

**DOMESTIC TENDER ENQUIRY DOCUMENT  
FOR  
CONSTRUCTION, TESTING, COMMISSIONING AND VALIDATION OF TB  
CONTAINMENT LABORATORY (BSL) AND ASSOCIATED WORKS ON TURNKEY  
BASIS WITH SUPPLY AND INSTALLATION OF  
EQUIPMENT (TWO CLASS II A2 BSC WITH THIMBLE CANOPY AND  
TWO ONLINE UPS, TWO VORTEX, ONE ELECTRIC MICRO  
INCINERATOR, ONE pH METER, ONE VERTICAL AUTOCLAVE, ONE  
REFRIGERATOR (165-200 L), ONE REFRIGERATOR (300-450 L), ONE  
ANALYTICAL BALANCE  
AT SHYAM SHAH MEDICAL COLLEGE, REWA**

**ON BEHALF OF  
THE DEAN, SHYAM SHAH MEDICAL COLLEGE, REWA**

**Tender Enquiry No.  
HITES/PCD/MP/BSL/SSMC/23-24**

**Dated  
02.03.2024**

*Through*



**HLL INFRA TECH SERVICES LIMITED**  
(Subsidiary of HLL Lifecare Ltd., a Govt. of India Enterprise)  
B-14 A, Sector-62, Noida-201 307  
Phone: 0120-4071500; Fax: 0120-4071513  
URL:  
[www.hllhites.com](http://www.hllhites.com) Email:  
[pcd@hllhites.com](mailto:pcd@hllhites.com),  
[bmenoida@hllhites.com](mailto:bmenoida@hllhites.com)

## **NOTICE INVITING TENDERS (NIT)**

| Tender ID              | Name of work   | Time limit for completion                       | EMD (Rs.)  | Site details   |
|------------------------|--|---|------------|--|
| 2024_HITE_18<br>9442_1 | Construction, testing, commissioning and validation of TB containment laboratory and associated works on “turnkey basis” with supply and installation of Required equipment with two year comprehensive warranty | 120 days from the date of issue of supply order | 1,28,000/- | Department of Microbiology,<br>Shyam Shah Medical College,<br>Hari Bhushan Nagar<br>Rewa – 486001,<br>Madhya Pradesh |

|  |   |
|--|---|
| <b>Name of Work</b>                                  | Construction, testing, commissioning and Validation of TB containment laboratory (BSL) and Associated works on “turnkey basis” under NTEP with supply and installation of required equipment with two year comprehensive warranty |
| <b>Bid Ref. No.</b>                                  | HITES/PCD/MP/BSL/SSMC/23-24   |
| <b>Last Date and Time for submission of queries</b>  | Date: 09.03.2024, 18.00 hrs<br>Email: pcd@hllhites.com, bmenoida@hllhites.com   |
| <b>Pre-Bid meeting</b>                               | Date: 11.03.2024, 11.00 hrs<br>Venue: By Video Conferencing<br>Google Meet Meeting Link: Shall be notified later  |
| <b>Last Date and Time for Receipt of online Bids</b> | 26.03.2024, 14:00 hrs   |
| <b>Last Date of receipt of EMD</b>                   | 26.03.2024, 14:00 hrs   |
| <b>Time and Date for Opening of Technical Bids</b>   | 27.03.2024, 15:00 hrs   |
| <b>Place of Opening of Bids</b>                      | Online on CPPP Portal<br>( <a href="https://eprocure.gov.in/eprocure/app">https://eprocure.gov.in/eprocure/app</a> )  |

**Bid Ref. No.: HITES/PCD/MP/BSL/SSMC Dated: 02.03.2024**

Department of Microbiology, Shyam Shah Medical College, Hari Bhushan Nagar, Rewa – 486001, Madhya Pradesh has been identified to set up TB Culture & Drug Sensitivity Testing laboratory under NTEP. The laboratory will provide services to clinical samples referred from the affiliated hospitals and all the nearby districts.

Procurement & Consultancy Services Division of HLL Infra Tech Services Limited (HITES), a fully owned subsidiary of HLL Lifecare Ltd. (HLL), for and on behalf of The Dean, Shyam Shah Medical College, Rewa, invites tenders, from eligible and qualified tenderers for Construction, Testing, Commissioning and Validation Of Tb Containment Laboratory and Associated Works on Turnkey Basis with Supply And Installation Of Required equipment with two year comprehensive warranty at Department of Microbiology, , Shyam Shah Medical College, Hari Bhushan Nagar, Rewa – 486001, Madhya Pradesh as given in Schedule of Requirement of the Bid Document.

Bidders can download the Bid Documents from the website: [www.hllhites.com](http://www.hllhites.com) or <https://etenders.gov.in/eprocure/app> for complete details. Bidders shall ensure that their tender(s), complete in all respects, are submitted online through CPPP website: <https://etenders.gov.in/eprocure/apponly>.

The bidders, who have downloaded the Bid Documents, shall be solely responsible for checking above website for any addendum/amendment issued/published subsequent to publication of this NIT and take the same into consideration while preparing and submitting their bids.

All bids must be accompanied by Bid Documents as specified. Late bids will be rejected.

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## **SECTION –I: INSTRUCTIONS TO BIDDERS(ITB)**

### **A. GENERAL**

#### **1. INTRODUCTION**

- 1.1** This Chapter provides the relevant information as well as instructions to assist the prospective bidders in preparation and submission of bids. It also includes the mode and procedure to be adopted by the Tendering Agency for receipt and opening as well as scrutiny and evaluation of bids and subsequent placement of award/contract.
- 1.2** Before preparing the bid and submitting the same to the Employer, the bidder should read and examine all the terms & conditions, instructions etc. contained in the Bid Documents. Failure to provide required information or to comply with the instructions incorporated in this Bid Documents may result in rejection of bids submitted by bidders.

#### **2. SOURCES OF FUNDS**

- 2.1** Deleted.

#### **3. BIDDER'S ELIGIBILITY**

- 3.1** This invitation for bids is open to only Class – I Local Suppliers as per the order issued by DPIIT dated 16<sup>th</sup> September, 2020. A Class-I Local Supplier means a supplier or service provider, whose goods, services or works offered for procurement has local content equal to or more than 50%.
- 3.2** As per GoI directive regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws.
- 3.3** The bidder should have authorization for the distribution of equipment/instruments etc which will be installed in the laboratory.
- 3.4** The bidder should have registered to ISO 9001:2008 or OHSAS 18001:2007 or ISO 14001:2004 certification or equivalent standard.
- 3.5** The bidder must have a PAN card, GST certificate and any other relevant tax certificates
- 3.6** The bidder should be registered with the respective Govt. Body.
- 3.7** The bidder should have achieved an average annual turnover of at least **INR 32 Lakhs** During last three financial years (i.e. 2021-22, 2022-23 & 2023-24)  
In support of the above qualification requirement, bidder should submit Copies of

Audited financial statements of accounts (including balance sheet, profit and loss account, auditor's reports, and IT returns) certified by the auditor of the Company for last three financial years (i.e. 2021-22, 2022-23 & 2023-24).

- 3.8** The bidder should have experience of successfully and satisfactorily executing and completing similar works\* at least two similar works over the last seven years (as on date of opening of technical bids) as specified below;

**\*Similar works** shall mean successful construction, testing, commissioning and validation of Bio-Safety laboratory/Biomedical research facility/vaccine facility including internal construction works, electrical works, HVAC works, Access Control System etc.

In support of this qualification requirement, bidder should submit name and address of Client, details of similar works executed, duration of work, date of completion, handing over of work, copies of work order / contract, satisfactory completion certificate issued by the Client. Self/Own certification by agencies shall not be considered for prequalification. The technical committee will have the discretion to verify the successful and satisfactory work completion certificate furnished by the bidder, failing which, the experience will not be considered.

- 3.9** The bidder shall have following minimum qualified and experienced team of key personnel for successful execution of the work:

- A. The bidder should have Project Manager with minimum 5-year \*Similar experience to participate intender.
- B. The bidder shall have (in-house or outsourced) design expertise for technical drawings.
- C. The bidder should have at least one qualified engineer/Site supervisor. She/he shall have minimum 3-years' experience (if B. Tech/B.E- Electrical/Mechanical) or 5-years' experience (if ITI Diploma-Electrical/Mechanical)

In support of this requirement, bidder should submit detailed CV with supporting documents of such personnel duly supported with the letter of undertaking from such personnel that they are full-time employee of the bidder and shall be ready for deployment at site(s) if contract is awarded to the bidder.

- 3.10** The bidder should not be debarred / blacklisted by MOH&FW, GOI, or any other Department of Central or State Government as on the date of opening of bid.

In support of this qualification requirement, the bidder should submit Notarized Affidavit giving undertaking to the effect that the bidder is not debarred / blacklisted by MOH&FW, GOI, or any other Department of Central or State Government as on the date of opening of bid.

The bidders who meet the qualification criteria as specified above shall be considered, for technical Evaluation.

## **BIDDING EXPENSES**

**3.11** The bidder shall bear all costs and expenditure, incurred and/or to be incurred, associated with its bid including preparation, mailing and submission of its bid and subsequently processing the same. The Employer will, in no case be responsible or liable for any such cost, expenditure, etc. regardless of the conduct or outcome of the bidding process.

## **4. SITEVISIT**

**4.1** It is strongly recommended that Bidders may visit and examine, at their own expense, the Site of Work and its surroundings and obtain all information that may be necessary for preparing the bid and if awarded the work, entering into a contract for successful execution and completion of the work.

## **5. LANGUAGE OF BID**

**5.1** The bid submitted by the bidder and all subsequent correspondences and documents relating to the bid exchanged between the bidder and the Employer, shall be written in English language. However, the language of any printed literature furnished by the bidder in connection with its bid may be written in any other language provided, the same is accompanied by an English translation and, for purposes of interpretation of the bid, the English translation shall prevail.

## **B. BIDDING DOCUMENTS**

### **6. CONTENT OF BIDDING DOCUMENTS**

**6.1** The set of Bidding Documents includes, in addition to Notice Inviting Tenders, (NIT) the documents listed below:

|             |   |  |
|-------------|---|--|
| Section I   | : | Instructions to Bidders (ITB)            |
| Section II  | : | Technical Proposal – Standard Forms      |
| Section III | : | Financial Proposal – Standard Forms      |
| Section IV  | : | Technical Specifications                 |
| Section V   | : | Contract Form and Conditions of Contract |
| Section VI  | : | Other Standard Form - Bid Security Form  |

**6.2** The relevant details of the required works and services, procedure for bidding, bid evaluation, placement of contract, the applicable contract terms and also the standard formats to be used for this purpose are incorporated in the above-mentioned sections.

**6.3** The interested bidders are expected to examine all such details etc. to proceed further.

## **7. AMENDMENTS TO BIDDOCUMENTS**

- 7.1** At any time prior to the deadline for submission of bids, the Employer may, for any reason deemed fit by it, modify the Bid Documents by issuing suitable amendment(s) to it.
- 7.2** Such an amendment will be notified on the websites where the tender had been originally published and the same shall be binding to all prospective Bidders.
- 7.3** In order to provide reasonable time to prospective bidders to take necessary action in preparing their bids as per the amendment, the Employer may, at its discretion, extend the deadline for the submission of bids and other allied time frames, which are linked with that deadline.
- 7.4** Any bidder who has purchased/downloaded the Bid Documents should watch for amendment, if any, issued on the websites and The Employer will not issue separate communication to them. Employer shall not be responsible, in any manner, if prospective Bidders miss any notifications placed on published websites.
- 7.5** At any time prior to the deadline for submission of bids, if the bidder wants to submit any additional information related to technical specifications, he may do so by communicating to the employer in writing via email.
- 7.6** The right to consider the additional information for technical evaluation is reserved with the employer.

## **8. CLARIFICATIONS OF TENDERDOCUMENTS**

- 8.1** A prospective bidder requiring any clarification regarding Scope of Work and Technical Specifications, conditions of contract, etc. given in the Bid Documents may submit written request via email as indicated in the Notice Inviting Tenders.
- 8.2** All the prospective bidders will be notified of response to clarifications only through return email.
- 8.3** The Employer shall not be responsible in any manner if a prospective bidder fails to notice any notifications placed on the above website.

### **C. PREPARATION OF BIDS**

## **9. DOCUMENTS COMPRISINGTHEBID**

- 9.1** The bid to be submitted by the bidder shall be in two separate parts, viz. "Technical

Bid” and “Financial Bid” and shall comprise of the following:

**A. TECHNICALBID**

- i. Documents in support of qualification criteria
- ii. Bid Security Declaration in accordance with SCC.
- iii. Technical Bid Forms, duly filled as per formats given in the Bid Documents as under:
  - (1) Form Tech-1: Bid form(Technical)
  - (2) Form Tech-2: Bidders “Information Form”
  - (3) Form Tech-3: Bidders“ Preliminary Programme”
  - (4) Form Tech-4: Proposed Project Team and Organizational Structure
  - (5) Form Tech-5: Works Management System
  - (6) Form Tech-6: Proposed Subcontractors and Suppliers
  - (7) Form Tech-7: Proposed Methodology to Execute the Works
  - (8) Form Tech-8: Technical Compliance sheet
  - (9) Form Tech-9: Proposed specifications and make/ manufacturer for item/material which bidder plans to use for the work
  - (10) Form Tech-10: Bid Security Form
- iv. Power of Attorney in favor of signatory of Bid.
- v. Valid certificate of Incorporation/ Registration of the bidder.
- vi. Self-attested copy of Income Tax Registration Certificate / PAN card
- vii. Self-attested copy of Sales Tax / VAT registration/GST registration
- viii. Self-declaration (Notarized affidavit) as per Section VI (About blacklisting)
- ix. Self-declaration/affidavit for acceptance of terms and conditions.
- x. Last three years Profit and loss statement and auditor report
- xi. IT returns certificate
- xii. Declaration showing the local content as per the Make in India policy

**B. FINANCIALBID**

- i. Bidder should submit Financial Bid as per Format given in Section III – Financial Proposal Standard Forms of the Documents as under:
  - (1) Form Fin-1: Form of Bid(Financial)
  - (2) Form Fin-2: Lump sum Contract Price
  - (3) Form Fin-3: Price Bill of Quantity

**10. BID CURRENCIES**

**10.1** The bidder providing services as per the scope of services should quote in Indian Rupees only.

**10.2** Bids, where prices are quoted in any other currency shall be treated as non-responsive

and rejected.

## **11. BID PRICES**

- 11.1** The Bidder shall indicate on the Bid Forms provided under Section III, total bid prices of the goods and services as per Scope of Services given in Bid Documents.
- 11.2** The bidder shall fill rates and prices and line item total (both in figures and words) for all items of the Works described in the Bill of Materials along with total bid price (both in figures and words). Items for which no rate or price is entered by the bidder will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Bill of Materials. Corrections, if any, shall be made by crossing out, initialing, dating and rewriting.
- 11.3** All duties, taxes and other levies payable by the contractor under the contract, or for any other cause shall be included in the rates, prices and total Bid Price submitted by the Bidder
- 11.4** The rates and prices quoted by the bidder shall be fixed for the duration of the Contract and shall not be subject to adjustment on any account.

## **12. ALTERNATIVEBIDS**

- 12.1** Bidders shall submit offers that fully comply with the requirements of the bidding documents, including the conditions of contract, basic technical design as indicated in the drawing and specifications. Conditional offer or alternative offers will not be considered further in the process of tender evaluation.

## **13. DOCUMENTS ESTABLISHING COMPLIANCE OF WORKS AND SERVICES AS PER BIDDOCUMENTS**

- 13.1** The bidder must submit Bid Form duly signed by authorized signatory certifying compliance on the Scope of works and technical specifications incorporated in the Bid Documents.
- 13.2** In case there is any variation and/or deviation between the Scope of works and technical specifications prescribed by the Employer and that offered by the bidder, the bidder shall list out the same in the above statement without any ambiguity.
- 13.3** If a bidder furnishes wrong and/or misleading/misleading data, statement(s) etc. about the services offered by it, its bid will be liable to be ignored and rejected in addition to other remedies available to the Employer in this regard.
- 13.4** Bids with conditional compliance to the technical specifications and/or modified proforma or annexures will be rejected.

#### 14. EARNEST MONEY DEPOSIT (EMD)

The bidder shall furnish along with its bid, Bid Security/EMD for amount as shown in the bid document. The Bid Security is required to protect the purchaser against the risk of the bidder's unwarranted conduct.

The bidders who are currently registered with MSME for the specific goods as per bidding document specification shall be eligible for exemption from Bid Security as defined in MSE Procurement Policy issued by the department of MSME. In case the bidder falls in this category, the bidder shall enclose relevant certificate of registration issued by department of MSME.

The Bid Security shall be denominated in Indian Rupees. The Bid Security shall be furnished in one of the following forms:

- i) Account Payee Demand Draft/ Banker's cheque
- ii) Fixed Deposit Receipt
- iii) Bank Guarantee
- iv) Insurance Surety Bond

The **Demand Draft** or **Banker's Cheque** or **Fixed Deposit Receipt** shall be drawn on any commercial bank in India or country of the bidder, in favour of HITES payable at New Delhi. In case of **Bank Guarantee**, the same is to be provided from any commercial bank in India or country of the bidder as per the format specified under **SECTION – XII** in this document.

The Bid Security shall be valid for a period of forty-five (45) days beyond the validity period of the bid. As offer validity period of Tender is One hundred and eighty days (180) days, the EMD shall be valid for 225 days from Techno – Commercial Tender opening date.

The Bid Security of unsuccessful bidders will be returned without any interest, after expiry of the bid validity period, but not later than thirty days after conclusion of the resultant contract. The Bid Security of successful bidder will be returned without any interest, after receipt of performance security from that bidder.

Bid Security is required to protect the purchaser's right against the risk of the Bidder's conduct, which would warrant the forfeiture of the Bid Security. Bid Security of a bidder will be forfeited, if the bidder withdraws or amends its bids or impairs or derogates from the bid in any respect within the period of validity of its bid or if it comes to the notice that the information/documents furnished in its bid is incorrect, false, misleading or forged without prejudice to other rights of the purchaser. The Bid Security of the successful bidder will be forfeited without prejudice to other rights of Purchaser if it fails to furnish the required performance security within the specified period.

#### 15. BID VALIDITY

**15.1** The bids shall remain valid for a period of not less than **180 days** after the due date of submission of bids. Any bid valid for a shorter period shall be treated as non-responsive and rejected.

**15.2** In exceptional situations, the bidders may be requested by the Employer to extend the validity of their bids up to a specified period. Such request(s) and responses thereto shall be conveyed by e-mail. The bidders, who agree to extend the bid validity, are to extend the same without any change or modification of their original bids. A bidder, however, may not agree to extend its bid validity.

**16. SIGNING AND SEALING OF BIDS**

- 16.1** The Bidders shall submit their bids as per schedule indicated in Notice Inviting Tenders (NIT) and any amendments made within due date for submission of bids.
- 16.2** Bid Documents seek bid submission by following two bid System i.e. "Technical Bid" (Technical Documents) and "Financial Bid"
- 16.3** The Technical and Financial bids shall either be typed or written in indelible ink and the same shall be signed by the bidder or by a person(s) who has been duly authorized to bind the bidder to the contract. The letter of authorization shall be by a written power of attorney, which shall also be furnished along with the technical bid.
- 16.4** All the pages of the bid shall be duly signed at the appropriate places as indicated in the Bid Documents and all other pages of the bid including printed literature, if any shall be initialed by the same person(s) signing the bid. The bid shall not contain any erasure or overwriting, except as necessary to correct any error made by the bidder and, if there is any such correction; the same shall be initialed by the person(s) signing the bid.

**D. SUBMISSION OF BIDS****17. SUBMISSION OF BIDS**

**17.1** Unless otherwise specified, bids should be submitted online in the Central Public Procurement Portal. Employer not later than the last date as specified earlier, including amendments in dates, if any as notified on website.

**17.2** Instructions for E bidding:

The service provider/ Contractor (bidders) should register on Central Public Procurement Portal (<https://eprocure.gov.in/eprocure/app>) and obtain User-ID and Password before tendering. In case of any problem, you may contact CPPP. Entire tender process will be carried out online through above mentioned website. Service Provider/Contractor (bidders) are advised to procure E-Token/Digital Signing Certificate from suitable vendors or from any authorized agency. Before submission of online bids, bidders must ensure that scanned copies of all necessary documents shall have been uploaded with the bid. Service Provider/Contractor (bidders) are advised to check/see Central Public Procurement Portal regularly to check for any amendment/corrigendum in the tender document. All subsequent notifications/amendments/notices shall be published only on the aforesaid website only.

The bids shall be opened on the date and time mentioned in the Tender Notice in the presence of Service Provider/Contractor(bidders) who opt to be present. If the date fixed for the opening of the tender is declared a holiday, the tenders shall be opened on the next working day at the same time as fixed for the original date for this purpose. The undersigned reserves the right to accept or reject any or all tenders in part or whole without assigning any reason, whatsoever.

**THE E-TENDER DOCUMENT SHALL BE UPLOADED IN TWO PARTS:**

A Pre-qualification/Eligibility/Technical Bid: The Service provider/Contractor shall submit, and upload required documents, information required as per tender document. It shall contain scanned copies of all requisite documents, certificates etc. As specified in the tender document duly filled in and digitally signed. All the documents must be scanned and uploaded in PDF format with 100 dpi with black and white option. The scanned documents should be clear and legible.

B Financial Bid/Price Bid/BOQ: It shall contain financial bid/BOQ uploaded in .xls format which will be available for Service Provider/Contractor (bidder) on Central Public Procurement Portal (<https://eprocure.gov.in/eprocure/app>). The financial bid /BOQ will be opened only of those Service Provider/Contractor (bidders) who qualify

Technical evaluation/Pre-qualification/Eligibility Bid criteria. Financial Bid/BOQ will not be accepted in physical form. Date & Time for opening of Financial Bid/Price Bid/BOQ shall be published on the aforesaid website after technical evaluation. Also Bidder should submit Financial Bid as per Format given in Section III – Financial Proposal Standard Forms of the Documents as under:

- (1) Form Fin-1: Form of Bid(Financial)
- (2) Form Fin-2: Lump sum Contract Price
- (3) Form Fin-3: Price Bill of Quantity

#### **18. LATEBIDS**

**18.1** The bids submitted after due date and time for submission of bids shall not be accepted.

#### **19. MODIFICATION AND WITHDRAWAL OF BID**

**19.1** The bids can't be withdrawn or modified after due date and time for submission of bids.

**19.2** If a bidder withdraws the bid any time during the due date and time for submission of bids and last date of validity of bids, it will result in forfeiture of the earnest money furnished by the bidder in its bid.

### **E. BID OPENING**

#### **20. OPENING OF BIDS**

**20.1** The Technical Bid shall be opened as per the timeline indicated in the Notice Inviting Tenders unless the same is not auto-extended at the system level. Any such auto-extensions can be viewed in CPPP.

**20.2** After opening of the Technical Bids on CPPP, the details of the bidders/ quoted equipment can be viewed/ downloaded from the portal.

**20.3** After the technical evaluation of bids are completed the Employer shall notify those Bidders whose Bids are found non-responsive at technical evaluation stage, their Financial Bids will be returned unopened after completing the selection process and Contract signing.

**20.4** The Employer shall simultaneously notify in writing to those Bidders that have qualified during technical evaluation stage and inform them of the date, time and location for the opening of the Financial Bids. The Bidder's attendance at the opening of the Financial Bids is optional and is at the Bidder's choice.

**20.5** The Financial Bids shall be opened by the Employer in the presence of the

representatives, if opted to be present, of those Bidders found qualified during technical evaluation stage. These Financial Bids shall be then opened, and the total prices read aloud and recorded. Copies of the record shall be sent to all Bidders who submitted Bids.

- 20.6** The employer/ Project implementary committee will conduct a negotiation meeting with the lowest priced bidder.
- 20.7** In case of receipt of single bid or a single bidder being qualified in technical evaluation, the right to open the financial bid or otherwise are reserved with the employer/Dean.

## **F. SCRUTINY AND EVALUATION OF BIDS**

### **21. BASIC PRINCIPLE**

- 21.1** Bids will be evaluated on the basis of the terms & conditions, instructions, criteria already incorporated in the Bid Documents, based on which bids have been received and the information/documents given by the bidders in their bids. No new condition will be brought in while scrutinizing and evaluating the bids.

### **22. PRELIMINARY SCRUTINY OF BIDS**

- 22.1** The Employer/Project implementary committee will examine the bids to determine whether they are complete, whether required securities have been furnished, whether the documents have been properly signed stamped and whether the bids are generally in order.
- 22.2** Prior to detailed evaluation of Bids, the Employer will determine the substantial responsiveness of each bid to the Bid Documents. For purposes of these clauses, a substantially responsive bid is one, which conforms to all the Conditions of Contract given in the Bid Documents without material deviations. Deviations from, or objections or reservations to critical provisions such as those concerning Performance Security, Taxes & Duties, Force Majeure, and Applicable law will be deemed to be a material deviation.
- 22.3** The Employer's determination of a Bids' responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.
- 22.4** The bids, which do not meet the eligibility and qualification requirements are liable to be treated as non-responsive and will be summarily ignored. In addition, the following are some of the important aspects, for which a bid shall be declared non-responsive and will be summarily ignored.

- (1)** Bid validity is shorter than the required period.

(2) Bid Security Form as per Form10

(3) Bidder has not agreed to give the required Performance Security.

**22.5** The employer reserves the right to evaluate the bid and the claims made by the bidder.

## **23. EVALUATION OF BIDS**

### **A. ASSESSMENT OF QUALIFICATION**

Subsequent to preliminary scrutiny of bids, Bidder's shall be assessed for their qualification by the project implementation committee as per criteria given below:

**a)** In order to qualify, the bidder should have:

- 1)** Achieved an average annual turnover of at least INR 32Lakh during last three financial years (i.e. 2021-22, 2022-23 & 2023-24)

In support of the above qualification requirement, bidder should submit Copies of audited financial statements of accounts (including balance sheet, profit and loss account, auditor's reports, and IT returns) certified by the auditor of the Company for last three financial years (i.e. 2021-22, 2022-23 & 2023-24).

