

# All India Institute of Medical Sciences

Veerbhadra Marg, Pashulok,

Rishikesh-249203



**Tender document for procurement of**  
**Establishment of TB Laboratory for Microbiology**  
**AIIMS, Rishikesh**

<b>Ref. No.</b>	<b>:</b>	<b>24/TB Lab/301/2017-Rish(Admn)</b>
<b>Publishing Date</b>	<b>:</b>	<b>06-02-2018 at 9.00 AM</b>
<b>Pre-Bid Meeting</b>	<b>:</b>	<b>12-02-2018 at 3.00 PM</b>
<b>Bid Submission Start Date</b>	<b>:</b>	<b>19-02-2018 at 9.00 AM</b>
<b>Last Date of Bid Submission</b>	<b>:</b>	<b>08-03-2018 at 3.00 PM</b>
<b>Bid Opening</b>	<b>:</b>	<b>09-03-2018 at 3.30 PM</b>

Tender documents may be downloaded from institute's web site [www.aiimsrishikesh.edu.in](http://www.aiimsrishikesh.edu.in) (for reference only) and CPPP site <https://eprocure.gov.in/eprocure/app>

**TENDER NOTICE**

**Establishment of TB Lab for Microbiology  
AIIMS, Rishikesh, Virbhadra Marg, Rishikesh, Dehradun  
Dated:06-02-2018**

1. E-tenders in Two Bids (Technical & Financial) are invited on behalf of the Director, All India Institute of Medical Sciences, Rishikesh from interested and eligible manufacturer or their authorised distributors/dealers, for **establishment of TB Laboratory for Microbiology** at AIIMS Rishikesh.
2. Bids shall be submitted online only at CPPP website: <https://eprocure.gov.in/eprocure/app>.
3. The complete bidding process is online. Bidders should be possession of valid digital Signature Certificate (DSC) for online submission of bids. Prior to bidding DSC need to be registered on the website mentioned above. For any assistance for e-bidding process, if required, bidder may contact to the helpdesk at 0135-2462915.
4. Tenderer/Contractor/Bidders are advised to follow the instructions provided in the 'Instructions to the Contractors/Tenderer/Bidders for the e-submission of the bids online through the Central Public Procurement Portal for e Procurement at <https://eprocure.gov.in/eprocure/app>'.
5. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
6. Hard Copy of original technical bid with earnest money deposit and tender fee etc. must be delivered to AIIMS, Rishikesh on or before last date/time of Bid Submission as mentioned above. The bid without EMD and tender fee will be summarily rejected. The scanned copy of the EMD and Tender fee should be attached in the technical bid.
7. The tender shall be submitted online in two part, viz., technical bid and financial bid. All the pages of bid being submitted must be signed and sequentially numbered by the bidder irrespective of nature of content of the documents before uploading.

**The offers submitted by Telegram/Fax/email shall not be considered. No correspondence will be entertained in this matter.**

8. Any future clarification and/or corrigendum(s) shall be communicated through Administrative Officer on the AIIMS, Rishikesh website: [www.aiimsrishikesh.edu.in](http://www.aiimsrishikesh.edu.in). And other Central Government Procurement Websites (*subject to its access of AIIMS Rishikesh*).The bidders are required to regularly check the website to know about any/all such corrigendum(s) as only these bids, taking care of such corrigendum(s) shall be considered for finalisation of the tender.
9. Bidder should necessarily enclose a covering letter mentioning a summary of applied document with proper numbering. Secondly, bid should also attach a compliance sheet as per specification mentioning that they are complying to all specification or have any variation.
10. The pre bid conference would be held on **12-02-2018 at 03.00 PM** in the office of Tender Opening Room, AIIMS, Rishikesh. All firm's representative who are attending the pre bid meeting, shall produce an authorization letter from their firm on the firm's letter head. They are required to put their query in writing before the committee and submit the same in writing on its letter head.
11. All the duly filled/completed pages of the tender should be given serial /page number on each page and signed by the owner of the firm or his Authorized signatory. In case the tenders are signed by the Authorized signatory, a copy of the power of attorney/authorization may be enclosed along with tender. A copy of the terms & conditions shall be signed on each page and submitted with the technical bid as token of acceptance of terms & conditions. Tender with unsigned pages/incomplete/partial/part of tender if submitted will be rejected out rightly.

12. Any omission in filling the columns of Financial Bid form (Schedule of Rates) shall debar a tender from being considered. Rates should be filed up carefully by the tenderer. All corrections in this schedule must be duly attested by full signature of the tenderers. The corrections made by using fluid and overwriting will not be accepted and tender would be rejected.

13.(i) **Bid Security:** -The bidder shall pay the respective amount of Bid Security (EMD) as mentioned in table-I along with the Technical Bid by way of demand draft/FD/TD/CD in favour of "AIIMS, Rishikesh" drawn on any Nationalized Bank/ Scheduled Bank and payable at Rishikesh and must be valid for (6) six month. Bids received without tender fees and Earnest Money deposit (EMD) shall stand rejected and thus shall not be considered for evaluation etc. at any stage. The original EMD will be put in cover-I containing with Technical bid.

- a) The Public Sector Undertaking of the Central/State Govt./MSEs/MSME/Registered with Central Purchase Organization are exempted from furnishing Earnest Money along with tender, **subject to submission of its valid proof.**
- b) The firms Registered with DGS & D/SSI and any approved source of Centre/States Govt. are not exempted from furnishing Earnest Money in so far as this institute is concerned.
- c) Earnest Money deposited with AIIMS, Rishikesh in connection with any other tender enquiry even if for same/similar material / Stores by the tenderer will not be considered against this tender.

(ii) EMD is required to protect the purchaser against the risk of Bidders conduct. The EMD will be forfeited if the bidder withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender or if it comes to the notice that the information/ documents furnished in its tender is incorrect or false.

14. The bid security (EMD) without interest shall be returned to the unsuccessful bidders after finalization of contract with successful bidder.

15. Bidders are not allowed to submit more than one bid for the same/similar tendered item else all his bids shall be cancelled thereby making him disqualified in addition to the forfeiture of the EMD.

16. The successful bidders have to execute a contract on Indian non judicial stamp paper of Rs.100/- (Rupees one hundred only) within twenty-one (21) days from the date of award of this tender in his favour and also required to furnish the **Security Deposit @ 10%** of contract value in the form of FD/BG/TD/CD for **three months extra of the contract period** from any Nationalised/Schedule bank duly pledged in favour of AIIMS, Rishikesh & payable at Rishikesh only. The EMD deposited by successful bidder may be adjusted towards Security Deposit as demanded above after its validation for the required period. If the successful bidder fails to furnish the full security deposit or difference amount between Security Deposit and EMD within 21 (twenty-one) days after the issue of **Letter of Award** of Work, his bid security (EMD) shall be forfeited and award of tender in suppliers favour automatically stands terminated at his cost & liability, unless time extension has been granted by AIIMS, Rishikesh.

17. The EMD/PBG shall be forfeited if successful bidder fails to supply the goods/equipment in stipulated time or fails to comply with any of the terms & conditions of the contract or fail to sign the contract.

18. The bid shall be valid and open for acceptance by the competent authority of AIIMS Rishikesh for a period of 180 (one hundred eighty) days from the published date of opening of the tenders and no request for any variation in quoted rates and / withdrawal of tender on any ground by bidders shall be entertained. The unilateral withdraw at any stage will cause forfeiture of EMD in addition to any remedy that the purchaser may have under the law.

19. To assist in the analysis, evaluation and computation of the bids, the Competent Authority, may ask bidders individually for clarification of their bids. The request for Clarification and the response shall be in writing but no change in the price or substance of the bid offered shall be permitted.

20. After evaluation, the work shall be awarded normally to the Agency fulfilling all the conditions of the contract and who has quoted the lowest rate as per financial bid after complying with the all the Acts / provisions stated / referred to for adherence in the tender.
21. The competent authority of AIIMS, Rishikesh reserves all rights to accept or reject any/ all tender(s) without assigning any reason. It can also impose/relax any administrative term and condition/specifications of the tender enquiry after due discussion in pre-bid conference. This will be communicated and shown over the website of the Institute. No representation will be considered after pre-bid meeting and **bidders may ensure its queries only in pre-bid meeting**. AIIMS, Rishikesh also reserves the right to reject any bid which in his opinion is non-responsive or violating any of the conditions/specifications without any liability to any loss whatsoever it may cause to the bidder in the process.
22. Tender must be submitted on the prescribed Tender Form otherwise tender will be cancelled straightway.
23. The tender form is not transferable.
24. Canvassing in any form is strictly prohibited and the tenderers who are found canvassing are liable to have their tenders rejected out rightly.
25. It is required by all concerned, namely the Bidders/Suppliers, as the case may be to observe highest standard of ethics during the procurement and execution of this Tender.
26. Installation at consignee's site should be free of cost immediately on arrival of equipment at consignee's site.
27. In case the quality of goods supplied are not in conformity with the standard given in tender and as per the samples supplied or the supplies are found defective at any stage these goods shall immediately will be taken back by the supplier and will be replaced with the tender quality goods, without any delay. The competent authority reserves all rights to reject the goods if the same are not found in accordance with the required description / specifications and liquidates damages shall be charged in addition to the cost of re- tender. The supplier is required to provide the demonstration of equipment at AIIMS premises to the AIIMS representatives for its evaluation as per the specification & desired functionality standard. However, a submission of videography displaying functionality as per tender specification may also be considered by the AIIMS, representative.
28. In case the bidder on whom the supply order has been placed, fails to make supplies within the delivery schedule and the purchaser has to resort risk purchase, the purchaser (AIIMS, Rishikesh) may recover from the tender the difference between the cost calculated on the basis of risk purchase price and that calculated on the basis of rates quoted by tenderer. In case of repeated failure in supplying the order goods the supply order may be cancelled and bid security deposit will be forfeited.
29. Where the specifications are as per tenderer's range of products the tenderer's offer should mention that the item meets all specifications as per the tender enquiry and if there are improvements/deviations the same should be brought out on separate Letter Head of the firm. It would be discretion of the competent authority of the institute to accept or reject such deviations which are not in accordance with our required specifications as given below the financial bid.
- 30.** It must be mentioned clearly whether bidder is a manufacturer/sole distributor/ sole agent for the items for which he is quoting.
- a. **Manufacturer** must add a certificate that item(s) is manufactured by them as per range of products.

