engineer in charge
(ii) Rescheduling of mile stones: Engineer in charge

(iii) Shifting of date of start in case of delay in handing over of site: Director IISER Tirupati

Clause 7

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment	Rs. 10 Lakhs

Clause 7A

Whether clause 7A shall be applicable: Yes.

No Running Account Bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in Charge.

Clause 10

List of testing equipment to be List of Equipment for Field Testing provided by the contractor at site lab.: NIL

Clause 10 B

Whether Clause 10 B shall be applicable : Not Applicable

Clause 10B(i)

Whether Clause 10B (i) shall be applicable. : Not Applicable.

Clause 10B(ii)

Whether Clause 10B (ii) shall be applicable. : Not Applicable.

Not applicable

Clause 10 C

CLAUSE 10 CA

NOT APPLICABLE

CLAUSE 10 CC

NOT APPLICABLE

Clause 11

Specifications to be followed for execution work

1) Technical specification given in Tender documents.
2) CPWD standard specification 2019 Volume I & II with up to date correction slips for civil works.
3) Indian Standard Specification
4) Manufactures specification
5) Engineer in charge decision.

12.2 (c) Deviation Limit beyond which clauses 12.2 (c) shall apply for building work — 100 %

(i) Deviation Limit beyond which clauses 12.2 (c) shall apply for foundation work — 100%

(Except items mentioned in earth work sub head in DSR and related items)

(ii) Deviation Limit for items mentioned in earth work Sub head of DSR or related items — 100%

Clause 16

Competent Authority for deciding reduced rates — Registrar, IISER Tirupati

Clause 25

Constitution of Dispute Redressal Committee (DRC) Chairman – To be nominated by Director, IISER Tirupati

Clause 32

Requirement of Technical Reprehensive(s) and Recovery Rates:

Sl. No	**Requirement of Technical Staff**		**Minimum Experience (Years)**	**Designation of Technical staff**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling**
	Qualification	**Number (of Major + Minor Component)**			
1	Graduate Engineer	1	5 years (and having experience of one similar nature of work)	Project Manager	Rs. 25,000/- Per month per person

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

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI

Volume II

Special conditions of contract and scope of work, technical specifications

Special Conditions of Contract:

1. The works contract to be entered into with the successful tenderer will be governed by the CPWD works Manual 2019 or the latest in force.
2. No night work will be permitted without the written permission of the Institute.
3. The successful tenderer / Contractor shall observe all safety regulations and take necessary safety precaution as called for and Safety Precautions enclosed herewith.
4. In all matters of dispute, the decision of the Director, INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati Shall be final and binding on the tenderer / contractor.
5. Some changes are likely in the quantities furnished as well as in the layout, design and specifications of the work. The rate quoted shall be deemed to be inclusive of all such contingencies.
6. No material shall be incorporated in the work until the inspecting Engineer certified in writing that such materials have been inspected and approved by him or else the rejected material should be removed from site immediately.
7. The Contractor shall closely scrutinize all the drawings issued in connection with the work by this organization and bring to the notice of the Institute if any discrepancies, omissions in the drawings before undertaking the actual work pertaining thereto.
8. The contractor should extend full co-operation to the other contractors who may be doing other works in the same areas to enable them to execute their portions of work without any delay or difficulty.
9. The power required for work will be at free of cost. However, the contractor should ensure safety precautions while handling electrical equipment. Power source will be shown near to the working place. Necessary cables etc. shall be in the scope of contractor. Water has to be arranged by the contractor as per requirement.
10. The contractor who has been terminated during the last three years is not eligible to participate in the tender. If tenders are submitted from them, those documents will not be considered for evaluation.
11. **The quantities given in the Bill of quantities of the tender are approximate only.**
12. During execution of the work, if there is any delay, stoppage of work on any reason, the same shall be recorded by the contractor in the hindrance register, with the signatures of the concerned authorities.
13. Ensuring proper lashing of the components while being transported in vehicles.
14. The materials should not be allowed to extend or overflow the sides of the vehicles.
15. The speed restrictions within the Institute must be strictly adhered to.
16. The required water for the execution of the work shall be provided by the Institute.
17. The work to be executed keeping the campus clean and any dirty area during the execution, it is the responsibility of the contractor to clean the space.
18. All personal protective equipment conforms with standard specification and Contractor including and labour engaged on the work are required to scrupulously adhere to the safety regulations, safety precautions and measurers. Any violation thereof will invite punitive

action being taken against them. Also, contractors with frequent violations of safety regulations will not be entrusted with further work in this organization.

19. In the event of any injured/fatal accident for the work men during the course of contract period, the compensation and other medical expenses towards the incident is lies with the contractor. No way is IISER Tirupati responsible.

20. **Labour sheds will not be allowed to erect within the campus.**

21. **Bulk materials will be allowed to store within the campus at the location identified by the Engineer-In-Charge.**

22. **For materials other than bulk materials, a separate container or shed need to be installed at the campus and no space within the existing building will be given.** The whole responsibility of loading unloading and security to the material is within the scope of the bidder.

23. SAFETY PRACTICES

(i) WARNING/ CAUTION BOARDS: All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in- Charge. These glow signage and red lights shall be suitably illuminated during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. This signage shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.

(ii) SIGN BOARDS: The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, Client/Owner, Engineer-in-charges, Structural Consultants, Department etc. besides providing space for names of other Contractors, Sub-Contractors and specialized agencies within 15 days from issue of award letter. Nothing extra shall be payable on this account. In case of noncompliance/delay in compliance in this, a penalty @ Rs. 1000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

(iii) Necessary protective and safety equipment such as helmet, safety shoes, gloves etc. shall be provided to the Site Engineer, Supervisory staff, labour and technical staff of the contractor and also to the departmental officials supervising / inspecting the works by the Contractor at his own cost and to be used at site. Nothing extra will be paid on this Account.

(iv) Pre coated GI sheet barricading of required thickness with MS supporting poles at required spacing to a height of minimum 6 m with necessary horizontal purlin with logos of IISERT, Client & Agency around the periphery of proposed building as directed by Engineer-in-charge shall be provided for safety of the working staff and to minimise noise / air pollution for which nothing extra will be paid on this account.

(v) No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities and as per the direction of Engineer –in- Charge in this regard. Also all precautions and safety measures shall be taken by the Contractor for safe handling of

the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the Contractor.

24. QUALITYASSURANCE

(i) The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material / work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.

(ii) All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per suggested list of brand names given in the tender document/particular specifications for approval of Engineer-In-Charge. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-In-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.

(iii) The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when the specified make is not available. This is, however, subject to documentary evidence produced by the contactor for non- availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in- Charge as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account. Also, the material shall be procured only after written approval of the Engineer-in-Charge.

(iv) The contractor has to establish field laboratory at site including all necessary equipment for field tests as given in Schedule 'F'. All the relevant and applicable standards and specifications shall be made available by the contractor at his cost in the field laboratory. The contractor shall designate one of his technical representatives as Quality Assurance Engineer, who shall be responsible for carrying out all mandatory field/laboratory tests. The contractor shall also provide adequate supporting staff at his cost for carrying out field tests, packaging and forwarding of samples for outside laboratory tests and for maintaining test records.

(v) The tests, as necessary and where no field laboratory facilities are available, shall be conducted in the laboratory approved by the Engineer–in- Charge. For materials for which field testing equipment is established at site, for those materials 90% of total tests shall be done at the laboratory established at site by contractor and remaining 10%in the reputed laboratories approved by Engineer- in-charge. The samples shall be taken for carrying out all or any of the tests stipulated in the particular specifications and as directed by the Engineer-in-Charge or his authorized representative.

(vi) The Contractor shall at his own risk and cost make all arrangements and shall provide all such facilities including material and labour, the Engineer-in-Charge may require for

collecting, preparing, forwarding the required number of samples for testing as per the frequency of test stipulated in the contract specifications or as considered necessary by the Engineer-in-Charge, at such time and to such places as directed by the Engineer-in- Charge. Nothing extra shall be payable for the above.

(vii) The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of such tests and consequences thereon shall be binding on the Contractor. The Contractor or his authorized representative shall remain in contact with the Engineer-in–Charge or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.
All the testing charges shall be borne by the contractor.

(viii) All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before covering and their measurements in computerized measurement book duly test checked shall be deposited with Engineer in charge or his authorized representative, prior to hiding these items.

(ix) Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should confirm to bylaws and municipal body / corporation where CPWD Specifications are not available. The contractor should engage licensed plumbers for the work and get the materials (fixtures/fittings) tested by the Municipal Body/Corporation authorities wherever required at his own cost.

(x) The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.

(xi) The contractor shall have to execute guarantee bonds in respect of water proofing works as per Performa enclosed.

(xii) The Contractor shall arrange electricity at his own cost for testing of the various electrical installations as directed by Engineer-in-Charge and for the consumption by the contractor for executing the work. Also all the water required for testing various electrical installations, fire pumps, wet riser / firefighting equipments, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, overhead tanks, water proofing treatment etc. shall be arranged by the contractor at his own cost. Nothing extra shall be payable on this account.

25. INSPECTION OF WORK

(i) In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by Engineers of IISERT and their representatives. The contractor shall at times during the usual working hours and at all times at which reasonable notices of the intention of the Engineer-in-charge 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 representative duly accredited in writing, to be present for that purpose.

(ii) Senior Officers of IISERT, Dignitaries from Central Ministry / Client Department Authorities shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor shall, therefore, keep updated the following requirements and detailing.

a) Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.

b) Entrance and area surrounding to be kept cleaned.

c) Display layout plan key plan, building drawings including plans, elevations and sections.
d) Upto date displays of Bar chart, CPM and PERT etc.
e) Keep details of quantities executed, balance quantities, deviations, possible Extra item, substituted Item etc.
f) Keep plastic / cloth mounted one sets of building drawings.
g) Set of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.
h) The work may be inspected by Chief Technical Examiners, Organization of Central Vigilance Commission, Sports Authority of India representatives. In such case the contractor shall make all arrangements for providing required details/documents.

PAYMENT OF BILLS: All payments to be made to the Contractor, under this contract shall be by NEFT or RTGS within a reasonable time, after the certification of bills by the execution department, as per the payment terms mentioned below and elsewhere in the document.

For Furniture
1. Supply - 95%
2. Installation- 5%

For HVAC works
1. Supply - 80 %
2. Installation - 10%
3. Testing & Commissioning - 10%

CAMC Payment Terms:

1. Comprehensive Annual Maintenance Contract will be valid for a period of 24 months after completion of defect liability period of 1 year and the payment shall be made on half yearly basis.

Brief scope & Technical specifications.

Name of Work: HVAC Reconfiguration comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati

A. The brief scope of the tender comprises of the following works:

1. HVAC works:

a) Comprehensively reconfigure the HVAC system by replacing the terrace-based ducted arrangement in the Young Scientist (UG Block) Lab building with ceiling-suspended

Air conditioning Units installed within the individual laboratory spaces. The indicative drawings are given in detailed specification and items are provided in the BOQ.

b) Reutilize, to the extent technically feasible and without compromising performance efficiency, the AHUs and associated ducting being removed from the Young Scientist Lab and provide air-conditioning to all facilities within the Indoor Sports Arena.

c) Supply Installation Testing and Commissioning of independent Cassette Air-Conditioning Units of specified capacity for the Chemistry laboratories in the Research Block.

2. Civil & Furnishing works:

a) Chain link fenced enclosure including all civil works for the volleyball court adjacent to the Dining Block.

b) Furnish the Library with modular workstations and ergonomic non-revolving cantilever chairs to accommodate 180 seating capacity, along with provision of alternate informal seating, discussion zones, and collaborative study arrangements as per the detailed specifications and drawings.

B. Detailed scope & Technical Specifications:

1. HVAC works:

a) Inspection of existing HVAC systems installed at UG block and get confirmation on the extent of reusability. Dismantling of 12 nos of existing Daikin make VRV condensing units and shifting to the nearest and appropriate location of the 6 labs from terrace level. These units should be carefully dismantled without damages.

b) Dismantling of existing 6 nos Air Handling units duly integrated with Daikin 12 nos control kits and 12 nos expansion kits and associated sensors and electronic components. These units should be carefully dismantled without damages. in order to reassembly at sports complex and reuse.

c) Dismantling of supply and return air ducts including inside lab area ducts and reutilizing the ducts in indoor sports complex. These ducts should be carefully removed in order to reutilise to the maximum possible extent.

d) Providing of 24 nos new Daikin make matching low noise indoor ductable units as per the OEM selection recommendations for the above existing Daikin make VRV out door units. Including reuse of existing refnuts and refrigerant piping etc .

These ductable units are to be installed inside the labs at the corners and to provide crescent shaped supply air modules. This module is made out of 20 mm thick fire rated PIR sheets with factory finished 80-micron aluminium foil at outside & 80-micron aluminium foil at inner side. Fitted with double skin powder coated jet supply air nozzles. Nozzles are to be properly selected to have better diffusion and to prevent the draft. Counter hit concept for diffusion to be adopted. Ductable units are to be fitted with automatic drain pump etc . Also to provide fresh air provision for each indoor ductable unit.

e) The entire works in the Young Scientist Lab (UG block) to be carried out in a phased manner based on the shut down availability and labs operation. Bidder to plan the works accordingly.

f) Vendor to inspect the existing used spare 3 nos 16 HP & 1 no 6 HP Daikin make VRV condensing units and to take up the required repairs including required PCBs etc .

g) Designing of new HVAC systems by utilising the above dismantled equipment and the existing spare Daikin VRV outdoor units and providing of new additional required equipment for the following areas. Ducting system should be designed to make use the existing duct sizes of UG block. Reutilised quantity should be maximum possible quantity.

h) Indoor Sports complex areas for Air conditioning:

S.NO	AREA NAME	AREA (SFT)	HEIGHT (FT)
1	GYM	3200	14
2	BADMINTON COURT	6086	34
3	SQUASH COURT-1 & 2	3500	34
4	BASKETBALL COURT	8950	24
TOTAL		**21736**	

The Gym room in the indoor sports arena should be provided with auto scavenging system so as to reduce the body odor and volatile orgonic compounds also to dilute the micro-organisms.

Carrying out the CFD analysis & evaluation of ADP for Badminton court with OEM software to ensure the system attains the required air flow patterns for shuttle/badminton play areas. This critical analysis is essential as to match with the existing courts configuration as the gaps between the court to court and court to wall is less.

