

Notice Inviting Quotation (E-Procurement mode)
कोटेशन को आमंत्रित करने की सूचना (ई-प्रोक्योरमेंट मोड)

INDIAN INSTITUTE OF TECHNOLOGY DELHI
भारतीय प्रौद्योगिकी संस्थान दिल्ली
HAUZ KHAS, NEW DELHI-110016
हौज खास, नई दिल्ली -110016

Dated/ दिनांक : 02/01/2024

Open Tender Notice No. / खुला प्रस्ताव निविदा सूचना नंबर: IITD/SenSE(SP-4484)/2024

Indian Institute of Technology Delhi is in the process of purchasing following item(s) as per details as given as under.

इंडियन इंस्टीट्यूट ऑफ टेक्नोलॉजी दिल्ली निम्नलिखित मदों की खरीद की प्रक्रिया में है।

Details of the item आइटम का विवरण	Preparation for clean room including equipments, consumable and related services
Earnest Money Deposit to be submitted बयाना जमा करने के लिए जमा राशि	NIL. However, bidders are required to submit 'Bid Security Undertaking' in lieu of EMD (Annexure-IX)
Warranty वारंटी अवधि	3 Years/3 साल
Performance security निष्पादन सुरक्षा	5% of the contract value
Delivery Schedule	12 To 16 Weeks Pl. refer Terms & Conditions No.12
Mandatory Minimum Local Content	1) 60% for Class I Supplier 2) 20% for Class II Supplier
Margin of Purchase Preference for Local Content	80% (Pl. refer to the DPIIT Order mentioned at T&C No.45)

Tender Documents may be downloaded from Central Public Procurement Portal <http://eprocure.gov.in/eprocure/app>. Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website <http://eprocure.gov.in/eprocure/app>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission'.

निविदा दस्तावेज केन्द्रीय सार्वजनिक खरीद पोर्टल <http://eprocure.gov.in/eprocure/app> से डाउनलोड हो सकते हैं ई-प्रोक्योरमेंट में पंजीकृत नहीं होने वाले इच्छुक बोलीदाताओं को वेबसाइट <http://eprocure.gov.in/eprocure/app> के माध्यम से भाग लेने से पहले पंजीकरण करना चाहिए। पोर्टल नामांकन मुफ्त है बोलीदाताओं को सलाह दी जाती है कि 'ऑनलाइन बोली के लिए निर्देश' पर दिए गए निर्देशों के माध्यम से जाने की सलाह दी जाए।

Tenderers 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 Delhi tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <http://eprocure.gov.in/eprocure/app> as per the schedule given in the next page.

निविदाकर्ता वेबसाइट पर निविदा दस्तावेज का उपयोग कर सकते हैं (एनआईसी साइट में खोज के लिए, कृपया निविदा खोज विकल्प और 'आईआईटी' टाइप करें। उसके बाद, सभी आईआईटी दिल्ली निविदाओं को देखने के लिए "गो" बटन पर क्लिक करें) उपयुक्त निविदा का चयन करें और उन्हें सभी प्रासंगिक सूचनाओं से भरें और वेबसाइट पर <http://eprocure.gov.in/eprocure/app> पर पूरा निविदा दस्तावेज ऑनलाइन जमा करें। अगले पृष्ठ में दिए गए कार्यक्रम के अनुसार

No manual bids will be accepted. All quotation (both Technical and Financial should be submitted in the E-procurement portal).

कोई मैनुअल बोली स्वीकार नहीं की जाएगी। सभी कोटेशन (तकनीकी और वित्तीय दोनों को ई-प्रोक्योरमेंट पोर्टल में जमा करना चाहिए)

SCHEDULE

Name of Organization	Indian Institute of Technology Delhi
Tender Type (Open/Limited/EOI/Auction/Single/Global)	Open
Tender Category (Services/Goods/works)	Goods and Services
Type/Form of Contract (Work/Supply/ Auction/ Service/ Buy/ Empanelment/ Sell)	Supply and Services
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	Clean room facility
Source of Fund (Institute/Project)	Budget Code _____/ Project Code RP04355G
Currency	Indian Rupee (INR)
Date of Issue/Publishing	05/01/2024 (18:00 Hrs)
Document Download/Sale Start Date	05/01/2024 (18:00 Hrs)
Document Download/Sale End Date	12/02/2024 (15:00 Hrs)
Last Date and Time for Uploading of Bids	12/02/2024 (15:00 Hrs)
Date and Time of Opening of Technical Bids	13/02/2024 (15:00 Hrs)
Tender Fee (If any)	Rs.NIL__/- (For Tender Fee) (To be paid through RTGS/NEFT. IIT Delhi Bank details are as under: Name of the Bank A/C : IITD Revenue Account SBI A/C No. : 10773572622 Name of the Bank : State Bank of India, IIT Delhi, Hauz Khas, New Delhi-110016 IFSC Code : SBIN0001077 MICR Code : 110002156 Swift No. : SBININBB547 (This is mandatory that UTR Number is provided in the on-line quotation/bid. (Kindly refer to the UTR Column of the Declaration Sheet at Annexure-II)
No. of Covers (1/2/3/4)	02
Bid Validity days (180/120/90/60/30)	180 days (From last date of opening of tender)
Address for Communication	Prof. Gufran Sayeed Khan , IIT Delhi, Hauz Khas, New Delhi, 110016, India
Contact No.	01126597335
Email Address	gufranskhan@sense.iitd.ac.in

Chairman Purchase Committee (Buyer Member)

Instructions for Online Bid Submission/ ऑनलाइन बोली (बिड) के लिए निर्देश:

As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)). 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.

व्यय विभाग के निर्देशों के अनुसार, यह निविदा दस्तावेज केंद्रीय सार्वजनिक प्रापण पोर्टल (यूआरएल: <http://eprocure.gov.in/eprocure/app>) पर प्रकाशित किया गया है। बोलीदाताओं को मान्य डिजिटल हस्ताक्षर प्रमाण पत्र का उपयोग करते हुए सीपीपी पोर्टल पर इलेक्ट्रॉनिक रूप से अपनी बोलियों की सॉफ्ट प्रतियां जमा करना आवश्यक है। सीपीपी पोर्टल पर पंजीकरण करने के लिए निविदाकर्ताओं की सहायता करने के लिए नीचे दिए गए निर्देशों का मतलब है, सीपीपी पोर्टल पर आवश्यकताओं के अनुसार अपनी बोलियां तैयार करें और अपनी बोलियां ऑनलाइन जमा करें।

More information useful for submitting online bids on the CPP Portal may be obtained at:

अधिक जानकारी सीपीपी पोर्टल पर ऑनलाइन बोलियां जमा करने के लिए उपयोगी हो सकती है:

<http://eprocure.gov.in/eprocure/app>

REGISTRATION

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)) by clicking on the link "Click here to Enroll". Enrolment on the CPP Portal is free of charge.

बोलीदाताओं को "नामांकन के लिए यहां क्लिक करें" लिंक पर क्लिक करके सेंट्रल पब्लिक प्रोक्योरमेंट पोर्टल (यूआरएल: <http://eprocure.gov.in/eprocure/app>) के ई-प्रोक्योरमेंट मॉड्यूल पर भर्ती करना आवश्यक है। सीपीपी पोर्टल पर नामांकन निःशुल्क है

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

नामांकन प्रक्रिया के भाग के रूप में, बोलीदाताओं को अपने खाते के लिए एक अद्वितीय उपयोगकर्ता नाम चुनना होगा और एक पासवर्ड प्रदान करना होगा।

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

बोलीदाताओं को सलाह दी जाती है कि पंजीकरण प्रक्रिया के भाग के रूप में अपना वैध ईमेल पता और मोबाइल नंबर पंजीकृत करें। इन का उपयोग सीपीपी पोर्टल से किसी भी संचार के लिए किया जाएगा।

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

नामांकन पर, बोलीदाताओं को सीसीए इंडिया द्वारा मान्यता प्राप्त किसी प्रमाणन प्राधिकरण द्वारा जारी किए गए अपने मान्य डिजिटल हस्ताक्षर प्रमाण पत्र (कक्षा द्वितीय या कक्षा III प्रमाण पत्र के साथ महत्वपूर्ण उपयोग पर हस्ताक्षर करने) की आवश्यकता होगी (जैसे सिफ़ी / टीसीएस / एनकोड / ई-मुद्रा आदि) , उनके प्रोफाइल के साथ

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

केवल एक मान्य डीएससी एक बोलीदाता द्वारा पंजीकृत होना चाहिए। कृपया ध्यान दें कि निविदाकर्ता यह सुनिश्चित करने के लिए जिम्मेदार हैं कि वे अपने डीएससी को दूसरों को उधार नहीं देते हैं जिससे दुरुपयोग हो सकता है।

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

बोलीदाता फिर अपने यूजर आईडी / पासवर्ड और डीएससी / ईटीकेन के पासवर्ड को दर्ज करके सुरक्षित लॉग-इन के माध्यम से साइट पर लॉग ऑन करता है।

SEARCHING FOR TENDER DOCUMENTS/ निविदा दस्तावेजों के लिए खोजना

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

सीपीपी पोर्टल में निर्मित विभिन्न खोज विकल्प हैं, ताकि बोलीदाताओं को कई मापदंडों से सक्रिय निविदाएं खोज सकें। इन मापदंडों में निविदा आईडी, संगठन का नाम, स्थान, तिथि, मूल्य आदि शामिल हो सकते हैं। निविदाओं के लिए उन्नत खोज का एक विकल्प भी है, जिसमें बोलीदाता कई नामों को जोड़ सकते हैं जैसे संगठन का नाम, अनुबंध का स्थान, स्थान, सीपीपी पोर्टल पर प्रकाशित निविदा की खोज के लिए तारीख, अन्य कीवर्ड आदि।

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

बोलीदाताओं ने एक बार निविदाएं चुनी हैं जिसमें वे रुचि रखते हैं, उसका वे आवश्यक दस्तावेज / निविदा कार्यक्रम डाउनलोड कर सकते हैं। ये निविदाएं 'मेरी निविदाओं' फ़ोल्डर में ले जाई जा सकती हैं। इससे सीपीपी पोर्टल को बोलीदाताओं को एसएमएस / ई-मेल के माध्यम से सूचित किया जा सकता है, यदि निविदा दस्तावेज में कोई शुद्धि जारी कि गई है।

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

बोलीदाता को प्रत्येक निविदा को निर्दिष्ट अद्वितीय निविदा आईडी का नोट बनाना चाहिए, अगर वे हेल्पडेस्क से कोई स्पष्टीकरण / सहायता प्राप्त करना चाहते हैं।

PREPARATION OF BIDS / बोली (बिड) की तैयारी

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

बोलीदाता को अपनी बोलियां जमा करने से पहले निविदा दस्तावेज पर प्रकाशित किसी भी शुद्धि को ध्यान में रखना चाहिए।

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

कृपया बोली के भाग के रूप में जमा किए जाने वाले दस्तावेजों को समझने के लिए निविदा विज्ञापन और निविदा दस्तावेज ध्यान से देखें। कृपया उन अंकों की संख्या पर ध्यान दें जिन में बोली दस्तावेज जमा करना है, दस्तावेजों की संख्या - जिसमें प्रत्येक दस्तावेज के नाम और सामग्री शामिल हैं, जिन्हें प्रस्तुत करने की आवश्यकता है। इनमें से कोई भी विचलन बोली को अस्वीकार कर सकता है।

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

बोलीदाता, अग्रिम में, निविदा दस्तावेज / अनुसूची में बताए अनुसार प्रस्तुत करने के लिए बोली दस्तावेज तैयार करना चाहिए और आम तौर पर, वे पीडीएफ / एक्सएलएस / आरएआर / डीडब्ल्यूएफ स्वरूपों में हो सकते हैं। बोली दस्तावेजों को 100 डीपीआई के साथ काले और सफेद विकल्प स्कैन किया जा सकता है।

- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “My Space” area available to them to upload such documents. These documents may be directly submitted from the “My Space” area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

मानक दस्तावेजों के एक ही सेट को अपलोड करने के लिए आवश्यक समय और प्रयास से बचने के लिए जो प्रत्येक बोली के भाग के रूप में जमा करने के लिए आवश्यक हैं, ऐसे मानक दस्तावेज अपलोड करने का प्रावधान (जैसे पैन कार्ड कॉपी, वार्षिक रिपोर्ट, लेखा परीक्षक प्रमाण पत्र आदि)) बोलीदाताओं को प्रदान किया गया है। ऐसे दस्तावेजों को अपलोड करने के लिए बोलीकर्ता उनके लिए उपलब्ध "मेरा स्पेस" क्षेत्र का उपयोग कर सकते हैं। बोली जमा करते समय ये दस्तावेज सीधे "मेरा स्पेस" क्षेत्र से जमा किए जा सकते हैं, और उन्हें बार-बार अपलोड करने की ज़रूरत नहीं है इससे बोली जमा प्रक्रिया के लिए आवश्यक समय में कमी आएगी।

SUBMISSION OF BIDS/ बोली (बिड) का जमा करना

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

बोलीदाता को बोली प्रस्तुति के लिए अच्छी तरह से साइट पर लॉग इन करना चाहिए ताकि वह समय पर बोली अपलोड कर सके या फिर बोली प्रस्तुत करने के समय से पहले। अन्य मुद्दों के कारण किसी भी देरी के लिए बोलीदाता जिम्मेदार होगा।

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

बोलीदाता को निविदा दस्तावेज में दर्शाए अनुसार एक-एक करके आवश्यक बोली दस्तावेजों को डिजिटल हस्ताक्षर और अपलोड करना होगा।

- 3) Bidder has to select the payment option as “on-line” to pay the tender fee as applicable and enter details of the instrument. Whenever, Tender fees is sought, bidders need to pay the tender fee separately on-line through RTGS (Refer to Schedule, Page No.2).

बोलीदाता को निविदा शुल्क / ईएमडी को भुगतान के लिए "ऑन लाइन" के रूप में भुगतान विकल्प चुनना होगा और उपकरण का विवरण दर्ज करना होगा। जब भी, ईएमडी / निविदा शुल्क की मांग की जाती है, बोलीदाताओं को टेंडर शुल्क और ईएमडी अलग-अलग आरटीजीएस के माध्यम से ऑन लाइन पर भुगतान करने की आवश्यकता होती है (अनुसूची, पेज नं .2 देखें) ।

- 4) A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white colored (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.

एक मानक BoQ प्रारूप को सभी बोलीदाताओं द्वारा भरने के लिए निविदा दस्तावेज प्रदान किया गया है। बोलीदाताओं को इस बात का ध्यान रखना चाहिए कि उन्हें आवश्यक प्रारूप में अपनी वित्तीय बोली जमा करनी चाहिए और कोई अन्य प्रारूप स्वीकार्य नहीं है। बोलीकर्ताओं को BoQ फाइल को डाउनलोड करने, इसे खोलने और अपने संबंधित वित्तीय उद्धरण और अन्य विवरण (जैसे बोलीदाता का नाम) के साथ सफेद रंगीन (असुरक्षित) कोशिकाओं को पूरा करना आवश्यक है। कोई भी अन्य कक्ष नहीं बदला जाना चाहिए। एक बार विवरण पूरा हो जाने पर, बोलीदाता को इसे सहेजना होगा और इसे ऑनलाइन जमा करना होगा, बिना फ़ाइल नाम बदलना। यदि BOQ फ़ाइल को बोलीदाता द्वारा संशोधित किया गया है, तो बोली को खारिज कर दिया जाएगा।

- 5) 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.

सर्वर का समय (जो बोलीदाताओं के डैशबोर्ड पर प्रदर्शित होता है) बोलीदाताओं द्वारा बोलियों को खोलने के लिए समय सीमा को संदर्भित करने के लिए मानक समय के रूप में माना जाएगा। बोलीदाताओं को खोलना आदि। बोलीदाताओं को बोली प्रस्तुत करने के दौरान इस समय का पालन करना चाहिए।

- 6) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done.

बोलीदाताओं द्वारा प्रस्तुत सभी दस्तावेज पीकेआई एन्क्रिप्शन तकनीकों का उपयोग करके एन्क्रिप्ट किया जाएगा जिससे डेटा की गोपनीयता सुनिश्चित हो सके। दर्ज किए गए डेटा को अनधिकृत व्यक्तियों द्वारा बोली खोलने के समय तक नहीं देखा जा सकता है। बोलियों की गोपनीयता को सुरक्षित सॉकेट लेयर 128 बिट एन्क्रिप्शन तकनीक का उपयोग कर रखा जाता है। संवेदनशील क्षेत्रों का डेटा संग्रहण एन्क्रिप्शन किया जाता है।

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

अपलोड किए गए निविदा दस्तावेज केवल अधिकृत बोलीदाता द्वारा निविदा खोलने के बाद ही पठनीय हो सकते हैं।

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

बोलियों के सफल और समय पर जमा होने पर, पोर्टल एक सफल बोली प्रस्तुत करने का संदेश देगा और एक बोली सारांश बोली संख्या के साथ प्रदर्शित किया जाएगा। और अन्य सभी प्रासंगिक विवरणों के साथ बोली प्रस्तुत करने की तारीख और समय।

- 9) Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

कृपया अनुपालन पत्रक की एक पीडीएफ फाइल में सभी प्रासंगिक दस्तावेजों के स्कैन किए गए पीडीएफ को जोड़ दें।

ASSISTANCE TO BIDDERS / बोलीदाताओं को सहायता

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

निविदा दस्तावेज से संबंधित कोई भी प्रश्न और इसमें निहित नियमों और शर्तों को निविदा आमंत्रण प्राधिकरण को निविदा के लिए या निविदा में वर्णित प्रासंगिक संपर्क व्यक्ति से संबोधित किया जाना चाहिए।

- 2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 7315.

ऑनलाइन बोली प्रस्तुत करने या सामान्य में सीपीपी पोर्टल से संबंधित प्रश्नों की प्रक्रिया से संबंधित कोई भी प्रश्न 24x7 सीपीपी पोर्टल हेल्पडेस्क पर निर्देशित किया जा सकता है। हेल्पडेस्क के लिए संपर्क संख्या 1800 233 7315 है

General Instructions to the Bidders / बोलीदाताओं के लिए सामान्य निर्देश

- 1) The tenders will be received online through portal <http://eprocure.gov.in/eprocure/app> . In the Technical Bids, the bidders are required to upload all the documents in .pdf format.

निविदाएं पोर्टल <http://eprocure.gov.in/eprocure/app> के माध्यम से ऑनलाइन प्राप्त होंगी तकनीकी बोलियों में, बोलीदाताओं को सभी दस्तावेजों को पीडीएफ प्रारूप में अपलोड करना होगा।

- 2) Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through <https://eprocure.gov.in/eprocure/app>. Digital Signature Certificates can be obtained from the

authorized certifying agencies, details of which are available in the web site <https://eprocure.gov.in/eprocure/app> under the link "Information about DSC".