- b. **Sole Manufacturers** must add a certificate that they are the sole manufacturer of the Item for which they are quoting in this tender enquiry & item is /are their proprietary Item in India. The rate certificate is also required from the sole manufactures that the Rates quoted are the same as they quote to other State/Centre Govt./reputed Private Organisation and DGS&D rate for the similar item(s) and these are not higher than those quoted by them.
- c. **Authorized agents** must add authority letter from their Manufacturer/Principals on the letter head of the manufacturer/principals signed by a competent person and comes in proforma given in attach must duly supported by a notarised affidavit on Indian Non Judicial Stamp Paper of Rs. 10/- (Rupees ten only) that they are quoting Rates on behalf of them. The authorization letter must give/mention the purpose for which it is allowed. The validity period of the authorization letter must be mentioned in the authority letter otherwise tender will be liable to rejection.

31. The bidders should have furnished a copy of GST/S.T. /C.S.T./VAT registration number, the State / U.T. of registration and the date of such registration. Tenders not complying with this condition will be rejected.

32. **Turnover provisions:** - (i) The tenderers should submit along with the tender, a photo state copy of the last three years Annual Accounts with Audit certificate by Chartered Accountant, Income Tax returns and a copy of current valid income tax clearance certificate (IT CC), otherwise bidder will not be considered for administrative evaluation (in evaluation of Technical bid) and will be declared **disqualified** in technical evaluation.

(ii) In case of bidder falls under Section 44AD/44ADA/44AE of Income Tax shall be required to submit turnover certificate verified by Chartered Accountant with his Registration number issued by Institute of Chartered Accountants of India.

(iii) In case of supplier is an Indian Agent, the firm can submit copies of purchase orders issued in favour of firm (*As the payment is made through LC directly to foreign manufacturer and equipment payment does not exist in the book of account of the supplier*) in support to its turnover whatever amount is getting short.

(iv) There will be relaxation on turnover on *case to case* basis for **Start-up firms** registered by Government of India under Start-ups scheme as per orders of Ministry of Commerce, Government of India.

33. **Sample/demonstration:** - In case, the item required prior submission of sample/ performing demonstration, tenderer will have to submit sample/perform demonstration of the equipment/item to the competent authority of the institute, the bidder will have to born all the expenses for the same. Non submission of sample/non performing demonstration will **disqualify** the bidder in the technical bidding process and financial bid of the bidder will not be opened.

34. The tenderer hereby guarantees that the equipment supplied to the Institute (purchaser) under the Contract shall be of the best quality/latest version and workmanship and new in all respects and shall be strictly in accordance with the specification and particulars contained/ mentioned in the Tender Document. The date of manufacturing of the equipment/goods supplied will not be more than 3 (Three months) old. The tenderer will have further guarantees that the said equipment would continue to conform to the description and quality aforesaid for a period of five (5) years guarantee period (As per MoH&FW guidelines), from the date of installation of the said equipment to the purchaser and notwithstanding the fact that the Purchaser (Inspector) may have inspected and /or approved the said equipment, if during the aforesaid period of five years the said equipment be discovered not to confirm to the description and quality as required as per specification or not giving satisfactory performance or have deteriorated, the decision of the Purchaser in that behalf shall be final and binding on the tenderer and the Purchaser shall be entitled to call upon the tenderer to rectify the equipment or such portion thereof as is found to be defective by the purchaser within a reasonable period or such specified period as may be allowed by the purchaser in his discretion on/an application made thereof by the tenderer and in such an event, the above mentioned warranty period shall apply to the equipment replaced from the date of replacement thereof. In case of failure of the tenderer to rectify or replace the equipment, within specified time, the purchaser shall be entitled to recover the cost with all expenses from the tenderer for such defective equipment.

35. Full description & specifications, make/brand and name of the manufacturing firm must be clearly mentioned in the tender, failing which, the tender will not be considered. The tenderer must also mention

whether the goods are imported / indigenous. Descriptive literature / catalogues must be attached with the tender in original, failing which, tender may be disqualified.

**36. Force Majeure:** Any failure or omission to carryout of the provisions of this supply by the supplier shall not give right for any claim by supplier and purchaser to one against the other, if such failure or omission arise from an act of God which shall include all acts of natural calamities from civil strikes compliance with any statistics and or requisitions of the Government lockout and Strikes, riots, embargoes or from any political or other reasons beyond the suppliers control including war (whether declared or not) civil war or state of incarceration provided that notice of the occurrence of any event by either party to the other shall be within two weeks from the date of occurrence of such an event which could be attributed to force majeure. Any delay due to Force Majeure will not be attributable to the either of the parties.

37. The equipment installed should be up for 95% of the total warranty time. If the equipment is down for more than 5% suitable action shall be taken against the supplier including imposition of penalty as deemed fit.

38. If there is a close system the tenderer shall ensure and will have to submit an affidavit on Indian Non Judicial stamp paper of Rs.10/- along with technical bid that spare parts and consumables for these equipment's/instruments/item will be available at reasonable fixed rates for next 10 (ten) years, such rates should not be more than the rates supplied to institutes of national importance.

39. The successful Bidder shall at all times agree to indemnify and keep indemnified the purchaser against all losses, damages which may arise in respect of action/inactions of such Bidder or breach of any term of this tender by such Bidder. All claims regarding indemnity shall survive the termination of the contract with such Bidder.

40. In case the vendor fails to supply the spare parts or fails to provide the agreed maintenance during the prescribed period, as per the terms of contract, the purchaser is automatically entitled to procure the required parts and hire services from the market at the risk and cost of the vendor, such inability of bidder will entail forfeiture the security deposit. The purchaser also reserves the right to terminate the contract on immediate notice, if the vendor fails to comply with this clause for more than one instance.

**41. Liquidated damage/demerge:** - The time for the date of delivery/ dispatch stipulated in supply order shall be deemed to be the essence of the contract and if the supplier fails to deliver or dispatch any consignment within the period prescribed for such delivery or dispatch in the supply order, liquidated damages may be deducted from the bill @ 0.5% per week subject to maximum of 10% of the value of the delayed goods or services under the contract. The competent authority of the institute may also cancel the supply at the cost & liability of the supplier. In such a case, bid security of the supplier shall stand forfeited. The supply of equipment must be in single consignment, inclusive of all parts & accessories in adherence to the specification so as to make the equipment fully functional at the time of the installation. No installation repeat shall be signed in case of absence of any part as per the specification.

**42. Legal Jurisdiction:** -The Courts at Rishikesh/ Dehradun alone and no other Court will have the jurisdiction to try the matter, dispute or reference between the parties arising out of this tender/supply Order/contract.

**Applicable Law:**

43. The contract shall be governed by the laws and procedures established by Govt. of India, within the framework of applicable legislation and enactment made from time to time concerning such Commercial dealings / processing.

44. Any disputes are subject to exclusive jurisdiction of Competent Court and Forum in Rishikesh/Dehradun, Uttarakhand India only.

45. Except as otherwise provided under this Contract for immediate termination of the Contract, in the event of a disputes which may be arising out of the execution of the tender contract, the matter will be referred to the Deputy Director (Administration). Appeal against the decision of the DDA will lie to the Director, AIIMS Rishikesh and his decision shall be final and binding upon both the parties.