The bidder should have experience of successfully and satisfactorily executing and completing similar works\* at least two similar works over the last seven years (as on date of opening of technical bids) as specified below;

**\*Similar works** shall mean successful construction, testing, commissioning, and validation of Bio-Safety laboratory/Biomedical research facility/vaccine facility including internal construction works, electrical works, HVAC works, Access Control System etc.

In support of this qualification requirement, bidder should submit name and address of Client, details of similar works executed, duration of work, date of completion, handing over of work, copies of work order / contract, satisfactory completion certificate issued by the Client. Self/Own certification by agencies shall not be considered for prequalification. The technical committee will have the discretion to verify the successful and satisfactory work completion certificate furnished by the bidder, failing which, the experience will not be considered.

**b)** The bidder shall have following minimum qualified and experienced team of key personnel for successful execution of the work:

- 1)** The bidder should have Project Manager with minimum 5-year \*Similar experience to participate in tender.
- 2)** The bidder shall have (in-house or outsourced) design expertise for technical drawings;

- 3) The bidder should have at least one engineer /Site supervisor. She/he shall have minimum 3-years" experience (if B. Tech/B. E- Electrical/Mechanical) or 5- years "experience (if ITI Diploma-Electrical/Mechanical)

In support of this requirement, bidder should submit detailed CV with supporting documents of such personnel duly supported with the letter of undertaking from such personnel that they are full-time employee of the bidder and shall be ready for deployment at site(s) if contract is awarded to the bidder.

- c) The bidders should submit a detailed work plan.
- d) The bidder should not be debarred / blacklisted by MoH&FW, GOI, or any other Department of Central or State Government as on the date of opening of bid.

In support of this qualification requirement, the bidder should submit Notarized Affidavit giving undertaking to the effect that the bidder is not debarred /blacklisted by MOH&FW, GOI, or any other Department of Central or State Government as on the date of opening of bid.

The bidders who meet the qualification criteria specified at (a), (b) (c) and (d) above shall be considered, for technical Evaluation, as qualified.

#### **B. TECHNICAL EVALUATION**

- 23.1** Subsequent to preliminary scrutiny of bids and assessment of qualification, the technical evaluation of substantial responsiveness of bids shall be carried out based on the information/ documents submitted against Scope of Works and Technical Specifications.
- 23.2** The bids determined as technically disqualified / non-responsive shall not be considered for opening of financial bids.
- 23.3** The decision regarding eligibility of the bidder based on the technical specification's rests with the employer and no further communication or negotiations in any form would be accepted.

#### **C. FINANCIAL EVALUATION:**

- 23.4** The financial evaluation of bids shall be carried out based on the total price for
- a) Design, construction, testing, commissioning, and validation of TB Containment laboratory work with two-year warranty period.
- b) The cost of additional associated civil work as specified in the bid document.
- c) supply and installation of equipment (two class II A2 BSC with thimble canopy and two online ups, two vortex, one electric micro incinerator, one pH meter, one vertical autoclave, one refrigerator (165-200 lit), one refrigerator (300-450 lit), one analytical balance with two year warranty period
- d) Cost of Comprehensive maintenance of laboratory for the period of 3 years after completion of two year warranty period including supplied equipment etc.

**24. MINOR INFIRMITY/IRREGULARITY/NON-CONFORMITY (CLARIFICATIONS OF BID)**

- 24.1** If during evaluation, employer needs any clarification regarding the bid documents it shall be done by contacting the bidder through email.
- 24.2** If during the preliminary scrutiny of bids or during technical evaluation of bids, the Employer finds any minor infirmity and/or irregularity and/or non-conformity in a bid, the Employer may waive the same provided it does not constitute any material deviation and financial impact and, also, does not prejudice or affect the ranking order of the bidders. Wherever necessary, the Employer will convey its observation on such "minor" issues to the bidder by e-mail asking the bidder to respond by a specified date. If the bidder does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, that bid will not be evaluated further.
- 24.3** No major/material changes in the technical specifications and/or financial specifications will be accepted.

**25. FINAL EVALUATION OF BIDDERS' CAPABILITY TO PERFORM THE CONTRACT**

- 25.1** The Employer, through the above process of bid scrutiny and evaluation will determine to its satisfaction whether the bidder, whose bid has been determined as the lowest evaluated responsive bid, is eligible, qualified and capable in all respects to perform the contract satisfactorily.
- 25.2** In order to adjudge bidders' capability to perform the contract, the Employer may ask bidders to make detailed presentation on implementation plan of project.

**26. CONTACTING THE EMPLOYER**

- 26.1** From the time of submission of bid to the time of awarding the contract, if a bidder needs to contact the Employer for any reason relating to its bid, it should do so only in writing through email.
- 26.2** In case a bidder attempts to influence the Employer in the Employer's decision on scrutiny, comparison & evaluation of bid and awarding the contract, the bid of the bidder shall be liable for rejection in addition to appropriate administrative and coercive actions being taken against that bidder, as deemed fit by the Employer.

## **G. AWARD OF CONTRACT**

### **27. EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS**

- 27.1** The Employer reserves the right to accept in part or in full any bid or reject any bid(s) without assigning any reason or to cancel the bidding process and reject all bids at any time prior to award of contract, without incurring any liability, whatsoever to the affected bidder(s).
- 27.2** Decision taken by the employer with respect to bidding process and award of contract will be final and binding to all concerned.

### **28. AWARD CRITERIA**

- 28.1** The contract will be awarded to the lowest priced qualified responsive bidder, decided by the Employer/project implementation committee.

### **29. VARIATION IN SCOPE OF SERVICES AT THE TIME OF AWARD AND/OR DURING VALIDITY OF CONTRACT**

- 29.1** The Employer reserves the right at the time of Contract award and/or during validity of contract, to increase or decrease the scope of services based on mutually agreed terms and conditions.

### **30. INTIMATION LETTER TO SUCCESSFUL BIDDER / NOTIFICATION OF AWARD**

- 30.1** Before expiry of the bid validity period, the Employer will notify the successful bidder(s) in writing, by speed post and/or by e-mail that its bid has been accepted, briefly indicating therein the essential details like description of services and corresponding prices accepted.
- 30.2** The Notification of Award shall constitute the formation of the Contract.

### **31. PERFORMANCE SECURITY**

- 31.1** The successful bidder must furnish a Performance Security of 5% of the contract value within 21 days from the date of issue of Notification of Award valid for a period of 30 months from the date of award.
- 31.2** Performance security should be in the form of Bank guarantee, Demand draft or certified cheque of a Scheduled Commercial Bank.
- 31.3** Failure of the successful Bidder to submit the performance security within time shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

**32. SIGNING OF CONTRACT**

**32.1** The successful bidder upon receipt of Notification of Award, shall send the purchaser a copy of Notification of Award as acceptance and this shall be considered as a firm contract and no separate contract form needs to be signed. The same shall be submitted within 21 days of issue of Notification of Award.

**33. CORRUPT OR FRAUDULENT PRACTICES**

**33.1** The Employer will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible.

**SECTION – II: TECHNICAL PROPOSAL- STANDARD FORMS****TECHNICAL PROPOSAL- STANDARD FORMS****Form Tech – 1: Bid Form (Technical)**

To,  
 CEO  
 HLL Infra Tech Services Limited  
 Procurement and Consultancy Division  
 B-14 A, Sector -62, Noida -201307, Uttar Pradesh.

Sir/Madam,

**Subject:** Bid for Design, Construction, testing, commissioning and validation of TB containment laboratory and associated works on “turnkey basis” with supply and installation of Required equipment with two year comprehensive warranty

**Bid Ref. No.:** ..... **Dated:** .....

1. We, ....., hereby submit a bid for the above-referenced works in response to the above-referenced Bid Document.
2. We agree to the terms and conditions mentioned in the tender documents
3. Our bid shall remain valid for acceptance until **180 days** from the Closing Date.
4. We acknowledge and agree that:
  - HLL Infra Tech Services Limited or Department of Microbiology, Shyam Shah Medical College, Hari Bhushan Nagar, Rewa – 486001, Madhya Pradesh is not bound to accept the lowest bid or any other bid it may receive in response to the above-referenced ITB.
  - No liability of HLL Infra Tech Services Limited or Department of Microbiology, Shyam Shah Medical College, Hari Bhushan Nagar, Rewa – 486001, Madhya Pradesh and no binding contract exists until the Contract is executed by both parties.
  - each party constituting the bidder is bound jointly and severally by this bid and
5. If we visit a site for inspection, we agree to release Department of Microbiology Shyam Shah Medical College, Hari Bhushan Nagar, Rewa – 486001, Madhya Pradesh from all, and any damage, expense, loss or liability of any nature suffered or incurred by as a result of.
  - Loss of or damage to any real or personal property.
  - Personal injury, disease, or illness to, or death of, any person.
  - financial loss or expense, arising out of the carrying out of that site inspection; and
  - transportation to the site (if provided) as a result of any accidents or malicious acts by third parties

**6. Enclosed is a bid security declaration**

Dated this .....dayof ..... Signature.....

(In the capacity of.....

Dulyauthorizedtosignthetenderofferforandonbehalfof.....

### **Form Tech – 2: Bidders' Information Form**

[Bidders are required to provide the information sought below]

1. Name, Address, phone / email of the Bidder:
2. Date of incorporation
3. **Expertise of Organization:** [In brief, not more than 500 words]
  - Organization structure
  - Years of experience in executing similar assignments
  - Core areas of expertise of the organization
4. Details of staff under permanent rolls of the Bidder
  - a) technical
  - b) skilled
  - c) unskilled
5. **Financial data of the organization**

Annual Turnover of Last 3 Financial Years

  - **Bidder**
  - F.Y. 2021-22 -Rs. \_\_\_\_\_
  - F.Y. 2022-23 -Rs. \_\_\_\_\_
  - F.Y. 2023-24- Rs. \_\_\_\_\_

**P.S. Please attach**

1. Audited financial statement, including Profit & Loss Statement, Income & Expenditure statements etc. (for the last three years as above).
2. Service tax registration number, VAT registration number/GST registration number, PAN
3. Name and Address of Banker

6. Client Reference List:

[Please provide references such as customer's details, tel. nos. etc.]

| Name of client/customer: | Description of service rendered & Date of work completion | Client's Contact person name, telephone and e-mail Id. | Total value of contract in Rs. |
|--------------------------|---|--|--------------------------------|
|                          |   |  |                                |
|                          |   |  |                                |
|                          |   |  |                                |

Attach separate sheet if needed.

**P.S. Please attach**

1. Please provide client list of bidder as per above table
2. Please attach self-attested copy of Work Order / MOU / Contract or any other document in support of above experience.

**7. Contact details of persons who may be contacted for requests for clarification during bid evaluation:**

- Name/Surname:
- Tel Number (direct): Landline and Mobile no.
- Email address(direct):

**8. Quality certificates if any**

| Sl.No. | Name of the certificate | Certified by | Year of getting certificate | Validity |
|--------|-------------------------|--------------|-----------------------------|----------|
|        |                         |              |                             |          |
|        |                         |              |                             |          |
|        |                         |              |                             |          |

**Note:**

1. Inadequate information could lead to disqualification of the bid
2. All items should be supported by proper documents

**Signature and seal of the Bidder**

### **Form Tech-3: Bidders' Preliminary Programme**

Note to bidders: Bidders shall submit a preliminary Programme for the execution of the works.

Bidders are required to make their own detailed assessment of the time, work methods and activities that shall be required for the successful and timely completion of the works, and shall submit their bid on the basis of an assurance that the works can be completed by the Time for Completion and the milestone dates identified in the Contract.

The preliminary Programme shall be prepared in sufficient detail to enable the committee to adequately evaluate the planned execution, staging and allocation of resources for the works.

The preliminary Programme shall show the due dates when the milestones identified in the Contract shall be achieved. It shall also include and/or be accompanied by:

- a Programme narrative that describes the mechanisms and assumptions made in preparing the Programme; and
- a flow chart for the execution of the works clearly showing the timeline for the execution of the work including each and every activity.

If a bidder is selected it shall be required to complete this project in accordance with the contract for works.

**Form Tech – 4: Proposed Project Team and Organizational Structure**

**Note:** Names of the personnel and their qualification and experience, involved in the execution of the work, shall be provided as below:

| No. | Name | Position Description | Qualification | Years Exp |
|-----|------|----------------------|---------------|-----------|
| 1   |      |                      |               |           |
| 2   |      |                      |               |           |
| 3   |      |                      |               |           |
| 4   |      |                      |               |           |
| 5   |      |                      |               |           |

### **Form Tech – 5: Works Management**

**System Note:** Bidders are required to provide the following information:

**1) Project implementation/quality management**

- Project implementation/quality management manual/policy (if any);
- An outline project implementation/quality management plan for the project.

**2) Health and safety management**

- Health and safety management manual/policy (if any);
- An outline health and safety management plan for the project.

**3) Environmental management**

- Environmental management manual/policy (if any);
- An outline environmental management plan for the project.

**Form Tech – 6: Proposed Subcontractors and Suppliers**

**Note:** Bidders shall provide details of their subcontractors and suppliers they propose to use on the project, including:

- Companies' names, address, contact details and the particulars of the works to be under taken by them.



**Form Tech –8: Technical Compliance sheet**

| Sl. No.  | Bid Technical Specification (Main)  | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|--|---|---|
| <b>TECHNICAL SPECIFICATIONS FOR CONSTRUCTION, TESTING, COMMISSIONING AND VALIDATION OF TB CONTAINMENT LABORATORY</b> |   |   |
| 1  | <b>SCOPE OF WORK:</b>   |   |
| a)   | The Scope of work involves for Design, Construction, Testing, Commissioning and Validation of TB Containment Laboratory and associated works with two years of comprehensive warranty period on 'Turnkey Basis' in compliance with Revised National Tuberculosis Control Programme (NTEP), Central TB Division(CTD), Govt of India (Gol).   |   |
| b)   | The scope of work shall include design, complete construction and establishment of TB Containment facility including minor civil works, electrical works, public health engineering works etc. complete in all respect. All the fixed equipment and systems like pass box, HVAC system and its components (including A/C plant, air handling, exhaust systems, filters, controls etc.), computers, laboratory workstations, uninterrupted power supply system, door interlocks, access control system, fire detection & alarm, system, surveillance systems CCTV with remotely placed monitor control, fire extinguishers and any other equipment/systems essentially required to meet the intent and purpose of setting up of TB Containment laboratory shall be provided and included in the scope of works. Items/equipment like scientific laboratory instruments, bio safety cabinets, autoclaves and other equipment such as freezers, refrigerator, incubators, centrifuges etc. will be available at/ procured by the site. Architectural layout of the lab will be provided (including of the TB Containment Lab and placement of equipment and power load requirement)-see <b>Annexure 1 to 3</b> |   |
| 2  | <b>The scope of works shall also include:</b>   |   |
| a)   | Supply and laying of the required power supply cables from the existing electrical room (LT Panel room) up to the proposed TB Containment Lab for its power supply.   |   |
| b)   | Extension of existing LT panel by providing feeder panel  |   |

| Sl. No. | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|--|---|
|         | with switchgears of required capacities to meet the power requirements of TB Containment Lab. Dedicated earthing for the TB Containment Lab shall be installed as required by the vendor.  |   |
| c)      | Power required for the TB Containment Laboratory shall be tapped from the existing feeder lines (through its expansion and laying of required power cabling) or panels. All necessary arrangements like extension of existing feeder/bus bars, laying of power cables etc. for tapping of required power shall be made by the contractor. Supply should be three phase and with proper earthing and required capacity of 440V for AHU Unit for TB Containment lab.   |   |
| d)      | Extension of existing water supply lines up to the TB Containment Lab to meet its water supply requirements. Supply and erection of water tank 750-1000litres in case of inadequate or absence of water supply for emergency shower and eye wash stations.   |   |
| 3       | <b>PRE-REQUISITES for the Site to comply</b>   |   |
| a)      | <b>Power required for the TB Containment Laboratory</b> shall be tapped from the existing feeder lines (through its expansion and laying of required power cabling) or panels. Supply should be three phase and with proper earthing and required capacity of 440V for AHU Unit for TB Containment lab. Adequate provision for power back up in the form connection to a green source for energy back up or Diesel Generator Set of about 120-150 KVA capacity (to be re-calculated based on requirement at time of procurement/assessment) is a must to keep lab functional all time. |   |
| b)      | <b>Water supply to the TB Containment Laboratory</b> shall be provided through the existing Water distribution network in campus.  |   |
| c)      | <b>Strength of existing building structure</b> - Space identified for TB lab should be strong enough to withstand local climate/ environmental hazard. The institute will require to take care of seepage issues in the building if extensive (minor issues can be taken care by vendor)   |   |
| 4       | <b>CRITICAL CONSIDERATIONS TO BE FOLLOWED IN DESIGN:</b>   |   |
| a)      | The proposed TB Containment Laboratory shall be constructed in accordance with CDC, WHO and NTEP and   |   |

| Sl. No. | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|--|---|
|         | other international guidelines as minimum (see later in document reference materials used). Some of the minimum essential critical considerations for construction of the proposed TB Containment Laboratory shall be as under:  |   |
| b)      | Restricted and controlled access shall be provided for entry into the laboratory.  |   |
| c)      | The HVAC systems shall be provided to maintain the desired inside conditions in terms of temperatures, humidity conditions, air filtration requirements. Unidirectional airflow to be achieved by appropriate negative differential pressures and a minimum of 6-12 Air changes per hour to be achieved. Air from the laboratories, shall be exhausted only after appropriate filtration (HEPA filters) as per guidelines/standards. Redundant exhaust systems shall be provided for Tb Containment lab room. Leak proof dampers with provision to prevent backflow of air shall be provided in supply and exhaust air systems of laboratory rooms for isolation of rooms/zones. |   |
| d)      | Interiors of the TB Containment Lab- The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant to phenol, hypochlorite, etc. cleaning and suitable to withstand chemical use during decontamination /fumigation. Modular false ceiling panels should be made for Clean Room application. <b>Flooring</b> inside the TB Containment lab shall be of self-levelling industrial epoxy and cleanroom compatible.  |   |
| e)      | The door interlocks, exhaust blower of BSCs, shall be provided with online, un-interrupted power supply system with minimum 30 minutes power backup.   |   |
| f)      | Safety measures for fire and electricity shall be provided   |   |
| g)      | Emergency shower, Eyewash station facility will be provided to address emergency spill situations. Emergency Exit door with panic latch door from the TB Containment Laboratory shall be provided  |   |
| 5       | <b>GENERAL CONSTRUCTION</b>  |   |
| 1.      | The drawings shall be submitted by the contractor for review and approval by the client/ Consultant. However, some of the critical elements of the building and  |   |

| Sl. No.                        | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|--------------------------------|--|---|
|                                | features are highlighted here under:   |   |
| a)                             | <b>Building Planning Concept:</b><br>The proposed TB Containment laboratory building shall be constructed on primary and secondary containment barrier system concept.   |   |
| b)                             | <b>The Primary Barriers:</b> Bio-safety cabinets (Class-IIA2) with thimble or canopy ducting, pass box, etc. shall constitute the primary containment barrier and shall be placed suitably to contain the contamination.   |   |
| c)                             | <b>The Secondary Barriers:</b> The laboratory building, air management and control system shall provide the secondary barrier system. Sustained directional airflow from "lesser contaminated area" towards "potentially higher contaminated areas" shall be achieved through differential pressure in areas/zones.  |   |
| d)                             | <b>Building Construction and Finishing:</b> The internal building finishing shall provide impervious and monolithic construction and all materials used for internal construction and finishing shall be non-particle shredding type and chemical resistant. Joints like wall to wall, wall to floor and ceiling to wall shall be provided with covings for easy cleaning. All joints and penetrations in the building shall be sealed with silicon sealant. The drainage and effluent piping system from the TB Containment Lab areas shall be of chemical resistant materials. |   |
| <b>DETAILED SPECIFICATIONS</b> |  |   |
| 1                              | <b>Restricted and controlled access</b> shall be provided for entry into the laboratory.   |   |
| i                              | Access control system for entry / exits should be provided. 20 numbers of card to be provided to each lab.   |   |
| 2                              | <b>HEATING VENTILATION &amp; AIR-CONDITIONING (HVAC) SYSTEM:</b>   |   |
| i                              | The entire laboratory shall be air-conditioned. The HVAC systems shall be provided to maintain the desired inside conditions in terms of temperatures, humidity conditions, air filtration requirements, room/zone pressure requirements and air change rate.  |   |
| ii                             | <b>Housing/Casing of AHU unit:</b> Air Handling Units shall be of sectionalized constructions with an under frame of extruded heavy aluminum profiles. The underframe shall be mechanically strong and shall take double   |   |

| Sl. No. | Bid Technical Specification (Main)  | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|---|---|
|         | skinned insulated panels. The powder coated panels shall consist of 0.8 mm galvanized iron outer skin and 0.63 mm galvanized iron inner skin with 23 mm thick injected PUF insulation in between two panels. The AHUs shall be with true thermal break. There should not be any projections inside the AHUs and the covings must flush with the side panels. Airtight access panel with suitable neoprene gaskets shall be provided in the fan section, coil and filter section. Similar gaskets should be used at all other joints of the AHU and its ducting. Units meant for indoor locations shall be specially designed to meet the arduous and corrosive atmosphere.  |   |
| iii     | <u>Platform for AHU:</u> In places where firm, even and concrete surface not available, the same will have to be constructed (masonry work) for the entire surface area which will be enclosed within AHU shed.   |   |
| iv      | There would be independent supply and exhaust system with unidirectional inward airflow and 100% exhaust.   |   |
| V       | <b>Supply Unit:</b>   |   |
| A       | <u>Air Conditioning Plant:</u> The Air-Conditioning plant (of suitable capacity based on requirements of the lab's AHU) shall be with Direct Extension (DX system). The condenser unit shall have <b>multiple compressors such that at least one compressor shall be as standby</b> . The AHU shall comprise of Cooling Coil Section with 8 row deep DX coil, necessary component, 18-gauge SS 304 drain pan with 13 mm thick closed cell self-sticking polyethylene insulation, having slope at one side, drain connection from other side. Inlet and outlet coil nipples shall be sealed against unit casing by means of neoprene gaskets. Alternately, the cold air from the existing Central Air-Conditioning plant may be taken. |   |
| B       | The laboratory rooms will be supplied with pre-conditioned (heating, cooling) fresh air by a mechanical ventilation system. Temperature inside the lab shall be maintained at 22°C±2.   |   |
| c       | The air will be cooled to 22°C then reheated with an electric duct coil to maintain required space conditions. This is required to maintain proper humidity conditions in the lab and humidity level should be maintained at 60±10%. To heat the air in the winter, an electrical   |   |

| Sl. No. | Bid Technical Specification (Main)  | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|---|---|
|         | heater unit (of adequate capacity) would be planned. This heater will be the same heater that will function as dehumidifier unit insummer.  |   |
| D       | <u>Design of Supply air system:</u> One variable speed supply fan of Gebhardt/ Krugger/ Nicotra or equivalent reputed OEM (Original Equipment Manufacturer) should be installed. Fan is designed for the whole required supply air amount (100% Redundancy). The fan shall be backward (or forward) curved centrifugal double inlet multi blade with optimized selection for low noise and high efficiency. Fans shall be statically and dynamically balanced for vibration free operation. Fans shall be enclosed in galvanized steel scroll cases and shall be driven by a variable frequency drive (VFD). The VFD should be pre-set Programme for five different varying fan speed with selector switch for user operation. Fan and motor assembly shall be mounted on vibration isolators eliminating the need for external vibration isolators. Provision shall be made for belt tensioning. Motor should be of required capacity of Crompton Greaves/ Siemens/ ABB or equivalent of reputed OEM make. The fan should not exceed noise level of 75 db (A) from 1 m distance. <b>A spare motor shall</b> be provided in case of any burn out/breakdown for immediate repair/replacement. <b>4-5 spare fan belts</b> shall also be provided which can be used for replacement in caseof wear/tear. |   |
| E       | Volume Control Dampers: The distribution of air is planned via air inlets in the laboratory rooms. To control the air volume flow variable volume boxes in the supply air ducts are planned (at mouth of supply, after blower and after fine filter). The housing for these dampers (in fact all) will be of extruded aluminum, Low Leakage Aero foil design. A constant volume mechanical control damper valve will be installed which will also be easily accessible for corrective purposes. The supply airneeds to be constant to maintain the proper air change rate.  |   |
| F       | A wire mesh screen to prevent entry of rodents/birds/insects, etc. will be placed in front of the damper at the mouth of supply.  |   |
| G       | <b>Filters:</b>   |   |

| Sl. No. | Bid Technical Specification (Main)  | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|---|---|
| 1       | There will be three sets of filters- coarse filters at mouth of supply and fine filter after blower motor of supply unit and HEPA filter housing in the supply ducting at a distance of about 500mm from fine filter unit.  |   |
| 2       | Coarse filter will be in outside fresh air pre-filter section and will be G4 washable filter (50 mm deep) class having average arrestance of 85-98% for 10 microns size as per EN779 2002, after damper at mouth of supply (as mentioned in volume control damper).   |   |
| 3       | Fine filters will be F7 filter (300 mm deep) Average Efficiency 85-95% for 1-micron size as per EN 779 2002 standards and placed after coarse filter before air goes into DX system.  |   |
| 4       | F-7 filter to be provided with test port elbows (pre and post) to put in magnehelic gauges tubing for measure differential pressure across it. These test port elbows will remain sealed/closed in routine condition.   |   |
| 5       | The HEPA filter plenums (Containment Housing) shall be made in SS 304 (14 gauge) with air tight and leak proof construction. The HEPA filter plenums shall be provided Isolation dampers at Inlet and Outlet and shall have provisions and facility to carry out on site HEPA filter scanning, testing and validation, magnehelic pressure gauge to monitor pressure drop across the HEPA filter, fumigation ports to allow IN-SITU decontamination of HEPA filters and Bag-In-Bag-Out facility for change/replacement of filters. The quantity of HEPA filter should be provided based on supply airroom volume, length of duct. |   |
| H       | <u>Ducting</u> : Ventilation ducting shall be made out of minimum 24-gauge GI sheet, all the ventilation ducting shall be leak proof and with thermal insulation (the color of insulation material will not be black). This insulation is made of nitrile rubber or glass wool. The GI duct should be fabricated as per SMACNA standards. To prevent air leakage, all the lateral joints and flanged joints of GI ducting should be sealed using silicone sealant. The external ducting with insulation needs to be covered by aluminum sheet completely (to protect from monkeys)  |   |
| I       | <u>Ducting design</u> will be submitted by the vendor along   |   |

| Sl. No.   | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|-----------|--|---|
|           | with details of bends, dimensions of the duct at various places from AHU to the TB Containment Lab, number of inlets/outlets planned, etc. which would be suitable from the lab being upgraded. It will have to be consulted with lab design expert and the labi/can approved before construction is carried out.  |   |
| <b>vi</b> | <b>Exhaust System</b>  |   |
| A         | <u>Design of Exhaust Air System</u> : One variable speed exhaust fan of Gebhardt/ Krugger/ Nicotra or equivalent reputed OEM (Original Equipment Manufacturer) should be installed. The fan shall be backward (or forward) curved centrifugal double inlet multi blade with optimized selection for low noise and high efficiency. Fans shall be statically and dynamically balanced for vibration free operation. Fans shall be enclosed in galvanized steel scroll cases and shall be driven by a variable frequency drive (VFD). The VFD should be pre-set programme for five different varying fan speed with selector switch for user operation. Fan and motor assembly shall be mounted on vibration isolators eliminating the need for external vibration isolators. Provision shall be made for belt tensioning. Motor should be of required capacity of Crompton Greaves/ Siemens/ ABB or equivalent of reputed OEM make. The fan should not exceed noise level of 75 db(A) from 1 m distance. <b>A spare motor</b> shall be provided in case of any burn out/breakdown for immediate repair/replacement which can be done by local engineer. <b>4-5 spare fan belts</b> shall also be provided which can be replaced by local engineer in case of wear/tear. |   |
| B         | Exhaust Air System will be designed such that it ensures directional air flow by differential pressure gradient across different rooms and maintains minimum 6-12-fold air change per hour in the lab area (including separate exhaust ducting for BSCs installed).  |   |
| C         | Ducting: Exhaust ducting (like supply) shall be made out of minimum 24-gauge GI sheet. The GI duct should be fabricated as per SMACNA standards. To prevent air leakage, all the lateral joints and flanged joints of GI ducting should be sealed using silicone sealant. All the ventilation ducting shall be leak proof and with thermal   |   |

