



**Centre Industrial Consultancy & Sponsored Research, IIT Madras**  
**Chennai 600 036**  
**PURCHASE SECTION**  
 Email: [tender@imail.iitm.ac.in](mailto:tender@imail.iitm.ac.in)  
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**GSTIN: 33AAAAI3615G1Z6**



The Manager (Project Purchase)

Date: 01.05.2023

Open Tender Reference No: CE/RAVI/102/2023/SMARTCLASS

GEM NAR ID: GEM/GARPTS/18042023/28SY61DTLI48

Due Date/Time: 22.05.2023@ 3:00 PM

Dear Sir/ Madam,

On behalf of the IC&SR, IIT Madras, Tenders are invited in two bid system from **Class-I local suppliers and Class II local suppliers**, namely technical and financial bids for

**“Civil, Interior finishes, and Electrical & Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM “**

conforming to the specifications enclosed in **Annexure ‘1’**

Tender Documents may be downloaded from Central Public Procurement Portal <https://etenders.gov.in/eprocure/app>. Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website <https://etenders.gov.in/eprocure/app>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at **“Help for contractors”**. [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal”

Bidders can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type ‘IIT’. Thereafter, click on “GO” button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <https://etenders.gov.in/eprocure/app> as per the schedule attached.

**No manual bids will be accepted.** All tender documents including pre-qualification, Technical and Financial bids should be submitted in the E-procurement portal.

**Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be placed in the technical part of the bid, wherever applicable. Samples if called for, should be submitted free of charges, and collected back at the supplier’s expenses.**

1	<b>LAST DATE for receipt of Tender</b>	:	22.05.2023@ 3:00 PM
	<b>PRE-BID Meeting</b>	:	08.05.2023 @ 2 PM, IC & SR, IIT Madras Before joining this meeting, bidders should send email with details of person who will attend this meeting and their company details along with your queries to <a href="mailto:sureshbabusls@gmail.com">sureshbabusls@gmail.com</a> on or before 06.05.2023 @ 05:00 PM
	<b>Date &amp; Time of opening of Tender</b>	:	23.05.2023 @ 3:00 PM

**GUIDELINES, TERMS AND CONDITIONS OF TENDER**

A	<b>Submission of Tender</b>	<p>: As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal URL: <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a></p> <p>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</p> <p>More information useful for submitting online bids on the CPP Portal may be obtained at: <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a></p> <p>All tender documents including Technical Bid &amp; Financial Bid should be submitted separately in online CPP portal as per the specified format only. Right is reserved to ignore any tender which fails to comply with the above instructions. <b>No manual bid submission will be entertained.</b></p>
B	<b>Instructions for online bid submission</b>	<p>: <b>REGISTRATION</b></p> <ul style="list-style-type: none"> <li>• Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL: <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a> by clicking on “Online Bidder Enrollment”. Enrolment on the CPP Portal is free of charge.</li> <li>• As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.</li> <li>• 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.</li> <li>• 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.) <a href="https://eprocure.gov.in/eprocure/app">https://eprocure.gov.in/eprocure/app</a> with their profile.</li> <li>• 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.</li> </ul> <p>Bidder then may log in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.</p>
C	<b>Searching for tender documents</b>	<p>: </p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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 “<b>My Tender</b>” folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document.</li> <li>• The bidder should make a note of the <b>unique Tender ID</b> assigned to each tender; in case they want to obtain any clarification / help from the Helpdesk.</li> </ul>

D	<b>Preparation of bids</b>	: <ul style="list-style-type: none"> <li>• Bidder should take into account any corrigendum published on the tender document before submitting their bids.</li> <li>• 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.</li> <li>• Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF / XLS formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option.</li> <li>• 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, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “<b>My Documents</b>” area available to them to upload such documents. These documents may be directly submitted from the “<b>My Documents</b>” 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.</li> </ul>
E	<b>Submission of bids</b>	: <ul style="list-style-type: none"> <li>• Bidder should log into the site well in advance for bid submission so that he/she can upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues.</li> <li>• The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.</li> <li>• A standard BOQ format has been provided in <b>Annexure-5</b> with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such as name of the bidder). If the BOQ file is found to be modified by the bidder, the bid will be rejected.</li> <li>• 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.</li> <li>• The <b>Tender Inviting Authority (TIA)</b> will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues.</li> <li>• The uploaded tender documents become readable only after the tender opening by the authorized bid openers.</li> <li>• Upon the successful and timely submission of bids, the portal will give a successful bid submission message &amp; a bid summary will be displayed with the bid no. and the date &amp; time of submission of the bid with all other relevant details.</li> <li>• Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.</li> </ul>

F	<b>Assistance to bidders</b>	: <ul style="list-style-type: none"> <li>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.</li> <li>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, 0120-4001005]</li> </ul>
G	<b>General Instructions to the Bidders</b>	: <ul style="list-style-type: none"> <li>The tenders will be received online through portal <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a>. In the Technical Bids, the bidders are required to upload all the documents in pdf format.</li> <li>Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a></li> <li>Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site <a href="https://etenders.gov.in/eprocure/app">https://etenders.gov.in/eprocure/app</a> under the "Information about DSC".</li> </ul>
2	<b>Marking on Technical Bid</b>	: <ol style="list-style-type: none"> <li>The vendor eligibility criteria, scope of work and technical Specification along with bill of materials details for this tender is given in <b><u>Annexure 1 to 3.</u></b></li> <li>The tenderer shall go through the Annexures and submit the technical bid.</li> <li>The Floor plan of Board room is given in <b><u>Annexure -2</u></b></li> <li>The AV Line Diagram is given in <b><u>Annexure -3.</u></b></li> <li>The Technical bid should be submitted in the proforma given as per <b><u>Annexure -4</u></b></li> <li>All technical bids should have the page-wise <b>heading as "Technical Bid" and page no.</b> in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents.</li> </ol> <p>The technical bid should consist of all technical details along with catalogue/brochure, model number and other technical, commercial terms and conditions. The technical bid should contain only technical details called for in the prescribed proforma along with the supporting documents. No other details apart from the technical details should be submitted in the technical bid. If any deviation in this regard is found in the technical bid submitted, the tender will be summarily rejected.</p>

3	<b>Marking on Financial Bid</b>	: <ol style="list-style-type: none"> <li>Financial bid should be submitted in the prescribed proforma format as per <b>Annexure-5 in xls format (BOQ)</b> through e-tender only. <b>No manual or other form of submission of Financial Bid will not be entertained.</b></li> <li>Financial bid should indicate item-wise price <u>for all the items</u> mentioned in the technical bid.</li> <li>Total value in the financial bid should be indicated in figures &amp; words clearly.</li> </ol>
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4	<p><b>EMD:</b> The EMD of <b>Rs.3,00,000</b> to be transferred to the account details mentioned in <b>Annexure 10 and proof should be enclosed in the Technical Bid</b>. Any offer not accompanied with the EMD shall be rejected summarily as non-responsive.</p> <p>The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited, if the tenderers withdraw their offer after the opening during the bid validity period. The Institute shall not be liable for payment of any interest on EMD.</p> <p>EMD is exempted for Micro and Small Enterprises (MSE) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) and Startups as recognized by Department of Industrial Policy &amp; Promotion (DIPP). (MSE/MSME/DIPP PROOF should be enclosed in the cover containing technical bid).</p>
5	<p><b>Performance Security: -</b></p> <p>The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt in the name of “The Registrar, IIT Madras” from any scheduled commercial bank or Bank Guarantee from any scheduled commercial bank in India. The performance security should be furnished within 14 days from the date of the purchase order.</p> <p>Performance Security in the form of Bank Guarantee: - In case the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed directly to IIT Madras from the Bank.</p> <p><b>The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.</b></p>
6	<p><b>Preparation of Tender:</b> The bidders should submit the bids in two bid system as detailed below.</p> <p><b>Bid I Technical Bid</b></p> <p>The technical bid should consist of Pre-Qualification Criteria (Bidder Eligibility Criteria - I &amp; II) and technical specification compliance sheet as per Annexure 4.</p> <p><b>Bid II Financial Bid</b></p> <p>The financial bid should be submitted in excel format (BoQ) as per the proforma (Annexure 5) uploaded in the e-Tender web site. The Quoted price should be for supply and installation of the item and inclusive of all cost and statutory levies at IIT Madras..</p>
7	<p><b>Prices:</b></p> <ul style="list-style-type: none"> <li>i. The prices quoted must be Nett considering all scope of work, terms &amp; conditions and as per the technical specification mentioned in <b>Annexures 1 -3. The prices quoted by the bidders should be inclusive of GST and other statutory levies.</b></li> <li>ii. <b>The percentage of tax etc. included in the price should be indicated in clear terms. If the inclusive price is not given, we will treat your offered rate as inclusive rate and comparison be made with others.</b> If at the time of comparison of your offer without taxes etc. is happen to be lowest, you are bound to supply as per the offered rate, i.e. without taxes etc.</li> <li>iii. Prices should be quoted in INR only.</li> </ul> <p><b>All conditional tenders will be summarily rejected.</b></p>

8	<p><b>Signing of Tender:</b></p> <p>The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and terms and conditions enclosed herewith. <b>Each page of the technical bid required to be signed and bears the official seal of the tenderers.</b></p> <p>If the application is made by a firm in partnership, it shall be signed (with seal) by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed along with current addresses of all the partners of the firm shall also accompany the application.</p> <p>If a limited company or a corporation makes the application, it shall be signed by a duly authorized person holding power of attorney for signing the application, in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation may be required to furnish satisfactory evidence of its existence. The applicant shall also furnish a copy of the Memorandum of Articles of association duly attested by a Public notary.</p>
9	<p><b>Period for which the offer will remain open:</b></p> <p>The Tender shall remain open for acceptance/validity till: <b>120 days from the date of opening of the tender.</b> However, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.</p>
10	<p>For the same tender, either the OEM or the authorized dealer/service provider can only quote. But both of them cannot quote separately for the same tender.</p>
11	<p><b>Public Procurement – Preference to Make in India:</b></p> <p>This tender will be evaluated based on Public Procurement (Preference to Make in India) DIPP, MoCI Order No. 45021/2/2017-PP (BE II) dated 16<sup>th</sup> September 2020 and other subsequent orders issued therein. Accordingly, preference will be given to the Make in India products while evaluating the bids, however, it is the sole responsibility of the bidder(s) to specify the product quoted by them is of Make in India product along with respective documentary evidence as stipulated in the aforesaid order in the technical bid itself. Necessary self- certification about the classification of the supplier/bidder as per the above order should be submitted by the bidder in <b>Annexure-6A and 6B</b>. Non-submission of self-certification will lead to rejection of bid out rightly and the bidder will be treated as non-local supplier. The bidder offering imported products will fall under the category of Non-local suppliers. They can't claim themselves as Class-I Local Suppliers/Class-II Local Suppliers by claiming services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC/CAMC etc. as local value addition.</p>

**PRE-QUALIFICATION CRITERIA****Bidder Eligibility Criteria I:**

1. Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16<sup>th</sup> September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I and Class-II local suppliers should be submitted in the prescribed proforma format as per **Annexure-6**.
2. Bidder should confirm their acceptance that they comply with the provisions with report to "Guidelines for eligibility of a bidder from a country which shares a land border with India as detailed at **Annexure-7**. The bidder should submit Certificate for "Bidder from/ Not from Country sharing Land border with India & Registration of Bidder with Competent Authority" as per Order of DoE F.No.6/18/2019-PPD dated 23.07.2020 as mentioned.

**Bidder Eligibility Criteria II:**

1. The firm should not have been blacklisted / debarred by any Government/ regulatory bodies in India. A self-declaration format given in **Annexure – 8**
2. The bidder should submit OEM authorization for all Make/brand of item for which they are submitting the bid (format is given in **Annexure-9**)
3. The Construction Firms shall be of National reputation having past experience of executing "similar works" (Civil, Interior finishes, Furniture, Furnishings and Electrical & Mechanical Works etc. for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals) during the last three years ending 31st December 2022.
4. Should have satisfactorily completed during the last three years ending 31st December 2022:
  - i) Three similar works as prime Interior Contractor each costing Rs 40,00,000/- or
  - ii) Two similar works as prime Interior Contractor each costing Rs 60,00,000/- or
  - iii) One similar work as prime Interior Contractor each costing Rs 80,00,000/-
  - The word similar completed works means Civil & Interior finishes, including Electrical & Mechanical Works for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals (Individually / aggregate of number of works mentioned in each criteria (a), (b), or (c) above) and should consist of Civil, structural, Interior Finishing / furnishings, including E&M Systems, etc. incorporating advanced Architectural & E&M design concepts with all modern services / amenities including acoustic performance, smart room services etc. (Proof of similar works executed shall be furnished along with photographs / views, duly certified by the client).
4. The bidder Should have had average annual turnover of Rs 1,00,00,000/- on construction works during any of the last three years ending 31st March 2023. (**Financial statements / certificates issued by Chartered Accountant should be submitted as proof**).
5. The Contractor should have done themselves or should have experience of working with specialised agencies for Interior finishes, E&M works, Smart room Services etc. in at least one of the Interior Works completed by them.

13	<p><b>Terms of Delivery:</b></p> <p>Supplier will be fully responsible for the safe carriage, Installation/Commissioning of goods up to the 3rd Floor, NAC, IITM or named place as per PO, Insurance coverage will be in the scope of the supplier. The tenderer should indicate clearly the time required for delivery of the item (subject to the approval of the Executive Committee-IIT-Madras). In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.</p> <p>In the event of delay or non-supply of materials/execution of Contract beyond the date of delivery/completion of job. The penalty will be levied @1% per week of delay subject to a max of 10% of the value of purchase order and if the delay is more than accepted time frame by IIT M, the PO would be partially or fully cancelled and liquidated damages will be enforced accordingly.</p>
14	<p><b>Evaluation of Bids:</b></p> <p><b>Bid evaluation will take place in two stages.</b></p> <p><b>Stage I: Technical Bid evaluation</b></p> <ol style="list-style-type: none"> <li>1. Bidder Eligibility Criteria-I will be evaluated first and those bidders who have complied with this criteria alone be evaluated for the Bidder Eligibility Criteria-II and technical Specification evaluation.</li> <li>2. In the 2<sup>nd</sup> stage, the Bidder Eligibility Criteria-II and the technical specification offered by the bidders will be evaluated by the technical committee for compliance. The proposed technical specification offered by the bidder should be equivalent or higher to the specifications mentioned in the technical bid.</li> <li>3. All bidders who have fully complied with Bidder Eligibility Criteria I, II and technical evaluation will only be considered for opening of financial bid.</li> </ol> <p><b>Stage II: Financial Bid Evaluation</b></p> <p>The financial bid evaluation will be based on price quoted by the bidder (BoQ). The tender will be awarded to the overall L1 bidder for the total work (Comprising all items).</p>
15	<p><b>Selection of successful bidder and Award of Order</b></p> <p>The order will be directly awarded to the technically qualified bidder as per the condition in para 3A of DIPP, MoCI Order No. 45021/2/2017-PP (BE II) dated 16<sup>th</sup> September 2020.</p>
16	<p><b>Completion of work :</b> Two months from the date of order.</p>
17	<p><b>Payment:</b></p> <ul style="list-style-type: none"> <li>• <b>No Advance Payment will be made for Indigenous purchase.</b></li> <li>• Payment will be made only after supply and satisfactory installation.</li> </ul>
18	<p><b>Warranty and Support:</b></p> <ul style="list-style-type: none"> <li>• All items must have a comprehensive warranty for 3 years</li> <li>• The vendor is responsible for 3 years' service support.</li> </ul>
19	<p><b>Terms and conditions:</b></p> <p>Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non-compliance will likely to lead to rejection of offers.</p>
20	<p><b>Right of Acceptance:</b> IIT MADRAS reserves the right to reject the whole or any part of the Tender without assigning any reason or to accept them in part or full.</p>
21	<p><b>Transit Insurance:</b> The Purchaser will not pay separately for Transit Insurance.</p>
22	<p>In terms of Rule 173 (iv) of General Financial Rules, 2017 the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of its bid.</p>
23	<p><b>Conditions of contract:</b></p> <p>Tenderer should quote on the basis of the conditions referred to in Para of the invitation to tender and tender papers. In case these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) there from in the body of the tender.</p>
24	<p><b>Tenderer shall submit along with this Tender:</b></p> <p>Name and full address of the Banker and their swift code and PAN No. and GSTIN number.</p>



25	<p><b>Disputes and Jurisdiction:</b></p> <p><b>Settlement of Disputes:</b> Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate on arbitrator. The Dean IC&amp;SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding shall be carried out in English language. The cost of arbitration and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&amp;SR IIT Madras, Chennai.</p> <p>a. <b>The Applicable Law:</b> The Purchase Order shall be construed, interpreted and governed by the Laws of India. Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.</p> <p>Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.</p>
26	<p><b>Force Majeure:</b></p> <p>The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.</p> <p>For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.</p> <p>If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.</p>
27	<p><b>Risk Purchase Clause:</b> In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause</p>
28	<p>All information including selection and rejection of technical or financial bids of the prospective bidders will be communicated through e-Tender portal. In terms of Rule 173(iv) of General Financial Rule 2017, the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of bids.</p>
29	<p>The tenderer shall certify that the tender document submitted by him / her are of the same replica of the tender document as published by IIT Madras and no corrections, additions and alterations made to the same. If any deviation found in the same at any stage and date, the bid / contract will be rejected / terminated and actions will be initiated as per the terms and conditions of the contract.</p>
30	<p>Due to Covid-19 pandemic the bidders will not be entertained to participate in opening of Bids. Since the tender is e-tender, the opening of the bids may be checked using the respective logins of the bidders.</p>

## **ACKNOWLEDGEMENT**

It is hereby acknowledged that I/We have gone through all the points listed under “Specification, Guidelines, Terms and Conditions” of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

**SIGNATURE OF TENDERER ALONG WITH SEAL  
OF THE COMPANY WITH DATE**

## ANNEXURE – 1

### Civil, Interior finishes, and Electrical & Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM

#### (A) PRE-QUALIFICATION CRITERIA

##### 1. Bidder Eligibility Criteria I:

1.1 Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16th September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I and Class-II local suppliers should be submitted in the prescribed proforma format as per **Annexure-6**

1.2 Bidder should confirm their acceptance that they comply with the provisions with report to “Guidelines for eligibility of a bidder from a country which shares a land border with India as detailed at **Annexure-7**. The bidder should submit Certificate for “Bidder from/ Not from Country sharing Land border with India & Registration of Bidder with Competent Authority” as per Order of DoE F.No.6/18/2019-PPD dated 23.07.2020 as mentioned.

##### 2. Bidder Eligibility Criteria II:

2.1 The firm should not have been blacklisted / debarred by any Government/ regulatory bodies in India. A self-declaration format given in **Annexure – 8**

2.2 The bidder should submit OEM authorization for all Make/brand wherever applicable for the item for which they are submitting the bid (format is given in **Annexure-9**).

2.3 The Construction Firms shall be of National reputation having past experience of executing “similar works” (Civil, Interior finishes, Furniture, Furnishings and Electrical & Mechanical Works etc. for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals) during the last three years ending 31st December 2022.

1. Should have satisfactorily completed during the last three years ending 31st December 2022:

- i) Three similar works as prime Interior Contractor each costing Rs 40,00,000/- or
- ii) Two similar works as prime Interior Contractor each costing Rs 60,00,000/- or
- iii) One similar work as prime Interior Contractor each costing Rs 80,00,000/-

- The word similar completed works means Civil & Interior finishes, including Electrical & Mechanical Works for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals (Individually / aggregate of number of works mentioned in each criteria (a), (b), or (c) above) and should consist of Civil, structural, Interior Finishing / furnishings, including E&M Systems, etc. incorporating advanced Architectural & E&M design concepts with all modern services / amenities including acoustic performance, smart room services etc. (Proof of similar works executed shall be furnished along with photographs / views, duly certified by the client).