Need to carry multiple evaluation for combination conditions & to achieve required discharge/intermediate and terminal velocities as per Badminton standards air velocity at required zone should not be more than 40 to 50 FPM to prevent no distortion to the shuttle cock. To prevent cross draft, appropriate return at strategic location for better diffusion & to have full sweep effect, right coordination between supply velocity, terminal velocity and occupied zone velocity.While designing the system vendor may adopt the occupied zone approach . Fresh air should be designed as per the ASHRAE 62.1 latest guidelines based on occupancy

Inside temperature & RH for all areas : 23+/-1 Deg C RH : 55+/-5%.

Squash court : Temp : 22+/-1 Deg C , RH: 55+/-5%.

In gym there should be less draft need to adopt displacement technique or other means. Focussed air flow to be followed for cardio and weight lifting areas

In badminton draft control is very critical parameter to prevent the affect on flight of shuttle. Ducting system should be designed to prevent the landing of shuttle and also to prevent the obstruction to the shuttle trajectory.

In squash courts bouncing & ball travel zone to be higher temperature with respect to other areas.

i) The contractor need to inspect the entire existing system and to take up the required rectifications before reusing at new locations.

j) The scope includes comprehensive warranty (defect Liability period) for 12 months for all the old and new units from the date of handing over.

k) Comprehensive AMC of the HVAC system in the scope for two years after DLP. The rate for the comprehensive AMC to be quoted separately in the BOQ item given. The payment shall be made on half yearly basis i.e. after completion of half year.

Agency will ensure the performance of VRV units by deputing your service engineer for thorough checking of all parameters once in a month and whenever asked for incase of any breakdown.
The VRV AC units are under CAMC cover replacements of all spares and parts without any cost to IISER Tirupati, including compressor indoor / outdoor unit, electronic parts & PCBs refrigerant & gas leakage etc.
Breakdown should be attended at earliest as possible but not more than four hours.
Payment will be made after satisfactory completion of each quarter during CAMC period.
TDS and other taxes shall be deducted at source as per rules.

l) The drawing provided below is indicative only and for the purpose of provisional guide scope & specifications. However, contractor to carry the complete inspection and to arrive the reusable quantity as per the design.

2. **For new HVAC units:**

REFERENCE CODES & STANDARDS

The applicable Standards/Codes are:

- American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE)
- American National standards institute (ANSI)
- American society of mechanical engineers (ASME)
- American society for testing and materials (ASTM)
- American wire gauge (AWG)
- Air-conditioning and refrigeration institute (ARI)
- Air-Moving and conditioning association (AMCA)
- National fire protection association (NFPA)
- National Electrical manufacturers association (NEMA)
- National electric code (NEC)
- The following IS codes shall be applicable:

S. No.	Material/item of Work	Standard/Code
1.	Ducting Fabrication	IS : 655 (Latest Rev.)/ SMACNA
2.	Galvanized Sheets/Wires	IS : 277-1977
3.	Aluminium Sheets/Wires	IS : 737
4.	Horizontal Centrifugal Pumps	IS : 13537
5.	Mild Steel, ERW Pipes	IS : 1239, IS : 3589
6.	Pipe Fittings	IS : 1239
7.	Steel Pipe Flanges	IS : 6392
8.	Gate, Globe & Check Valves	
	a) Upto 40 mm gun metal	IS : 778
	b) Butterfly valves of 50 mm and above (cast iron)	IS : 13095
	c) Balancing Valves	IS : 778
	d) Non Return Valves	IS : 5312
9.	Colour Code for Identifications of pipes	IS : 2379-1963
10.	3 Phase induction motors	IS : 325
11.	Burden type pressure gauges	IS : 3624
12.	PVC insulated electric cables	IS : 1554
13.	HRC cartridge fuse links direct switching of motors	IS : 2208Specific requirements for IS : 4064 (Part II)
14.	Code of practice for electric wiring	IS : 732 (Part III)
15.	Glossary of terms used in refrigeration and air-conditioning	IS : 3615
16.	Hot die zinc coated steel pipes	IS : 4736-1968
17.	Expanded polystyrene	IS : 4671
18.	Glass wool	IS : 8183

Safety codes

The following safety codes as laid down by ISI shall be followed:

a)	Safety code for mechanical refrigeration	IS : 660
b)	Safety code for air-conditioning	IS : 659
c)	Safety code for scaffolding and ladders	IS : 3696
d)	Code for practice for safety and health requirements in electrical and gas welding & cutting operations	IS : 818
e)	Code of safety procedures and practices in electrical works	IS : 5216

2.1 DESIGN PARAMETERS FOR DUCTING DESIGN:

Duct Design Criteria The following maximum duct design velocities will be used in the design of ductwork systems. Where a range is indicated, it is intended to represent velocities over a range of flow volume.

	Metres/Second
Low Pressure Systems	
- Main Duct	7.5
- Primary Branch	5.0
- Secondary Branch	2.0-3.5
Medium Pressure Systems	13.0

The following maximum friction losses are to be used in conjunction with the velocities noted above.

	Pascals/metre
Low pressure systems	1.0
Medium pressure systems	3.3

External Glazing 'U' Value : 1.5 W/Sq.m.C

DESIGN PARAMETERS FOR INSULATION MATERIALS:

Material : Nitrile rubber
Thermal conductivity : 0.035 W/m^{o}k
Surface spread of flame as per BS476 Part 7 : CLASS O
Density : 50 KG/cub.m

DESIGN PARAMETERS FOR DUCT ACOUSTIC:

Material : Open cell Nitrile rubber
Thermal conductivity : 0.030 W/m^{o}k
Surface spread of flame as per BS476 Part 7 : CLASS 1
Density : 140-160 KG/cub.m

Drawings:

The drawings provided to the bidder with the tender documents give a general scheme of the system and are not meant to be the working drawings. The contractor shall furnish the shop drawings to be sent to the Consultant through the Project Manager, of all the equipment/ layouts within fifteen days of the award of the contract and the same shall be approved by the Consultant. No work shall be allowed to be executed without the approved shop drawings. However, the contractor may alter the scheme for improving the layout and meeting the site conditions. All such changes shall however be subject to the consultant's approval.

Testing:

All the equipment and the system shall be tested as specified and all the test data shall be furnished to the Consultants in the prescribed format.

Deviations:

Any deviations from specifications may be acceptable, provided such deviations are found necessary and appropriate for fulfilling the overall intent and purpose of the system and must be clearly spelled out and have to be submitted and attached along with tender.

Technical Data:

The contractor shall furnish complete technical data of the equipment offered by him as required under the heading "technical data".

Noise Criterion:

All air conditioning equipment and materials (like ventilation fans, ac units, ducts, grilles,

acoustic lining etc.) will be selected, designed and installed in such a manner that the inside noise criterion for all conditioned spaces will be in the range NC-30 to NC-35. The noise levels in conditioned occupied spaces due to all air conditioning equipment will not exceed 40 DB when measured at any point in the occupied spaces less than 1.5 meter above floor level and not closer than 1.5 meter from any supply air register or 60 cm from any return air grille.

When taking noise level measurements, the background noise level without the equipment operating shall be at least 7 DB below the actual background noise level when the equipment is in operation.

The contractor shall guarantee that the capacity of various components as well as the whole system shall not be less than specified.

2.2 AC EQUIPMENTS

This chapter covers the detailed requirements of factory built double skin air handling unit (AHU), High-wall mounted split unit and VRV air-conditioning system.

FACTORY BUILT AIR HANDLING UNIT (AHU)

TYPE

The air handling unit shall be of double skin construction, draw through type in sectionalized construction consisting of blower section, coil section, humidification section (where specified), filter section and drain pan. Unless otherwise specified, the unit shall be horizontal type.

a. RATING

- The capacity of the cooling coil, the air quantity from the blower fan and static pressure of blower fan shall be as laid down in the tender documents. Where these parameters as calculated by the tenderer exceed the specified values, the coils and the blower fan shall satisfy these calculated values.
- Each unit shall be a factory built, modular type with field assembled (as per requirement) casing sections, complete with High Efficiency SISW Plug Fan with EC motors or DIDW fan with TEFC motor (AS SPECIFIED IN BOQ), wire guard (N/A for CSU), cooling/ heating coils, drain section, structural mountings, vibration isolators and all other related accessories as required under BOQ/ Schedule.
- The unit shall be of the type and size suitable for ensuring a performance and capacity not less than the minimum required for the design when operating under the specified conditions. The physical size of the selected unit shall be suitable for the space allocated on the drawings and in Equipment schedule.
- The coil shall be designed for a face velocity of air not exceeding 155 m/min.
- The requisite static pressure demanded by the air circuit shall be developed by the fan at the selected operating speed. The fan motor HP shall be suitable to satisfy these requirements and the drive losses.
- The air outlet velocity from the blower fan shall not exceed 610 m/min.
- Noise level at a distance of 2M from AHU shall not exceed 75dBA.

b. MATERIAL AND CONSTRUCTION

1. HOUSING / CASING

- The housing/ casing of the air handling unit shall be of double skin construction. The housing shall be so made that it can be delivered at site in total semi knocked down

conditions depending upon the requirements. The main framework shall be of suitable structural sections. The entire framework shall be assembled using mechanical joints to make a sturdy and strong framework for various sections. Framework of all air handling units shall be made of thermal break hollow extruded aluminum profile. In case of AHU casing design with no contact between inner and outer surface, thermal break profiles can be avoided. The entire framework shall be assembled using mechanical joints to make a sturdy and strong framework for various sections. Entire framework shall be made of extruded aluminum profile.

- Double skin panels shall be minimum 40mm thick made of 0.8mm pre-plasticized and pre- painted with PVC guard, GSS sheet on outside and 0.8mm galvanized sheet inside with HFC/ CFC free polyurethane foam insulation of density not less than 38 kg/cum injected in between by injection moulding machine. These panels shall be joined and connected to the framework/ supports with soft rubber gasket in between (if necessary) to make the joints airtight and low air leakage potential. The gaskets shall be inserted within groove in extruded aluminum profile of the framework.
- Suitable doors with nylon handles, aluminum die cast hinges & hatches shall be provided for access to various panels for maintenance. Units shall be required with access door(s) for maintenance purpose. The entire frame shall be mounted on rolled / formed GSS heavy gauge galvanized steel (N/A for CSU)
- Frame work for each section shall also be joined together to make the joints air tight. Suitable doors with nylon handles and all access panels should be openable with allen key/ suitable locking arrangement. Aluminium die-cast powder coated/ Nylon hinges & latches shall be provided for access to various panels for maintenance. However, AHU in the form of complete single unit shall also be acceptable with access door(s) for maintenance to various sections. The entire housing shall be mounted on galvanized steel channel frame work made out of G.I. sheet of thickness not less than 2mm. For higher capacity AHUs hot dip galvanized steel channel framework made of minimum 3 mm thick G.S. sheet shall be used.

2. DRAIN PAN

Drain pan shall be made out of minimum 1.25 mm stainless steel sheet externally insulated (If Drain pan is outside the unit), with 10mm thick closed cell Polyethylene foam/ equivalent suitable insulation with necessary dual slope to facilitate fast removal of condensate. Necessary supports will be provided to slide the coil in the drain pan. The cooling coil segment shall have a full width, multi sloped drain pan that extends Downstream of the coil to provide sufficient amount of space to contain moisture Carry-over. The unit design shall not require a drain pan in any downstream section to Contain the coil condensate. Drain pan must be accessible for inspection and cleaning.

3. COOLING/ HEATING COIL

- The coil shall be made from seamless solid drawn copper tubes. The minimum thickness of tube shall be 0.5 mm for cooling coils.
- The depth of the coil shall be such as to suit the requirements, viz. re-circulated air applications, or 100 % fresh air applications and the bypass factor required shall be specified in the tender specifications. The coil shall be 4 or 6 rows deep for normal re-

circulated air application and 8rows deep for all outdoor air application, unless otherwise specified in the tender specifications. In case of 8 rows deep coils, it shall be made of 2x4 rows deep coils with a spacing of 200mm between the two coils, access door and independent drain pan.

- U bends shall be of copper, jointed to the tubes by brazing, soft soldering shall not be used.
- Each section of the coil shall be fitted with flow and return headers to feed all the passes of the coil properly. The headers shall be of copper and shall be complete with water in/out connections, vent plug on top and drain at the bottom. The coil shall be designed to provide water velocity between 0.6 to 1.8m/s in the tubes.
- The fins shall be of aluminum. The minimum thickness of the fins shall be 0.15 mm nominal. The no. of fins shall not be less than 4-5 per cm length of coil. Fins may be of either spiral or plate type. The tubes shall be mechanically expanded to ensure proper thermal contact between fins and tubes. The fins shall be evenly spaced and upright. The fins bent during installation shall be carefully realigned. For coastal areas fins shall be phenolic coated and for 100% FA application fins shall be hydrophilic type.
- The coil shall be suitable for use with the refrigerant specified or with water as the case may be. Refrigerating coils shall be designed for the maximum working pressure under the operating conditions. Water coils shall be designed for a maximum working pressure of 10 kg./sq.cm.
- Shut off and regulating valves at the inlet and outlet of water shall be provided. In the case of DX coils, solenoid valve and expansion valves shall be provided at the inlet of coil. Computerized cooling coil selection output shall be submitted. Coils shall be AHRI 410 certified.

4. SUPPLY AIR FAN AND DRIVE

- The supply air fan shall be AMCA certified SISW backward curved aerofoil plug fan with High Efficiency external rotor EC(Electronically Commutated) motor, energy optimized for operation for high efficiency and favorable acoustic behavior..
- The high efficiency Backward curved impeller made of welded aluminium sheet or high performing composite material with external rotor motor balanced together statically and dynamically according to relevant standards. The EC fan should be capable of being fitted in horizontal position in the AHU. Fan impeller shall be mounted on solid shaft supported to housing using heavy duty ball bearings. Fan housing and motor shall be mounted on a common extruded aluminum base mounted inside the fan section on anti-vibration spring mounts or cushy-foot mount. The fan outlet shall be connected to casing with the help of fire retardant fabric.
- The fan impeller assembly shall be statically and dynamically balanced.
- Motor: The minimum efficiency class of the motor shall be equivalent to IE4. The motor shall be permanent magnet external rotor motor with integrated electronics and suitable for continuous operation. The speed of the motor shall be varied with an external 0-10V/ PWM control signal. The fan in totality shall be of most

efficient type so that the power consumption and noise level is minimal. The motor shall be minimum IP54 protection class. The motor shall be suitable for operation on 415 ± 10%V, 3phase, 50 Hz, A.C. supply.