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|         | insulation (the colour of insulation material will not be black). This insulation is made of nitrile rubber or glass wool. The external ducting with insulation needs to be covered by aluminum sheet completely (to protect from monkeys)  |   |
| D       | Air Filtration: The exhaust air filter handling systems shall be provided with HEPA Filters such that it protects the maintenance staff from acquiring any infections while handling/replacing the filters -Bag in Bag out system (BIBO). It is essential that the maintenance person wears PPE while doing so. The HEPA filters will be located prior to exhaust unit at a place which is easily accessible and has adequate space for BIBO to function effectively. The HEPA filter housed in BIBO should have efficiency of H13 or H14 tested as per EN1822 at MPPS (Maximum Penetrating Particle Size). The HEPA filter plenums (Containment Housing) shall be made in SS 304 (14 gauge) with air tight and leak proof construction. The HEPA filter plenums shall be provided Isolation dampers at Inlet and Outlet and shall have provisions and facility to carry out on site HEPA filter scanning, testing and validation, magnehelic pressure gauge to monitor pressure drop across the HEPA filter, fumigation ports to allow IN-SITU decontamination of HEPA filters and Bag-In-Bag-Out facility for change/replacement of filters. HEPA Filters of 99.99% efficiency would be used in all exhaust. All the HEPA filters should have 0.3µm filtration. |   |
| E       | Supply Air system to be electrically interlocked (fans, dampers, electrical) with exhaust air system, to prevent sustained positive pressurization.   |   |
| vii     | <b>Appropriate negative differential pressures</b> (for e.g. the negative pressure room where bio safety cabinets are placed shall be -12.5 Pa (-0.05" WG) relative to the anteroom, anteroom shall be -12.5 Pa (-0.05" WG) relative to change room if planned, and the change room shall be -12.5Pa (-0.05" WG) relative to the outside atmospheric pressure. Manual differential pressure gauges shall be placed outside ChangeRoom, Ante room and main lab. Pressure balancing system to   |   |

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|         | maintain room/zone pressures within specified set limits shall be provided which should be done through manual control. Magnehelic gauges used will be of DYWER/ WAREE/ WIKA or equivalent reputed OEM (Range -50 to 0 to +50 Pascals) with supporting SS Hardware with Top plate & suitable Box SS 304 including tubing & suitable fitting & accessories in wall panel.  |   |
| viii    | <b>Fire Dampers for supply and exhaust air:</b> As a safety feature, fire dampers shall be provided in both supply as well as exhaust duct. In supply system it will be in between variable damper and inlet (but at an accessible point from outside). In the exhaust system it will be located in exhaust ducting coming out of the building and prior to BIBO assembly at an accessible point from outside. These dampers are curtain type made of SS interlocking blades with fusible link which melts at 74°C  |   |
| ix      | <b>Leak proof dampers</b> with provision to prevent backflow of air shall be provided in supply unit (after blower motor and before volume control damper) and in exhaust unit (in between blower motor and volume control damper). It is made of SS blades with neoprene gasket  |   |
| X       | <b>AHU SHED:</b> It will be required at sites where AHU is installed on roof/ outside the lab building. AHU shed with provision for fencing, door with lock-key arrangement.<br>a. Framework vertically made of M S Square Pipe frame: 2 Inches X 2 Inches, 16 Gauge<br>b. M S Fencing with wiremesh: ½ inch X ½ inch<br>c. Supporting Structure M S Angle: 50 X 5mm<br>d. GI pre-coated corrugated profile roof sheet: 0.5 mm thick duly supported with J Hook.<br>e. 10 SWG with provision of door with lock and key<br>AHU Shed with fencing should be duly enamel painted and with anti-rust coating from both sides. The height covered shall be at least 8 feet. There should be no gap between roof sheet and wire mesh, if any angle creates gap, it should be covered with iron bars and wire mesh in between. |   |
| 3       | <b>Electricals:</b>   |   |
| I       | The electrical power requirement (power matrix) for the   |   |

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|         | TB Containment laboratory should be calculated and provided by the lab.  |   |
| ii      | Supply should be three phase supply with proper earthing and required 440 V capacity to support the functioning of AHU Unit.   |   |
| iii     | <b>Earthing:</b> the vendor will do the necessary grounding work to ensure entire TB C&DST Lab has adequate earthing.  |   |
| iv      | All the required electrical panels, cabling, switchgears, surge and spike protection system and arrangements, etc. for the purpose of energizing the TB Containment Laboratory facility shall be carried out by the contractor.  |   |
| V       | All the electrical fittings and fixtures in the laboratories areas on the walls shall be sealed (all conduits, outlets shall be sealed with silicon sealant), leak proof and capable to withstand chemical exposures during fumigation.  |   |
| vi      | Lighting should be on ceiling and surface mounted, LED of reputable manufacturer, suitable capacity (~18W) and arranged as per the layout provided. Light fixtures inside shall be with gasket or otherwise sealed with silicon.   |   |
| vii     | The electrical power distribution scheme shall be provided to provide back-up power supply to the critical components and equipment through a UPS (to prevent any disruption of work) and through Diesel power generator set for the entire lab.   |   |
| viii    | Every workbench should have at least one socket which received electrical input through UPS of TB Containment lab. Extractor fans of BSC' ducting should also receive electrical input through this online UPS of the TB Containment Lab.  |   |
| ix      | Power sockets with lid (15-20 in each room) should be provided for equipment (as per the layout provided). Modular type, power sockets with lid of 5A/15A are to be provided at various locations on the wall as per discretion and strategic arrangements /provisions for lab equipment. The Sockets meant for UPS should be screen printed as (UPS) for ease of operation and identification marked wires and cables used shall be copper wire of standard make (ISI Marked) and manufacturer. |   |

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| X       | <b>AHU Control panel:</b>  |   |
| i       | Cabling from the panel to individual AHUs and control wiring will be in the scope of HVAC contractor. However, cabling up to the electrical panel will be provided by site. Termination will be done by HVAC contractor. In case of power failure, the alternate power through Main Diesel Generator Set of the Hospital Supply to be used. The Panel is to be design accordingly. |   |
| ii      | Housing of the AHU panel shall be GI 16-gauge powder coated, with cable inlet and outlet going through grommet and with earthing connection arrangement.   |   |
| iii     | Multi-function meter displaying voltage, load and power factor for electricity supply to AHU panel should be present.  |   |
| iv      | LED indicator for ON/OFF will be provided for RBY phase, AHU supply, AHU exhaust, Standby exhaust, Condensation unit, Heating Coil of Supply Unit  |   |
| v       | DOL Starter Switch to be provided for AHU exhaust, AHU Supply and Condensation Unit (in the order)   |   |
| vi      | All electrical equipment used should be high quality of reputed manufacturers like VFD may be Allen Bradley, Siemens make or equivalent, MCCB may be of Havells, Legrant, Anchor, Siemens, L&T or equivalent, wiring of Havells, Polycab or equivalent make, etc.  |   |
| vii     | Control panel should show simple instructions for starting the AHU   |   |
| viii    | Diagrams of electric circuit should be displayed on the backside of door of panel.   |   |
| ix      | Control panel should have its lock and key (for controlled access)   |   |
| x       | SOP for lab condition for operating VFD with selector switch for manual operation of AHU   |   |
| xi      | MCCB panel suggesting supply and safety mechanism for different sections of the lab should be provided at adequate place near AHU control panel.   |   |
| 4       | <b>Fire Safety</b>   |   |
|         | Fire Safety: Fire detection and alarm system (FDA System) and fire extinguishers of Type ABC 4 Kg) with inert gas system shall be provided at strategic locations (TB Containment Room, Ante Room and outside at entrance of TB Containment Lab and near control panel,  |   |

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|         | near AHU and should overall comply with fire safety guidelines). Training will be provided for its operation.   |   |
| 5       | <b>Emergency Preparedness:</b>  |   |
| i       | One emergency shower and one eye wash station for each site shall be provided at strategic location in compliance with ANSI / ISEA Z358.1. The water supply for emergency shower shall be enough to supply at least 3 GPM for 10 minutes. Shower shall be hands free and stay open valve type. The water supply for eye wash shall be enough to supply 0.4 GPM (1.5 litres) for 10 minutes in low velocity flow.  |   |
| ii      | Emergency Exit door with panic latch door from the TB Containment Laboratory shall be provided wherever mentioned for personnel exit in case of an emergency and can also be used for equipment placement inside lab. Door should be equipped with hooter/audible alarm every time it is opened.  |   |
| iii     | UNINTERRUPTED POWER SUPPLY SYSTEM (UPS): A central UPS console shall be provided to cater to the extreme essential power requirement of the laboratory. All critical components like lights, Door Interlocks, exhaust blowers of BSCs, Fire alarm sensor, CCTV camera & monitoring shall be provided with uninterrupted power supply for 30 minutes.  |   |
| iv      | Fire and electrical safety are described in the relevant sections.  |   |
| 6       | <b>Interiors of the TB Containment Lab:</b>   |   |
| i       | <b>Modular walls:</b> The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant especially to Hypochlorite cleaning and suitable to withstand chemical use during decontamination/ fumigation. Modular wall should be made for Clean Room application, pre-engineered 60 mm thick PUF panels with GPSP Sheets with PUF insulation of minimum 38-40 kg/m <sup>3</sup> . Both surfaces should be 0.8 mm thick GPSP sheet and must be installed along the outer walls, partitions and false ceiling to create an impervious shell which is fully sealed. The panels on either side will be coated with Epoxy painted. These panels must have good aesthetic appeal as well and must be easily maintainable. The |   |

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|         | height of wall shall be minimum 9 feet (to accommodate BSC with its thimble and damper).  |   |
| ii      | <u>Modular false ceiling:</u> The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant especially to Hypochlorite cleaning and suitable to withstand chemical use during decontamination/ fumigation. Modular false ceiling panels should be made for Clean Room application, pre-engineered 60 mm thick PUF panels with GPSP Sheets with PUF insulation of minimum 38-40 kg/m <sup>3</sup> . Both surfaces should be 0.8 mm thick GPSP sheet and must be installed along the ceiling, to create an impervious shell which is fully sealed. The panels on inner side will be coated with Epoxy painted and powder coated on outer side. These panels must have good aesthetic appeal as well and must be easily maintainable. The construction of false ceiling shall be strong to allow 1 person weighing 50-60 kg to easily walk/crawl above it for necessary work. Service window will be provided for access above false ceiling preferably outside TB containment lab. |   |
| iii     | <u>Flooring</u> shall be of 5 mm (3 mm + 2mm) of self-levelling industrial epoxy including screed compound for adhesion, 3 mm semisolid cladding of EPOXY will be applied over a uniform cemented flooring and 2 mm semi-liquid epoxy over 3 mm hardened surface with bubble free perfect smooth finishing completed in three steps: Cementing (Uniform Flooring), Hardening (3 mm epoxy) and smoothening (2mm epoxy). Epoxy used for this application will be self-levelling and clean room compatible. Flooring outside the TB Containment facility where required for aesthetic purpose will be covered with vinyl flooring.   |   |
| iv      | <u>Doors:</u>   |   |
| A       | Flush Door finishes shall be 45mm thick with chemical resistant, anti-fungal and anti-bacterial properties. 1.2mm thick GPSP sheet suitable to fix on 60 mm thick wall panel with provisions for double glazing glass for all door and hardware like push plates and handle on both side, lock and key, etc. PUF Panels will be with GPSP Sheets, epoxy painted on both sides and   |   |

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|         | PUF insulation of minimum 38-40 kg/m <sup>3</sup> . Concealed hardware for fixing of door frames, TS-71 door closure, SS hinges, SS Door handle, SS ball bearing butt hinges, concealed tower bolt for the double door, both sides lock and key arrangement. Suitable neoprene "Y seal" type gaskets may be used between the door jamand door stop.   |   |
| B       | Door interlocking systems shall be complete with controller module, push button stations with LED indication, electromagnetic locks. To take care of malfunctioning of interlocking, alternative electrical switch to manually open the doors should be provided.   |   |
| C       | Vision Glass for doors shall be fixed type vaccumised and insulated type with 6 mm toughened glass and shall be installed for natural lightening flushed with surfaces of the door. Fixed flush to both faces of the door / wall panels to provide ease of cleaning and maintenance. No crevices / joints / sloped profiles are used for fixing the glass. This will avoid particle contamination and dust accumulation.  |   |
| v       | <u>Covings</u> : Extruded aluminum anodized R75 clip-on type (Male & Female connectors) covings for entire wall to floor, wall to wall & wall to ceiling joints. Extruded aluminum double cove integrated with top track of the partition panels. Corner internal & external cove joining pieces in aluminum anodized finish. Having similar construction and finish as the walls and properly sealed with silicon sealant with wall & ceiling. Covings used in construction shall include Wall to Wall Coving -R-75, Wall to Ceiling Coving-R-75, 90°Corner, 3-DCorner, 2-D Corner |   |
| vi      | All penetrations through walls, ceiling & floors will be sealed using a suitable caulking. Caulking shall be applied around pipes and conduit. The interior of electrical and cable conduit shall also be caulked.  |   |
| vii     | <b>Pass Box</b> : Pass Box (Static type) shall be provided at strategic / required locations for transfer of samples, chemicals and materials to and from the Laboratories (as indicated in the design submitted). In case of two pass box, one will be to receive the sample within and second will be for sample discard to autoclave room or   |   |

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|         | <p>for disinfected waste collection. It shall be made of SS 304, with inbuilt UVGI system, with interlocking in such a way that both doors cannot be opened simultaneously, panel mounted, with buzzer to indicate open status for any door, fixed at a height of 750 mm from floor in sandwich panel, with dimension of 610mm (L) X 610 MM (W) X 610 MM (D), with load bearing capacity of 40 Kg, door make-Single door in each side, with glass and air tight gasket, with door latch for one door (door opening outside), with handle of superior quality, with viewing glass made of polycarbonate or 10 mm thick tempered glass, hinges made of SS304, with one LED lamp inside pass box, chemical resistant especially to Hypochlorite solution, alcohol, etc., flange to seal pass-box and sandwich panel, with indicating lamps in both sides to show status. Manual ON/OFF switch for both Fluorescent &amp; UV lamp on both side of the Pass box. A SOP must be developed for pass-box decontamination.</p> |   |
| 7       | <b>Furniture inside the lab:</b>  |   |
| i       | <p><b>Laboratory workstations</b> (numbers as per the Lab design)- Frame shall be made up of SS 304, with nylon cushion/bushing for the legs, non-particle shredding material and shall be chemical resistant to allow chemical disinfection. It should be strong to hold the granite top/workbench as well as equipment places on the workbench. It should be stable and vibration free. There shall be no drawers or safe in the workstation and shall have arrangement for placing the UPS below the work bench.</p>   |   |
| ii      | <p><b>Garment Storage Cabinet</b>- One garment storage cabinet that can be locked shall be provided in the Change room/Ante Room. It shall be of SS 304 with two compartments and shelves for storage of clean items of suitably large dimension to fit in the Ante/ Change Room (size to be consulted with site i/c)</p>   |   |
| iii     | <p><b>Coat hangers</b> 8-10 individual hangers made of SS30, in group of 4-5 each, will be providing to hang gowns/aprons in Ante Room and change room (in consultation with site i/c)</p>  |   |
| iv      | <p><b>Shoe rack</b> (one)- It should be made of SS 304 with 5</p>   |   |

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|          | shelves, open type and wide enough to hold two pairs of shoes in each shelf and shall be able to fit in available space as per design.   |   |
| V        | <b>Wash Basin</b> (two): Modular standalone hand washing sinks made of SS 304 with elbow or foot operated mechanism shall be provided as per design inside lab and in change or ante room or as indicated in the layout. Wall hanging soap dispenser to be provided along with each wash basin unit. A Tissue paper rack with a mechanism to pull out tissue papers, will be provided near the wash basin to dry hands. Water lines that penetrate the TB Containment space shall be equipped with back-flow prevention devices. Outlet pipes should be made of PVC with closure outside lab made of SS plate. |   |
| vi       | <b>Laboratory Stools</b> (five): Laboratory grade hydraulic SS stools with back support, foot rest, rotating type with castor wheels at the base, shall be provided by contractor.   |   |
| vii      | <b>Trolleys:</b> Two tier trolleys (two quantity) made of SS 304, size 2'x1'6" with side walls to prevent fall of items from sides and wheels at bottom for smooth movement, shall be provided. Plus, one similar trolley will be provided for each BSC. One of the trolleys for transportation of material from lab to the Autoclave room shall be provided with alid to prevent direct exposure of material to outside.  |   |
| <b>8</b> | <b>Monitoring Mechanism</b>  |   |
|          | Monitoring Mechanism: Monitoring of crucial parameters will be made available in the lab for the following:  |   |
| I        | Visual display of Room Pressure, Relative humidity and temperature in the TB Containment Lab   |   |
| li       | Differential pressure through Magnehelic gauges in Ante-room, Change Room (where available) and outside TB Containment Lab   |   |
| lii      | In the Control Panel- Multi-function meter displaying voltage, load and power factor for electricity supply to AHU panel and LED indicator for ON/OFF will be provided for RBY phase, AHU supply, AHU exhaust,   |   |

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|         | Standby exhaust, Condensation unit, Heating Coil of Supply Unit  |   |
| iv      | CCTV footage from the various sections in the Microbiologist's room  |   |
| V       | Hooter/alarm when the emergency exit door is opened as well as when fire detection system is activated in incidence of fire.   |   |
| 9       | <b>Connectivity:</b>   |   |
| I       | LAN wiring for internet access inside the lab with sockets to be provided at strategic locations (nearwork benches) in TB Containment Room.  |   |
| ii      | A suitable EPABX System shall be provided for the laboratory. Telephone instrument with line will be kept in Microbiologist room, Staff room and TB containment room and any other place as suggested by Site i/c. Telephone with speaker for hands free operation will be provided inside TB Containment Room.  |   |
| 10      | <b>SPECIALIZED LABORATORY SUPPORT EQUIPMENTS AND SYSTEMS</b>   |   |
| I       | <b>Split AC for MGIT:</b> Two wall mounted split air conditioners (of suitable tonnage according to the area of the TB Containment Lab) should be installed near to MGIT. These will be inverter ACs (minimum three star) of Hitachi/ Bluestar/ Carrier/ Lloyd/ Godrej or equivalent OEM with suitable voltage stabilizer. The outdoor unit will be suitably placed outside the lab with easy access and adequate protection from theft. Drainage pipe of ACs will be adequately long and connected into the drainage system of the institute. Both the Split ACs should be connected with alternator (Timer Control cut-off and start) for changeover every 4 hours between them so that load is distributed between both the ACs. These will be used at the end of the day when main HVAC system is not operating to provide ambient temperature for MGIT. |   |
| ii      | <b>Biological Safety Cabinets:</b> Biological Safety Cabinets (BSC) will be installed, commissioned and validated inside the TB Containment Lab at the required location as per the plan. BSCs should be placed away from doors, air supply vents or other things which may disrupt the cabinet airflow. The Biological Safety Cabinets that are being procured shall be Class II A2 type. Lab upgradation   |   |

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|         | <p>agency shall coordinate/liaise with BSC Manufacturer for installation, ducting, commissioning and calibration of BSC if under warranty or newly supplied (else it shall be done by vendor). The exhaust from the Biological Safety Cabinets shall be thimble connected and individually ducted out. The external extraction fan installed at the end of the ducting should exceed the volumetric flow rate of each BSC by 30–50%, and should be controllable, provided with easily accessible dampers and connected to an uninterrupted power supply. The air from the BSC should be ducted with ventilation pipes that have a diameter exceed 20 cm. <b>(The exhaust from the Biological Safety Cabinets shall be thimble connected and individually ducted out. The ducting material&amp;Externalblowerofadequatecapacityfor BSC ducting should be provided by Identified Agency.)</b></p> |   |
| iii     | <p><b>CCTV Monitoring Devices:</b> Camera to continuously monitor the activities inside and outside the TB Containment Lab by providing Central CCTV Monitor. 10 Camera unit should be installed. Supply, installation, testing and commissioning of the following shall be done in coordination with the site:</p>   |   |
| A       | Color Camera 1/3" CCD, IR type, dome shaped, 480 TV lines resolution which work in low light.   |   |
| B       | 16 Channel standalone / Network version DVR Make: DAHUA /equivalent reputed OEM   |   |
| C       | Hard Disk with 2 TB (TERA byte) Capacity -Make - Seagate or equivalent reputed OEM  |   |
| D       | 16 Channel Power Supply of reputed Make   |   |
| E       | Supply Laying of Co-axial Cable with necessary Accessories  |   |
| F       | Wall mounted monitor (at least 32-inch LED/LCD) located in Microbiologist room or as suggested by site i/c.   |   |
| 11      | <b>Civil works and Plumbing:</b>  |   |
| I       | <p>Ensure water proofing of the roof (if required) is done prior to carrying out the work. Leveling of the floor where required will be carried out the vendor. Civil works to create new door arrangement/ closureof exiting openings, sealing of the existing windows, etc. will be carried out by the vendor.</p>  |   |

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| ii        | Drain: All the liquid drain coming out from the laboratory shall be connected to a single drain with back flow prevention, which would be further connected to existing local ETP plant in the hospital campus if available. All drains shall be equipped with “p traps”. Penetrations made in walls and floors must be properly sealed. |   |
| iii       | Water connections for the emergency shower and eye wash and wash basins to be appropriate provided.  |   |
| iv        | Ensure that pipes and connections are leak proof to avoid flooding behind modular walls.   |   |
| <b>12</b> | <b>Labelling to be done as per following details:</b>  |   |
| i         | Biohazard label should be placed outside the laboratory.   |   |
| ii        | Labels for all switches (to be provided) including in the MCCB panels, LT Panel and AHU Control panel  |   |
| iii       | Labelling of the TB Containment Lab and Ante Room/ Change room including Emergency exist.  |   |
| iv        | TB Containment laboratory layout should be provided at the entrance of Lab   |   |
| <b>13</b> | <b>Final performance and capacity testing and validation: All the certification and validation parameters for TB Containment Lab must be done in accordance in with NIH certification Requirement. BSCs will be validated and calibrated as per NSF 49 and EN 12469 standards.</b>   |   |
| i         | There will be periodic mid-term assessment of the project (after plumbing, electrical works, ducting and AHU installation, construction of interiors and dry run) by identified technical people and Site i/c to assess the timely and proper execution of the project.  |   |
| ii        | After completion of the construction and installations, the entire laboratory facility, all the equipment, systems and services shall be validated by the contractor under supervision of a committee of the consultants / client or lab i/c as follows:   |   |
| <b>A</b>  | <b>For Bio Safety Cabinet:</b>   |   |
| i         | Validation of BSC: Particle count test, PAO (Filter Integrity test for pre-filters, filters ULPA filter/ HEPA filters), Air in-flow velocity and down-flow velocity test as per NSF 49 and EN 12469 standards with devices traceable to National/International Standards, UV and Fluorescent light intensity                             |   |
| ii        | Maintenance of the BSC to be carried out if existing one to be used (and not covered under warranty) i.e.  |   |