I / We hereby accept the terms and Conditions given in the tender

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*(Signature & Stamp of the bidder)*

*Note- Please sign each page of document including terms & conditions & tender*

**(B) Financial terms and conditions**

1. Rates are strictly required to be offered/quoted on the prescribed **“Financial Bid format”**. Financial bid submitted without prescribed format may not be considered and will be deemed improper subject to the condition that there is a requirement to mention other item which are not mentioned in the said format.
2. Rates quoted should be inclusive of all applicable taxes, packing, forwarding, postage and transportation charges at for AIIMS Rishikesh (Site of installation/Use). To sum up the rates should be quoted for establishment of complete cath lab. Rates should be mentioned both in figures and in words. The offer should be typed or written in Ink Pen/ Ball Pen without any correction. Offers in pencil will be cancelled. Telegraphic/ Telex/ Fax offers will not be considered and cancelled straightway.
3. The supplier has to submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that the bidder has not quoted the price higher than previously supplied to any government Institute/Organisation/reputed Private Organisation or DGS&D rate in recent past. Therefore, if at any stage it has been found that the supplier has quoted lower rates than those quoted in this tender; the Institute (the purchaser) would be given the benefit of lower rates by the Supplier and any excess payment if any, will become immediately payable to the AIIMS, Rishikesh. If such affidavit is not submitted, tender will be out rightly rejected.*(Part of technical bid)*
4. If the price of the contracted articles is/ are controlled by the Government, in no circumstances the payment will be higher than the controlled rate.
5. Tender will be regarded as constituting an offer open to acceptance in whole or in part at the discretion of the competent authority of the institute for a period of 180 days (6 months) valid from the date of opening of the tender by the committee.
6. The corrections made by using fluid and overwriting will not be accepted and tender would be rejected.
7. Tenderer shall have to provide complete warranty for all equipment’s for 5 (five) years & followed by CMC for 5 (five) years of the equipment’s and other items installed in the CCU. Financial bid should be quoted accordingly. In this regard, the tenderer shall submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that bidder will provide complete warranty for entire equipment’s installed in the Cath Lab for 5 (five) years & CMC for 5 (five) years of the entire items and equipment’s.
7. **Tender Currencies:**
  - a. The bidder supplying indigenous goods or already imported goods shall quote only in Indian Rupees. Further, imported goods to be imported and supplied by the bidder are also required to be quoted in Indian Rupees.
  - b. For imported goods, if supplied directly from abroad, prices shall be quoted in any freely convertible currency say US Dollar, Euro, GBP or Yen. As regards price(s) for allied services, if any, required with the goods, the same shall be quoted in Indian Rupees only, if such services are to be performed /undertaken in India.
  - c. Tenders, where prices are quoted in any other way shall be treated as non -responsive and rejected.
8. **Tender Prices:** While filling up the columns of the Financial Bid, the following aspects should be noted for compliance: -
  - I- ***For domestic goods or goods of foreign origin located within India, the prices in the corresponding Financial Bid shall be entered separately in the following manner: -***
    - a. The price of the goods, quoted ex-factory/ ex-showroom/ ex-warehouse/ off-the-shelf, as applicable, including all taxes and duties like sales tax, GST/CST/ VAT, CENVAT, Custom Duty,



Excise Duty etc. already paid or payable on the components and raw material used in the manufacture or assembly of the goods quoted ex-factory etc. or on the previously imported goods of foreign origin quoted ex-showroom etc.;

- b. Any sales tax or other taxes and any duties including excise duty, which will be payable on the goods in India if the contract is awarded;
- c. Charges towards Packing & Forwarding, Inland Transportation, Insurance, Loading/Unloading and other local costs incidental to delivery of the goods to their final destination as specified in the List of Requirements and Financial Bid;
- d. The price of Incidental Services, as mentioned in List of Requirements and Financial Bid;
- e. The prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Financial Bid; and
- f. The price of CMC **after warranty period**, as mentioned in List of Requirements, Technical Specification and Financial Bid.

**II- For goods offered from abroad, the prices in the corresponding Financial Bid shall be entered separately in the following manner: -**

- a. The price of goods quoted FOB port of shipment, as indicated in the List of Requirements and Financial Bid;
  - b. The price of goods quoted CIF port of entry in India as indicated in the List of Requirements and Financial Bid;
  - c. The price of goods quoted for delivery at AIIMS, Rishikesh as indicated in the List of Requirements, Financial Bid and Consignee List;
  - d. Wherever applicable, the amount of custom duty with CDEC applicable on CIF value on the goods to be imported;
  - e. The charges for Loading/Unloading, Inland transportation, Insurance and other local costs, Incidental cost to delivery of the goods from the port of entry in India to AIIMS, Rishikesh, as specified in the List of Requirements and Financial Bid;
  - f. The charges for Incidental Services, as in the List of Requirements and Financial Bid;
  - g. The prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Financial Bid; and
  - h. The price of annual CMC,after warranty period as mentioned in List of Requirements, Technical Specification and Financial Bid.
9. Additional information and instruction on Duties and Taxes: If the Bidder desires to ask for excise duty, sales tax/GST/CST / VAT/ CENVAT, Custom Duty, Service Tax, Works Contract Tax etc. to be paid extra, the same must be specifically stated. In the absence of any such stipulation the price will be taken inclusive of such duties and taxes and no claim for the same will be entertained later.

**10. Excise Duty:**

- a. If reimbursement of excise duty is intended as extra over the quoted prices, the supplier must specifically say so also indicating the rate, quantum and nature of the duty applicable. In the absence of any such stipulation it will be presumed that the prices quoted are full and final and no claim on account of excise duty will be entertained after the opening of tenders.

b. If a Bidder chooses to quote a price inclusive of excise duty and also desires to be reimbursed for variation, if any, in the excise duty during the time of supply, the Bidder must clearly mention the same and also indicate the rate and quantum of excise duty included in its price. Failure to indicate all such details in clear terms may result in rejection of that tender.

c. Subject to sub clauses (i) & (ii) above, any change in excise duty upward/downward as a result of any statutory variation in excise duty taking place within contract terms shall be allowed to the extent of actual quantum of excise duty paid by the supplier. In case of downward revision in excise duty, the actual quantum of reduction of excise duty shall be reimbursed to the AIIMS Rishikesh by the supplier. All such adjustments shall include all reliefs, exemptions, rebates, concession etc. if any obtained by the supplier.

11. **Sales Tax:** - If a bidder asks for sales tax/GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax to be paid extra, the rate and nature of sales tax applicable should be shown separately. The GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax will be paid as per the rate at which it is liable to be assessed or has actually been assessed provided the transaction of sale is legally liable to sales tax/ GST/CST / VAT/CENVAT, Service Tax and Works Contract Tax and is payable as per the terms of the contract.

12. **Octroi Duty and Local Duties & Taxes:** - Normally, goods to be supplied to Government departments against Government contracts are exempted from levy of town duty, Octroi duty, terminal tax and other levies of local bodies. However, on some occasions, the local bodies (like town body, municipal body etc.) as per their regulations allow such exemptions only on production of certificate to this effect from the concerned Government department. Keeping this in view, the supplier shall ensure that the goods to be supplied by the supplier against the contract placed by the AIIMS, Rishikesh are exempted from levy of any such duty or tax and, wherever necessary, obtain the exemption certificate from the AIIMS, Rishikesh. However, if a local body still insists upon payment of such local duties and taxes, the same should be paid by the supplier to the local body to avoid delay in supplies and possible demurrage charges and obtain a receipt for the same. The supplier should forward the receipt obtained for such payment to the AIIMS, Rishikesh to enable the AIIMS, Rishikesh reimburse the supplier and take other necessary action in the matter.

13. **Customs Duty:** In respect of imported goods offered from abroad, the bidder shall specify the rate as well as the total amount of customs duty payable with Custom Duty Exemption Certificate, if applicable, on the quoted goods in the Financial Bid. The bidder shall also indicate the corresponding Indian Customs Tariff Number applicable for the goods.

a. For transportation of imported goods offered from abroad, relevant instructions as incorporated shall be followed.

b. For insurance of goods to be supplied, relevant instructions as provided shall be followed.

c. Unless otherwise specifically indicated in this NIT document, the terms FCA, FOB, FAS, CIF, CIP etc. for imported goods offered from abroad, shall be governed by the rules & regulations prescribed in the current edition of INCOTERMS, published by the International Chamber of Commerce, Paris.

d. The need for indication of all such price components by the bidders, as required in this clause is for the purpose of comparison of the tenders by the purchaser and will no way restrict the AIIMS, Rishikesh right to award the contract on the selected bidder on any of the terms offered.

14. **Indian Agent:** - If a foreign bidder has engaged an agent in India in connection with its bid, the foreign bidder, in addition to indicating Indian agent's commission, if any, shall also furnish the following information:

a. The complete name and address of the Indian Agent and its Permanent Account Number as allotted by the Indian Income Tax authority.

b. The details of the services to be rendered by the agent for the subject requirement.

- c. Details of Service outlets in India, nearest to the AIIMS, Rishikesh to render services during Warranty and CMC period.

**Firm Price:-**

- a. Unless otherwise specified in the NIT, prices quoted by the bidder shall remain firm and fixed during the currency of the contract and not subject to variation on any account.
- b. However, as regards taxes and duties, if any, chargeable on the goods and payable, the conditions stipulated will apply.

15. **Conversion of tender currencies to Indian Rupees:** - In case the bid document permits the bidders to quote their prices in different currencies, all such quoted prices of the responsive bidders will be converted to a single currency viz., Indian Rupees for the purpose of equitable comparison and evaluation, as per the closing exchange rates established by the Reserve Bank of India for similar transactions, as on the date of 'Opening Date of Financial Bid'.