2.4 The bidder Should have had average annual turnover of Rs **1,00,00,000/-** on construction works during the last three years ending 31st March 2023.-(Financial statements / certificates issued by Chartered Accountant should be submitted as proof)

2.5 The Contractor should have done themselves or should have experience of working with specialised agencies for Interior finishes, E&M works, Smart room Services etc. in at least one of the Interior Works completed by them.

#### (B) SCOPE OF WORK

Bidders who fulfil the following requirements shall be eligible to apply. Joint Ventures are not acceptable.

1. The tender is called for Civil, Interior finishes, and Electrical & Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM.

2. The bidder is required to execute the work as per the drawings (**Annexure 2**) and specification given below:

##### • **General**

The Scope of work shall comprise of but not limited to Supply of materials, construction, erection, installation, setting to work, integration with services, testing, pre-commissioning, commissioning, trial runs, completion, operations and maintenance of the work specified in the Bill of Quantities, Technical Specifications and drawing. The scope of work includes but not limited to the following:

##### 2) **Preliminary and Enabling Works**

- i) Preparation of samples, mock-ups, and prototypes.
- ii) Procurement, manufacture, assembling, installation, and construction.
- iii) Integrated testing and commissioning of Works and Equipment.
- iv) Supply of all Spare Parts and special tools.
- v) Preparation of Operation and Maintenance Manuals and training of Employer's personnel in the operation and maintenance of systems, integrated systems, and installed equipment.
- vi) Safety signs to safeguard / caution the workers and other Site related personnel from any accident or mishap during Construction Phase.
- vii) Protection of existing utilities and services

### **3) Civil Works**

Construction of Block Masonry, laying of Plain Cement Concreting, Internal Plastering, Internal Painting etc.

### **4) Interior Finishing Works**

Supply, installation, testing and commissioning of doors with ironmongeries, flooring (Tiles, stone & vinyl flooring), Acoustic partitions, acoustic cladding / panelling, glass partitions, suspended ceiling, etc.

### **5) Furnitures & Furnishings**

Supply, erection, integration with E&M services, testing and commissioning of Smart Classroom Furniture including Classroom Table, Faculty Table, Lectern for Faculty, Control Room tables, vertical blinds etc.

### **6) Electrical & Mechanical (E&M) Works**

- i. Electrification works  
Supply, erection / installation, testing and commissioning of Electrification works including Earthing, Cables & Trays, Distribution Boards & Breakers, Wiring & Conduiting, Lighting Fixtures, UPS, Tap off box etc.
- ii. HVAC System  
Supply, erection / installation, testing and commissioning of Air Distribution System, Ozone friendly Split Units, Insulation etc.
- iii. Fire Alarm System  
Supply, erection / installation, testing and commissioning of Fire Alarm System.

3. Any change in the above design is not permitted

4. The bidder can be an OEM or an authorized dealer (format is given in **Annexure-9**)

5. The Classroom layout and section is given in **Annexure – 2**.

6. The bidder should use the Quantity mentioned in the Bill of Material for designing and should choose any of one of the mentioned brands/make of items as per BOM.

7. Any other brand other than what mentioned in BOM will not be accepted.

**8. All materials which are in the BoQ must be submitted for approval by IITM prior to the work/installation. Samples of each material and table setup are required for review and must meet the necessary standards.**

**BILL OF MATERIAL****1) Civil & Interior Works**

Sr#	Description	Make	UoM	Qty
1	Autoclaved Aerated Cement ( AAC) Block masonry (floor gallery)	Birla (Aerocon) / BILT Technologies Ltd / Magicrete Building Solutions / Finecrete Eco-Blocks or approved equivalent	cum	27
2	PCC layer above aerocon steps	Cement: ACC Ltd / Ultratech / Ambuja Cement / Zuari Cement	cum	9
3	AAC Blockwork (wall)	Birla (Aerocon) / BILT Technologies Ltd / Magicrete Building Solutions / Finecrete Eco-Blocks or approved equivalent	cum	11
4	Plastering of new blockwork	As per specification	sqm	126
5	Painting	Akzo Nobel India Pvt Ltd (ICI) / Asian Paints Ltd. / Berger Paints or approved equivalent	sqm	126
6	Vinyl flooring	Tarkett IQ Optima / Gerfloor Mipolam Cosmo/ Responsive - Spica RQ	sqm	274
7	Step edge nosings, beadings, trimmers etc.	Dural or approved equivalent	rm	168
8	Partition with wooden acoustic panelling	Anutone or equivalent	sqm	54
9	Double glazing unit	Saint gobain glass and Dorma fittings	sqm	12
10	Flush door	Mangalam Timbers Private Limited / Greenply Wooden Door / CenturyPly Plywood	sqm	2
11	Glass door	Saint gobain glass and Dorma fittings	sqm	2
12	Acoustic cladding using Pinewood core panels	Anutone or equivalent	sqm	83
13	Acoustic cladding using fabric mounted glasswool core panels	Anutone or equivalent	sqm	90

14	800 mm wide Control room and service balcony door	Envirotech or equivalent	sqm	2
15	1500mm Main doors - Double door	Envirotech or equivalent	sqm	7
16	False ceiling (size 1200x600x15mm)	Saint gobain / Anutone	sqm	163
17	False ceiling (size 600x600x15mm)	Saint gobain / Anutone	sqm	27
18	Vertical bands for stepped false ceiling	Saint gobain / Anutone	sqm	19
19	Special fixed glass with patch fitting	Saint gobain glass and Dorma fittings	sqm	26
20	Student tables of width 375 mm, height 750mm	Ply-UniPLY, Laminate- Merino / Greenlam.	rm	60
21	Table for faculty (1200mm x 600mm x 750mm)	Ply-UniPLY, Laminate- Merino / Greenlam.	no	1
22	Lectern for faculty (1000mm x 750mm x 750mm)	Ply-UniPLY, Laminate- Merino / Greenlam.	no	1
23	Table of size 2000mm x 600mm and height 750mm and ledge for control room	Ply-UniPLY, Laminate- Merino / Greenlam.	no	2

#### **DETAILED TECHNICAL SPECIFICATIONS**

<b>Sr#</b>	<b>Description</b>	<b>Specification</b>
1	Autoclaved Aerated Cement ( AAC) Block masonry (floor gallery)	Providing and constructing masonry using Autoclaved Aerated Cement ( AAC) Blocks - 200mm thk blocks with Birla aerocon block jointing mortar including setting out, providing and raking out joints, curing including, Makes: Birla or approved equivalent.
2	PCC layer above aerocon steps	PCC layer - 75mm thk M20 using hard blue granite metal 20mm and down gauge including centering, shuttering, curing etc., complete at all levels.(The minimum cement content for M20 design mix shall be 300kg/cum)
3	AAC Blockwork (wall)	Providing and constructing masonry using Autoclaved aerated cement (AAC) blocks - 200mm thk with bonding material including setting out, providing & installing scaffolding, staging , raking out the joints, curing including provision of 2 Nos 6mm dia bars every fifth course & 75mm thk M20 grade concrete band horizontally with contractor's materials, plant, equipment, tools, tackles, consumables, etc., complete. Makes: Birla or approved equivalent
4	Plastering of new blockwork	Preparing surface and plastering with cement mortar 1:4 (1 cement,4 sand) 20mm thick to walls (interior) finished smooth including scaffolding, curing, clearing of mortar debris etc

5	Painting	<p>Providing and applying white cement based putty to level the surface, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete. Applying priming coats with primer of approved brand, having low VOC (Volatile Organic Compound ) content using water thinnable cement primer on wall surface having VOC content less than 50 grams/litre. Wall painting with premium emulsion paint of interior grade, three coats, having VOC (Volatile Organic Compound ) content less than 50 grams/ litre of approved brand, including applying additional coats wherever required to achieve even shade and colour</p>
6	Vinyl flooring	<p>Providing &amp; fixing of Homogeneous vinyl flooring of 2mm thick, densely compacted for improved wear and ease of maintenance. The Vinyl shall be with antistatic, anti fungal, antibacterial &amp; have Phthalete free properties with directional or non-directional polychrome design colour dyed as a raw mixture to ensure even colour throughout the thickness. The flooring shall comply with the EN 649 and has a (Group P) wear rating. The vinyl shall be installed on base floor leveling with self leveling material. The rates are inclusive of all materials, labour charges, tools &amp; tackles. The adhesive used for laying the floor shall be as per written recommendation made by the manufacturer &amp; as approved by the Architect/Engineer. Cleaning for any stains before handover. etc. complete as per the drawing and to complete satisfaction of the Engineer.          Make : Tarkett IQ Optima / Gerflor Mipolam Cosmo/ Responsive - Spica RQ.</p> <p>Vinyl floor covering to confirm to the following standards:</p> <p>2mm thick Vinyl Sheet (roll form of 2m width and 25m length)</p> <p>Classification : Class 34 Commercial 43 industrial (EN 649 )</p> <p>Total thickness : 2mm (EN 428)</p> <p>Total weight : 2700 g/m<sup>2</sup></p> <p>Surface Treatment : New IQ PUR Reinforced</p> <p>Wear layer binder content: ISO 10581 Type 1</p> <p>Residual indentation : ≤ 0.10mm (EN ISO 24343-1)</p> <p>Clean Room Test : ASTM F51/00 Class A ISO 14644-1 ISO class 4</p> <p>Dimensional stability : ≤ 0.40% (EN ISO 23999)</p> <p>Reaction to fire: &gt; 8kW/m<sup>2</sup> (EN ISO 9239-1 )</p> <p>Static electrical charge: &lt; 2 kV (EN 1815)</p> <p>Light fastness: ≥ level 7 (EN ISO 105-B02) Method 3a</p> <p>Chemical resistance: Excellent (EN ISO 26987)</p> <p>Slip Resistance: R9 (DIN 51130), ≤ 0.3 ( EN13893)</p> <p>Thermal resistance underfloor heating: 0.001 m<sup>2</sup>K / W Suitable - max 27° C (EN 12667/DIN 52612)</p> <p>Note: <span style="float: right;">Pattern of</span>          flooring to be considered. Quantity to be taken as per site measurement before quoting</p>
7	Step edge nosings, beadings,	Supply and installation of Step edge nosing and beading between

	trimmers etc.	vertical and horizontal surfaces from Dural or approved equivalent
8	Partition with wooden acoustic panelling	Dry wall partition and wooden acoustic panelling from Anutone or equivalent. Supply and installation of dry wall partition using Anutone tufbloc panels of 12mm thick in two layers on either side of a 50x50mm Aluminium framework. Anutone soundsynth 50mm thick is used as infill in the gap between the two boards. Joints are filled with jointing compound and fibre mesh tape. Over the partition, Supply & installation of Anutone Salon Slats made of pinewood E1 grade fiberboard, melamine/veneer laminated finish, groove perforated slats L16-2 - (2mm Slats @16mm pitch) / L32-2 - (2mm grooves @ 32mm centers) backlined with Soundtexblack acoustical fleece, tongue-groove edge for a seamless look, size 128x2440x16mm, volume density of base board 800Kg/m <sup>3</sup> , weight 8Kgs/m <sup>2</sup> (L16), installed by using Anutone Strut framework system. Anutone Strut framework system includes Anutone Strut CC25 aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Anutone Strut CC18 aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm & 27mm, depth 18mm and flanges of 7mm with suitable edge & centre brackets is then fixed perpendicular to the Strut CC25 Cross channel with the help of fasteners at every 400mm centers. Slats of size 128x 2440x16mm in then fixed perpendicular to CC18 with suitable edge & centre brackets. Short edges of the panel are staggered. Contractor to provide expansion joints of 3mm at every 4.88m length wise and 4.992m width wise. Panels are backlined with Anutone SynthPF 10x25
9	Double glazing unit	Providing and fixing full height double glazed partition using 6mm glass on either sides and necessary teak wood beading support. The rate shall be inclusive of necessary hardwares etc complete including beading, polish etc complete. Including frosted film of approved design and shade of 3M make or equivalent.
10	Flush door	Providing and fixing in position Single leaf solid core shutter made from 38mm thick marine grade block board thermo pressed with 12mm thick seasoned teak wood external lipping as per IS:2202 and finished in approved melamine polish. The external surfaces of the shutter to be finished in 1.5mm thick laminate on one side. The cost to include the following hardware (1) SS ball bearing hinges 4 Nos (2) Exposed Door closer (3) handle, lock. The rate to include providing Door frame using 110 x 75mm teak wood section for the same. Necessary provisions to be made to install specified acoustic material over the external door surface. Finished level to match with acoustic panel on adjacent surfaces
11	Glass door	Supply and fixing of 12mm thick openable glass door in toughened clear glass with patch fittings, including all necessary hardware.  Make : Dorma or equivalent
12	Acoustic cladding using Pinewood core panels	Acoustic cladding using pinewood core panels from Anutone or equivalent. Pinewood core panels supply & installation of Anutone Salon Slats made of pinewood E1 grade fiberboard, melamine/veneer laminated finish, groove perforated slats L16-2 - (2mm Slats @16mm pitch) / L32-2 - (2mm grooves @ 32mm centers) backlined with Soundtexblack acoustical fleece, tongue-groove edge for a seamless look, size 128x2440x16mm, volume density of base board 800Kg/m <sup>3</sup> , weight 8Kgs/m <sup>2</sup> (L16), installed by using Anutone Strut framework



		<p>system. Anutone Strut framework system includes Anutone Strut CC25 aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Anutone Strut CC18 aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm &amp; 27mm, depth 18mm and flanges of 7mm with suitable edge &amp; centre brackets is then fixed perpendicular to the Strut CC25 Cross channel with the help of fasteners at every 400mm centers. Slats of size 128x 2440x16mm in then fixed perpendicular to CC18 with suitable edge &amp; centre brackets. Short edges of the panel are staggered. Contractor to provide expansion joints of 3mm at every 4.88m length wise and 4.992m width wise. Panels are backlined with Anutone SynthPF 10x25.</p> <p>Technical Parameters :</p> <ul style="list-style-type: none"> <li>• Fire (Class) – 1 &amp; P (For FR grade)</li> <li>• Acoustics – NRC 0.77 (For E300* Mounting)</li> <li>• Thermal conductivity (W/mk)– na</li> <li>• Climate (°C, RH) – 50, 70</li> <li>• Light reflectance (%) – 75 (Maple Arce)</li> <li>• Green (VOC, RC %) – Low, 25</li> </ul>
13	Acoustic cladding using fabric mounted glasswool core panels	<p>Acoustic cladding using fabric mounted glasswool core panels from Anutone or equivalent. Supply and installation of Anutone Acoustic wall fabric stretch system by using FR Grade fabric of size 1700mm width, shall be stretched by using infill of Synth PF 10X25 mm thick, rigid vinyl Stretch Tracks half wrap/full wrap 15mm (FS15) and Midseam 15mm (FS15), Strand board, Synth PF infill with requisite accessories &amp; tools. FS15 tracks to be installed on wooden base, after applying Stick S7 adhesive on both surfaces for a true and continuous secure grip, and heavy-duty fasteners at 150mm centers on one/both sides of Stretch Tracks. Anutone Strut framework system includes Anutone Strut FC50 GI Partition Channel of 50mm with SC48 Strut Channel. Strand3 Fibre square edge magnesite bonded pinewood fiber panels of size 600x1200x20mm having density 400 kg/m<sup>3</sup>, weight 4 kg which is fixed to the wall with suitable fasteners. Synth PF 10x25mm thick adhered on the strand panel by using adhesive. Fabric of width 1700mm, acoustically transparent to about 99% , is then aligned to the Stretch tracks by following the fabric thread line or pattern. The fabric is stretched and tucked into the Stretch tracks and secured into the locking jaws so that it will be smooth, free of wrinkles with the tucking tools. Note -minimum 50mm additional fabric is required for tucking hence maximum module wall fabric width would be 1600mm. Window openings to be closed with plywood and white laminate on the elevation side and on the inside with the fabric stretch system as above.</p> <p>Technical Parameter:</p> <ul style="list-style-type: none"> <li>• Fire (Class) – 1 &amp; P</li> <li>• Acoustics – NRC 0.85 (For 25mm C50 Mounting)</li> <li>• Thermal conductivity (W/mk)– 0.08</li> <li>• Climate (°C, RH) – 50, 90</li> <li>• Light reflectance (%) – colour dependant</li> <li>• Green (VOC, RC %) – Low, 30</li> </ul>

14	800 mm wide Control room and service balcony door	800 mm wide Control room and service balcony door - single door (to be acoustically treated)
15	1500mm Main doors - Double door	<p>1500mm Main doors - Double door (to be acoustically treated )</p> <p>Providing and fixing of Noise Reduction doors (make ENVIROTECH or approved Equivalent ) consisting of Door frame made out of good quality hard wood , section size – 100 mm x 110 mm fitted with ‘D’ type rubber gasket to block noise leakage from gap and acoustic door shutter with minimum 60 mm thickness along with fire rating and smoke Intumescent seal strip of size 10mm x 4mm for 120 minutes fire rated and STC 37dB Tested by reputed Laboratory and having infill of 50mm thick resin bonded glasswool of 48 kg/cum density sandwiched by two 10mm thick approved quality marine grade ply and finished with 1 mm thick laminate of approved make, shade and colour and design on both sides. Further edges of shutter shall be provided with 6mm thick teak wood beading using exterior quality synthetic adhesive, headless GI nails, screws, beading finished with approved melamine polish etc.</p> <p>The ply shall be resistant to vermin, mold growth, minor impact, abrasion and short term water attack and with a smooth surface suitable to receive most forms of decoration. The door shall have acoustic seal in door rebates and drop dead seal at the bottom of the door including ironmongeries. HARDWARE :-The door assembly shall be fixed to the door frame with heavy duty hardware i.e. Geze/ Assa abloy/Dorma Make or equivalent make SS Hinge Size: 4" x 3" x 3mm , 600 mm SS door handle , SS Tower bolt , Door closer , Panic Bar ,Panic trim etc. ACOUSTIC INSULATION: The Panels filled with Acoustic material Rock wool confirming to IS-8183 of 96 kg/m<sup>3</sup> density, very good noise absorber for high, mid &amp; low frequencies along with, 6 MM thick anti donning layer having Thermal Conductivity 0.037 @ 20 C as per EN ISO 8497 (DIN 52613) and 2 mm thick Sound Damping layer MTS 05- 303 to achieve higher Sound STC as per site condition.</p>
16	False ceiling (size 1200x600x15mm)	<p>False ceiling from Saint Gobain or equivalent. Supply and Installation of Ecophon Advantage E - Tegular edge modular ceiling, 15 mm thickness,easily demountable tile , visible surface of each tile is 7 mm below the grid, manufactured from High density glass wool , visible surface is a batch painted glass tissue in white, back of the tile covered with glass tissue of size 1200x600x15mm compatible with T15 grid or silhouette of Gyproc make</p> <p>Acoustics-Sound absorption(Alpha W) - 0.95 at 200 mm o.d.s as per EN ISO 354</p> <p>Acoustics-Sound absorption Class - Class A at 200 mm o.d.s as per EN ISO 11654</p> <p>Acoustics-Articulation class - 180 as per ASTM E1111, ASTM E1110</p> <p>NRC - 0.9 NRC as per ASTM C 423</p> <p>Humidity Resistance -Permanent ambient RH up to 95% at 30*C without sagging, warping and delaminating ( 13964:2014).</p> <p>Fire Safety - Tested and classified as non combustible according to EN ISO 1182 with reaction to fire classification class A2 s1 d0 according to EN 13501-1 - European Standard.</p> <p>Light Reflectance - 83% light reflectance.</p>