कंपनी के नाम में स्मार्ट कार्ड / ई-टोकन के रूप में मान्य क्लास II / III डिजिटल हस्ताक्षर प्रमाण पत्र (डीएससी) के पंजीकरण के लिए एक शर्त है और <https://eprocure.gov.in/eprocure/> के माध्यम से बोली प्रस्तुत करने की गतिविधियों में भाग ले सकते हैं। डिजिटल हस्ताक्षर प्रमाण पत्र अधिकृत प्रमाणित एजेंसियों से प्राप्त की जा सकती है, जिनमें से जानकारी "डीएससी के बारे में सूचना" लिंक के तहत वेब साइट <https://eprocure.gov.in/eprocure/app> पर उपलब्ध है।

- 3) Tenderer are advised to follow the instructions provided in the 'Instructions to the Tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e Procurement at <https://eprocure.gov.in/eprocure/app>.

निविदाकर्ता को सलाह दी जाती है कि वे निविदाकार को निर्देश दिए गए हों ताकि ई-प्रोक्योरमेंट के लिए सेंट्रल पब्लिक प्रोक्ॉर्ममेंट पोर्टल के जरिए <https://eprocure.gov.in/eprocure/app> पर ऑनलाइन निविदाएं जमा कर सकें।

**Centre for Sensors, Instrumentation and Cyber Physical System Engineering (SENSE)
Indian Institute of Technology
Hauz Khas, New Delhi-110 016**

NOTICE INVITING QUOTATIONS

Subject: Preparation for clean room including equipments, consumable and related services

Invitation for Tender Offers

Indian Institute of Technology Delhi invites online Bids (Technical bid and Commercial bid) from eligible and experienced vendors for setting up a cleanroom facility in Room No.WS-129 (1000 sq. ft.) and Room No.WS-127 (800 sq. Ft.) at SeNSE, IIT Delhi. It is proposed to house the Laser Lithography system and its accessories for the fabrication. The total space is divided into two areas: area one (Room No.WS-129) is subdivided into two labs, i.e., Lab 1 and Lab 2, and the second area (Room No. WS-127) is subdivided into two areas, i.e., Lab 3 and the utility/control/sitting area.

TECHNICAL SPECIFICATION:

Scope of Supply	The vendor has to undertake the design (provided by IIT Delhi) and detailed engineering, which includes supply, installation, commissioning, validation, operation and maintenance of the heating, ventilation and air conditioning (HVAC) systems, Gas and Compressed air distribution systems, Gas Exhaust, acid and normal drain systems, Electricals, Fire detection and protection & surveillance systems, Tool hook-up, process chiller units, etc. The specifications in this document are broad in nature, depending upon the final requirement; therefore, may not include minor details. The vendor will be responsible for any other minor items needed to realize the facility.				
Layout	IIT Delhi planned the broad layout of the clean room based on functional requirements, including equipment being procured and available spaces. Refer Annexure XI & XII . The vendor shall further develop and detail this layout for IIT Delhi approval.				
Cleanroom Specifications	Details	Lab 1	Lab 2	Lab 3	Gowning area
	ISO Class of Room	100	1000	1000	10000
	Total approximate area (Sq ft)	410	320	420	230
	Room Height (floor to ceiling) (ft)	9.84	9.84	9.84	9.84
	Room approx. volume (Cu. Ft.)	4034	3148	4132	2263
	Flooring	Raised Floor	Anti-static	Anti-static	Anti-static
	Room Temperature (°C)	NMT* -24	NMT-24	NMT-24	NMT-24
	Room Relative Humidity**	NMT-45	NMT-55	NMT-55	NMT-55
	Room Positive Pressure with respect to Atmosphere (pa)	+25±5	+20±5	+20±5	+10±5

	Air Flow pattern	Vertical Laminar (Unidirectional)	Vertical Flow	Vertical Flow	Vertical Flow
	Air Change Rate (per hour)	≥400	≥200	≥200	≥60
	Filter Coverage (%)	≥85	≥40	≥40	≥20
	Sound Pressure level (dB) [#]	≤60	≤50	≤50	≤60
	Light Intensity (LUX)	600	600	600	600
	Max occupancy (Person)	5	5	5	---
	Filters type	ULPA	HEPA	HEPA	HEPA
	* Not more than. ** Adequate to offset exhaust and to maintain specified RH and Pressure in the clean room. # The measurements are to be demonstrated at rest, i.e., keeping all process equipment in rest condition at any height.				
Salient Features of Cleanrooms	Separate AHU for all Labs and Gowning areas,				
	The exposed surfaces of the plastered wall of cement concrete Blocks/ brick masonry and RCC beams and columns, soffits of RCC slab in the Cleanrooms, including service corridor, etc., shall be cladded with a 6 mm thick PUF Panel. PUF shall be flame retardant to have a smooth and dust-free finish.				
	A false ceiling suitable for supply and return air ducts in the service corridor (ISO 8) with HEPA filters and suitable lighting shall be considered.				
	Class 100 should have unidirectional laminar airflow; to achieve such airflow, raised flooring is planned in class 100. A raised floor of the required height is proposed in the Class 100 area, whereas an Antistatic floor is in all other labs. To have a common working level of complete fab, it is proposed to lower the concrete floor level by the required height in the class 100 lab area. The lowering of the required floor level height in the Class 100 area is provided to the vendor.				
	IIT Delhi will provide only Raw/DG-backed electrical power at the main electrical panel. Further electrical power distribution to cleanroom labs is under the vendor's scope.				
	It is proposed to complete HVAC automation to maintain the required parameters inside labs, i.e., temperature, humidity, and pressure specified in the technical details.				
	Necessary clean laboratory furniture required for the LAB Area, is also included in the vendor's scope.				
	The vendor's scope includes the supply of accessories like oil-free scroll compressor, nitrogen bank, power backup system, RO and DI water plant, wet bench, fume hood, oven and particle counter.				
Cleanroom Interiors	Walls	Features	The Clean Room Wall System shall be smooth, cleanable, non-contaminating, flexible, easily modifiable, modular, attractive and airtight.		
		CLASS 100 walls (Lab 1)	50 mm (nominal) thick, honeycomb or PUF filled with 40 Kg/m ³ density, 3000 mm high studless epoxy/PE roll-coated aluminium clean room wall system complete with all the hardware items, e.g. head track, floor track, vertical posts, wall ends, batten strips, white PVC gaskets, etc. required for installation all complete.		
		CLASS 1000 walls (Lab 2,3, Gowning area)	80 mm (nominal) thick, PUF filled with 40 Kg/m ³ density, 3000 mm high studless epoxy/PE roll-coated aluminium clean room wall system complete with all the hardware items, e.g. head track, floor track, vertical posts, wall ends, batten strips, white PVC gaskets, etc. required for installation all complete.		
		Dimensions	The vendor has to calculate the total dimensions of the walls as per the broad build plan shared in Annexures XI and XII .		
		Type	Raised Floor System: Raised floor grill panel mounted on adjustable pedestals to provide an under-floor space to accommodate mechanical service line electrical conduits and serve as an air supply and return plenum.		

Cleanroom Interiors	Flooring	LAB 1	Material	Floor tiles shall be aluminium die-cast construction with static conductive vinyl, non-combustible chemical and abrasive resistant cover of minimum 2 mm thickness.
			Conductivity	Floor tile system resistivity shall have a minimum value of 1.5×10^5 ohm and a maximum value of 2×10^7 ohm between the top structure of the tile and the under-structure.
			Load Capacity	Pedestal assemblies shall be capable of supporting a 2250 Kg axial load without deformation.
			Dimensions	As per the drawings given in Annexures XI and XII .
		LAB 2,3 and Gowning area	Type	2 mm thick homogeneous flexible antistatic PVC flooring
			Resistance level	1×10^6 ohms to 1×10^9 ohms
			load carrying capacity	≥ 750 PSI
			Suitable copper strip (foil) grid of size 10' x 10' (approx.) as recommended by the manufacturer and connecting to the earthing as per SCL's requirement, preparing of the existing surface with plaster of paris so as to make the surface free from any undulations, fixing the PVC sheet/roll with conductive adhesive (Water based) of approved make, rolling with 100 lb roller.	
	Grid Ceiling System	The cleanroom ceiling shall be formed from a HEAVY-DUTY ALUMINIUM WALKABLE extruded T-Grid ceiling systems for all areas. The ceiling grid colour should match the wall panel (Designer white shade). The ceiling grid shall be a heavy-duty, walkable inverted T-grid ceiling system of approx. 50 mm T width (gasket type ceiling) to be provided on 600 mm x 1200 mm hanging configuration, the system shall include aluminium (approx.. 50 mm wide) extrusions, aluminium extruded cross connector with hammerhead bolts and nuts, M8 bolt and matching square hanger and other standard accessories.		
		Doors	The cleanroom single doors shall be of aluminium construction, of appropriate sizes (or specified), flush configuration, swing type, double skin, aluminium frame and powder coated matching with the cleanroom wall system, with door closer, handles, lock sets with option of one or both side access, half glazed with 6 mm clear tempered glass on the top and 6 mm honey-comb panel on the bottom. The door locations are marked in Annexures XI & XII ,	
	Windows & Door Vision Panels		Windows and door vision panels shall be formed from double-glazed toughened glass composite modules. The proposed position of the vision panels can be taken from Annexure XI ; UV filtration film is to be applied to the ISO-5 Lab 1 (class 100) and Lab 3 windows and door vision panels.	
		Lighting	LAB 1 and LAB 3	Yellow LED lights (Temp 3000 K) and filters for <420 nm wavelength light if necessary.
	LAB 2 and gowning areas		LED panels	
Emergency exit		Emergency crush panel of appropriate dimensions with a hammer		
Planar grounding		All metallic components within the cleanroom fabric should have separate earth points outside the parent building and be connected to the main earthing line provided to the vendor.		

	Access control system	The vendor must install the access control system at the various entry points with a suitable door locking and unlocking mechanism.	
	Smoke detectors	The appropriate number of smoke detectors with control panels above and below the ceiling of Labs 1, 2, and 3 with hooters for alarms and a manual call point in each lab. Emergency lighting should be at least 100 lux.	
	Dynamic pass box	Pass-box made of SS304, Non-EP, smooth and powder free, fitted with door interlocks. The pass-box shall also be fitted with an appropriate dimension of viewing-glass made of tempered-glass supported by HEPA filter. Hinges and handles shall also be of SS304. The door shall have a release switch on either side of the pass box. Size: 600 mm x 600 mm x 600 mm (Approx.)	
	Surveillance and access control System	The vendor must install CCTV in cleanrooms and entry/exit for proper monitoring and surveillance with access control system at entry/exit points.	
HVAC System	AHU and MAU	Suitable AHUs/MAUs are to be located outside the fabrication (fab) area envelope in the utility area and fitted with cooling coils, dehumidifiers, stages of filters, etc., to maintain the required temperature and relative humidity (RH). The required quantity of dehumidified air should be delivered through suitably sized supply air ducts from where the air is supplied to the negative pressurised plenum. The scope includes the supply, installation, testing, and commissioning of an appropriate number of Air handling units as per the design to maintain the specified environmental conditions in the cleanrooms.	
		Framework	Extruded Aluminum/Stainless steel
		Joints	Moulded high tensile reinforced plastic.
		Section frame	Each section shall have its independent base and be mounted on 14G galvanised sheet steel and aluminium die-cast channels. Zinc deposition on the GI sheets shall be a minimum of 120 GSM.
		Body structure	Double skin with 43 ± 2 mm thick PUF insulation sand-witched panel, 1 mm GI outer skin pre-coated and 0.8 mm thick Aluminum sheet inside. The density of PUF insulation shall be a minimum of 40 Kg/m^3 .
		Sections joints	The framework for each section shall be joined together with a soft rubber gasket in between to make joints airtight.
		Doors	Suitable air-tight access doors with aluminium cast heavy-duty hinges and locks shall be provided for various sections.
		Cooling coils	Copper coils with anticorrosion-coated aluminium fins.
		Circulation fan motors	Adequately sized, TEFC Squirrel cage induction motor with VFD drive and suitable for $415\text{V} \pm 10\%$, 3 phase, $50 \text{ Hz} \pm 5\%$ AC power supply. The motor shall be of high-efficiency IE3 class as per IS 12615 – 2011-Non FLP.
		Fan blades	Made of aluminium alloy
		Heater	Strip/tubular heaters of sufficient capacity shall be selected in each AHU to maintain the area temperature. The heaters shall have a mounting frame, thermostat, humidistat, and air-stat in redundant arrangement, along with all control devices that the thyristors will control.
		Filters	Pre-filters, micro-filters and fine-filters with efficiency of G4, M5, and F9 grades.

	Humidity control	The vendor should provide automated humidity control with respect to the ambient temperature by any means, such as descent filters, strip heaters, etc. Also, for the winter season it can increase humidity to maintain the RH by humidifier.
FFU	HEPA filter efficiency	≥99.995% (H14)
	ULPA filter efficiency	≥99.9995% (U15)
	Prefilter assembly	A pre-filter of 10 microns is used at the inlet of the FFUs in order to protect the HEPA filters.
	Material of FFU	Galvanized PF anodized 690-alloy steel or Stainless steel or Powder coated Aluminium (min 300 GSM/m ²)
	Filters in ISO-5 Lab	ULPA Filters
	Servicing	The filter should be replaceable from beneath the ceiling.
	Blower assembly	The Blower shall be centrifugal type if required, Aluminium construction, dynamically and statically balanced, and suitable for a 220 V, 50Hz, single-phase power supply. Sound Level: 50 + 5 dB.
	Note:-Outside filter dimensions (mm), Nominal air volume (m ³ /hr.), Pressure drops at nominal air volume (Pa) and tolerance pressure drop (%) are to be submitted as part of the technical bid.	
Air Distribution	Air distribution shall be via GI fabricated rectangular/spiral ducts with zinc deposition of 270 gms/m ² , and all metal shall be used internally or externally for fixing, bracing, stiffening, etc. Air distribution ductwork shall be as per SMACNA standards. The duct shall be insulated using closed-cell nitrile rubber of sufficient thickness to avoid condensation.	
	Supply air duct	Insulated with 50 mm thick aluminium-faced Closed-cell nitrile rubber, Density 50 kg/m ³ .
	Return air duct	Insulated with 30 mm thick aluminium-faced Closed-cell nitrile rubber, Density 50kg/m ³ .
	Sound attenuators	Sound attenuators should be installed in the supply air duct to reduce the sound to 70 ± 2 dB
Note: - Detailed heat load calculations (considering the environmental conditions at Delhi and the cleanroom layout/equipment @ IIT Delhi) along with the assumptions to be submitted with the technical bid.		
Electricals	All electrical equipment and accessories to be furnished, installed and commissioned under the scope of these specifications shall be designed, manufactured, tested and installed in accordance with relevant Indian Standard Specifications IS 1554, Indian electricity rules and any other applicable regulations.	
	General configurations	
	Voltage supply	415 V± 10%
	Frequency	50 Hz± 5%
	Fault level	As specified in the SLD
No of Phase and grounding	3 Phase & solidly ground earth	
Power distribution	A.C., 3 phase 4 wire for 3 phase system, 1 phase 3 wire system	

	<p>The incomer of capacity 100 KW power backed by IIT Delhi DG will be provided by IIT Delhi, The vendor has to provide all the electrical connections in the clean room as specified in Annexure XVI. The vendor will provide the extra electrical connections required for HVAC, compressors, RO/DI plant, and Power backup system. The vendor should have calculated and considered the number of power switch sockets/lighting switch sockets, 3-phase power supply sockets, and single-phase high ampere supply sockets, as per the drawing mentioned in Annexure XVI.</p>		
Scope of Supply	Panels/MCCs/MCB DBs: 415 V/240 V Lighting /Power Distribution Panel/Boards		
	Cables/wires: FRLS 1.1 KV grade XLPE cable for power and lighting distribution		
	G I Conduits, earthing materials, double/single compression brass cable glands, cable lugs (Al & Cu as required), cable ties, cable/wire identification tags required for the installation and maintenance of trouble-free operation of the downstream system and accessories covered under this specification.		
	Lighting fixtures complete with accessories, specifications and quantities specified in the BOQ, including the required accessories for installation in cleanrooms, grey-areas, etc.		
	Trunking and raceways for power and LAN cables, including the required accessories like bends, tee, etc., if required, shall be in the scope of the contractor.		
	Installation, testing & commissioning spares as required.		
	The party shall submit all relevant drawings, data, catalogues with instruction and troubleshooting manuals, and type test certificates.		
	Materials and accessories necessary or used for satisfactory and trouble-free operation and maintenance of the above equipment/material shall also be furnished.		
Lighting	Lab 1 and 3	Yellow LED lights (Temp 3000K) and filters for <420nm wavelength light if necessary. Luminosity: 600 Lux.	
	Lab 2 and gowning areas	LED panels (6500 K Temp), Luminosity:600 Lux	
Approx Load	Labs	Load (KW)	Type
	Lab 1	30.0	UPS
	Lab 2	11.0	UPS
	Lab 3	15.0	UPS
	Gowning	3.5	UPS
	Total	59.5 KW	UPS
	The detailed specifications of cable, wire, conduits, switchboards, switches/sockets, MCC Panel, bushbar and bus taps, VFD, MCCB, contactors, cable terminations, cable termination, grounding, terminal boxes, painting, distribution box, surface wiring, switches sockets, cable tray are given in Annexure X .		
Cleanroom Furniture	All the furniture should be cleanroom environment compatible with material SS304 grade.		
	Item	Description	Quantity
	Chair	Seating area 400 mm x 400 mm Height 600 mm	8
	Table	Size: 1200 mm x 750 mm x 800 mm (L x B x H)	6
		Size: 900 mm x 800 mm x 800 mm (L x B x H)	1
	Storage racks	800 mm x 800 mm x 800 mm Separate 2 partitions	2
	Almirah	Size: 750 mm x 500 mm x 1500 mm	2
	Eye Washer	Clean room compatible Acid fume resistant	1

	Garment Cubical	HEPA filter H14-grade, Pre-filter G4-grade, non-woven CE certified blowers 1' UV light along with a digital hour meter 1' LED light Levelling jack - 4 No's Double skin doors with toughened view glass Exhaust grill - 1 Nos SS 304 Door handle - 2 No's SS hinges - 1 Set Size: 750 mm x 500 mm x 1500 mm	2
	Fume Hood	Bench top fume hood 1800 mm x 1000 mm x 2350 mm (W x D x H) MOC CRCA with powder coating FRP lined interiors 6mm tempered safety glass for sash Standard base cabinets - 2 No's Light fixture Filler panels Dished granite worktop 18 mm with finishing 3 Modular cover frame with 6/16 A switch and sockets - 6 No's Remote control valves - 3 No's. PP cup sink Bottle trap PVC skirting	1
	Cross over benches	Size: 1500 mm x 500 mm x 300 mm	1
		Size: 2000 mm x 500 mm x 300 mm	1
	Ladder	6 Step aluminium/SS cleanroom-compatible ladder	1
Process Extraction System	Vendors to design, supply/construct, and install corrosion-resistant, soundproof and vibration-free (less than 70 dB) systems for DRY & WET exhaust, meeting the local pollution control board norms. Process extract duct with proper exhaust work to be distributed through the supply plenums, connected to a suitable blower for all the equipment, HVAC, equipment in the clean room, etc., as per the requirements given in Annexure XV .		
	After considering the total exhaust volumes provided in the utility matrix, 20% extra exhaust flow should be considered for selecting the capacity of the fans and scrubbers.		
	The exhaust system comprising ducting, blowers, and casing is a corrosion-resistant material of construction (MOC) to handle the gases/fumes.		
	GI for solvent and heat exhaust, control dampers/Magnehelic gauges, and flexible ducting wherever required.		
	Suitable exhaust fan to be provided for solvent and heat exhausts.		
	Ducting exposed to ambient to be firmly supported with galvanized brackets & tie rods.		
	Similar equipment exhaust is to be clubbed inside, dissimilar exhaust should be clubbed together outside the building.		
	The system is to be soundproof in nature (< 60db) and vibration-free.		
	Proper exhaust should be there for all cabinets, gas pods, pumps, scrubbers, etc. as per the requirements		
	The exhaust system should be elevated to the top floor of the building.		
A minimum of 4 No's Magnehelic gauges will be provided for exhaust monitoring in ISO-5 (Class 100) areas.			