16. **Payment terms:** -If the supplier supplied the requisite item within stipulated time and installation is pending on the part of AIIMS Rishikesh on various reasons, up to 90 *per cent* payment against supply can be made by the AIIMS Rishikesh on the case wise only, but will not be considered as precedence in all cases.

**(A)Payment Term for Imported goods:** For imported goods payment shall be made in the following manner:

a) On shipment: 75 % payment of the contract price shall be paid 60 days after presentation of shipping documents { goods shipped shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the supplier in a bank in his country} and upon the submission of the following documents: -

- i. Four copies of Supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
- ii. Original and four copies of the clean, on-board Bill of Lading/ Airway bill, marked freight prepaid and four copies of non-negotiable Bill of Lading/Airway bill.
- iii. Insurance Certificate;
- iv. Certificate of origin by the chamber of commerce of the concerned country;
- v. Certificate of country of origin;
- vi. Manufacture's / Supplier's warranty certificate;
- vii. Manufacturer's own factory inspection report.

b) On Acceptance: 25 % payment would be made after satisfactory installation, commissioning, demonstration and training, if required on issuance of Inspection certificate by the AIIMS, Rishikesh.

**B) PAYMENT TERMS FOR INLAND GOODS**

(Seventy-five) 75% Payment of the contract price shall be paid on receipt of goods condition and upon the submission of the following documents: -

- (i) One Original and Four Copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount.
- (ii) Final Acceptance as per Inspection report issued by faculty.
- (iii) Two copies of packing list identifying contents of each package.
- (iv) Inspection Certificate issued by the user concerned department.
- (v) Final Acceptance Certificate issued by the Institute

**On Acceptance: -**

- (i) Balance Twenty-Five (25) % payment would be made against 'Final Acceptance Certificate' as per Para (B) (i) &(v) of goods to be issued by the consignee's subject to recoveries, if any, either on account of non-rectification of defects/deficiencies not attended by the Supplier or otherwise.

17. **Guarantee / Warrantee Period:** The Tenderers must quote for 5 years' comprehensive warranty (Including all Spares, Accessories software application, if any and Labour) from the date of completion of the satisfactory installation. The warranty charges shall not be quoted separately otherwise the offer shall be summarily rejected. Also the bidders are requested to submit their quote (Rates) for subsequent 5 years Comprehensive Maintenance Contract (CMC) (Including All Spares, Accessories software application, if any and Labour). Failure to comply this condition will entail the rejection of the bids. The price comparison shall be taken into account on basic price and post warranty CMC.

18. **Custom Clearance:** For the Goods to be imported and supplied, the Institute will provide Custom Duty Exemption Certificate (CDEC) to successful bidder for availing concessional rate of duty as per prevailing Custom Tariff. In case, the bidder requires CDEC certificate, then the same should be specifically mentioned in the bid. The supplier is solely responsible for getting the material clearance from customs. Institute will provide all custom documents for custom clearance on the demand of supplier. The supplier undertakes to fully co-operate to avoid any fine, demurrage or other charges and shall indemnify AIIMS Rishikesh in case of any such failure. Transportation of goods up to AIIMS, Rishikesh and its successful installation and commissioning demonstration (and training, if required) is also the responsibility of the supplier. All charges/ expenses incurred in this process will be borne by the supplier and after submission of deposit slips of custom clearance and transportation charges will be reimbursed to the supplier if said provisions are to be shown separately in the financial bid.

19. **L1 Clause:** *L1 will be decided on the basis of total cost of equipment in addition to CMC value of 5 years and turnkey cost, where applicable including all applicable taxes at time of financial bid evaluation of individual equipment. The rates should be quoted separately in .pdf formt*

NO DEMURRAGE / WHARFAGE CHARGES WILL BE PAYBALE BY THE INSTITUTE UNDER ANY CIRCUMSTANCES. NO ADVANCE PAYMENT WILL BE PAYABLE FOR CUSTOM CLEARANCE/ FREIGHT/INSURANCE ETC

**Note: In case of any dispute regarding award of tender, decision of AIIMS Administration would be final.**

I / We hereby accept the terms and Conditions given in the tender

-----  
(Signature & Stamp of the bidder)

*Note- Please sign each page of document including terms & conditions & tender*

**Establishment of TB Laboratory at AIIMS, Rishikesh**

**TECHNICAL BID**

**(In separate sealed Cover-I super scribed as “Technical Bid”)**

1. Name & Address of the manufacturer and their authorised dealers/ distributors/Agency with phone number, email, name and telephone/mobile	
2. Specify your firm/company is a manufacturer/ authorised dealer/ distributor/ Agency	
3. Whether the signature on each page has been made by the of bidder or not.	
4. Name, Address & designation of the authorized person (Sole proprietor/partner /Director)	
5. Have you previously executed CCU/ICU works to any government/ reputed private organization? If yes, attach the relevant poof thereof.	
6. Please provide a notarised affidavit on Indian Non Judicial stamp paper of Rs. 10/- that you have not quoted the price higher than previously supplied to any government Institute/Organisation/reputed Private Organisation or DGS&D rate in last one year. If you don't fulfil this criteria, your tender will be out rightly rejected.	
7. Please attach copy of last three years' of Income Tax Return	
<b>8. Turnover</b> a. Please attach balance sheet (duly certified by Chartered Accountant) for last three (3) years (Attach copy of average minimum turnover for three years should not be less than 10 crores duly certified by the Chartered Accountant) b. The bidder falls under Section 44AD/44ADA/44AE of Income Tax Act shall be required to submit turnover certificate verified by Chartered Accountant with his Registration number issued by Institute of Chartered Accountants of India. c. Indian Agent can submit its copy of POs of LC cases, in support of its amount getting short in required turnover. d. Start-ups may submit its Start-up Registration for consideration ( <i>Relaxation in turnover can be considered as the case may be, subject to fulfilment of other conditions. However, it will not mandatory</i> )	
9. PAN No. (Please attach copy)	
10. GST/VAT/Service Tax Registration Number. (Please attach copy)	
11. Acceptance of terms & conditions attached (Yes/No). Please sign each page of terms and conditions as token of acceptance and submit as part of tender document with technical bid. Otherwise your tender will be rejected.	
12. Power of Attorney/authorization for signing the bid documents (Not required in case of sole-proprietorship.)	
13. Please submit a notarised affidavit on Indian Non judicial stamp paper of Rs. 10/- that no case is pending with the police against the Proprietor/firm/partner or the Company (Agency). Indicate any convictions in the past against the Company/firm/partner.	
14. Please declare that proprietor/firm/company has never been black listed/debarred by any organization. An oath certificate to this effect may be enclosed on Rs.10 notarised stamp paper.	
15. Please submit a notarised affidavit on Indian Non Judicial Stamp Paper of Rs.10/- that they will provide complete warranty for all equipment's/items for 5 (five) years followed by CMC for further 5 (five) years of these equipment's/items.	
16. Please furnished a notarised affidavit on Indian Non judicial stamp paper of Rs.10/- that they will supply spare parts for next 10 years at reasonable price by submission of suitable benchmarks.	
17. Please submit two performance certificate from your two different customers to whom you have supplied such type of equipment in previous 3 years	
18. Details of the FD/DD/TD/CD of bid security (EMD)  FD/DD/TD/CD No:  Date:  Payable at-	Detail of cost of Tender for Rs. 1180/- (if downloaded from website) <b>DD No.</b> <b>Date:</b> <b>Payable at-</b>

**Undertaking**

1. I/We have read and understood the contents of the Tender and agree to abide by the terms and conditions of this Tender.
2. I/We shall supply the items of requisite quality and quantity at given rate in timely manner.
3. I/We also confirm that in the event of my/our tender being accepted, I/we hereby undertake to furnish within 15 days, Bank Guarantee/ Performance Security after the issue of Purchase Order, as applicable, in the format to be provided by AIIMS Rishikesh in addition to execution of a Contract as pre-condition for obtaining the supply orders.
4. I/We further undertake that none of the Proprietor/Partners/Directors of the firm was or is Proprietor or Partner or Director of any firm with whom the Government have banned /suspended business dealings. I/We further undertake to report to the AIIMS Rishikesh immediately after we are informed but in any case not later 15 days, if any firm in which Proprietor/Partners/Directors are Proprietor or Partner or Director of such a firm which is banned/suspended in future during the currency of the Contract with you.
5. I/We undertake that the information given in this tender are true and correct in all respect and I/We hold the responsibility for the same.

(Signature of the Bidder)

Name:

Designation with Seal of the Firm:

**“Establishment of Tb Lab”**

**AIIMS, Rishikesh**

**Chapter-II (Schedule of requirements& EMD)**

**Table-I**

**Details of items & their tentative quantity and EMD**

**The following work of Establishment of complete Cath Lab on turnkey basis manufactured by Indian/International firms/agencies of repute are required.**

<b>S.No.</b>	<b>Item</b>	<b>Quantity</b>	<b>EMD</b>
1	establishment of TB laboratory	01 Nos.	INR 10,00,000/-

**MANUFACTURER's / PRINCIPAL's AUTHORIZATION FORM**

(Clause 11 (c) of **other terms and conditions** of the tender)

To

The Administrative Officer,  
All India Institute of Medical Sciences  
Rishikesh

Dear Sir,

TENDER: \_\_\_\_\_.

we, \_\_\_\_\_, who are established and reputable manufacturers of \_\_\_\_\_, having factories at \_\_\_\_\_ and \_\_\_\_\_, hereby authorize Messrs. \_\_\_\_\_ (*name and address of agents*) to bid, negotiate and conclude the contract with you against Tender No. \_\_\_\_\_ for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per the conditions of tender contract for the goods offered for supply against this tender by the above firm.