17	False ceiling (size 600x600x15mm)	<p>False ceiling from Saint Gobain or equivalent. Supply and Installation of Ecophon Advantage E - Tegular edge modular ceiling, 15 mm thickness, easily demountable tile, visible surface of each tile is 7 mm below the grid, manufactured from High density glass wool, visible surface is a batch painted glass tissue in white, back of the tile covered with glass tissue of size 600x600x15mm compatible with T15 grid or silhouette of Gyproc make</p> <p>Acoustics-Sound absorption(Alpha W) - 0.95 at 200 mm o.d.s as per EN ISO 354</p> <p>Acoustics-Sound absorption Class - Class A at 200 mm o.d.s as per EN ISO 11654</p> <p>Acoustics-Articulation class - 180 as per ASTM E1111, ASTM E1110</p> <p>NRC - 0.9 NRC as per ASTM C 423</p> <p>Humidity Resistance -Permanent ambient RH up to 95% at 30°C without sagging, warping and delaminating ( 13964:2014).</p> <p>Fire Safety - Tested and classified as non combustible according to EN ISO 1182 with reaction to fire classification class A2 s1 d0 according to EN 13501-1 - European Standard.</p> <p>Light Reflectance - 83% light reflectance.</p>
18	Vertical bands for stepped false ceiling	<p>Supply and Installation of gypsum board ceiling square edge, installed by using GI Strut ceiling framework.</p> <p>The GI Strut ceiling framework system shall include Strut WC25 Wall channel, fully knurled, sectional thickness 0.55mm, length 3600mm, unequal flanges of 20 &amp; 30mm and web of 25mm, fixed along the perimeters of the wall with nylon sleeves and suitable fasteners at every 300mm centers. Then suspend Strut MC45 Main channels, fully knurled, sectional thickness 0.8mm, length 3600mm, equal flanges of 15mm and web 45mm from the soffit at 1200mm centers with Strut SA25, fully knurled, Suspender angle with sectional thickness 0.55mm, unequal flanges of 25 &amp; 10mm. Strut CC25 Cross channel, fully knurled, sectional thickness 0.55mm, length 3600mm, web 35mm, depth of 20mm and equal flanges 15mm is fastened to the Strut MC45 perpendicularly at 600mm centers for upto RH70, at 400mm centers for RH70-RH90 and at 300mm centers for &gt;RH90. Gypsum board is installed on the Strut CC25 with suitable fasteners at 600/400/300mm centers. a 4mm gap should be maintained between adjacent boards on all sides and should be filled and finished with fiber mesh tape.</p>
19	Special fixed glass with patch fitting	<p>Supplying and fixing of 12mm toughened clear glass with Patch Fittings. Including all necessary hardware and conceal all round with approved sealant.</p> <p>Make : Dorma</p>
20	Student tables of width 375 mm, height 750mm	<p>Providing and fixing desk of specified size made of 18 mm thick BWR ply table top with adequate metal supports using MS hollow pipes in powder coated finish. The table top and exposed surfaces shall be finished with 1mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The modesty panel shall be finished with flexi ply finished using 1mm thick laminate. MS stiffener connecting the legs to be provided using CRCA sheet in powder coated finish as per design. Tables to be provided with book tray and provisions for power outlet, made using CRCA sheets bent to</p>

		profile in powder coated finish, as per drawings. Table legs to be bolted to the ground using chemical fasteners of Hilti / Ruth of approved model and specifications. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply - Uniply, Laminate- Merino / Greenlam.
21	Table for faculty (1200mm x 600mm x 750mm)	Providing and fixing desk of specified size made of 19 mm thick BWR ply with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply- Uniply, Laminate- Merino / Greenlam.
22	Lectern for faculty (1000mm x 750mm x 750mm)	Providing and fixing desk of specified size made of 19 mm thick BWR ply with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply- Uniply, Laminate- Merino / Greenlam.
23	Table of size 2000mm x 600mm and height 750mm and ledge for control room	Providing and fixing desk of specified size made of 19 mm thick BWR ply with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply - Uniply, Laminate- Merino / Greenlam.

## 2) Electrical works

Sr#	Description	Make	UoM	Qty
1	<b>EARTHING</b>			
a	Copper wire No.10 SWG	ISI Grade	Rm	100
b	Copper wire No.8 SWG		Rm	30
2	<b>CABLE &amp; TRAYS</b>			
2.1	<b>Cable laying &amp; end termination</b>			
a	4C x 16Sq.mm cable XLPE Cable	KEI/ Polycab/Havells/RRKables/Apar	Rm	60
b	4C x 10 Sq.mm CU Wire		Rm	40
c	4C x 1.5 CU Sq.mm cable for lighting		Rm	300

<b>2.2</b>	<b>Cable End Termination</b>			
a	4C x 16 Sq.mm cable XLPE Cable	Dowell's/ Jaison/ Prabhat/ Lotus/Compaq	Each	4
b	4C x 10 Sq.mm CU Wire		Each	4
c	4.Cx 1.5 Sq.mm CU cable		Each	4
<b>2.3</b>	<b>Cable tray</b>			
a	150mm x 50mm x 3mm Perforated cable tray	OBO/Equivalent	Rm	30
<b>3</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>			
<b>3.1</b>	<b>Distribution Board - IP 43</b>			
a	Three phase 7 SEGMENT 8 way DB	ABB/Legrand/ Schneider/Great white	Each	1
b	Three phase VERTICAL DB 8 way DB		Each	1
<b>3.2</b>	<b>RCC /MCB/ MCCB</b>			
a	40A DP RCCB having a sensitivity of 30mA	ABB/Great white/Schneider/Legrand	Each	3
b	6A - 32A SP D - curve 10kA MCB		Each	18
c	6A - 32A SP B & C - curve 10kA MCB		Each	12
d	40A FP MCB		Each	1
e	63A FP MCB		Each	1
<b>3.3</b>	<b>ISOLATOR</b>			
a	20A to 40A FP MCB	ABB/Great white/Schneider	Each	3
<b>4</b>	<b>WIRING &amp; CONDUIT</b>			
<b>4.1</b>	<b>Wiring Light point</b>			
a	Rate to be quoted for Circuit length upto 5m	Switches/sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great	Each	2

		White		
<b>4.2</b>	<b>Wiring Light Point without control switch</b>			
a	Wiring Light Point without control switch	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	2
<b>4.3</b>	<b>5A Plug points - independent position</b>			
a	5A Plug points - independent position	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	2
<b>4.4</b>	<b>5A Plug points - combined position</b>			
a	5A Plug points - combined position	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	2
<b>4.5</b>	<b>Table mounted socket</b>			
a	Table mounted socket	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.	Each	43

		Modular Boxes: Legrand/Schneider/Anchor/Great White		
<b>4.6</b>	<b>AC points - SPLIT AC</b>			
a	20A,DP switch	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White	Each	1
b	20A Power socket	Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	1
<b>4.7</b>	<b>16A Power plug points</b>			
a	16A Power plug points	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	18
<b>4.8</b>	<b>Telephone Point</b>			
a	Telephone Point	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Delton/ Finolex / Lapp India/RR Kables  Conduits:Supreme/Precision/Aeroc on/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	1
<b>4.9</b>	<b>Data point</b>			
a	Data point	Switches/Sockets:Legrand/ABB/ Schneider/LnT/Great White  Wires:Delton/ Finolex / Lapp India/RR Kables  Conduits:Supreme/Precision/Aeroc	Each	4

		on/Anchor/Great White. Modular Boxes: Legrand/Schneider/Anchor/Great White		
<b>4.10</b>	<b>Telecommunication</b>			
a	CAT 6 cable	Delton/ Finolex / Lapp India	Rm	120
b	0.5 mm <sup>2</sup> telephone cable		Rm	100
<b>4.11</b>	<b>Copper wire</b>			
a	2 Runs 4 sq.mm and 1 run of 2.5 sq.mm copper wire (Four table mounted sockets)	Power flex/Polycab/Anchor/Great White/RR Kables	Rm	400
b	2 Runs 2.5 sq.mm. and 1 run 1.5mm <sup>2</sup> Cu wire (General 15a sockets- 2nos)		Rm	160
c	3 Runs 1.5 sq.mm. Cu wire		Rm	20
<b>4.12</b>	<b>PVC Conduit and accessories</b>			
a	20mm PVC Conduit (concealed/Floor)	Supreme/Precision/Aerocon/Anchor	Rm	150
b	25mm PVC Conduit(concealed/Floor)		Rm	280
<b>4.13</b>	<b>MS CONDUIT</b>			
a	20mm MS Conduit (Exposed)	Jindal/TATA/ISI Grade	Rm	20
b	25mm MS Conduit (Exposed)		Rm	20
<b>4.14</b>	<b>PVC Conduit and accessories</b>			
a	20mm PVC Conduit (concealed/Floor)	Supreme/Precision/Aerocon/Anchor	Rm	70
b	25mm PVC Conduit(concealed/Floor)		Rm	150
4.15	MS CONDUIT			
a	20mm MS Conduit (Exposed)	Jindal/TATA/ISI Grade	Rm	20
b	25mm MS Conduit (Exposed)		Rm	20
<b>5</b>	<b>LIGHTING FIXTURES,</b>			
a	2X2 LED Fitting with DALI Drive Recess mounted	Jaquar/Bajaj/Great white/Wipro	Each	14



b	26W LED Fitting with DALI Drive Recess mounted		Each	19
c	20W Wall mounted LED Fitting with DALI Drive		Each	4
<b>6</b>	<b>ISOLATOR</b>			
a	40A 4P MCB with enclosure	Legrand/L&T/Schnider/ABB	Each	2
<b>7</b>	<b>UPS</b>			
a	UPS	ABB/APC/Neumeric/Counsul	Each	1
Please refer to the list of approved makes for further references.				

### DETAILED TECHNICAL SPECIFICATIONS

Sr#	Description	Specification
<b>1</b>	<b>EARTHING</b>	Supply, laying, fixing of earthing conductor of CU flat / wires jointing as per IS; 3043/87 in trench/ wall/pulling through pipes using bolts, nuts, washer, welding etc as required..(quantity considered tentatively as per site condition may be vary)
a	Copper wire No.10 SWG	
b	Copper wire No.8 SWG	
<b>2</b>	<b>CABLE &amp; TRAYS</b>	
<b>2.1</b>	<b>Cable laying &amp; end termination</b>	Supplying and laying the following XLPE insulated PVC sheathed 1.1KV grade Aluminium armoured conductor cable conforming IS: 1554 (Part-I) in masonry cable trenches or on concrete wall or through pipes as per specifications. Necessary clamping should be provided while laying cables in trenches, Walls etc. as instructed by the Consultant
a	4C x 16Sq.mm cable	
b	4C x 4 CU Sq.mm cable	
c	4C x 1.5 CU Sq.mm cable for lighting	Supply laying and clamping of 1No. XLPE sheathed armoured heavy duty power cable conductor of best conductivity copper (2XFY) 1.1KV grade strictly conforming to IS:1554 (Part-I) 1964 of the following sizes in cable tray/wall, existing pipes using factory made heavy gauge GI/painted MS clamps not exceeding 60cms making good the damages colour washing etc as required.
<b>2.2</b>	<b>Cable End Termination</b>	
a	4C x 16Sq.mm cable	supplying and terminating Single compression gland type, Aluminium glands , earth clamps for XLPE insulated and PVC sheathed conductor cable 1.1kv grade and making end terminations suitable for 2/3/3.5/4 core cables of the following sizes as required
b	4C x 10 sq mm CU wire	
c	4C x 1.5 Sq.mm cable	

<b>2.3</b>	<b>Cable tray</b>	Fabricating, supplying and erecting (ladder type/ perforated type) type cable tray as IS 61537 in various places for laying the cables, power/lighting/telephone/TV conduits etc with suitable angle iron/flat as required in welded construction to form continuous gap for fixing clamps with bolt, nut. Rate should also include for all bracket supports suspended from ceiling/ supported on walls with anchor bolts all as per requirement at site. Rate should include for all connected civil works for grouting the tray.
a	150mm x 50mm x 3mm Perforated cable tray	
<b>3</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>	
<b>3.1</b>	<b>Distribution Board - IP 43</b>	Supply, installation, testing and commissioning of wall mounting type three phase 7-segment Distribution board with lockable front door of approved make and quality with cable end box etc as required suitable for Isolators/RCCB/MCCB as incomer and MCBs as outgoing.(IP 43) in recess/in surface including cutting holes on the wall making good the damage colour washing etc. as required. The rate should include the cost of materials required for DB dressing like cable mount, cable ties, black tape, black buttons, end ferrules, stickers etc., complete.
a	Three phase 7 SEGMENT 8 way DB	
b	Three phase VERTICAL DB 8 way DB	
<b>3.2</b>	<b>RCC /MCB/ MCCB</b>	Supply and fixing the following rating Circuit Breaker with over current & short circuit protection,in the existing MCB DB, complete with connections, testing and commissioning etc., as required.
a	40A DP RCCB having a sensitivity of 30mA	
b	6A - 32A SP D - curve 10kA MCB	
c	6A - 32A SP B & C - curve 10kA MCB	
d	40A FP MCB	
e	63A FP MCB	
i	32A DP MCB	
<b>3.3</b>	<b>ISOLATOR</b>	Supply and installation of C - curve 10kA MCB in dust & vermin proof wall mounted metallic enclosure including cutting holes on the wall making good the damage colour washing etc. as required
a	20A to 40A FP MCB	
<b>4</b>	<b>WIRING &amp; CONDUIT</b>	
<b>4.1</b>	<b>Wiring Light point</b>	Supplying all materials and wiring for light points/exhaust fan using 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, including supplying and fixing 6A modular type switch housed in a suitable factory made M.S box with moulded front plate including earthing the box, 3 plate ceiling rose etc. complete as required including rough plastering. (Colour coding to be followed Phase (Red, Yellow, Blue), Neutral- Black & Earth - Green) (length of
a	Rate to be quoted for Circuit length upto 5m	

		circuit upto 5m length)
<b>4.2</b>	<b>Wiring Light Point without control switch</b>	Wiring for light point with 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires, run as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, in surface/recessed, 3 plate ceiling rose etc. complete as required Junction box to be provided below the beam bottom.(without control switch)(for group controlled light points)( Colour coding to be followed Phase(Red, Yellow, Blue), Neutral- Black & Earth - Green)
a	Wiring Light Point without control switch	
<b>4.3</b>	<b>5A Plug points - independent position</b>	Supplying all materials and wiring for 5A plug points in independent positions including circuit mains using 3 runs of 1.5 mm <sup>2</sup> 650V grade PVC insulated FRLS copper conductor wire run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, and fixing 6A modular type 3 pin shuttered plug socket (2 in 1) controlled by 6A switch with moulded front plate, housed in a suitable factory built MS box. Giving connections, earthing the box, rough plastering etc complete as required. This circuit shall be looped to the lighting circuit.(circuit wire upto 10m length)
a	5A Plug points - independent position	
<b>4.4</b>	<b>5A Plug points - combined position</b>	Supplying all materials and wiring for 5A plug points in combined positions using 1.5 sq.mm PVC insulated FRLS copper conductor single core stranded wire run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, and fixing 6A modular type 3 pin shuttered plug socket (2 in 1) controlled by 6A switch with moulded front plate, housed in a suitable factory built MS box. Giving connections, earthing ,rough plastering etc complete as required. This circuit shall be looped to the lighting circuit.
a	5A Plug points - combined position	
<b>4.5</b>	<b>Table mounted socket</b>	Supplying all materials and wiring for Table mounted 5A plugs points with switches- 2nos Sockets in combined positions complete with necessary accessories, box. Giving connections, earthing ,rough plastering etc complete as required.
a	Table mounted socket	
<b>4.6</b>	<b>AC points - SPLIT AC</b>	
a	20A,DP switch	Supply and fixing 20A,DP switch for control housed in a suitable factory made Metal box (recessed) with frame, front plate etc including earthing the box etc. complete with connections, testing and commissioning etc as required
b	20A Power socket	Supply and fixing 20A Power socket heavy duty for indoor AC unit housed in a suitable factory made MS box (recessed) with frame, front plate etc including earthing the box etc. complete with connections , testing and commissioning etc as required

<b>4.7</b>	<b>16A Power plug points</b>	Supply and providing 16A combined modular type power plug socket (shuttered) controlled with 20A modular type switch, mounted on a suitable factory built MS box with earthing facility, giving interconnections etc as required.
a	16A Power plug points	
<b>4.8</b>	<b>Telephone Point</b>	Supply and fixing telephone socket (telephone jack single line RJ 11) on suitable factory made Metal box (recessed)with frame, with face cover plate etc. complete required with connections, testing and commissioning as required
a	Telephone Point	
<b>4.9</b>	<b>Data point</b>	Supply and fixing Data socket (Data jack - RJ 45) on suitable factory made Metal box (recessed)with frame, with face cover plate etc. complete required with connections, testing and commissioning as required
a	Data point	
<b>4.10</b>	<b>Telecommunication</b>	
a	CAT 6 cable	Supply & drawing of CAT 6 cable for Data through existing conduit .(quantity considered tentatively as per site condition may be vary)
b	0.5 mm <sup>2</sup> telephone cable	Supply and laying of following pair 0.5 mm <sup>2</sup> telephone cable through existing conduit/ pipe.(.quantity considered tentatively as per site condition may be vary))
<b>4.11</b>	<b>Copper wire</b>	Supply and wiring of following runs of FRLS PVC insulated, 1.1kV grade, copper conductor, stranded wires and copper bare earth wire drawn through existing suitable size ISI grade medium PVC conduit including rough plastering with all accessories as required. The earth wire shall be of green colour. (conduit separate item )
a	2 Runs 4 sq.mm and 1 run of 2.5 sq.mm copper wire (Four table mounted sockets)	
b	2 Runs 2.5 sq.mm. and 1 run 1.5mm <sup>2</sup> Cu wire (General 15a sockets- 2nos)	
c	3 Runs 1.5 sq.mm. Cu wire	
<b>4.12</b>	<b>PVC Conduit and accessories</b>	Supply and providing of the following size electrical grade ISI medium grade PVC pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided at every 6 meters and also to be provided below the beam bottom.
a	20mm PVC Conduit (concealed/Floor)	
b	25mm PVC Conduit(concealed/Floor)	
<b>4.13</b>	<b>MS CONDUIT</b>	Supply and providing of the following size electrical grade ISI medium grade MS pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided at every 6 meters and also to be provided below the beam bottom.
a	20mm MS Conduit (Exposed)	
b	25mm MS Conduit (Exposed)	
<b>4.14</b>	<b>PVC Conduit and accessories</b>	Supply and providing of the following size electrical grade ISI medium grade PVC pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided
a	20mm PVC Conduit (concealed/Floor)	

b	25mm PVC Conduit(concealed/Floor)	at every 6 meters and also to be provided below the beam bottom.
4.15	MS CONDUIT	
a	20mm MS Conduit (Exposed)	
b	25mm MS Conduit (Exposed)	
<b>5</b>	<b>LIGHTING FIXTURES,</b>	Supply,Conveyance, Installation, testing and commissioning of prewired, light fittings/wall lamp including lamps of all types complete with all accessories etc. directly on ceiling including connection with, copper cable etc. as required.
a	2X2 LED Fitting with DALI Drive Recess mounted	
b	26W LED Fitting with DALI Drive Recess mounted	
c	20W Wall mounted LED Fitting with DALI Drive	
<b>6</b>	<b>ISOLATOR</b>	Supply, installation, testing and commissioning of the following MCB isolator with Metallic Enclosure below mentioned ratings
a	40A 4P MCB with Enclosure	
<b>7</b>	<b>UPS</b>	<p>UPS 10KVA inbuilt Isolation Transformer 15 min backup with maintenance free sealed batteries.</p> <p>Mode of operation:The UPS system should be designed to operate continuously at rated capacity in following modes (a)Normal operation(b) Battery operation(c) Recharge operation(d) By pass operation.</p> <p>Technical Specification: Input voltage -415 V AC 3 phase 4 wire ,frequency 50HZ +/-5%,PF &gt;0.98 at full load.</p> <p>System output: Rated power : 10 KVA,output voltage 415 V three phase with frequency 50 HZ +/-0.1 Hz.</p> <p>Max voltage transient recovery time :10 millisecond to nominal. Overload 125-150% for 60 sec in normal operations.System efficiency 100% load: 95% in all load conditions. Acoustical noise: dB(A)of noise,typically measured at 1 meter from operator surface: not more than 67.Environment: storage ambient temp: 0 to 50 Deg CelOperating ancient Temp : 0to 40 Deg Cel.Relative Humidity: 5% to 95% max.</p> <p>Warranty :Complete UPS system and all other accessories of the system shall be warranty for 3 years he date of installation and successful running certified by IC&amp;SR.For Battery Bank min 3 years or higher based on manufacture.</p>
a	UPS	