- Integrated Electronics: The device electronics shall be protected from overload by the "Active Temperature Management" so that if the ambient operating temperature exceeds the design limit then the fan is not switched off immediately. In such a condition the fan should be operational at lower speeds till the operating ambient temperature drops down.

5. AIR FILTERS

The air used in an air-conditioning system must be filtered to maintain a clean atmosphere in the conditioned space. The concentration of contaminants in the air and the degree of cleanliness required in the conditioned space will determine the type of filter or filters that must be used.

a. Pre Filters

Each unit shall be provided with a factory assembled filter section containing 50mm thick washable synthetic type air filters having anodized aluminium frame with minimum 1.6 mm thickness. The filter shall have minimum 90% efficiency down to 10 microns. The media shall be supported with HDPE mesh on one side and aluminium mesh on other side. Filter banks shall be easily accessible and designed for easy withdrawal and renewal of filter cells. Filter framework shall be fully sealed and constructed from aluminium alloy. Face velocity across these filters shall not exceed 155 MPM. Each filter shall carry test certificate from manufacturer. The filter area shall be made up of panels of size convenient for handling. The filter testing method shall be as per ASHRAE 52.1 latest edition.

Design Parameters of Filters

Parameter	Filter
Parameter	Filter
Type	Flange type
Grade	MERV-8
Efficiency	90% down to 10 micron
Initial P (mm WG) - clean condition	5 mm
Final P (mm WG) - clogged condition	12 mm
Casing	Aluminium Anodized
Sealing of medium	Epoxy or equivalent
Medium	Synthetic medium supported by HDPE mesh and aluminium mesh
Sample testing at Mfr's works	No
Packing	Yes
Test Method	As per ASHRAE 52.1
Washable	Yes

b. Fine Filters (Wherever is specified in BOQ)

Each unit shall be provided with a factory assembled filter section containing 300mm thick synthetic media type air filters having anodized aluminium frame with minimum

1.6 mm thickness. The filter shall have minimum 95% efficiency down to 3 microns. The media shall be supported with HDPE mesh on one side and aluminium mesh on other side. Filter banks shall be easily accessible and designed for easy withdrawal and renewal of filter cells. Filter framework shall be fully sealed and constructed from aluminium alloy. Face velocity across these filters shall not exceed 155 MPM. Each filter shall carry test certificate from manufacturer. The filter area shall be made up of panels of size convenient for handling. The filter testing method shall be as per ASHRAE 52.1 latest edition.

Design Parameters of Filters

Parameter	Filter
Type	Flange type
Grade	MERV-13
Efficiency	95% down to 3 micron
Initial P (mm WG) - clean condition	12 mm
Final P (mm WG) - clogged condition	25 mm
Casing	Aluminium Anodized
Sealing of medium	Epoxy or equivalent
Medium	Synthetic medium supported by HDPE mesh and aluminium mesh
Sample testing at Mfr's works	No
Packing	Yes
Test Method	As per ASHRAE 52.1
Washable	No

c. GENERAL CONSTRUCTION OF FILTERS

- Each AHU shall be provided with a factory assembled filter section containing pre-filters made of cleanable metal viscous filters made of corrugated aluminum wire mesh, or dry cleanable synthetic filters. These shall be minimum 50 mm thick with a frame work of aluminum/GI.
- The filter area shall be made up of panels of size convenient for handling. The filter panels shall be held snugly within suitable aluminum framework made out of minimum 1.6 mm GI/ aluminum sheet with sponge neoprene gaskets by sliding the panels between the sliding channels so as to avoid air leakage.
- In order to indicate the condition of these filters while in operation, a manometer shall be provided to indicate the pressure drop across the fine filters and absolute filters.
- Special filters, if any specified in the tender specifications shall be provided in addition to the above filters. In that event, the latter shall function as pre-filters.
- Each filter shall carry test certificate from manufacturer.

HUMIDIFICATION SECTION

Wherever specified in the BOQ, humidification section shall be provided in the AHU to connect the humidification system to the AHU.

INSTALLATION

The air handling unit shall be so installed as to transmit minimum amount of vibration to the building structure. Adequate vibration isolation shall be provided by use of rubber/ neoprene pads and/or vibration isolation spring mountings.

Safety Features

The fan access door shall be equipped with micro-switch inter locked with fan motor to enable switching off the fan motor automatically in the event of door opening (N/A for CSU). The access door shall be further having wire mesh screen as an added safety feature bolted on to the unit frame (N/A for CSU).

Fan and motor base shall be properly earthed from the factory.

All screws used for panel fixing, projecting inside the unit shall be covered with PVC caps to avoid human injury.

Units needs to be CE certified.

Accessories

Each unit shall be provided with manual air vent at high point in the cooling coil and drain plug at the bottom of the coil. (only for water type)

Performance Data

The Unit shall be selected for the optimum operating point with respect to noise level & efficiency of the equipment. Fan performance rating and power consumption data with operation points clearly indicated shall be submitted and verified at the time of testing commissioning of the installation.

Submittals

After supply/ assembly of the units at site the manufacturers shall submit three complete sets of unit's drawings, test certificates of coil, test certificate of fan, test certificate of the unit and operation- maintenance manual.

2.3 HIGH WALL MOUNTED UNITS

The units shall be wall-mounted type. The units include pre-filter, fan section and DX coil section. The housing of units shall be light weight powder coated galvanized steel. Units shall have an attractive external casing for supply and return air.

a. INSTALLATION:

The units shall be mounted on ribbed rubber pads for vibration isolation. The contractor shall supply the required charge of refrigerant, lubricant and other consumables, for commissioning and testing of the equipment.

All the equipment shall be thoroughly tested and checked for leaks. All safety controls shall be suitably set and a record of all setting shall be furnished to the project supervisor.

Providing and fixing M.S. structural support for condensing unit with vibration isolator pad in- between support and structure and vibration isolation suspender and pads for evaporating units.

b. DIMENSIONS:

Dimensions given in figures shall be taken in preference to scaled dimensions in all cases. Before commencing any work the contractor shall get clarifications wherever necessary.

c. PAINTING:

Shop coats of paint that have become marred during transportation 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 surfaces.

d. CONDENSATE DRAIN PIPING:

All pipes to be used for condensate drain shall be Insulated medium class GI pipe & all joints should be Gluing or solvent cementing as per manufacturer recommendation. The piping shall be insulated with 9mm thick XLPE insulation with Glass Fabric.

e. REFRIGERANT PIPING:

- All refrigerant pipes and fittings shall be type 'L' hard drawn copper tubes and wrought copper fitting suitable for connection with silver solder.

- All joints in copper piping shall be swaged joints using low temperature brazing and/or silver solder. Before jointing any copper pipe or fittings, its interior shall be thoroughly cleaned be passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while construction of the joints. Subsequently, it shall be thoroughly blown out using nitrogen.
- Refrigerant lines shall be sized to limit pressure drop between evaporator and condensing unit to less than 0.2 kg per Sq.cm.
- After the refrigerant piping installation has been completed the refrigerant piping system shall be pressure tested using, Freon mixed with nitrogen at a pressure of 20 Kg per Sq. cm. (High side) and 10 Kg per Sq. cm (Low side) pressure shall be maintained on the system for a minimum of 12 hours. The system shall then be evacuated to a minimum vacuum of 70 cm. of mercury and held for 24 hours, during which time change in vacuum shall not exceed 12 cm of mercury. Vacuum shall be checked with vacuum gauge.
- All refrigerant piping shall be installed strictly as per the instructions and recommendations of air conditioning equipment manufacturers.
- The copper thickness of wall shall be 20G/22G(0.7 to 1 mm)

POWER SUPPLY:

Power supply near the indoor unit will be provided by the owner with suitable MCBs. From MCB to indoor unit and outdoor unit to Indoor unit by the contractor along with earthing.

2.4 VARIABLE REFRIGERANT VOLUME (VRV) AIR CONDITIONERS

General:

The contractor shall supply and install VRV system air conditioners wherever indicated. The system shall be complete in all respects and comply with the specifications as given.

Condensing Units:

a. Each condensing unit shall be complete unit with hermetic compressor/s, air condenser, condenser fans with motors, internal piping, switches and internal wiring and shall be enclosed in a corrosion resistant, epoxy coated weather proof outdoor type housing.

a. The compressor shall be VRV with Twin/ Triple compressor control. The compressors shall be suitable for R-410a. The optimum capacity control shall be of multiple compressors in accordance with load.

b. The condenser coil shall be air cooled type with aluminium fins and copper tubes and necessary refrigerant connections. The copper tubes shall not be less than 1/2" O.D.

c. The condenser air fans shall be propeller type direct driven, each complete with motor. The air quantity and area of the condenser shall be adequate for working in the specified outdoor conditions.

d. The casing shall be fabricated from galvanized steel zinc phosphate and finished with epoxy coating. The casing shall make the whole unit fully weather proof, suitable for outdoor installation on the sea side.

e. The unit shall include a remote control assembly with thermostat and starting and speed switches.
f. The necessary charge of refrigerant gas and lubricated oil shall be provided to run the system.

Indoor Unit:

a. The cooling unit shall be matched to condensing units and shall consist of cooling coil, blower, filters, outer casing, drain pan, accessories etc.
b. The cooling coil shall have copper tubes of not less than 3/8" O.D. and continuous aluminium plate fins with integral collars. The tubes shall be staggered in the direction of air flow.
c. The fan section shall comprise of 1 no. Aluminium /industrial plastic centrifugal blower, statically and dynamically balanced motor, drive package, mounting arrangement etc.
d. The unit shall include a cordless remote control assembly with thermostat and starter and 3 speed switches.

Refrigerant Piping:

a. The condensing unit and evaporator units shall be interconnected by type 'l' seamless copper refrigerant liquid and suction lines using flared or brazed fittings. Necessary accessories shall be incorporated in the circuit. 1 condensing unit shall be connected to 4-14 evaporator units (wherever applicable). The maximum number of connectable indoor units shall be 20-32 Nos. and the capacity ratio shall be 50 ~ 130%.
b. The insulation of suction line shall be as per manufacturer standard.

Miscellaneous:

a. The unit shall have control panel, housing, the starters, contactor, relays etc.
b. Isolation pads shall be provided under the units.
Drain line shall be provided from the right / left hand side of the indoor unit to a drain trap as per drawing.
c. Suitable galvanized steel angle iron supporting frame shall be provided for the condensing unit and supporting arrangement for the indoor units, primed and painted with epoxy paint of a suitable color as per Engineering In charge approval.
d. Interconnecting power cabling shall be provided.
e. All units shall have microprocessor based thermostats with a cordless remote control.
f. All the connections to the condensing unit shall necessarily be corrosion resistant. One set of spare filters for each unit.

2.5 SHEET METAL DUCT

FACTORY FABRICATED (As per SMACNA):

1. This section deals with supply, erection, testing & balancing of GI sheet metal duct work and air registers conforming to specifications as given below:

2. MATERIAL FOR DUCTING

All the ducts shall of LFQ (Lock Forming Quality) grade prime G.I. raw material furnished with accompanying Mill Test Certificates. Galvanizing shall be 120gms/sq.m. (total coating on both sides).

In addition, if deemed necessary, sample of raw material, selected at random by owner's site representative shall be subject to approval and tested for thickness and zinc coating at contractor's expense.

The G.I. raw material should be used in coil-form (instead of sheets) so as to limit the longitudinal joints at the edges only, irrespective of cross-section dimensions.

Governing Standards

Unless otherwise specified here, the construction, erections, testing and performance of the ducting system shall conform to the SMACNA standards and Addendum of SMACNA

Duct connectors and Accessories

All the transverse duct connectors (Flanges\Cleats) and accessories related hardware such as support system shall be zinc coated (galvanized).

Fabrication standards

All the ductwork including straight sections, tapers, elbows, branches, shoe pieces, collars, terminal boxes and other transformation pieces shall be factory-fabricated. Equivalency will require fabrication by utilizing the following machines and process to provide the requisite quality of ducts and speed of supply.

Coil lines to ensure location of longitudinal seams at corners\folded edges only to obtain the required duct rigidity and low leakage characteristics. No longitudinal seams permitted along any side of the ducts.

All ducts, transformation pieces and fittings shall be made on CNC profile cutters for required accuracy of dimensions, location and dimensions of notches at the folding lines.

All edges shall be machines treated using lock-formers and rollers for furning up edges.

Selection of G.I. and Transverse Connectors

Duct construction shall be in compliance with 1" (250 Pa) w.g. static norms as per SMACNA. All transverse connectors shall be 4-bolt system.

To avoid any leakage additional sealant shall be used.

The specified class of transverse connectors and duct gauge for a given duct dimensions shall be 1" (250 Pa) pressure class.

Non-toxic, AC-application grade P.E. or PVC gasketing shall be provided between all mating flanged joints. Gasket sizes shall conform to flange manufacturer's specification.

Duct construction

The fabricated duct dimensions shall be as per approved drawings and all connecting sections shall be dimensionally matched to avoid any gaps.

Dimensional Tolerances: All fabricated dimensions shall be within + 1.0mm of specified dimension. To obtain required perpendicularity, permissible diagonal tolerance shall be +1.0mm per meters.

Each duct pieces shall be identified by coded sticker, which shall indicate specific part number, job name, drawing number, duct sizes and gauge.

Ducts shall be straight and smooth on the inside. Longitudinal seams shall be airtight and at corners, which shall be either Pittsburgh or snap button punch as per SMACNA practice, to ensure air tightness.

Changes in dimensions and shape of ducts shall be gradual (between 1:4 and 1:7) turning vanes or air splitters shall be installed in all bends and duct collars designed to permit the air to make the turn without appreciable turbulence.

Plenum shall be factory fabricated panel type and assembled at site.

Factory fabricated ducts shall have the thickness of the sheet as follows and length of the piece not more than 1200mm and should have beading at every 300mm.