	Solvent bench – take-off point with proper scrubber system (activated carbon filter if required) provided near the wet bench tap-off.		
	The tentative drain layout from various locations of a cleanroom is given in Annexure XIV ; all the drain piping must be made of acid-proof PVC pipe; the vendor has to calculate the required piping and quote accordingly with all required accessories.		
	The vendor has to dig an acid drain pit and connect it to the normal drain.		
Fluid Distribution system	Supply installation and commissioning of this fluid distribution system from the Nitrogen bank and CDA storage to the point of use as mentioned in the drawing in Annexure XIII , The supplied materials should be SS316L (non–electro polished) with point-of-use SS regulators, Compressed dry air shall be distributed through SS316L (non–electro polished) orbital welded/compressor fittings tubing work with all associated ancillaries and equipment in clean room. All POU (Point of Use) connections of CDA shall have an isolation valve and pressure regulator with double ferrule mechanical joint end connections. The vendor should also provide the PVC-based N ₂ guns, the number of guns as per Annexure XIII . The vendor should have installed the RO/DI water line from the RO/DI storage plant to the point of use as per defined under Annexure XIII , The RO/DI line must be free of any contamination before the installation with appropriate methods.		
Cleanroom accessories	Item name	Description	Quantity
	Water purification system	<ul style="list-style-type: none"> a) Water purification system which can produce RO water (Type III), pure water (Type II) ultrapure water (Type I ASTM (D1193-91)) from potable tap water. b) The system must constitute a prefiltration system for the treatment of potable water and a booster pump for circulation, c) The water can be stored internally or externally in a separate tank, d) The purification system must include a pretreatment module, a High-pressure pump for water treatment, an RO membrane, a UV lamp, an electrode ionization module, ultra-purification cartridges, etc., to produce specified water. e) Purification capacity: ≥ 2 L/H f) Storage: min 60 liter 	1
	Air compressor	The compressor should be an oil-free scroll type compressor with minimum 250 Liter storage capacity and CD absorption dryer with a working pressure of 6 Bar all the time, min 3L/sec air flow rate; the output should comply with ISO 8573-1	1
	N₂ Bank	Arrangement of hookup 60-litre water capacity cylinders at a time with an output pressure of 5-Bar, total cylinders to be hookup: 5 No's.	1
	UPS with battery	Supply installation and commissioning of single-phase output online UPS with batteries Load capacity of 60 KW with all electrical protections	1
	Portable air particle counter	<ul style="list-style-type: none"> Three size channels : 0.3 μm, 2.5 μm, 10.0 μm Light source: Semiconductor laser diode Count modes : Piece/L or $\mu\text{g}/\text{m}^3$ Counting efficiency 100\pm10% @0.5 μm Principle: Optoelectronic type Measurement Range: 0-1000$\mu\text{g}/\text{m}^3$ Operating environment : 0 ~50°C Humidity Range : 0 ~99% RH 	1

Wet bench	<p>Construction: All stress-relieved white polypropylene, 0.5" (13 mm) thick</p> <p>Exhaust: Ducted through a standard 10" (254 mm)-diameter flange positioned at the top rear of the cabinet</p> <p>Drain: located at bottom of sub-deck plenum</p> <p>Power: 220VAC, 50Hz, depending on component selection. Power outlets available for process equipment.</p> <p>Illuminator: 800 Lux (3000K Temp) filtered for <450nm</p> <p>Control: The instrument panel provides a power switch, power indicating light, light switch, static pressure exhaust meter, and power fuse. Provisions are made for audible and visible pressure alarms, visible alarm silence, and for control of optional processing baths.</p> <p>Noise: < 60 dB</p> <p>Filter: 99.99% HEPA</p> <p>Air flow control: min three-step airflow control</p> <p>Blower assembly: centrifugal lubricated bearing type ISI marked assembly</p> <p>Working size: 6 ft. x 3 ft. x 3ft.</p>		1
Cleanroom oven	<p>Max Temperature: $\geq 400^{\circ}$ C</p> <p>Volume: ≥ 100 L</p> <p>Full sealed low thermal mass insulation to avoid shedding fibres</p> <p>Fully enclosed brushless fan motor</p> <p>Single ramp to set-point & process timer</p> <p>Smooth easily cleaned gloss epoxy exterior</p> <p>Polished stainless steel sealed interior</p> <p>Perforated stainless steel shelves</p> <p>Particle-free silicone rubber door seal</p> <p>Membrane control panel with clear bright LED display</p> <p>Double skin construction ensures safe outer case temperature</p> <p>Over-temperature protection</p> <p>ISO-14644 Class 5 certified</p>		1
Cloth washing machine	8 Kg front load fully automatic washing machine for clean room garment washing.		1
Vacuum cleaner	A general vacuum cleaner with high suction capacity.		2
Precision Manual Diamond Wafer Scriber	Cutting pressure is adjustable by the spring Replaceable diamond scribe The thickness of the cutting wheel: 0.55 mm to 0.75 mm	Cutting size 100 mm x 100 mm	1
		200 mm x 200 mm	1
	Diamond scribe		5
Stereo Microscope	<p>Magnification from 10X to 160X</p> <p>Rubber fixed eyecups</p> <p>Binocular view or trinocular view (if supplied with camera and camera objective lens)</p> <p>Halogen or LED-type dimmable lighting system</p>		1
Vacuum Pump	Compact, lightweight and mobile oil-free piston vacuum pump with silencer, Vacuum regulator including pressure gauge, CE Certified Vacuum: 100 mbar		1

Delivery terms		The Delivery shall be executed in two (2) Phases.
	Phase 1	Phase I of the work covers installing cleanrooms, including all utilities distribution networks, utilities plants/systems (complete base build), etc. The period for completion of Phase 1 shall be 3 months from the first day of handover of the site to the selected vendor.
	Phase 2	Phase II of the work shall cover tool hook-up, and the period for completion of the tool hook-up work shall be 1 month to be reckoned from the 5th day of the date of issuance of instructions by IIT to commence tool hook-up work. While it is envisaged that the tool (Equipment) move-in shall be undertaken immediately upon certification of the clean rooms under “As Built Condition”, in the event there is a delay in the tool move-in due to any unforeseen reason, the vendor may, if it so desires, de-mobilize the site, and thereafter re-mobilize the site within two (2) weeks upon instructions from IIT to take up the tool hook-up work. There shall be no financial implication on IIT for de-mobilizing the site by the contractor. The vendor shall facilitate tool move-in activity by removing the wall panels, etc., as required, for the tools to be moved to the location within the cleanrooms, including bulk-heading, making cutouts/penetrations in the wall panels, sealing and re-installing the wall panels etc. for smooth tool move-in activity. The quoted rates shall be deemed to include the costs of these activities.
Acceptance/completion terms	Acceptance/completion shall be on successful installation, testing and commissioning of all the systems covered in the contract agreement and acceptance of Phase I and II work. Acceptance certificate shall be given by IIT Delhi on successful demonstration of all clean room parameters and other system parameters for a period of 4 weeks after commissioning. The following checklist should be performed before the handing over and commissioning.	
	1	Facility air supply should be balanced to ensure that the design supply air volume is achieved.
	2	Positive differential pressure cascade should be commissioned with the extraction systems running, and doors closed.
	3	The ISO-5 (class 100) Lithography cleanroom will have the highest differential pressures, with the differential pressure diminishing across thresholds.
	4	The pressure cascade and extraction losses will dictate the fresh air volume of the system, with suitable ductwork leakage factors being taken into account during the detailed design stage.
	5	Commissioned airflow volumes should be within 10% of design calculations. Remedial action should be required where measured rates are greater or less than 10% of the design.
	6	Tests shall be performed in accordance with the testing procedure specified in ISO 14644
	7	Validation by an independent agency experienced in validating cleanrooms is in the contractor’s scope. The “independent” testing firm shall have experience of having conducted cleanroom testing/validation for certification of a minimum of 2 (two) Class 100 cleanrooms in the last 5 years.
	8	As-built room particle counts (as per ISO-14644).
	9	At-rest room particle counts (as per ISO-14644).
	10	FFM air volumes should be measured with a barometer.
	11	Temperature and relative humidity should be measured in each area.
	12	Light levels should be measured at the working plane (at a height of 900mm from the floor).
The Vendor should appoint a team of two people (1 technician + 1 caretaker) for one year to operate and maintain the facility at their own cost (The IIT Delhi will not bear any costs like food, lodging, salary, transportation and any allowance). The facility will always be operational on working days with office hours The one year of operation and maintenance will be counted after the successful handover of the facility to the IIT Delhi, The major roles of the person appointed by the vendor are as follows.		

Maintenance and operation	1	To monitor the facility on CCTV and instruct the students and other staff members on do's and don'ts in the clean room. It is the responsibility of the person to maintain discipline in the cleanroom for the efficient and fluent use of the facility,
	2	To maintain the log of the persons who are entering and leaving the facility,
	3	Washing of cleanroom gowns whenever required or at regular intervals,
	4	It is the sole responsibility of the person to maintain the cleanroom facility,
	5	They should know how to operate the facility control and monitoring system,
	6	Provide consumable items for the gowning or keep a record of usage of such items (The consumables will be provided by IIT Delhi),
	7	They should know how to troubleshoot small failures or coordinate with the manufacturer of the clean room to rectify the problems.
	8	The facility will be on standby mode during non-operation hours and the person responsible for putting it on standby.
	Note: After the completion of one year, SeNSE, IIT Delhi will decide on the operation and maintenance contract of the facility on a yearly basis.	
Warranty	1	The Vendor shall provide at least three (3) three-year on-site comprehensive warranties for the installation. The warranty shall be for 3 years from installation and acceptance on successful commissioning.
	2	During the warranty period vendor shall carry out preventive maintenance once every quarter at his own cost. Further, the vendor shall attend to a breakdown in any installations performed under the PO/Contract at his own cost within 48 hours of intimation from IIT.
	3	The vendor should provide the validation certificate to certify the ISO Class of the facility at least twice a year.
Eligibility criteria	The parties/firms participating in the tender should be technically competent and decent experience in having undertaken cleanroom projects for semiconductor/ MEMS/nano-fabrication facilities with the following eligibility criteria (points 1-8)	
	1	Parties/ firms should have successfully completed at least one similar work. "Similar Work" shall mean "Design, detailed engineering, supply, installation, testing, commissioning and validation of Clean Room facility (Class 100/ISO 5 or better, as per FED Std. 209E/ISO14644) and associated utilities comprising of High Purity Gas Distribution system, HVAC works, Gas management (GM) System, Electricals, Fire Detection etc. for semiconductor/Microelectronic/Nanofabrication/ MEMS facilities". Also, The party should have at least of two years of experience as a facilitator in a similar field.
	2	The firm/party may not associate with another firm/party (experienced in the relevant field, viz. cleanroom/HVAC/High purity utility distribution network), and in such cases, the combined experience of the consortium members will not be considered as "similar work" for determining the eligibility.
	3	Copies of Purchase Orders (PO's)/ work orders regarding "similar work" executed by the party/firm with documents evidencing satisfactory completion issued by the respective clients/organizations shall be submitted along with the bid.
	4	Completion issued by the respective clients/organizations shall also be submitted with the bid.
	5	Average annual financial turnover should not be less than Rs. 40 million (fifty million rupees) during the last 3 years. The prospective firm/party shall provide a chartered accountant's certificate for the annual financial turnover.
	6	Should solvency of not less than Rs. 25 million (twenty-five million rupees). The prospective firm/party shall provide a current (not prior to six (6) months) solvency certificate from any scheduled bank.

	7	Should not have incurred any loss in more than 2 years during the last (three) 3 financial years. The prospective firm/party shall provide a copy of audited annual accounts by a chartered accountant for the previous 3 (three) financial years.
	8	The contractor should have an in-house manufacturing facility of 80% for supply materials.
Terms and conditions for the installation and commissioning of a clean room	1	The vendor should seek approval for the material made during and before the execution from the IIT Delhi Concerned user,
	2	Vendor to provide test and quality certificates from the OEM of all the materials and equipment supplied with all relevant details.
	3	All industrial safety practices to be followed during the implementation.
	4	Appropriate training to be provided to IIT Delhi staff employed for the facility, with respect to the operation and first-level maintenance and monitoring. The vendor should also train the staff to perform routine measurements of all utility parameters. The vendor must also provide a set of documents detailing all protocols. The person should also be trained for purging and changing inert gas cylinders.
	5	The following drawing /documents shall be submitted at the time of acceptance of the system. a) Electrical single line diagrams for the complete electrical system starting from electrical panel power and lighting DBs, including an Illumination system, Power distribution system, Fire detection system, network system, and telephone and paging system. b) Foundation drawing of all floor-mounted equipment (Electrical panels, Network Racks, etc.), ceiling mounting details for lighting fixture/speakers/detector, etc. and any other relevant drawing required for repair and maintenance. c) Layout drawing with dimensions of all electrical equipment under the bidder's scope. d) Make, type and catalogue of lighting fixtures, raceways, Trunking and related accessories along with technical leaflets, data sheets, polar curves, etc. to be provided by the vendor. The contractor shall offer recommended makes mentioned in this document. e) Equipment data sheets furnishing guaranteed performance figures for each type of equipment. f) Checks list and test to be conducted during erection, testing & commissioning of the individual equipment. g) Wiring diagram for lighting, power, fire detection system and LAN.
	6	The vendor shall ensure adherence to safe construction practices, which shall inter-alia include the use of Personnel Protection Equipment (PPE) by their workmen, supervisors, etc., deployed on the work. PPE, viz., safety helmets, safety shoes, harnesses, safety glasses, gloves, etc., shall be provided by the vendor for the safety of all the personnel at the work site. The vendor shall take adequate measures to ensure that no damage or loss is caused to IIT's buildings, equipment and personnel due to any activity carried out by the vendor relating to the performance of the Contract. The vendor shall be liable to make good the loss/damage, including any consequential damage caused by them, and in case of failure to do so, IIT shall effect financial recovery for the same from the vendor.
	7	Electricity required for installation shall be provided by IIT at no charge basis to the vendor. For this, an electricity connection will be provided at a single point, and further distribution shall be the vendor's responsibility. The vendor shall provide the wattage of all the electrical loads required for installation and install all safety and protection devices, viz., MCB/MCCB/ELCB/RCCB, etc., as per the applicable electricity rules.
	8	The vendor shall follow the security procedures in vogue at IIT Delhi to move the vendor's personnel, materials, etc., into/from the IIT campus.
	9	The vendor shall be permitted to construct a temporary site office near the site office for their staff. The vendor shall also make a temporary storage shed for the materials brought to the site by them for incorporation in the work at their cost close to the site of work.

	10	The vendor may inspect the site on a working day and during working hours up to the last date of uploading the bids to get acquainted with the site conditions. The vendor has to contact 2 days prior to Prof. Gufran S. Khan (gufranskhan@sense.iitd.ac.in) before the inspection.
	11	No labour hutment shall be allowed inside IIT Delhi premises. The vendor shall make necessary arrangements for the accommodation of their labour/workmen to be deployed by them for project execution at their own cost.
Submittals in Technical quotations	The following submittals should be provided in technical quotations along with other documents mentioned in (ANNEXURE-XVI)	
	1	Concept design and as-built drawing showing the layout of the cleanroom area, HVAC blocks, Gas yard and gas hook-up (if any),scrubber, other facility and utility services blocks, etc.
	2	PERT/Gantt chart for the overall deliverables.
	3	The vendors shall present their Techno-commercial offer/bid to IIT Delhi technical team. If the bid /offer does not meet the technical requirements as spelt out in this document, the same shall be rejected by IIT Delhi. Also, if the vendor is absent from making the presentation to the IIT Delhi Technical team, their bid/offer shall be rejected.
	4	Detailed cleanroom layout drawings, facilities layout drawings, ducting layouts, utilities distribution layouts, cut sections of the facility at critical locations, gas pad layout, Gas cabinets/VMBs layout, MCCs layout, BMS configuration, control room layout, lighting layout, cleanroom layout with services and utility distribution network marked on the drawing, Plant Room concept design drawing. etc. Vendor to submit details like detailed design data/details and detailed engineering, P&I diagrams for all services and utilities, etc.,Detailed un-priced Bill of Quantity/Materials envisaged for the tender, Make/Brands of all the equipment/materials conforming to the specifications in this document, etc. alongwith technical part of the bid. No pricing information is to be submitted in the technical bid.
	5	An item-wise compliance statement indicating any deviations, if any, from specifications, recommended makes, etc. To support compliance with the specifications, the vendor shall submit all required documents mentioning the Annexure's number. If the offer deviates from the specifications and is not acceptable to the IIT Delhi technical committee, the vendor is bound to change the materials per the IIT Delhi official's recommendations. Otherwise, the bid shall not be considered for further processing.
Submittals should be provided by the selected vendor	1	Detailed design, including design analysis and data for cleanrooms, HVAC systems, utility distribution, electrical systems and distribution, fire detection and suppression, LAN, etc., for all the works covered under the scope of work for the approval of IIT Delhi.
	2	On completion of the cleanroom, the vendor shall submit 'As Built Drawings' in CAD format, PDF and a hard copy (three sets) of each drawing.
	3	Operating and maintenance manuals in hard copy and electronic format. handover and operator instruction.