## 2.1)

Sr#	Description	Make	UoM	Qty
<b>1</b>	<b>CABLE &amp; TRAYS</b>			
<b>1.1</b>	<b>Cable laying &amp; end termination</b>			
a	4C x 10Sq.mm cable XLPE Cable	KEI/ Polycab/Havells/RRKables/Apar	Rm	15
b	1C x 16 CU Sq.mm cable un armoured		Rm	60
<b>1.2</b>	<b>Cable End Termination</b>			
a	4C x 10 Sq.mm XLPE Cable	Dowell's/ Jaison/ Prabhat/ Lotus/Compaq	Each	4
b	1C x 16 CU Sq.mm cable		Each	16
<b>1.3</b>	<b>Cable tray</b>			
a	600mm x 50mm x 3mm Perforated cable tray	OBO/Equivalent	Rm	2
b	300mm x 50mm x 3mm Perforated cable tray		Rm	2
<b>2</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>			
<b>2.1</b>	<b>Distribution Board - IP 43</b>			
a	Three phase 4 way DB	ABB/Legrand/ Schneider/Great white	Each	1
b	Single phase 12 way DB		Each	1
<b>2.2</b>	<b>RCC /MCB/ MCCB</b>			
a	20A DP RCCB having a sensitivity of 30mA	ABB/Great white/Schneider/Legrand	Each	3
b	32A DP RCCB having a sensitivity of 30mA		Each	3
c	20A DP MCB		Each	2
d	32A DP MCB		Each	2
<b>3</b>	<b>WIRING &amp; CONDUIT</b>			
<b>3.1</b>	<b>Wiring Light point</b>			
a	Rate to be quoted for Circuit length upto 10m	Switches/Socket:Legrand/ABB/	Each	2

b	Rate to be quoted for Circuit length upto 15m	Schneider/LnT/Great White Wires:Power flex/Polycab/Anchor/Great White/RR Kables Conduits:Supreme/Precision/Aeroc on/Anchor/Great White. Modular Boxes: Legrand/Schneider/Anchor/Great White	Each	2
<b>3.2</b>	<b>Telecommunication</b>			
a	RG 6 cable	Delton/ Finolex / Lapp India	Rm	10
<b>3.3</b>	<b>POWER &amp; DATA RACEWAY</b>			
a	300mm x 38mm raceway	OBO Betterman/legrand/Cape Electric	Rm	15
b	225mm x 38mm raceway		Rm	20
c	150mm x 38mm raceway		Rm	20
d	100mm x 38mm raceway		Rm	40
e	50mm x 38mm raceway		Rm	18
<b>3.4</b>	<b>Junction Box</b>			
a	100mm x 100mm x 65mm	OBO Betterman/legrand/Cape Electric	Each	8
b	150mm x 150mm x 65mm		Each	1
c	225mm x 225mm x 65mm		Each	1
d	300mm x 300mm x 65mm		Each	1
<b>4</b>	<b>LIGHTING FIXTURES,</b>			
a	1X4 LED Fitting with DALI Drive Recess mounted	Jaquar/Bajaj/Great white/Wipro	Each	1
b	26W LED Fitting with DALI Drive Recess mounted		Each	1
c	20W Wall mounted LED Fitting with DALI Drive		Each	1
<p>Please refer to the list of approved makes for further references.</p> <p>Note: i)All these items are optional and to be mandatorily quoted by bidders. IITM reserves rights to consider for purchase as per our requirements.</p> <p>ii)Optional items will not be considered for price bid evaluation.</p>				

## DETAILED TECHNICAL SPECIFICATIONS

Sr#	Description	Specification
<b>1</b>	<b>CABLE &amp; TRAYS</b>	
<b>1.1</b>	<b>Cable laying &amp; end termination</b>	Supplying and laying the following XLPE insulated PVC sheathed 1.1KV grade Aluminium armoured conductor cable conforming IS: 1554 (Part-I) in masonry cable trenches or on concrete wall or through pipes as per specifications. Necessary clamping should be provided while laying cables in trenches, Walls etc. as instructed by the Consultant
a	4C x 10Sq.mm cable	
b	1C x 16 CU Sq.mm cable un armoured	Supply laying and clamping of 1No. XLPE sheathed armoured heavy duty power cable conductor of best conductivity copper (2XFY) 1.1KV grade strictly conforming to IS:1554 (Part-I) 1964 of the following sizes in cable tray/wall, existing pipes using factory made heavy gauge GI/painted MS clamps not exceeding 60cms making good the damages colour washing etc as required.
<b>1.2</b>	<b>Cable End Termination</b>	
a	4C x 10Sq.mm cable	supplying and terminating Single compression gland type, Aluminium glands , earth clamps for XLPE insulated and PVC sheathed conductor cable 1.1kv grade and making end terminations suitable for 2/3/3.5/4 core cables of the following sizes as required
b	1C x 16 CU Sq.mm cable	
<b>1.3</b>	<b>Cable tray</b>	Fabricating, supplying and erecting (ladder type/ perforated type) type cable tray as IS 61537 in various places for laying the cables, power/lighting/telephone/TV conduits etc with suitable angle iron/flat as required in welded construction to form continuous gap for fixing clamps with bolt, nut. Rate should also include for all bracket supports suspended from ceiling/ supported on walls with anchor bolts all as per requirement at site. Rate should include for all connected civil works for grouting the tray.
a	600mm x 50mm x 3mm Perforated cable tray	
b	300mm x 50mm x 3mm Perforated cable tray	
<b>2</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>	
<b>2.1</b>	<b>Distribution Board - IP 43</b>	Supply, installation, testing and commissioning of wall mounting type three phase 7-segment Distribution board with lockable front door of approved make and quality with cable end box etc as required suitable for Isolators/RCCB/MCCB as incomer and MCBs as out goings.(IP 43) in recess/in surface including cutting holes on the wall making good the damage colour washing etc. as required. The rate should include cost of materials required for DB dressing like cable mount, cable ties, black tape, black buttons, end ferrules, stickers etc., complete.
a	Three phase 4 way DB	
b	Single phase 12 way DB	



<b>2.2</b>	<b>RCC /MCB/ MCCB</b>	Supply and fixing the following rating Circuit Breaker with over current & short circuit protection,in the existing MCB DB, complete with connections, testing and commissioning etc., as required.
a	20A DP RCCB having a sensitivity of 30mA	
b	32A DP RCCB having a sensitivity of 30mA	
c	20A DP MCB	
d	32A DP MCB	
<b>3</b>	<b>WIRING &amp; CONDUIT</b>	
<b>3.1</b>	<b>Wiring Light point</b>	Supplying all materials and wiring for light points/exhaust fan using 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, including supplying and fixing 6A modular type switch housed in a suitable factory made M.S box with moulded front plate including earthing the box, 3 plate ceiling rose etc. complete as required including rough plastering. (Colour coding to be followed Phase (Red, Yellow, Blue), Neutral- Black & Earth - Green) (length of circuit upto 5m length)
a	Rate to be quoted for Circuit length upto 10m	
b	Rate to be quoted for Circuit length upto 15m	
<b>3.2</b>	<b>Telecommunication</b>	
a	RG 6 cable	Supply & drawing of RG 6 cable for television through existing conduit
<b>3.3</b>	<b>POWER &amp; DATA RACEWAY</b>	Supply and fixing of covered Raceway with horizontal & vertical bends, reducers, Tee's, cross over , suitable supports and brackets and other accessories as required. The raceways shall be anti corrosive powder coated with RAL 7032( Siemens grey . The raceways shall be of 14 G thickness and shall have a welded GI slotted angle at every 1.5m for tying the cables as well as clamping the body earthing GI earthing strips. The raceways shall be joined together with powder coated anti corrosive GI plates and cadmium coated anti corrosive bolts and nuts .Raceway poles only should be used to drop down the cables. Do not clamp the raceways onto the wall or to the partition and also do not bury any cables within the wall or the partition . The IS standard for powder coating IS 13871. No warping, & raceways shall be temperature resistant only.
a	300mm x 38mm raceway	
b	225mm x 38mm raceway	
c	150mm x 38mm raceway	
d	100mm x 38mm raceway	
e	50mm x 38mm raceway	
<b>3.4</b>	<b>Junction Box</b>	Supply,laying,testing and commissioning of Raceway
a	100mm x 100mm x 65mm	
b	150mm x 150mm x 65mm	
c	225mm x 225mm x 65mm	

d	300mm x 300mm x 65mm	
4	<b>LIGHTING FIXTURES,</b>	Supply,Conveyance, Installation, testing and commissioning of prewired, light fittings/wall lamp including lamps of all types complete with all accessories etc. directly on ceiling including connection with, copper cable etc. as required.
a	1X4 LED Fitting with DALI Drive Recess mounted	
b	26W LED Fitting with DALI Drive Recess mounted	
c	20W Wall mounted LED Fitting with DALI Drive	
5	AMC onsite for a period of 4 <sup>th</sup> &5 <sup>th</sup> year beyond 3 years warranty period to be quoted for 10Kva UPS on the basis of 4 periodic maintenance's in a year	

### 3) HVAC Works

Sr#	Description	Make	UoM	Qty
<b>A</b>	<b>AIR DISTRIBUTION SYSTEM</b>			
1	Factory fabricated GSS Ducting			
1.1	24 G	ROLASTAR / ZECO / GP SPIRA / EQUIVALENT - SHEET FROM TATA & JINDAL	sqm	50
1.2	22G	ROLASTAR / ZECO / GP SPIRA / EQUIVALENT - SHEET FROM TATA & JINDAL	sqm	100
2	multi blade, motorized Fire Dampers with spring return actuator	BELIMO / HONEYWELL / SIEMENS	sqm	1.5
3	Factory fabricated Volume control dampers	SYSTEM AIR / DYNACRAFT/CARYAIRE/AIRMASTER	sqm	3
4	single deflection 1250x150mm Supply Linear Grille	RUSKIN / SYSTEM AIR / AIR MASTER / COSMOS / CARYAIRE	sqm	2
5	Return Linear Grille	RUSKIN / SYSTEM AIR / AIR MASTER / COSMOS / CARYAIRE	sqm	2
6	Pressure Independent Variable Air Volume Terminals	COSMOS / RUSKIN TITUS /CARYAIRE / TROX / AIR MASTER	nos	1

Sr#	Description	Make	UoM	Qty
<b>B</b>	<b>SPLIT UNITS - Minimum 3 Star Rated Energy saving Type</b>			
1	Nominal Capacity -1.0 TR - Wall mounted Type	BLUE STAR / DAIKIN / LG	nos	1
2	MS support works:		kg	50
<b>C</b>	<b>INSULATION</b>			
1	Thermal Insulation of inside lab supply/Return air ducts	ARMACELL/ KFLEX / AEROFLEX / ARMAFLEX / VIDO FEX / TROCELLEN		
a	19mm thick for supply air ducts for labs		sqm	135
b	13mm thick for return air ducts for labs		sqm	15
2	Duct acoustic liner with open cell Nitrile foam soft rubber	ARMACELL/ KFLEX / AEROFLEX / ARMAFLEX / VIDO FEX / TROCELLEN	sqm	130
Please refer to the list of approved makes for further references.				

#### **DETAILED TECHNICAL SPECIFICATIONS**

Sr#	Description	Specification
<b>A</b>	<b>AIR DISTRIBUTION SYSTEM</b>	
1	Factory fabricated GSS Ducting	Factory fabricated GSS Ducting (Box ducts only) made of Lock-forming quality GSS complying with IS: 277, pressure classes from minus 500 to plus 2500 Pa and having 120GSM coating classification, with TDF Flanges, corner saddles, guide vanes, inside lab hot dipped galvanised threaded rod and L-angle duct supports, cleat joints, food grade gaskets, VOC free adhesives bolts & nuts. sealing around the duct at wall crossings. No fabrication at site. Ducts should be supplied, stored and installed with polythene sheets wrapped around and the open ends are sealed from the factory. Angle frames should be used for above 1200mm wide duct joints. If used, angle frames shall be painted with red oxide primer and finished with enamel paint. Duct leakage pressure & Light test is must for all ducting works.
1.1	24 G	
1.2	22G	
2	multi blade, motorized Fire Dampers with spring return actuator	Supply, installation, testing & commissioning of multi blade, motorised Fire Dampers with spring return actuator. The damper shall be of at least 120 minutes fire rating with minimum 450 mm

Sr#	Description	Specification
		duct sleeve. The damper shall be as per UL 555S; 1995 classified and UL approved. The damper shall be constructed out of 16G galvanised sheet steel. It shall be complete with control panel, actuator, sensor and inter-locking / wiring / connection for tripping of AHU fan motor. the vendor should furnish the UL test certificate at the time of delivery & UL symbol should be there in all fire dampers.
3	Factory fabricated Volume control dampers	Supply, installation, testing & commissioning of Factory fabricated Volume control dampers of 1.2mm thick Aluminium blades, 150mm depth, extended linkage rods for manual operation, channels, flanges suitable for duct mounting and with a manual operating handle. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration & engraved marking on position of damper.
4	single deflection 1250x150mm Supply Linear Grille	Powder coated Aluminium extruded single deflection 1250x150mm Supply Linear Grille. The color & pattern shall be pre-approved by Architects.
5	Return Linear Grille	Powder coated Aluminium extruded 600x150mm Return Linear Grille. The color & pattern shall be pre-approved by Architects.
6	Pressure Independent Variable Air Volume Terminals	<p>Pressure Independent Variable Air Volume Terminals RECTANGLE boxes with damper actuator,multi point pick-up inlet air flow velocity sensor,differential pressure transmitter,WALL MOUNTED DIGITAL thermostat &amp; step-down transformer,unit casing shall be G.S.S.22G with internal lining 15mm thk density 140kg/m<sup>2</sup>open cell insulation or 25mm thk density 48 kg/m<sup>2</sup> with rptissue,programmable controller with bacnet protocol or BACnet MS/TP/factory calibrated to operate 30 to 100%.(Each VAV box to be tested and the volume V min and V max flow rates set in the Factory,minimum and maximum volume flow rate settings are to be also adjustable on site during commissioning to be done by the manufacturer authorized engineer and warranty certificate to be issued by the manufacturer authorized engineer. Velocity sensor to be covered at factory with GI flexible sleeves before dispatch-no color other than GI shall be allowed on the VAV box.</p> <p>Price shall be inclusive of FRLS copper power cabling from power cabling from VAV to socket &amp; plug top and copper control wiring from thermostat as required in GI conduit.</p> <p>VAV should be integrated with in the ducts i.e. VAV size should be same as of duct it would be installed in, Also should be integrated with existing AHU</p>
B	<b>SPLIT UNITS - Minimum 3 Star Rated Energy saving Type</b>	Supply, Installation, Testing & Commissioning air cooled split air conditioners with hermetically sealed, swing type compressors having one outdoor unit & one indoor unit, stand required for mounting the outdoor unit and complete with required refrigerant pipes,Condensate drain pipe, stabilizer & power cabling required.(15 Rmt/unit including suction and liquid line) with insulation. The indoor and outdoor units shall be provided with ribbed rubber pad vibration isolators.

Sr#	Description	Specification
		Refrigerant : Ozone friendly HFC
1	Nominal Capacity -1.0 TR - Wall mounted Type	
2	MS support works:	MS support with one coat of epoxy paint over & above two coats of anti-corrosive red oxide paint. This support is considered only for external ducts like vertical riser ducts, Technical area and ducts on terrace (Internal duct support is part of ducting line items). All supports as per TDS.
<b>C</b>	<b>INSULATION</b>	
1	Thermal Insulation of inside lab supply/Return air ducts	Thermal Insulation of inside lab supply/Return air ducts - (CLASS 'O' ) closed cell Nitrile foam soft rubber faced with aluminum foil The density of nitrile rubber shall be 65-70Kg/Cum.The material should have a thermal conductivity not exceed 0.0351 W/m <sup>2</sup> K with VOC free self adhesive and Al tape.
a	19mm thick for supply air ducts for labs	
b	13mm thick for return air ducts for labs	
2	Duct acoustic liner with open cell Nitrile foam soft rubber	Duct acoustic liner shall be with open cell Nitrile foam soft rubber - 15 mm thick of 140-180 Kg/cum density. The material should have a thermal conductivity not exceeding 0.050 W/mK. with VOC free self adhesive and Al tape

#### 4) Fire Alarm system works

Sr#	Description	Make	UoM	Qty
1	Analogue Addressable Fault isolator	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	1
2	Addressable Input Modules	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	3
3	Analogue Addressable Control dual relay module	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	2
4	Addressable Horn with Strobe including Control module	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	2
5	24V / 5A Power supply unit		nos	2
6	Addressable Manual call point	Siemens/Notifier/GST/	nos	2

		Hochiki/Schneider / Honeywell		
7	FRLS ARMOURED cable. 2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )	Power flex/Anchor / polycab / finolex	Rmt	100
8	MS conduits, 25 mm dia.	ISI Grade	Rmt	20
9	Analogue addressable Response Indicator with base	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	4
10	Analogue addressable Smoke Detector with base	Siemens/Notifier/GST/ Hochiki/Schneider / Honeywell	nos	8
Please refer to the list of approved makes for further references.				