Recommended SMACNA standard at 4 feet Transverse Joint Reinforcement

Duct Static Pressure In Inches	**1”**	**2”**	**3”**	**4”**	**6”**
Duct Size (mm)					
150-250	B-26	B-26	B-26	B-26	C-26
251-300	B-26	B-26	B-26	C26	C-24
301-350	B-26	C26	C26	C26	C-24
351-400	B-26	C26	C26	D-26	D-24
401-450	C26	C26	C26	D-26	E-24
451-500	C26	C26	D-24	D-24	E-24
501-550	C26	C26	D-24	E-24	F-22
551-600	C26	D-26	E-24	E-24	F-22
601-650	C26	D-26	E-24	E-24	F-22
651-700	C26	D-26	E-24	F-22	G-22 R
701-750	C26	E-24	E-24	F-22	G-20
751-900	D-26	E-24	F22	G-22 R	H-20 R
901-1000	E-24	F-22	G-22R	H-20 R	I-18
1001-1200	E-24	G-22	H-20R	I-18	I-18
1201-1300	F-22	H20	I-18	I-18	J-18 R
1301-1500	F-22	H-20 R	I-18	I-18 R	-
1501-1800	H-22	I-18	J-18 R	-	-
1801-2100	I-20	J-18 R	-	-	-
2101-2400	I-18	J-18 R	-	-	-
2401-2700	I-18	-	-	-	-

Note: SMACNA- sheet Metal & Air Conditioning Contractor National Association Inc. “HVAC Duct construction standard metal & flexible”- Third Edition 2005 USA.
In 1” static pressure i.e. comfort cooling application optional “C&S and C&SS cleats joints can be used Upto 450mm duct size use C&SS cleats.

Over 750 mm duct size use TDF/TDC flanges with respective gauges as mentioned above.
Alphabets B,C,D,E,F,G,H,I and j per SMACNA 2005, transverse joint reinforcement table 1- 12m (T-25b flanged) and TDC addendum.
R means reinforcement with Zeebar Stiffener / Joint Tie Rod /Mid Tie Rod.
The gauges, joints and bracing for sheet metal ductwork shall further conform to the provisions as shown on the drawings.
Ducts larger than 600 mm shall be cross broken, duct sections up to 1200 mm length may be used with bracing angles omitted
Changes in section of duct work shall be affected by tapering the ducts with as long a taper as possible. All the branches shall be taken off at not more than 45 DEG. Angle from the axis of the main duct unless otherwise approved by the Engineer-in-charge.

* Ducts 2250 mm and larger require special field study for hanging and supporting methods.

In addition to above the following points should be also taken into account while fabrication of ducts.

a) All ducts of size larger than 450mm shall be cross broken.

b) All ducts shall be supported from the ceiling / slab by means of MS rods of dia 9mm with MS angle of size 40 x 40 x 5 mm at the bottom with neoprene pad in between the duct & MS angle. The ducts shall be suspended from the ceiling with the help of dash fasteners. Provision for necessary ancillary materials required for hanging the ducts shall be arranged by the contractor.

c) The vanes shall be provided wherever required and shall be securely fastened to prevent noise & vibration.

d) The rubber gasket shall be installed between duct flanges in all connections and joints.

e) All flanges and supports should be primer coated.

f) The flexible joints shall be fitted to the delivery side of AHU fans with Fire Retardant Double canvass. The length of flexible joints should not be less than 150 mm and not more than 300 mm between faces.

g) The ducting work can be modified if deemed necessary in consultation with the Engineer in Charge to suit actual site conditions in the building.

h) Box Type Dampers & Splitters

These dampers shall be provided in the ducting work for proper control and balancing of air distribution. All dampers shall be louver type robust construction. These dampers shall be fitted with easily accessable operating mechanism, complete with links, levers, quadrant for proper control and setting in a desired position. The position of the handle of the damper operating mechanism shall be clearly visible and shall indicate the position of the damper in the duct. All dampers, splitters shall be fabricated out of G.S. sheet of two gauges higher than the duct piece having these fittings. Dampers shall be installed in duct at all required locations.

No extra payment shall be made separately since these form part of Air Circulation System

NOTE: In case angle iron supports are not feasible to be installed for supporting the ducts due to height constraint then the contractor shall support the ducts with M.S flats of at least double the thickness of the angle iron supports.

2.6 SHEET METAL DUCT (SITE FABRICATED):

i) GENERAL:

Supply, fabrication, installation and testing of all sheet metal ducts & supply, installation, testing and balancing of all grilles, registers and diffusers, in accordance with these specifications and the general arrangement shown on the drawings.

Duct work shall mean all ducts, casings, dampers, access doors, joints, vanes, stiffeners, hangers and supports etc.

All ducts shall be fabricated according to ASTM 525A from galvanized steel sheets of zinc grade G27 or Z90 of the following thickness as indicated in schedule of quantities & as described in the relevant latest IS code.

ii) RECTANGULAR DUCT:

Dimensions of Ducts	GI sheet		Type of Joints	Type of Bracing
	Thickness (mm)	Gaug		
Upto 750	0.63	24	G.I. Flange at 2.5 Centre	Cross Bracing

751 to 1500	0.80	22	25x25x3mm angle iron frame with 8mm dia nuts	25x25x3mm M.S. angle bracing at 1500mm from joints.
1501 to 2250	1.0	20	40x40x5mm angle iron be cross braced diagonally with 10mm dia nuts & bolts at 125 centre	40x40x3mm M.S. angle bracing at 1200mm from joints or 40x40x3 mm M.S. angle diagonal bracing.
2251 and above	1.25	18	50x50x6mm angle iron frame with 10mm dia nuts & bolts at 125	50x50x3mm M.S. angle bracing at 1200mm from joints or 50x50x3 mm M.S. angle diagonal bracing.

iii) THICKNESS OF SHEET FOR ROUND DUCTS (FROM ISS: 655):

Diameter of Duct (mm)	Thickness of sheet (mm)	
	G.I. Sheets	Aluminium
150 to 500	0.63	0.80
501 to 750	0.80	0.80
751 to 1000	0.80	1.00
1001 to 1250	1.00	1.50
1251 and above	1.25	1.80

Sheet metal ducts shall be fabricated out of galvanized steel sheets conforming to BIS 655, BIS 277, BIS 737. Sheets used shall be produced by Hot dip process and galvanizing shall be Class VIII.

iv) HANGERS FOR DUCT:

Duct Size	Spacing (M)	Size of MS angle (mm x	Size of rod dia
Upto 750	2.4	25 x 3	8
751 to 1500	2.4	40 x 5	10
1501 to 2250	2.4	50 x 5	12
2251 to above	2.4	50 x 5	12

v)

All ducts irrespective of size shall be fabricated and installed in workman like manner, generally conforming to relevant latest IS code.

a) Ducts so identified on the drawings shall be acoustically lined with thermal insulation as described in the section `Insulation' and as indicated in schedule of quantities. Duct dimensions shown on drawings are overall sheet metal dimensions inclusive of the acoustic lining, where required and indicated in schedule of quantities.

b) Ducts shall be straight and smooth on the inside with neatly finished joints. All joints shall be made air tight.

c) Changes in dimensions and shape of ducts shall be gradual. Curved elbows, unless otherwise indicated, shall have a centre line radius equal to one and a half times the width of the duct. Air turns shall be installed in all vanes, arranged to permit the air to make the turn without appreciable turbulence. Suitable vanes shall be provided in duct collar to have uniform/ proper air distribution.

d) Ducts shall be fabricated as per details shown on drawings. All ducts shall be rigid and shall be adequately supported and braced where required with standing seams, tees, or angles of sample size to keep the ducts true to shape and to prevent bulking, vibration, breathing or oil canning.

e) All sheet metal connections, partitions and plenums required to confine the flow of air

to and through 18g GI/16 gauge aluminium, thoroughly stiffened with 25mm x 25mm x 3mm angle iron braces and fitted with all necessary doors as required to give access to all parts of the apparatus. Access Doors shall be not less than 45cm x 45cm in size.

vi) INSTALLATION:

All ducts shall be installed generally as per the drawings and in strict accordance with approved shop drawings to be prepared by the Contractor.

i. The Contractor shall provide and neatly erect all sheet metal work as may be required to carry out the intent, of these specifications and drawings. The work shall meet with the approval of Owner's site representative in all its parts and details.

ii. All necessary allowances and provisions shall be made by the Contractor for beams, pipes, or other obstructions in the building, whether or not the same are shown on the drawings. Where necessary to avoid beams or other structural work, plumbing or other pipes, and/ or conduits, the ducts shall be transformed, divided or curved to one side, the required area being maintained, all as per the site requirements.

iii. If a duct cannot be run as shown on the drawings, the contractor shall install the duct between the required points by any path available, in accordance with other services and as per approval of Owners site representatives.

iv. All duct work shall be independently supported from building structure. Duct shall be supported to the ceiling with the help of anchor fasteners by drilling holes in concrete slab and inserting anchor fasteners and bolts. All horizontal ducts shall be rigidly and securely supported, in approved manner with trapeze hangers formed of MS rods and angle iron under ducts at not greater than 2.4 meter centres. All vertical duct work shall be supported by structural members at each floor.

If duct is passing through in such areas where space between ceiling slab to false ceiling is more than 1500 mm than duct should be supported by wall mounted brackets of 40 x 40 x 3 mm angle.

Ducting over furred ceiling shall be supported from the slab above, or from beams, after obtaining approval of Owner's site representative. In no case shall any duct by supported from false ceiling hangers or be permitted to rest on false ceiling. All metal work in dead or furred down spaces shall be erected in time to occasion no delay to other contractors on the building.

v. Where metal ducts or sleeves terminate in wood work, tight joints shall be made by means of closely fitted heavy flanged collars. Where ducts pass through brick or masonry opening and wooden frame work shall be provided within the opening and crossing ducts provided with heavy flanged collars on each side of wooden frame work, so that duct crossing is made leak-proof.

vi. All ducts shall be totally free from vibration under all conditions of operation. Whenever duct work is connected to fans, air handling units or blower coil units that may cause vibrations in the ducts, ducts shall be provided of closely woven, rubber impregnated double layer canvas or neoprene coated fibre glass fire resistant flexible connection. The flexible connections located close to the unit, in mutually perpendicular directions. The flexible sleeve at least 10cm long securely bonded and

bolted on both sides. Sleeve shall be made smooth and the connecting duct work rigidly held by independent supports on both ends. The flexible connection shall be suitable for pressures at the point of installation and shall be class 'O' smoke rated.

vii. Air conditioning unit and exhaust fans shall be connected to duct work by inserting at air inlet and air outlet a double canvass sleeve. Each sleeve shall minimum 150mm securely bolted to duct and the connecting duct work rigidly held in line with unit inlet or outlet and shall be class 'O' smoke rated.

viii. All ducts above 450 mm are to be cross broken to provide rigidity to the ducts.

2.7 ACCESS PANEL:

A hinged and gasketed access panel shall be provided on duct work at each control device that may be located inside the duct work.

MISCELLANEOUS:

All ducts above 450 mm are to be cross broken to provide rigidity to the ducts.

All duct work joints are to be true right angle or approaching with all sharp edges removed.

Smoke rated sponge rubber gaskets also to be provided behind the flange of all grilles.

Each branch from the duct, leading to a grille, shall be provided with an air deflector to divert the air into the grille through the branch.

Inspection doors measuring at least 450 mm x 450 mm are to be provided in each system at an appropriate location, as directed by Project Manager/Engineer-in-charge.

Diverting vanes must be provided at the bends exceeding 600 mm and at branches connected into the main duct without a neck.

Proper hangers and supports should be provided to hold the duct rigidly, To keep them straight and to avoid vibrations. Additional supports are to be provided where required for rigidity or as directed by Project Manager/Engineer-in-charge.

The ducts should be routed directly with a minimum of directional change.

The duct work shall be provided with additional supports /hangers, wherever required or as directed by the directed by Project Manager/Engineer-in-charge, at no extra cost.

All duct supports, flanges, hangers and damper boxes etc. shall be either zinc coated or given 2 coats of anti corrosion red oxide paint before installation and one coat of aluminium paint after the erection, at no extra cost.

All angle iron flanges to be welded electrically and holes to be drilled.

All the angle iron flanges to be connected to the GSS ducts by rivets at 100 mm centres. All the flanged joints, to have a 3 mm neoprene rubber gasket to the flanges with Adhesive.

The G.S.S. Ducts should be lapped 6 mm across the flanges.

The ducts should be supported by approved type supports at a distance not exceeding 2.4 metres and at every vertical floor penetration.

Sheet metal connection pieces, partitions and plenums required, shall be constructed of
1.25 (18 gauge) sheet thoroughly stiffened with 25 mm x 25 mm angle iron braces and fitted with access doors.

Readymade (factory fabricated) flanges shall be used for all ducting.

All duct joints shall be filled up by silicon.

All duct penetrations in fire rated walls and slabs shall be filled up by fire resistant materials of fire rating not less than fire rating of wall / slab.

GRILLES:

The supply and return air grilles shall be fabricated from aluminium extruded sections. The supply and return air grille shall have single horizontal extruded section fixed louvers. The grilles may or may not be with an outer frame. The grille flange shall be fabricated out of 20x20x1.5 mm aluminium angle. Grilles longer than 450 mm shall have intermediate supports for the horizontal louvers.

The grilles shall have opposed blade dampers of M.S. Black sheets, which shall be key operated from the grille face wherever required as approved.

The damper blades shall be of 0.63 mm (24 gauge) M.S. Black sheets and shaped to form air tight joints. The frame work for dampers shall be fabricated from 0.63 mm (24 gauge) M.S. Black sheet.

FIRE DAMPERS:

All supply and return air ducts at AHU room crossings and at all floor crossings shall be provided with fire dampers of at least 90 minute fire rating tested by CBRI as per UL 555 standard. These shall be multi leaf dampers.

Fire dampers blades and outer frames shall be of 16SWG GSS construction. The damper blades shall be provided on both ends using chrome plated spindles in self lubricated bronze bushes. Stop shall be provided on top and bottom of damper housing made of 16SWG GSS. For preventing smoke leakage, side metallic compression seals shall be provided.

Fire damper shall be provided with factory fitted sleeves. Access doors shall be provided within the duct in accordance with the manufacturer’s recommendation.

All stainless steel fire dampers blades and outer frame shall be fabricated from 16 SWG SS 304 sheet or better grade in the same manner as specified above for GSS.