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|          | complete and thorough cleaning of working Area of cabinet, cleaning of exhaust filter from the top to eliminate and external clogging or disturbance and inspection of ducting, cleaning and oiling of sliding sash movement system, checking of switches, tube lights and UV light fittings, checking of airflow and exhaust system, calibration and validation of Magnehelic Gauges if existing, etc.  |   |
| <b>B</b> | <b>For TB Containment Lab- The installation as a whole shall be balanced, tested and validated upon completion, and all relevant information, including the following shall be submitted to the Institution</b>  |   |
| 1        | Pressure in each room/zone as per the design, differential pressure readings including across filters.   |   |
| 2        | Air inflow velocity and outflow velocity test across all inlets and outlets to measure/derive air change rate per hour (minimum 6-12 ACH) and as per design  |   |
| 3        | Smoke pattern test for directional airflow should be performed during validation including for Pass box.   |   |
| 4        | Temperature shall be maintained at 22°C±2 and humidity level should be maintained at 60±10%  |   |
| 5        | HEPA Filter (in BIBO) integrity test based on PAO test and manufacturer's certifications   |   |
| 6        | Electrical current readings, in amperes on full load work, average running, and on starting, Testing of power cabling, earthing, AHU control panel, MCCB panel and LT panels   |   |
| 7        | Containment room -the walls, floors, ceilings, penetrations, and other containment barrier features have adequate integrity  |   |
| 8        | Operational performance testing for  |   |
| 9        | <ul style="list-style-type: none"> <li>• HVAC including Blower motors in the Supply, exhaust including emergency, extractor of BSC ducting and condensation unit</li> <li>• Ducting for any potential leakages and insulation breakage</li> <li>• Dampers including variable control, leak proof and fire control (only verification)</li> <li>• Magnehelic Gauges</li> <li>• Temperature control sensors; pressures control sensors,</li> </ul> |   |

| Sl. No. | Bid Technical Specification (Main)  | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|---|---|
|         | <ul style="list-style-type: none"> <li>• Passbox</li> <li>• SplitACs</li> <li>• Fire Detectionsystem</li> <li>• EPABXSystem</li> <li>• Access ControlSystem</li> <li>• CCTVSystem</li> <li>• UPS Back upsystem</li> <li>• Emergency Shower and eye washstation</li> <li>• Interlocking of supply blower motor and exhaust blowermotor</li> </ul>  |   |
| iii     | Prior to validation, the contractor shall prepare and submit a detailed 'Validation Document' for approval.   |   |
| A       | The Validation Document shall provide the detailed procedure for validation, parameters for validation, validation schemes and formats for recording the validation details.  |   |
| B       | The contractor shall arrange to do a mandatory third-party validation   |   |
| C       | The contractor shall arrange for all the instruments, tools, manpower etc. required for the validation. The validation results shall be recorded and documented and shared with the site and hiring/funding agency.   |   |
| iv      | The above validation tests shall be performed Annually during the warranty as well as maintenance period  |   |
| a       | <b>In addition to the above validation tests, preventive maintenance servicing of all installations, operational performance testing as listed above shall be carried out on a quarterly basis during the maintenance as well as defects liability period or Comprehensive warranty period (2 years).</b>   |   |
| 14      | <b>Maintenance Services</b>   |   |
|         | After the completion of defect liability or warranty period of two years, it will be appropriate to have a longer-term maintenance of the upgraded lab for a period of at least three years through the same agency who upgraded the lab. Apart from annual validation and quarterly preventive maintenance servicing as described above, it should include attending breakdown maintenance calls as and when required, repair/replacement of compressors, refrigerant gas charging of condensing units, besides replacement of |   |

| Sl. No. | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|--|---|
|         | spares required (due to wear and tear) at pre-fixed rates.   |   |
| 15      | <b>Training of personnel</b>   |   |
|         | Institution personnel to be trained over 2 days for:   |   |
| I       | Operation of HVAC Plant and all other equipment and systems.   |   |
| ii      | Adjustments of settings for controls and protective devices  |   |
| iii     | Servicing and Preventive maintenance   |   |
| iv      | Emergency response training.   |   |
| 16      | <b>Submission of specialized systems and services layout schemes prior to initiation of the work</b>   |   |
|         | Conceptual layout plans and schematic drawings of various specialized services and utilities showing tentative locations of equipment and furniture such as to be submitted before initiating work atsite for approval to hiring/funding agency and site i/c |   |
| i       | HVAC system (including Air filtration system Drawing of Supply AHU, Drawing of Exhaust AHU, Ducting drawing)   |   |
| ii      | Pressure control system including differential pressure zones  |   |
| iii     | Fire Detection and Alarm system  |   |
| iv      | Air distribution System including ACH ((Heat load calculation & Design Data)   |   |
| v       | Electrical distribution system (including Single Line Diagram with UPS system)   |   |
| vi      | Monitoring system including CCTV and three important parameter monitoring (pressure, temp and humidity)  |   |
| vii     | Water supply and drainage system   |   |
| viii    | AHU Control Panel System with VFD controls and SOP for lab condition for operating VFD with selector switch for manual operation of AHU  |   |
| ix      | Chart for defining the AHU fan and its speed for air quantity being delivered by supply and exhaust blower at differentspeed   |   |
| x       | Un-interrupted Power Supply system   |   |
| xi      | Specialized laboratory support equipment/ primary containment barriers such as   |   |
|         | <ul style="list-style-type: none"> <li>- Passboxes</li> <li>- Entry exit protocols</li> </ul>  |   |
| 17      | <b>Documents for final submission</b>  |   |

| Sl. No. | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|--|---|
|         | The following documents are required to be submitted after Final assessment and validation of TB Containment Lab for verification and approval to hiring/funding agency and to the lab within 15 days of completion of successful validation.  |   |
| i       | The drawings and layout of each final commissioned TB Containment laboratory should be shared with site and hiring/funding agency (both in soft and hard copy) for verification.   |   |
| ii      | All Test Certificates / Maintenance manuals / As Built drawings / Spare Part List should be submitted to site and hiring/funding agency after validation within one week.  |   |
| iii     | Detailed document on Laboratory Validation Procedures and to include as per table;   |   |
| 18      | <b>Submission of validation documents as per followings</b>  |   |
|         | <b>Submission of validation documents as per followings.</b><br>Design Qualification<br>Installation Qualification<br>Performance Qualification<br>Operational Qualification<br>All Test Certificates / Maintenance manuals/ As Built drawings / Spare Part List.  |   |
| 19      | <b>DOCUMENTS TO BE SUBMITTED BY THE BIDDER ALONG WITH THEIR BIDS FOR TECHNICAL QUALIFICATION AND EVALUATION</b>  |   |
|         | <b>Project Implementation Methodology including following documents</b>  |   |
| I       | Past experiences of developing labs including TB Containment labs (with contact details of at least 5 such)  |   |
| ii      | Team (members and their qualifications) which will be building the TB Lab (including designing, HVAC and ducting team, electrical, plumbing, civil work team, interiors developing team, etc.)   |   |
| lii     | List of Construction Material and Equipment Proposed for construction of the laboratory along with specifications including manufacturers (OEM) along with warranty period (as specified by Manufacturer) should be clearly mentioned and submitted as per table FORM Tech 9 given below for the labs quoted. Any additional material proposed for construction by bidder may also be specified in the same table. |   |

| Sl. No. | Bid Technical Specification (Main)   | Specifications Compliance /Deviation, if any (kindly specify Quantity of items, technical specifications, Make and model of the quoted items) |
|---------|--|---|
| Iv      | GANTT Chart informing timelines for executing the various stages of work                                       |   |
| 20      | Dedicated earthing for the TB Containment facility   |   |
| 21      | Additional site-specific civil work  |   |
| 22      | Biological Safety Cabinet Class II A2 with thimble Canopy/connection and with Uninterrupted Power Supply (UPS) |   |
| 23      | Vortex Mixer   |   |
| 24      | Electric Microincinerator  |   |
| 25      | pH meter   |   |
| 26      | Autoclaves (vertical)  |   |
| 27      | Refrigerator 165-200 lit   |   |
| 28      | Refrigerator 300-450 lit   |   |
| 29      | Analytical Balance   |   |

**Form TECH – 9: Proposed specifications and Make/ Manufacturer for item/material which bidder plans to use for the work**

List of Construction Material and Equipment Proposed for Construction of the Laboratory along with specifications including manufacturers (OEM) along with warranty period (as specified by Manufacturer) **should be clearly mentioned as per tables given below.** Any additional material proposed for construction by bidder may also be specified in the same table.

| Sl. No. | Item description  | Unit of Measurement (UOM) | Qty | Specifications with capacity (wherever applicable) and warranty as specified by Manufacturer | Proposed Makes / Manufacturers |
|---------|---|---------------------------|-----|--|--------------------------------|
| 1       | Thermal Insulation  |                           |     |  |                                |
| 2       | HEPA Filter H14   |                           |     |  |                                |
| 3       | Diffusers, Grilles  |                           |     |  |                                |
| 4       | Airtight and Gastight Isolation Dampers                     |                           |     |  |                                |
| 5       | VAV Dampers & Leak dampers                                  |                           |     |  |                                |
| 6       | Fire Damper   |                           |     |  |                                |
| 7       | Magnehelic Gauge  |                           |     |  |                                |
| 8       | Containment HEPA filter housing                             |                           |     |  |                                |
| 9       | BIBO Indigenous   |                           |     |  |                                |
| 10      | AHU and Ventilation units                                   |                           |     |  |                                |
| 11      | AHU Plenum Filters G4 , F7                                  |                           |     |  |                                |
| 12      | AHU Blower- Supply & Exhaust                                |                           |     |  |                                |
| 13      | AHU Motor-Supply & Exhaust                                  |                           |     |  |                                |
| 14      | Condensing unit   |                           |     |  |                                |
| 15      | HVAC Control valves   |                           |     |  |                                |
| 16      | Modular Material for Ceiling and Walls                      |                           |     |  |                                |
| 17      | GI Sheets   |                           |     |  |                                |
| 18      | Epoxy Flooring Material                                     |                           |     |  |                                |
| 19      | Distribution Boards   |                           |     |  |                                |
| 20      | LT Switchgear (ACB, MCCB, MCB,ELCB, RCCB, Contactors, SFUs) |                           |     |  |                                |
| 21      | FUSE  |                           |     |  |                                |
| 22      | VFD   |                           |     |  |                                |
| 23      | Timers  |                           |     |  |                                |
| 24      | Protection Relays   |                           |     |  |                                |
| 25      | Selector Switches   |                           |     |  |                                |
| 26      | Change Over Switch  |                           |     |  |                                |

| Sl. No. | Item description                                     | Unit of Measurement (UOM) | Qty | Specifications with capacity (wherever applicable) and warranty as specified by Manufacturer | Proposed Makes / Manufacturers |
|---------|--|---------------------------|-----|--|--------------------------------|
| 27      | Ammeters, Voltmeters,                                |                           |     |  |                                |
| 28      | Indication Lamps (LED Type)                          |                           |     |  |                                |
| 29      | Push Buttons   |                           |     |  |                                |
| 30      | PF Meters  |                           |     |  |                                |
| 31      | Energy Meter   |                           |     |  |                                |
| 32      | Electrical Multi-function Meters                     |                           |     |  |                                |
| 33      | Load Managers  |                           |     |  |                                |
| 34      | Current Transformers (Cast Resin)                    |                           |     |  |                                |
| 35      | Telephone Tag Box                                    |                           |     |  |                                |
| 36      | Industrial type Metallic plug sockets                |                           |     |  |                                |
| 37      | Modular switches, socket outlets, LED ceiling lights |                           |     |  |                                |
| 38      | PVC Conduits, Accessories                            |                           |     |  |                                |
| 39      | MS Structural's                                      |                           |     |  |                                |
| 40      | Copper wires   |                           |     |  |                                |
| 41      | XLPE insulated, armoured,                            |                           |     |  |                                |
| 42      | Aluminium conductor cables                           |                           |     |  |                                |
| 43      | Telephone, Co-axial wires & Cables                   |                           |     |  |                                |
| 44      | Data Cables (CAT 5e, 6)                              |                           |     |  |                                |
| 45      | CONTROL JUNCTION BOXES                               |                           |     |  |                                |
| 46      | Network Switches                                     |                           |     |  |                                |
| 47      | CCTV & CAMERAS                                       |                           |     |  |                                |
| 48      | UPS  |                           |     |  |                                |
| 49      | LED Monitor  |                           |     |  |                                |
| 50      | Door Interlock and Access control System             |                           |     |  |                                |
| 51      | Smoke Detectors                                      |                           |     |  |                                |
| 52      | Addressable analogue main panel                      |                           |     |  |                                |
| 53      | FIRE ALARM SYSTEM                                    |                           |     |  |                                |
| 54      | Differential Pressure Switch                         |                           |     |  |                                |
| 55      | Temperature sensor                                   |                           |     |  |                                |
| 56      | Temperature transmitter                              |                           |     |  |                                |
| 57      | Temperature display                                  |                           |     |  |                                |
| 58      | Humidity sensor                                      |                           |     |  |                                |
| 59      | Humidity transmitter                                 |                           |     |  |                                |

| Sl. No. | Item description   | Unit of Measurement (UOM) | Qty | Specifications with capacity (wherever applicable) and warranty as specified by Manufacturer | Proposed Makes / Manufacturers |
|---------|--|---------------------------|-----|--|--------------------------------|
| 60      | Humidity display   |                           |     |  |                                |
| 61      | Pressure sensor  |                           |     |  |                                |
| 62      | Pressure transmitter   |                           |     |  |                                |
| 63      | Pressure display   |                           |     |  |                                |
| 64      | 3-Channel Monitor display with Audio-visual alarm system, wiring & accessories   |                           |     |  |                                |
| 65      | Biological Safety Cabinet Class II A2 with thimble Canopy/connection and with Uninterrupted Power Supply (UPS)- 2 number |                           |     |  |                                |
| 66      | Vortex Mixer – 2 number  |                           |     |  |                                |
| 67      | Electric Micro incinerator – 1 number  |                           |     |  |                                |
| 68      | pH meter – 1 number  |                           |     |  |                                |
| 69      | Autoclaves (vertical) – 1 number   |                           |     |  |                                |
| 70      | Refrigerator 165-200 lit– 1 number   |                           |     |  |                                |
| 71      | Refrigerator 300-450 lit– 1 number   |                           |     |  |                                |
| 72      | Analytical Balance– 1 number   |                           |     |  |                                |
| 73      | Associated additional Civil work for creating TB Containment Lab Room  |                           |     |  |                                |
| 74      | ** Any other (please specify)  |                           |     |  |                                |

**Note:**

- i. Attach separate sheets for specifications and manufacturers catalogues/brochures for construction materials and equipment proposed.
- ii. Use separate table as above for each quoted Schedule
- iii. **\*\*Other items include any important item missed from the above list and site-specific work requirement associated with TB Containment Lab upgradation**

**SECTION III – FINANCIAL PROPOSAL-STANDARD FORMS**

**Form Fin – 1: Form of Bid (Financial)**

To,  
 CEO  
 HLL Infra Tech Services Limited  
 Procurement and Consultancy Division  
 B-14 A, Sector -62, Noida -201307, Uttar Pradesh.

**Subject:** Bid for Design, Construction, testing, commissioning and validation of TB containment laboratory and associated works on “turnkey basis” with supply and installation of Required equipment with two year comprehensive warranty

**BidRef.No.:** \_\_\_\_\_ **Dated:** \_\_\_\_\_

1. We, ....., hereby submit a bid for the construction of the above-referenced works in response to the above-referenced ITB.
2. We warrant that in preparing and submitting this bid, we have complied with, and are willing to be bound by, any and all of the requirements and provisions of the above-referenced ITB, including the terms and conditions of the Contract asset out in the Bid Documents.
3. Based on the above, our proposed **Total Contract Price is Rs..... inclusive of all relevant taxes** (Rupees only) and as per Fin-2 and Fin-3 Forms attached
4. I, the undersigned, certify that I am duly authorized by ..... to sign this bid and bind.....

Name:

Title:

Date:

Signature: \_\_\_\_\_

**Form Fin – 2: Lump sum Contract Price**

| <i>Description</i>   | <b>Costs (inclusive of all applicable taxes)</b> |
|--|--|
| <b>A.</b> Cost of Financial Bid for Design, Construction, Testing, Commissioning and Validation of TB Containment Laboratory with two-year warranty as per NTEP specification  |  |
| <b>B.</b> Cost of associated additional works as per Scope of work   |  |
| <b>C.</b> supply and installation of equipment (two class II A2 BSC with thimble canopy and two online ups, two vortex, one electric micro incinerator, one pH meter, one vertical autoclave, one refrigerator (165-200 lit), one refrigerator (300-450 lit), one analytical balance with two year warranty period |  |
| <b>D.</b> Cost of Comprehensive maintenance of laboratory for the period of 3 years after completion of two year warranty period including supplied equipment etc.   |  |

**Form FIN-3: Priced Bill of Quantity**

*Bidders shall submit detailed workings of Lump Sum Contract Price (Component-A , B& D as given in FIN-2) for Design, Construction, Testing, Commissioning and Validation of TB Containment Laboratory and associated additional civil works on 'Turnkey Basis'. The total price mentioned in the table below should coincide with the Price Component A, B& D as given in FIN-2 for each Schedule.*

| Sl. No.  | Item description  | UNIT of Measurement | Quantity | Unit Price (inclusive of all applicable taxes) | Total Price (inclusive of all applicable taxes) |
|--|---|---------------------|----------|--|---|
| <b>HVAC</b>  |   |                     |          |  |   |
| 1  | Thermal Insulation for Ducting  |                     |          |  |   |
| 2  | Ducting   |                     |          |  |   |
| 3  | Containment HEPA Filter (H14) Housing with Test elbow port  |                     |          |  |   |
| 4  | Diffusers, Grills   |                     |          |  |   |
| 5  | Airtight and Gastight Isolation Dampers   |                     |          |  |   |
| 6  | VAV, Dampers (VCDs, Low Leakage dampers)  |                     |          |  |   |
| 7  | Fire Dampers  |                     |          |  |   |
| 8  | Magnehelic Gauge  |                     |          |  |   |
| 9  | HEPA filter with BIBO Indigenous with Test elbow port   |                     |          |  |   |
| 10   | AHU and Ventilation Units   |                     |          |  |   |
| 11   | AHU Filters (G4, F7)  |                     |          |  |   |
| 12   | AHU Fan/Blower  |                     |          |  |   |
| 13   | Motor   |                     |          |  |   |
| 14   | Condensing Unit   |                     |          |  |   |
| 15   | compatible cooling coil   |                     |          |  |   |
| 16   | HVAC Control Valves   |                     |          |  |   |
| 17   | VFD   |                     |          |  |   |
| 18   | MS Structural for AHU Shed  |                     |          |  |   |
| 19   | BSC ducting with Exhaust blower (Damper, Pipe, other ducting accessories material and foundation work for Exhaust blower) |                     |          |  |   |
| <b>Electrical Panel, AHU Control Panel, Electrical Cabling &amp; accessories</b> |   |                     |          |  |   |
| 1  | LT Switch Gears (ACB, MCCB, MCB, ELCB, RCCB, Contactors,  |                     |          |  |   |

| Sl. No.          | Item description                                  | UNIT of Measurement | Quantity | Unit Price (inclusive of all applicable taxes) | Total Price (inclusive of all applicable taxes) |
|------------------|---|---------------------|----------|--|---|
|                  | SFUs)   |                     |          |  |   |
| 2                | FUSE  |                     |          |  |   |
| 3                | Protection Relays                                 |                     |          |  |   |
| 4                | Selector Switches                                 |                     |          |  |   |
| 5                | Ammeters, Voltmeters                              |                     |          |  |   |
| 6                | Indication Lamps (LED Type)                       |                     |          |  |   |
| 7                | Push Buttons                                      |                     |          |  |   |
| 8                | PF Meters   |                     |          |  |   |
| 9                | Energy Meter                                      |                     |          |  |   |
| 10               | Electric Multifunction Meter                      |                     |          |  |   |
| 11               | Load Managers                                     |                     |          |  |   |
| 12               | Current Transformers                              |                     |          |  |   |
| 13               | Modular Switches, Socket outlets, Ceiling lights  |                     |          |  |   |
| 14               | PVC Conduits, Accessories (running meter)         |                     |          |  |   |
| 15               | Copper wires                                      |                     |          |  |   |
| 16               | XLPE Insulated armoured wire                      |                     |          |  |   |
| 17               | UPS- 3KVA 30 minutes backup                       |                     |          |  |   |
| 18               | Distribution Board                                |                     |          |  |   |
| 19               | CONTROL JUNCTION BOXES                            |                     |          |  |   |
| <b>Interiors</b> |   |                     |          |  |   |
| 1                | Modular Material for Ceiling                      |                     |          |  |   |
| 2                | Modular Material for wall panels with coving      |                     |          |  |   |
| 3                | Epoxy Flooring                                    |                     |          |  |   |
| 4                | Modular (PUFF panel) Flush Doors                  |                     |          |  |   |
| 5                | CCTV Camera                                       |                     |          |  |   |
| 6                | LED Monitor                                       |                     |          |  |   |
| 7                | Fire Alarm system with Fire extinguishers         |                     |          |  |   |
| 8                | Addressable analogue main panel                   |                     |          |  |   |
| 9                | Smoke Detectors                                   |                     |          |  |   |
| 10               | Emergency eye wash and Shower                     |                     |          |  |   |
| 11               | Pass Box  |                     |          |  |   |
| 12               | Split ACs with Accessories with change over timer |                     |          |  |   |

| Sl. No.                      | Item description   | UNIT of Measurement | Quantity | Unit Price (inclusive of all applicable taxes) | Total Price (inclusive of all applicable taxes) |
|------------------------------|--|---------------------|----------|--|---|
| 13                           | Data Cable (CATFI Cable connection point)  |                     |          |  |   |
| 14                           | Door interlocking & access control system  |                     |          |  |   |
| 15                           | Temperature sensor, transmitter & display  |                     |          |  |   |
| 16                           | Humidity sensor, transmitter & display   |                     |          |  |   |
| 17                           | Pressure sensor & display  |                     |          |  |   |
| 18                           | EPABX Box  |                     |          |  |   |
| 19                           | Telephone set, Co-axial wires & cables   |                     |          |  |   |
| 20                           | Laboratory Stools  |                     |          |  |   |
| 21                           | SS Trolley   |                     |          |  |   |
| 22                           | SS Workbench   |                     |          |  |   |
| 23                           | SS Shoe Racks  |                     |          |  |   |
| 24                           | Wash Basin   |                     |          |  |   |
| 25                           | Garment Cubicles   |                     |          |  |   |
| 26                           | RTV Silicon Sealant  |                     |          |  |   |
| 27                           | Validation of Lab & BSC  |                     |          |  |   |
| 27                           | Misc. Civil & Plumbing Work including AHU foundation   |                     |          |  |   |
| 28                           | Dedicated Earthing   |                     |          |  |   |
| <b>Additional Civil work</b> |  |                     |          |  |   |
| 1                            | Associated additional civil work as per scope of work  |                     |          |  |   |
| <b>Required Equipment</b>    |  |                     |          |  |   |
| 1                            | Biological Safety Cabinet Class II A2 with thimble Canopy/connection and with Uninterrupted Power Supply (UPS)- 2 number |                     |          |  |   |
| 2                            | Vortex Mixer – 2 number  |                     |          |  |   |
| 3                            | Electric Micro incinerator – 1 number  |                     |          |  |   |
| 4                            | pH meter – 1 number  |                     |          |  |   |
| 5                            | Autoclaves (vertical) – 1 number   |                     |          |  |   |
| 6                            | Refrigerator 165-200 lit– 1 number   |                     |          |  |   |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| 7 | Refrigerator 300-450 lit–<br>1 number      |  |  |  |  |
| 8 | Analytical Balance – 1 number              |  |  |  |  |
|   | Any other items as quoted by<br>the bidder |  |  |  |  |

The bidder may add/delete price components as deemed necessary and as per requirement of sites.

\*\* Other items include any important item missed from the above list and site-specific work requirement associated with TB Containment Lab upgradation

## SECTION IV

### REQUIREMENT, TECHNICAL SPECIFICATIONS AND DRAWING/ LAYOUT OF LABORATORY AND REQUIRED WORKS

#### A SCOPE OF WORK, TECHNICAL SPECIFICATIONS AND DRAWINGS/ LAYOUTS OF LABORATORIES

##### SCOPE OF WORK:

***The Scope of work involves 'Construction, Testing, Commissioning and Validation of TB Containment Laboratory & associated works approved under the Revised National Tuberculosis Control Programme (NTEP), Central TB Division (CTD), Govt. of India (GoI).***

The scope of work shall include design, complete construction and establishment of TB Containment facility including minor civil works, electrical works, public health engineering works etc. complete in all respect. All the fixed equipment and systems like pass box, HVAC system and its components (including A/C plant, air handling, exhaust systems, filters, controls etc.), computers, laboratory workstations, uninterrupted power supply system, door interlocks, access control system, fire detection & alarm, system, surveillance systems CCTV with remotely placed monitor control, fire extinguishers and any other equipment/systems essentially required to meet the intent and purpose of setting up of TB Containment laboratory shall be provided and included in the scope of works. Items/equipment like scientific laboratory instruments, bio safety cabinets, autoclaves and other equipment such as freezers, refrigerator, incubators, centrifuges etc. will be available at site/ procured by the site. Architectural layout of the lab will be provided (including TB Containment Lab and placement of equipment and power load requirement)-see **Annexure 1 to 3**.

##### **The scope of works shall also include:**

- i. Supply and laying of the required power supply cables from the existing electrical room (LT Panel room) up to the proposed TB Containment Lab for its power supply.
- ii. Extension of existing LT panel by providing feeder panel with switchgears of required capacities to meet the power requirements of TB Containment Lab. Dedicated earthing for the TB Containment Lab shall be installed as required by the vendor.
- iii. Power required for the TB Containment Laboratory shall be tapped from the existing feeder lines (through its expansion and laying of required power cabling) or panels. All necessary arrangements like extension of existing feeder/bus bars, laying of power cables etc. for tapping of required power shall be made by the contractor. Supply should be three phase and with proper earthing and required capacity of 440V for AHU Unit for TB Containment lab.
- iv. Extension of existing water supply lines up to the TB Containment Lab to meet its water supply requirements. Supply and erection of water tank 750-1000 litres in case of inadequate or absence of water supply for emergency shower and eye wash stations.

##### **PRE-REQUISITES for the Site to comply**

- i. **Power required for the TB Containment Laboratory** shall be tapped from the existing feeder lines (through its expansion and laying of required power cabling) or panels. Supply should be

three phase and with proper earthing and required capacity of 440V for AHU Unit for TB Containment lab. Adequate provision for power back up in the form connection to a green source for energy back up or Diesel Generator Set of about 120-150 KVA capacity (to be re-calculated based on requirement at time of procurement/assessment) is a must to keep lab functional alltime.