### **DETAILED TECHNICAL SPECIFICATIONS**

Sr#	Description	Specification
1	Analogue Addressable Fault isolator	Supply, Installation, Testing, and Commissioning of Analogue Addressable Fault isolator base capable of monitoring shorted loop circuit and automatically restore communications when shorted conditions are corrected, Built-in LED indication upon short circuit condition, Operating Voltage 17 - 41 VDC, Current Consumption Normal: 160µA , Active: 10mA
2	Addressable Input Modules	Supply, Installation, Testing, and Commissioning of "Addressable Input Modules", UL Listed. Inputs modules shall be used for Monitoring the Power supply units, Fire Sprinkler valve supervision, and base builder integration, Fast, reliable contact monitoring utilizing the Digital Communications Protocol, can be programmed to monitor Normally Open (NO) or Normally Closed (NC) contacts, electronic addressing, rotary switch or DIP switch not acceptable.  Operates on Class A or Class B loop. The module should be supported independently of their attachment to wirings using necessary mounting GI 4 X 4 Junction Box with cable gland, clamps/brass screws etc for mounting at True ceiling, as per the drawing.
3	Analogue Addressable Control dual relay module	Supply, Installation, Testing, and Commissioning of Analogue Addressable Control dual relay module for tripping HVAC units, Lift's,. and shall be capable of providing SPDTcontact rated at 30v DC, 2A. electronic addressing, rotary switch or DIP switch not acceptable, Dual Relay Module allows independent control of two form contacts for a variety of normally open and normally closed contact applications. Visible Bi-colored LED is software controlled and can be programmed to blink red or green when polled. The LED can be latched on when activated.Programming is highly flexible providing 16 priority states plus zoning capability. Operates on Class A or Class B loop
4	Addressable Horn with Strobe including Control module	Supply, Installation, Testing, and Commissioning of Addressable Horn with Strobe including Control module wall mounted type rated at 82 dBA @ 3m for Audible annunciation and Fixed candela options of

		15/75 and 177 visual indication. The quoted rate shall include Metal Boxes to fix the Horn, switch for continuous or temporal.
5	24V / 5A Power supply unit	Supply, Installation, Testing, and Commissioning of "24V / 5A Power supply unit",UL Listed for power the hooter cum strobe modules. The vendor shall specify the capacity and quantity as required based on their respective technical requirements. The Power supply unit should be supported independently of their attachment to wirings using necessary wall & column mounting support, clamps/brass screws,etc.
6	Addressable Manual call point	Supply, Installation, Testing, and Commissioning of Addressable Manual call point having an integrally mounted addressable module that monitors and reports contact status, single action type, EPROM addressable, electronic addressing, rotary switch or DIP switch not acceptable. The quoted rate shall include Metal Boxes to fix the Horn.Operating Voltage (SLC) 17~41 VDC, Average Current Consumption 550uA (Typical) or 660uA (Alarm). Ambient Temperature (0 °C) - (49°C). Maximum Humidity 90% RH, non-condensing
7	FRLS ARMoured cable. 2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )	Supplying, installing, testing and commissioning of FRLS ARMoured cable Fire survival at 750°C for 2hours (Minimum)) confirming to IS standards and specifications. (Outer sheath of the cable to be red).  2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )
8	MS conduits, 25 mm dia.	Supplying, installing, testing and commissioning approved make MS conduits on ceiling / wall / floor etc. complete with accessories like, Junction boxes, Collars, Bends etc. The quoted rate shall also include for chasing /chipping walls, making bore holes in walls / floor and making them good with filler material and finished in cement mortar etc. Complete.  25 mm dia.
9	Analogue addressable Response Indicator with base	Analogue addressable Response Indicator with base.It shall meet the UL standard
10	Analogue addressable Smoke Detector with base	Analogue addressable Smoke Detector with base.It shall meet the UL standard

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**ANNEXURE - 4**

**Civil, Interior finishes, and Electrical & Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM**

**TECHNICAL BID COMPLIANCE STATEMENT**  
**Tender No. CE/RAVI/102/2023/SMARTCLASS**

**(A) PRE-QUALIFICATION CRITERIA**

<b>Sl.No.</b>	<b>Description</b>	<b>Compliance (Yes/ No)</b>	<b>Proof with Page No.</b>
<b>I</b>	<b>Bidder Eligibility Criteria I:</b>		
1	Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16 <sup>th</sup> September 2020 and other subsequent orders issued therein, shall be eligible to bid in this tender. Declaration for Class-I and Class-II local suppliers should be submitted in the prescribed proforma format as per <b>Annexure-6</b>		
2	Bidder should confirm their acceptance that they comply with the provisions with report to "Guidelines for eligibility of a bidder from a country which shares a land border with India as detailed at <b>Annexure-7</b> . Bidder should also submit the required certificates as mentioned.		
<b>II</b>	<b>Bidder Eligibility Criteria II:</b>		
1	The firm should not have been blacklisted / debarred by any Government/ regulatory bodies in India. A self-declaration format given in <b>Annexure – 8</b>		
2	The bidder should submit OEM authorization for all Make/brand wherever applicable for the item for which they are submitting the bid (format is given in		
3	<p>The Construction Firms shall be of National reputation having past experience of executing "similar works" (Civil, Interior finishes, Furniture, Furnishings and Electrical &amp; Mechanical Works etc. for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals) during the last three years ending 31st December 2022.</p> <p>Should have satisfactorily completed during the last three years ending 31st December 2022:</p> <ul style="list-style-type: none"> <li>o Three similar works as prime Interior Contractor each costing Rs 40,00,000/- or</li> <li>o Two similar works as prime Interior Contractor each costing Rs 60,00,000/- or</li> <li>o One similar work as prime Interior Contractor each costing Rs 80,00,000/-</li> </ul> <ul style="list-style-type: none"> <li>• The word similar completed works means Civil &amp; Interior finishes, including Electrical &amp; Mechanical Works for Multi-storeyed Institutional Buildings / Corporate Offices / Hotels / Super Speciality Hospitals (Individually / aggregate of number of works mentioned in each criteria (a), (b), or (c) above) and should consist of Civil, structural, Interior Finishing / furnishings, including E&amp;M Systems, etc. incorporating advanced Architectural &amp; E&amp;M design concepts with all modern services / amenities including acoustic performance, smart room services etc. (Proof of similar works executed shall be furnished along with photographs / views, duly certified by the client).</li> </ul>		
4	The bidder Should have had average annual turnover of Rs 1,00,00,000/- on construction works during the last three years ending 31st March 2023.. (Financial statements / certificates issued by Chartered Accountant should be submitted as proof)		
5	The Contractor should have done themselves or should have experience of working with specialised agencies for Interior finishes, E&M works, Smart room Services etc. in at least one of the Interior Works completed by them.		



(B) **TECHNICAL SPECIFICATION SHEET FOR Civil, Interior finishes, and Electrical & Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM**

**1) Civil & Interior Works**

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
1	Autoclaved Aerated Cement ( AAC) Block masonry (floor gallery)	Birla (Aerocon) / BILT Technologies Ltd / Magicrete Building Solutions / Finecrete Eco-Blocks or approved equivalent	cum	27		
2	PCC layer above aerocon steps	Cement: ACC Ltd / Ultratech / Ambuja Cement / Zuari Cement	cum	9		
3	AAC Blockwork (wall)	Birla (Aerocon) / BILT Technologies Ltd / Magicrete Building Solutions / Finecrete Eco-Blocks or approved equivalent	cum	11		
4	Plastering of new blockwork	As per specification	sqm	126		
5	Painting	Akzo Nobel India Pvt Ltd (ICI) / Asian Paints Ltd. / Berger Paints or approved equivalent	sqm	126		
6	Vinyl flooring	Tarkett IQ Optima / Gerflor Mipolam Cosmo/ Responsive - Spica RQ	sqm	274		
7	Step edge nosings, beadings, trimmers etc.	Dural or approved equivalent	rm	168		
8	Partition with wooden acoustic panelling	Anutone or equivalent	sqm	54		
9	Double glazing unit	Saint gobain glass and Dorma fittings	sqm	12		
10	Flush door	Mangalam Timbers Private Limited / Greenply Wooden Door / CenturyPly Plywood	sqm	2		
11	Glass door	Saint gobain glass and Dorma fittings	sqm	2		
12	Acoustic cladding using Pinewood core panels	Anutone or equivalent	sqm	83		

13	Acoustic cladding using fabric mounted glasswool core panels	Anutone or equivalent	sqm	90		
14	800 mm wide Control room and service balcony door	Envirotech or equivalent	sqm	2		
15	1500mm Main doors - Double door	Envirotech or equivalent	sqm	7		
16	False ceiling (size 1200x600x15mm)	Saint gobain / Anutone	sqm	163		
17	False ceiling (size 600x600x15mm)	Saint gobain / Anutone	sqm	27		
18	Vertical bands for stepped false ceiling	Saint gobain / Anutone	sqm	19		
19	Special fixed glass with patch fitting	Saint gobain glass and Dorma fittings	sqm	26		
20	Student tables of width 375 mm, height 750mm	Ply-UniPLY, Laminate- Merino / Greenlam.	rm	60		
21	Table for faculty (1200mm x 600mm x 750mm)	Ply-UniPLY, Laminate- Merino / Greenlam.	no	1		
22	Lectern for faculty (1000mm x 750mm x 750mm)	Ply-UniPLY, Laminate- Merino / Greenlam.	no	1		
23	Table of size 2000mm x 600mm and height 750mm and ledge for control room	Ply-UniPLY, Laminate- Merino / Greenlam.	no	2		

#### DETAILED TECHNICAL SPECIFICATIONS

Sr #	Description	Specification	Comply / Not Comply	Ref. Page No.
1	Autoclaved Aerated Cement ( AAC) Block masonry (floor gallery)	Providing and constructing masonry using Autoclaved Aerated Cement ( AAC) Blocks - 200mm thk blocks with Birla aerocon block jointing mortar including setting out, providing and raking out joints, curing including, Makes: Birla or approved equivalent.		
2	PCC layer above aerocon steps	PCC layer - 75mm thk M20 using hard blue granite metal 20mm and down gauge including centering, shuttering, curing etc., complete at all levels.(The minimum cement content for M20 design mix shall be 300kg/cum)		
3	AAC Blockwork (wall)	Providing and constructing masonry using Autoclaved aerated cement (AAC) blocks - 200mm thk with bonding material including setting out, providing & installing scaffolding, staging , raking out the joints, curing including provision of 2 Nos 6mm dia bars every fifth course & 75mm thk M20 grade		

		concrete band horizontally with contractor's materials, plant, equipment, tools, tackles, consumables, etc., complete. Makes: Birla or approved equivalent		
4	Plastering of new blockwork	Preparing surface and plastering with cement mortar 1:4 (1 cement,4 sand) 20mm thick to walls (interior) finished smooth including scaffolding, curing, clearing of mortar debris etc		
5	Painting	Providing and applying white cement based putty to level the surface, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete. Applying priming coats with primer of approved brand, having low VOC (Volatile Organic Compound ) content using water thinnable cement primer on wall surface having VOC content less than 50 grams/litre. Wall painting with premium emulsion paint of interior grade, three coats, having VOC (Volatile Organic Compound ) content less than 50 grams/ litre of approved brand, including applying additional coats wherever required to achieve even shade and colour		
6	Vinyl flooring	<p>Providing &amp; fixing of Homogeneous vinyl flooring of 2mm thick, densely compacted for improved wear and ease of maintenance. The Vinyl shall be with antistatic, anti fungal, antibacterial &amp; have Phthalete free properties with directional or non-directional polychrome design colour dyed as a raw mixture to ensure even colour throughout the thickness. The flooring shall comply with the EN 649 and has a (Group P) wear rating. The vinyl shall be installed on base floor leveling with self leveling material. The rates are inclusive of all materials, labour charges, tools &amp; tackles. The adhesive used for laying the floor shall be as per written recommendation made by the manufacturer &amp; as approved by the Architect/Engineer.Cleaning for any stains before handover. etc. complete as per the drawing and to complete satisfaction of the Engineer. Make : Tarkett IQ Optima / Gerflor Mipolam Cosmo/ Responsive - Spica RQ.</p> <p>Vinyl floor covering to confirm to the following standards:</p> <p>2mm thick Vinyl Sheet (roll form of 2m width and 25m length)</p> <p>Classification : Class 34 Commercial 43 industrial (EN 649 )</p> <p>Total thickness : 2mm (EN 428)</p> <p>Total weight : 2700 g/m2</p> <p>Surface Treatment : New IQ PUR Reinforced</p> <p>Wear layer binder content: ISO 10581 Type 1</p> <p>Residual indentation : ≤ 0.10mm (EN ISO 24343-1)</p> <p>Clean Room Test : ASTM F51/00 Class A ISO 14644-1 ISO class 4</p> <p>Dimensional stability : ≤ 0.40% (EN ISO 23999)</p> <p>Reaction to fire: &gt; 8kW/m2 (EN ISO 9239-1 )</p> <p>Static electrical charge: &lt; 2 kV (EN 1815)</p> <p>Light fastness: ≥ level 7 (EN ISO 105-B02) Method 3a</p> <p>Chemical resistance: Excellent (EN ISO 26987)</p> <p>Slip Resistance: R9 (DIN 51130), ≤ 0.3 ( EN13893)</p> <p>Thermal resistance underfloor heating: 0.001 m2K / W max 27° C (EN 12667/DIN 52612)</p> <p style="text-align: right;">Suitable - Note:</p>		

		Pattern of flooring to be considered. Quantity to be taken as per site measurement before quoting		
7	Step edge nosings, beadings, trimmers etc.	Supply and installation of Step edge nosing and beading between vertical and horizontal surfaces from Dural or approved equivalent		
8	Partition with wooden acoustic panelling	Dry wall partition and wooden acoustic panelling from Anutone or equivalent. Supply and installation of dry wall partition using Anutone tubloc panels of 12mm thick in two layers on either side of a 50x50mm Aluminium framework. Anutone soundsynth 50mm thick is used as infill in the gap between the two boards. Joints are filled with jointing compound and fibre mesh tape. Over the partition, Supply & installation of Anutone Salon Slats made of pinewood E1 grade fiberboard, melamine/veneer laminated finish, groove perforated slats L16-2 - (2mm Slats @16mm pitch) / L32-2 - (2mm grooves @ 32mm centers) backlined with Soundtexblack acoustical fleece, tongue-groove edge for a seamless look, size 128x2440x16mm, volume density of base board 800Kg/m <sup>3</sup> , weight 8Kgs/m <sup>2</sup> (L16), installed by using Anutone Strut framework system. Anutone Strut framework system includes Anutone Strut CC25 aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Anutone Strut CC18 aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm & 27mm, depth 18mm and flanges of 7mm with suitable edge & centre brackets is then fixed perpendicular to the Strut CC25 Cross channel with the help of fasteners at every 400mm centers. Slats of size 128x 2440x16mm in then fixed perpendicular to CC18 with suitable edge & centre brackets. Short edges of the panel are staggered. Contractor to provide expansion joints of 3mm at every 4.88m length wise and 4.992m width wise. Panels are backlined with Anutone SynthPF 10x25		
9	Double glazing unit	Providing and fixing full height double glazed partition using 6mm glass on either sides and necessary teak wood beading support. The rate shall be inclusive of necessary hardwares etc complete including beading, polish etc complete. Including frosted film of approved design and shade of 3M make or equivalent.		
10	Flush door	Providing and fixing in position Single leaf solid core shutter made from 38mm thick marine grade block board thermo pressed with 12mm thick seasoned teak wood external lipping as per IS:2202 and finished in approved melamine polish. The external surfaces of the shutter to be finished in 1.5mm thick laminate on one side. The cost to include the following hardware (1) SS ball bearing hinges 4 Nos (2) Exposed Door closer (3) handle, lock. The rate to include providing Door frame using 110 x 75mm teak wood section for the same. Necessary provisions to be made to install specified acoustic material over the external door surface. Finished level to match with acoustic panel on adjacent surfaces		
11	Glass door	Supply and fixing of 12mm thick openable glass door in toughened clear glass with patch fittings, including all necessary hardware.  Make : Dorma or equivalent		
12	Acoustic cladding using Pinewood core panels	Acoustic cladding using pinewood core panels from Anutone or equivalent. Pinewood core panels supply & installation of Anutone Salon Slats made of pinewood E1 grade fiberboard, melamine/veneer laminated finish, groove perforated slats L16-2 - (2mm Slats @16mm pitch) / L32-2 - (2mm grooves @ 32mm centers) backlined with Soundtexblack acoustical fleece, tongue-		

		<p>groove edge for a seamless look, size 128x2440x16mm, volume density of base board 800Kg/m<sup>3</sup>, weight 8Kgs/m<sup>2</sup> (L16), installed by using Anutone Strut framework system. Anutone Strut framework system includes Anutone Strut CC25 aluminium core cross channel having thickness 0.55mm, length 3600mm, knurled web 40mm, depth 10mm and equal flanges 15mm is fastened to wall or framework behind vertically/horizontally at every 600mm c/c. Anutone Strut CC18 aluminium core cross channel, thickness 0.5mm, length 2400mm, web 15mm &amp; 27mm, depth 18mm and flanges of 7mm with suitable edge &amp; centre brackets is then fixed perpendicular to the Strut CC25 Cross channel with the help of fasteners at every 400mm centers. Slats of size 128x 2440x16mm in then fixed perpendicular to CC18 with suitable edge &amp; centre brackets. Short edges of the panel are staggered. Contractor to provide expansion joints of 3mm at every 4.88m length wise and 4.992m width wise. Panels are backlined with Anutone SynthPF 10x25.</p> <p>Technical Parameters :</p> <ul style="list-style-type: none"> <li>• Fire (Class) – 1 &amp; P (For FR grade)</li> <li>• Acoustics – NRC 0.77 (For E300* Mounting)</li> <li>• Thermal conductivity (W/mk)– na</li> <li>• Climate (°C, RH) – 50, 70</li> <li>• Light reflectance (%) – 75 (Maple Arce)</li> <li>• Green (VOC, RC %) – Low, 25</li> </ul>		
13	Acoustic cladding using fabric mounted glasswool core panels	<p>Acoustic cladding using fabric mounted glasswool core panels from Anutone or equivalent. Supply and installation of Anutone Acoustic wall fabric stretch system by using FR Grade fabric of size 1700mm width, shall be stretched by using infill of Synth PF 10X25 mm thick, rigid vinyl Stretch Tracks half wrap/full wrap 15mm (FS15) and Midseam 15mm (FS15), Strand board, Synth PF infill with requisite accessories &amp; tools. FS15 tracks to be installed on wooden base, after applying Stick S7 adhesive on both surfaces for a true and continuous secure grip, and heavy-duty fasteners at 150mm centers on one/both sides of Stretch Tracks. Anutone Strut framework system includes Anutone Strut FC50 GI Partition Channel of 50mm with SC48 Strut Channel. Strand3 Fibre square edge magnesite bonded pinewood fiber panels of size 600x1200x20mm having density 400 kg/m<sup>3</sup>, weight 4 kg which is fixed to the wall with suitable fasteners. Synth PF 10x25mm thick adhered on the strand panel by using adhesive. Fabric of width 1700mm, acoustically transparent to about 99% , is then aligned to the Stretch tracks by following the fabric thread line or pattern. The fabric is stretched and tucked into the Stretch tracks and secured into the locking jaws so that it will be smooth, free of wrinkles with the tucking tools. Note -minimum 50mm additional fabric is required for tucking hence maximum module wall fabric width would be 1600mm. Window openings to be closed with plywood and white laminate on the elevation side and on the inside with the fabric stretch system as above.</p> <p>Technical Parameter:</p> <ul style="list-style-type: none"> <li>• Fire (Class) – 1 &amp; P</li> <li>• Acoustics – NRC 0.85 (For 25mm C50 Mounting)</li> <li>• Thermal conductivity (W/mk)– 0.08</li> <li>• Climate (°C, RH) – 50, 90</li> <li>• Light reflectance (%) – colour dependant</li> <li>• Green (VOC, RC %) – Low, 30</li> </ul>		

14	800 mm wide Control room and service balcony door	800 mm wide Control room and service balcony door - single door (to be acoustically treated)		
15	1500mm Main doors - Double door	<p>1500mm Main doors - Double door (to be acoustically treated )</p> <p>Providing and fixing of Noise Reduction doors (make ENVIROTECH or approved Equivalent ) consisting of Door frame made out of good quality hard wood , section size – 100 mm x 110 mm fitted with ‘D’ type rubber gasket to block noise leakage from gap and acoustic door shutter with minimum 60 mm thickness along with fire rating and smoke Intumescent seal strip of size 10mm x 4mm for 120 minutes fire rated and STC 37dB</p> <p>Tested by reputed Laboratory and having infill of 50mm thick resin bonded glasswool of 48 kg/cum density sandwiched by two 10mm thick approved quality marine grade ply and finished with 1 mm thick laminate of approved make, shade and colour and design on both sides. Further edges of shutter shall be provided with 6mm thick teak wood beading using exterior quality synthetic adhesive, headless GI nails, screws, beading finished with approved melamine polish etc.</p> <p>The ply shall be resistant to vermin, mold growth, minor impact, abrasion and short term water attack and with a smooth surface suitable to receive most forms of decoration. The door shall have acoustic seal in door rebates and drop dead seal at the bottom of the door including ironmongeries.</p> <p>HARDWARE :-The door assembly shall be fixed to the door frame with heavy duty hardware i.e. Geze/ Assa abloy/Dorma Make or equivalent make SS Hinge Size: 4”x 3”x 3mm , 600 mm SS door handle , SS Tower bolt ,Door closer , Panic Bar ,Panic trim etc. ACOUSTIC INSULATION: The Panels filled with Acoustic material Rock wool confirming to IS-8183 of 96 kg/m3 density, very good noise absorber for high, mid &amp; low frequencies along with, 6 MM thick anti donning layer having Thermal Conductivity 0.037 @ 20 C as per EN ISO 8497 (DIN 52613) and 2 mm thick Sound Damping layer MTS 05- 303 to achieve higher Sound STC as per site condition.</p>		
16	False ceiling (size 1200x600x15mm)	<p>False ceiling from Saint Gobain or equivalent. Supply and Installation of Ecophon Advantage E - Tegular edge modular ceiling, 15 mm thickness,easily demountable tile , visible surface of each tile is 7 mm below the grid, manufactured from High density glass wool , visible surface is a batch painted glass tissue in white, back of the tile covered with glass tissue of size 1200x600x15mm compatible with T15 grid or silhouette of Gyproc make</p> <p>Acoustics-Sound absorption(Alpha W) - 0.95 at 200 mm o.d.s as per EN ISO 354</p> <p>Acoustics-Sound absorption Class - Class A at 200 mm o.d.s as per EN ISO 11654</p> <p>Acoustics-Articulation class - 180 as per ASTM E1111, ASTM E1110</p> <p>NRC - 0.9 NRC as per ASTM C 423</p> <p>Humidity Resistance -Permanent ambient RH up to 95% at 30*C without sagging, warping and delaminating ( 13964:2014).</p> <p>Fire Safety - Tested and classified as non combustible according to EN ISO 1182 with reaction to fire classification class A2 s1 d0 according to EN 13501-1 - European Standard.</p> <p>Light Reflectance - 83% light reflectance.</p>		
17	False ceiling (size 600x600x15mm)	False ceiling from Saint Gobain or equivalent. Supply and Installation of Ecophon Advantage E - Tegular edge modular ceiling, 15 mm thickness,easily demountable tile , visible surface of each tile is 7 mm below the grid,		