Fire isolating dampers complete with outer frame, damper blades, motorized or fusible link actuator, linkages and sleeves, shall be installed in all locations as may be required by the relevant Authorities. In particulars, fire dampers shall be installed in ducts where they pass through compartmentation walls, fire walls and concrete floors except in the case where the duct itself is in a fire isolated shaft.

Fusible link type fire dampers shall be provided at all locations. Fusible link fire dampers shall be of the spring or dead weight type and shall be complete with fusible link 72 Deg. C rating so that they close automatically and remain closed under fire condition. The damper shall have a rating of not less that the rating of the fire separation walls or floors and shall be tested by a approved testing authority.

Inspection door shall be provided for fire dampers. All fire dampers shall be complete with factory fabricated and fitted duct sleeve. The joints at the sleeve end shall be slip on type.

Fire Rated Ductwork

All Fire Rated Ductwork shall have a minimum of 2 hours fire rating and to the approval of the local authorities.

Fire dampers shall be CBRI tested & certified for 90 minutes rating against collapse & flame penetration as per procedure of UL 555.

The fire damper shall be installed in the duct in such a manner that vibration and rattling does not occur due to the passage of air.

Fire dampers shall be motorized smoke & fire dampers type. Fire damper shall also close on receipt of fire alarm signal to cut off air supply instantaneously. An electric limit switch shall also beoperated by the closing of fire damper, which in turn shall switch off power supply to AHU blower motor as well as strip heaters.

Fire dampers shall be compatible with the fire detection system of building & shall be capable of operating automatically through an electric motor on receiving signal from fire alarm panel.

DIFFUSERS:

The ceiling type round or square diffusers shall be of 1.25 mm (18 gauge) aluminium sheets with flush or step down face, as specified with fixed pattern and round neck.

The diffusers shall be die formed for proper air diffusion.

All supply diffusers shall be provided with M.S. Sheet dampers, with knurled knobs for adjustment from the bottom.

PAINTING:

All grilles, and diffusers shall be anodised or powder coated, as required, before installation.
All ducts immediately behind the grilles/diffusers etc. are to be given two coats of black paint in matt finish.

TESTING:

After completion of sections all duct systems shall be tested for air leakage.

The entire air distribution system shall be balanced to supply the air quantity for each area and the final balance of air quantity for each area shall be submitted to the Project Manager/Engineer-in-charge, for approval. All the instrument required for testing and balancing i.e. rotating vane anemometer, thermometer, ducthood, inclined manometer etc. shall be provided by the Contractor.

FLAT OVAL/ROUND SPRIAL DUCTS

- All Flat Oval/ Round Spiral Duct and Fittings shall be manufactured from 180 gsm galvanized steel of lock forming quality.
- All Flat Oval/ Round Spiral Ducts should have in Continuous external reinforcement with 4-ply Spiral lock seam at regular intervals of 125 mm of maximum length of 3 m each. The fabrication of flat Oval spiral ducts & duct fittings should be as per SMACNA High pressure duct standards, 1985.
- All Flat Oval/ Round Spiral Ducts and Duct fittings shall be joined with slip joint connects of 50mm insertion length and fastened with rivets.

Minimum duct wall thickness shall be as indicated in Table below:-

Flat Oval Duct Gauge

Major Dimension Duct Width	Longitudinal Seam	Spiral Seam (GAUGE)	Fitting (GAUGE)
UPTO 600	20	24	20
601 TO 750	20	22	20
751 TO 900	20	22	20
901 TO 1050	18	22	18
1051 TO 1200	18	22	18
1201 TO 1350	18	20	18
1351 TO 1500	18	20	18
1501 TO 1750	16	20	16
1751 & ABOVE	16	18	16

ROUND Duct Gauge

Major Dimension Duct Width	Seam (GAUGE)	Fitting (GAUG
UPTO 600	24	24
601 TO 900	22	22
901 TO 1250	20	20
1251 & ABOVE	18	18

- Reinforcement for oval/ Round duct shall be of the same and spacing interval as specified for rectangular duct or shall be provided to limit wall deflection to ¾ in. (19mm) and reinforcement deflection to ¼ in (6.4mm).
- Unless otherwise specified, joints and seams shall be similar to those indicated for round duct.
- Fittings shall conform to the thickness schedules in Table, shall conform to the seam,

joint, and connection arrangements permitted for round duct, and shall be reinforced to conform to Point no. 1.

- The duct construction shall be capable of withstanding a pressure 50 percent greater than that of the assigned pressure class without structural failure or permanent deformation.
- Duct wall deflection at atmospheric pressure, with reinforcement and connections in place, shall not exceed ¼ in. (6.4 mm) on widths of 36 in. (914mm) or less of ½ in (13 mm) on greater widths. Refer Criteria in Chapter 11 of SMACNA Standards – 2005 Third Edition.
- Supports shall conform to those permitted for rectangular duct, with the overall dimensions taken as references.

INSULATION

This section deals with supply and fixing of **Thermal/Acoustic** insulation of ducts, pipes etc. as per the specification given in this section.

MATERIAL OF INSULATION

The insulation material of the following kind shall be used for cold insulation.

a) Closed Cell Elastomeric Nitrile Rubber

Insulation material shall be Closed Cell Elastomeric Nitrile Rubber. Thermal conductivity of elastomeric nitrile rubber shall not exceed 0.036 W/m□K at an average temperature of 0□ C. The insulation shall have fire performance such that it passes CLASS 0 as per BS476 Part 7 for surface spread of flame. Water vapour permeability shall not exceed 0.04 Perm inch (2x 10-10 Kgs/m.hr.Pa). The Nitrile Rubber Insulation should have approval from CBRI, Roorkee.
Thickness of the insulation shall be as specified for the individual application

INSULATION ON SHEET METAL DUCTING

The air handling ducts shall be insulated with **Closed Cell Elastomeric Nitrile Rubber**. Duct insulation thickness shall be 19 mm thick.

Installation

a) Clean the surface with a wire brush and make it free from rust and oil.
b) Apply one coat of heat resistant, polychloroprene base low VOC adhesive grade R242/SR998 on both surfaces with open time 10-25 minutes.
c) Fix the insulation on duct surface of the thickness mentioned in BOQ with 50 mm wide and 3 mm thick self adhesive insulating material (Nitrile rubber).

Additional treatment on Exposed duct insulation

- Apply tack coat of insulation protective coating evenly by brush (Min. 0.5 mm thick).
- After applying tack coat embed the glass fiber or canvas cloth immediately and make

it wrinkle free.

- Apply finish coat of protective coating (Min. 0.5 mm thick).

ACOUSTIC LINING:

The acoustic lining shall consist of open cell nitrile rubber density 140-160 kg/m^3 (min) then it shall be covered by 0.46 mm perforated aluminium sheets having 3 mm perforation at 6 mm centres.

Installation:

- a) Clean the surface with a wire brush and make it free from rust and oil.
- Apply one coat of heat resistant, polychloroprene base low VOC adhesive both surfaces with open time 10-25 minutes.
- Fix the insulation on duct surface of the thickness mentioned in BOQ with 50 mm wide and 3 mm thick self-adhesive insulating material (Nitrile rubber).

INSULATION OF PIPES

The refrigerant pipes shall be insulated with Nitrile rubber insulation in the form of tube. Drain pipes shall be insulated with Nitrile rubber in the form of preformed pipe sections. The thickness of the insulation shall be as per BOQ.

Installation:

Refrigerant and Drain Piping:

- The pipe shall be thoroughly cleaned with a wire brush and rendered free from all rust and grease.
- Apply one coat of heat resistant, polychloroprene base low VOC adhesive grade R242/SR998 on both surfaces with open time 10-25 minutes.
- The insulation shall be fixed tightly to the surface taking care to seal all joints with 50mm wide and 3 mm thick self adhesive insulating material (Nitrile rubber) (transverse and circumferential).
- Apply tack coat of insulation protective coating evenly by brush (Min. 0.5 mm thick).
- After applying tack coat embed the glass fiber or canvas cloth immediately and make it wrinkle free.
- Apply finish coat of protective coating (Min. 0.5 mm thick).

  No broken insulation anywhere shall be permitted under any circumstances what so ever.

  If anywhere the quality of installation is found to be inadequate as per Specifications or as per the performance requirement, the installation shall have to be redone without any extra cost to the Client.

INSULATION OF VALVES AND FITTINGS IN REFRIGERANT LINE

All valves, fittings, flanges, strainers etc. in the refrigerant line shall be insulated in the same manner as described above for refrigerant pipes. Care should be taken to ensure that no damage would be caused to the insulation when valves or strainers are operated.

APPLICATION OF ZINC CHROMATE COATING ON EXPOSED DUCT

External Surface of duct on which the rubberized paint coating is to be provided shall be thoroughly cleaned with wire brush and rendered free from all dust and grease.
Apply three coat of coating evenly by brush @ 2 m^2/liter.

2.8 TECHNICAL DATA

Contractor should furnish technical data as mentioned below, of the equipment and accessories offered by him as per scheme given in schedule of equipment and Bill of Quantities.

S. No.	Description	Unit	Condition of Services
1.0	**VRV type Air-conditioning Units:**		
1.1	**General:**		
	Manufacturer		
	Overall Dimensions		
	(mm) Weight (Kg)		
1.2	**Compressor:**		
	Refrigerant		
	No. of Cylinders		
	Bore of Stroke		
	Swept Volume		
	(mm) Speed		
	(R.P.M.) Capacity		
	K. Cal/Hr at		
	7°C Sat. Suction Temp. and 43.3°C Cond. Temp.		
1.3	**Cooling Coil:**		
	Refrig. Temp.		
	(^{O}C) Type of		
	Tube Tube		
	Material Tube		
	Dia (mm)		
1.4	**Condenser:**		
	Cond. Temp.		
	(^{O}C) Type of		
	Tube Tube		
	Material		
	Tube Dia (mm)		
1.5	**TFA:**		

Unit No.	
Manufacturer	
Type-Horizontal/Vertical/ Ceiling Suspended	
Air Quantity	m^3/Hr
Fan Outlet Velocity	M/S
No. of Fans	Nos.
Dia. of Fans	mm
Fan Speed	RPM
Total Static Pressure	MM
WG/ Balancing-Static and/or Dynamic	
Operating Weight	Kg.
Overall Dimension	m
Dimension of Coil	m
Finned Area	m^2
No. of Rows	No.
Fins per cm	No.
Type of Fins	
No. of Circuits	Nos.
Water Velocity in Tubes	M/S
Tube Material	mm
Tube Dia Thickness	mm
of Tubes Fin	
Material	m
Water Pressure Drop	
Motor Output Type	HP/KW
of Motor	
Type of Air Filters	

Velocity Across Filters M/

2.0 Ventilation Fans:

2.1 S. No.

2.2 Type

2.3 Manufacturer

2.4 CFM

2.5 Static Pressure MM WG

2.6 Motor H.P.

2.7 Insulation Class

2.8 Outlet Vel. FPM

2.9 R.P.M

2.10 Type of Drive

2.11 Noise Level DB

3.0 Grilles/Diffusers/Dampers: Make, Materials and Gauge

3.1 Fire Dampers - UL Listed

3.2 Grilles

3.3 Louvers

3.4 Diffusers

3.5 Duct Dampers

4.0 Insulations:

4.1 Manufacturer

4.2 Duct Acoustic Lining Materials

4.3 Duct Insulation Material

4.4 Thermal Conductivity

4.5 Duct Insulation

MATERIAL AND EQUIPMENT-PREFERRED MAKES

All materials and equipment shall conform to the relevant standards and shall be one of the preferred makes indicated below:

Sl.No.	Items	Approved Make List
1	VRV/VRF System	Daikin / Mitsubishi or Equivalent
2	Copper Pipe	Mandev/ Hariom/ Indigo
3	Air Handling Unit	Systemair/ York-USA/ Robotherm / Edgetech
4	GS Sheet	Tata/Jindal/Sail/JSW/ASNM
5	PIR Ducting	Asawa or Equivalent
6	Open/Closed cell Elastomeric insulation	K-Flex/Aerofoam/Armaflex/Supreme/Armacell
7	Protective Coating Over Insulation	Pedilite
8	AHU Items	Airmaster/ MJS/ Sagarair/Systemair or Equivalent
9	Actuators	Belimo/ Siemes/Honeywell/Johnson Control
10	CPVC Pipes	Supreme/ Astral/Ashirvad
11	Drain Pump	Aspen/Siccom/Equivalent
12	Flexible/Armoured Cable	Havells/Finolex/KEI/Polycab/Gloster Vguard/RR Kabel
13	Electrical Panels	CPRI APPROVED
	Control Panels	Autosys/SSG or Equivalent
14	Protection Device (MCB/RCCB/RCBO/ELCB)	Siemens/Schneider/Legrand/ABB/L&T
15	Variable Frequency Drive	Danfoss/ ABB/ Equivalent
16	Cable Tray	NSKS/Equivalent
17	Auto Scavenging Systems	Autosys/ Sagarair
18	Draft Controlling & Monitoring System	Autosys/SAS/Sagarair/Equivalent
19	LT XLPE Cables	Polycab/Finolex/Gloster
20	Cable Lugs	Dowells, Jainsons
21	Cable Glands	Comet,Peeco or Equivalent
22	MFM/Ammeter/Voltmeter (Other All Digital Type)	L&T / Schneider/Legrand/Secure/Neptune
23	Lamps, Push Buttons, Actuators	L&T/Schneider/TEknic
24	PVC Conduit & accessories	Sudhakar/Precision/BEC
25	FRLS Insulated Multistrandrad Wires	Polycab/Finolex/KEI
26	DLP Trunking 32x20mm	Legrand/MK or Equivalent
27	Modular Switch Plates	Northwest/Legrand/MK/Schneider

NOTE: 1. The mentioning of particular make under preferred makes does not fulfil automatically for acceptance. The make shall comply all the particular specifications, item of work and other conditions of the contract.

2. Either the model shall get approved or sample shall be submitted for approval by engineer-in-charge before confirming any order to supplier by the contractor.