Sl. No.		List of optional items
1	AMC	Vendor shall also quote post warranty 1,2,3-year AMC price separately, as an option.
2	White Light Reflectance Spectroscopy system	White Light Reflectance Spectroscopy system with the incident light normal (perpendicular) to the sample surface. The measured reflectance spectrum, produced by interference from the individual interfaces, is used to determine the thickness, optical constants (n & k), etc.

	Laptop/PC supplied for controlling and analyzing the data Cartesian (X-Y) automated stage with wafer chuck.	
White light source wavelength (nm)	Minimum	≤ 250
	Maximum	≥ 900
	Lifetime of source	≥ 1500 hours
Measurement Thickness (SiO ₂)	Minimum	≤ 1 nm
	Maximum	≥ 110 micron
	Accuracy	$\leq 0.5\%$
	Precision	≤ 0.06 nm
	Stability	≤ 0.06 nm
Spot Diameter	400 microns or less	

A complete set of tender documents* may be Download by prospective bidder free of cost from the website <http://eprocure.gov.in/eprocure/app>. Bidder has to make payment of requisite fees (i.e. Tender fees, if any online through RTGS/NEFT only).

Terms & Conditions Details

Sl. No.	Specification
1.	Due date: The tender has to be submitted on-line before the due date. The offers received after the due date and time will not be considered. No manual bids will be considered.
2.	Preparation of Bids: The offer/bid should be submitted in two bid systems i.e. Technical bid and Financial bid. The Technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid in the given format i.e BoQ_XXXX. The Technical bid and the financial bid should be submitted Online. Note: -Comparison of prices will be done ONLY on the bids submitted for the Main Equipment and anything asked as 'Optional' in the specs is not to be included for overall comparison.
3.	EMD (if applicable): The tenderer should submit an EMD amount through RTGS/NEFT. The Technical Bid without EMD would be considered as UNRESPONSIVE and will not be accepted. The EMD will be refunded without any interest to the unsuccessful bidders after the award of contract. Refer to Schedule (at page 1 of this document) for its actual place of submission.
4.	Refund of EMD: The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment.
5.	Opening of the tender: The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received along with EMD (if any) will be opened as mentioned at "Annexure: Schedule" in presence of bidders representative if available. Only one representative will be allowed to participate in the tender opening. Bid received without EMD (if present) will be rejected straight way. The technical bid will be opened online first and it will be examined by a technical committee (as per specification and requirement). The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification, and will be opened in the presence of the vendor's representatives subsequently for further evaluation. The bidders if interested may participate on the tender opening Date and Time. The bidder should produce authorization letter from their company to participate in the tender opening.
6.	Acceptance/ Rejection of bids: The Committee reserves the right to reject any or all offers without assigning any reason.
7.	Pre-qualification criteria: (i) Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed. (ii) An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well. (Ref. Annexure-II) (iii) OEM should be internationally reputed Branded Company. (iv) Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid. (v) In the tender, either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender. (vi) If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
8.	Performance Security: Performance Security may be furnished in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt from a Commercial bank, Bank Guarantee (including e-Bank Guarantee) from a Commercial bank or online payment in an acceptable form safeguarding the purchaser's interest in all respects within 21 days from the date of receipt of

	the purchase order and should be kept valid for a period of 60 days beyond the date of completion of warranty period.
9.	<p>Force Majeure: 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> <ul style="list-style-type: none"> ● 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. ● 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.
10.	Risk Purchase Clause: 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.
11.	<p>Packing Instructions: Each package will be marked on three sides with proper paint/indelible ink, the following:</p> <ol style="list-style-type: none"> i.Item Nomenclature ii.Order/Contract No. iii.Supplier's Name and Address iv.Consignee details v.Packing list reference number
12.	<p>Delivery and Documents: Delivery of the goods should be made within a maximum of 12 to 16 weeks (<i>for goods ready for shipment</i>) & Maximum (<i>To be filled by Purchaser</i>) weeks (<i>For special/ to be fabricated goods</i>) from the date of the Purchase Order. Within 24 hours of shipment, the supplier shall notify the purchaser and the insurance company by email the full details of the shipment including contract number, railway receipt number/ AAP etc. and date, description of goods, quantity, name of the consignee, invoice etc. The supplier shall mail the following documents to the purchaser with a copy to the insurance company:</p> <ol style="list-style-type: none"> 1. 4 Copies of the Supplier invoice showing contract number, goods' description, quantity 2. unit price, total amount; 3. Insurance Certificate if applicable; 4. Manufacturer's/Supplier's warranty certificate; 5. Inspection Certificate issued by the nominated inspection agency, if any 6. Supplier's factory inspection report; and 7. Certificate of Origin (if possible by the beneficiary); 8. Two copies of the packing list identifying the contents of each package. 9. The above documents should be received by the Purchaser before arrival of the Goods (except where the Goods have been delivered directly to the Consignee with all documents) and, if not received, the Supplier will be responsible for any consequent expenses.
13.	Delayed delivery: If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty 1% per week and the maximum deduction is 10% of the contract value / price.
14.	<p>Prices: The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges.</p> <p>Price quoted should be in Indian Rupees, free delivery at IIT Delhi Campus at site (DDP/FOR).</p>

Further, depending on the nature of the goods, there may be cost elements towards installation and commissioning, operator's training, and so on. Normally, it may be included in the equipment cost but if it is quoted separately, the same will be added in the item price for the determination of ranking of the bidders.

The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. However, the percentage of taxes & duties shall be clearly indicated.

Necessary certificate will be issued on demand.

The Buyer/PFC will have the right to award contracts to different Bidders for being lowest in particular items.

For ranking of offers, price of complete scope of supply as detailed in technical specifications, the procuring authority/Purchaser may decide as follows for comparison of price bid -

- (i) All items of the bid which are mandatorily required to meet the tendered specifications of the item/system
- (ii) If a bidder has put certain items/modules which are required to meet the tendered specifications in the 'optional' part of the bid, then such optional items shall also be included for the purpose of price comparison
- (iii) On the other hand, if a bidder has inadvertently included any item/module in its main price bid which is not required as per tender specifications, then the price of such item/module shall be excluded from the price comparison provided that the price for the said item/module is clearly reflected separately in the bid
- (iv) Anything asked as 'optional' in our specs is not to be included for overall comparison

Non-conformities between Figures and words:

Sometimes, non-conformities/errors are also observed in responsive tenders between the quoted prices in figures and in words. This situation normally does not arise in case of e-Procurement. This should be taken care of in the manner indicated below:

- (i) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the total price will be corrected.
- (ii) If there is an error in a total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and the total shall be corrected;
- (iii) If there is a discrepancy between words and figures, the amount in words will prevail for calculation of price.

15.

Notices: For the purpose of all notices, the following shall be the address of the Purchaser and Supplier.

Purchaser: <_____> ,

<Deptt./Section/Centre>

Indian Institute of Technology

Hauz Khas, New Delhi - 110016.

Supplier: (To be filled in by the supplier)

(Supplier should submit its supplies information as per Annexure-II).

16.	<p>Progress of Supply: Wherever applicable, supplier shall regularly intimate progress of supply, in writing, to the Purchaser as under:</p> <ol style="list-style-type: none"> 1. Quantity offered for inspection and date; 2. Quantity accepted/rejected by inspecting agency and date; 3. Quantity dispatched/delivered to consignees and date; 4. Quantity where incidental services have been satisfactorily completed with date; 5. Quantity where rectification/repair/replacement effected/completed on receipt of any communication from consignee/Purchaser with date; 6. Date of completion of entire Contract including incidental services, if any; and 7. Date of receipt of entire payments under the Contract (In case of stage-wise inspection, details required may also be specified).
17.	<p>Inspection and Tests: Inspection and tests prior to shipment of Goods and at final acceptance are as follows:</p> <ul style="list-style-type: none"> • After the goods are manufactured and assembled, inspection and testing of the goods shall be carried out at the supplier's plant by the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications attached to the purchase order. Manufacturer's test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The purchaser shall be present at the supplier's premises during such inspection and testing if need is felt. The location where the inspection is required to be conducted should be clearly indicated. The supplier shall inform the purchaser about the site preparation, if any, needed for installation of the goods at the purchaser's site at the time of submission of order acceptance. • The acceptance test will be conducted by the Purchaser, their consultant or other such person nominated by the Purchaser at its option after the equipment is installed at purchaser's site in the presence of supplier's representatives. The acceptance will involve trouble free operation and ascertaining conformity with the ordered specifications and quality. There shall not be any additional charges for carrying out acceptance test. No malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser, the successful completion of the test specified. • In the event of the ordered item failing to pass the acceptance test, a period not exceeding one weeks will be given to rectify the defects and clear the acceptance test, failing which the Purchaser reserve the right to get the equipment replaced by the Supplier at no extra cost to the Purchaser. • Successful conduct and conclusion of the acceptance test for the installed goods and equipment shall also be the responsibility and at the cost of the Supplier.
18.	<p>Resolution of Disputes: The dispute resolution mechanism to be applied pursuant shall be as follows:</p> <ul style="list-style-type: none"> • In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to the Director, Indian Institute of Technology Delhi and if he is unable or unwilling to act, to the sole arbitration of some other person appointed by him willing to act as such Arbitrator. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order.
19.	<p>Applicable Law: The place of jurisdiction would be New Delhi (Delhi) INDIA.</p>
20.	<p>Right to Use Defective Goods: If after delivery, acceptance and installation and within the guarantee and warranty period, the operation or use of the goods proves to be unsatisfactory, the Purchaser shall have the right to continue to operate or use such goods until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.</p>

21.	<p>Supplier Integrity: The Supplier is responsible for and obliged to conduct all contracted activities in accordance with the Contract using state of the art methods and economic principles and exercising all means available to achieve the performance specified in the contract.</p>
22.	<p>Training: The Supplier is required to provide training to the designated Purchaser's technical and end user personnel to enable them to effectively operate the total equipment.</p>
23.	<p>Installation & Demonstration: The supplier is required to done the installation and demonstration of the equipment within one month of the arrival of materials at the IITD site of installation, otherwise the penalty clause will be the same as per the supply of materials.</p> <p>In case of any mishappening/damage to equipment and supplies during the carriage of supplies from the origin of equipment to the installation site, the supplier has to replace it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. IITD will not be liable to any type of losses in any form.</p>
24.	<p>Insurance: For delivery of goods at the purchaser's premises, the insurance shall be obtained by the supplier in an amount equal to 110% of the value of the goods from "warehouse to warehouse" (final destinations) on "All Risks" basis including War Risks and Strikes. The insurance shall be valid for a period of not less than 3 months after installation and commissioning.</p>
25.	<p>Incidental services: The incidental services also include:</p> <ul style="list-style-type: none"> ● Furnishing of 01 set of detailed operations & maintenance manual. ● Arranging the shifting/moving of the item to their location of final installation within IITD premises at the cost of Supplier through their Indian representatives.
26.	<p>Warranty:</p> <p>(i) Warranty period shall be (as stated at page #2 of this tender) from date of installation of Goods at the IITD site of installation. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the contract. If for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall at its discretion make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests. The warranty should be comprehensive on site.</p> <p>(ii) The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately within in 02 days arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie on the Purchaser for the replaced parts/goods thereafter. The period for correction of defects in the warranty period is 02 days. If the supplier having been notified fails to remedy the defects within 02 days, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses and without prejudice to any other rights, which the purchaser may have against the supplier under the contract.</p> <p>(iii) The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned. The comprehensive warranty will commence from the date of the satisfactory installation/commissioning of the equipment against the defect of any manufacturing, workmanship and poor quality of the components.</p> <p>(iv) After the warranty period is over, Annual Maintenance Contract (AMC)/Comprehensive Maintenance Contract (CMC) up to next two years should be started. The AMC/CMC charges will not be included in computing the total cost of the equipment.</p>

27.	<p>Governing Language: The contract shall be written in English language. English language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the same language.</p>
28.	<p>Applicable Law: The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction.</p>
29.	<p>Notices:</p> <ul style="list-style-type: none"> • Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by email and confirmed in writing to the other party's address. • A notice shall be effective when delivered or on the notice's effective date, whichever is later.
30.	<p>Taxes: Suppliers shall be entirely responsible for all taxes, duties, license fees, octroi, road permits, etc., incurred until delivery of the contracted Goods to the Purchaser. However, GST etc, in respect of the transaction between the Purchaser and the Supplier shall be payable extra, if so stipulated in the order.</p>
31.	<p>Duties: IIT Delhi is exempted from paying custom duty under notification No.51/96 (partially or full) and necessary "Custom Duty Exemption Certificate" can be issued after providing following information and Custom Duty Exemption Certificate will be issued to the shipment in the name of the Institute, (no certificate will be issued to third party): The procured product should be used for teaching, scientific and research work only. a) Shipping details i.e. Master Airway Bill No. and House Airway No. (if exists) b) Forwarder details i.e. Name, Contact No., etc.</p>
32.	<p>Payment: 100% payment shall be made by the Purchaser against delivery, inspection, successful installation, commissioning and acceptance of the equipment at IITD in good condition and to the entire satisfaction of the Purchaser and on production of unconditional performance bank guarantee as specified in Clause 8 of tender terms and conditions.</p>
33.	<p>User list: Brochure detailing technical specifications and performance, list of industrial and educational establishments where the items enquired have been supplied must be provided. (Ref. Annexure-III)</p>
34.	<p>Manuals and Drawings:</p> <ol style="list-style-type: none"> (i) Before the goods and equipment are taken over by the Purchaser, the Supplier shall supply operation and maintenance manuals. These shall be in such details as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the specifications. (ii) The Manuals shall be in the ruling language (English) in such form and numbers as stated in the contract. (iii) Unless and otherwise agreed, the goods equipment shall not be considered to be completed for the purposes of taking over until such manuals and drawing have been supplied to the Purchaser.
35.	<p>Application Specialist: The Tenderer should mention in the Techno-Commercial bid the availability and names of Application Specialist and Service Engineers in the nearest regional office. (Ref. to Annexure-III)</p>
36.	<p>Site Preparation: The supplier shall inform to the Institute about the site preparation, if any, needed for the installation of equipment, immediately after the receipt of the purchase order. The supplier must provide complete details regarding space and all the other infrastructural requirements needed</p>

	<p>for the equipment, which the Institute should arrange before the arrival of the equipment to ensure its timely installation and smooth operation thereafter.</p> <p>The supplier shall visit the Institute and see the site where the equipment is to be installed and may offer his advice and render assistance to the Institute in the preparation of the site and other pre-installation requirements.</p>
37.	<p>Spare Parts</p> <p>The Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:</p> <ul style="list-style-type: none"> ii. Such spare parts as the Purchaser may elect to purchase from the Supplier, providing that this election shall not relieve the Supplier of any warranty obligations under the Contract; and iii. In the event of termination of production of the spare parts: iv. Advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements; and v. Following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings and specifications of the spare parts, if requested. <p>Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spares for the Goods, such as gaskets, plugs, washers, belts etc. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order.</p>
38.	<p>Defective Equipment: If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, un-merchantable or not in accordance with the description/specification or otherwise faulty, the committee will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the Tenderer with 18% interest if such payments for such equipment have already been made. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 45 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges. In case supplier fails to replace above item as per above terms & conditions, IIT Delhi may consider "Banning" the supplier.</p>
39.	<p>Termination for Default:</p> <p>The Purchaser may, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Supplier, terminate the Contract in whole or part:</p> <ul style="list-style-type: none"> i. If the Supplier fails to deliver any or all of the Goods within the period(s) specified in the order or within any extension thereof granted by the Purchaser; or ii If the Supplier fails to perform any other obligation(s) under the Contract. iii If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract. <ul style="list-style-type: none"> ● For the purpose of this Clause: <ul style="list-style-type: none"> i. “Corrupt practice” means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. ii. “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;” ● In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure, upon such terms and in such manner, as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar

	Goods or Services. However, the Supplier shall continue the performance of the Contract to the extent not terminated.
40.	Downtime: During the warranty period not more than 5% downtime will be permissible. For every day exceeding permissible downtime, penalty of 1/365 of the 5% item value will be imposed. Downtime will be counted from the date and time of the filing of complaint with in the business hours.
41.	Training of Personnel: The supplier shall be required to undertake to provide the technical training to the personnel involved in the use of the equipment at the Institute premises, immediately after completing the installation of the equipment for a minimum period of one week at the supplier's cost.
42.	Disputes and Jurisdiction: 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 New Delhi.
43.	Compliance certificate: This certificate must be provided indicating conformity to the technical specifications. (Annexure-I)
44.	<p>As per Ministry of Finance, Deptt. of Expenditure, Public Procurement Division Order (Public Procurement No.1) issued from file No.6/18/2019-PPD dated 23rd July, 2020 regarding Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs) 2017, it is directed that any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority i.e. the Deptt. for Promotion of Industry and Internal Trade (DPIIT). <i>The said order will not apply to bidders from those countries (even sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects (updated lists of the countries are given in the Ministry of External Affairs)</i></p> <p>“Bidder” (including the term ‘tenderer’, ‘consultant’ or ‘service provider’ in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participated in a procurement process.</p> <p>“Bidders from a country which shares a land border with India” for the purpose of this Order means:</p> <ol style="list-style-type: none"> i. An entity incorporated, established or registered in such a country; or ii. A subsidiary of an entity incorporated, established or registered in such a country; or iii. An entity substantially controlled through entities incorporated, established or registered in such a country; or iv. An entity whose <i>beneficial owner</i> is situated in such a country; or v. An Indian (or other) agent of such an entity; or vi. A natural person who is the citizen of such a country; or vii. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above <p>The <i>beneficial owner</i> for the purpose of above will be as under: -</p> <ol style="list-style-type: none"> 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person (s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercise control through other means. <p>Explanation-</p> <ol style="list-style-type: none"> a. “Controlling ownership interest” means ownership of or entitlement to more than twenty-five per cent of share or capital or profit of the company;

	<p>b. "Control" shall include the right to appoint majority of the directors or to control the management of policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;</p> <ol style="list-style-type: none"> 2. In case of a partnership firm, the beneficial owner is the natural person (s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership; 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person (s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals; 4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official; 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership. <p>An agent is a person employed to do any act for another, or to represent another in dealings with the third person.</p> <p>For Works contracts, including Turnkey contracts, the successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.</p> <p>A certificate shall be submitted by bidders in the tender documents regarding their compliance with the said order. If the certificate submitted by a bidder whose bid is accepted is found to be false, this would be a ground for immediate termination and further legal action in accordance with law. Annexure VI (For Goods/ Services contracts)/ <i>Annexure VII (For Works contracts, including Turnkey contracts)</i></p>
45	<p><u>It is mandatory for bidders to quote items having local content minimum 20%. Refer revised Public Procurement (Preference to Make in India), Order 2017, No. P-45021/2/2017-PP (B.E-II) dated 16.09.2020 issued by DPIIT, Ministry of Commerce and Industry, Govt. of India. (Submit duly filled Annexure VIII for the same). <i>The Annexure VIII once submitted in the Technical Bid will be final. Submission of Revised Annexure VIII will NOT be accepted.</i></u></p> <p><i>As per O.M. of DPIIT, Ministry of Commerce and Industry, Govt. of India No.P-45021/102/2019-BE-II- Part (1) (E-50310) Dated 04.03.2021, Bidders offering Imported products will fall under the category of Non_Local Suppliers. They cannot claim themselves as Class-I or Class -II Local Suppliers by claiming the services such as Transportation, Insurance, Installation, Commissioning, Training and After Sale Service Support like AMC/ CMC etc. as Local Value Addition.</i></p>