		<p>manufactured from High density glass wool , visible surface is a batch painted glass tissue in white, back of the tile covered with glass tissue of size 600x600x15mm compatible with T15 grid or silhouette of Gyproc make</p> <p>Acoustics-Sound absorption(Alpha W) - 0.95 at 200 mm o.d.s as per EN ISO 354</p> <p>Acoustics-Sound absorption Class - Class A at 200 mm o.d.s as per EN ISO 11654</p> <p>Acoustics-Articulation class - 180 as per ASTM E1111, ASTM E1110</p> <p>NRC - 0.9 NRC as per ASTM C 423</p> <p>Humidity Resistance -Permanent ambient RH up to 95% at 30*C without sagging, warping and delaminating ( 13964:2014).</p> <p>Fire Safety - Tested and classified as non combustible according to EN ISO 1182 with reaction to fire classification class A2 s1 d0 according to EN 13501-1 - European Standard.</p> <p>Light Reflectance - 83% light reflectance.</p>		
18	Vertical bands for stepped false ceiling	<p>Supply and Installation of gypsum board ceiling square edge, installed by using GI Strut ceiling framework.</p> <p>The GI Strut ceiling framework system shall include Strut WC25 Wall channel, fully knurled, sectional thickness 0.55mm, length 3600mm, unequal flanges of 20 &amp; 30mm and web of 25mm, fixed along the perimeters of the wall with nylon sleeves and suitable fasteners at every 300mm centers. Then suspend Strut MC45 Main channels, fully knurled, sectional thickness 0.8mm, length 3600mm, equal flanges of 15mm and web 45mm from the soffit at 1200mm centers with Strut SA25, fully knurled, Suspender angle with sectional thickness 0.55mm, unequal flanges of 25 &amp; 10mm. Strut CC25 Cross channel, fully knurled, sectional thickness 0.55mm, length 3600mm, web 35mm, depth of 20mm and equal flanges 15mm is fastened to the Strut MC45 perpendicularly at 600mm centers for upto RH70, at 400mm centers for RH70-RH90 and at 300mm centers for &gt;RH90. Gypsum board is installed on the Strut CC25 with suitable fasteners at 600/400/300mm centers. a 4mm gap should be maintained between adjacent boards on all sides and should be filled and finished with fiber mesh tape.</p>		
19	Special fixed glass with patch fitting	<p>Supplying and fixing of 12mm toughened clear glass with Patch Fittings . Including all necessary hardware and conceal all round with approved sealant.</p> <p>Make : Dorma</p>		
20	Student tables of width 375 mm, height 750mm	<p>Providing and fixing desk of specified size made of 18 mm thick BWR ply table top with adequate metal supports using MS hollow pipes in powder coated finish. The table top and exposed surfaces shall be finished with 1mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The modesty panel shall be finished with flexi ply finished using 1mm thick laminate. MS stiffener connecting the legs to be provided using CRCA sheet in powder coated finish as per drawings. Tables to be provided with book tray and provisions for power outlet, made using CRCA sheets bent to profile in powder coated finish, as per design. Table legs to be bolted to the ground using chemical fasteners of Hilti / Ruth of approved model and specifications. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply - Uniply, Laminate- Merino / Greenlam.</p>		
21	Table for faculty	<p>Providing and fixing desk of specified size made of 19 mm thick BWR ply</p>		

	(1200mm x 600mm x 750mm)	with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply- UniPLY, Laminate- Merino / Greenlam.		
22	Lectern for faculty (1000mm x 750mm x 750mm)	Providing and fixing desk of specified size made of 19 mm thick BWR ply with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply- UniPLY, Laminate- Merino / Greenlam.		
23	Table of size 2000mm x 600mm and height 750mm and ledge for control room	Providing and fixing desk of specified size made of 19 mm thick BWR ply with adequate wood supports. The table top and exposed surfaces shall be finished with 1 mm thick laminate of approved shade. Edges of the table top shall be finished using edge forming. The Apron shall be finished with flexi ply on 50mm thk framework. Rate inclusive of providing all necessary supports, adhesive and hardwares etc complete. Approved make of Ply - UniPLY, Laminate- Merino / Greenlam.		

## 2) Electrical works

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
1	<b>EARTHING</b>					
a	Copper wire No.10 SWG	ISI Grade	Rm	100		
b	Copper wire No.8 SWG		Rm	30		
2	<b>CABLE &amp; TRAYS</b>					
2.1	<b>Cable laying &amp; end termination</b>					
a	4C x 16Sq.mm cable XLPE Cable	KEI/ Polycab/Havells/RRKables/ Apar	Rm	60		
b	4C x 10 Sq.mm CU Wire		Rm	40		
c	4C x 1.5 CU Sq.mm cable for lighting		Rm	300		
2.2	<b>Cable End Termination</b>					
a	4C x 16 Sq.mm cable XLPE Cable	Dowell's/ Jaison/ Prabhat/ Lotus/Compaq	Each	4		
b	4C x 10 Sq.mm CU Wire		Each	4		
c	4.Cx 1.5 Sq.mm CU cable		Each	4		



<b>2.3</b>	<b>Cable tray</b>					
a	150mm x 50mm x 3mm Perforated cable tray	OBO/Equivalent	Rm	30		
<b>3</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>					
<b>3.1</b>	<b>Distribution Board - IP 43</b>					
a	Three phase 7 SEGMENT 8 way DB	ABB/Legrand/ Schneider/Great white	Each	1		
b	Three phase VERTICAL DB 8 way DB		Each	1		
<b>3.2</b>	<b>RCC /MCB/ MCCB</b>					
a	40A DP RCCB having a sensitivity of 30mA	ABB/Great white/Schneider/Legrand	Each	3		
b	6A - 32A SP D - curve 10kA MCB		Each	18		
c	6A - 32A SP B & C - curve 10kA MCB		Each	12		
d	40A FP MCB		Each	1		
e	63A FP MCB		Each	1		
<b>3.3</b>	<b>ISOLATOR</b>					
a	20A to 40A FP MCB	ABB/Great white/Schneider	Each	3		
<b>4</b>	<b>WIRING &amp; CONDUIT</b>					
<b>4.1</b>	<b>Wiring Light point</b>					
a	Rate to be quoted for Circuit length upto 5m	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	2		

<b>4.2</b>	<b>Wiring Light Point without control switch</b>					
a	Wiring Light Point without control switch	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	2		
<b>4.3</b>	<b>5A Plug points - independent position</b>					
a	5A Plug points - independent position	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	2		
<b>4.4</b>	<b>5A Plug points - combined position</b>					
a	5A Plug points - combined position	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	2		
<b>4.5</b>	<b>Table mounted socket</b>					
a	Table mounted socket	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great	Each	43		

		<p>White</p> <p>Wires:Power flex/Polycab/Anchor/Great White/RR Kables</p> <p>Conduits:Supreme/Precision /Aerocon/Anchor/Great White.</p> <p>Modular Boxes: Legrand/Schneider/Anchor/ Great White</p>				
<b>4.6</b>	<b>AC points - SPLIT AC</b>					
a	20A,DP switch	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White	Each	1		
b	20A Power socket	<p>Wires:Power flex/Polycab/Anchor/Great White/RR Kables</p> <p>Conduits:Supreme/Precision /Aerocon/Anchor/Great White.</p> <p>Modular Boxes: Legrand/Schneider/Anchor/ Great White</p>	Each	1		
<b>4.7</b>	<b>16A Power plug points</b>					
a	16A Power plug points	<p>Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White</p> <p>Wires:Power flex/Polycab/Anchor/Great White/RR Kables</p> <p>Conduits:Supreme/Precision /Aerocon/Anchor/Great White.</p> <p>Modular Boxes: Legrand/Schneider/Anchor/ Great White</p>	Each	18		
<b>4.8</b>	<b>Telephone Point</b>					
a	Telephone Point	<p>Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White</p> <p>Wires:Delton/ Finolex / Lapp India/RR Kables</p> <p>Conduits:Supreme/Precision /Aerocon/Anchor/Great</p>	Each	1		

		White. Modular Boxes: Legrand/Schneider/Anchor/ Great White				
<b>4.9</b>	<b>Data point</b>					
a	Data point	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Delton/ Finolex / Lapp India/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	4		
<b>4.10</b>	<b>Telecommunication</b>					
a	CAT 6 cable	Delton/ Finolex / Lapp India	Rm	120		
b	0.5 mm <sup>2</sup> telephone cable		Rm	100		
<b>4.11</b>	<b>Copper wire</b>					
a	2 Runs 4 sq.mm and 1 run of 2.5 sq.mm copper wire (Four table mounted sockets)	Power flex/Polycab/Anchor/Great White/RR Kables	Rm	400		
b	2 Runs 2.5 sq.mm. and 1 run 1.5mm <sup>2</sup> Cu wire (General 15a sockets- 2nos)		Rm	160		
c	3 Runs 1.5 sq.mm. Cu wire		Rm	20		
<b>4.12</b>	<b>PVC Conduit and accessories</b>					
a	20mm PVC Conduit (concealed/Floor)	Supreme/Precision/Aerocon /Anchor	Rm	150		
b	25mm PVC Conduit(concealed/Floor)		Rm	280		
<b>4.13</b>	<b>MS CONDUIT</b>					
a	20mm MS Conduit (Exposed)	Jindal/TATA/ISI Grade	Rm	20		
b	25mm MS Conduit (Exposed)		Rm	20		

<b>4.14</b>	<b>PVC Conduit and accessories</b>					
a	20mm PVC Conduit (concealed/Floor)	Supreme/Precision/Aerocon /Anchor	Rm	70		
b	25mm PVC Conduit(concealed/Floor)		Rm	150		
4.15	MS CONDUIT					
a	20mm MS Conduit (Exposed)	Jindal/TATA/ISI Grade	Rm	20		
b	25mm MS Conduit (Exposed)		Rm	20		
<b>5</b>	<b>LIGHTING FIXTURES,</b>					
a	2X2 LED Fitting with DALI Drive Recess mounted	Jaquar/Bajaj/Great white/Wipro	Each	14		
b	26W LED Fitting with DALI Drive Recess mounted		Each	19		
c	20W Wall mounted LED Fitting with DALI Drive		Each	4		
<b>6</b>	<b>ISOLATOR</b>					
a	40A 4P MCB with enclosure	Legrand/L&T/Schnider/ABB	Each	2		
<b>7</b>	<b>UPS</b>					
a	UPS	ABB/APC/Neumeric/Coun sul	Each	1		
Please refer to the list of approved makes for further references.						

#### DETAILED TECHNICAL SPECIFICATIONS

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
<b>1</b>	<b>EARTHING</b>	Supply, laying, fixing of earthing conductor of CU flat / wires jointing as per IS; 3043/87 in trench/ wall/pulling through pipes using bolts, nuts, washer, welding etc as required..(quantity considered tentatively as per site condition may be vary)		
a	Copper wire No.10 SWG			
b	Copper wire No.8 SWG			
<b>2</b>	<b>CABLE &amp; TRAYS</b>			

<b>2.1</b>	<b>Cable laying &amp; end termination</b>	Supplying and laying the following XLPE insulated PVC sheathed 1.1KV grade Aluminium armoured conductor cable conforming IS: 1554 (Part-I) in masonry cable trenches or on concrete wall or through pipes as per specifications. Necessary clamping should be provided while laying cables in trenches, Walls etc. as instructed by the Consultant		
a	4C x 16Sq.mm cable			
b	4C x 4 CU Sq.mm cable	Supply laying and clamping of 1No. XLPE sheathed armoured heavy duty power cable conductor of best conductivity copper (2XFY) 1.1KV grade strictly conforming to IS:1554 (Part-I) 1964 of the following sizes in cable tray/wall, existing pipes using factory made heavy gauge GI/painted MS clamps not exceeding 60cms making good the damages colour washing etc as required.		
c	4C x 1.5 CU Sq.mm cable for lighting			
<b>2.2</b>	<b>Cable End Termination</b>			
a	4C x 16Sq.mm cable	supplying and terminating Single compression gland type, Aluminium glands , earth clamps for XLPE insulated and PVC sheathed conductor cable 1.1kv grade and making end terminations suitable for 2/3/3.5/4 core cables of the following sizes as required		
b	4C x 10 sq mm CU wire			
c	4C x 1.5 Sq.mm cable			
<b>2.3</b>	<b>Cable tray</b>	Fabricating, supplying and erecting (ladder type/ perforated type) type cable tray as IS 61537 in various places for laying the cables, power/lighting/telephone/TV conduits etc with suitable angle iron/flat as required in welded construction to form continuous gap for fixing clamps with bolt, nut. Rate should also include for all bracket supports suspended from ceiling/ supported on walls with anchor bolts all as per requirement at site. Rate should include for all connected civil works for grouting the tray.		
a	150mm x 50mm x 3mm Perforated cable tray			
<b>3</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>			
<b>3.1</b>	<b>Distribution Board - IP 43</b>	Supply, installation, testing and commissioning of wall mounting type three phase 7-segment Distribution board with lockable front door of approved make and quality with cable end box etc as required suitable for Isolators/RCCB/MCCB as incomer and MCBs as out goings.(IP 43) in recess/in surface including cutting holes on the wall making good the damage colour washing etc. as required. The rate should include the cost of materials required for DB dressing like cable mount, cable ties, black tape, black buttons, end ferrules, stickers etc., complete.		
a	Three phase 7 SEGMENT 8 way DB			
b	Three phase VERTICAL DB 8 way DB			
<b>3.2</b>	<b>RCC /MCB/ MCCB</b>	Supply and fixing the following rating Circuit Breaker with over current & short circuit protection,in the existing MCB DB, complete with connections, testing and commissioning etc., as required.		
a	40A DP RCCB having a sensitivity of 30mA			
b	6A - 32A SP D - curve			

	10kA MCB			
c	6A - 32A SP B & C - curve 10kA MCB			
d	40A FP MCB			
e	63A FP MCB			
i	32A DP MCB			
<b>3.3</b>	<b>ISOLATOR</b>	Supply and installation of C - curve 10kA MCB in dust & vermin proof wall mounted metallic enclosure including cutting holes on the wall making good the damage colour washing etc. as required		
a	20A to 40A FP MCB			
<b>4</b>	<b>WIRING &amp; CONDUIT</b>			
<b>4.1</b>	<b>Wiring Light point</b>	Supplying all materials and wiring for light points/exhaust fan using 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, including supplying and fixing 6A modular type switch housed in a suitable factory made M.S box with moulded front plate including earthing the box, 3 plate ceiling rose etc. complete as required including rough plastering. (Colour coding to be followed Phase (Red, Yellow, Blue), Neutral- Black & Earth - Green) (length of circuit upto 5m length)		
a	Rate to be quoted for Circuit length upto 5m			
<b>4.2</b>	<b>Wiring Light Point without control switch</b>	Wiring for light point with 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires, run as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, in surface/recessed, 3 plate ceiling rose etc. complete as required Junction box to be provided below the beam bottom.(without control switch)(for group controlled light points)( Colour coding to be followed Phase(Red, Yellow, Blue), Neutral- Black & Earth - Green)		
a	Wiring Light Point without control switch			
<b>4.3</b>	<b>5A Plug points - independent position</b>	Supplying all materials and wiring for 5A plug points in independent positions including circuit mains using 3 runs of 1.5 mm <sup>2</sup> 650V grade PVC insulated FRLS copper conductor wire run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, and fixing 6A modular type 3 pin shuttered plug socket (2 in 1) controlled by 6A switch with moulded front plate, housed in a suitable factory built MS box. Giving connections, earthing the box,rough plastering etc complete as required. This circuit shall be looped to the lighting circuit.(circuit wire upto 10m length)		
a	5A Plug points - independent position			
<b>4.4</b>	<b>5A Plug points - combined position</b>	Supplying all materials and wiring for 5A plug points in combined positions using 1.5 sq.mm PVC insulated FRLS		

a	5A Plug points - combined position	copper conductor single core stranded wire run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, and fixing 6A modular type 3 pin shuttered plug socket (2 in 1) controlled by 6A switch with moulded front plate, housed in a suitable factory built MS box. Giving connections, earthing ,rough plastering etc complete as required. This circuit shall be looped to the lighting circuit.		
<b>4.5</b>	<b>Table mounted socket</b>	Supplying all materials and wiring for Table mounted 5A plugs points with switches- 2nos Sockets in combined positions complete with necessary accessories, box. Giving connections, earthing ,rough plastering etc complete as required.		
a	Table mounted socket			
<b>4.6</b>	<b>AC points - SPLIT AC</b>			
a	20A,DP switch	Supply and fixing 20A,DP switch for control housed in a suitable factory made Metal box (recessed) with frame, front plate etc including earthing the box etc. complete with connections, testing and commissioning etc as required		
b	20A Power socket	Supply and fixing 20A Power socket heavy duty for indoor AC unit housed in a suitable factory made MS box (recessed) with frame, front plate etc including earthing the box etc. complete with connections , testing and commissioning etc as required		
<b>4.7</b>	<b>16A Power plug points</b>	Supply and providing 16A combined modular type power plug socket (shuttered) controlled with 20A modular type switch, mounted on a suitable factory built MS box with earthing facility, giving interconnections etc as required.		
a	16A Power plug points			
<b>4.8</b>	<b>Telephone Point</b>	Supply and fixing telephone socket (telephone jack single line RJ 11) on suitable factory made Metal box (recessed)with frame, with face cover plate etc. complete required with connections, testing and commissioning as required		
a	Telephone Point			
<b>4.9</b>	<b>Data point</b>	Supply and fixing Data socket (Data jack - RJ 45) on suitable factory made Metal box (recessed)with frame, with face cover plate etc. complete required with connections, testing and commissioning as required		
a	Data point			
<b>4.10</b>	<b>Telecommunication</b>			
a	CAT 6 cable	Supply & drawing of CAT 6 cable for Data through existing conduit .(quantity considered tentatively as per site condition may be vary)		
b	0.5 mm <sup>2</sup> telephone cable	Supply and laying of following pair 0.5 mm <sup>2</sup> telephone cable through existing conduit/ pipe.(.(quantity considered tentatively as per site condition may be vary))		