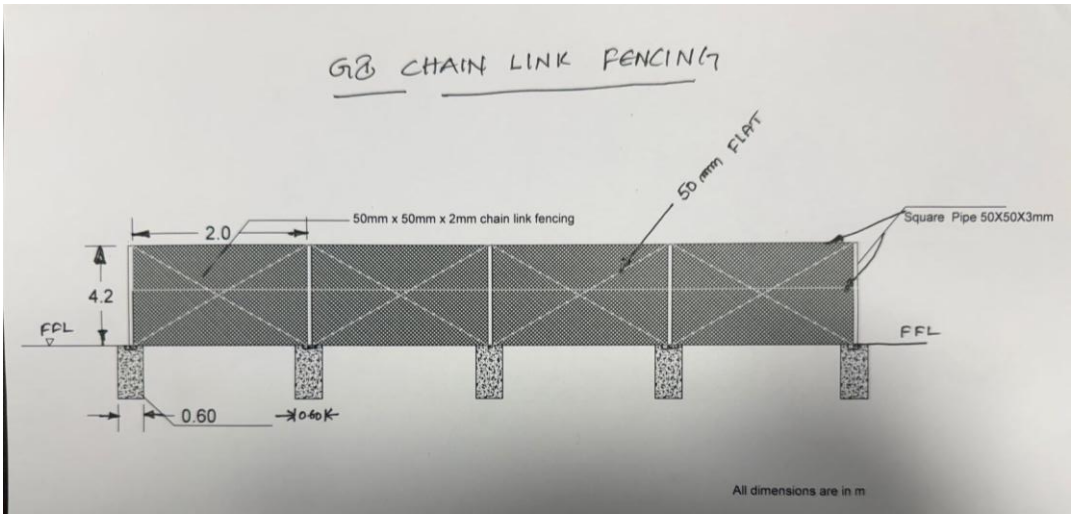
3. Preferred makes mentioned anywhere in the NIT shall be read addition to this list of preferred make.

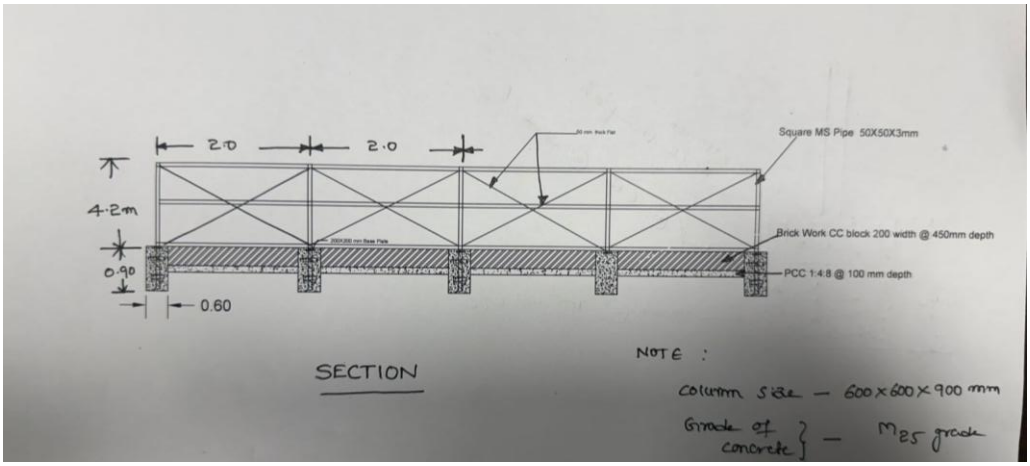
4. For any item not covered in the above list, the contractor shall submit the makes and sample for seeking approval from the engineer-in-charge before supply the material.

The list of approved materials is for guideline. However, the client reserves the right to choose any of the indicated makes.

3 Civil & Furnishing Works:

a) **Chain link Fencing:** As per the approved drawing by the engineer in charge. The reference drawing is as given below.





b) Furnishing

i) Chairs:

Overall Non-revolving Chair size: 610W (handle to handle) x 500Dx 960Hmm, BACKREST: The outer frame of the backrest made of injection moulded in black 20% Glass Filled Polypropylene and inner frame made up of injection moulded in black polypropylene. Inner

frame upholstered with mesh fabric then assembled with outer frame. the back should be ergonomically designed for comfort preferably with lumber support. SEAT:The seat is made up of 12 mm thick (7 layers) hot pressed plywood and moulded seat foam upholstered with fabric. The bottom cover made up of injection moulded in black PP to cover the plywood. Seat size 500(W) x 480 mm (D). .Seat Foam: Foam made out of moulded polyurethane foam with the following properties. Average thickness of 55-65 mm with the following properties: Density: 52-55 Kg/M^3 , Hardness: 25±/3 KGF ,Compression Set: 10% Max ,Tensile Strength: 0.90 to 1.2 Kg/Cm^2 ,Resilience: 40%-60% ,Comfort / Indentation Hardness: 15.4 ,Weight: 650 gms, ARM REST & HANDLES: ARMS:The armrest is made up of Thermo Polyurethane with 40 - 55 Shore Hardness and reinforced with 4 mm thick nylon insert. Arm pad size 235 mm (L) x 80 mm (W). The handle is fitted to the seat with seat/handle connecting strip assembly made of 35% Glass filled nylon 20 mm thick. Adjustable arm rest with height adjustment up to 70 mm. Minimum and Maximum height of armrest is 265 mm / 335 mm respectively. The front and back movement of armrest is 60 mm. Complete as directed by the Engineer in charge. Product should be AIOTA and IAQ Gold certified for inhouse air quality. The manufacturer should have ISO9001, ISO14001, ISO45001, ISO50001 from NABCB accredited agency and a member of BIFMA.

ii) Work stations:

Desk based system worktop supported on understructure made of MS Leg with arch share design as per the image in the specification of sleek section size 60 x 12 mm where Structure made from cold rolled steel,thickness min 1.2 mm. Epoxy powder coated spray paint, baked at temperature 200 C° coated of 70-80 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). Screen :28mm thick offset Fully alumium frame screen with Combination of Fabric Pinup & marker board , and screen height of 360mm above the top. Wiremanagement: Completely concealed wiremanagement with vertical wire uptake from floor via MS power pole having removable cover one side and wire seperator for data and wire seperation (for both the sides of the table), segregates to hozizontal cable tray below aluminium flipper with soft closure Epoxy powder coated spray color, baked at temperature 200 C°.Raceways contain the horizontal cable channel that fitted with a modesty panel tidily and effectively with appropriate depth. Epoxy powder coated spray paint,baked at temperature 200 C° coated of 80-90 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method) Worktop :Worktop Made of 25mm thick E-1 grade particle board finished with 2mm PVC edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding. (the shade & design of the laminate, edge banding, powder coating, fabric will be finalized by the engineer in charge)

Linear workstation1200W x 600D x 1050H

LIST OF APPROVED BRANDS / MANUFACTURERS / MAKES MATERIALS FOR CIVIL AND FURNISHING

NOTE: 1) A List of Preferred Brand Names of Various Materials / Products are shown below for usage in execution of Work. However, approved equivalent material of any other Specialized Companies / Firms may also be used, in case it is established that the Brands Specified below are not available in the market and subject to Approval of the alternate Brand by the Engineer In charge

2) It must be ensured, in general, that all materials to be used in the works shall bear BIS Certification mark. In cases where for a particular material / product, BIS Certification Mark is not available, then the material proposed to be procured can be used subject to the condition that it should conform to CPWD Specifications and relevant BIS codes. In such cases written approval of the Engineer-in -Charge shall be obtained before use of such material in their works

3)The list given below does not absolve the Executing Agency from their responsibility for using these products. It is only after, they are satisfied about the quality and performance, the products shall be used. To achieve this, proper check on the quality of the product, actually to be used, should be exercised.

S.No	Items	Approved Make List
1	Ordinary Portland Cement	ACC (ACC Cements Ltd.), Ultra tech (Ultra tech Cement Ltd.), Coromandel (India Cements Ltd), Ambuja Cement (Ambuja Cements Ltd.), Jaypee Cement (Jaypee Cements Ltd.), Century Cement (Birla Gold Cement), JK Cement (JK Cement Pvt., Ltd.), Penna Cement (Penna Cement Industries Ltd.) Bharathi Cement (Bharathi Cement Corporation Ltd.), Birla (Birla Corporation Ltd), Chettinad (Chettinad Cement Corporation Ltd.), Dalmia (Dalmia Cement Bharat Ltd.), Zuari (Zuari Cement Ltd), Maha Cement (My home Industries Pvt, Ltd.), Konark Cement (Konark Cement), Shree Cement (Shree Cement
2	White Cement	Birla, J. K
3	TMT bars Fe-500D	SAIL (Steel authority of India Ltd.), TISCO (TATA Steel Ltd.), VIZAG TMT (Rashtriya Ispat Nigam Ltd.), JSW (JSW Steel Ltd.).
4	Ready Mix Concrete	Ultra Tech (Ultra Tech Concrete), ACC (ACC Ltd.), RMC (India) (RMC(India) Pvt Ltd.), Lafarge (Lafarge India Pvt Ltd.)
5	Structural steel	SAIL (SAIL), TISCO (TATA STEEL), VIZAG STEEL (RINL), JSW (JSW),

		TATA, JINDAL.
6	Furniture	Rock worth/Steelcase/Haworth/ Godrej
7	Stainless steel	Salem (SAIL), Connect (Connect Ltd.), Ark Product Pvt., Ltd (Ark Product Pvt., Ltd), Jindal (JSW), SAIL (SAIL), KINGSTON (KINGSTON Brass)
8	Synthetic enamel Paint	Premium gloss enamel (Asian paints Ltd.), Akzo Nobel (Dulux) (Akzonobel India), Nerolac (Nerolac Paints Ltd.), Berger (Berger Paints), Nippon (Nippon Paints India Ltd.)
9	Red Oxide Zinc Chromate Primer	High Performance yellow metal primer (Asian paints), Aczo Nobel (Dulux) (Akzonobel India), Nerolac (Nerolac Paints Ltd.) Berger (Berger paints), Nippon (Nippon Paints India Ltd.)
10	Acrylic Emulsion	Premium emulsion (Asian paints), AkzoNobel (Dulux) (Super Cover) (Akzonobel India), Nerolac (Beauty Gold) (Nerolac Paints Ltd.,), Berger (Bison) (Berger paints).
11	Acrylic Smooth Exterior paint	ULTIMA (Asian paints), Aczo Nobel (Dulux) (Maxilite) (ICI Dulux Ltd.,) Nerolac (Nerolac Paints Ltd.) Berger (Berger Paints)
12	Cement Primer	Asian Paints (Asian Paints), JK Primaxx (JK Cement Ltd.), Berger (Berger Paints India Ltd).

NOTE: 1. The mentioning of particular make under preferred makes does not fulfil automatically for acceptance. The make shall comply all the particular specifications, item of work and other conditions of the contract.

2. Either the model shall get approved or sample shall be submitted for approval by engineer-in-charge before confirming any order to supplier by the contractor.

3. Preferred makes mentioned anywhere in the NIT shall be read addition to this list of preferred makes.

4. For any item not covered in the above list, the contractor shall submit the makes and sample for seeking approval from the engineer-in-charge before supply the material.

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER) TIRUPATI

Volume III

Financial Bid (for Item Rate Tender)

	Tender Inviting Authority: Director, IISER Tirupati				
	Name of Work: HVAC Reconfiguration Comprising Dismantling and Re-deployment of Existing Air Handling Units with Capacity Augmentation, Provision of Ceiling Suspended Air Conditioning Units, and Ancillary Infrastructure and Interior Furnishing Works at IISER Tirupati, Yerpedu.				
	Contract No: IISERT/ENGG/2025-26/05		**Date: 14/02/2026**		
Bidder Name:					
SL NO	**ITEM DESCRIPTION**	**QTY**	**UOM**	**RATE**	**AMOUNT**
1	Removing of refrigerant gas from the system, disconnection of copper pipes and electrical supply teriminations both from supply side, panels side and equipment side of the following VRV out door units, lifting the outdoors from terrace by using appropriate unloading means like hydra/crane or deric system, shifting to the new location as per design.				
1.1	12 HP	12.00	Each		
2	Existing supply and return air inside ducts in each lab bay in the UB Lab building to be dismantled and shifted to the designated location within campus, ensuring no damage for reuse in the new sports complex. Agency has to quote the rate that room is fully equiped with all lab equipments proper care has to be take to avoid any damage.	6.00	Job		

3	Removing of existing all sizes of copper refrigerant piping with proper care so as to reuse to the maximum possible extent. Pipe ends should be sealed to prevent dust entry and oxidization. These pipes are to be flushed with dry nitrogen. Agency has to execute the work in coordination with IISER team for joint measurement.	300.00	meter		
4	Installation testing & commissioning of following unit which includes necessary civil pedestals by using MS stands, as recommended by OEM with suitable vibration isolation pads to avoid vibration etc as required.				
4.1	Nominal Capacity -12 HP Capacity	12.00	Each		
5	Supplying, Installing, testing and commissioning of liquid / gas refrigerant hard copper piping of following sizes along with necessary fittings duly insulated with 19mm thick nitrile rubber insulation covered with interwoven glass fabric for UV and mechanical protection and necessary supports. The insulation over the exposed pipe work shall be finished with one coat of 500 micron (0.5 mm) WFT Fire Retardant coating confirming to "Surface spread flame as per ASTM E 84, Fungal Resistance -ASTM D 3273 & ASTM G21, Weathering Resistance - ASTM D 6695, Surface Flammability - ASTM E 84, Resistance to fire at liquid stage-ASTM D 3278, Content of VOC- EPA 24, Resistance to water vapour permeance-ASTM E 96, Algal Resistance -ASTM D 5589, Rain Water Resistance-As per ASTM D 6904, Antimicrobial Efficacy - ASTM E 2315, Fungal Resistance -ASTM G21. Entire refrigerant piping work be carried out in accordance with the specifications and as per the design and combination between VRV out door units and VRV indoor units. Piping shall be of following sizes.				
5.1	9.53mm Dia	300.00	meter		
5.2	19.05mm Dia	300.00	meter		
5.3	34.93mm Dia	40.00	meter		