The authorization is valid up to \_\_\_\_\_

Yours faithfully,

(Name)

For and on behalf of Messrs. \_\_\_\_\_  
(*Name of manufacturers*)/Principal.



AIIMS Rishikesh tender Enquiry No. F.No 24/TB Lab/301/2017-RISH (ADMN)  
**BANK GUARANTEE FORM FOR PERFORMANCE SECURITY/ CMC**  
**SECURITY**

To

**The Administrative Officer**  
All India Institute of Medical Sciences  
Rishikesh,  
Virbhadra Marg,  
Rishikesh-249201

WHEREAS \_\_\_\_\_ (Name and address of the supplier) (Hereinafter called “the supplier”) has undertaken, in pursuance of contract no \_\_\_\_\_ dated \_\_\_\_\_ to supply (description of goods and services) (herein after called “the contract”). AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognised by you for the sum specified therein as security for compliance with its obligations in accordance with the contract; AND WHEREAS we have agreed to give the supplier such a irrevocable bank guarantee;

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you unconditionally, on behalf of the supplier, up to a total of \_\_\_\_\_ (Amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of you to first demanding the said amount of guarantee from the supplier before raising the demand with us. You may directly raise the demand with us, without asking the supplier for the same.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee will not be changed due to change in the constitution of the bank or the supplier.

This guarantee shall be valid up to 65 months from the date of satisfactory installation of the equipment i.e. up to --  
----- (indicate 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

**TECHNICAL SPECIFICATIONS FOR TB LABORATORY**

- 1. SCOPE OF WORK** The Scope of work shall comprise ‘Detailed Design, Construction and Establishment of secondary containment and associated works for TB laboratory at All India Institute of Medical Sciences Rishikesh on ‘Turnkey Basis’ in accordance with the Fifth edition of BMBL Guidelines issued by the U.S. Department of Health and Human Services, CDC, USA’ including Testing, Commissioning and Validation of the facility.

**1.1. Principal standards:**

Biosafety in Microbiological and Biomedical Laboratories (BMBL– 5th Edition)

Tuberculosis laboratory biosafety manual, WHO, 2012.

**Reference Standards:**

EN12128 -1998, Biotechnology- Laboratories for research development and analysis.

EN12738-1999, Biotechnology Laboratories for research, development and analysis.

NIH Guidelines for research involving recombinant DNA molecules (Jan 2001)

Regarding Civil, Electrical and Mechanical latest relevant International Standards shall be applicable.

- 1.2. The scope under the contract shall cover and include the following works to be executed by the Contractor on ‘Turnkey Basis’:

1.2.1. **Preparation and submission of Detailed Design & Engineering** including preparation of working drawings for internal construction and finishing work, Plumbing System and associated area drawings, Electrical power distribution SLD and Panel GA drawings, Electrical light, power, data & voice Layout, FDA system drawing, HVAC System details and drawings, Door Interlock and Access Control system details and drawings, Shower System, CCTV system details and drawings, Building Management System details and drawings, Furniture Layout plan, construction drawings and details of shed for effluent decontamination system and CO2 cylinder bank and details and other required and associated systems and services for the proposed secondary containment and associated works for TB laboratory.

1.2.2. Submission of Technical Data Sheet, Catalogues and Literatures for equipment including Autoclave, Bio-Safety Cabinet, Pass Box, Air Handling Units, Chiller, Compressors, Exhaust Blower, CCTV system, Access Control system, other instruments as mentioned in annexure A etc.

1.2.3. Submission of any other relevant drawing and technical details considered essential and required for successful completion of the works and asked by the employer.

1.2.4. The executing agency/contractor shall submit the working drawings, technical literature, brochure, literature, technical specifications and other details, sufficiently in advance for approval of the Employer, giving sufficient time for its review. The work shall be taken up only after approval of the drawings and specifications.

1.2.5. Supply and erection of materials, items and equipments/s for execution and completion of internal construction and finishing work, construction of shed for effluent decontamination system and CO2 cylinder bank, Electrical and associated works, HVAC work, BMS work, systems and services etc. required as per approved designs and drawings.

1.2.6. Supply and installation of equipment’s and systems shall be done by the executing agency.

- 1.2.7. The Employer reserves the right to do changes in the given layout plan or change the quantities of fittings and fixture. All such changes shall be incorporated and the work shall be executed by the contractor without any additional cost.
- 1.2.8. Site preparatory works including dismantling/demolition of existing walls, clearance of malba, making opening in walls and any other ancilliary work required to complete the works. The contractor shall take all precautions not to damage any part of the remaining building and the structure. All the opening and dismantling works required for the execution of the works shall be repaired by the contractor in good condition at no extra cost.
- 1.2.9. Additional two or three or more electrical point of suitable capacity must be provided for future expansion or addition of additional equipments in various area of laboratory and this must be mentioned in the detailed drawing by the vendor.
- 1.2.10. Location of equipment to be placed needs to be provided in the detailed drawing by the vendor.
- 1.2.11. Price quotes for turnkey project should provide breakup for following :
- secondary containment laboratory (Biocontainment laboratory 3) lab
  - ASSOCIATED MOLECULAR & Other WORKS AREA
  - Instruments cost individually mentioned
  - Warranty annually for 5 years and CMC annually for subsequent five years for
    - secondary containment laboratory (Biocontainment laboratory 3) lab
    - ASSOCIATED MOLECULAR & Other WORKS AREA
    - Equipment's/instruments
  - Tax etc as required in general condition of tender
  - Total cost of turnkey project
  - Optional items cost (Warranty annually for 5 years and CMC annually for subsequent five years
- 1.2.12. Testing and commissioning of all the equipment/s, items, systems and services supplied and installed in the Laboratory Facility and Validation of the BSL-3 Laboratory as per the BSL-3 Laboratory Certification Guidelines of NIH, USA in the presence of representative/s of Employer and submission of compiled report.
- 1.2.13. Preparation and submission of 3 sets of AS BUILT DRAWINGS, OPERATION & MAINTENANCE MANUAL AND INSTRUCTION' for the complete installation and 'BIO-SAFETY MANUAL' for the BSL-3 Lab.

**2. Design Basis**(detailed plan need to be submitted by vendor for approval)

**2.1.** Overall secondary containment laboratory (BSL 3 Lab) Area (Sq. Ft. ) 32.5ft x 23ft = 750 Sq. feet approx.

Main Lab Area -	450 Sqft Approx.
Air Lock Entry	25 Sqft Approx
Air Lock Exit	25 Sqft Approx
Change Room	80 Sqft Approx.
Shower in/out	25 Sqft Approx.
Autoclave facility	45 Sqft Approx.
Corridor	100 Sqft Approx
Overall Height	8.0 feet

## 2.2. ASSOCIATED MOLECULAR & Other WORKS AREA (Approx. 950 square feet currently divided into 4 rooms and small corridor area)

Need to be divided into following area:

- Extraction Area ( DNA and RNA Extraction)
  - Master Mix and Reagent Preparation Area
  - Hybridization and Amplification Area
  - Post amplification analysis area
  - Air Lock to Amplification and Hybridization Area
  - Media preparation room
- The construction material shall be modular PUF Sandwiched panels 40mm thick and modular walkable PUF sandwiched ceiling 60mm thick.
  - Modular Doors with viewing double glass flushed honey comb PUF sandwiched.
  - Modular furniture MS powder coated with Granite Bench Top
  - Modular cupboard spaces below the bench top.
  - Individual Re-circulatory air conditioning system for the associated areas .
  - Water supply and drainage system at desired locations.
  - Necessary clean Room flushed lighting including UV lights
  - Epoxy Flooring 3mm

**2.3. Laboratory Area:** The proposed Laboratory Layout design for secondary containment laboratory (BSL 3 Lab) Area is enclosed. The Laboratory space shall consist of one main lab, one set change room, ante room (Entry and Exit), Shower in/out and Autoclave section. The layout will be amended if required (only with prior approval) for better utilization of the available space to increase the laboratory area in B4 area 1<sup>st</sup> floor. Vendor may approach Head, department of Microbiology, AIIMS Rishikesh for showing the area allotted for construction & preparation of detailed layout plan for secondary containment laboratory (BSL 3 laboratory) and associated molecular work & other area. Detailed plan for both area needs to be submitted by the vendor at their own expenses in the tender document (including electrical points, air and water system, biosafety for both secondary containment laboratory (BSL 3 laboratory) and associated molecular work & other area for effective utilization of space and cost). Any accessory material which needs to be installed outside the laboratory area has to be installed at top of building or away from building without bad shaping exterior of institute and with written permission and approval of drawing for all necessary alteration.