<b>4.11</b>	<b>Copper wire</b>	Supply and wiring of following runs of FRLS PVC insulated, 1.1kV grade, copper conductor, stranded wires and copper bare earth wire drawn through existing suitable size ISI grade medium PVC conduit including rough plastering with all accessories as required. The earth wire shall be of green colour. (conduit separate item )		
a	2 Runs 4 sq.mm and 1 run of 2.5 sq.mm copper wire (Four table mounted sockets)			
b	2 Runs 2.5 sq.mm. and 1 run 1.5mm <sup>2</sup> Cu wire (General 15a sockets-2nos)			
c	3 Runs 1.5 sq.mm. Cu wire			
<b>4.12</b>	<b>PVC Conduit and accessories</b>	Supply and providing of the following size electrical grade ISI medium grade PVC pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided at every 6 meters and also to be provided below the beam bottom.		
a	20mm PVC Conduit (concealed/Floor)			
B	25mm PVC Conduit(concealed/Floor)			
<b>4.13</b>	<b>MS CONDUIT</b>	Supply and providing of the following size electrical grade ISI medium grade MS pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided at every 6 meters and also to be provided below the beam bottom.		
a	20mm MS Conduit (Exposed)			
b	25mm MS Conduit (Exposed)			
<b>4.14</b>	<b>PVC Conduit and accessories</b>	Supply and providing of the following size electrical grade ISI medium grade PVC pipe through wall, floor, ceiling, trays etc. including rough plating and the supply of all accessories as required. Junction boxes should be provided at every 6 meters and also to be provided below the beam bottom.		
a	20mm PVC Conduit (concealed/Floor)			
b	25mm PVC Conduit(concealed/Floor)			
4.15	MS CONDUIT			
a	20mm MS Conduit (Exposed)			
b	25mm MS Conduit (Exposed)			
<b>5</b>	<b>LIGHTING FIXTURES,</b>	Supply,Conveyance, Installation, testing and commissioning of prewired, light fittings/wall lamp including lamps of all types complete with all accessories etc. directly on ceiling including connection with, copper		
a	2X2 LED Fitting with DALI			

	Drive Recess mounted	cable etc. as required.		
b	26W LED Fitting with DALI Drive Recess mounted			
c	20W Wall mounted LED Fitting with DALI Drive			
<b>6</b>	<b>ISOLATOR</b>	Supply, installation, testing and commissioning of the following MCB isolator with Metallic Enclosure below mentioned ratings		
a	40A 4P MCB with Enclosure			
<b>7</b>	<b>UPS</b>	UPS 10KVA inbuilt Isolation Transformer 15 min backup with maintenance free sealed batteries.		
a	UPS	<p>Mode of operation: The UPS system should be designed to operate continuously at rated capacity in following modes (a) Normal operation (b) Battery operation (c) Recharge operation (d) By pass operation.</p> <p>Technical Specification: Input voltage -415 V AC 3 phase 4 wire, frequency 50HZ +/-5%, PF &gt;0.98 at full load.</p> <p>System output: Rated power : 10 KVA, output voltage 415 V three phase with frequency 50 HZ +/-0.1 Hz.</p> <p>Max voltage transient recovery time :10 millisecond to nominal. Overload 125-150% for 60 sec in normal operations. System efficiency 100% load: 95% in all load conditions. Acoustical noise: dB(A) of noise, typically measured at 1 meter from operator surface: not more than 67.</p> <p>Environment: storage ambient temp: 0 to 50 Deg Cel</p> <p>Operating ambient Temp : 0 to 40 Deg Cel.</p> <p>Relative Humidity: 5% to 95% max.</p> <p>Warranty : Complete UPS system and all other accessories of the system shall be warranty for 3 years the date of installation and successful running certified by IC&amp;SR. For Battery Bank min 3 years or higher based on manufacture.</p>		

2.1)

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
<b>1</b>	<b>CABLE &amp; TRAYS</b>					
<b>1.1</b>	<b>Cable laying &amp; end termination</b>					
a	4C x 10Sq.mm cable XLPE Cable	KEI/ Polycab/Havells/RRKables/Apar	Rm	15		
b	1C x 16 CU Sq.mm cable un armoured		Rm	60		
<b>1.2</b>	<b>Cable End Termination</b>					
a	4C x 10 Sq.mm XLPE Cable	Dowell's/ Jaison/ Prabhat/ Lotus/Compaq	Each	4		
b	1C x 16 CU Sq.mm cable		Each	16		
<b>1.3</b>	<b>Cable tray</b>					
a	600mm x 50mm x 3mm Perforated cable tray	OBO/Equivalent	Rm	2		
b	300mm x 50mm x 3mm Perforated cable tray		Rm	2		
<b>2</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>					
<b>2.1</b>	<b>Distribution Board - IP 43</b>					
a	Three phase 4 way DB	ABB/Legrand/ Schneider/Great white	Each	1		
b	Single phase 12 way DB		Each	1		
<b>2.2</b>	<b>RCC /MCB/ MCCB</b>					
a	20A DP RCCB having a sensitivity of 30mA	ABB/Great white/Schneider/Legrand	Each	3		
b	32A DP RCCB having a sensitivity of 30mA		Each	3		
c	20A DP MCB		Each	2		
d	32A DP MCB		Each	2		

<b>3</b>	<b>WIRING &amp; CONDUIT</b>					
<b>3.1</b>	<b>Wiring Light point</b>					
a	Rate to be quoted for Circuit length upto 10m	Switches/Sockets:Legrand/A BB/ Schneider/LnT/Great White  Wires:Power flex/Polycab/Anchor/Great White/RR Kables  Conduits:Supreme/Precision /Aerocon/Anchor/Great White.  Modular Boxes: Legrand/Schneider/Anchor/ Great White	Each	2		
b	Rate to be quoted for Circuit length upto 15m		Each	2		
<b>3.2</b>	<b>Telecommunication</b>					
a	RG 6 cable	Delton/ Finolex / Lapp India	Rm	10		
<b>3.3</b>	<b>POWER &amp; DATA RACEWAY</b>					
a	300mm x 38mm raceway	OBO Betterman/legrand/Cape Electric	Rm	15		
b	225mm x 38mm raceway		Rm	20		
c	150mm x 38mm raceway		Rm	20		
d	100mm x 38mm raceway		Rm	40		
e	50mm x 38mm raceway		Rm	18		
<b>3.4</b>	<b>Junction Box</b>					
a	100mm x 100mm x 65mm	OBO Betterman/legrand/Cape Electric	Each	8		
b	150mm x 150mm x 65mm		Each	1		
c	225mm x 225mm x 65mm		Each	1		
d	300mm x 300mm x 65mm		Each	1		
<b>4</b>	<b>LIGHTING FIXTURES,</b>					
a	1X4 LED Fitting with DALI Drive Recess mounted	Jaquar/Bajaj/Great white/Wipro	Each	1		
b	26W LED Fitting with DALI Drive Recess mounted		Each	1		

c	20W Wall mounted LED Fitting with DALI Drive		Each	1		
<p>Please refer to the list of approved makes for further references.</p> <p>Note: i)All these items are optional and to be mandatorily quoted by bidders. IITM reserves rights to consider for purchase as per our requirements.</p> <p>ii)Optional items will not be considered for price bid evaluation.</p>						

### DETAILED TECHNICAL SPECIFICATIONS

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
<b>1</b>	<b>CABLE &amp; TRAYS</b>			
<b>1.1</b>	<b>Cable laying &amp; end termination</b>	Supplying and laying the following XLPE insulated PVC sheathed 1.1KV grade Aluminium armoured conductor cable conforming IS: 1554 (Part-I) in masonry cable trenches or on concrete wall or through pipes as per specifications. Necessary clamping should be provided while laying cables in trenches, Walls etc. as instructed by the Consultant		
a	4C x 10Sq.mm cable			
b	1C x 16 CU Sq.mm cable un armoured		Supply laying and clamping of 1No. XLPE sheathed armoured heavy duty power cable conductor of best conductivity copper (2XFY) 1.1KV grade strictly conforming to IS:1554 (Part-I) 1964 of the following sizes in cable tray/wall, existing pipes using factory made heavy gauge GI/painted MS clamps not exceeding 60cms making good the damages colour washing etc as required.	
<b>1.2</b>	<b>Cable End Termination</b>			
a	4C x 10Sq.mm cable	supplying and terminating Single compression gland type, Aluminium glands , earth clamps for XLPE insulated and PVC sheathed conductor cable 1.1kv grade and making end terminations suitable for 2/3/3.5/4 core cables of the following sizes as required		
b	1C x 16 CU Sq.mm cable			
<b>1.3</b>	<b>Cable tray</b>	Fabricating, supplying and erecting (ladder type/ perforated type) type cable tray as IS 61537 in various places for laying the cables, power/lighting/telephone/TV conduits etc with suitable angle iron/flat as required in welded construction to form continuous gap for fixing clamps with bolt, nut. Rate should also include for all bracket supports suspended from ceiling/ supported on walls with anchor bolts all as per requirement at site. Rate should include for all connected civil works for grouting the tray.		
a	600mm x 50mm x 3mm Perforated cable tray			
b	300mm x 50mm x 3mm Perforated cable tray			
<b>2</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>			

<b>2.1</b>	<b>Distribution Board - IP 43</b>	Supply, installation, testing and commissioning of wall mounting type three phase 7-segment Distribution board with lockable front door of approved make and quality with cable end box etc as required suitable for Isolators/RCCB/MCCB as incomer and MCBs as out goings.(IP 43) in recess/in surface including cutting holes on the wall making good the damage colour washing etc. as required. The rate should include cost of materials required for DB dressing like cable mount, cable ties, black tape, black buttons, end ferrules, stickers etc., complete.		
a	Three phase 4 way DB			
b	Single phase 12 way DB			
<b>2.2</b>	<b>RCC /MCB/ MCCB</b>	Supply and fixing the following rating Circuit Breaker with over current & short circuit protection,in the existing MCB DB, complete with connections, testing and commissioning etc., as required.		
a	20A DP RCCB having a sensitivity of 30mA			
b	32A DP RCCB having a sensitivity of 30mA			
c	20A DP MCB			
d	32A DP MCB			
<b>3</b>	<b>WIRING &amp; CONDUIT</b>			
<b>3.1</b>	<b>Wiring Light point</b>	Supplying all materials and wiring for light points/exhaust fan using 3 runs of 1.5 mm <sup>2</sup> 1.1kV grade PVC insulated FRLS copper conductor single core stranded wires run continuously as per IS through ISI grade medium gauge rigid PVC conduits concealed in wall / slab etc, complete with necessary accessories, including supplying and fixing 6A modular type switch housed in a suitable factory made M.S box with moulded front plate including earthing the box, 3 plate ceiling rose etc. complete as required including rough plastering. (Colour coding to be followed Phase (Red, Yellow, Blue), Neutral- Black & Earth - Green) (length of circuit upto 5m length)		
a	Rate to be quoted for Circuit length upto 10m			
b	Rate to be quoted for Circuit length upto 15m			
<b>3.2</b>	<b>Telecommunication</b>			
a	RG 6 cable	Supply & drawing of RG 6 cable for television through existing conduit		
<b>3.3</b>	<b>POWER &amp; DATA RACEWAY</b>	Supply and fixing of covered Raceway with horizontal & vertical bends, reducers, Tee's, cross over , suitable supports and brackets and other accessories as required. The raceways shall be anti corrosive powder coated with RAL 7032( Siemens grey . The raceways shall be of 14 G thickness and shall have a welded GI slotted angle at every 1.5m for tying the cables as well as clamping the body earthing GI earthing strips. The raceways shall be joined together with powder coated anti corrosive GI plates and cadmium coated anti corrosive bolts and nuts .Raceway poles only should be used to drop down the		
a	300mm x 38mm raceway			
b	225mm x 38mm raceway			
c	150mm x 38mm raceway			
d	100mm x 38mm raceway			

e	50mm x 38mm raceway	cables. Do not clamp the raceways onto the wall or to the partition and also do not bury any cables within the wall or the partition . The IS standard for powder coating IS 13871. No warping, & raceways shall be temperature resistant only.		
<b>3.4</b>	<b>Junction Box</b>	Supply,laying,testing and commissioning of Raceway		
a	100mm x 100mm x 65mm			
b	150mm x 150mm x 65mm			
c	225mm x 225mm x 65mm			
d	300mm x 300mm x 65mm			
<b>4</b>	<b>LIGHTING FIXTURES,</b>	Supply,Conveyance, Installation, testing and commissioning of prewired, light fittings/wall lamp including lamps of all types complete with all accessories etc. directly on ceiling including connection with, copper cable etc. as required.		
a	1X4 LED Fitting with DALI Drive Recess mounted			
b	26W LED Fitting with DALI Drive Recess mounted			
c	20W Wall mounted LED Fitting with DALI Drive			
<b>5</b>	<b>AMC onsite</b> for a period of 4 <sup>th</sup> &5 <sup>th</sup> year beyond 3 years warranty period to be quoted for 10Kva UPS on the basis of 4 periodic maintenance's in a year			

### 3) HVAC Works

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
<b>A</b>	<b>AIR DISTRIBUTION SYSTEM</b>					
1	Factory fabricated GSS Ducting					
1.1	24 G	ROLASTAR / ZECO / GP SPIRA / EQUIVALENT - SHEET FROM TATA & JINDAL	sqm	50		
1.2	22G	ROLASTAR / ZECO / GP SPIRA / EQUIVALENT - SHEET FROM TATA & JINDAL	sqm	100		
2	multi blade, motorized Fire Dampers with spring return	BELIMO / HONEYWELL / SIEMENS	sqm	1.5		

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
	actuator					
3	Factory fabricated Volume control dampers	SYSTEM AIR / DYNACRAFT/CARYAIRE/AIRMASTER	sqm	3		
4	single deflection 1250x150mm Supply Linear Grille	RUSKIN / SYSTEM AIR / AIR MASTER / COSMOS / CARYAIRE	sqm	2		
5	Return Linear Grille	RUSKIN / SYSTEM AIR / AIR MASTER / COSMOS / CARYAIRE	sqm	2		
6	Pressure Independent Variable Air Volume Terminals	COSMOS / RUSKIN TITUS /CARYAIRE / TROX / AIR MASTER	nos	1		
<b>B</b>	<b>SPLIT UNITS - Minimum 3 Star Rated Energy saving Type</b>					
1	Nominal Capacity -1.0 TR - Wall mounted Type	BLUE STAR / DAIKIN / LG	nos	1		
2	MS support works:		kg	50		
<b>C</b>	<b>INSULATION</b>					
1	Thermal Insulation of inside lab supply/Return air ducts	ARMACELL/ KFLEX / AEROFLEX / ARMAFLEX / VIDO FEX / TROCELLEN				
a	19mm thick for supply air ducts for labs		sqm	135		
b	13mm thick for return air ducts for labs		sqm	15		
2	Duct acoustic liner with open cell Nitrile foam soft rubber	ARMACELL/ KFLEX / AEROFLEX / ARMAFLEX / VIDO FEX / TROCELLEN	sqm	130		
Please refer to the list of approved makes for further references.						



**DETAILED TECHNICAL SPECIFICATIONS**

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
A	<b>AIR DISTRIBUTION SYSTEM</b>			
1	Factory fabricated GSS Ducting	Factory fabricated GSS Ducting (Box ducts only) made of Lock-forming quality GSS complying with IS: 277, pressure classes from minus 500 to plus 2500 Pa and having 120GSM coating classification, with TDF Flanges, corner saddles, guide vanes, inside lab hot dipped galvanised threaded rod and L-angle duct supports, cleat joints, food grade gaskets, VOC free adhesives bolts & nuts. sealing around the duct at wall crossings. No fabrication at site. Ducts should be supplied, stored and installed with polythene sheets wrapped around and the open ends are sealed from the factory. Angle frames should be used for above 1200mm wide duct joints. If used, angle frames shall be painted with red oxide primer and finished with enamel paint. Duct leakage pressure & Light test is must for all ducting works.		
1.1	24 G			
1.2	22G			
2	multi blade, motorized Fire Dampers with spring return actuator	Supply, installation, testing & commissioning of multi blade, motorised Fire Dampers with spring return actuator. The damper shall be of at least 120 minutes fire rating with minimum 450 mm duct sleeve. The damper shall be as per UL 555S; 1995 classified and UL approved. The damper shall be constructed out of 16G galvanised sheet steel. It shall be complete with control panel, actuator, sensor and interlocking / wiring / connection for tripping of AHU fan motor. the vendor should furnish the UL test certificate at the time of delivery & UL symbol should be there in all fire dampers.		
3	Factory fabricated Volume control dampers	Supply, installation, testing & commissioning of Factory fabricated Volume control dampers of 1.2mm thick Aluminium blades, 150mm depth, extended linkage rods for manual operation, channels, flanges suitable for duct mounting and with a manual operating handle. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration & engraved marking on position of damper.		
4	single deflection 1250x150mm Supply Linear Grille	Powder coated Aluminium extruded single deflection 1250x150mm Supply Linear Grille. The color & pattern shall be pre-approved by Architects.		
5	Return Linear Grille	Powder coated Aluminium extruded 600x150mm Return Linear Grille. The color & pattern shall be pre-approved by Architects.		
6	Pressure Independent Variable Air Volume	Pressure Independent Variable Air Volume Terminals RECTANGLE boxes with damper actuator, multi point pick-up		

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
	Terminals	<p>inlet air flow velocity sensor,differential pressure transmitter,WALL MOUNTED DIGITAL thermostat &amp; step-down transformer,unit casing shall be G.S.S.22G with internal lining 15mm thk density 140kg/m<sup>2</sup>open cell insulation or 25mm thk density 48 kg/m<sup>2</sup> with rptissue,programmable controller with bacnet protocol or BACnet MS/TP/factory calibrated to operate 30 to 100%.(Each VAV box to be tested and the volume V min and V max flow rates set in the Factory,minimum and maximum volume flow rate settings are to be also adjustable on site during commissioning to be done by the manufacturer authorized engineer and warranty certificate to be issued by the manufacturer authorized engineer. Velocity sensor to be covered at factory with GI flexible sleeves before dispatch-no color other than GI shall be allowed on the VAV box.</p> <p>Price shall be inclusive of FRLS copper power cabling from power cabling from VAV to socket &amp; plug top and copper control wiring from thermostat as required in GI conduit.</p> <p>VAV should be integrated with in the ducts i.e. VAV size should be same as of duct it would be installed in, Also should be integrated with existing AHU</p>		
<b>B</b>	<b>SPLIT UNITS - Minimum 3 Star Rated Energy saving Type</b>	<p>Supply, Installation, Testing &amp; Commissioning air cooled split air conditioners with hermetically sealed, swing type compressors having one outdoor unit &amp; one indoor unit, stand required for mounting the outdoor unit and complete with required refrigerant pipes,Condensate drain pipe, stabilizer &amp; power cabling required.(15 Rmt/unit including suction and liquid line) with insulation. The indoor and outdoor units shall be provided with ribbed rubber pad vibration isolators.</p> <p>Refrigerant : Ozone friendly HFC</p>		
1	Nominal Capacity -1.0 TR - Wall mounted Type			
2	MS support works:	<p>MS support with one coat of epoxy paint over &amp; above two coats of anti-corrosive red oxide paint. This support is considered only for external ducts like vertical riser ducts, Technical area and ducts on terrace (Internal duct support is part of ducting line items). All supports as per TDS.</p>		
<b>C</b>	<b>INSULATION</b>			
1	Thermal Insulation of inside lab supply/Return air ducts	<p>Thermal Insulation of inside lab supply/Return air ducts - (CLASS 'O' ) closed cell Nitrile foam soft rubber faced with aluminum foil The density of nitrile rubber shall be 65-70Kg/Cum.The material should have a thermal conductivity not exceed 0.0351 W/m<sup>2</sup>K with VOC free self adhesive and Al tape.</p>		
a	19mm thick for supply air ducts for labs			

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
b	13mm thick for return air ducts for labs			
2	Duct acoustic liner with open cell Nitrile foam soft rubber	Duct acoustic liner shall be with open cell Nitrile foam soft rubber - 15 mm thick of 140-180 Kg/cum density. The material should have a thermal conductivity not exceeding 0.050 W/mK. with VOC free self adhesive and AI tape		

#### 4) Fire Alarm system works

Sr#	Description	Make	UoM	Qty	Comply / Not Comply	Ref. Page No.
1	Analogue Addressable Fault isolator	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	1		
2	Addressable Input Modules	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	3		
3	Analogue Addressable Control dual relay module	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	2		
4	Addressable Horn with Strobe including Control module	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	2		
5	24V / 5A Power supply unit		nos	2		
6	Addressable Manual call point	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	2		
7	FRLS ARMoured cable. 2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )	Power flex/Anchor / polycab / finolex	Rmt	100		
8	MS conduits, 25 mm dia.	ISI Grade	Rmt	20		
9	Analogue addressable Response Indicator with base	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	4		
10	Analogue addressable Smoke Detector with base	Siemens/Notifier/GST/Hochiki/Schneider / Honeywell	nos	8		
Please refer to the list of approved makes for further references.						