- ii. **Water supply to the TB Containment Laboratory** shall be provided through the existing Water distribution network incampus.
- iii. **Strength of existing building structure-** Space identified for TB lab should be strong enough to withstand local climate/ environmental hazard. The institute will require to take care of seepage issues in the building if extensive (minor issues can be taken care by vendor)

#### **CRITICAL CONSIDERATIONS TO BE FOLLOWED IN DESIGN:**

The proposed TB Containment Laboratory shall be constructed in accordance with CDC, WHO and NTEP and other international guidelines<sup>1</sup> as minimum. Some of the minimum essential critical considerations for construction of the proposed TB Containment Laboratory shall be as under:

- i. Restricted and controlled access shall be provided for entry into the laboratory.
- ii. The HVAC systems shall be provided to maintain the desired inside conditions in terms of temperatures, humidity conditions, air filtration requirements. Unidirectional airflow to be achieved by appropriate negative differential pressures and a minimum of 6-12 Air changes per hour to be achieved. Air from the laboratories, shall be exhausted only after appropriate filtration (HEPA filters) as per guidelines/standards. Redundant exhaust systems shall be provided for Tb Containment lab room. Leak proof dampers with provision to prevent backflow of air shall be provided in supply and exhaust air systems of laboratory rooms for isolation of rooms/zones.
- iii. Interiors of the TB Containment Lab- The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant to phenol, hypochlorite, etc. cleaning and suitable to withstand chemical use during decontamination /fumigation. Modular false ceiling panels should be made for Clean Room application. Flooring inside the TB Containment lab shall be of self-levelling industrial epoxy and cleanroom compatible.
- iv. The door interlocks, exhaust blower of BSCs, shall be provided with online, un-interrupted power supply system with minimum 30 minutes power backup.
- v. Safety measures for fire and electricity shall be provided
- vi. Emergency shower, Eyewash station facility will be provided to address emergency spill situations. Emergency Exit door with panic latch door from the TB Containment Laboratory shall be provided

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#### <sup>1</sup>**Guidelines & Standards for reference:**

- i. *Bio safety in Microbiological and Biomedical Laboratories, 5<sup>th</sup> edition, 2007 (CDC/NIH BMBSL).* This guideline recommends minimum facility and operational requirements for laboratories working with biological hazards. Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets,
- ii. Canadian Tuberculosis Standards 6th Edition
- iii. American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. *Laboratory Design Guide -2001*
- iv. NIH Design Policy and Guidelines, 2008
- v. American National Standards Institute (ANSI)
- vi. NIH BSL 3 Certification requirement, 2006
- vii. WHO TB Containment Lab Biosafety Manual, 2012

## GENERAL CONSTRUCTION

The drawings shall be submitted by the contractor for review and approval by the client/ Consultant. However, some of the critical elements of the building and features are highlighted here under:

- i. **Building Planning Concept:**  
The proposed TB Containment laboratory building shall be constructed on primary and secondary containment barrier system concept.
- ii. **The Primary Barriers:**  
Bio-safety cabinets (Class-IIA2) with thimble or canopy ducting, pass box, etc. shall constitute the primary containment barrier and shall be placed suitably to contain the contamination.
- iii. **The Secondary Barriers:**  
The laboratory building, air management and control system shall provide the secondary barrier system. Sustained directional airflow from "lesser contaminated area" towards "potentially higher contaminated areas" shall be achieved through differential pressure in areas/zones.
- iv. **Building Construction and Finishing:**  
The internal building finishing shall provide impervious and monolithic construction and all materials used for internal construction and finishing shall be non-particle shredding type and chemical resistant. Joints like wall to wall, wall to floor and ceiling to wall shall be provided with covings for easy cleaning. All joints and penetrations in the building shall be sealed with silicon sealant. The drainage and effluent piping system from the TB Containment Lab areas shall be of chemical resistant materials.

## DETAILED SPECIFICATIONS

1. **Restricted and controlled access** shall be provided for entry into the laboratory.
  - Access control system for entry / exits should be provided. 20 numbers of card to be provided to each lab.
2. **HEATING VENTILATION & AIR-CONDITIONING (HVAC) SYSTEM:**
  - i. The entire laboratory shall be air-conditioned. The HVAC systems shall be provided to maintain the desired inside conditions in terms of temperatures, humidity conditions, air filtration requirements, room/zone pressure requirements and air change rate.
  - ii. **Housing/Casing of AHU unit:** Air Handling Units shall be of sectionalized constructions with an under frame of extruded heavy aluminum profiles. The under frame shall be mechanically strong and shall take double skinned insulated panels. The powder coated panels shall consist of 0.8 mm galvanized iron outer skin and 0.63 mm galvanized iron inner skin with 23 mm thick injected PUF insulation in between two panels. The AHUs shall be with true thermal break. There should not be any projections inside the AHUs and the covings must flush with the side panels. Air tight access panel with suitable neoprene gaskets shall be provided in the fan section, coil and filter section. Similar gaskets should be used at all other joints of the AHU and its ducting. Units meant for indoor locations shall be specially designed to meet the arduous and corrosive atmosphere.
  - iii. **Platform for AHU:** In places where firm, even and concrete surface not available, the same will have to be constructed (masonry work) for the entire surface area which will be enclosed within AHU shed.

- iv. There would be independent supply and exhaust system with unidirectional inward airflow and 100%exhaust.
- v. **SupplyUnit:**
  - a. Air Conditioning Plant: The Air-Conditioning plant (of suitable capacity based on requirements of the lab's AHU) shall be with Direct Extension (DX system). The condenser unit shall have multiple compressors such that at least one compressor shall be as standby. The AHU shall comprise of Cooling Coil Section with 8 row deep DX coil, necessary component, 18-gauge SS 304 drain pan with 13 mm thick closed cell self-sticking polyethylene insulation, having slope at one side, drain connection from other side. Inlet and outlet coil nipples shall be sealed against unit casing by means of neoprene gaskets. Alternately, the cold air from the existing Central Air-Conditioning plant may betaken.
  - b. The laboratory rooms will be supplied with pre-conditioned (heating, cooling) fresh air by a mechanical ventilation system. Temperature inside the lab shall be maintained at  $22^{\circ}\text{C}\pm 2$ .
  - c. The air will be cooled to  $22^{\circ}\text{C}$  then reheated with an electric duct coil to maintain required space conditions. This is required to maintain proper humidity conditions in the lab and humidity level should be maintained at  $60\pm 10\%$ . To heat the air in the winter, an electrical heater unit (of adequate capacity) would be planned. This heater will be the same heater that will function as dehumidifier unit in summer.
  - d. Design of Supply air system: One variable speed supply fan of Gebhardt/ Krugger/ Nicotra or equivalent reputed OEM (Original Equipment Manufacturer) should be installed. Fan is designed for the whole required supply air amount (100% Redundancy). The fan shall be backward (or forward) curved centrifugal double inlet multi blade with optimized selection for low noise and high efficiency. Fans shall be statically and dynamically balanced for vibration free operation. Fans shall be enclosed in galvanized steel scroll cases and shall be driven by a variable frequency drive (VFD). The VFD should be pre-set Programme for five different varying fan speed with selector switch for user operation. Fan and motor assembly shall be mounted on vibration isolators eliminating the need for external vibration isolators. Provision shall be made for belt tensioning. Motor should be of required capacity of Crompton Greaves/ Siemens/ ABB or equivalent of reputed OEM make. The fan should not exceed noise level of 75 db (A) from 1 m distance. A spare motor shall be provided in case of any burn out/breakdown for immediate repair/replacement. 4-5 spare fan belts shall also be provided which can be used for replacement in case of wear/tear.
  - e. Volume Control Dampers: The distribution of air is planned via air inlets in the laboratory rooms. To control the air volume flow variable volume boxes in the supply air ducts are planned (at mouth of supply, after blower and after fine filter). The housing for these dampers (in fact all) will be of extruded aluminum, Low Leakage Aero foil design. A constant volume mechanical control damper valve will be installed which will also be easily accessible for corrective purposes. The supply air needs to be constant to maintain the proper air change rate.
  - f. A wire mesh screen to prevent entry of rodents/birds/insects, etc. will be placed in front of the damper at the mouth of supply.
  - g. Filters;

- There will be three sets of filters- coarse filters at mouth of supply and fine filter after blower motor of supply unit and HEPA filter housing in the supply ducting at a distance of about 500mm from fine filter unit.
  - Coarse filter will be in outside fresh air pre-filter section and will be G4 washable filter (50 mm deep) class having average arrestance of 85-98% for 10 microns size as per EN779 2002, after damper at mouth of supply (as mentioned in volume control damper).
  - Fine filters will be F7 filter (300 mm deep) Average Efficiency 85-95% for 1-micron size as per EN 779 2002 standards and placed after coarse filter before air goes into DX system.
  - F-7 filter to be provided with test port elbows (pre and post) to put in magnehelic gauges tubing for measure differential pressure across it. These test port elbows will remain sealed/closed in routine condition.
  - The HEPA filter plenums (Containment Housing) shall be made in SS 304 (14 gauge) with air tight and leak proof construction. The HEPA filter plenums shall be provided Isolation dampers at Inlet and Outlet and shall have provisions and facility to carry out on site HEPA filter scanning, testing and validation, magnehelic pressure gauge to monitor pressure drop across the HEPA filter, fumigation ports to allow IN-SITU decontamination of HEPA filters and Bag-In-Bag-Out facility for change/replacement of filters. The quantity of HEPA filter should be provided on the basis of supply air room volume, length of duct.
- h. Ducting: Ventilation ducting shall be made out of minimum 24-gauge GI sheet, all the ventilation ducting shall be leak proof and with thermal insulation (the colour of insulation material will not be black). This insulation is made of nitrile rubber or glass wool. The GI duct should be fabricated as per SMACNA standards. To prevent air leakage, all the lateral joints and flanged joints of GI ducting should be sealed using silicone sealant. The external ducting with insulation needs to be covered by aluminum sheet completely (to protect from monkeys)
- i. Ducting design will be submitted by the vendor along with details of bends, dimensions of the duct at various places from AHU to the TB Containment Lab, number of inlets/outlets planned, etc. which would be suitable from the lab being upgraded. It will have to be consulted with lab design expert and the lab i/c and approved before construction is carried out.
- j. Noise Reduction: To avoid the allowed noise level, sound absorber will be installed on the housing of the AHU.

**vi. Exhaust System**

- i. Design of Exhaust Air System: One variable speed exhaust fan of Gebhardt/ Krugger/ Nicotra or equivalent reputed OEM (Original Equipment Manufacturer) should be installed. The fan shall be backward (or forward) curved centrifugal double inlet multi blade with optimized selection for low noise and high efficiency. Fans shall be statically and dynamically balanced for vibration free operation. Fans shall be enclosed in galvanized steel scroll cases and shall be driven by a variable frequency drive (VFD). The VFD should be pre-set programme for five different varying fan speed with selector switch for user operation. Fan and motor assembly shall be mounted on vibration isolators eliminating the need for external vibration isolators. Provision shall be made for

- belt tensioning. Motor should be of required capacity of Crompton Greaves/ Siemens/ ABB or equivalent of reputed OEM make. The fan should not exceed noise level of 75 db(A) from 1 m distance. A spare motor shall be provided in case of any burn out/breakdown for immediate repair/replacement which can be done by local engineer. 4-5 spare fan belts shall also be provided which can be replaced by local engineer in case of wear/tear.
- ii. Exhaust Air System will be designed such that it ensures directional air flow by differential pressure gradient across different rooms and maintains minimum 6-12-fold air change per hour in the lab area (including separate exhaust ducting for BSCs installed).
  - iii. Ducting: Exhaust ducting (like supply) shall be made out of minimum 24-gauge GI sheet. The GI duct should be fabricated as per SMACNA standards. To prevent air leakage, all the lateral joints and flanged joints of GI ducting should be sealed using silicone sealant. All the ventilation ducting shall be leak proof and with thermal insulation (the colour of insulation material will not be black). This insulation is made of nitrile rubber or glass wool.
  - iv. Air Filtration: The exhaust air filter handling systems shall be provided with HEPA Filters such that it protects the maintenance staff from acquiring any infections while handling/replacing the filters -Bag in Bag out system (BIBO). It is essential that the maintenance person wears PPE while doing so. The HEPA filters will be located prior to exhaust unit at a place which is easily accessible and has adequate space for BIBO to function effectively. The HEPA filter housed in BIBO should have efficiency of H13 or H14 tested as per EN1822 at MPPS (Maximum Penetrating Particle Size). The HEPA filter plenums (Containment Housing) shall be made in SS 304 (14 gauge) with air tight and leak proof construction. The HEPA filter plenums shall be provided Isolation dampers at Inlet and Outlet and shall have provisions and facility to carry out on site HEPA filter scanning, testing and validation, magnehelic pressure gauge to monitor pressure drop across the HEPA filter, fumigation ports to allow IN-SITU decontamination of HEPA filters and Bag-In-Bag-Out facility for change/replacement of filters. HEPA Filters of 99.99% efficiency would be used in all exhaust. All the HEPA filters should have 0.3µm filtration.
  - v. Supply Air system to be electrically interlocked (fans, dampers, electrical) with exhaust air system, to prevent sustained positive pressurization.
- vii. **Appropriate negative differential pressures** (for e.g. the negative pressure room where bio safety cabinets are placed shall be -12.5 Pa (-0.05" WG) relative to the anteroom, anteroom shall be -12.5 Pa (-0.05" WG) relative to change room if planned, and the change room shall be -12.5 Pa (-0.05" WG) relative to the outside atmospheric pressure. Manual differential pressure gauges shall be placed outside Change Room, Ante room and main lab. Pressure balancing system to maintain room/zone pressures within specified set limits shall be provided which should be done through manual control. Magnehelic gauges used will be of DYWER/ WAREE/ WIKA or equivalent reputed OEM (Range -50 to 0 to +50 Pascals) with supporting SS Hardware with Top plate & suitable Box SS 304 including tubing & suitable fitting & accessories in wallpanel.
- viii. **Fire Dampers for supply and exhaust air:** As a safety feature, fire dampers shall be provided in both supply as well as exhaust duct. In supply system it will be in between variable

damper and inlet (but at an accessible point from outside). In the exhaust system it will be located in exhaust ducting coming out of the building and prior to BIBO assembly at an accessible point from outside. These dampers are curtain type made of SS interlocking blades with fusible link which melts at 74°C

- ix. **Leak proof dampers** with provision to prevent backflow of air shall be provided in supply unit (after blower motor and before volume control damper) and in exhaust unit (in between blower motor and volume control damper). It is made of SS blades with neoprene gasket
- x. **AHU SHED:** It will be required at sites where AHU is installed on roof/ outside the lab building. AHU shed with provision for fencing, door with lock-key arrangement.
  - a. Framework vertically made of MS Square Pipe frame: 2 Inches X 2 Inches, 16 Gauge
  - b. M S Fencing with wire mesh: ½ inch X ½ inch
  - c. Supporting Structure M S Angle: 50 X 5mm
  - d. GI pre-coated corrugated profile roof sheet: 0.5mm thick duly supported with J Hook.
  - e. 10 SWG with provision of door with lock and key AHU Shed with fencing should be duly enamel painted and with anti-rust coating from both sides. The height covered shall be at least 8 feet. There should be no gap between roof sheet and wire mesh, if any angle creates gap, it should be covered with iron bars and wire mesh in between.

### 3. Electricals:

- i. The electrical power requirement (power matrix) for the TB Containment laboratory should be calculated and provided by the lab.
- ii. Supply should be three phase supply with proper earthing and required 440 V capacity to support the functioning of AHU Unit.
- iii. **Earthing:** If earthing is not adequate, the vendor will do the necessary grounding work to ensure entire TB C&DST Lab has adequate earthing.
- iv. All the required electrical panels, cabling, switchgears, surge and spike protection system and arrangements, etc. for the purpose of energizing the TB Containment Laboratory facility shall be carried out by the contractor.
- v. All the electrical fittings and fixtures in the laboratories areas on the walls shall be sealed (all conduits, outlets shall be sealed with silicon sealant), leak proof and capable to withstand chemical exposures during fumigation.
- vi. Lighting should be on ceiling and surface mounted, LED of reputable manufacturer, suitable capacity (~18W) and arranged as per the layout provided. Light fixtures inside shall be with gasket or otherwise sealed with silicon.
- vii. The electrical power distribution scheme shall be provided to provide back-up power supply to the critical components and equipment through a UPS (to prevent any disruption of work) and through Diesel power generator set for the entire lab.
- viii. Every workbench should have at least one socket which received electrical input through UPS of TB Containment lab. Extractor fans of BSC' ducting should also receive electrical input through this online UPS of the TB Containment Lab.
- ix. Power sockets with lid (15-20 in each room) should be provided for equipment (as per the layout provided). Modular type, power sockets with lid of 5A/15A are to be provided at various locations on the wall as per discretion and strategic arrangements /provisions for lab equipment. The Sockets meant for UPS should be screen printed as

(UPS) for ease of operation and identification marked wires and cables used shall be copper wire of standard make (ISI Marked) and manufacturer.

x. AHU Controlpanel:

- Cabling from the panel to individual AHUs and control wiring will be in the scope of HVAC contractor. However cabling up to the electrical panel will be provided by site. Termination will be done by HVAC contractor. In case of power failure, the alternate power through Main Diesel Generator Set of the Hospital Supply to be used. The Panel is to be design accordingly.
- Housing of the AHU panel shall be GI 16 gauge powder coated, with cable inlet and outlet going through grommet and with earthing connection arrangement.
- Multi-function meter displaying voltage, load and power factor for electricity supply to AHU panel should be present.
- LED indicator for ON/OFF will be provided for RBY phase, AHU supply, AHU exhaust, Standby exhaust, Condensation unit, Heating Coil of Supply Unit
- DOL Starter Switch to be provided for AHU exhaust, AHU Supply and Condensation Unit (in the order)
- All electrical equipment used should be high quality of reputed manufacturers like VFD may be Allen Bradley, Siemens make or equivalent, MCCB may be of Havells, Legrant, Anchor, Siemens, L&T or equivalent, wiring of Havells, Polycab or equivalent make, etc.
- Control panel should show simple instructions for starting the AHU
- Diagrams of electric circuit should be displayed on the backside of door of panel.
- Control panel should have its lock and key (for controlled access)
- SOP for lab condition for operating VFD with selector switch for manual operation of AHU

- xi. MCCB panel suggesting supply and safety mechanism for different sections of the lab should be provided at adequate place near AHU control panel.

4. **Fire Safety:** Fire detection and alarm system (FDA System) and fire extinguishers of Type ABC (4 Kg) with inert gas system shall be provided at strategic locations (TB Containment Room, Ante Room and outside at entrance of TB Containment Lab and near control panel, near AHU and should overall comply with fire safety guidelines). Training will be provided for its operation.

5. **Emergency Preparedness:**

- i. One emergency shower and one eye wash station for each site shall be provided at strategic location in compliance with ANSI / ISEA Z358.1. The water supply for emergency shower shall be sufficient to supply at least 3 GPM for 10 minutes. Shower shall be hands free and stay open valve type. The water supply for eye wash shall be sufficient to supply 0.4 GPM (1.5 litres) for 10 minutes in low velocity flow.
- ii. Emergency Exit door with panic latch door from the TB Containment Laboratory shall be provided wherever mentioned for personnel exit in case of an emergency and can also be used for equipment placement inside lab. Door should be equipped with hooter/audible alarm every time it is opened.

- iii. **UNINTERRUPTED POWER SUPPLY SYSTEM (UPS):** A central UPS console shall be provided to cater to the extreme essential power requirement of the laboratory. All critical components like lights, Door Interlocks, exhaust blowers of BSCs, Fire alarm sensor, CCTV camera & monitoring shall be provided with uninterrupted power supply for 30minutes.
- iv. Fire and electrical safety is described in the relevant sections.

#### **6. Interiors of the TB Containment Lab:**

- i. **Modular walls:** The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant especially to Hypochlorite cleaning and suitable to withstand chemical use during decontamination/ fumigation. Modular wall should be made for Clean Room application, pre-engineered 60 mm thick PUF panels with GPSP Sheets with PUF insulation of minimum 38-40 kg/m<sup>3</sup>. Both surfaces should be 0.8 mm thick GPSP sheet and has to be installed along the outer walls, partitions and false ceiling to create an impervious shell which is fully sealed. The panels on either side will be coated with Epoxy painted. These panels must have good aesthetic appeal as well and have to be easily maintainable. The height of wall shall be minimum 9 feet (to accommodate BSC with its thimble and damper).
- ii. **Modular false ceiling:** The internal building finishes shall be monolithic, impervious, non-particle shredding, chemical resistant especially to Hypochlorite cleaning and suitable to withstand chemical use during decontamination/ fumigation. Modular false ceiling panels should be made for Clean Room application, pre-engineered 60 mm thick PUF panels with GPSP Sheets with PUF insulation of minimum 38-40 kg/m<sup>3</sup>. Both surfaces should be 0.8 mm thick GPSP sheet and has to be installed along the ceiling, to create an impervious shell which is fully sealed. The panels on inner side will be coated with Epoxy painted and powder coated on outer side. These panels must have good aesthetic appeal as well and have to be easily maintainable. The construction of false ceiling shall be strong to allow 1 person weighing 50-60 kg to easily walk/crawl above it for necessary work. Service window will be provided for access above false ceiling preferably outside TB containment lab.
- iii. **Flooring** shall be of 5 mm (3 mm + 2mm) of self-levelling industrial epoxy including screed compound for adhesion, 3 mm semisolid cladding of EPOXY will be applied over a uniform cemented flooring and 2 mm semi-liquid epoxy over 3 mm hardened surface with bubble free perfect smooth finishing completed in three steps: Cementing (Uniform Flooring), Hardening (3 mm epoxy) and smoothening (2mm epoxy). Epoxy used for this application will be self-levelling and clean room compatible. Flooring outside the TB Containment facility where required for aesthetic purpose will be covered with vinyl flooring.
- iv. **Doors:**
  - 1. Flush Door finishes shall be 45mm thick with chemical resistant, anti-fungal and anti-bacterial properties. 1.2mm thick GPSP sheet suitable to fix on 60 mm thick wall panel with provisions for double glazing glass for all door and hardware like push plates and handle on both side, lock and key, etc. PUF Panels will be with GPSP Sheets, epoxy painted on both sides and PUF insulation of minimum 38-40 kg/m<sup>3</sup>. Concealed hardware for fixing of door frames, TS-71 door closure, SS hinges, SS Door handle, SS ball bearing butt hinges, concealed tower bolt for the

- double door, both sides lock and key arrangement. Suitable neoprene “Y seal” type gaskets may be used between the door jam and doorstep.
2. Door interlocking systems shall be complete with controller module, push button stations with LED indication, electromagnetic locks. To take care of malfunctioning of interlocking, alternative electrical switch to manually open the doors should be provided.
  3. Vision Glass for doors shall be fixed type vacuumised and insulated type with 6 mm toughened glass and shall be installed for natural lightening flushed with surfaces of the door. Fixed flush to both faces of the door / wall panels to provide ease of cleaning and maintenance. No crevices / joints / sloped profiles are used for fixing the glass. This will avoid particle contamination and dust accumulation.
- v. Covings: Extruded aluminium anodized R75 clip-on type (Male & Female connectors) covings for entire wall to floor, wall to wall & wall to ceiling joints. Extruded aluminium double cove integrated with top track of the partition panels. Corner internal & external cove joining pieces in aluminium anodized finish. Having similar construction and finish as the walls and properly sealed with silicon sealant with wall & ceiling. Covings used in construction shall include Wall to Wall Coving -R-75, Wall to Ceiling Coving-R-75, 90° Corner, 3-D Corner, 2-D Corner
  - vi. All penetrations through walls, ceiling & floors will be sealed using a suitable caulking. Caulking shall be applied around pipes and conduit. The interior of electrical and cable conduit shall also be caulked.
  - vii. **Pass Box**: Pass Box (Static type) shall be provided at strategic / required locations for transfer of samples, chemicals and materials to and from the Laboratories (as indicated in the design submitted). In case of two pass box, one will be to receive the sample within and second will be for sample discard to autoclave room or for disinfected waste collection. It shall be made of SS 304, with inbuilt UVGI system, with interlocking in such a way that both doors cannot be opened simultaneously, panel mounted, with buzzer to indicate open status for any door, fixed at a height of 750 mm from floor in sandwich panel, with dimension of 610 mm (L) X 610 MM (W) X 610 MM (D), with load bearing capacity of 40 Kg, door make-Single door in each side, with glass and air tight gasket, with door latch for one door (door opening outside), with handle of superior quality, with viewing glass made of polycarbonate or 10 mm thick tempered glass, hinges made of SS304, with one LED lamp inside pass box, chemical resistant especially to Hypochlorite solution, alcohol, etc., flange to seal pass-box and sandwich panel, with indicating lamps in both sides to show status. Manual ON/OFF switch for both Fluorescent & UV lamp on both side of the Pass box. A SOP must be developed for pass-box decontamination.

## 7. Furniture inside the lab:

- i. **Laboratory work stations** (numbers as per the Lab design)-Frame shall be made up of SS 304, with nylon cushion/bushing for the legs, non-particle shredding material and shall be chemical resistant to allow chemical disinfection. It should be strong to hold the granite top/workbench as well as equipment places on the workbench. It should be stable and vibration free. There shall be no drawers or safe in the workstation and shall have arrangement for placing the UPS below the workbench.

- ii. **Garment Storage Cabinet-** One garment storage cabinet that can be locked shall be provided in the Change room/Ante Room. It shall be of SS 304 with two compartments and shelves for storage of clean items of suitably large dimension to fit in the Ante/Change Room (size to be consulted with sitei/c)
  - iii. **Coat hangers** 8-10 individual hangers made of SS30, in group of 4-5 each, will be provide to hang gowns/ aprons in Ante Room and change room (in consultation with sitei/c)
  - iv. **Shoe rack** (one)- It should be made of SS 304 with 5 shelves, open type and wide enough to hold two pairs of shoes in each shelf and shall be able to fit in available space as per design.
  - v. **Wash Basin** (one): Modular standalone hand washing sinks made of SS 304 with elbow or foot operated mechanism shall be provided as per design inside lab and in change or ante room. Wall hanging soap dispenser to be provided along with each wash basin unit. A Tissue paper rack with a mechanism to pull out tissue papers, will be provided near the wash basin to dry hands. Water lines that penetrate the TB Containment space shall be equipped with back-flow prevention devices. Outlet pipes should be made of PVC with closure outside lab made of SS plate.
  - vi. **Laboratory Stools**(Six): Laboratory grade hydraulic SS stools with back support, foot rest, rotating type with castor wheels at the base, shall be provided by contractor.
  - vii. **Trolleys:** Two tier trolleys (two quantity) made of SS 304, size 2'x1'6" with side walls to prevent fall of items from sides and wheels at bottom for smooth movement, shall be provided. **Plus**, one similar trolley will be provided for each BSC. One of the trolleys for transportation of material from lab to the Autoclave room shall be provided with a lid to prevent direct exposure of material to outside.
8. **Monitoring Mechanism:** Monitoring of crucial parameters will be made available in the lab for the following:
- i. Visual display of Room Pressure, Relative humidity and temperature in the TB Containment Lab
  - ii. Differential pressure through Magnehelic gauges in Ante-room, Change Room (where available) and outside TB Containment Lab
  - iii. In the Control Panel- Multi-function meter displaying voltage, load and power factor for electricity supply to AHU panel and LED indicator for ON/OFF will be provided for RBY phase, AHU supply, AHU exhaust, Standby exhaust, Condensation unit, Heating Coil of Supply Unit
  - iv. CCTV footage from the various sections in the Microbiologist's room
  - v. Hooter/alarm when the emergency exit door is opened as well as when fire detection system is activated in incidence of fire.
9. **Connectivity:**
- i. LAN wiring for internet access inside the lab with sockets to be provided at strategic locations (near work benches) in TB Containment Room.
  - ii. A suitable EPABX System shall be provided for the laboratory. Telephone instrument with line will be kept in Microbiologist room, Staff room and TB containment room

and any other place as suggested by Site i/c. Telephone with speaker for hands free operation will be provided inside TB Containment Room.