### 2.3.1. secondary containment laboratory (BSL 3 Lab) Area

#### 2.3.1.1. Controlled Area –

- BSL-3 Main Laboratory: 23 ft x 10.5 ft + 11 ft x 11.5 ft
- Change Room: 10.5 feet x 5 feet + 5 feet x 5 feet
- Ante Room Entry: 5 feet x 5 feet
- Ante Room Exit: 5 feet x 5 feet
- Autoclave section: 7.5 Feet x 6 feet

#### 2.3.1.2. Uncontrolled Area –

- Outer Gallery: 13 feet x 7.5 feet
- Eye wash and Emergency Shower: 5 feet x 5 feet.

**2.4. Pressure Gradient** - The following pressure gradient condition shall be maintained in controlled areas of the laboratory.

- BSL-3 Main Laboratory: Operating pressure: -30 Pa.
- Ante Room (Entry/Exit): Operating pressure: -15 Pa.
- Change Room: Operating pressure: -10 Pa.
- Outer corridor : Operating Pressure: Atmospheric Pressure

**2.5. Temperature and Humidity** -

- The following temperature and humidity conditions shall be maintained.
- Inside Temperature :  $23.0 \pm 2.0^{\circ}\text{C}$
- RH :  $55 \pm 5\%$
- ACPH:  $\geq 12$  ACPH (Air Changes Per Hour)

**2.6. Cleanliness:**

- Controlled Area: Class 100,000.
- Uncontrolled Area: Nil.

**2.7. Lighting:** Light – 1.5 w per ft<sup>2</sup>

### 3. TECHNICAL SPECIFICATIONS

#### 3.1. INTERNAL CONSTRUCTION & FINISHES AND other WORKS

- 3.1.1.** All the internal partition walls and ceiling construction in BSL-3 laboratory and support areas shall be carried out with prefabricated, non-particle shredding panels in Powder Coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish. The existing external brick walls shall be provided with cladding from inside with similar prefabricated wall panels. The Flooring shall be carried out in 3 mm Self Leveling Epoxy, in approved shade.
- 3.1.2.** The internal partition and ceiling panels shall be able to withstand negative pressure of upto -100 Pa, without any sag or buckling. The ceiling shall be walkable type for access of services above for maintenance purpose.

#### MODULAR WALL PANELS

- Minimum 40 mm thick prefabricated modular wall panels with Powder Coated GSS sheet of 0.8 mm thickness on both sides
- Bonded with PUF insulation having density of  $35\text{-}40\text{kg/m}^3$  in-between both side of sheets
- All joints shall be sealed with RTV (Silicone) sealant
- Wall panels shall have provision of electrical conduit, pre inserted in panels, to run electrical wires and cables.
- The conduits shall be sealed with silicon sealant after completing installation of electrical wires and cables.

#### CEILING PANELS

- Minimum 60 mm thick Walkable ceiling panels- Powder Coated GSS sheet of 0.8 mm thickness on both sides
- Ceiling panels shall be monolithic with minimum number of joints
- Bonded with PUF density of  $35\text{-}40\text{ kg/m}^3$  in-between both side sheets.
- All the joints shall be sealed with RTV (Silicone) sealant
- The ceiling panels shall be in the installed in uniform manner and there should be no over lapping of panels

- The ceiling panels shall be provided with uniform and symmetrical cutouts for supply air and return/exhaustair diffusers

## **VIEW PANEL/WINDOW**

- View panels/window frame work shall be made in similar construction as partition panels and shall be installed flushed with the wall panel.
- The view panels shall be double glazed type and shall be in size 1000 mm × 1000 mm (or as required) in the wall partitions.
- The view panel glazing shall be in 8 mm thick toughened glass on both sides and shall be fully glued fit and sealed along with desiccant to avoid condensation
- The view panels/window frame and glass panel glazing shall be perfectly sealed not to allow any ingress of air, due to negative pressure.

**3.1.3.** Wall and ceiling corners shall be provided with R75 radius aluminium coving in same shade as of wall panels. Wall to floor corners shall be provided with epoxy coving in same or approved colour top coat and in same radius as of aluminium coving provided for wall to wall and wall to ceiling coving.

**3.1.4.** Flooring shall be in 3 mm Self-level epoxy in approved shade, complete with base coat, sealer coat and 3mm top coat in self-levelling epoxy.

**3.1.5.** The wall and ceiling surface finish shall provide impervious, monolithic, chemical resistant (organic solvents, acids and alkalis), antibacterial and antifungal finish and shall sustain Formalin/H<sub>2</sub>O<sub>2</sub> fumigation of lab spaces.

**3.1.6.** The Door Frames and Shutters in laboratory and support area shall be in metallic construction and factory pre-painted/powder coated in chemical resistant finish. The doors shall be provided with lip gaskets on top and sides and drop down gasket at the bottom. Doors shall be provided with approx. 300 mm × 600 mm vision panel with double glass in 5 mm thickness, both sides installed flushed with the door surface.

**3.1.7.** The doors shall be provided with heavy duty door closer, stainless steel kick plate on outer side and Stainless Steel handle. The doors shall be provided with Key-Lock, except for doors inside the BSL-3 Laboratory area.

**3.1.8.** The Door Frames and Door Shutters of the Biosafety Doors (BD) shall be constructed in stainless steel 304 (16 gauge).

**3.1.9.** The Biosafety Doors of fumigation airlock and BSL-3 Lab shall be Air-Tight Doors, provided with inflatable gaskets, connected to compressed air line from the air compressor, to ensure perfect sealing when in closed position. The inflatable gaskets shall be interlocked with the door interlock system such that when the door is closed, the gasket should inflate and seal the door and when the door release button is pressed, the gasket should deflate to allow opening of the door. The doors shall be provided with sealed vision glass and shall be complete with door closers and SS handles.

**3.1.10.** To minimize penetrations in the ceiling, service pendant/s manufactured in SS 304 (18 gauge) shall be provided for connecting services like steam, water and compressed air inside the BSL-3 Laboratory. The ceiling pendant penetration shall be perfectly caulked and sealed with Epoxy Sealant not to allow any ingress of air, due to negative pressure.

**3.1.11.** All the joints and penetrations in the BSL-3 Laboratory area shall be perfectly sealed with Epoxy Sealant and made leak proof not to allow any ingress of air, due to negative pressure.

- 3.1.12.** Floor traps/U-traps in BSL-3 Lab area shall provide double pass and shall have minimum 2” W.C head. The effluent drainage piping from the BSL-3 Lab shall be in chemical resistant material like HDPE with all joints welded and tested to be leak proof. The drain lines from the Containment area shall be segregated from drain lines of other areas.
- 3.1.13.** Each BSL-3 Lab room shall be provided with stainless steel sink with hands free tap and emergency eye wash station. Water distribution piping in High Containment area shall be provided in polypropylene and shall be provided with non-return valve/backflow prevention device.
- 3.1.14.** Water distribution piping for water supply to the BSL-3 Laboratories and support areas, through existing overhead water tanks after verifying (by vendor) its suitability for various area of secondary containment facility (BSL-3) laboratory and molecular and other associated areas. Quotes are to be provided separately for additional 1,000 Ltrs. overhead water storage tank in HDPE in case of non-suitability existing water storage system (to be determined by vendor after testing water supply) or non-availability of storage system from the existing water supply to area.

### **3.2. HVAC SYSTEM AND BUILDING MANAGEMENT SYSTEM**

The proposed BSL-3 Laboratory, and Associated Molecular & Other Works Area shall be air conditioned through a separate dedicated Central AC System comprising of Chiller Pack, Air Handling Units, Exhaust System, Air Filtration System and Air Distribution System complete in all respect. The system shall be with standby and backup provisions capable to provide uninterrupted continuous 24x7x365 days operation of BSL-3 Lab and associated areas to maintain the required temperature, humidity, air-change rate, differential pressure gradient and air filtration conditions of the Laboratory Facility. The contractor shall submit the HVAC system and BMS design and working drawings for prior approval. The HVAC system shall comply with the given specifications and performance requirements and shall be complete in all respect, as required and approved. The following design and performance conditions shall be maintained in the BSL-3 Laboratories:

- Inside Temperature: 23 +/- 2° C
- Relative humidity : less than 60%
- Negative Pressure gradient : As per tender zoning plan
- ACPH in BSL-3 Lab : More than 12
- Filtration: HEPA Filter Supply Air in BSL-3  
HEPA Filter Exhaust Air in BSL-3 (BIBO)
- Ventilation: 100% FA system for BSL-3  
70% Re-circulatory, 30% exhaust in Other areas with Re-circulatory system
- Exhaust Fan location for BSL-3 : Minimum 25 ft from AHU intake
- Air velocity at exhaust discharge : 15-20 m/s (3000-4000 fpm) for BSL-3

3.2.1. Air Conditioning Plant(**Price Quote must be given separately as an optional in price bid**): The air-conditioning plant shall provide enough flexibility in operation such that selective areas of the facility can be operated, to economize the operating costs.

Chiller Pack:

The Chiller Pack shall be skid mounted with Air Cooled Condenser, Evaporator/Chiller, Micro-processor control panel, interconnecting control and power wiring, refrigerant charge etc. complete in all respect. To economize the operating cost and provide backup capacity, the chiller pack shall have multiple compressors.