**DETAILED TECHNICAL SPECIFICATIONS**

Sr#	Description	Specification	Comply / Not Comply	Ref. Page No.
1	Analogue Addressable Fault isolator	Supply, Installation, Testing, and Commissioning of Analogue Addressable Fault isolator base capable of monitoring shorted loop circuit and automatically restore communications when shorted conditions are corrected, Built-in LED indication upon short circuit condition, Operating Voltage 17 - 41 VDC, Current Consumption Normal: 160µA , Active: 10mA		
2	Addressable Input Modules	<p>Supply, Installation, Testing, and Commissioning of "Addressable Input Modules", UL Listed. Inputs modules shall be used for Monitoring the Power supply units, Fire Sprinkler valve supervision, and base builder integration, Fast, reliable contact monitoring utilizing the Digital Communications Protocol, can be programmed to monitor Normally Open (NO) or Normally Closed (NC) contacts, electronic addressing, rotary switch or DIP switch not acceptable.</p> <p>Operates on Class A or Class B loop. The module should be supported independently of their attachment to wirings using necessary mounting GI 4 X 4 Junction Box with cable gland, clamps/brass screws etc for mounting at True ceiling, as per the drawing.</p>		
3	Analogue Addressable Control dual relay module	Supply, Installation, Testing, and Commissioning of Analogue Addressable Control dual relay module for tripping HVAC units, Lift's,. and shall be capable of providing SPDTcontact rated at 30v DC, 2A. electronic addressing, rotary switch or DIP switch not acceptable, Dual Relay Module allows independent control of two form contacts for a variety of normally open and normally closed contact applications. Visible Bi-colored LED is software controlled and can be programmed to blink red or green when polled. The LED can be latched on when activated.Programming is highly flexible providing 16 priority states plus zoning capability. Operates on Class A or Class B loop		
4	Addressable Horn with Strobe including Control module	Supply, Installation, Testing, and Commissioning of Addressable Horn with Strobe including Control module wall mounted type rated at 82 dBA @ 3m for Audible annunciation and Fixed candela options of 15/75 and 177 visual indication. The quoted rate shall include Metal Boxes to fix the Horn, switch for continuous or temporal.		
5	24V / 5A Power supply unit	Supply, Installation, Testing, and Commissioning of "24V / 5A Power supply unit",UL Listed for power the hooter cum strobe modules. The vendor shall specify the capacity and quantity as required based on their respective technical requirements. The Power supply unit should be supported independently of their attachment to wirings using necessary wall & column mounting support, clamps/brass screws,etc.		
6	Addressable Manual call point	Supply, Installation, Testing, and Commissioning of Addressable Manual call point having an integrally mounted addressable module that monitors and reports contact status, single action		

		type, EPROM addressable, electronic addressing, rotary switch or DIP switch not acceptable. The quoted rate shall include Metal Boxes to fix the Horn. Operating Voltage (SLC) 17~41 VDC, Average Current Consumption 550uA (Typical) or 660uA (Alarm). Ambient Temperature (0 °C) - (49°C). Maximum Humidity 90% RH, non-condensing		
7	FRLS ARMOURED cable. 2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )	Supplying, installing, testing and commissioning of FRLS ARMOURED cable Fire survival at 750°C for 2hours (Minimum)) confirming to IS standards and specifications. (Outer sheath of the cable to be red).  2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )		
8	MS conduits, 25 mm dia.	Supplying, installing, testing and commissioning approved make MS conduits on ceiling / wall / floor etc. complete with accessories like, Junction boxes, Collars, Bends etc. The quoted rate shall also include for chasing /chipping walls, making bore holes in walls / floor and making them good with filler material and finished in cement mortar etc. Complete.  25 mm dia.		
9	Analogue addressable Response Indicator with base	Analogue addressable Response Indicator with base.It shall meet the UL standard		
10	Analogue addressable Smoke Detector with base	Analogue addressable Smoke Detector with base.It shall meet the UL standard		

## ANNEXURE - 5

## Civil, Interior finishes, and Electrical &amp; Mechanical Works for the Smart Classroom at 3rd Floor, NAC, IITM

## PROFORMA FORMAT FOR FINANCIAL BID (BOQ) FORMAT

Tender No: CE/RAVI/102/2023/SMARTCLASS

\*\*\*All values should be in INR

## 1) Civil &amp; Interior Works

Sr#	Description	UoM	Qty	Rate Per Unit	Total Cost without Tax	GST	Total Cost with Tax
1	Autoclaved Aerated Cement ( AAC) Block masonry (floor gallery)	cum	27				
2	PCC layer above aerocon steps	cum	9				
3	AAC Blockwork (wall)	cum	11				
4	Plastering of new blockwork	sqm	126				
5	Painting	sqm	126				
6	Vinyl flooring	sqm	274				
7	Step edge nosing, beading, trimmers etc.	rm	168				
8	Partition with wooden acoustic panelling	sqm	54				
9	Double glazing unit	sqm	12				
10	Flush door	sqm	2				
11	Glass door	sqm	2				
12	Acoustic cladding using Pinewood core panels	sqm	83				
13	Acoustic cladding using fabric mounted glasswool core panels	sqm	90				
14	800 mm wide Control room and service balcony door	sqm	2				
15	1500mm Main doors -	sqm	7				

	Double door						
16	False ceiling (size 1200x600x15mm)	sqm	163				
17	False ceiling (size 600x600x15mm)	sqm	27				
18	Vertical bands for stepped false ceiling	sqm	19				
19	Special fixed glass with patch fitting	sqm	26				
20	Student tables of width 375 mm, height 750mm	rm	60				
21	Table for faculty (1200mm x 600mm x 750mm)	no	1				
22	Lectern for faculty (1000mm x 750mm x 750mm)	no	1				
23	Table of size 2000mm x 600mm and height 750mm and ledge for control room	no	2				

## 2) Electrical works

Sr#	Description	UoM	Qty	Rate Per Unit	Total Cost without Tax	GST	Total Cost with Tax
<b>1</b>	<b>EARTHING</b>						
a	Copper wire No.10 SWG	Rm	100				
b	Copper wire No.8 SWG	Rm	30				
<b>2</b>	<b>CABLE &amp; TRAYS</b>						
<b>2.1</b>	<b>Cable laying &amp; end termination</b>						
a	4C x 16Sq.mm cable XLPE Cable	Rm	60				
b	4C x 10 Sq.mm CU wire	Rm	40				
c	4C x 1.5 CU Sq.mm cable for lighting	Rm	300				
<b>2.2</b>	<b>Cable End Termination</b>						

a	4C x 16 Sq.mm cable XLPE Cable	Each	4				
b	4C x 10 Sq.mm CU Wire	Each	4				
c	4C x 4CU Sq.mm cable	Each	4				
<b>2.3</b>	<b>Cable tray</b>						
a	150mm x 50mm x 3mm Perforated cable tray	Rm	30				
<b>3</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>						
<b>3.1</b>	<b>Distribution Board - IP 43</b>						
a	Three phase 7 SEGMENT 8 way DB	Each	1				
b	Three phase VERTICAL DB 8 way DB	Each	1				
<b>3.2</b>	<b>RCC /MCB/ MCCB</b>						
a	40A DP RCCB having a sensitivity of 30mA	Each	3				
b	6A - 32A SP D - curve 10kA MCB	Each	18				
c	6A - 32A SP B & C - curve 10kA MCB	Each	12				
d	40A FP MCB	Each	1				
e	63A FP MCB	Each	1				
<b>3.3</b>	<b>ISOLATOR</b>						
a	20A to 40A FP MCB	Each	3				
<b>4</b>	<b>WIRING &amp; CONDUIT</b>						
<b>4.1</b>	<b>Wiring Light point</b>						
a	Rate to be quoted for Circuit length upto 5m	Each	2				
<b>4.2</b>	<b>Wiring Light Point without control switch</b>						
a	Wiring Light Point without control switch	Each	2				



<b>4.3</b>	<b>5A Plug points - independent position</b>						
a	5A Plug points - independent position	Each	2				
<b>4.4</b>	<b>5A Plug points - combined position</b>						
a	5A Plug points - combined position	Each	2				
<b>4.5</b>	<b>Table mounted socket</b>						
a	Table mounted socket	Each	43				
<b>4.6</b>	<b>AC points - SPLIT AC</b>						
a	20A,DP switch	Each	1				
b	20A Power socket	Each	1				
<b>4.7</b>	<b>16A Power plug points</b>						
a	16A Power plug points	Each	18				
<b>4.8</b>	<b>Telephone Point</b>						
a	Telephone Point	Each	1				
<b>4.9</b>	<b>Data point</b>						
a	Data point	Each	4				
<b>4.10</b>	<b>Telecommunication</b>						
a	CAT 6 cable	Rm	120				
b	0.5 mm <sup>2</sup> telephone cable	Rm	100				
<b>4.11</b>	<b>Copper wire</b>						
a	2 Runs 4 sq.mm and 1 run of 2.5 sq.mm copper wire (Four table mounted sockets)	Rm	400				
b	2 Runs 2.5 sq.mm. and 1 run 1.5mm <sup>2</sup> Cu wire (General 15a sockets- 2nos)	Rm	160				
c	3 Runs 1.5 sq.mm. Cu wire	Rm	20				

<b>4.12</b>	<b>PVC Conduit and accessories</b>						
a	20mm PVC Conduit (concealed/Floor)	Rm	150				
b	25mm PVC Conduit(concealed/Floor)	Rm	280				
<b>4.13</b>	<b>MS CONDUIT</b>						
a	20mm MS Conduit (Exposed)	Rm	20				
b	25mm MS Conduit (Exposed)	Rm	20				
<b>4.14</b>	<b>PVC Conduit and accessories</b>						
a	20mm PVC Conduit (concealed/Floor)	Rm	70				
b	25mm PVC Conduit(concealed/Floor)	Rm	150				
<b>4.15</b>	<b>MS CONDUIT</b>						
a	20mm MS Conduit (Exposed)	Rm	20				
b	25mm MS Conduit (Exposed)	Rm	20				
<b>5</b>	<b>LIGHTING FIXTURES,</b>						
a	2X2 LED Fitting with DALI Drive Recess mounted	Each	14				
b	26W LED Fitting with DALI Drive Recess mounted	Each	19				
c	20W Wall mounted LED Fitting with DALI Drive	Each	4				
<b>6</b>	<b>ISOLATOR</b>						
a	40A 4P MCB with Enclosure	Each	2				
<b>7</b>	<b>UPS</b>						
a	UPS	Each	1				

## 2.1) Electrical Optional Items

Sr#	Description	UoM	Qty	Rate Per Unit	Total Cost without Tax	GST	Total Cost with Tax
<b>1</b>	<b>CABLE &amp; TRAYS</b>						
<b>1.1</b>	<b>Cable laying &amp; end termination</b>						
a	4C x 10Sq.mm cable XLPE Cable	Rm	15				
b	1C x 16 CU Sq.mm cable un armoured	Rm	60				
<b>1.2</b>	<b>Cable End Termination</b>						
a	4C x 10 Sq.mm XLPE Cable	Each	4				
b	1C x 16 CU Sq.mm cable	Each	16				
<b>1.3</b>	<b>Cable tray</b>						
a	600mm x 50mm x 3mm Perforated cable tray	Rm	2				
b	300mm x 50mm x 3mm Perforated cable tray	Rm	2				
<b>2</b>	<b>DISTRIBUTION BOARDS &amp; BREAKERS</b>						
<b>2.1</b>	<b>Distribution Board - IP 43</b>						
a	Three phase 4 way DB	Each	1				
b	Single phase 12 way DB	Each	1				
<b>2.2</b>	<b>RCC /MCB/ MCCB</b>						
a	20A DP RCCB having a sensitivity of 30mA	Each	3				
b	32A DP RCCB having a sensitivity of 30mA	Each	3				
c	20A DP MCB	Each	2				
d	32A DP MCB	Each	2				
<b>3</b>	<b>WIRING &amp; CONDUIT</b>						

<b>3.1</b>	<b>Wiring Light point</b>						
a	Rate to be quoted for Circuit length upto 10m	Each	2				
b	Rate to be quoted for Circuit length upto 15m	Each	2				
<b>3.2</b>	<b>Telecommunication</b>						
a	RG 6 cable	Rm	10				
<b>3.3</b>	<b>POWER &amp; DATA RACEWAY</b>						
a	300mm x 38mm raceway	Rm	15				
b	225mm x 38mm raceway	Rm	20				
c	150mm x 38mm raceway	Rm	20				
d	100mm x 38mm raceway	Rm	40				
e	50mm x 38mm raceway	Rm	18				
<b>3.4</b>	<b>Junction Box</b>						
a	100mm x 100mm x 65mm	Each	8				
b	150mm x 150mm x 65mm	Each	1				
c	225mm x 225mm x 65mm	Each	1				
d	300mm x 300mm x 65mm	Each	1				
<b>4</b>	<b>LIGHTING FIXTURES,</b>						
a	1X4 LED Fitting with DALI Drive Recess mounted	Each	1				
b	26W LED Fitting with DALI Drive Recess mounted	Each	1				
c	20W Wall mounted LED Fitting with DALI Drive	Each	1				
<b>5</b>	<b>AMC onsite for a period of 4<sup>th</sup> &amp; 5<sup>th</sup> year beyond 3 years warranty period to be quoted for 10Kva UPS on the basis of 4 periodic maintenance's in a year</b>						

**Note : Optional items to be mandatorily quoted and it will be not considered for price bid evaluation.**

### 3) HVAC Works

Sr#	Description	UoM	Qty	Rate Per Unit	Total Cost without Tax	GST	Total Cost with Tax
<b>A</b>	<b>AIR DISTRIBUTION SYSTEM</b>						
1	Factory fabricated GSS Ducting						
1.1	24 G	sqm	50				
1.2	22G	sqm	100				
2	multi blade, motorized Fire Dampers with spring return actuator	sqm	1.5				
3	Factory fabricated Volume control dampers	sqm	3				
4	single deflection 1250x150mm Supply Linear Grille	sqm	2				
5	Return Linear Grille	sqm	2				
6	Pressure Independent Variable Air Volume Terminals	nos	1				
<b>B</b>	<b>SPLIT UNITS - Minimum 3 Star Rated Energy saving Type</b>						
1	Nominal Capacity -1.0 TR - Wall mounted Type	nos	1				
2	MS support works:	kg	50				
<b>C</b>	<b>INSULATION</b>						
1	Thermal Insulation of inside lab supply/Return air ducts						
a	19mm thick for supply air ducts for labs	sqm	135				
b	13mm thick for return air ducts for labs	sqm	15				
2	Duct acoustic liner with open cell Nitrile foam soft rubber	sqm	130				

#### 4) Fire Alarm system works

Sr#	Description	Uo M	Qty	Rate Per Unit	Total Cost without Tax	GST	Total Cost with Tax
1	Analogue Addressable Fault isolator base	nos	1				
2	Addressable Input Modules	nos	3				
3	Analogue Addressable Control dual relay module	nos	2				
4	Addressable Horn with Strobe including Control module	nos	2				
5	24V / 5A Power supply unit	nos	2				
6	Addressable Manual call point	nos	2				
7	FRLS ARMOURED cable. 2 Core x 1.5 Sq.mm armoured cable (Fire Alarm )	Rmt	100				
8	MS conduits, 25 mm dia.	Rmt	20				
9	Analogue addressable Response Indicator with base	nos	4				
10	Analogue addressable Smoke Detector with base	nos	8				

ANNEXEUR: 6

**FORMAT FOR AFFIDAVIT OF SELF-CERTIFICATION UNDER PREFERENCE TO MAKE IN INDIA – PER ITEM**

**Tender Reference Number:**

**Name of the item / Service:**

Date: \_\_\_\_\_

I/We \_\_\_\_\_ S/o, D/o, W/o, \_\_\_\_\_  
Resident of

\_\_\_\_\_

Hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019 and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P-45021/102/2019-BE-II-Part (1) (E-50310) Dt.4th March 2021 and any subsequent modifications/Amendments, if any and

That the local content for all inputs which constitute the said item/service/work has been verified by me and I am responsible for the correctness of the claims made therein.

Tick ( ✓ ) and Fill the Appropriate Category	
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to or more than 50% and come under <b>“Class-I Local Supplier”</b> category.
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to 20% but less than 50% and come under <b>“Class-II Local Supplier”</b> category.

- The details of the location (s) at which the local value addition is made and the proportionate value of local content in percentage

Address \_\_\_\_\_ Percentage of Local content: \_\_\_\_\_ %  
\_\_\_\_\_

For and on behalf of.....(Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)

<Insert Name, Designation and Contact No.>

[Note: In case of procurement for a value in excess of Rs. 10 Crores, the bidders shall provide this certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.]

**This letter should be on the letterhead of the quoting firm and should be signed by a competent authority. Non-submission of this will lead to Disqualification of bids.**

**CERTIFICATE**

(To be given on the letter head of the bidder)

No:

Dated:

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am not from such a country.

*OR (whichever is applicable)*

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I from \_\_\_\_\_(Name of Country) and has been registered with the Competent Authority. I also certify that I fulfil all the requirements in this regard and is eligible to be considered.

*(Copy/ evidence of valid registration by the Competent Authority is to be attached)*

Place:

Signature of the Tenderer

Date:

Name & Address of the

Tenderer with Office Stamp



**Self-Declaration that the Service Provider has not been blacklisted**

(To be given on the letter head of the bidder)

I.....S/o.....

R/o ..... police station ..... District ..... Director

/ partner/ sole proprietor (Strike out whichever is not applicable) of .....

..... (Firm or Company) do hereby declare and solemnly affirm:

- I. That the Firm ..... has not been Blacklisted or declared insolvent by any of the Union or State Government / Organization.
- II. That none of the individual / firm / Company Blacklisted or any partners or shareholder thereof has any connection directly or indirectly with or has any subsistence interest in the deponent business / firm company.
- III. That neither the Firm nor any of its partner has been involved / convicted in any criminal case / economic offence nor any criminal case / economic offence is pending against firm or any partner of the Firm before any Court of Law / Police.

Place:

Date:

Signature of the Tenderer  
Name & Address of the  
Tenderer with Office Stamp

**OEM CERTIFICATION FORM**  
**(In Original Letter Head of OEM)**

TenderNo:..... Dated:.....

We are Original Equipment Manufacturers (OEM) of..... (Name of the company)  
Ms..... (Name of the vendor) is one of our Distributors/Dealers/Resellers/Partners  
(tick one) for the ..... and is participating in the above-mentioned tender  
by offering our product model.....(Name of the product with model number).

..... is authorized to bid, sell and provide service support warranty for our product  
as mentioned above.

Name and Signature of the authorized  
signatory of OEM along with  
seal of the company with Date



CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH (IC&SR)  
INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI 600 036



**ELECTRONIC CLEARING SERVICE (Credit Clearing)/ REAL TIME GROSS SETTLEMENT (RTGS) FACILITY FOR RECEIVING PAYMENTS**

**A. Details of Account Holder**

Name of the Institution	Indian Institute of Technology - Madras
Complete Contact Address	Industrial Consultancy and Sponsored Research Indian Institute of Technology-Madras, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
Telephone No./ Fax No.	Tel - 044-2257 8356
E- mail ID of the FO/AO/REG/DIR	dricsr@iitm.ac.in

**B. Bank Account Details:**

Institution Account Name (As per Bank Record)	The Registrar, Indian Institute of Technology - Madras
Account No.	2722101003872
Account Print Name	IIT F A/C , The Registrar IIT Madras
IFSC CODE	CNRB0002722
Bank Name (in full)	Canara Bank
Branch Name	IIT-Madras Branch
Complete Branch Address	Canara Bank, IIT-Madras Branch, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
MICR No.	600015085
Account Type	Savings Account

Certified that the Institute's account is in an RTGS enabled branch.

I hereby declare that the particulars given above are correct and complete.

Date:

Signature of the Competent Authority  
of the Institution with seal.