6	Installation, testing and commissioning of removed piping, including vaccumiazation and Nitrogen testing and commissioning of Refrigerant of liquid / gas refrigerant hard copper piping of following sizes along with necessary fittings duly insulated with 19mm thick nitrile rubber insulation covered with interwoven glass fabric for UV and mechanical protection and necessary supports. The insulation over the exposed pipe work shall be finished with one coat of 500 micron (0.5 mm) WFT Fire Retardant coating confirming to "Surface spread flame as per ASTM E 84, Fungal Resistance - ASTM D 3273 & ASTM G21, Weathering Resistance - ASTM D 6695, Surface Flammability - ASTM E 84, Resistance to fire at liquid stage-ASTM D 3278, Content of VOC- EPA 24, Resistance to water vapour permeance-ASTM E 96, Algal Resistance -ASTM D 5589, Rain Water Resistance-As per ASTM D 6904, Antimicrobial Efficacy -ASTM E 2315, Fungal Resistance -ASTM G21. Entire refrigerant piping work be carried out in accordance with the specifications and as per the design and combination between VRV out door units and VRV indoor units. Piping shall be of following sizes:				
6.1	12.7 mm dia	100.00	meter		
6.2	34.93 mm dia	100.00	meter		
7	Supply and fabrication of structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a primer coat of approved steel primer all complete.	3,000.00	Kg		

8	Supply,Installation,Testing and Commissioning of VRV Ductable Units comprising DX cooling coil, DIDW centrifugal fan with multi speed motor, insulated casing insulated rain pan, required PCB , The indoor units shall be suitable to work on cooling mode. The indoor units shall be suitable for operation on 220 ±6% volts, 50Hz, 1 phase AC power supply. The indoor unit shall be complete with pre filter & with wireless remote as per requirement .. This includes N2 pressure testing of the entire system covering Out door units, refrigerant piping and this indoor unit. the price included the fire retaurdent canvas connection , vendor to study the Lab areas and to design the suitable system and location of equipment so as to ensure that systems will have a proper service and maintanace access with good aesthetic appearance. Placement drawings should get approved by engineering Incharege. 5.5 TR with external static of minimum 76 pascals, minimum air qty of 1925 cfm, as per OEM nominal capacity. unit to be suitable with existing Daikin make VRV condensing comprising of all accessories as per the specifications. The work should proceed as per the given schedule, in phases, considering shutdown availability and UG block lab operations. (Make will be same as of Outdoor) **Make: Daikin**	24.00	sets		
9	Design, supply, instaltion of aluminum powder coated Jet Nozzle (Double Skin Eye Ball Type) 250 mm Dia Nozzle Rotation in all Direction up to 30 Degree Horizontal & Verticle Direction. This includes required necks & control damper and required opening to be made on the exsisting duct etc as required. The work should proceed as per the given schedule, in phases, considering shutdown availability and UG block lab operations.	120.00	Each		

10	Supply, Instllation of automatic drain pump along with required pipe fittings, clamps and carryingout the interlocking wiring . This pumps should be capable of lifting the water minimum 6 mtrs head with removable reservoir, low noise with maximum of 16 to 18 db(a) with minimum flow rate of 20 LPH as required.	24.00	Each		
11	Dismantling of existing Air Handling Unit (AHU) including complete isolation and disconnection of connected supply/return ducting, refrigerant piping, drain lines, and all electrical/control cabling, dismantling of AHU assembly comprising fan section, VRV DX cooling coil, casing panels, and base frame. Also removing of Daikin VRV Control kit and expansion kit, Controller, sensors and associated electronic componenets. Item includes gas cutting of identified structural members of the fan casing / base frame for safe rigging, lifting, removal, shifting to the sports complex, complete with all tools, tackles, labor, and safety measures, as directed and to site requirements. Unloading of units from This activity should be carriedout properly as these required to be re assembled and re used for proposed areas. No extra amount shall be paid for any of the shortfalls and damages .Disconnection of power supply from the main HVAC panel and connected cabling and Unit mounted Variable frequency drive (VFD) etc and shifting to sports complex. This activity should be carried out properly as these required to be re assembled and re used for proposed areas. AHU capacity : 7000 CFM (Make Edgeteck, Model No. ETU-080 H)	6.00	Each		

12	Removing existing ducts from UG block terrace in a safe manner and shifting of these ducts to the new proposed location. Proper cleaning of those ducts and use them to the max extent possible in the new design.Agency has to clean the terrace area after removal of the ducts.Vendor to provide deatiled sheet of usaged quantity along with drawings for exection. Executed quantity will be conisdered for the payment.	250.00	Sqmt		
13	Re assembling of the above Air Handling Unit (AHU) at the designated location by fixing a base frame and required vibration isolation pads, carrying out necessary modifications/corrections to the AHU casing and internal structure, use of required fastners, Installtion of VRV DX cooling coil,drain tray, coil support frames. Fan assy , fan grid structural members for mounting fan, complete with all supports and reinforcements as per requirement. Providing and fixing food grade self adhesive EPDM gaskets as per requirment like between AHU panels and structural members to ensure airtight construction at all dismantled and modified sections, Installation and integration of Daikin VRV expansion kit and contol kit, Controller, sensors and associated electronic componenet, Refrigerant piping related integrating joints. complete with alignment, fasteners, tools, labor, and workmanship. Item also includes supply and fixing of required vibration isolation rubber pads, shims, U traps , associate materials for AHU capacity : 7000 CFM (Make Edgeteck, Model No. ETU-080 H). Nothing extra shall be paid.	6.00	Each		

14	Air treatment units as per the following details Supply, Installation of double skin floor mounted Thermal break profiled Air Treatment Unit . The panels made out of 50 +/- 2 mm thick fabricated out of pre coated 0.8 mm thick GI on outer side and 0.6 mm thick ALUZINC on inner side with CFC free PUF insulation density of 38+/-2 Kg/Cu.m. The framework shall be of internally coved extruded aluminum and thermal break hollow sections. Food grade self adhesive coated EPDM gasket to be provided between panels and structure of the AHU to ensure the entire housing is airtight. 100mm heavy duty GSS baseframe shall be powder coated for better aesthetics, cleaning and maintenance. AHU shall comprising of mixing box section with aluminum airofoil blade low leakage type RA damper & F/A damper with 10 microns filter suitable for manual/motorized operation. 19 mm thick nitirl rubber insulated 18 G SS 304 stainless steel drain pan, AHU should have marine lamp including adequately rated LED light fitting inside the AHU Cabinet. AHU inspection door should have View window with perfectly sealed gaksets on either side to ensure air tightness. All AHUs shall be provided with door limit switch and also door safety GI guard. All internals shall be powder coated for corrosion resistance.Bleed off section with bleed off dampers, Outlet damper and fire retardant flexible canvas connection between fan & AHU panel, internal vibration mounts under the fan & motor frame, All the internal wiring of the unit for lamps & door interlock etc shall be in the scope of the AHU vendor(All the dampers shall be low leakage aluminium aerofoil design and suitable for manual / motorised operation & leakage class to be AMCA class 1A. Noise level should be less than 60-65 dBa at 1 m distance from filter				

	AHU construction to be as per EUROVENT & as per OEM certified design for all possible modules/components (leakage class L1, casing strength D1, thermal trasnmitamce T2, Thermal bridge factor TB 2, filter leakage factor F9) Supply Fan section: Direct driven SISW high efficiency centrifugal fan / Plug type fan, with IE3 motor,outlet velocity should be lessthan 9.3 m/sec, All fans should be of AMCA certified . Frequecy difference between critical speed and selected speed should be more than 5-8 Hz, Critical speed frequency shloud be more than 53-55 Hz . Noise level should not be more than 60-65 dBA at 1 m distance from filter . All fans should be selected at best over all efficiency.Filters (High efficiency with maximam arrestance) : Prefilter 10Milli micron on common frame . Fresh air filter with 20 m Micron filter with low leakage type aluminum damper (To supply water washable for posiible filters) with rain protected entry GI powder coated louvers . Maximum filter face velocity : 500 FPM Coil : Coil section with 6 Row INTERLACED / INTERWINED design DXVRV cooling coil made out of aluminum fins with blufin coating and copper tubes. Design is to make multi distributers for multiple circuits as per requirement & configuration, Unit should be able to extract high level of latent heat . Required static pressure will be ascertained during detailed engineering to over come the duct pressure and supply air outlet so as to have the proper diffusion to cater the area.				

	Capacities mentioned are with diversity of VRV ODUs An UV generator / Watmiser shall along with controller comprising of whatmiser type Ultraviolet Germicidal Irradiation (UVGI) System UV generator , control panel UL listed enclosure etc g High balast enclosure with IP54 enclsoure , lamp harness , basic mounting hardware, associated control cable etc. to be installed at the cooling coil section to prevent the formation of Bacteria & with 95% virus kill rate in a single pass etc. Item also includes of necessarry expansion kit & Control kit and controller along with required sensors, wiring SMPS etc .Item also includes supply and fixing of required vibration isolation rubber pads, shims, U traps , associate materials for the following AHU capacity				
14.01	17.5 TR, 7000 CFM TSP : 50 mm	1.00	Each		
14.02	28 TR, 12000 CFM TSP : 55 mm	2.00	Each		
15	Supply,Installation, Nitrogen testing , Vaccuming and Commissioning of air cooled variable refrigerant flow modular type condensing units,each comprising of multiple scroll compressors all inverter driven, Refrigerant gas (R-410a) lubricating oil and all accessories as per OEM specifications. The condensing units shall be suitable to work on cooling mode. The minimum Energy Efficiency Ratio shall be as per ASHRAE STANDARDS 90.1 The condensing units shall be suitable for operation on 415 ± 10% volts, 50Hz, 3 phase AC power supply and , outdoor units to be mounted with suitable Vibration Isolation pads to avoid vibrations. The quoted price shall be inclusive of all trasnporattion, lifting to the terrace etc as required for the following capacities.Nothing extra shall be paid				
15.1	10 HP	5.00	Each		
15.2	12 HP	8.00	Each		

15.3	20 HP	1.00	Each		
16	Lifting,Installation, Nitrogen testing , Vaccuming and Commissioning of existing above serviced Daikin make air cooled variable refrigerant flow modular type condensing units,supply and , outdoor units to be mounted with suitable Vibration Isolation pads to avoid vibrations. The quoted price shall be inclusive of all trasnporation, lifting, shifting from Research block to the sports block terrace etc as required for the following capacities.Nothing extra shall be paid. **Make : Daikin Model No.**				
16.1	16 HP	3.00	Each		
16.2	6 HP	1.00	Each		
17	Supplying, Installing, testing and commissioning of liquid / gas refrigerant hard copper piping of following sizes along with necessary fittings duly insulated with 19mm thick nitrile rubber insulation covered with interwoven glass fabric for UV and mechanical protection and necessary supports. The insulation over the exposed pipe work shall be finished with one coat of 500 micron (0.5 mm) WFT Fire Retardant coating confirming to “Surface spread flame as per ASTM E 84, Fungal Resistance -ASTM D 3273 & ASTM G21, Weathering Resistance - ASTM D 6695, Surface Flammability - ASTM E 84, Resistance to fire at liquid stage-ASTM D 3278, Content of VOC- EPA 24, Resistance to water vapour permeance-ASTM E 96, Algal Resistance -ASTM D 5589, Rain Water Resistance-As per ASTM D 6904, Antimicrobial Efficacy - ASTM E 2315, Fungal Resistance -ASTM G21.				
17.1	9.5 mm	30.00	meter		
17.2	12.7 mm	60.00	meter		
17.3	15.9 mm	10.00	meter		

17.4	19.1 mm	10.00	meter		
17.5	22.2 mm	50.00	meter		
17.6	28.6 mm	70.00	meter		
18	Supplying, Installing, testing and commissioning of following sizes Extra Hard CPVC drain piping for condensate complete with 9 mm thick nitrile rubber insulation in form of pipe sleeves covered with interwoven glass fabric for UV and mechanical protection, all required fittings and providing clean out plug at suitable location for roding the pipe when required as per technical specifications with all the necessary mounting accessories as required for complete installation.				
18.1	40 mm dia	80.00	meter		
18.2	32 mm dia	120.00	meter		
18.3	25 mm dia	50.00	meter		

19	CFD Analysis for Badminton Court ADP Evaluation Ensure the proposed ADP system meets required airflow patterns for badminton play areas, matching existing court configuration, with minimal gaps between courts and walls. Scope of work: 1. Conduct CFD analysis using OEM software 2. Evaluate ADP design for: - Discharge velocity - Intermediate velocity - Terminal velocity (40-50 FPM in play zone) - Cross-draft prevention - Return air placement for optimal diffusion 3. Simulate multiple scenarios for combination conditions 4. Provide detailed report with: - Analysis results - Recommendations for optimal ADP design - Airflow patterns and velocity profiles Requirements: - Air velocity in play zone: 40-50 FPM - Prevent shuttle cock distortion - Ensure full sweep effect with coordinated supply and return airflow. Agency to submit a comprehensive report with findings and recommendations.	2.00	Courts		
20	Installation of old ducting including round & rectangular by using required supports etc. All exposed round ducts to be duly painted with appropriate color.Indise and outside ducts to be cleaned properly. Agency has to submit the detailed drawing to Engineering Incharge before executing the work	250.00	Sqmt		

21	Supply, installation, testing of factory fabricated rectangular/round 120GSM GSS ducting using class VIII sheets/coil,galvanised hardware & supports ,silicon sealant at all joints are designed with angle iron flanges with reverse design for all the joints minimum 5mm thick neoprene rubber gasket Along with required supports and accessories etc. This includes required vanes, drop catchers etc as per the standard design. Ducts are to be designed for reverse angle iron flanges				
21.1	24 Gauge	250.00	Sqmt		
21.2	22 Gauge	600.00	Sqmt		
21.3	20 Gauge	240.00	Sqmt		
22	Supply, installation, testing and commissioning of factory fabricated Smart PIR duct made out from CFC & HCFC Free closed cell polyisocyanurate foam “sandwitched” between aluminum foil of 80 micron thickness 20 mm. thermal conductivity (0.019 w/m.k), environment friendly (green building product), certified fire retardan BS 476, Class 0 galvanised hardware & supports ,This includes required vanes, drop/tap catchers etc as per the standard design.	500.00	Sqmt		
23	Supply & installation of 32mm thick Duct Nitrile rubber Insulation Class 'O' Closed cell elastromeric material covered with 7mill factory laminated glass cloth.by using OEM recommended adhesive. Materials should be of FM global approved. The insulation will be coated with 2 Coats of UV Protective paint Weather protekt of fevicol make-For exposed ducting for supply air	600.00	Sqmt		
24	Supply & installation of 25mm thick Duct Nitrile rubber Insulation Class 'O' Closed cell elastromeric material covered with 7mill factory laminated glass cloth.by using OEM recommended adhesive. Materials should be of FM global approved. The insulation will be coated with 2 Coats of UV Protective paint Weatherprotekt of fevicol make-For exposed ducting for return air	600.00	Sqmt		