#### 10. SPECIALIZED LABORATORY SUPPORT EQUIPMENTS AND SYSTEMS

- i. **Split AC for MGIT:** Two wall mounted split air conditioners (of suitable tonnage according to the area of the TB Containment Lab) should be installed near to MGIT. These will be inverter ACs (minimum three star) of Hitachi/ Bluestar/ Carrier/ Lloyd/ Godrej or equivalent OEM with suitable voltage stabilizer. The outdoor unit will be suitably placed outside the lab with easy access and adequate protection from theft. Drainage pipe of ACs will be adequately long and connected into the drainage system of the institute. Both the Split ACs should be connected with alternator (Timer Control cut-off and start) for changeover every 4 hours between them so that load is distributed between both the ACs. These will be used at the end of the day when main HVAC system is not operating to provide ambient temperature for MGIT.
- ii. **Biological Safety Cabinets:** Biological Safety Cabinets (BSC) will be installed, commissioned and validated inside the TB Containment Lab at the required location as per the plan. BSCs should be placed away from doors, air supply vents or other things which may disrupt the cabinet airflow. The Biological Safety Cabinets that are being procured shall be Class II A2 type. Lab upgradation agency shall coordinate/liase with BSC Manufacturer for installation, ducting, commissioning and calibration of BSC if under warranty or newly supplied (else it shall be done by vendor). The exhaust from the Biological Safety Cabinets shall be thimble connected and individually ducted out. The external extraction fan installed at the end of the ducting should exceed the volumetric flow rate of each BSC by 30–50%, and should be controllable, provided with easily accessible dampers and connected to an uninterrupted power supply. The air from the BSC should be ducted with ventilation pipes that have a diameter exceed 20 cm. **(The exhaust from the Biological Safety Cabinets shall be thimble connected and individually ducted out. The ducting material & External blower of adequate capacity for BSC ducting should be provided by Identified Agency.)**
- iii. **CCTV Monitoring Devices:** Camera to continuously monitor the activities inside and outside the TB Containment Lab by providing Central CCTV Monitor. 10 Camera unit should be installed (Supply, installation, testing and commissioning of the following shall be done in coordination with the site:
  - Color Camera 1/3" CCD, IR type, dome shaped, 480 TV lines resolution which work in lowlight.
  - 16 Channel standalone / Network version DVR Make: DAHUA / equivalent reputed OEM
  - Hard Disk with 1 TB (TERA byte) Capacity -Make -Seagate or equivalent reputed OEM
  - 16 Channel Power Supply of reputed Make
  - Supply Laying of Co-axial Cable with necessary Accessories
  - Wall mounted monitor (at least 32-inch LED/LCD) located in Microbiologist room or as suggested by site i/c.

#### 11. Civil works and Plumbing:

- i. Ensure water proofing of the roof (if required) is done prior to carrying out the work. Leveling the floor where required will be carried out the vendor. Civil works to create new door arrangement/ closure of exiting openings, sealing of the existing windows, etc. will be carried out by the vendor.
- ii. Drain: All the liquid drain coming out from the laboratory shall be connected to a single drain with back flow prevention, which would be further connected to existing local ETP plant in the hospital campus if available. All drains shall be equipped with "p traps". Penetrations made in walls and floors must be properly sealed.
- iii. Water connections for the emergency shower and eye wash and wash basins to be appropriately provided.
- iv. Ensure that pipes and connections are leak proof to avoid flooding behind modular walls.

**12. Labelling to be done as per following details:**

- i. Biohazard label should be placed outside the laboratory.
- ii. Labels for all switches (to be provided) including in the MCCB panels, LT Panel and AHU Control panel
- iii. Labelling of the TB Containment Lab and Ante Room/ Change room including Emergency exit.
- iv. TB Containment laboratory layout should be provided at the entrance of Lab

**13. Final performance and capacity testing and validation:** All the certification and validation parameters for TB Containment Lab must be done in accordance in with NIH certification requirement. BSCs will be validated and calibrated as per NSF 49 and EN 12469 standards.

- i. There will be periodic mid-term assessment of the project (after plumbing, electrical works, ducting and AHU installation, construction of interiors and dry run) by identified technical people and Site i/c to assess the timely and proper execution of the project.
- ii. After completion of the construction and installations, the entire laboratory facility, all the equipment, systems and services shall be validated by the contractor under supervision of a committee of the consultants / client or lab i/c as follows:
  - i. For Bio Safety Cabinet:
    - o Validation of BSC: Particle count test, PAO (Filter Integrity test for pre-filters, filters ULPA filter/ HEPA filters), Air in-flow velocity and down-flow velocity test as per NSF 49 and EN 12469 standards with devices traceable to National/International Standards, UV and Fluorescent light intensity
    - o Maintenance of the BSC to be carried out if existing one to be used (and not covered under warranty) i.e. complete and thorough cleaning of working Area of cabinet, cleaning of exhaust filter from the top to eliminate and external clogging or disturbance and inspection of ducting, cleaning and oiling of sliding sash movement system, checking of switches, tube lights and UV light fittings, checking of airflow and exhaust system, calibration and validation of Magnehelic Gauges if existing, etc.
  - ii. For TB Containment Lab- The installation as a whole shall be balanced, tested and validated upon completion, and all relevant information, including the following shall be submitted to the Institution

- Pressure in each room/zone as per the design, differential pressure readings including across filters.
  - Air inflow velocity and outflow velocity test across all inlets and outlets to measure/derive air change rate per hour (minimum 6-12 ACH) and as per design
  - Smoke pattern test for directional airflow should be performed during validation including for Passbox.
  - Temperature shall be maintained at  $22^{\circ}\text{C} \pm 2$  and humidity level should be maintained at  $60 \pm 10\%$
  - HEPA Filter (in BIBO) integrity test based on PAO test and manufacturer's certifications
  - Electrical current readings, in amperes on full load work, average running, and on starting, Testing of power cabling, earthing, AHU control panel, MCCB panel and LT panels
  - Containment room -the walls, floors, ceilings, penetrations, and other containment barrier features have adequate integrity
  - Operational performance testing for
    - HVAC including Blower motors in the Supply, exhaust including emergency, extractor of BSC ducting and condensation unit
    - Ducting for any potential leakages and insulation breakage
    - Dampers including variable control, leak proof and fire control (only verification)
    - Magnehelic Gauges
    - Temperature control sensors; pressure control sensors,
    - Passbox
    - Split ACs
    - Fire Detection system
    - EPABX System
    - Access Control System
    - CCTV System
    - UPS Back up system
    - Emergency Shower and eye wash station
    - Interlocking of supply blower motor and exhaust blower motor
- iii. Prior to validation, the contractor shall prepare and submit a detailed 'Validation Document' for approval.
- i. The Validation Document shall provide the detailed procedure for validation, parameters for validation, validation schemes and formats for recording the validation details.
  - ii. The contractor shall arrange to do a mandatory third party validation
  - iii. The contractor shall arrange for all the instruments, tools, manpower etc. required for the validation. The validation results shall be recorded and documented and shared with the site and hiring/funding agency.
- iv. The above validation tests shall be performed Annually during the warranty as well as maintenance period

In addition to the above validation tests, preventive maintenance servicing of all installations, operational performance testing as listed above shall be carried out on a quarterly basis during the maintenance as well as defects liability period.

**14. Maintenance Services:** After the completion of defect liability or warranty period of two years, it will be appropriate to have a longer-term maintenance of the upgraded lab for a period of at least three years through the same agency who upgraded the lab. Apart from annual validation and quarterly preventive maintenance servicing as described above, it should include attending breakdown maintenance calls as and when required, repair/replacement of compressors, refrigerant gas charging of condensing units, besides replacement of spares required (due to wear and tear) at pre-fixed rates.

**15. Training of personnel:** Institution personnel to be trained over 2 days for:

- i. Operation of HVAC Plant and all other equipment and systems.
- ii. Adjustments of settings for controls and protective devices
- iii. Servicing and Preventive maintenance
- iv. Emergency response training.

**16. Submission of specialized systems and services layout schemes prior to initiation of the work:**

Conceptual layout plans and schematic drawings of various specialized services and utilities showing tentative locations of equipment and furniture such as to be submitted before initiating work at site for approval to hiring/funding agency and site i/c

- a. HVAC system (including Air filtration system Drawing of Supply AHU, Drawing of Exhaust AHU, Ducting drawing)
- b. Pressure control system including differential pressure zones
- c. Fire Detection and Alarm system
- d. Air distribution System including ACH ((Heat load calculation & Design Data)
- e. Electrical distribution system (including Single Line Diagram with UPS system)
- f. Monitoring system including CCTV and three important parameter monitoring (pressure, temp and humidity)
- g. Water supply and drainage system
- h. AHU Control Panel System with VFD controls and SOP for lab condition for operating VFD with selector switch for manual operation of AHU
- i. Chart for defining the AHU fan and its speed for air quantity being delivered by supply and exhaust blower at different speed
- j. Un-interrupted Power Supply system
- k. Specialized laboratory support equipment/ primary containment barriers such as
  - o Passboxes
  - o Entry exit protocols

**17. Documents for final submission: The following documents are required to be submitted after Final assessment and validation of TB Containment Lab for verification and approval to hiring/funding agency and to the lab within 15 days of completion of successful validation.**

- i. The drawings and layout of each final commissioned TB Containment laboratory should be shared with site and hiring/funding agency (both in soft and hard copy) for verification.

- ii. All Test Certificates / Maintenance manuals / As Built drawings / Spare Part List should be submitted to site and hiring/funding agency after validation within one week.
- iii. Detailed document on Laboratory Validation Procedures and to include as per table;

|   |
|---|
| <b>Submission of validation documents as per followings.</b>                      |
| Design Qualification  |
| Installation Qualification  |
| Performance Qualification   |
| Operational Qualification   |
| All Test Certificates / Maintenance manuals/ As Built drawings / Spare Part List. |

#### **18. DOCUMENTS TO BE SUBMITTED BY THE BIDDER ALONG WITH THEIR BIDS FOR TECHNICAL QUALIFICATION AND EVALUATION**

Project Implementation Methodology including

- i. Past experiences of developing labs including TB Containment labs (with contact details of at least 5 such)
- ii. Team (members and their qualifications) which will be building the TB Lab (including designing, HVAC and ducting team, electrical, plumbing, civil work team, interiors developing team, etc.)
- iii. List of Construction Material and Equipment Proposed for construction of the laboratory along with specifications including manufacturers (OEM) along with warranty period (as specified by Manufacturer) should be clearly mentioned and submitted as per table (**FORM Tech 9**) given above for the quoted labs. Any additional material proposed for construction by bidder may also be specified in the same table.
- iv. GANTT Chart informing timelines for executing the various stages of work

**Associated additional civil work with TB Containment Lab Please refer to lab layouts for clarity on below requirements:**

- a) Extension of Existing room by dimension of (13' L x 6' W x 9'7" H) in proposed TB Containment Lab room with sliding grill door to enter extension room. Extension should be constructed with brick and cement wall. Floor level should be levelled up to existing floor level of proposed TB containment Labroom.
- b) Permanent closing of existing entrance door into proposed TB containment lab with brick and mortar.
- c) Existing window in front of existing entrance door should be converted into door (size 3' Wx 6'8" H) for proposed entry from Ante room to proposed TB containment lab.
- d) Another existing window nearby wash basin should be converted into view panel (size 2' x 2') and remaining portion should be permanently closed with brick and mortar.
- e) Existing window of wall towards passage should be converted to emergency exit door (size 4' W x 6'8" H) towards passage area.
- f) Chemical seepage treatment for the whole ceiling.
- g) Provision of emergency eye wash and shower station in passage area, adjoining emergency exit door as proposed in the layout.
- h) Existing nonfunctional water storage area to be removed completely.
- i) Creation of door (size 3' W x 6'8" H) from existing window between Autoclave room no 12 and Sample Processing room 13.
- j) Flooring of passage area should be made of kota stone/vitrified tile material. Floor levelling should be done at existing floor level of proposed TB culture lab as shown in the layout.
- k) Provision of roof shed in entire passage area as shown in the layout.
- l) Removal of existing electrical fixtures, ceiling fans from inside the room.
- m) Platform creation for HVAC outdoor unit (size 20' X 15') adjacent to Existing platform for Genset as shown in the proposed layout.
- n) New door replacement for existing old wooden door for BMW as shown in the layout.
- o) Water supply and drainage line required for various sections to connect with existing sources. Existing visible drainage lines should be concealed with concrete block for maintenance purpose.

**General Work Requirement for Sites:**

- Batteries of UPS should be provided with rack. UPSs with batteries should be installed and well-arranged/organized well giving aesthetic look
- Dedicated earthing to be done for TB Containment Lab

**Detailed Scope of work:**

- Surface dressing of the ground including removing of vegetation and in equalities not exceeding 15 in deep in all kind of soil.
- Demolish of brick masonry in the identified area and disposal of materials to a suitable area.
- Earth work in excavation by mechanical means (hydraulic excavator) in foundation area.
- Providing and laying in positions cement concrete in the identified area as per layout.
- Centering and shuttering including strutting, propping etc and removal of disposal materials.
- Providing and laying in position specified of reinforce M 20 grade cement concrete with 20 mm nominal good.
- Providing and laying in position specified of reinforce M 20 grade cement concrete with 20 mm nominal good in beams and pillar structure as applicable.
- Reinforcement for RCC work including straightening, cutting, and bending placing in position and binding etc.

- Brick work for the identified area as applicable and as per layout.
- 15 mm cement plaster on the rough side of brick walls.
- Structural steel work including welding, cutting and placement as required work for construction of shade including provide and fixing of iron profile sheet, bolt etc.
- Grading and waterproof treatment of roof.
- Supplying and filling in plinth with hard moorum and concrete cement with vitrified tiles for uniform tile flooring.
- Providing and fixing of false ceiling at acceptable height as applicable and as per layout.
- Providing and fixing of MS door assembly with framework.

### Technical Specifications of Required Equipment – General Requirements

1. **Pre-requisite for equipment installation:** The pre-requisites for installation of equipment should be clearly defined in the technical proposal by bidder and the cost for pre-requisite for installation should be borne by bidder. Before proceeding for installation, bidder to confirm that pre-requisite for installation are completed onsite
2. **Installation of Equipment:** Selected/Awarded bidder has to install the delivered equipment by certified or qualified personnel. Bidder to perform IQ, OQ and PQ for equipment as per Manufacturer Protocols. Bidder to provide user training to end user during installation.
3. **Service/Maintenance:** The supplier shall have a functioning after-sale-service in India covering the whole country, including adequate infrastructure, competent and adequately staffed technical personnel with adequately provisioned spare part store allowing responding to any complaints and to repair within 7 days/replace the unit within 14 days of receipt of complaint.
4. **Comprehensive Warranty Period & CMC Services:**

|                                       |  |
|---------------------------------------|--|
| <b>Equipment Name</b>                 | <b>Biological Safety Cabinet Class IIA2 with thimble / canopy connection and with UPS, Vortex Mixer, Electric Micro incinerator, pH meter, Autoclaves (vertical), Refrigerator 165-200 lit– Refrigerator 300-450 lit, Analytical Balance</b>   |
| Comprehensive Warranty Period         | 2 years, Warranty period starts from successful installation and validation at site  |
| Services under Comprehensive Warranty | <ul style="list-style-type: none"> <li>• Besides activities mentioned in Comprehensive Maintenance Services it includes replacements of part, consumables etc. during the warranty period</li> <li>• Calibration /Validation to be done annually during three year of warranty period for parameters [Air velocity, Particle count test, Filter integrity (PAO) with traceable to National (NABL) /International Standards and if any other test specified by manufacturer. All the test to be perform as per manufacturer's Instructions/protocol.</li> </ul>   |
| Comprehensive Maintenance services    | <p>It includes following during warranty and CMC Period:</p> <ul style="list-style-type: none"> <li>• Breakdown calls to be attended as and when required</li> <li>• Preventive Maintenance to be carried out annually</li> <li>• Annual Validation to be carried out</li> <li>• Validation should be done for BSC;               <ol style="list-style-type: none"> <li>1. At initial installation: on site, prior to initial use</li> <li>2. Annually in warranty period</li> <li>3. After replacing filter/blower or any major repair/replacement work</li> <li>4. After moving the cabinet</li> </ol> </li> <li>• The bidder should submit price list of parts / consumables (as Applicable), which are not covered under standard definition of CMC.</li> </ul> |
| CMC Period:                           | 3 years after comprehensive warranty period  |

5. **Equipment Manual:** Installation, Operator, Maintenance/Service manuals in English should be provided with each equipment.
6. **Spare part list:** Bidder to submit the spare part list including the cost for quoted equipment

- 7. Accessories list:** Bidders to submit the accessories list including the cost for quoted equipment
- 8. Factory Calibrated Certificate:** Equipment must be supplied with valid calibration certificate stating that the equipment has been calibrated at factory.
- 9. Packing data**

Packing data are not necessarily part of the bidding process but are needed for shipment and for customs declarations.

  - Net weight.
  - Gross weight.
  - Dimensions (W × H × D) in cm.
  - Appliances must be transported upright (Y/N).
  - Customer's tariff number.
- 10.** The design and workmanship of equipment offered, including power supply, has to be suited to operate properly and continuously under the climatic conditions in India, especially humidity (e.g. <90% at 35°C), permissible ambient temperature (e.g. +5°C to +45° C), protection against fungi, and possible spikes in the electric network.
- 11.** ISO 9001: The manufacturer must have Manufacturer System Certified to ISO 9001.
- 12.** Safety standards: The equipment must comply with ISI certification as per BIS Standards or any equivalent international safety standards such as IEC- 61010 and IEC-60601 etc.

### Technical Specifications – Specific Requirements

#### 1. Biological Safety Cabinet Class 2A with thimble ducting and with UPS

**Description of function:** The class II BSC is used in a TB laboratory for processing specimens consisting of liquefaction of sputa and handling cultures of tubercle bacilli. This type of BSC is not adequate for handling volatile or toxic chemicals or radionuclides.

Before ordering a BSC, facility and engineering requirements to be checked.

Organization of a periodical recertification of the BSC by an authorized agency to be in place.

#### **Main specifications**

- The BSC to meet the requirements of class IIA2 NSF 49 or class II EN 12469; specifically, with regard to inward airflow ( $\geq 0.40$  m/s according to EN 12469:2000 or  $\geq 0.50$  m/s according to NSF 49:2004)
- External height  $\leq 2200$  mm including support stand, allowing an available space of at least 400 mm from the top of the BSC to the ceiling. Higher versions may be accepted, provided the 400 mm over the BSC is available to measure air velocity above the exhaust filter, and to have enough space for changing the filter and for ducting and/ or a thimble connection to outlet.

#### **Internal working area (approximate):**

- For a BSC of 120 cm (4 ft): width 1150 mm  $\times$  depth 630 mm  $\times$  height 650–750 mm.
- A BSC of 120 cm (4 ft) provides the minimal space needed for safe work.
- Inside finish: stainless steel, high quality (e.g. grade 304).
- External housing, including screws, made of stainless steel or equivalent resistant galvanized (zinc-coated) sheet steel, subsequently powder coated and thermally hardened; minimum 80  $\mu$ m thick, or other material that is hard-wearing, resistant to disinfectants and chemicals used in a TB laboratory, and abrasion resistant.
- Vertically adjustable sliding window: aerosol-tight, sliding, safety glass (laminated multilayer safety glass only), thickness  $\geq 6.7$  mm, counterbalanced.
- High optical transmission, but absorption of UV light; minimal reflection.
- Working aperture:  $\geq 170$  mm measured from work surface to the bottom of the sash window.
- Maximal lifting height of front window: 500 mm.
- Ability to lock the window hermetically for gaseous disinfection for filter decontamination.
- Single-piece working surface with integrated (V-shaped) front air grill.
- Alternative: Working surface as segments.
- Noise pressure level:  $\leq 60$  dbA.

#### **Internal fittings**

Two plugs, 230  $\pm$  10 V, AC, 50 Hz, protected with separate T5A (slow blow) fuse.

Voltage and plugs adapted to those used in the country. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

**Warning:** Plugs inside the BSC may differ from the main connection to the electricity network.

Flicker-free, low-glare, warm-coloured light, >1000 lux.

Control display on the front of the BSC.

- Electrical control or indicators.
- Electronic fan control.
- Flow meter for air inflow velocity.
- Flow indicator or meter for air down flow velocity.
- Operating hours indicator (counter).
- Optional: UV light timer.
- Filter and flow conditions.

**Optional:** ultraviolet C (UVC) light (253.7 nm wavelength); 30 W with hour counter; with interlock with white light so that the UVC light can be switched on only when the white light source is switched off.

**Optional:** (if a safety gas burner will be used): Gas tap with solenoid valve, optional right or left side.

For a laboratory located in a seismic area, gas pipes are not recommended; small gas containers (approximately 200–400 ml) with butane gas directly fixed to the burner to be used instead.

Not necessary when a micro-incinerator is used.

Pre filter construction preferred; easily accessible, filter change without tools preferred.

High-efficiency particulate air (HEPA) filter (exhaust air filter); classification at least H14; conforming with EN 1822; metal framed.

Air down flow velocity:

- NSF 49–2002: Requires compliance with the manufacturer's set points, or down flow velocity with a deviation of <0.025 m/s from a nominal set point.
- EN 12469: Airflow velocity should be between 0.25 and 0.50 m/s and is defined by the manufacturer according to the construction. Additionally, no individual measurement should differ by more than 20% of the value requested by the manufacturer within the limits given.

Air circulation volume flow (Modify according to the BSC dimensions):

- For a BSC of 120 cm (4 ft): 700–1200 m<sup>3</sup>/h.

Influx air velocity:

- According to NSF 49, the average airflow velocity at front aperture should be 0.51 m/s for class A2.
- EN 12469 does not sub classify within class II BSC. The average airflow velocity at front aperture should be at least 0.4 m/s, according to the manufacturer's specifications.

Exhaust volume airflow/fresh airflow inward:

- For a BSC of 120 cm (4 ft): 300–600 m<sup>3</sup>/h.

Blower system to be able to maintain the airflow within a minimum window (narrow limits) on voltage fluctuations. Data to be available on request.

Alarms, visible and/or audible, for any unsafe condition of the BSC (e.g. airflow, window position, hardware or software errors). Possibility to shut down alarm for cleaning and maintenance.

### **Electricity requirements**

**Supply voltage:** 230 ± 10 V, AC, 50/60 Hz.

Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

Lead fuse T16A (slow blow) or circuit breaker B16. The electrical regulations valid in the country of use as well as the relevant connection conditions are required.

**Power consumption** (approximate): Modify according to the BSC dimensions

- For a BSC of 120 cm (4 ft): 600 W.

Power consumption for plugs inside: Approximately 1000 W. Note: In areas with frequent breakdown of electricity supply, BSCs with low energy consumption can be an advantage; a UPS with lower capacity can be used.

Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.

Protection class (in accordance with EN 60529).

Designed not to interfere with circuit radio (in accordance with EN 55014).

### **Documentation**

#### **Manufacturer's certificate**

The manufacturer must have a management system certified to ISO 9001.

The manufacturer to individually test each BSC before shipment. The test report to be provided to the customer, with a duplicate fixed to the BSC. The tests to be performed with research-grade instruments for valid calibration according to test methods outlined in EN 12469 or NSF 49.

The test report to contain at least data on:

- inflow air velocity
- downflow air velocity
- filter leak scan for both filters to document filters' efficiency and integrity.

**Quality and safety standards** met by the product to be listed.

### **Accessories**

**Table or support frame** (support stand) for a working height of 78 ± 2 cm, adjustable at least at three points (feet) to level.

**A telescopic support stand** is advisable for a flexible use.

**Ergonomic laboratory chair**, designed for infectious laboratory areas:

- adjustable height to suit different users, seat range approximately 400–490 mm
- adjustable-angle back rest (no arm rest)
- caster wheels (five)
- all metal parts chrome plated
- disinfectable with alcohol-containing disinfectants.

**Thimble Ducting:** Air duct construction with thimble to exhaust air from the BSC. The air duct to be made for the BSC offered and fit precisely. A thimble connection (see WHO TB Biosafety guidelines 2012 page 33) is used with Class II type A2 BSC that is ducted to the outside. The thimble fits over the cabinet's exhaust housing, sucking the air expelled from the cabinet into ducts that lead outside. A small opening (usually 5 cm wide) is maintained between the thimble and the cabinet's exhaust housing. This opening enables room air to be drawn into the exhaust ducting system. The thimble must be removable or be designed to allow for operational testing of the cabinet. The power of the external extraction fan installed at the end of the ducting should exceed the volumetric flow rate of each BSC by 30–50%, and should be controllable and connected to an uninterrupted power supply. The air from the BSC should be ducted with ventilation pipes that have a diameter exceed 20 cm. The extractor fan assembly must be easily accessible and preferably kept at the end of ducting with stable fitting. Ducting design should be straight and number of bands should be minimal, bend should be round shaped (sharp/ square bends should not be used). Ducting should have adjustable balancing dampers with easily accessibility so that flow can be controlled as and when required.