COMPLIANCE SHEET

TECHNICAL SPECIFICATION

Specifications						Compliance
Scope of Supply	The vendor has to undertake the design (provided by IIT Delhi) and detailed engineering, which includes supply, installation, commissioning, validation, operation and maintenance of the heating, ventilation and air conditioning (HVAC) systems, Gas and Compressed air distribution systems, Gas Exhaust, acid and normal drain systems, Electricals, Fire detection and protection & surveillance systems, Tool hook-up, process chiller units, etc. The specifications in this document are broad in nature, depending upon the final requirement; therefore, may not include minor details. The vendor will be responsible for any other minor items needed to realize the facility.					
Layout	IIT Delhi planned the broad layout of the clean room based on functional requirements, including equipment being procured and available spaces. Refer Annexure XI & XII . The vendor shall further develop and detail this layout for IIT Delhi approval.					
Cleanroom Specifications	Details	Lab 1	Lab 2	Lab 3	Gowning area	
	ISO Class of Room	100	1000	1000	10000	
	Total approximate area (Sq ft)	410	320	420	230	
	Room Height (floor to ceiling) (ft)	9.84	9.84	9.84	9.84	
	Room approx. volume (Cu. Ft.)	4034	3148	4132	2263	
	Flooring	Raised Floor	Anti-static	Anti-static	Anti-static	
	Room Temperature (°C)	NMT*-24	NMT-24	NMT-24	NMT-24	
	Room Relative Humidity**	NMT-45	NMT-55	NMT-55	NMT-55	
	Room Positive Pressure with respect to Atmosphere (pa)	+25±5	+20±5	+20±5	+10±5	
	Air Flow pattern	Vertical Laminar (Unidirectional)	Vertical Flow	Vertical Flow	Vertical Flow	
	Air Change Rate (cfm)	≥400	≥200	≥200	≥60	
	Filter Coverage (%)	≥85	≥40	≥40	≥20	
	Sound Pressure level (dB) [#]	≤60	≤50	≤50	≤60	
	Light Intensity (LUX)	600	600	600	600	
Max occupancy (Person)	5	5	5	---		
Filters type	ULPA	HEPA	HEPA	HEPA		

	<p>* Not more than.</p> <p>** Adequate to offset exhaust and to maintain specified RH and Pressure in the clean room.</p> <p># The measurements are to be demonstrated at rest, i.e., keeping all process equipment in rest condition at any height.</p>		
Salient Features of Cleanrooms	Separate AHU for all Labs and Gowning areas,		
	The exposed surfaces of the plastered wall of cement concrete Blocks/ brick masonry and RCC beams and columns, soffits of RCC slab in the Clean rooms, including service corridor, etc., shall be cladded with a 6 mm thick PUF Panel. PUF shall be flame retardant to have a smooth and dust-free finish.		
	A false ceiling suitable for supply and return air ducts in the service corridor (ISO 8) with HEPA filters and suitable lighting shall be considered.		
	Class 100 should have unidirectional laminar airflow; to achieve such airflow, raised flooring is planned in class 100. A raised floor of the required height is proposed in the Class 100 area, whereas an Antistatic floor is in all other labs. To have a common working level of complete fab, it is proposed to lower the concrete floor level by the required height in the class 100 lab area. The lowering of the required floor level height in the Class 100 area is provided to the vendor.		
	IIT Delhi will provide only Raw/DG-backed electrical power at the main electrical panel. Further electrical power distribution to cleanroom labs is under the vendor's scope.		
	It is proposed to complete HVAC automation to maintain the required parameters inside labs, i.e., temperature, humidity, and pressure specified in the technical details.		
	Necessary clean laboratory furniture required for the LAB Area, is also included in the vendor's scope.		
The vendor's scope includes the supply of accessories like oil-free scroll compressor, nitrogen bank, power backup system, RO and DI water plant, wet bench, fume hood, oven and particle counter.			
Cleanroom Interiors	Walls	Features	The Clean Room Wall System shall be smooth, cleanable, non-contaminating, flexible, easily modifiable, modular, attractive and airtight.
		CLASS 100 walls (Lab 1)	50 mm (nominal) thick, honeycomb or PUF filled with 40 Kg/m ³ density, 3000 mm high studless epoxy/PE roll-coated aluminium clean room wall system complete with all the hardware items, e.g. head track, floor track, vertical posts, wall ends, batten strips, white PVC gaskets, etc. required for installation all complete.
		CLASS 1000 walls (Lab 2,3, Gowning area)	80 mm (nominal) thick, PUF filled with 40 Kg/m ³ density, 3000 mm high studless epoxy/PE roll-coated aluminium clean room wall system complete with all the hardware items, e.g. head track, floor track, vertical posts, wall ends, batten strips, white PVC gaskets, etc. required for installation all complete.
		Dimensions	The vendor has to calculate the total dimensions of the walls as per the broad build plan shared in Annexures XI and XII .

Cleanroom Interiors	Flooring	LAB 1	Type	Raised Floor System: Raised floor grill panel mounted on adjustable pedestals to provide an under-floor space to accommodate mechanical service line electrical conduits and serve as an air supply and return plenum.	
			Material	Floor tiles shall be aluminium die-cast construction with static conductive vinyl, non-combustible chemical and abrasive resistant cover of minimum 2 mm thickness.	
			Conductivity	Floor tile system resistivity shall have a minimum value of 1.5×10^5 ohm and a maximum value of 2×10^7 ohm between the top structure of the tile and the under-structure.	
			Load Capacity	Pedestal assemblies shall be capable of supporting a 2250 Kg axial load without deformation.	
			Dimensions	As per the drawings given in Annexures XI and XII .	
		LAB 2,3, Gowning	Type	2 mm thick homogeneous flexible antistatic PVC flooring	
			Resistance level	1×10^6 ohms to 1×10^9 ohms	
			load carrying capacity	≥ 750 PSI	
			Suitable copper strip (foil) grid of size 10' x 10' (approx.) as recommended by the manufacturer and connecting to the earthing as per SCL's requirement, preparing of the existing surface with plaster of paris so as to make the surface free from any undulations, fixing the PVC sheet/roll with conductive adhesive (Water based) of approved make, rolling with 100 lb roller.		
	Grid Ceiling System	The cleanroom ceiling shall be formed from a HEAVY-DUTY ALUMINIUM WALKABLE extruded T-Grid ceiling systems for all areas. The ceiling grid colour should match the wall panel (Designer white shade). The ceiling grid shall be a heavy-duty, walkable inverted T-grid ceiling system of approx. 50 mm T width (gasket type ceiling) to be provided on 600 mm x 1200 mm hanging configuration, the system shall include aluminium (approx.. 50 mm wide) extrusions, aluminium extruded cross connector with hammerhead bolts and nuts, M8 bolt and matching square hanger and other standard accessories.			
	Doors	The cleanroom single doors shall be of aluminium construction, of appropriate sizes (or specified), flush configuration, swing type, double skin, aluminium frame and powder coated matching with the cleanroom wall system, with door closer, handles, lock sets with option of one or both side access, half glazed with 6 mm clear tempered glass on the top and 6 mm honey-comb panel on the bottom. The door locations are marked in Annexures XI & XII ,			
	Windows & Door Vision Panels	Windows and door vision panels shall be formed from double-glazed toughened glass composite modules. The proposed position of the vision panels can be taken from Annexure XI ; UV filtration film is to be applied to the ISO-5 Lab 1 (class 100) and Lab 3 windows and door vision panels.			
	Lighting	LAB 1 and LAB 3	Yellow LED lights (Temp 3000 K) and filters for <420nm wavelength light if necessary.		
		LAB 2 and gowning areas	LED panels		
Emergency exit	Emergency crush panel of appropriate dimensions with a hammer				

	Planar grounding	All metallic components within the cleanroom fabric should have separate earth points outside the parent building and be connected to the main earthing line provided to the vendor.		
	Access control system	The vendor must install the access control system at the various entry points with a suitable door locking and unlocking mechanism.		
	Smoke detectors	The appropriate number of smoke detectors with control panels above and below the ceiling of Labs 1, 2, and 3 with hooters for alarms and a manual call point in each lab. Emergency lighting should be at least 100 lux.		
	Dynamic pass box	Pass-box made of SS304, Non-EP, smooth and powder free, fitted with door interlocks. The pass-box shall also be fitted with an appropriate dimension of viewing-glass made of tempered-glass supported by HEPA filter. Hinges and handles shall also be of SS304. The door shall have a release switch on either side of the pass box. Size: 600 mm x 600 mm x 600 mm (Approx.)		
	Surveillance and access control System	The vendor must install CCTV in cleanrooms and entry/exit for proper monitoring and surveillance with access control system at entry/exit points.		
HVAC System	AHU and MAU	Suitable AHUs/MAUs are to be located outside the fabrication (fab) area envelope in the utility area and fitted with cooling coils, dehumidifiers, stages of filters, etc., to maintain the required temperature and relative humidity (RH). The required quantity of dehumidified air should be delivered through suitably sized supply air ducts from where the air is supplied to the negative pressurized plenum. The scope includes the supply, installation, testing, and commissioning of an appropriate number of Air handling units as per the design to maintain the specified environmental conditions in the cleanrooms.		
		Framework	Extruded Aluminum/Stainless steel	
		Joints	Moulded high tensile reinforced plastic.	
		Section frame	Each section shall have its independent base and be mounted on 14G galvanized sheet steel and aluminium die-cast channels. Zinc deposition on the GI sheets shall be a minimum of 120 GSM.	
		Body structure	Double skin with 43 ± 2 mm thick PUF insulation sand-witched panel, 1 mm GI outer skin pre-coated and 0.8 mm thick Aluminum sheet inside. The density of PUF insulation shall be a minimum of 40 Kg/m ³ .	
		Sections joints	The framework for each section shall be joined together with a soft rubber gasket in between to make joints airtight.	
		Doors	Suitable air-tight access doors with aluminum cast heavy-duty hinges and locks shall be provided for various sections.	
		Cooling coils	Copper coils with anticorrosion-coated aluminium fins.	
		Circulation fan motors	Adequately sized, TEFC Squirrel cage induction motor with VFD drive and suitable for 415V \pm 10%, 3 phase, 50 Hz \pm 5% AC power supply. The motor shall be of high efficiency IE3 class as per IS 12615 – 2011-Non FLP.	
		Fan blades	Made of aluminium alloy	

		Heater	Strip/tubular heaters of sufficient capacity shall be selected in each AHU to maintain the area temperature. The heaters shall have a mounting frame, thermostat, humidistat, and air-stat in redundant arrangement, along with all control devices that the thyristors will control.		
		Filters	Pre-filters, micro-filters and fine-filters with efficiency of G4, M5, and F9 grades.		
		Humidity control	The vendor should provide automated humidity control with respect to the ambient temperature by any means, such as descent filters, strip heaters, etc. Also, for the winter season it can increase humidity to maintain the RH by humidifier.		
	FFU	HEPA filter efficiency	≥99.995% (H14)		
		ULPA filter efficiency	≥99.9995% (U15)		
		Prefilter assembly	A pre-filter of 10 microns is used at the inlet of the FFUs in order to protect the HEPA filters.		
		Material of FFU	Galvanized PF anodized 690-alloy steel or Stainless steel or Powder coated Aluminium (min 300 GSM/m ²)		
		Filters in ISO-5 Lab	ULPA Filters		
		Servicing	The filter should be replaceable from beneath the ceiling.		
		Blower assembly	The Blower shall be centrifugal type if required, Aluminium construction, dynamically and statically balanced, and suitable for a 220 V, 50Hz, single-phase power supply. Sound Level: 50 + 5 dB.		
			Note:-Outside filter dimensions (mm), Nominal air volume (m ³ /hr.), Pressure drops at nominal air volume (Pa) and tolerance pressure drop (%) are to be submitted as part of the technical bid.		
	Air Distribution	Air distribution shall be via GI fabricated rectangular/spiral ducts with zinc deposition of 270 gms/m ² , and all metal shall be used internally or externally for fixing, bracing, stiffening, etc. Air distribution ductwork shall be as per SMACNA standards. The duct shall be insulated using closed-cell nitrile rubber of sufficient thickness to avoid condensation.			
		Supply air duct	Insulated with 50 mm thick aluminium-faced Closed-cell nitrile rubber, Density 50 kg/m ³ .		
		Return air duct	Insulated with 30 mm thick aluminium-faced Closed-cell nitrile rubber, Density 50kg/m ³ .		
		Sound attenuators	Sound attenuators should be installed in the supply air duct to reduce the sound to 70 ± 2 dB		
		Note:- Detailed heat load calculations (considering the environmental conditions at Delhi and the cleanroom layout/equipment @ IIT Delhi) along with the assumptions to be submitted with the technical bid.			
Electricals	All electrical equipment and accessories to be furnished, installed and commissioned under the scope of these specifications shall be designed, manufactured, tested and installed in accordance with relevant Indian Standard Specifications IS 1554, Indian electricity rules and any other applicable regulations.				
	Genera	Voltage supply	415 V± 10%		
		Frequency	50 Hz± 5%		

	Fault level	As specified in the SLD			
	No of Phase and grounding	3 Phase & solidly ground earth			
	Power distribution	A.C., 3 phase 4 wire for 3 phase system, 1 phase 3 wire system			
	The incomer of capacity 100 KW power backed by IIT Delhi DG will be provided by IIT Delhi, The vendor has to provide all the electrical connections in the clean room as specified in Annexure XVI . The vendor will provide the extra electrical connections required for HVAC, compressors, RO/DI plant, and Power backup system. The vendor should have calculated and considered the number of power switch sockets/lighting switch sockets, 3-phase power supply sockets, and single-phase high ampere supply sockets, as per the drawing mentioned in Annexure XVI .				
	Scope of Supply	Panels/MCCs/MCB DBs: 415 V/240 V Lighting /Power Distribution Panel/Boards			
		Cables/wires: FRLS 1.1 KV grade XLPE cable for power and lighting distribution			
		G I Conduits, earthing materials, double/single compression brass cable glands, cable lugs (Al & Cu as required), cable ties, cable/wire identification tags required for the installation and maintenance of trouble-free operation of the downstream system and accessories covered under this specification.			
		Lighting fixtures complete with accessories, specifications and quantities specified in the BOQ, including the required accessories for installation in cleanrooms, gray areas, etc.			
		Trunking and raceways for power and LAN cables, including the required accessories like bends, tee, etc., if required, shall be in the scope of the contractor.			
		Installation, testing & commissioning spares as required.			
The party shall submit all relevant drawings, data, catalogues with instruction and troubleshooting manuals, and type test certificates.					
Materials and accessories necessary or used for satisfactory and trouble-free operation and maintenance of the above equipment/material shall also be furnished.					
Lighting	Lab 1 and 3	Yellow LED lights (Temp 3000K) and filters for <420nm wavelength light if necessary. Luminosity: 600 Lux			
	Lab 2 and gowning area	LED panels (6500 K Temp), Luminosity: 600 Lux			
Approx Load	Labs	Load (KW)	Type		
	Lab 1	30.0	UPS		
	Lab 2	11.0	UPS		
	Lab 3	15.0	UPS		
	Gowning	3.5	UPS		
	Total	59.5 KW	UPS		
The detailed specifications of cable, wire, conduits, switchboards, switches/sockets, MCC Panel, bushbar and bus taps, VFD, MCCB, contactors, cable terminations, cable termination, grounding, terminal boxes, painting, distribution box, surface wiring, switches sockets, cable tray are given in Annexure X .					
Cleanroom	All the furniture should be cleanroom environment compatible with material SS304 grade.				
	Item	Description	Quantity		
	Chair	Seating area 400 mm x 400 mm Height 600 mm	8		
	Table	Size: 1200 mm x 750 mm x 800 mm (L x B x H)	6		

		Size: 900 mm x 800 mm x 800 mm (L x B x H)	1	
	Storage racks	800 mm x 800 mm x 800 mm Separate 2 partitions	2	
	Almirah	Size: 750 mm x 500 mm x 1500 mm	2	
	Eye Washer	Clean room compatible Acid fume resistant	1	
	Garment Cubical	HEPA filter H14-grade, Pre-filter G4-grade, non-woven CE certified blowers 1' UV light along with a digital hour meter 1' LED light Leveling jack - 4 No's Double skin doors with toughened view glass Exhaust grill - 1 Nos SS 304 Door handle - 2 No's SS hinges - 1 Set Size: 750 mm x 500 mm x 1500 mm	2	
	Fume Hood	Bench top fume hood 1800 mm x 1000 mm x 2350 mm (W x D x H) MOC CRCA with powder coating FRP lined interiors 6mm tempered safety glass for sash Standard base cabinets - 2 No's Light fixture Filler panels Dished granite worktop 18 mm with finishing 3 Modular cover frame with 6/16 A switch and sockets - 6 No's Remote control valves - 3 No's. PP cup sink Bottle trap PVC skirting	1	
	Cross over benches	Size: 1500 mm x 500 mm x 300 mm	1	
		Size: 2000 mm x 500 mm x 300 mm	1	
	Ladder	6 Step aluminium/SS cleanroom-compatible ladder	1	
Process Extraction System	Vendors to design, supply/construct, and install corrosion-resistant, soundproof and vibration-free (less than 70 dB) systems for DRY & WET exhaust, meeting the local pollution control board norms. Process extract duct with proper exhaust work to be distributed through the supply plenums, connected to a suitable blower for all the equipment, HVAC, equipment in the clean room, etc., as per the requirements given in Annexure XV .			
	After considering the total exhaust volumes provided in the utility matrix, 20% extra exhaust flow should be considered for selecting the capacity of the fans and scrubbers.			
	The exhaust system comprising ducting, blowers, and casing is a corrosion-resistant material of construction (MOC) to handle the gases/fumes.			
	GI for solvent and heat exhaust, control dampers/Magnehelic gauges, and flexible ducting wherever required.			
	Suitable exhaust fan to be provided for solvent and heat exhausts.			