The Chiller Pack unit shall be completely factory assembled including:

- Evaporator
- Air cooled Condenser
- Oil separator
- Hermetically sealed Compressors (Screw/Scroll)
- Compressor Motor • Microprocessor based control panel
- Inter connecting refrigerant piping, wiring and other accessories
- Refrigerant
- Chiller Pack mounted on sturdy MS painted base frame
- Anti-vibration mounts/pads

Chilled Water and Hot Water Piping System:

Chilled water and hot water piping system shall be provided in accordance with ASHRAE standards. The piping shall be carried out in heavy class MS ERW pipes conforming to IS 1239 for pipe size upto 150 mm dia and IS 3589 above 150 mm dia pipes. The joints in the water piping system shall be welded as per IS 823.

The piping system shall be complete with required butterfly valves, ball valves, balancing valves as per IS 780, IS 5152 and IS 5155. Non-return valves as per IS 778 & IS 5312

- Valves shall be suitable for upto 15 Kg working pressure
- Non return valves shall be disc type
- Strainers shall be provided (Y type/ pot strainers)
- Strainers should have bronze screen with 3 mm perforations
- Strainers should be provided on the inlet side of each pump
- Piping, fittings and supports shall be painted with red oxide primer
- The flow-direction shall be visibly marked with arrows
- Pressure Gauge and Thermometers at AHU's & pump inlet and outlet
- Non return valve shall be provide at chilled water, hot water & shower pumps
- The Piping shall be tested to hydrostatic test pressure of at least 2 ½ times the maximum operation pressure but not less than 8 kg per sq.cm gauge for a period of not less than 24 hrs. The pressure testing shall be done before application of insulation.

The piping shall be insulated with 50 mm thick expanded polystyrene insulation or 25 mm thick Class 'O' closed cell nitrile foam insulation with aluminium cladding.



Hot Water Generator: Hot water generator shall be provided for winter heating and reheating. The hot water generator shall be electric water heater consisting of a vertical tubular shell, closed to both the ends with bolted end covers. The shell shall be fabricated from M.S. sheet and joints shall be welded. The construction shall conform to the BIS standards/international standards. It shall be designed for a working pressure of 21 Kg/cm<sup>2</sup> and tested accordingly

**Chilled Water and Hot Water Pumps:**

Chilled water and Hot Water pumps shall be Mono-block Type in 1+1 configuration (1 working + 1 standby). Installation of pumps shall be done on a common MS base frame grouted to concrete foundation

The pumps shall conform to following specifications:

Casing : Cast iron

Impeller : Bronze

Shaft : carbon steel to EN 8

Mechanical seal : Carbon / ceramic face

Motor : TEFC squirrel cage induction motor,

Power supply : 415V +/- 10% / 3Ph/50Hz

Pump Duty : As required

Base plate : Cast iron /MS fabricated

**3.2.2. Air Handling Units :**

The Air Handling Units shall be Double Skin type and shall be complete with blower, motor, drive set, cooling coil, filter section, drain tray etc. complete in all respect. The Air Handling Units shall be floor mounted type installed on civil foundation with vibration isolation pads. To ensure un-interrupted operation, AHU with twin blower shall be provided for supply air to BSL-3 in manifold arrangement, with n+1 redundancy. The capacity of Air Handling System of BSL-3 Lab shall be 10% higher than the designed required capacity.

AHU Casing: AHU Casing shall be made of minimum 25 mm thick PUF sandwich panels. The outer wall should be of galvanized sheet, chemically treated having scratch free pre plasticized coating and plain GI inner sheet. In-fill shall be with PUF insulation having density 35-40 kg/m<sup>3</sup> fixed on modular frame. The frame work shall be in extruded aluminium sections with thermal break to avoid condensation/sweating The AHU should be provided with electric power /control junction box on external side of the unit.

Fan section: The Fan Section shall have SISW type, multi blade type Fan / Blower. The Fan / Blower blades shall be made of treated heavy gauge steel treated. The fans should be statistically and dynamically balanced and should have AMCA approval.

Cooling coils and heating coils: Coils shall be constructed in 12.5 - 15mm dia copper tubes, 24 gauge thickness with aluminium fins (at least 12 fpi) firmly bounded to copper tubes assembled in zinc coated steel frame. Air velocity across the coil should not exceed 500 fpm. The coil shall

be factory tested at 21kg/sq.cm air pressure. The cooling coil shall be 8 RD for 100% FA system and 6 RD for re-circulatory system.

Filter section: The Filter Section shall be same as that of AHU casing. The Filter section shall be complete with Filters of 5 micron and 0.5 micron particulate size.

Dampers: AHU shall be complete with OPEN/CLOSE Dampers and Fire Dampers. The dampers shall be opposed blade type. Blades shall be made of double skinned aero foil aluminium sections with integral gasket and assembled within extruded aluminium alloy frame. All linkages and supporting spindles should be made of aluminium or nylon. Spindle shall be provided with a bakelite knob for locking the damper blades in position. The OPEN CLOSE dampers shall be provided with compatible motor actuator.

Motor and Drive: Fan motors shall be flame proof and suitable for 415V+/-10%, 50Hz, 3 phase, AC supply. Motor shall be squirrel cage TEFC motors. Motors shall be designed for quiet operation. Drive to fan shall be provided through belt-drive with a standard belt guard housing the bolt and adjustable motor sheave.

AHU Drain piping : AHU drain piping shall be carried out in GI upto the nearest drain traps complete as required. The drain pipes shall be insulated with 12 mm thick closed cell nitrile foam insulation.

AHU Controls: Three way mixing valve with actuator and limit switch for AHU access doors shall be provided complete with power and control wiring.

### 3.2.3. Exhaust System:

The exhaust system of the BSL-3 Laboratory shall comprise of High Static Exhaust Blowers, SISW type, backward curve, complete with motor, drive set, vibration isolation pads, OPEN/CLOSE damper and other fittings and accessories. The Exhaust System shall be provided with redundant backup (1 w+1 s) to ensure un-interrupted operation (24x7x365 days) of the Laboratory. The capacity of the selected Exhaust Blowers shall be 10% higher than the designed required capacity.

The other associated area of Laboratory shall be provided with normal exhaust system complete with Exhaust Blowers, SISW/DIDW type, backward curve, motor, drive set, vibration isolation pads, OPEN/CLOSE damper and other fittings and accessories.

### 3.2.4. Air Filtration System

BSL-3 Lab Supply Air : Three stage air filters shall be provided

- The first stage shall be for 5 micron particulate size, 90% efficiency
- Second stage shall be for 0.5 micron particulate size, 99.9% efficiency
- Third stage shall be for 0.3 micron particulate size HEPA Filters, 99.97% efficiency

BSL-3 Lab Exhaust Air (BIBO )-HEPA Filter, 0.3 micron particulate size, 99.97% efficiency

The system for BSL-3 Lab shall be designed and configured to provide multiple HEPA Filter bank to permit un-interrupted round the clock (24x7x365 days) operation of the BSL-3 Laboratory including during HEPA filter maintenance, replacement and/or change.

The HEPA filters shall be of micro-fibreglass filter media mini pleated type and shall be capable to withstand corrosive agents and gases used for lab fumigation. The HEPA filters shall have minimum 99.97% efficiency for 0.3 micron particulates. The HEPA filters shall be HOT DOP tested at the manufacturer's works, before supply at site, as per ASTM D 2986-71, US-MIL STD 282 to validate the filter efficiency.

The HEPA filter plenums shall be made in SS 304 (14 gauge) with air tight and leak proof construction. The HEPA filter plenums shall have provision to carry out on site HEPA filter scanning, testing and validation, pressure sensors 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 of filters.

### 3.2.5. Supply and Exhaust Air Ducting

#### BSL-3 Laboratory Ducting:

The ducting from AHU upto supply air HEPA Filter Plenum and from exhaust air HEPA Filter Plenum upto Exhaust Blower shall be carried out in GI sheet (class VIII with zinc coating of 120 gm/ sq.m.)

The ducting after supply air HEPA Filter Plenum upto BSL-3 Laboratory rooms and exhaust air ducting from BSL-3 Laboratory rooms upto the Exhaust Air HEPA filter plenums shall be carried out in welded Stainless Steel and shall be leak proof.

All duct fabrication work, thickness of sheet metal, supports, hangars shall conform to SMACNA standards.

Supply air ducting insulation – 19 mm thick Al. faced closed cell nitrile foam.

Exhaust air ducting insulation 13mm thick Al. faced closed cell nitrile foam

Volume Control Dampers, Fire dampers, air diverting vanes shall be provided in the supply and exhaust air ducting, as per the requirements, and ASHRAE standards and approved design. Each BSL-3 Lab room/zone supply and exhaust air duct shall be provided with gas tight Isolation Damper to allow isolation of the room/zone and carry out selective decontamination/fumigation. The exhaust system of BSL-3 Laboratory shall be provided backdraft / non-return damper.

### 3.2.6. Pressure Adjustment and Control System:

The BSL-3 Laboratory area/zone Pressure shall be PLC Controlled through VAV's and VFD's, to automatically balance the negative pressure fluctuations in the BSL-3 Laboratory rooms/zones caused due to varying conditions like opening of doors, operation of BSC's etc. for continued maintenance of the differential pressure gradient.