All standard accessories, consumables and parts required for the proper installation, operation and maintenance of the BSC to be included in the offer by the supplier and to be specified and quantified.

## **Operation, maintenance and installation**

### **Operation and maintenance manual**

At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the BSC.

### **Installation and maintenance**

- The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
- The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
- The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or

replace the BSC within 14 days.

- Initial on-site testing (aerosol leak test, recirculating air filter, exhaust air filter, airflow measurements inside the BSC and inward/exhaust airflow) to be carried out by a certified expert and certified compliant for satisfactory installation and safe operation. Measurement results to be printed out for documentation in the maintenance record.

**Warranty** starts with certification on site.

#### **Standard maintenance tools**

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning equipment, to be included in the offer.

Bidders to specify the quantity of every item included in their offer (including items not specified above). If special tools are needed (e.g. to change filters), they must be provided.

#### **Spare parts**

- Each assembled BSC to be accompanied by an authorized list of accessories and spare parts.
- At least one, and preferably two, additional sets of HEPA filters as specified above.

**Warning:** Special clamps may be needed to fix HEPA filter.

#### **Remarks**

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose products additional to the requirements listed above.

#### **Uninterrupted power supply with battery pack for BSC**

**Description of function and use:** The UPS must be used in any settings that have frequent problems in the electricity network (e.g. surges, sags, spikes and blackouts) to assure and back up the function of the BSC, so that any current work can be finalized and all potentially infectious sources closed. If the BSC is connected to a generator, the UPS will maintain the function of the BSC during the time needed for the generator to start and to provide full power.

#### **Main specifications**

- UPS: microprocessor controlled, online continuous transducer, 20 minutes.
- Booster function to regulate up voltage breakdown to 170 V.
- Buck function to regulate down voltage increase up to 280 V.
- Filter to protect against voltage spikes.
- Protection against overload and short circuit.
- Advanced battery check for automated periodic battery inspection.
- Indicators for status (e.g. normal function, net down, working on battery, loading battery, battery capacity).
- Sleep mode if item consuming power is shut off.

- Power: 230 V  $\pm$  25%, 50 Hz or 60 Hz ( $\pm$  10%) with automatic recognition.
- Battery: maintenance-free, automatic shut-off before reaching the level of discharge from which recharging to the original capacity will no longer be possible.
- Time for recharging: approximately 4 hours to reach at least 90% of total capacity.
- Outlet voltage: 230 V  $\pm$  3%, 50 or 60 Hz  $\pm$  0.5% (if the country's standard voltage is 110 V AC, adjustment will be needed).
- Efficiency coefficient: approximately 98%, on battery >85%.
- Noise at 1 m distance <48 dBA.
- Permissible ambient temperature and relative humidity: 0–40 °C and 95% (not condensing).

### **Electricity requirements**

**Supply voltage:** 230  $\pm$  10 V, AC, 50/60 Hz.

Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

**Power consumption:** Approximately 1500 W (may change depending on requirement for the model chosen as well as the extractor fan connected with thimble connection at the outer end).

Protection class (in accordance with EN 60529).

Designed not to interfere with circuit radio (in accordance with EN 55014).

### **Documentation**

#### **Manufacturer's certificate**

The manufacturer must have a management system certified to ISO 9001.

**Quality and safety standards** met by the product to be listed.

#### **Accessories**

- Battery pack.
- Connection (cable and fittings) for battery pack.

### **Operation, maintenance and installation**

#### **Operation and maintenance manual**

At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the UPS.

#### **Installation and maintenance**

- The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.
- The bidder to provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

### **Standard maintenance tools**

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders to specify the quantity of every item included in their offer (including items not specified above).

### **Spare parts**

Each UPS to be accompanied by an authorized list of accessories and spare parts.

## **2 Vortex Mixer:**

**Purpose and use:** The mini-shaker is for use in a BSC

### **Technical Specifications:**

- Adjustable speed: 100 to 3,000 rpm, continuous and intermittent “touch-control” modes,
- 220-230 Volts, AC, 50HZ; The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Cup heads size: 25 mm dia. x 22 mm deep for mixing contents in McCartney bottles.
- Heavy cast-metal base and suction cup to assure stability, prevent “walking”.
- Disinfectable
- Remarks: Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines.

## **3 Electric micro-incinerator:**

**Description of function and use:** The micro-incinerator allows sterilization of metal inoculating loops without a flame and is suited for work in a BSC.

### **Main specifications**

- Heating element of ceramic surrounded by isolating cover.
- Quick infrared heating to temperatures  $\geq 800$  °C for fast sterilization.
- Stand with suction-cup feet (or equivalent) for stable, safe operation.
- Possibility to fix the incinerator to a stand at different angles.
- Electricity requirements: Supply voltage:  $230 \pm 10$  V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- Power consumption: 2000 W.
- Protection class (in accordance with EN 60529).
- Designed not to interfere with circuit radio (in accordance with EN 55014).

**Documentation**

Manufacturer's certificate

- The manufacturer must have a management system ISO 9001.
- Certificates to be provided for each item supplied.
- Quality and safety standards met by the product must be listed.

**Accessories**

Attached loop holder.

**Operation, installation and maintenance**

Operation and maintenance manual: At least one set of operation, maintenance and service manuals, written in United Nations languages (or at least in English) and preferably also in the official national language of the country requesting the micro-incinerator.

Installation and maintenance

The bidder must arrange for the equipment to be installed by certified or qualified personnel; any prerequisites for installation to be communicated to the purchaser in advance, in detail.

The bidder to also provide user training (including how to use and maintain the equipment) and a comprehensive maintenance plan. The cost of the maintenance plan to be defined and guaranteed over the period of warranty.

The supplier to provide an after-sale service that covers the whole country. The service to have competent staff, adequate infrastructure and sufficient spare parts to be able to respond to any complaints and to repair or replace the micro-incinerator within 14 days.

Standard maintenance tools

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning material, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

**Spare parts**

Each micro-incinerator to be accompanied by an authorized list of accessories and spare parts.

**Warranty:** Three years.

**Remarks**

The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose products additional to the requirements listed above.

**4 PH Meter****Technical Specifications:**

- pH range 0-14 with digital display and stand by and calibration mode;
- Bench top with shielded electrode bulb and waterproof housing.

- Temperature compensation should be provided
- calibration with at least three standard calibration buffers (pH 4.0, 7.0, 10.0)
- Resolution: 0.01 pH units.
- Accuracy:  $\pm 0.01$  pH units.
- No. of Display Digits: Three
- Supply voltage:  $230 \pm 10$  V, AC, 50/60 Hz, Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
- The manufacturer must have a management system certified to ISO 9001
- Provision of spare electrode
- A certificate to state that the pH meter has been calibrated at the factory.

### **5. Autoclave (Vertical):**

**Description of function and use:** Autoclaves are used for sterilization of infectious or clean materials.

- For effective sterilization for smaller work load.
- For decontamination of infected material prior to its disposal.
- For faster work in the laboratory.

#### **Main specifications**

- Vertical autoclave, universal basic version for microbiological standard laboratory to sterilize liquids, instruments, glassware, plastic articles or general infectious waste.
- Triple walled construction; chamber, basket, door lid, doorframe, bolts made of corrosion-resistant material and able to prevent stress cracking preferably made of high grade stainless steel sheet of SS-304 grade. Housing with SS legs
- Pressure vessel should be Hydraulic tested at factory with minimum Hydrostatic Pressure: 2.5 kg/cm sq. (35 psi)
- Working Chamber volume: approx. 70 -80 liters.
- Electrically heated by immersion type heaters bearing ISI mark.
- Fast safety lid lock with silicone gasket, it may be radial locking, automatic locking, single lever locking, fly nut assembly mechanism and with heat resistant/safety handle.
- Manual water feed system with water level indicator, pressure gauge, steam release cock, spring loaded safety valve, water inlet and water valves
- Accessories to be supplied include stainless steel basket (where 2 fit in autoclave directly plus two spare total 4), stainless steel wire basket (where 2 fit in autoclave directly plus two spare total 4), Chemical indicator tape for sterilization (2), Biological indicator (100), spare heating elements (two), fuses (10) and silicone gaskets (2).

- Automatic Water Cut-off Device – To protect the heaters from running dry and to ensure that the machine is automatically switched off in case the desired water level falls below the prescribed level
- Working temperature: 121°C, Maximum operating temperature: 134 °C (273 °F).
- Working pressure: 15 PSI, Maximum operating pressure: 2.5 bar or 36 PSI

**Timer with Alarm System** - To regulate the sterilization time of the media to be sterilized with a buzzer, Sterilization timer: 1–99 minutes.

A visual chamber gauge, which easily identifies pressure in the chamber must be accessible to the operator as a backup for reading pressure gauge when no electrical power is available.

**Micro-processor temperature control system** with sensor-with user changeable set temperature and timer option. The microprocessor controls the desired temperature (pressure automatically regulated) by cutting off the current to the heating element automatically & restart the mechanism as required. The control panel to be mounted so that the components sensitive to steam and heat are protected. Large LCD display showing:

- Chamber Temperature
- Sterilization time
- Alarm information.

**Alarm:** audible, with display on dysfunction & after completion of sterilization cycle.

Electrical control box, fitted with toggle switch, indicating Neon lamps for Autoclave ON/OFF status, heater ON/Off status.

Over-temperature and over-pressure protection limiter

**Electrical requirements:** Equipment to work on 230 ± 10 volts single phase, 50 Hz, plug type adopted to local country scenario, Voltage regulator of appropriate rating to be included to cope with 160-260 V. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

**Remarks:** The apparatus should conform to national or international standards with latest amendments covering Markings, Safety requirements with recommendations of safe operations from any reputed firm with ISO 9001:2000 certification.

## **6. Refrigerator 165-200 liter**

### **Technical Specifications:**

Vertical, capacity 165lts or more (up to 200L), frost free, CFC free, single door.

House hold refrigerator. Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines. Supply voltage: 230 ± 10 V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of

acceptable durability, length, and current carrying capacity complying with Indian Standards. Voltage regulator of appropriate rating to be included to cope with 160-260 V.

## **7. Refrigerator 300-450 liter**

### **Technical Specifications:**

Vertical, capacity 300 lts or more (up to 450L), frost free, CFC free, single door.

House hold refrigerator. Equipment quoted should comply with Indian Standards Institutions Guidelines or any other National or International Guidelines. Supply voltage:  $230 \pm 10$  V, AC, 50/60 Hz. Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards. Voltage regulator of appropriate rating to be included to cope with 160-260 V.

## **8. Analytical Balance:**

**Description of function and use:** An analytical balance is needed to prepare media containing drugs, for DST. The balance may also be used to calibrate, recalibrate and maintain microliter pipettes used in the laboratory, especially for molecular biology. Temperature variation and static electricity will cause analytical balances to display erratic readings. Therefore, the balance is to be operated on an antistatic surface, in a room with a constant temperature and a steady relative humidity of >65%.

### **Main specifications**

- Weighing capacity range: 1 mg to at least 200 g.
- Tare range = full capacity by subtraction.
- Stabilization time:  $\leq 5$  seconds.
- Housing resistant to chemicals and cleaning materials.
- Glass doors (not plastic) that close tightly.
- Stainless steel weighing pan, approximately 80 mm diameter.
- Full glass windscreen, able to be opened on both sides and from the top cover.
- Adjustable feet (so the balance can be levelled).
- Waterproof display and keypad, sealed by a durable flexible membrane.
- Background illuminated (backlit) display with digits at least 15 mm high.
- User-friendly menu (preferably in different languages but at least in English) so the balance can be configured to individual requirements.
- Level indicator to be close to the display or in the view field of the display.
- Built-in motorized calibration of weight with automatic adjustment (or calibration using an external standard weight).

- Readability: 0.0001 g (0.1 mg).
- Repeatability: 0.0001 g (0.1 mg).
- Linearity: 0.0002 g (0.2 mg).

### **Electricity requirements**

**Supply voltage:** 230 ± 10 V, AC, 50/60 Hz.

Voltage and plugs to be adapted to meet the country requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.

**Power consumption:** Low.

- Protection class (in accordance with EN 60529)
- Designed not to interfere with circuit radio (in accordance with EN 55014)

### **Documentation**

#### **Manufacturer's certificate**

The manufacturer must have a management system certified to ISO 9001. The manufacturer to provide a declaration of conformity to standards that apply to the product, including ingress protection rating and weight classifications and applications.

One certificate to state that the balance has been calibrated at the factory. Certificates to be provided for each item supplied.

**Quality and safety standards** met by the product must be listed.

#### **Accessories**

- Balance table with vibration bumpers, preferably granite isolator.
- Protective dust cover.
- Optional: Weighing scoop, 90 mm, stainless steel.

### **Operation, installation and maintenance**

#### **Installation and maintenance**

- The bidder must arrange for the equipment to be installed by certified or qualified personnel at the place indicated, free of cost. Detailed installation prerequisites to be communicated to the purchaser in advance, especially for the electric power supply needed, including type of plug (or other way of connection).
- Detailed instruction of laboratory personnel on use, function and maintenance of the equipment (user training), as well as a comprehensive maintenance plan (logbook with daily, weekly, monthly and quarterly maintenance checklist), to be provided.
- The cost of the maintenance plan to be defined and guaranteed over the period of warranty.
- The supplier to provide a functioning after-sale service covering the whole country. The service to have adequate infrastructure, competent staff and sufficient spare parts to be able to respond to any complaints and

to repair or replace the balance within 14 days.

**Standard maintenance tools**

All standard accessories, consumables and parts required to operate the equipment, including all standard tools and cleaning and lubrication materials, to be included in the offer. Bidders must specify the quantity of every item included in their offer (including items not specified above).

**Spare parts**

Each balance to be accompanied by an authorized list of accessories and spare parts.

**Remarks:** The equipment offered, including its power supply, to be designed and constructed to operate properly and continuously in the conditions of the purchaser's country; the equipment may need to tolerate high humidity (as high as 90% at 35 °C), ambient temperatures of 5–40 °C, fungi, and spikes in the electricity supply.

Bidders may propose products additional to the requirements listed above.

**Annexure-  
4 Schedule of Payment**

**Payment Authority: HLL Infra Tech Services Limited**

| Sl. No. | Suggested milestones for TB Containment Lab establishment     | Project activity in brief | Payment Slab | Documents to be submitted for processing the payment   |
|---------|---|---------------------------|--------------|--|
| 1       | Signing of Contract and submission of Performance of Security | None                      | 10%          | <ol style="list-style-type: none"> <li>1. Signed copy of NoA acceptance</li> <li>2. Bank Guarantee towards Performance Security for a value of 5% of contract value initially valid for a period of 30 months</li> <li>3. Bank Guarantee towards Advance Payment for an amount equivalent to 10% of total Contract Price valid till date of handing over of completed Works.</li> <li>4. Original and one copy of supplier's invoice indicating Bill to Consignee (mentioning Consignee GSTN) through M/s HLL Infra Tech Services Limited and Ship to as Place of Supply showing contract number, milestone completed, goods/works description, and amount to be paid</li> </ol> |

| Sl. No. | Suggested milestones for TB Containment Lab establishment   | Project activity in brief   | Payment Slab | Documents to be submitted for processing the payment  |
|---------|---|---|--------------|---|
| 2       | Approval of Inception Report along-with related document & all working drawings<br>Completion of Electrical Cabling, communication network, Plumbing, Minor civil works and confirmation from Technical Representative(s) of Consignee & HITES. | <p><b>Contractor's Introduction visit to site with technical team:</b></p> <p>1) Contractor will give detail work plan along with timelines for the project</p> <p>3) Any support required from Site (Approvals/road permits).</p> <p>3) There requirement from Site (electrical requirement, water lines, drainage line/any other)</p> <p>6) Checklist to be used for Monitoring of Project,</p> <p><b>Electrical, plumbing and minor civil works:</b> Contractor will provide report on completion of electrical, plumbing and minor civil works along with photographs of site as an evidence of completion of electrical cabling, communication network, plumbing, minor civil works etc.</p> | 30%          | <ol style="list-style-type: none"> <li>1. Approved copy of Inception Report &amp; working drawings. Report from Consignee &amp; HITES representative along with photographs &amp; Confirmation visit report from Technical team</li> <li>2. Original and one copy of supplier's invoice indicating Bill to Consignee (mentioning Consignee GSTN) through M/s HLL Infra Tech Services Limited and Ship to as Place of Supply showing contract number, milestone completed, goods/works description, and amount to be paid</li> </ol> |
| 3       | Completion of Ventilation Unit (HVAC) ducting, Filters, Air conditioning Unit and AHU installation, Transducers and control systems, dampers, AHU Shed  | <p><b>HVAC Ducting &amp; commissioning:</b></p> <p>Visit by Technical Representative(s) of Consignee &amp; HITES to ensure all the activities as per checklist &amp; Specification in Coordination with Lab's representative(s).</p>  | 25%          | <ol style="list-style-type: none"> <li>1. Site Visit Report (Quality Checklist) along with photographs of site and confirmation from Technical Representative(s) of Consignee &amp; HITES</li> <li>2. Original and one copy of supplier's invoice indicating Bill to Consignee (mentioning Consignee GSTN) through M/s HLL Infra Tech Services Limited and Ship to as Place of Supply showing contract number, milestone completed,</li> </ol>  |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  | goods/works description, and amount to be paid |
|--|--|--|--|--|

| Sl. No. | Suggested milestones for TB Containment Lab establishment  | Project activity in brief   | Payment Slab | Documents to be submitted for processing the payment   |
|---------|--|---|--------------|--|
| 5       | Completion of Interiors, Modular Monolithic Panelling, Pass box, Doors, Glass windows, Coving (Wall and Ceiling), Electrical fixtures and outlets, Fire Safety, Flooring, Epoxy, Coving (Floor), Monolithic Finishing (Silicon sealing), Furniture, Connectivity, monitoring and access control devices. Split AC Installation, BSC Placement and ducting, Emergency preparedness AND Performance testing of HVAC, Final commissioning and validation, labelling, Training, Laboratory documents submission and handover of TB Containment Lab including supply and installation of required equipment | <b>Interior, BSC Installation, Midterm Assessment and Performance testing of HVAC (Dry Run, validation and installation of required equipment):</b> Visit by Technical Representative(s) of Consignee & HITES to ensure all the activities as per checklist & Specification in coordination with Lab's Representative and performance testing of HVAC and also confirm completion of previous pending activity. Upon handover of completed Works, a Project Taking Over Certificate shall be issued by Lab-in-charge and endorsed by Technical Representative | 25%          | <ol style="list-style-type: none"> <li>1. Visit Report (Signed checklist &amp; Quality Checklist) along with photographs of site and confirmation from Technical Representative(s) of Consignee &amp; HITES &amp; <b>'Taking-over Certificate' issued by Lab in-Charge of the respective site.</b></li> <li>2. Original and one copy of supplier's invoice indicating Bill to Consignee (mentioning Consignee GSTN) through M/s HLL Infra Tech Services Limited and Ship to as Place of Supply showing contract number, milestone completed, goods/works description, and amount to be paid</li> </ol> |
| 6       | After two months from the final completion of Works of the laboratories, provided no complaints on operation of labs are received or rectified.  | <p><b>Post Validation &amp; Handover:</b><br/>Visit by Technical Representative(s) of Consignee &amp; HITES to ensure all the activities as per checklist &amp; Specification in coordination with Lab's Representative.</p> <p>Technical Representative(s) of Consignee &amp; HITES shall also confirm completion of previous pending activity</p>   | 10%          | <ol style="list-style-type: none"> <li>1. Copy of <b>'Final Work Completion Certificate' issued by Lab in-Charge of the respective site.</b></li> <li>2. Original and one copy of supplier's invoice indicating Bill to Consignee (mentioning Consignee GSTN) through M/s HLL Infra Tech Services Limited and Ship to as Place of Supply showing contract number, milestone completed, goods/works description, and amount to be paid</li> </ol>   |
|         | <b>Total</b>   |   | 100%         |  |

**Note-** Above Payment Schedule covers completion of Works as per broad milestones given above for each Schedule.

**SECTION V - CONTRACT FORM and CONDITIONS OF CONTRACT****DESIGN, CONSTRUCTION, TESTING, COMMISSIONING AND VALIDATION OF TB CONTAINMENT  
LABORATORY AND ASSOCIATED WORKS ON 'TURNKEY BASIS'****Laboratory Site Address:**

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**- and -****[*Contractor's name*]****[ *date* ]**

## CONTRACT FORM

**THIS CONTRACT** is made on the \_\_\_\_\_ day of \_\_\_\_\_ 2020.

### BETWEEN

- 1) ("Employer"); and
- 2) **(insert name)**, a **(insert type of company i.e. limited liability)** company incorporated under the laws of **(insert)** and having its registered address at **(insert address)**, **(insert name of city and country)** ("Contractor").

### BACKGROUND

- a) The Employer intend to undertake the Project. The Works are an integral part of the Project.
- b) The Contractor has represented to the Employer that it has the appropriate experience, expertise, licenses and resources to undertake the Works and has agreed to undertake the Works in accordance with the Contract
- c) In reliance on the Contractor's representations, the Employer has entered into the Contract.
- d) The Contract sets out the terms and conditions upon which the Contractor will undertake the Works.

### THIS CONTRACT:

- 1) The Employer agrees to pay the Contractor the Contract Price, at the times and in the manner prescribed by the Contract, in consideration for the Contractor executing and completing the Works and remedying all defects in accordance with the Contract and otherwise performing all of its obligations in accordance with the Contract.
- 2) In the Contract words and expressions will have the same meanings as are respectively assigned to them in the General Conditions.
- 3) The following documents, listed in the order of priority, are deemed to form, and be read and construed as part of the Contract:
  - 3.1 this Instrument of Agreement.
  - 3.2 Letter of acceptance, notice to proceed with the works
  - 3.3 Contractor's bid.
  - 3.4 Conditions of contract.
  - 3.5 The Specifications.
  - 3.6 the Drawings.
  - 3.7 Bill of quantities and
  - 3.8 Any other document listed in contract conditions

**IN WITNESS WHEREOF**, the Parties have caused this Contract to be executed by their respective duly authorised representatives as of the date first written above:

SIGNED BY

\_\_\_\_\_  
**(insert name of authorised signatory of Employer)**

Duly authorised to sign this Contract for and on behalf of the Employer: In the presence of:

Signature \_\_\_\_\_(witness)Address \_\_\_\_\_

Occupation

SIGNEDBY

\_\_\_\_\_  
*[insert name of authorised signatory of*

**the Contractor]** Duly authorised to sign this Contract for and on

behalf of the Contractor, **[insert]**: In the presenceof:

Signature \_\_\_\_\_(witness)

Address

Occupation

## CONDITIONS OF CONTRACT

### General Conditions

#### 1. GENERAL PROVISIONS

In view of above-mentioned parties having signed the contract, which will lay the foundation for execution of the proposed work as per the terms and conditions.

#### 2. OBLIGATIONS & RIGHTS OF THE EMPLOYER

##### 2.1 Provision of Site

The Employer will provide non-exclusive possession of the Site and non-exclusive right of access to the Site. The Contractor must comply with any conditions relating to the Site.

##### 2.2 Permits and Licenses

The Employer must, if requested, assist the Contractor in applying for such permits, licenses, authorizations or approvals which are required for the Works.

##### 2.3 Employer's Representative

The employer may appoint a representative for supervising and carrying out the necessary procedures required for assisting the contractor in executing the contract. The Employer's Representative is authorised to carry out the duties assigned to it in the Contract. The Employer's Representative has no authority to amend the terms of the Contract unless an amendment is authorised and approved in writing by the Employer.

##### 2.4. Completion certificate

The Employer must issue the Final Completion Certificate within 28 days after the Contractor has supplied all relevant documents and completed and tested all of the Works, including remedying defects.

#### 3. OBLIGATIONS OF THE CONTRACTOR & PERFORMANCE OF THE WORKS

##### 3.1 General Obligations

The Contractor must carry out the Works properly and in accordance with the Contract, including all works which are necessary to satisfy the Specifications and the Drawings and all other works which (although not expressly mentioned in the Contract) are necessary for the stability and/or for the completion, and/or safe and proper operation of the Works. The Contractor must provide all supervision, labour, Materials, Plant and Contractor's Equipment which may be required. All Materials and Plant on Site are deemed to be the property of the Employer.

The Contractor must comply with all applicable occupational health and safety and environmental laws, guidelines, rules, procedures, quality control requirements and codes of practice.

The Contractor is deemed to have inspected and examined the Site, its surroundings, and access to the Site and to have satisfied itself that the Site and access to the Site, including security, is suitable for the Works and is deemed to have obtained all necessary information as to risks which may affect execution of the Works including climatic,

hydrological and natural conditions and is not entitled to an increase to the Contract Price or to an extension to the Time for Completion based upon such conditions encountered during the execution of the Works that could have been reasonably foreseen by an experienced contractor acting in accordance with industry best practice.

The Contractor must, in a form acceptable to the Employer's Representative, provide the Employer's Representative with fortnightly, or more frequently on request by the Employer's Representative, reports in relation to the Works and any occupational, health and safety issues in relation to the Works.

The Contractor must obtain and comply with all relevant permits, licenses, authorizations, and approvals necessary to carry out the Works in accordance with the Contract.

### **3.2 Permits and Licenses**

The Contractor must obtain and comply with all relevant permits, licenses, authorizations and approvals necessary to carry out the Works in accordance with the Contract.

### **3.3 Employer's Instructions**

The Contractor must comply with all instructions given by the Employer or the Employer's Representative in respect of Works. The Employer or the Employer's Representative is entitled to suspend progress of part or all of the Works at any time and for any reason by giving the Contractor written notice. During such suspension, the Contractor must protect, store and secure such part of the Works against any deterioration, loss or damage. If the Contractor receives a notice of suspension under this Sub-Clause 3.3, the Contractor must suspend progress of the relevant parts of the Works until such time as the Employer/Employer's Representative directs the Contractor to resume progress of those parts of the Works by notice in writing. If a suspension under this Sub-Clause 3.3 has continued for more than 180 consecutive days, the Contractor may request the Employer's Representative's permission to proceed with the Works. If the Employer's Representative does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Employer's Representative, treat the suspension as an omission of the affected part of the Works.