	Ducting exposed to ambient to be firmly supported with galvanized brackets & tie rods.		
	Similar equipment exhaust is to be clubbed inside, dissimilar exhaust should be clubbed together outside the building.		
	The system is to be soundproof in nature (< 60db) and vibration-free.		
	Proper exhaust should be there for all cabinets, gas pods, pumps, scrubbers, etc. as per the requirements		
	The exhaust system should be elevated to the top floor of the building.		
	A minimum of 4 No's Magnehelic gauges will be provided for exhaust monitoring in ISO-5 (Class 100) areas		
	Solvent bench – take-off point with proper scrubber system (activated carbon filter if required) provided near the wet bench tap-off.		
	The tentative drain layout from various locations of a cleanroom is given in Annexure XIV ; all the drain piping must be made of acid-proof PVC pipe; the vendor has to calculate the required piping and quote accordingly with all required accessories.		
	The vendor has to dig an acid drain pit and connect it to the normal drain.		
Fluid Distribution system	Supply installation and commissioning of this fluid distribution system from the Nitrogen bank and CDA storage to the point of use as mentioned in the drawing in Annexure XIII , The supplied materials should be SS316L (non-electro polished) with point-of-use SS regulators, Compressed dry air shall be distributed through SS316L (non-electro polished) orbital welded/compressor fittings tubing work with all associated ancillaries and equipment in clean room. All POU (Point of Use) connections of CDA shall have an isolation valve and pressure regulator with double ferrule mechanical joint end connections. The vendor should also provide the PVC-based N ₂ guns, the number of guns as per Annexure XIII . The vendor should have installed the RO/DI water line from the RO/DI storage plant to the point of use as per defined under Annexure XIII , The RO/DI line must be free of any contamination before the installation with appropriate methods.		
Cleanroom accessories	Item name	Description	Qty
	Water purification system	<ul style="list-style-type: none"> a) Water purification system which can produce RO water (Type III), pure water (Type II) ultrapure water (Type I ASTM (D1193-91)) from potable tap water. b) The system must constitute a prefiltration system for the treatment of potable water and a booster pump for circulation, c) The water can be stored internally or externally in a separate tank, d) The purification system must include a pretreatment module, a High-pressure pump for water treatment, an RO membrane, a UV lamp, an electrode ionization module, ultra-purification cartridges, etc., to produce specified water. e) Purification capacity: ≥2 L/H f) Storage: min 60 liter 	1
	Air compressor	The compressor should be an oil-free scroll type compressor with minimum 250 Liter storage capacity and CD absorption dryer with a working pressure of 6 Bar all the time, min 3L/sec air flow rate; the output should comply with ISO 8573-1	1
	N₂ Bank	Arrangement of hookup 60-litre water capacity cylinders at a time with an output pressure of 5-Bar, total cylinders to be hookup: 5 No's.	1

UPS with battery	Supply installation and commissioning of single-phase output online UPS with batteries Load capacity of 60 KW with all electrical protections	1	
Portable air particle counter	Three size channels : 0.3 µm, 2.5 µm, 10.0 µm Light source: Semiconductor laser diode Count modes : Piece/L or ug/m ³ Counting efficiency 100±10% @0.5 µm Principle: Optoelectronic type Measurement Range: 0-1000ug/m ³ Operating environment : 0 ~50°C Humidity Range : 0 ~99% RH	1	
Wet bench	Construction: All stress-relieved white polypropylene, 0.5" (13 mm) thick Exhaust: Ducted through a standard 10" (254 mm)-diameter flange positioned at the top rear of the cabinet Drain: located at bottom of sub-deck plenum Power: 220VAC, 50Hz, depending on component selection. Power outlets available for process equipment. Illuminator: 800 Lux (3000K Temp) filtered for <450nm Control: The instrument panel provides a power switch, power indicating light, light switch, static pressure exhaust meter, and power fuse. Provisions are made for audible and visible pressure alarms, visible alarm silence, and for control of optional processing baths. Noise: < 60 dB Filter: 99.99% HEPA Air flow control: min three-step airflow control Blower assembly: centrifugal lubricated bearing type ISI marked assembly Working size: 6 ft. x 3 ft. x 3ft.	1	
Cleanroom oven	Max Temperature: ≥ 400 ⁰ C Volume: ≥100 L Full sealed low thermal mass insulation to avoid shedding fibres Fully enclosed brushless fan motor Single ramp to set-point & process timer Smooth easily cleaned gloss epoxy exterior Polished stainless steel sealed interior Perforated stainless steel shelves Particle-free silicone rubber door seal Membrane control panel with clear bright LED display Double skin construction ensures safe outer case temperature Over-temperature protection ISO-14644 Class 5 certified	1	
Cloth washing machine	8 Kg front load fully automatic washing machine for clean room garment washing.	1	
Vacuum cleaner	A general vacuum cleaner with high suction capacity.	2	
Precision Manual	Cutting pressure is adjustable by the spring Replaceable diamond scriber	Cutting 100 mm x 100 mm	1

	Diamond Wafer Scriber	The thickness of the cutting wheel: 0.55 mm to 0.75 mm	200 mm x 200 mm	1		
			Diamond scriber	5		
	Stereo Microscope	Magnification from 10X to 160X Rubber fixed eyecups Binocular view or trinocular view (if supplied with camera and camera objective lens) Halogen or LED-type dimmable lighting system			1	
	Vacuum Pump	Compact, lightweight and mobile oil-free piston vacuum pump with silencer, Vacuum regulator including pressure gauge, CE Certified Vacuum: 100 mbar			1	
Delivery terms		The Delivery shall be executed in two (2) Phases.				
	Phase 1	Phase I of the work covers installing cleanrooms, including all utilities distribution networks, utilities plants/systems (complete base build), etc. The period for completion of Phase 1 shall be 3 months from the first day of handover of the site to the selected vendor.				
	Phase 2	Phase II of the work shall cover tool hook-up, and the period for completion of the tool hook-up work shall be 1 month to be reckoned from the 5th day of the date of issuance of instructions by IIT to commence tool hook-up work. While it is envisaged that the tool (Equipment) move-in shall be undertaken immediately upon certification of the clean rooms under “As Built Condition”, in the event there is a delay in the tool move-in due to any unforeseen reason, the vendor may, if it so desires, de-mobilize the site, and thereafter re-mobilize the site within two (2) weeks upon instructions from IIT to take up the tool hook-up work. There shall be no financial implication on IIT for de-mobilizing the site by the contractor. The vendor shall facilitate tool move-in activity by removing the wall panels, etc., as required, for the tools to be moved to the location within the cleanrooms, including bulk-heading, making cutouts/penetrations in the wall panels, sealing and re-installing the wall panels etc. for smooth tool move-in activity. The quoted rates shall be deemed to include the costs of these activities.				
Acceptance/completion terms	Acceptance/completion shall be on successful installation, testing and commissioning of all the systems covered in the contract agreement and acceptance of Phase I and II work. Acceptance certificate shall be given by IIT Delhi on successful demonstration of all clean room parameters and other system parameters for a period of 4 weeks after commissioning. The following checklist should be performed before the handing over and commissioning.					
	1	Facility air supply should be balanced to ensure that the design supply air volume is achieved.				
	2	Positive differential pressure cascade should be commissioned with the extraction systems running, and doors closed.				
	3	The ISO-5 (class 100) Lithography cleanroom will have the highest differential pressures, with the differential pressure diminishing across thresholds.				
	4	The pressure cascade and extraction losses will dictate the fresh air volume of the system, with suitable ductwork leakage factors being taken into account during the detail design stage.				
	5	Commissioned airflow volumes should be within 10% of design calculations. Remedial action should be required where measured rates are greater or less than 10% of the design.				

	6	Tests shall be performed in accordance with the testing procedure specified in ISO 14644	
	7	Validation by an independent agency experienced in validating cleanrooms is in the contractor's scope. The "independent" testing firm shall have experience of having conducted cleanroom testing/validation for certification of a minimum of 2 (two) Class 100 cleanrooms in the last 5 years.	
	8	As-built room particle counts (as per ISO-14644).	
	9	At-rest room particle counts (as per ISO-14644).	
	10	FFM air volumes should be measured with a barometer.	
	11	Temperature and relative humidity should be measured in each area.	
	12	Light levels should be measured at the working plane (at a height of 900mm from the floor).	
Maintenance and operation	The Vendor should appoint a team of two people (1 technician + 1 caretaker) for one year to operate and maintain the facility at their own cost (The IIT Delhi will not bear any costs like food, lodging, salary, transportation and any allowance). The facility will always be operational on working days with office hours The one year of operation and maintenance will be counted after the successful handover of the facility to the IIT Delhi, The major roles of the person appointed by the vendor are as follows.		
	1	To monitor the facility on CCTV and instruct the students and other staff members on do's and don'ts in the clean room. It is the responsibility of the person to maintain discipline in the cleanroom for the efficient and fluent use of the facility,	
	2	To maintain the log of the persons who are entering and leaving the facility,	
	3	Washing of cleanroom gowns whenever required or at regular intervals,	
	4	It is the sole responsibility of the person to maintain the cleanroom facility,	
	5	They should know how to operate the facility control and monitoring system,	
	6	Provide consumable items for the gowning or keep a record of usage of such items (The consumables will be provided by IIT Delhi),	
	7	They should know how to troubleshoot small failures or coordinate with the manufacturer of the clean room to rectify the problems.	
	8	The facility will be on standby mode during non-operation hours and the person responsible for putting it on standby.	
	Note: After the completion of one year, SeNSE, IIT Delhi will decide on the operation and maintenance contract of the facility on a yearly basis.		
Warranty	1	The Vendor shall provide at least three (3) three-year on-site comprehensive warranties for the installation. The warranty shall be for 3 years from installation and acceptance on successful commissioning.	
	2	During the warranty period vendor shall carry out preventive maintenance once every quarter at his own cost. Further, the vendor shall attend to a breakdown in any installations performed under the PO/Contract at his own cost within 48 hours of intimation from IIT.	
	3	The vendor should provide the validation certificate to certify the ISO Class of the facility at least twice a year.	
	The parties/firms participating in the tender should be technically competent and decent experience in having undertaken cleanroom projects for semiconductor/ MEMS/nano-fabrication facilities with the following eligibility criteria (points 1-8)		

Eligibility criteria	1	Parties/ firms should have successfully completed at least one similar work. “Similar Work” shall mean “Design, detailed engineering, supply, installation, testing, commissioning and validation of Clean Room facility (Class 100/ISO 5 or better, as per FED Std. 209E/ISO14644) and associated utilities comprising of High Purity Gas Distribution system, HVAC works, Gas management (GM) System, Electricals, Fire Detection etc. for semiconductor/Microelectronic/Nanofabrication/ MEMS facilities”. Also, The party should have at least of two years of experience as a facilitator in a similar field.	
	2	The firm/party may not associate with another firm/party (experienced in the relevant field, viz. Clean room/HVAC/High purity utility distribution network), and in such cases, the combined experience of the consortium members will not be considered as “similar work” for determining the eligibility.	
	3	Copies of Purchase Orders (PO’s)/ work orders regarding “similar work” executed by the party/firm with documents evidencing satisfactory completion issued by the respective clients/organizations shall be submitted along with the bid.	
	4	Completion issued by the respective clients/organizations shall also be submitted with the bid.	
	5	Average annual financial turnover should not be less than Rs. 40 million (fifty million rupees) during the last 3 years. The prospective firm/party shall provide a chartered accountant’s certificate for the annual financial turnover.	
	6	Should solvency of not less than Rs. 25 million (twenty-five million rupees). The prospective firm/party shall provide a current (not prior to six (6) months) solvency certificate from any scheduled bank.	
	7	Should not have incurred any loss in more than 2 years during the last (three) 3 financial years. The prospective firm/party shall provide a copy of audited annual accounts by a chartered accountant for the previous 3 (three) financial years.	
	8	The contractor should have an in-house manufacturing facility of 80% for supply materials.	
	1	The vendor should seek approval for the material made during and before the execution from the IIT Delhi Concerned user,	
	2	Vendor to provide test and quality certificates from the OEM of all the materials and equipment supplied with all relevant details.	
	3	All industrial safety practices to be followed during the implementation.	
	4	Appropriate training to be provided to IIT Delhi staff employed for the facility, with respect to the operation and first-level maintenance and monitoring. The vendor should also train the staff to perform routine measurements of all utility parameters. The vendor must also provide a set of documents detailing all protocols. The person should also be trained for purging and changing inert gas cylinders.	

Terms and conditions for the installation and commissioning of a clean room	5	<p>The following drawing /documents shall be submitted at the time of acceptance of the system.</p> <p>a) Electrical single line diagrams for the complete electrical system starting from electrical panel power and lighting DBs, including an Illumination system, Power distribution system, Fire detection system, network system, and telephone and paging system.</p> <p>b) Foundation drawing of all floor-mounted equipment (Electrical panels, Network Racks, etc.), ceiling mounting details for lighting fixture/speakers/detector, etc. and any other relevant drawing required for repair and maintenance.</p> <p>c) Layout drawing with dimensions of all electrical equipment under the bidder's scope.</p> <p>d) Make, type and catalogue of lighting fixtures, raceways, Trunking and related accessories along with technical leaflets, data sheets, polar curves, etc. to be provided by the vendor. The contractor shall offer recommended makes mentioned in this document.</p> <p>e) Equipment data sheets furnishing guaranteed performance figures for each type of equipment.</p> <p>f) Checks list and test to be conducted during erection, testing & commissioning of the individual equipment.</p> <p>g) Wiring diagram for lighting, power, fire detection system and LAN.</p>		
	6	The vendor shall ensure adherence to safe construction practices, which shall inter-alia include the use of Personnel Protection Equipment (PPE) by their workmen, supervisors, etc., deployed on the work. PPE, viz., safety helmets, safety shoes, harnesses, safety glasses, gloves, etc., shall be provided by the vendor for the safety of all the personnel at the work site. The vendor shall take adequate measures to ensure that no damage or loss is caused to IIT's buildings, equipment and personnel due to any activity carried out by the vendor relating to the performance of the Contract. The vendor shall be liable to make good the loss/damage, including any consequential damage caused by them, and in case of failure to do so, IIT shall effect financial recovery for the same from the vendor.		
	7	Electricity required for installation shall be provided by IIT at no charge basis to the vendor. For this, an electricity connection will be provided at a single point, and further distribution shall be the vendor's responsibility. The vendor shall provide the wattage of all the electrical loads required for installation and install all safety and protection devices, viz., MCB/MCCB/ELCB/RCCB, etc., as per the applicable electricity rules.		
	8	The vendor shall follow the security procedures in vogue at IIT Delhi to move the vendor's personnel, materials, etc., into/from the IIT campus.		
	9	The vendor shall be permitted to construct a temporary site office near the site office for their staff. The vendor shall also make a temporary storage shed for the materials brought to the site by them for incorporation in the work at their cost close to the site of work.		
	10	The vendor may inspect the site on a working day and during working hours up to the last date of uploading the bids to get acquainted with the site conditions. The vendor has to contact 2 days prior to Prof. Gufran S. Khan (gufrankhan@sense.iitd.ac.in) before the inspection.		
	11	No labour hutment shall be allowed inside IIT Delhi premises. The vendor shall make necessary arrangements for the accommodation of their labour/workmen to be deployed by them for project execution at their own cost.		
		The following submittals should be provided in technical quotations along with other documents mentioned in (ANNEXURE-XVI)		
	1	Concept design and as-built drawing showing the layout of the cleanroom area, HVAC blocks, Gas yard and gas hook-up (if any),scrubber, other facility and utility services blocks, etc.		

Submittals in Technical quotations	2	PERT/Gantt chart for the overall deliverables.	
	3	The vendors shall present their Techno-commercial offer/bid to IIT Delhi technical team. If the bid /offer does not meet the technical requirements as spelt out in this document, the same shall be rejected by IIT Delhi. Also, if the vendor is absent from making the presentation to the IIT Delhi Technical team, their bid/offer shall be rejected.	
	4	Detailed cleanroom layout drawings, facilities layout drawings, ducting layouts, utilities distribution layouts, cut sections of the facility at critical locations, gas pad layout, Gas cabinets/VMBs layout, MCCs layout, BMS configuration, control room layout, lighting layout, cleanroom layout with services and utility distribution network marked on the drawing, Plant Room concept design drawing. etc. Vendor to submit details like detailed design data/details and detailed engineering, P&I diagrams for all services and utilities, etc., Detailed un-priced Bill of Quantity/Materials envisaged for the tender, Make/Brands of all the equipment/materials conforming to the specifications in this document, etc. along with technical part of the bid. No pricing information is to be submitted in the technical bid.	
	5	An item-wise compliance statement indicating any deviations, if any, from specifications, recommended makes, etc. To support compliance with the specifications, the vendor shall submit all required documents mentioning the Annexure's number. If the offer deviates from the specifications and is not acceptable to the IIT Delhi technical committee, the vendor is bound to change the materials per the IIT Delhi official's recommendations. Otherwise, the bid shall not be considered for further processing.	
Submittals should be provided by the selected vendor	1	Detailed design, including design analysis and data for cleanrooms, HVAC systems, utility distribution, electrical systems and distribution, fire detection and suppression, LAN, etc., for all the works covered under the scope of work for the approval of IIT Delhi.	
	2	On completion of the cleanroom, the vendor shall submit 'As Built Drawings' in CAD format, PDF and a hard copy (three sets) of each drawing.	
	3	Operating and maintenance manuals in hard copy and electronic format. handover and operator instruction.	

Sl. No.		List of optional items		Compliance	
1	AMC	Vendor shall also quote post warranty 1,2,3-year comprehensive AMC price separately, as an option.			
2	White Light Reflectance Spectroscopy system	White Light Reflectance Spectroscopy system with the incident light normal (perpendicular) to the sample surface. The measured reflectance spectrum, produced by interference from the individual interfaces, is used to determine the thickness, optical constants (n & k), etc. Laptop/PC with software for analyzing the data and controlling the system. Cartesian (X-Y) automated stage with wafer chuck.			
		White light source wavelength (nm)	Minimum	≤250	
			Maximum	≥900	
			Lifetime of source	≥1500 hours	
		Minimum	≤1 nm		

Measurement Thickness (SiO ₂)	Maximum	≥110 micron	
	Accuracy	≤0.5%	
	Precision	≤0.06 nm	
	Stability	≤0.06 nm	
Spot Diameter	400 microns or less		

I have also enclosed all relevant documents supporting my claims, (as above) in the following pages.

Signature of Bidder

Name: _____

Organization Name: _____

Designation: _____

Contact No. : _____

**<< Organization Letter Head >>
DECLARATION SHEET**

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

This is certified that our organization has been authorized (Copy attached) by the OEM to participate in Tender. We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document. Moreover, OEM has agreed to support on regular basis with technology / product updates and extend support for the warranty.

The prices quoted in the financial bids are subsidized due to academic discount given to IIT Delhi.