25	Supply and Installation of 10mm thick class 1 Acoustic insulation for the initial portion of supply air ducting. Material of construction shall be fibre-free elastomeric nitrile rubber foam with open cell structure by using approved adhesive.	100.00	Sqmt		
26	Supplying, Fixing,testing and commissioning of fire dampers in supply air duct/main branch and return air path as and where required of required sizes i/c control wiring,the damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal complete as required and as per specifications.Fusible link type Fire Damper 16G GI sheet construction, 1 6G GI casing,and 16G GI blades 150 mm wide complete with chrome plated spindles, self lubricating bushes, 120 minute fire rating, as per UL-555,1995	10.00	Sqmt		
27	Supplying, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc in confirmation to SMACNA/IS and as per specifications complete etc. as required.GI Volume control dampers along with required supports and accessories etc. 20 G blade, 18 G frame Chrome palted spindles, sel lubricating bushes, fully enclosed linkages, handle operation with position indicator and locking arrangment	12.00	Sqmt		
28	Supply & installation of alluminium powder coated linear fixed bar grilles with black bushes 5mm nominal blade thickness grill height 20mm, blade pitch 14 mm and blade angle 0 or 15deg delfection along with alluminium vision break provision,black powder coated bushes along with required supports and accessories etc. Deflection is to be selected as per the CFD as well as proper down draught requirement.	9.00	Sqmt		

29	Supply and fixing of alluminium drum jet diffuser With a bank of individually adjustable blades for horizontal adjustment of airflow, held within a rotating drum enabling vertical adjustment, direction upto 30 degrees horizontal and vertical direction This includes required Aluminum black chromate Control damper suitable for adjusting for airflow along with required supports and accessories etc. Or multi vaned drum deflectors cum air diffusing module to acheive requuired discharge/intermediate and teriminal velocities	78.00	Nos		
30	Supply and installtion of aluminium black chromate collar dampers as per the required sizes for the supply air outlets	10.00	Sqmt		
31	Supply and installtion of aluminum powder coated capsule grill with proper embeded means with the supply air ducts	15.00	Sqmt		
32	Supply and instalation and adjusting of draft control cum deflecting modules with position locking system & indicators. These are required to be customised as per the required draft control as per the CFD analysis and design as required.	5.00	Each		
33	Supply & installation of draft monitoring cum control data information systems comprising of draft sensors & intermediate teriminal draft monitoring sensors, Common PLC with HMI for all zones with integrating and coordinating programme for ensuring that desired drafts at critical zones . This includes required design and programming of PLC. Required information to be extracted for configuration from CFD & other related information of ADP. system integrator Make: Autosys/SAS:	1.00	Job		

34	Supply, installtion, Testing & Commissioning of out door type Electrical panel comprising space for 2 sets of 3.7 KW VFD to install existing VFDs and associated switch gears and A/M shift, Local/Remote shift, Fire alarm integrator, common Digital controller in conjunction with AHUs and VRV condensing units. This should have lead and lag sequencing feature,temerature display. Incoming 100 Amps MCCB and Out goings : 1 No of 63A MCB, 2 Nos of 20A MCB for AHU starters & VFD, 4 nos of 32 A MCBs for condensing units, required MF meter, Inter locking control wiring, On/off push buttons indication lamps etc - For Gym (VFDs are not Included in this Item).	1.00	sets		
35	Supply, installtion, Testing & Commissioning of out door type Electrical panel comprising space for 2 sets of 7.5 KW VFD to install existing VFDs and associated switch gears and A/M shift, Local/Remote shift, Fire alarm integrator, common Digital controller in conjunction with AHUs and VRV condensing units. Incoming 200 Amps MCCB and Out goings : 1 No of 63A MCB, 2 Nos of 32A MCB for AHU starters & VFD, 4 nos of 40 A MCBs for condensing units, required MF meter, Inter locking control wiring, On/off push buttons indication lamps etc - For Badminton court (VFDs are not Included in this Item).	1.00	sets		
36	Supply, installtion, Testing & Commissioning of out door type Electrical panel comprising space for 4 sets of 3.7 KW VFD to install existing VFDs and associated switch gears and A/M shift, Local/Remote shift, Fire alarm integrator, common Digital controller in conjunction with AHUs and VRV condensing units. Incoming 160 Amps MCCB and Out goings : 1 No of 63A MCB, 8 Nos of 32A MCB for AHU starters & VFD, 4 nos of 20 A MCBs for condensing units, required MF meter, Inter locking control wiring, On/off push buttons indication lamps etc - For Bakset court (VFDs are not Included in this Item).	1.00	sets		

37	Supply, installtion, Testing & Commissioning of out door type Electrical panel comprising space for 1 set of 3.7 KW VFD to install existing VFDs and associated switch gears and A/M shift, Local/Remote shift, Fire alarm integrator, common Digital controller in conjunction with AHUs and VRV condensing units. Incoming 100 Amps MCCB and Out goings : 1 No of 63A MCB, 2 Nos of 20A MCB for AHU starters & VFD, 1 nos of 40 A MCBs for condensing units, required MF meter, Inter locking control wiring, On/off push buttons indication lamps etc - For Squash court (VFDs are not Included in this Item).	1.00	sets		
38	Design, supply, installation, testing, and commissioning of an auto scavenging system to reduce body odor, volatile orgonic compounds, and microorganisms. This includes programmers,motorized dampers for return duct and scavenge air duct and additional fresh air port and also necessarry interlocking control wiring, control panel with SMPS system to ensure effective air quality management.	2.00	Each		
39	Supply and charging by adopting auto charging mode and monitoring of all stages and it healthy ness for the above systems of R410A refrigerant gas based on the requirement during execution. Agency has to give prior information with necessarry quanity to the IISER Tirupati for approval.	400.00	Kgs		
40	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 300 mA along with IP65 Enclouser with connections, testing and commissioning etc. as required.				
40.1	63 Amps 4 Pole 300mA	4.00	Each		
40.2	40 Amps 4 Pole 300mA	4.00	Each		
40.3	25 Amps 4 Pole 300mA	20.00	Each		

41	Supply of HVAC dedicated VFDs with minimum IP 21 rating and to be installed in the existing panel 5% non-saturating dual reactors on both rails of DC bus. Swinging chokes which do not provide full harmonic filtering throughout the entire load range are not acceptable. VFDs with saturating (non-linear) DC reactors to provide additional 3% AC chokes.Shall comply with requirements of IEC 61800-3 : 2004, Category C1 with 50m motor cable(Unrestricted Distribution). VFD shall be suitable to satisfactory work on 415 + 10% voltage range. Three-feedback PID controllers to control the speed of the VFD & other functions.VFD must have min. 1 PID controllers inbuilt VFD speed etc. as per requirement.Alpha numeric Graphical Display with inbuilt energy meter, ammeter, voltmeter etc. and shall be capable of displaying any 5 parameters simultaneously.BMS compatibility : RS-485 connector with BacNet over IP communication protocol VFD shall be capable of withstanding 100 K Amperes Short circuit current at Output terminals				
41.1	3.7 KW VFD	1.00	sets		
41.2	7.5 KW VFD	2.00	sets		
	CASSETTE TYPE SPLIT UNITS				

42	CASSETTE TYPE SPLIT UNITSSupplying, Installation, Testing and Commissioning of Air Cooled Cassette type Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), R-32/R410A/R-407 Green Refrigerant, wireless Remote, inbuilt drain pump, suitable for 400/230V, 50 Hz ,1 /3 phase AC supply, including surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5.5 Mtr (IDU to ODU), copper power and control cable upto 5.5 Mtr (IDU to ODU) including drain pipe, the system shall be capable of performing cooling, dehumidification, Air circulation, filteration & ventilation of following capacity with Scroll/rotary compressor with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB) as specified. The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electrotechnical Commission (IEC) 17025 standards/Central Power Research Institute (CPRI)/ Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required.				
42.1	**Inverter Type- Cooling only** - 3.0 TR with 5 Star BEE Rating	6.00	Each		
43	Supplying of following sizes of PVC insulated and PVC sheathed/ XLPE copper conductor armoured cable of 1.1 KV grade confirming to IS:7098 (Part-I) 1988 with upto date amendments duly ISI marked complete as required.				
43.1	4x16 Sq.mm XLPE armoured copper cable	60.00	meter		
43.2	4x10 Sq.mm XLPE armoured copper cable	200.00	meter		
43.3	4x 6 Sq.mm XLPE armoured copper cable	100.00	meter		

44	Supply and laying of following control cables with required accessories like saddles etc.				
44.1	4x 1 Sq.mm XLPE flexible copper cable	600.00	meter		
45	Providing and fixing 4.00 mm dia copper wire on surface or in recess for loop earthing as required.	800.00	meter		
46	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
46.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	500.00	Meter		
47	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.				
47.1	4 X 16 sq. mm (28mm)	10.00	Each		
47.2	4 X 10 sq. mm (25mm)	10.00	Each		
47.3	4 X 6 sq. mm (25mm)	6.00	Each		
48	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 two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
48.1	100 mm width X 50 mm depth X 1.6 mm thickness	50.00	meter		
48.2	150 mm width X 50 mm depth X 1.6 mm thickness	50.00	meter		
48.3	300 mm width X 50 mm depth X 1.6 mm thickness	100.00	meter		

49	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 two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
49.1	100 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
49.2	150 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
49.3	300 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
50	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 two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
50.1	100 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
50.2	150 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
50.3	300 mm width X 50 mm depth X 1.6 mm thickness	5.00	Each		
51	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
51.1	20 mm	500.00	Each		
52	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.				

52.1	3 X 4 sq. mm wire	600.00	metre		
53	Supplying and fixing of Legrand DLP White Mini Trunking W32 mm x D20mm PVC with required accessories as required.	100.00	metre		
54	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
54.1	5/6 A switch	300.00	Each		
54.2	15/16 A switch	50.00	Each		
54.3	3 pin 5/6 A socket outlet	300.00	Each		
54.4	3 pin 15/16 A socket outlet	50.00	Each		
55	Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required.				
55.1	6 Module (200mmX75mm)	150.00	Each		
55.2	8 Module (200mmX75mm)	20.00	Each		
56	supply and fixing of 3core x4 sqmm copper flexible cable with required accessories as required along with pvc glands as required for work station power connection purpose	200.00	meter		
	CIVIL Items				

57	Providing and placing Desk Based Workstations with following specifications: Understructure, Screen and Cable management : Desk based system worktop supported on understructure made of MS Leg with arch share design as per the image in the specification of sleek section size 60 x 12 mm where Structure made from cold rolled steel,thickness min 1.2 mm. Epoxy powder coated spray paint, baked at temperature 200 C° coated of 70-80 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). Screen :28mm thick offset Fully alumium frame screen with Combination of Fabric Pinup & marker board , and screen height of 360mm above the top. Wiremanagement: Completely concealed wiremanagement with vertical wire uptake from floor via MS power pole having removable cover one side and wire seperator for data and wire seperation (for both the sides of the table), segregates to hozizontal cable tray below aluminium flipper with soft closure Epoxy powder coated spray color, baked at temperature 200 C°.Raceways contain the horizontal cable channel that fitted with a modesty panel tidily and effectively with appropriate depth. Epoxy powder coated spray paint,baked at temperature 200 C° coated of 80-90 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method) Worktop :Worktop Made of 25mm thick E-1 grade particle board finished with 2mm PVC edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding. (the shade & design of the laminate, edge banding, powder coating, fabric will be finalized by the engineer in charge)				
57.1	Linear workstation1200W x 600D x 1050H	80.00	nos		

58	Providing & supplying cantilever Chair . Chair Seat made up of insert moulded polyurethane foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 52.5 cm width , 54.0 cm depth , sub assembly back size 48.5 cm max. width, 62.0 cm height.(approx.), effective back height from Seat 57.0 cm. (approx.), polyurethane foam for seat moulded with density 65±4 kg/m3, sledbase leg frame welded assembly made of MS ERW round tube having outer dia 24mm (approx.) and thickness 2mm. including powder coating, based shoes on frame etc. all complete as per manufacturers specification. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. The manufacturer should have NABCB Certified ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018. The product should be certified for Indoor Air Quality by SCS Global . The manufacturer should have an active BIFMA Membership. The manufacturing unit should be IGBC Gold Certified. The manufacturing unit should be IGBC Gold Certified. The chair comes with a 3-year warranty, guaranteeing its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, and the direction of the Engineer-in-Charge.	160.00	nos		
59	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, for all lift, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
59.1	All Kinds of Soil	50.00	cum		

60	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level				
60.1	1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 20 mm nominal size derived from natural sources)	12.00	cum		
61	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge, for the following grades of concrete.:Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
61.1	All works upto plinth level:Concrete of M25 grade with minimum cement content of 330 kg /cum	19.00	cum		
62	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
62.1	Thermo-Mechanically Treated bars of grade Fe-500D or more	740.00	Kgs		
63	Providing and laying factory made Precast concrete solid blocks of 200 mm thickness of grade M10 made of C&D waste from approved manufacturer in superstructure above plinth level up to floor V level				

63.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	6.50	cum		
64	Centering and shuttering including strutting, propping etc. and removal of form work for :				
64.1	Foundations, footings, bases for columns	150.00	sqm		
65	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete				
65.1	Hot finished welded type tubes	7,531.00	Kgs		
66	Providing and fixing G.I. chain link fabric fencing of required width in mesh size 50x50 mm including strengthening with 2 mm dia wire or nuts, bolts and washers as required complete as per the direction of Engineer-incharge				
66.1	Made of G.I. wire of dia. 4 mm, PVC coated to achieve outer dia not less than 5 mm in required colour and shade	610.00	sqm		
67	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade				
67.1	Two or more coats on new work	400.00	sqm		
68	18 mm cement plaster in two coats under layer 12 mm thick cement plaster 1:5 (1 cement : 5 coarse sand) finished with a top layer 6 mm thick cement plaster 1:6 (1 cement : 6 fine sand).	70.00	sqm		
69	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.				
69.1	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre	70.00	sqm		
70	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade				-

70.1	New work (Two or more coats applied @ 1.43 ltr/10 sqm over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm)	70.00	sqm		
				Total(Rs.)	