### **3.4 Contractor's Representative**

The Contractor's Representative must be communicated to the employer in writing. The Contractor is responsible for all acts and omissions of the Contractor's Representative. The Contractor gives the Contractor's Representative all authority necessary to act on the Contractor's behalf under the Contract.

### **3.5 Subcontracting**

The Contractor must not subcontract the whole of the Works. Subcontracting shall not relieve the Contractor from the responsibility of completing the works and giving the performance as per the Contract.

**3.6 Bank Guarantee for Performance**

The Contractor must deliver to the Employer, within 15 days of the award of contract an unconditional and irrevocable on-demand bank guarantee in the prescribed format from a nationalized bank for the specified amount.

Any Bank Guarantee for performance provided to the Employer under Sub-Clause 3.6 must be valid for six months from the date of award of contract.

**3.7 Contractor's Personnel**

The Contractor's Personnel must be appropriately qualified, skilled, and experienced in their respective trades or occupations. The Contractor must comply with all relevant labour laws, acts & regulations including all statutory amendments and reenactments acts that may be passed in future either by the state or the Central Government or local authority. The Employer will not be liable for or in respect of any damages or compensation payable at law in respect or in consequence of any accident or injury to any of the Contractor's Personnel. The Contractor must defend, hold and save harmless and indemnify the Employer against all claims and proceedings, as well as damages and compensation in relation to any accident or injury to any of the Contractor's Personnel. The Contractor is responsible for all costs, including legal costs, charges and expenses whatsoever associated with the defense of the Employer.

**3.8 Alcoholic Liquor or Drugs**

The Contractor must not bring onto or store on the Site, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by its subcontractors, agents, staff or labour. In case of violation of this clause, the employer may initiate an action deemed fit for such an act.

**3.9 Arms, Ammunition & Explosives**

The Contractor and/or subcontractor must not bring onto or store on the Site, give, barter or otherwise dispose of to any person or persons, any arms, ammunition or explosives of any without prior written permission of the employer.

**3.10 Epidemics**

In the event of any outbreak of illness of an epidemic nature, the Contractor must comply with and carry out such regulations, orders and requirements as may be made by the relevant authorities or local medical or sanitary authorities for the purpose of dealing with or overcoming the epidemic.

**3.11 Security of the Site**

The Contractor must keep unauthorized persons from entering the Site. Authorised persons are limited to the Contractor's Personnel and the Employer's personnel and any

other personnel notified to the Contractor, by the Employer or the Employer's Representative, as authorised personnel of the Employer or the Employer's other contractors on the Site. The security and safety of the Site, the Contractor's Equipment, the Employer's equipment, Plant, Materials and all other property or personnel on the Site is the sole responsibility of the Contractor. The Contractor must comply with any other security requirements as and when needed.

### **3.12 Contractor's Design**

The Contractor must carry out design to the extent specified in accordance with the Contract. The Contractor is responsible for any design it has prepared and such design must be fit for the intended purposes defined in the Contract. The Contractor is also responsible for any infringement of any patent or copyright in respect of the same.

The Contractor must promptly submit to the Employer or Employer's Representative all designs prepared by him, the Employer's Representative may notify any comments or, if the design submitted is not in accordance with the Contract, may reject it stating the reasons within one week of receipt of the same. The Contractor must not construct any element of the permanent work designed by the Contractor without the approval and prior written consent of the Employer or Employer's Representative. The Contractor must resubmit all designs commented on, taking these comments into account as necessary.

### **3.13 Execution of the Works**

**3.13.1** The Contractor must commence the Works on the specified date and must proceed expeditiously and without delay and must complete the Works within the Time for Completion.

**3.13.2** The timeline as per flow chart for execution of works submitted along with the technical bid shall be discussed by both the parties and approved. The timeline will be used to monitor the progress of the Works under the Contract.

**3.13.3** The Contractor may be entitled to an extension to the Time for Completion if it is or will be delayed by any of the following:

- a) Force Majeure event (earthquake, hurricane, typhoon, tsunami)
- b) any delay or disruption caused by any Variation, except where that Variation is caused by the Contractor's failure, act, omission or breach,

**3.13.4** Despite any other provision in this Contract, the Employer/Employer's Representative may, in its absolute discretion and at any time, grant an extension to the Time for Completion. Such an extension must be granted in writing.

### **3.14 Late Completion**

If the Contractor fails to complete the Works within the Time for Completion, the Contractor must pay delay damages for such failure at a rate of 0.05% per day of contract value to a maximum cumulative amount not more than 10% of the contract value. If the cumulative amount of delay damages crosses 10% of the contract value the Employer may

terminate the Contract.

### **3.15 Takingover**

#### **3.15.1. Completion of works**

The Contractor must notify the Employer in writing as soon as it considers that the Works have reached the stage of Substantial Completion.

*“Substantial Completion” means that stage in the execution of the Works when the following has occurred:*

- (a) the Works are performed and completed in accordance with this Contract except for minor defects which would not affect the performance or operation of the Works.*
- (b) all tests required by this Contract have been undertaken and successfully passed.*
- (c) all documents, technical and other information, including plans, designs, drawings, as-built drawings, engineering information, data, specifications, reports and any other information required under this Contract have been supplied to the Employer’s Representative in accordance with this Contract or as directed by the Employer from time to time;*
- (d) all third-party warranties and certificates and local authority approvals have been issued and provided to the Employer*

#### **3.15.2. Taking over certificate**

After receiving the notice under Sub-Clause 3.15.1, the Employer must either issue a Taking-Over Certificate stating the Date of Substantial Completion or notify the Contractor that there are defects or deficiencies in the Works that prevent Substantial Completion being reached.

If the Employer notifies the Contractor that there are defects or deficiencies in the Works, the Contractor must correct the defects or deficiencies. The Contractor must remedy at no cost to the Employer any defects due to the Contractor’s design, Materials, Plant or workmanship not being in accordance with the Contract. The timing of remedying a defect must be agreed between the Parties, or failing agreement, be reasonably specified by the Employer. The procedures in the Clause 3.15 must then be repeated until the Employer issues a Taking-Over Certificate.

If the Contractor fails to rectify the defect within the time agreed or specified, the Employer’s Representative may do so or engage another party to do so at the Contractor’s risk and expense and any cost will be a debt due from the Contractor to the Employer.

On remedying the defects if any and the procedures carried out as stated above, the Employer must take over the Works upon the Date of Substantial Completion.

After issuance of the Taking-Over Certificate the Contractor must promptly complete any outstanding work, submit a statement showing the value of the work performed and details of any other amounts to which the Contractor considers itself entitled. If requested by the Employer’s Representative, when submitting the statement the Contractor must

provide verification of all payments owed to subcontractors and the Contractor's Personnel.

The statement must be based on the prices and/or rates set out in the Bill of Quantities or as otherwise set out in the Contract Price.

### **3.15.3 Testing**

The Contractor must undertake all tests in accordance with the requirements set out in the Section IV.

### **3.16 Final Completion Certificate**

Performance of the Contractor's obligations will not be considered to have been completed until the Employer has issued the Final Completion Certificate to the Contractor, stating the date on which the Contractor completed its obligations under the Contract.

The Employer must issue the Final Completion Certificate within 28 days after the Contractor has supplied all relevant documents and completed and tested all of the Works, including remedying defects.

### **3.17 Unfulfilled Obligations**

After the Final Completion Certificate has been issued, each Party remains liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract is deemed to remain in force

### **3.18 Right to Vary**

The Employer may, in its absolute discretion and at any time before the Taking-Over Certificate is issued, initiate, or immediately instruct Variations by written notice and the Contractor must carry out and be bound

by any such Variations. Unless otherwise instructed by the Employer in this notice, the Contractor must provide a detailed breakdown of the increase or decrease in the Contract Price and any effect on the Time for Completion within 7 days of receipt of this notice, and before the Contractor carries out the Variation. The Contractor must then execute and is bound by the Variation unless otherwise instructed by the Employer.

The Contractor agrees that a Variation may involve an omission of any part or parts of the Works and in the case of an omission the Employer may engage others to perform that part or parts so omitted.

### **3.19 Valuation of Variations**

Variations will be valued by the Employer at a rate or lump sum price agreed between both the Parties. For the avoidance of doubt the Contractor's entitlement to payment for a Variation excludes non-project specific overheads and costs.

### **3.20 Notice of Delay**

The Contractor must notify the Employer as soon as practicable and in any case in writing no later than 7 days after it becomes aware of any event or circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment, Costs and/or other entitlements or relief from obligations, under any Clause of these General Conditions or otherwise arising out of or in connection with the Contract. The Contractor must take all reasonable steps to minimize these effects.

The notice submitted by the Contractor must set out details of the event or circumstance giving rise to the claim, and if requested supply supporting documents, stating a reasonable period by which the Contractor believes the Time for Completion should be extended and the nature and extent of any additional resultant Costs. As soon as practicable after the receipt of this notice, the Employer will notify the Contractor of the period, if any, by which the Time for Completion will be extended and additional payment of Costs (if any) to which the Contractor is entitled under the Contract. The Employer may also respond with comments and request any necessary further particulars.

The Contractor is not entitled to an extension to the Time for Completion or additional payment or Costs if it does not submit a notice in accordance with and within the time stated as above in which case the Contractor will be deemed to have waived its entitlement to make such claim, the Employer will be discharged from all liability arising out of or in connection with the claim and the Contractor must comply with its obligations to perform the Works by the Time for Completion and for the Contract Price.

### **3.20 Adjustments for Changes in Cost**

Unless otherwise expressly stated in the Schedule of Contract Price, the Contract Price, and the rates and prices inserted in the Bill of Quantities, will not be adjusted for rises or falls in the cost of labour, goods and other inputs to the Works and the Contract Price and the rates and prices inserted in the Bill of Quantities, will be deemed to include amounts to cover contingency of rises and falls in the cost of labour, goods and other inputs to the Works.

### **3.21 Payment**

#### **3.21.1 Advance Payment**

The Employer may make an advance payment of a maximum of 10% of the total contract value (if any) as a loan for mobilization, when the Contractor submits a Bank Guarantee.

#### **3.21.2 Final payment**

Within 7 days after receiving the Final Completion Certificate, the Contractor must submit a final account to the Employer together with any documentation reasonably required to enable the Employer to ascertain the final contract value. Within 28 days after the submission of this final account, the Employer must pay to the Contractor any amount due. If the Employer disagrees with any part of the Contractor's final account, the Employer must specify its reasons for disagreement when making payment.

### **3.22 Audit and Investigations**

Each payment made by the Employer to the Contractor may be subject to a post-payment audit by auditors, whether internal or external, of the Employer or by other authorised and qualified agents of the Employer at

any time during the term of the Contract and for a period of two (2) years following the expiration or prior termination of the Contract. The Employer is entitled to a refund from the Contractor for any amounts shown by such audits to have been paid by the Employer other than in accordance with the terms and conditions of the Contract.

### **3.23 Default by Contractor**

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Employer or fails to proceed expeditiously and without delay, or is in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default. If the Contractor has not taken all practicable steps to remedy the default within 14 days after the Contractor's receipt of the Employer's notice, the Employer may by a second notice of 14 days, terminate the Contract.

The Employer may terminate the Contract immediately by written notice if the Contractor is declared insolvent under any applicable law.

If the Employer delivers a termination notice the Contractor must stop work and demobilize (except to the extent specified in the notice from the Employer) and take such action as necessary or as the Employer directs, for the transfer, protection and preservation of the Employer's property and deliver any required goods and documents to the Employer. The Contractor must use its best efforts to comply immediately with any reasonable instructions included in the notice for the assignment of any subcontract and for the protection of life or property or for the safety of the Works. The Contractor must leave behind any Contractor's Equipment, Materials and Plant which the Employer instructs, in writing, is to be used until the completion of the Works. The Employer may employ others to complete or perform the Works and the cost incurred that exceeds the Contract Price will be a debt due from the Contractor to the Employer.

### **3.24 Payment upon Termination**

After termination, the Contractor is entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant.

### **3.25 Employer's Entitlement to Terminate for Convenience**

The Employer may in its absolute discretion terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination will take effect 28 days after the latter of the dates on which the Contractor receives this notice, or the Employer returns the Bank Guarantee for performance.

### **3.26 Contractor's Care of the Works**

The Contractor is responsible for the care of the Works from the Commencement Date until the date the taking-over Certificate is issued. Responsibility will then pass to the

Employer. If any loss or damage happens to the Works during the above period, the Contractor must rectify such loss or damage so that the Works conform with the Contract and the requirements of any relevant authorities.

The Contractor must defend, hold and save harmless and indemnify, at its own cost, including legal costs, the Employer, its agents and employees from and against all suits, actions, claims and costs arising out of the acts or omissions of the Contractor, its employees, agents or subcontractors in connection with the Works and the Contractor's other obligations under or in connection with the Contract, in respect of any accident, bodily injury, sickness or death to any person, infringement of any intellectual property rights and loss or damage to the Works or any property unless due to an act or default of the Employer or its personnel. In defending the Employer, the Contractor shall not enter into a settlement agreement without the prior written approval of the Employer.

### **3.27 Force Majeure**

If a Party is or will be prevented from performing any of its obligations by Force Majeure, the Party affected must notify the other Party immediately in writing and not later than 7 days, setting out full details of the Force Majeure event and the reasons for the Force Majeure event preventing that Party from, or delaying that Party from, performing the affected obligations under this Contract. If instructed by the Employer, the

Contractor must suspend the execution of the affected Works and, to the extent agreed with the Employer demobilize the Contractor's Equipment, but only so far as, and for so long as, the performance of those obligations is affected by the Force Majeure event. The affected Party must use its best endeavors to overcome or remove the effects of the Force Majeure event as quickly as possible.

Upon completion of the Force Majeure event, the affected Party must as soon as is reasonably practicable recommence the performance of the affected obligations.

If the event continues for a period of 84 days, either Party may then give notice of termination which will take effect 28 days after the giving of the notice.

After termination, the Contractor is entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and Plant reasonably delivered to the Site.

The Contractor acknowledges and agrees that, with respect to any of its obligations under the Contract, the Contractor will be performing such obligations in areas in which the Employer, is engaged in, preparing to engage in, or disengaging from peacekeeping, humanitarian or similar operations and any delays or failure to perform such obligations arising from or relating to harsh conditions within such areas, shall not, in and to itself, constitute a Force Majeure event.

### **3.28 Insurance and Extent of Cover**

The Contractor must, on or prior to the Commencement Date, effect and thereafter maintain insurances in the joint names of the Parties:

- a) for loss and damage to the Works, Materials, Plant and the Contractor's Equipment,
- b) for liability of both Parties for loss, damage, death or injury to third parties or their property arising out of the Contractor's performance of the Contract, including the Contractor's liability for damage to the Employer's property other than the Works, and
- c) For liability of both Parties and of any Employer's personnel for death or injury to the Contractor's Personnel.

The policies must be issued by insurers and in terms approved by the Employer. The Contractor must provide the Employer with evidence that any required policy is in force and that the premiums have been paid. All payments received from insurers relating to loss or damage to the Works must be held jointly by the Parties and used for the repair of the loss or damage or as compensation for loss or damage that is not to be repaired.

If the Contractor fails to effect or keep in force any of the insurances referred to in the previous Sub-Clauses, or fails to provide satisfactory evidence, policies or receipts, the Employer may, without prejudice to any other right or remedy, effect insurance for the cover relevant to such default and pay the premiums due and recover the same as a deduction from any other monies due to the Contractor.

### **3.29 Resolution of Disputes**

Unless settled amicably by the Parties' Representatives, any dispute or difference which arises between the Contractor and the Employer out of or in connection with the Contract, including any valuation or other decision of the Employer ("**Dispute**"), the Dispute must be referred, if requested by either Party, to the Senior Representatives of the Parties, or any replacement notified by a Party to the other Party in writing.

If the Senior Representatives of the Parties are unable to resolve a Dispute referred to them within 28 days, either Party may invite the other Party to conciliate. Otherwise the Dispute must be referred, if requested by either Party, directly to arbitration.

The Parties will be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such dispute, controversy, or claim.

The arbitral proceedings and any information and documents relating to these proceedings must be regarded as confidential.

Despite any activation of the dispute resolution procedures, the Contractor must continue to execute the Works and its other obligations under or in connection with the Contract.

### **3.30 Privileges & Immunities**

Nothing in or relating to the Contract is deemed a waiver, express or implied, of any of the privileges and immunities whatsoever.

## SECTION VI– Other Standard Forms

**Bid Security Form**

Whereas \_\_\_\_\_ (herein called the "Bidder") has submitted its bid dated \_\_\_\_\_ For the services \_\_\_\_\_ (herein called the "bid") against the Client's Bid Ref.No. \_\_\_\_\_

The conditions of the obligation are:

- (1) If the Bidder withdraws or amends, impairs or derogates from the bid in any respect within the period of validity of this bid.
- (2) If the Bidder having been notified of the acceptance of his tender by the Client during the period of its validity:-
  - a) fails or refuses to furnish the performance security for the due performance of the contract. Or
  - b) fails or refuses to accept/execute the contract. or
  - c) if it comes to notice that the information/documents furnished in its bid is incorrect, false, misleading or forged

The bidder will be suspended for the period of 6 months from being eligible to submit Bids for contracts with the entity that invited the Bids

**Signature and seal of the Bidder**

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**SELF-DECLARATION (NOTARIZED  
AFFIDAVIT)**

**To,**

**CEO**

**HLL Infra Tech Services Limited**

**Procurement and Consultancy Division**

**B-14 A, Sector -62, Noida -201307, Uttar Pradesh.**

1. In response to the Tender No.....Dated ..... as a owner/partner/Director of..... I / We hereby declare that our Agency..... is having Unblemished past record and was not declared ineligible for corrupt and fraudulent practices either indefinitely or for a particular period of time.
2. I / We M/s \_\_\_\_\_ (Name of the Company/Firm ) are not blacklisted in any Department of the Central or any state Government.
3. I / We further undertake that our partner M/s \_\_\_\_\_ (Name of Vendor) having office are also not blacklisted in any Department of the Central or any state Government.
4. I / We hereby declare that there are no pending cases against M/s \_\_\_\_\_ (Name & Address of Bidder) with Department of the Central or any state Government or any other court of law.
5. I / We hereby declare that Bidder's company or Director/Owner of the company have not been declared by any Court or Competent Authorities insolvent or involved in any fraudulent means (Economical & Criminal) as on today.

**Signature and seal of the Bidder**

**BIDDER'S AUTHORISATION CERTIFICATE****To,****CEO****HLL Infra Tech Services Limited****Procurement and Consultancy Division****B-14 A, Sector -62, Noida -201307, Uttar Pradesh.**

<Bidder'sName>.....-<Designation> ---..... is hereby authorized to sign relevant documents on behalf of the Company /Firm in dealing with Tender of reference <Tender No.andDate> ----- --. He is also authorized to attend Meetings and submit Technical and Financial information as may be required by you in the course of processing above said tender.

Thanking you,

The specimen signature of the authorized person is as :-

Authorized Signatory

.....-

**FORM OF TAKING-OVERCERTIFICATE**

[ON LAB/SITE OFFICIAL LETTERHEAD]

[insert Date]

Contractor's Representative

[Address]

**TAKING-OVER CERTIFICATE**

Dear [insert]

[insert works title] Construction Contract ("Contract")

[insert name of the development] We

refer to tenderContract

We advise you that on [insert date] the Works, or a Section or part of the Works as specified below, were completed to a stage ready to be Taken Over by the Purchaser in accordance with theContract.

|  |  |
|--|--|
| The works to which this Taking-Over Certificate relates are: |  |
|--|--|

By signing this Taking-Over Certificate, the Purchaser acknowledges and accepts that the Works, or the Section or part of the Works specified above, were completed, including the matters described in tender contract [Time for Completion], and Taken Over by the Purchaser in accordance with the Contract on [insertdate].

This Taking-Over Certificate is executed by an official representative duly authorized to bind theEmployer.

This Taking-Over Certificate does not relieve you from any of your unperformed or continuing warranties, obligations or liabilities under or in connection with the Contract or at law, including the remedying of alldefects.

Yours sincerely

.....

[insert]

Lab incharge/Representative

**FORM OF FINAL COMPLETION CERTIFICATE**

[ON LAB/SITE OFFICIAL LETTERHEAD]

[insert Date]

Contractor's

Representative [**Address**]

**FINAL COMPLETION CERTIFICATE**

Dear [*insert*]

[*insert works title*] Construction Contract ("Contract")

[*insert name of the development*]

We refer to Sub-Clause 9.3 of the Contract.

We advise that on [*insert date*] you have completed your obligations under the Contract to a stage ready for the Final Completion Certificate to be issued by the Purchaser in accordance with the Contract.

By signing this Final Completion Certificate, the Purchaser acknowledges and accepts that your obligations under the Contract have been completed to a stage ready for the Final Completion Certificate to be issued by the Employer.

This Final Completion Certificate is executed by an official representative duly authorized to bind the Employer.

This Final Completion Certificate does not relieve you from any of its unperformed or continuing warranties, obligations or liabilities under or in connection with the Contract or at law.

Yours sincerely

.....

[*insert*]

Lab incharge/Representative

## BANK GUARANTEE FORM FOR PERFORMANCE SECURITY/CAMC SECURITY

Whereas **(vendor name)** hereinafter called "**the vendor**" has undertaken, in pursuance of **(contract\_ details)** And whereas it has been stipulated by you in the said contract that the vendor shall furnish you with a Bank Guarantee for the sum specified therein as security for the obligations in accordance with the contract.

WE, (Bank Name), a banking company incorporated and registered under Companies Act 1956 and having license to carry on banking business under the Banking Regulation Act, 1949 having its registered office .....and its one of branch office at ..... (hereinafter called the "Bank") hereby undertake to pay to the HLL Infra Tech Services Ltd an amount not exceeding **Rs..... (in words)** on demand by the HLL Infra Tech Services Ltd.

2. We, (Bank Name), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a written demand from the HLL Infra Tech Services Ltd stating that the amount claimed as required to meet the recoveries due or likely to be due from the said Vendor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs..... (in words)**.

3. We, (Bank Name), further undertake to pay the HLL Infra Tech Services Ltd any money so demanded notwithstanding any dispute or disputes or tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this guarantee shall be a valid discharge of our liability for payment there under and the vendor shall have no claim against us for making such payment.

4. We, (Bank Name), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the HLL Infra Tech Services Ltd under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till the Engineer-in-charge on behalf of the HLL Infra Tech Services Ltd certified that the terms and conditions of the said Agreement have been fully and properly carried out by the said Vendor and accordingly discharges the guarantee or till (Expiry date) whichever is earlier.

5. We, (Bank Name), further agree with the HLL Infra Tech Services Ltd that the HLL Infra Tech Services Ltd shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder, to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Vendor from time to time or to postpone for any time or from time to time any of the powers exercisable by the HLL Infra Tech Services Ltd against the said Vendor and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Vendor or for any forbearance act or omission on the part of the HLL Infra Tech Services Ltd or any indulgence by the HLL Infra Tech Services Ltd to the said Vendor or by any such matter or thing what so ever which under the law relating to securities would but for this provision have effect of so relieving us.

6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Vendor.

7. We, (Bank Name), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the HLL Infra Tech Services Ltd in writing.

8. The bank guarantee shall be valid up to **(validity period)** unless extended on demand by the HLL Infra Tech Services Ltd and at our sole discretion Notwithstanding anything mentioned above, our liability against this bank guarantee is restricted to **Rs.....(in words)** and unless a claim in writing is lodged with us of the date of expiry i.e. **(One year from the date of expiry of BG i.e., claim expiry date)** or the extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Notwithstanding anything therein:

- (i) Our liability under this bank guarantee shall not exceed **Rs. ....(in words)**.
- (ii) This bank guarantee shall be valid upto **(validity period)**.
- (iii) We shall be liable to pay the guaranteed amount or any part thereof under this bank guarantee upon receipt of written demand on or before **(one year from the date of expiry of BG i.e., claim expiry date)**.
- (iv) In case no demand is made before the claim expiry date specified in clause c, the bank shall stand discharged from all its liabilities under this bank guarantee irrespective of fact whether the original bank guarantee is returned to us or not and
- (v) Any dispute or claims arising out of this bank guarantee are necessarily required to be enforced before the competent court of law within one year (1) from the date of demand, provided that such demand is received by the bank before the claim expiry date specified in clause c above.

THIS BANK GUARANTEE IS SUBJECT TO THE ICC UNIFORM RULES FOR DEMAND GUARANTEES (ICC PUBLICAITON NO. 758) AND SHALL BE GOVERNED BY AND CONSTRUED IN ALL RESPECTS, IN ACCORDANCE WITH THE LAW OF INDIA

.....  
(Signature with date of the authorised officer of the Bank)

.....  
Name and designation of the officer

.....  
.....

Seal, name & address of the Bank and address of the Branch

**BANK GUARANTEE FORM FOR EMD/BID SECURITY**

Whereas \_\_\_\_\_ (Name and address of the Bidder)

(Hereinafter called the "Bidders")

Has submitted its Bid dated \_\_\_\_\_ for the supply of

\_\_\_\_\_ (Hereinafter called the "Bid")

Against the purchaser's ATE No. \_\_\_\_\_

Know all persons by these present that we \_\_\_\_\_ having our

registered office at \_\_\_\_\_

(Hereinafter called the "Bank")

Are bound unto HITES, Noida (for and on behalf of consignee)

(Hereinafter called the "Purchaser")

In the sum of \_\_\_\_\_ for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its successors and assigns by these presents. Sealed with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

**The conditions of this obligation are:**

- 1) If the Bidder withdraws or amends, impairs or derogates from the bid in any respect within the period of validity of this Bid.
- 2) If the Bidder having been notified of the acceptance of his Bid by the Purchaser during the period of its validity:-
  - a. if the bidder fails or refuses to furnish the performance security for the due performance of the contract or
  - b. if the bidder fails or refuses to accept/execute the contract or
  - c. if it comes to notice at any time, that the information/documents furnished in its Bid are false or incorrect or misleading or forged.

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it owing to the occurrence of one or more the three conditions, specifying the occurred condition(s).

This guarantee will remain in force upto \_\_\_\_\_ (insert date of additional forty-five days after Bid validity) and any demand in respect thereof should reach the Bank not later than the above date.

.....

(Signature with date of the authorized officer of the Bank)

.....

(Name and designation of the Officer)

.....

.....

(Seal, name & address of the Bank and address of the Branch)