We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS OF THE Vendor/ Manufacturer / Agent
1. Phone	
2. Fax	
3. E-mail	
4. Contact Person Name	
5. Mobile Number	
6. GST Number	
7. PAN Number	
(In case of on-line payment of Tender Fees)	
8. UTR No. (For Tender Fee)	
9. Kindly provide bank details of the bidder in the following format: a) Name of the Bank	
b) Account Number	

(Signature of the Tenderer)

Name: _____

Seal of the Company

PREVIOUS SUPPLY ORDER DETAILS

Annexure - IV

Name of the Firm _____

Order placed by (Full address of Purchaser)	Order No. and Date	Description and quantity of order equipment	Value of order	Date of Completion of delivery as per contract	Has the equipment been installed satisfactorily (Attach a Certificate from the Purchaser/ Consignee)	Contact person along with Telephone No., Fax No. and email address)
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Signature and Seal of the Manufacturer/ Bidder

Place: _____

Date: _____

ORIGINAL EQUIPMENT MANUFACTURER (OEM)
Manufacturing Authorization form (MAF)
(On Letter Head of Manufacturer)

ANNEXURE-V (Revised)

Tender No. :-

Date:-

To
The Director,
Indian Institute of Technology Delhi,
New Delhi- 110016

Dear Sir,

We manufactures of original equipment at (.....address of factory.....) do hereby authorize M/s (Name and address of Agent) to submit a bid, negotiate and receive the order format against your tender enquiry.

M/s. is authorized to bid and conclude the contract in regard to this business.

We hereby extend our full guarantee and warranty as per clause of the terms and conditions NIQ for the goods and services offered by the above firm.

Yours Faithfully,

(Name)

(Name & Seal of Manufactures)

Note: -

1. **Items of indigenous nature or quoted in INR**, more than 1 authorized representative may participate in the same tender and submit their bids on behalf of their OEM/Principal/Manufacturer if the OEM permits more than one authorized bidder in such case as per their policy.
2. **In cases of agents quoting in offshore procurements**, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. **One manufacturer can also authorize only one agent/dealer**
3. The letter of authority should be on the letterhead of the manufacturer and should be signed by a person competent and having the power of attorney to bind the manufacturer. The same should be included by the bidder in its techno-commercial unpriced bid.

<On Organization Letter Head>

(ANNEXURE-VI)
(For Goods/ Services Contracts)

No. _____

Dated: _____

CERTIFICATE

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 this bidder is 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 this bidder is from _____ (*Name of Country*) and has been registered with the Competent Authority. I also certify that this bidder fulfills 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)

Signature of Bidder/ Agent

Name: _____

Designation: _____

Organization Name: _____

Contact No. : _____

<On Organization Letter Head>

(ANNEXURE-VII)

(For Works Contracts, including Turnkey contracts)

No. _____

Dated: _____

CERTIFICATE

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries and hereby certify that this bidder is not from such a country and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority.

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 on sub-contracting to contractors from such countries and hereby certify that this bidder is from _____ (*Name of Country*) and has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I also certify that this bidder fulfills 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)

Signature of Bidder/ Agent

Name: _____

Designation: _____

Organization Name: _____

Contact No. : _____

DECLARATION OF LOCAL CONTENT

(To be given on Company Letter Head – For tender value below Rs.10 Crores)

(To be given by Statutory Auditor/ Cost Auditor/ Cost Accountant/ CA for tender value above Rs.10 Crores)

To,
The Director,
Indian Institute of Technology Delhi
New Delhi-110016

Subject: - Declaration of Local Content

Tender Reference No: _____

Name of Tender/ Work: _____

1. Country of Origin of Goods being offered: _____
2. We hereby declare that items offered has _____% local content
3. Details of the Location at which the Local Value Addition is made _____
4. Details of Local Content _____

“*Local Content*” means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

Bidders offering Imported products will fall under the category of Non Local Suppliers. They cannot claim themselves as Class-I or Class –II Local Suppliers by claiming the services such as Transportation, Insurance, Installation, Commissioning, Training and After Sale Service Support like AMC/ CMC etc. as Local Value Addition.

“*False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.”

Yours faithfully,

(Signature of the bidder, with Official Seal)

Note: It is mandatory for bidders to quote items having local content minimum 20%. Refer revised Public Procurement (Preference to Make in India), Order 2017, No. P-45021/2/2017-PP (B.E-II) dated 16.09.2020 issued by DPIIT, Ministry of Commerce and Industry, Govt. of India. (Submit duly filled Annexure VIII for the same). *The Annexure VIII once submitted in the Technical Bid will be final. Submission of Revised Annexure VIII will NOT be accepted.*

BID SECURITY UNDERTAKING

(To be issued by the bidder on company's letterhead in lieu of EMD)

To,

The Registrar,
I.I.T. Delhi, Hauz Khas,
Delhi – 110016.

We, M/s _____ (Name of the Firm), with ref. to Tender

No. _____ dated _____ hereby undertake that:

1. We accept all terms and conditions of the tender document.
2. We accept that, we will not modify our bid during the bid validity period and will honour the contract after the award of contract.
3. In the event of any modification to our bid by us or failure on our part to honour the contract after final award, our firm may be debarred from participation in any tender/ contract notified by IIT Delhi for a period of one year.

Yours faithfully,

(signature)

Name:

Date:

Office Seal:

Detailed specifications of electrical systems

1. Cables, wire, conduit, earthing, Switchboards, Switches/sockets etc.

- a) Cables: The scope includes the Supply and installation of ISI marked PVC/XLPE insulated, Extruded PVC inner sheath, GI strip armoured overall FRLS PVC outer sheathed, on wall/surface/existing cable tray as required as per the detailed specification and quantity in the BOQ. Control cables shall be copper conductor PVC insulated, and power cables shall be XLPE insulated. The necessary hardware for the installation of cable, like cable ties, clamps, tags, etc., will be in the scope of the Contractor. Instrumentation cables shall be conforming to BS 5308, type II, 300/500 V grade with stranded 0.75sq mm copper conductor, PVC insulated, colour coded, twisted to form a pair/pairs, twisted to form a unit, units laid up, Myler taped binding, overall screened with aluminium Myler tap with tinned copper drain wire, extruded inner sheathed, galvanised steel round wire /strip armoured, overall FRLS PVC sheathed.
- b) Wire: The scope includes the Supply and installation of stranded Copper conductor wire, 1100-volt grade, FR PVC insulated single core conforming to IS 694 as per the detailed specification,
- c) Conduit: The scope includes the Supply and installation of ISI-made rigid steel, hot dip galvanised conduits of different sizes. As required, the conduit shall be installed on a wall/surface/ metal truss/existing cable tray. Flexible conduit shall be made with bright cold rolled annealed and electro-galvanised mild steel. Installation of conduits shall include all necessary hardware, metal strip, welding, clamps etc.
- d) Earthing: The scope includes the Supply and provision of earth pits and earth strips for earthing of Panels, DBs, and Process Tools as per established norms/Indian codes.
- e) Switchboards and Switch/sockets: The scope includes the Supply and installation of Different sizes of Switchboards and switch/sockets for Lighting, Power Distribution and Trunking.

2. MCC Panel

The technical scope of the work includes the Design, Fabrication, Supply, Installation, Testing and Commissioning of electrical panels as per the Single Line diagrams (SLDs),

- a) Panel shall be fabricated per IEC 61439 parts 1 & 2.
- b) Panel shall be indoor, metal clad, air-insulated floor mounted extendable to side, single front construction, front wired, front connected.
- c) The minimum thickness of sheet metal shall be 2 mm, and the panel shall confirm IP54 protection.
- d) The working height of the Panel shall be limited as per standard engineering practices.
- e) The design should be fully compartmentalized with metal partitions between compartments. All doors shall be gasketed. Each vertical section shall have a removable back cover.
- f) All switches, push buttons, lamps, and indicating instruments shall be flush mounted.
- g) A full-height vertical cable chamber with cable supports shall be provided in each section to facilitate unit wiring. The cable chamber shall be sized to accommodate all cables and shall have removable covers. A horizontal wire extending the entire length shall be provided at the top of the panel for inter panel wiring.
- h) The panel shall have a minimum 75mm high base MS channel frame.
- i) The panel shall undergo a tank or better process per relevant IS standards.
- j) A lifting hook shall be provided at each section for easy transportation.
- k) Different panel compartments shall be provided with dustproof air filter louvres
- l) explosion vents or similar safety arrangements to let out gases under pressure generated during any fault inside the panel.
- m) The panel shall have a pocket for the Panel drawing in the incomer section.

3. Busbar and Bus Taps

- a) The main bus and connections shall be of high connectivity Aluminium/Aluminium alloy, sized for specified current ratings with a maximum temperature limited to 85°C. i.e. 35°C rise and ambient 50°.
- b) Separate vertical bus bars shall be provided for each vertical panel.
- c) Adequate contact pressure shall be ensured at bus connections by means of two bolt connections with plain and spring washers and lock nuts.
- d) Bus bar and connections shall be fully insulated for working voltages with adequate phase/ground clearances. Insulating sleeves heat shrink type for bus bar and shrouds, removable type joints shall be provided. Bus insulators shall be flame retardant.
- e) The bus bar shall be colour-coded for easy identification.
- f) The busbar should be connected in such a way that it can be dismantled/assembled while separating different sections of the panel.
- g) Shrouds of the transparent sheet on the exposed bus in cable alleys, for adequate safety measure.
- h) Bus bar Conductor shall be conforming to IS-5082.
- i) Minimum clearance (PH-PH, PH-N and PH-E) between Bus bars shall be maintained per the latest IS.
- j) Bus Bar supporting Material shall be of SMC/DMC
- k) Material of Aluminium Bus bar shall be of E91 grade.
- l) The bus bar shall be protected from the transparent insulated material for standing safety points.

4. VFD

- a) The VFD shall be IGBT based, air cooled and in compliance with latest industry norms/standards. The VFD shall be equipped with all required circuit protectors of suitable rating to protect the VFD to external as well as internal faults. The VFD shall have built-in harmonic filters, active/passive or both, to reduce the voltage and current harmonics interferences. The VFD shall have a dedicated screen to display the operation parameters, errors/faults etc. and Power factor should be better than 0.95.
- b) VFD shall be capable to communicate with the Facilities Control & Monitoring System (FCMs) if required.
- c) Line reactor/choke of suitable rating shall be connected before/after the VFD.

5. MCCB

- a) The MCCBs should be extra current limiting type with trip time of less than 10 m sec under short circuit conditions. The current limiting action should be achieved with repulsion principle. The MCCBs should preferably have an anti-reclosing feature.
- b) The MCCBs should be 3 or 4 poles as per SLD.
- c) The MCCBs should have a Service short circuit breaking capacity (Ics) of not less than 35 kA rms at 415 Volts 50Hz AC for incomer. The service breaking capacity should be equal to ultimate breaking capacities (Icu) (i.e. Ics= Icu=100%).
- d) The release should be thermal magnetic having adjustable overload and short circuit.
- e) Switches shall be triple pole air break AC23 motor duty for motor starter feeders.
- f) Cubicle doors of incoming and outgoing shall be mechanically interlocked with switchgear to prevent unintentional openings of the door while the unit is in energized condition. However, defeat interlock provision is also to be provided.
- g) All incoming and outgoing feeders shall be provided with bolted disconnect link for isolation of neutral, if necessary. Selector switches shall be of rotary type.
- h) The MCCB shall be provided with rotary drive kit, spreader terminals and ON/OFF/Trip (MCCB) position of switch handle to be clearly marked.
- i) Duct Heater MCCB shall be motorized to control (ON/off) from FCMS.
- j) For incomers it should be EDO, microprocessor based communicable MCCB (35 kA or above) with

numerical releases for O/L, S/C & EFR. (With mechanical and Electrical interlocking for operation of only one ACB at any point of time.)

6. Contactors

- a) The contactor shall be 3 pole, air break type AC3 Duty continuous rating for motor starter feeders with non-bouncing silver/ silver alloy contacts.
- b) Contactor shall be of electromagnetic type rated for uninterrupted duty as per relevant standards and also suitable for capacitor duty
- c) Contactor shall be provided with adequate auxiliary contacts rated for 10Amps @ 240VAC for interfacing with control scheme.
- d) Contactor coil rating shall be minimum pick up of 85% of rated voltage and minimum drop out of 75% rated voltage.

7. Cable termination

- a) Panel shall be designed for cable entry from top.
- b) Each cable shall be clearly marked at both ends with an indestructible marker, preferably a cable tag made of Aluminium tacked with indicating cable number & both end feeder tags with switchboard tags. Cable tags at ends of cable shall be provided inside the gland plate as well as outside the gland plate
- c) All provisions and accessories shall be furnished for termination of cables including removable gland plates, cable supports and terminal blocks.
- d) Gland plate shall be minimum 3 mm thick.

8. Grounding

- a) A GI ground bus rated to carry the maximum fault current shall extend full length of Panel. The ground bus shall be provided with 2 bolts with GI bolt and nuts at each end to receive 50x6mm GI flat.

9. Terminal boxes

- a) Terminal block shall be 660V grade box clamp type with marking strips.
- b) Terminal for CT secondary leads shall have provision for shorting IF REQUIRED.
- c) Not more than two wires shall be connected to any terminal.
- d) Spare terminals equal in number to 20% active terminals shall be provided.
- e) Terminal blocks shall be suitably located in cable alleys.
- f) For Power cable, Bus Bar type cable connector (Melamine material) shall be provided.
- g) For Control cable, heavy duty screw type cable connector (Melamine material) shall be provided.

10. Painting

- a) Panel shall be painted with light grey epoxy painted (Gray RAL 7032) and caution notice plate shall be fixed at the back of each vertical panel.

11. Distribution box

- a) SITC of Flush/Surface mounting Horizontal/Vertical TPN MCB DB as per IS with Copper Bus Bar for each phase, fully insulated busbar and neutral bar, masking sheet, Door earthing, having IP 54 protection, with 1/3 phase MCB/ Isolator of different rating (6A to 32A) as outgoing RCBO of suitable rating at incomer with complete connection, testing and commissioning etc as required for lighting/Power DBs.

12. Surface wiring

- a) The surface wiring shall be cased in conduits which shall be of 1100 volts grade and conform to IS 9587-1987 (revised to date)
- b) The conduits used shall be of high quality & all joints shall be made with sockets. The bends and

elbows shall have inspection covers fixed with grease free screws. The joints shall be water tight. Approved metal saddles shall be used to secure the exposed conduits at a space of 1 meter or less. The connection of the conduits to switches etc., shall be secured by check nuts and ebonite bushes provided at the ends of conduits.

- c) The M.S. conduits shall be heavy duty and rigid type-ISI marked/conforming to IS specifications. The wall thickness shall not be less than 2 mm. For conduits above 32 mm dia. Metallic conduits of 19 mm dia. and below shall not be used. Conduit accessories (Boxes etc.) shall conform to IS-5133-1968 and IS-2667-64 (amended-revised to date). Conduit pipes shall be jointed, wherever necessary by means of screwed couples and screwed accessories only. In Long distance straight, run of conduits inspection type couplers at suitable intervals shall be provided.
- d) Threads on conduit pipes shall be between 13 mm to 19 mm long.
- e) The wiring shall be carried-out as per IS 732-1989 (Amended and revised to date).
- f) Flush inspection covers shall be provided in case of Concealed, recessed conduits. The staples for the conduits shall not be spaced more than 0.60 meters apart. Before filling up the chase with concrete the conduits should be given a coat of rust proof paint.
- g) The wires shall be drawn only after all the conduits have been properly fixed in position. Fish wires (steel wire: 16 SWG) shall be laid in conduits for drawing of wires.

13. Switches sockets

- a) Supply, installation, testing and commissioning of different size (2 to 12 modules as required) modules, GI box along with modular base & cover plate, modular switches/sockets (6A and 16A as required) in recess/wall/wall panel etc. as required.
- b) Note: Party to work out the no switch/sockets to meets the clean room requirement as a part of the detailed engineering and approval of the same shall be provided by IIT Delhi.

14. Cable tray

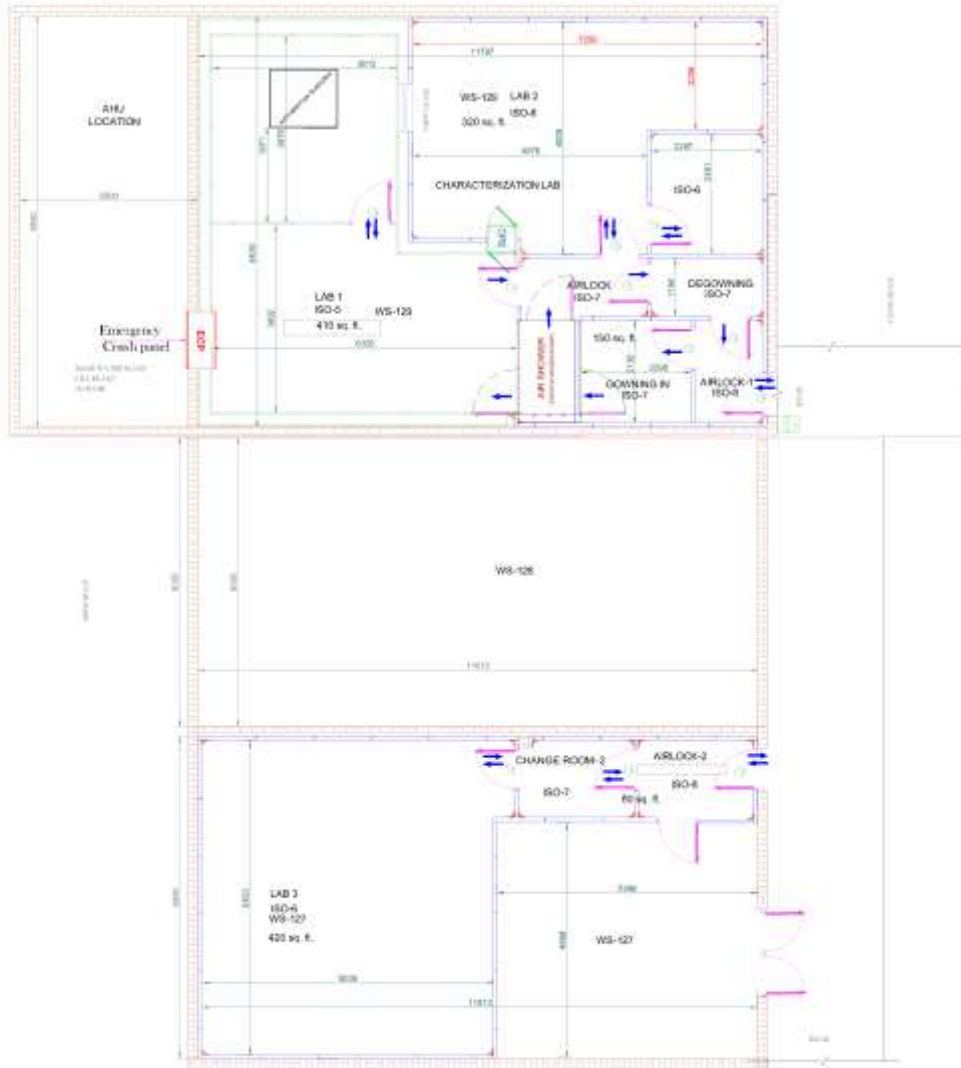
- a) MS powder-coated

15. Miscellaneous

- a) The final connections to the equipment shall be through Flexible connections in case of conduit wiring and also where the equipment is likely to be moved back and forth, such as on slide rails.
- b) An isolator switch shall be provided at any motor which is separated from the main switch panel by a wall or partition or other barrier or is more than 15 metres away from the main panel(IF NECESSARY).
- c) Two separate and distinct earthing conductors shall be connected from the equipment upto the main switch board panel.
- d) The branch lines from the main panel to each equipment shall be separated and should not criss cross other lines.
- e) The entire installation shall be tested as per Electricity rules and I.S.S. 732-1973 with amendments 1,2&3 prior to the commissioning of the plant and a suitable test report furnished by a competent and authorized person. The test report will be obtain by contractor himself at his own expenses.
- f) All exposed switch board panels, conduits, hangers etc. shall be given 2 coats of suitable paint of approved colour, when all work has been completed.

Cleanroom Layout Plan

The drawings can also be viewed using this [link](#)

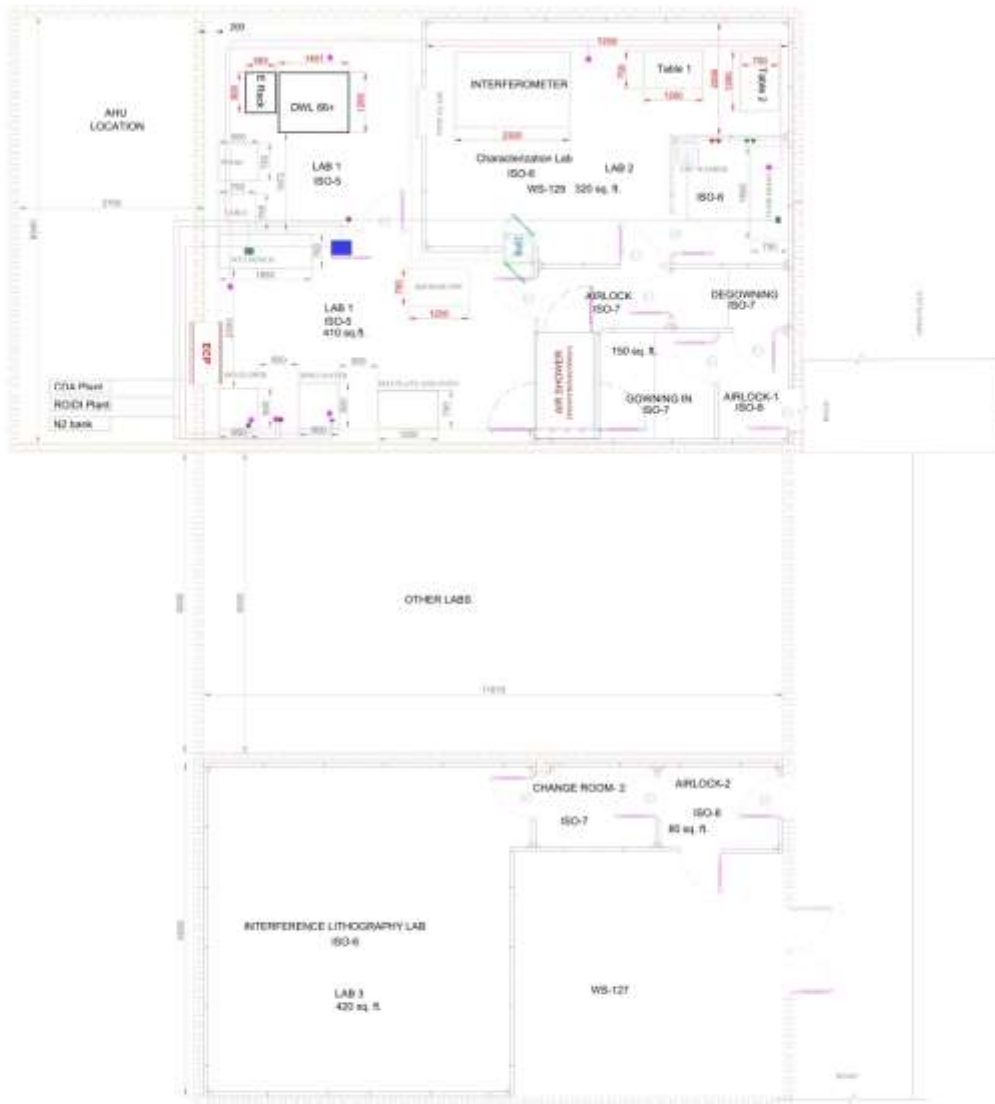


Symbol	Description
	DOUBLE LEAF DOOR
	AIR LOCK DOOR

LEGEND:	
	800 x 2100 X 80 MM SINGLE LEAF DOORS
	3 Door Air shower - 1 No
	DYNAMIC PASS DOOR (2 Doors) - 1 No
	68 MM WALL PANEL - (418 PLUF)
	50 MM WALL PANEL - (418 PLUF)

CLIENT :			
PROJECT: BT, Baha			
TITLE :			
DATE	DATE	ISSUE NO	NO: 475
Drawn			Basu/Saha
Checked			
Approved			

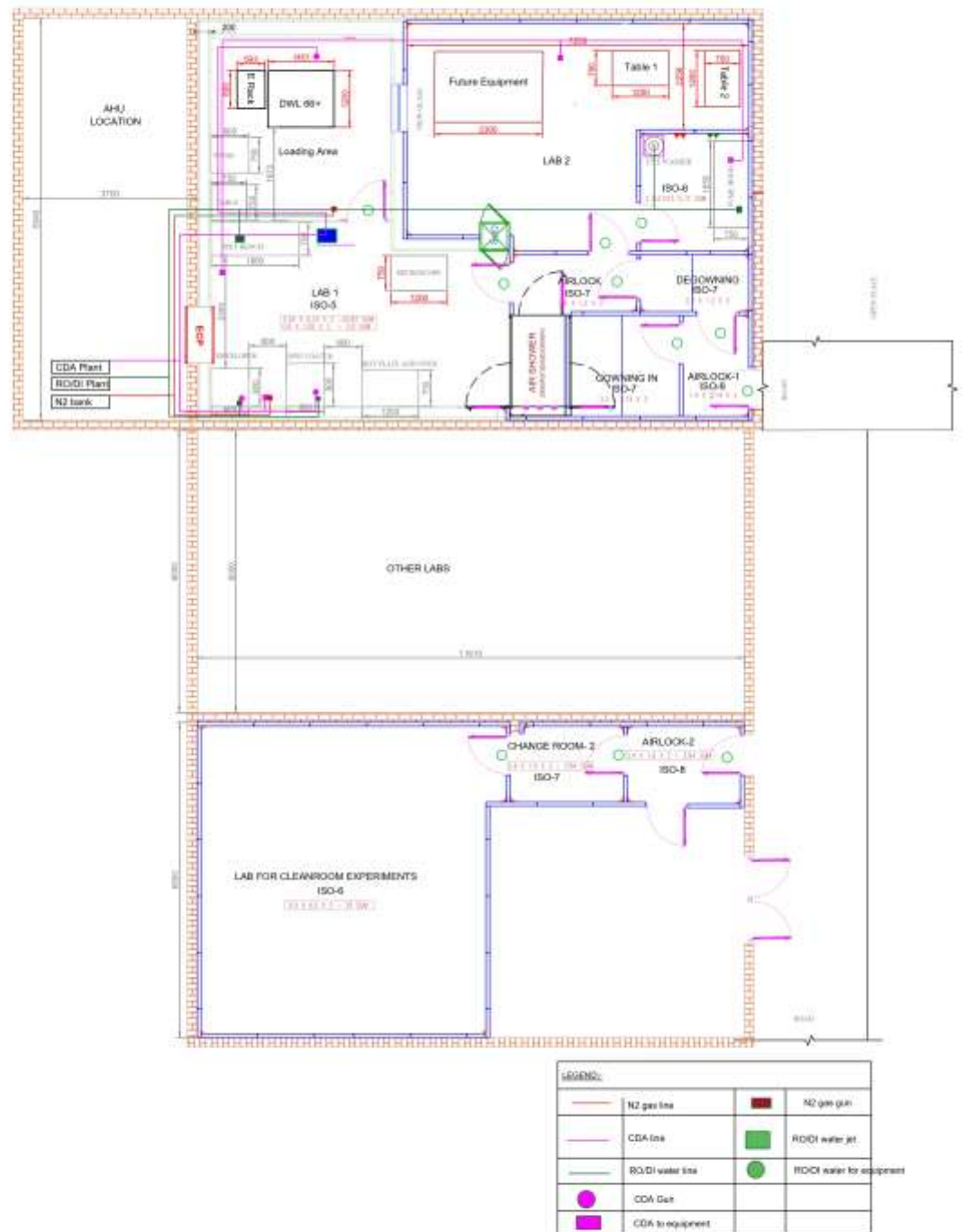
Equipment layout plan



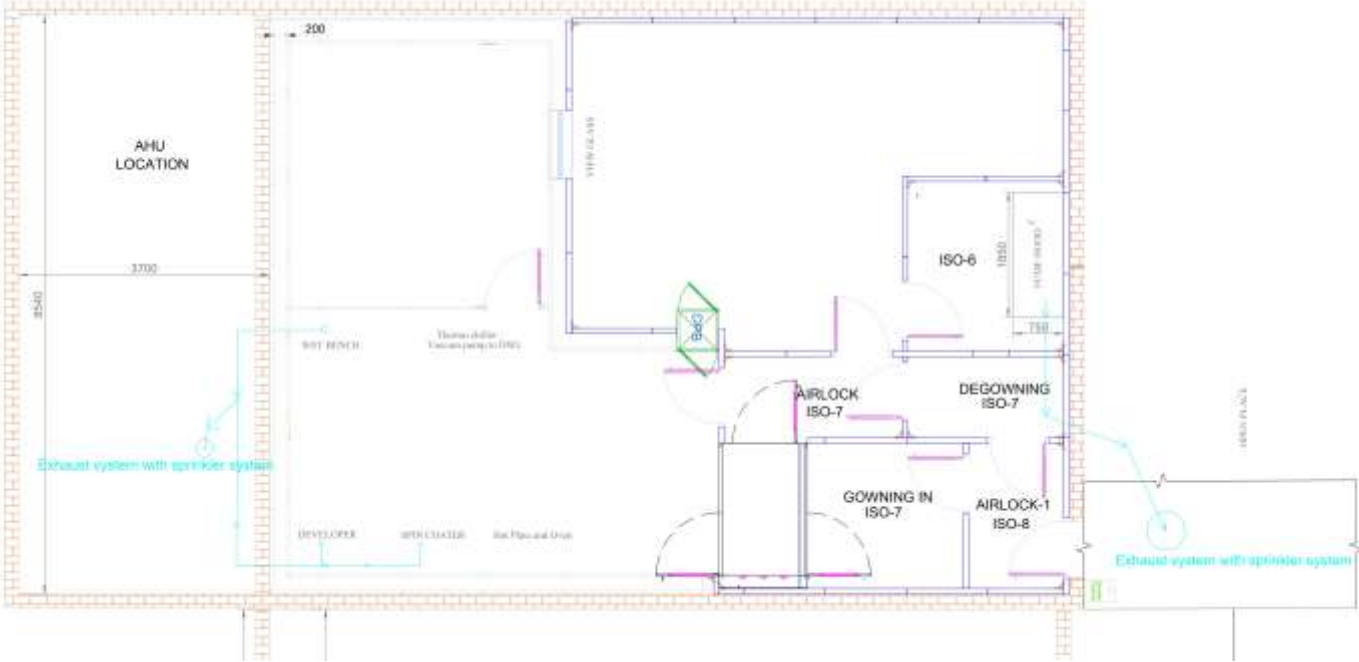
Symbol	Meaning
	80MM (VMS & H2)
	140MM (DTRV & H2)

LEGEND:	
	800 x 2100 X 80 MM SINGLE LEAF DOORS - 12 Nos
	3 Door Air closer - 1 No
	DYNAMIC PASS BOX @ Door's) - 1 No's
	80 MM WALL PANEL - (WHI - PUF)
	80 MM WALL PANEL - (WHI - PUF)

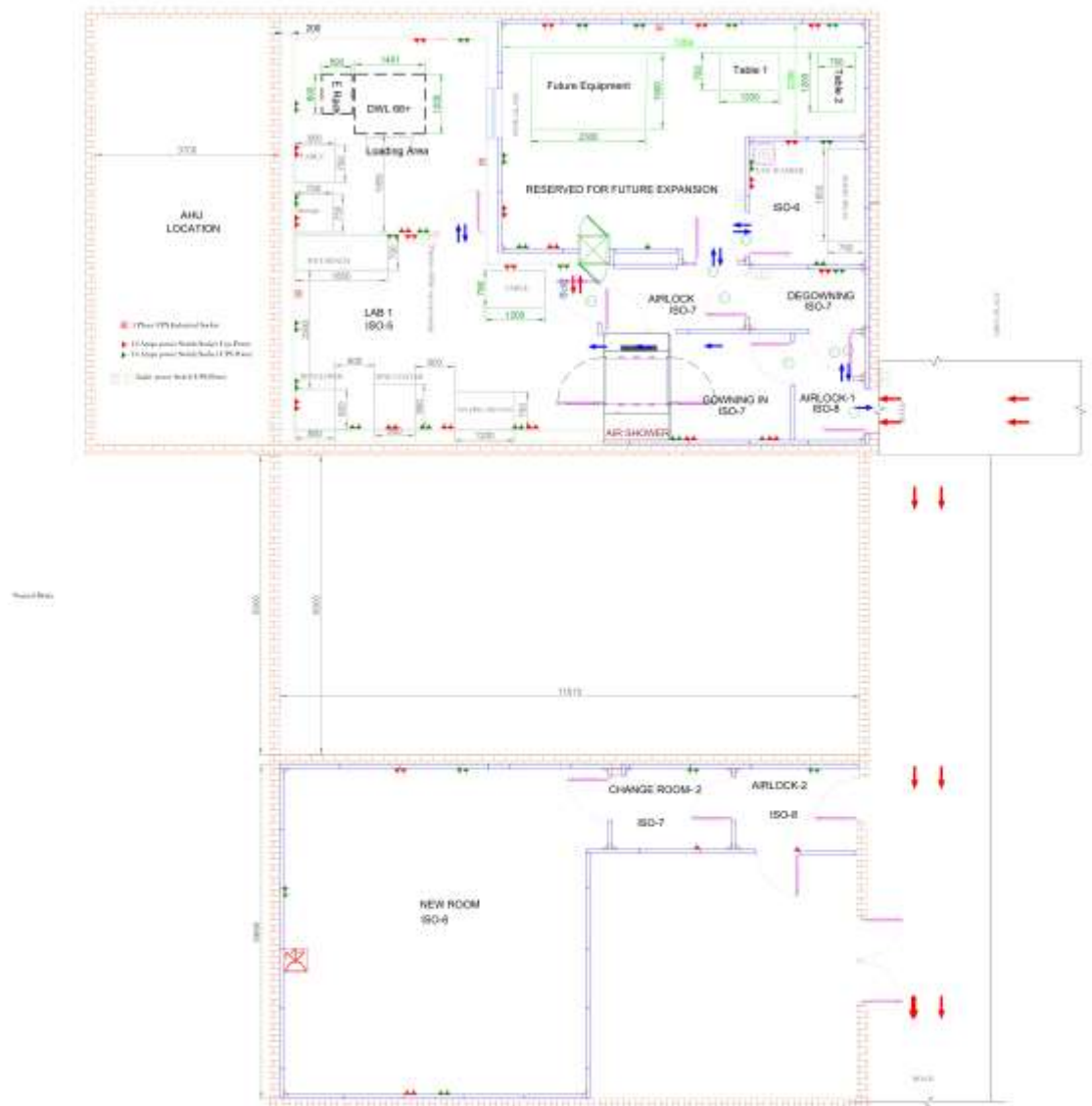
(ANNEXURE-XIII)
Fluid Distribution system



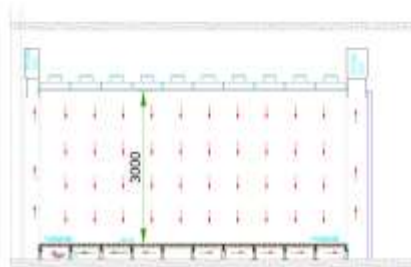
Exhaust system



Electrical Switch/socket layout



SYMBOL	DESCRIPTION	QTY. in Nos
	6/16 AMPS RAW POWER SOCKET	48 Nos
	6/16 AMPS UPS POWER SOCKET	42 Nos
	15 AMPS 3V RAW POWER SOCKET	3 Nos
	RAW POWER LIGHT CONTROL SWITCH	7Nos
	UPS LIGHT CONTROL SWITCH	7Nos



BID SUBMISSION**Online Bid Submission:**

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

Envelope – 1 (Following documents to be provided as single PDF file)			
Sl. No.	Document	Content	File Types
1.	Technical Bid	Compliance Sheet (Annexure - I)	.PDF
2.		Organization Declaration (Annexure - II)	.PDF
3.		List of organizations/ clients where the same products have been supplied (in last two years) along with their contact number(s). (Annexure-III)	.PDF
4.		Technical supporting documents in support of all claims made at Annexure-I	.PDF
5.		Previous Supply Order (Annexure - IV)	.PDF
6.		Original Equipment Manufacturing Manufacturing Authorization Form (MAF) (Annexure – V)	.PDF
7.		<i>(For Goods/ Services Contracts)</i> Certificate - Bidder Not from/ from Country sharing Land border with India & Registration of Bidder with Competent Authority (Annexure-VI)	.PDF
8.		<i>(For Works Contracts, including Turnkey Contracts)</i> Certificate – Bidder Not from/ from Country sharing Land border with India, Registration of Bidder with Competent Authority & not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority (Annexure-VII)	.PDF
9.		Declaration of Local Content (Annexure-VIII)	.PDF
10.		Bid Security Undertaking in lieu of EMD (Annexure-IX)	.PDF
Envelope – 2			
Sl. No.	Document	Content	File Types
1.	Financial Bid	Price bid should be submitted in given BOQ_XXXX.xls format. <i>(Note: -Comparison of prices will be done ONLY on the bids submitted for the Main Equipment and anything asked as ‘Optional’ in the specs is not to be included for overall comparison.)</i> Bids for optional items are to be submitted in ‘sheet2_Quote for optional items’	.XLS