The AHU motor and Exhaust Blower motors shall be provided with Variable Frequency Drive (VFD). The Adjustment, Control and Monitoring system of the BSL-3 Laboratory room/zone pressures shall be provided through the BMS.

### 3.2.7. Fire Dampers :

Fire Dampers provided in the supply and exhaust air systems shall be interlocked with the AHU blower motors such that in case of fire, the AHU fan motor should trip automatically

3.2.8. Alarms :

The system shall be provided with following alarms:

HVAC system failure alarm

Room/zone pressure failure alarm

3.2.9. Canopy Hood:

Canopy hood shall be provided above the loading / unloading door of the Autoclave to capture steam vapor and heat generated by equipment and above aerosol generating equipment's like centrifuges

The canopy hood on the containment side shall be ducted and connected to the HEPA filtered laboratory exhaust and on non-containment side shall be ducted and connected to normal exhaust. The Canopy hood exhaust air capture velocity shall be minimum 50 fpm.

**3.3. BUILDING MANAGEMENT SYSTEM**

A customized Building Management System shall be designed, programmed and provided to control and monitor the operation of HVAC system and other laboratory operating parameters in the BSL-3 Lab rooms/zones like

- Room/Area/zone pressure
- Room/Area/zone temperature & RH
- Ambient temperature & RH
- AHU and Exhaust Blower operating status
- VFD status & VAV status
- OPEN/Close dampers status
- Supply & exhaust air quantity in each BSL-3 Laboratory rooms/zone.

The supply and exhaust air duct of each BSL-3 Lab Rooms/Area shall be provided with VAV device with flow measurement sensor for adjustment and balancing of the desired supply and exhaust air quantities. The Air Handling Units and Exhaust Blowers shall be provided with Variable Frequency Drives (VFD's). The VAV's and VFD's shall be controlled to maintain the set laboratory inside pressure conditions through BMS Program.

The Building Management System shall allow START/STOP operation of the Complete HVAC system in AUTO Mode. However, the system shall have the provision to override the parameters (password protected) and to enable START/STOP operation of the HVAC system in MANUAL mode, as well. The BMS shall provide alarm in case of HVAC system failure, collapse in room/zone negative pressure and deviation of any operating parameter from the set limits.

Each BSL-3 Laboratory Rooms/Zones area shall be provided with Pressure Sensors, Temperature Sensors and RH Sensors, wired and integrated with the BMS to display the operating conditions.

The Building Management System shall be complete with PLC, Sensors, Controllers, power and control wiring, customized Software and other associated field devices, hardware and accessories complete in all respect, as per requirement and approved design. The HVAC system START and STOP sequence shall be interlocked to prevent positive pressurization of the BSL-3 laboratory, at any point of time. A dedicated desktop PC shall be provided for the BMS operation and control along with a parallel secondary display screen of 32” size at the BSL-3 laboratory entrance to show the operating parameters.

The BMS control panel shall be powered through UPS. Upon restoration of power after a power failure, the BMS shall start the HVAC system automatically without any human interface and restore the normal operational set points of the system.

### **3.4. ELECTRICAL SYSTEM AND ASSOCIATED WORKS**

The Vendor shall provide the electrical power distribution system scheme for the BSL-3 Laboratory and Associated Molecular & Other Works Area. The electrical distribution system shall be designed and installed as per the Indian Electricity Rules and shall conform to NBC. The executing agency shall submit the electrical load calculation sheet, power and light wiring diagrams, GA and Single Line diagrams for Electrical Distribution Panels, cable routing etc..

All the materials, items, fittings and appliances to be used for the works shall conform to the specification given hereunder and manufactured in accordance with current Bureau of Indian Standard specifications wherever they exist or with CPWD specifications.

#### **a) Power Distribution system**

The executing agency shall design and provide the main power distribution (LT) panel, sub-distribution boards and panels complete with required switchgears, breakers, circuit breakers, power and control wiring, etc. for power distribution system for the BSL-3 Laboratory and Associated Molecular & Other Works Area. The power distribution system shall include supply and laying of cabling/wiring for HVAC System and Fixed equipment and systems like Autoclaves, Bio-safety cabinets, access control system, CCTV system etc., required and provided for the Laboratory with the provision of adding new instrument with load capacity of 20% extra.

The main Power Distribution panel (LT Panel) shall be manufactured by a CPRI approved manufacturer. The LT Power cables for use on 415 V system shall be of 1100 volt grade, aluminium conductor, PVC insulated, PVC sheathed, armoured and overall PVC sheathed, strictly as per IS: 1554 (part I) - 1976 amended upto date. Cable Glands shall be provided for end termination of cables. These shall be provided at both ends of armoured/unarmoured electrical cables. Cable glands shall conform to BS- 6121 amended as on date. Double compression glands shall be complete with check-nut, gland body, neoprene outer ring, armour clamping cone, armour-clamping ring, armour clamping nut, skid washer & outer seal nut. The power cables shall be neatly dressed on cable trays.

The Cable Trays shall be perforated type heavy duty, return flange or inward bend shape, manufactured from mild steel conforming to IS 226 and hot dip galvanised as per IS 2629/BS 729. The width of cable tray shall be as per the requirement.

For circuit and power distribution, the DB's shall be 8/12 way TPN vertical/Horizontal with double door 3 phase/ 1 phase, fitted with ELCB, RCCB, MCB etc. complete as required. The circuits, lighting and power

distribution shall be fully wired and complete in all respect. Only multistranded copper conductor wires shall be used for submain wiring, circuit wiring, light and power wiring.

Earthing should be sufficient enough for the various equipment installed in various area of BSL 3 laboratory and associated molecular area for TB laboratory.

**b) Backup Power System (Quote must be given separately for this item as an optional in price bid)**

A dedicated Diesel Generator Set of 150 KVA prime power capacity, complete with Alternator and sound proof enclosure shall be provided for supply of backup power to the BSL-3 and Associated Molecular & Other Works Area. The DG set shall be with sound proof canopy/enclosure and shall be suitable for outdoor installation.

The DG set shall be complete with engine, alternator, AMF panel, day oil tank (900 ltrs capacity) and fuel piping system, exhaust ducting and chimney as per the pollution control board norms, power and control wiring, foundations, earthing, etc. complete in all respect. The required statutory approval/clearance for the installation and operation of the DG set shall be obtained by the contractor and included in the scope of work.

DG Set power supply available from the centralized DG set of AIIMS Rishikesh shall also be connected with the BSL-3 and and Associated Molecular & Other Works Area to provide backup-to-backup power supply. The contractor shall plan, design and provide the backup electrical power system and main LT panel accordingly, to connect to the main (DG set supplied by the contractor) as main backup power source and also to the DG set power supply made available by AIIMS Rishikesh to be used as backup-tobackup.

**c) Internal Light Points, Power Points, Fittings and Fixtures**

The Electrical fittings and fixtures in the BSL-3 Laboratory and Associated Molecular & Other Works Area shall be sealed type, explosion proof, capable to withstand chemical exposures during laboratory fumigation. The Laboratory rooms shall provide 400-450 lighting Lux level and the light fixtures shall be surface mounted type. The switches, sockets and light fixtures shall have IP 55 or better protection. The electrical switches and sockets in BSL-3 Laboratory and other support areas shall be modular type.

All the electrical points, power points, light and power sockets shall be fully wired with switches, sockets, connections complete in all respect as required. Only multistranded copper conductor wires shall be used for light and power wiring. The internal wiring shall conform to the Indian Electricity Rules and BIS standards. The conduit work for light points, power points, data points, FDA system etc., shall be concealed type and shall be done in rigid PVC as per IS specifications. All the conduit pipes shall be sealed to prevent ingress of air.

**d) Fire Detection and Alarm System**

The complete BSL-3 Laboratory and Associated Molecular & Other Works Area shall be provided with addressable type Fire Detection(4 zone and better) and Alarm System. The Fire Detection & Alarm System shall be complete with Smoke detectors, Fire Alarm Panel, manual call points, response indicators, power and control wiring and cabling etc. complete in all respect. The FDA system shall be provided as per NBC and shall meet the statutory requirements and guidelines.

**e) Communication Facility (Intercom & LAN)**

The BSL-3 Laboratory areas and support and service area shall be provided with Data and Voice points for communication. The system shall be complete with required conduit and wiring. The incoming voice lines and internet connection for the facility shall be procured and provided by AIIMS Rishikesh. The Data and Voice points shall be fully wired with CAT5 cable complete with output terminals.

A suitable EPABX shall be provided for upto 8 incoming lines and 20 outgoing lines for the laboratory for internal communication. All the rooms shall be provided with intercom connection and telephone instrument set. For External Lines the provision for wiring has to be undertaken by the management however internal communication shall be in provision of vendor.

#### **f) Door Interlock & Access Control System**

The door interlock and access control system shall be provided with combination of proximity card based, numerical key pad lock based and push button based system. The system shall be complete with access logic controllers, door electromagnets, proximity cards and card reader/s, numerical keypad locks, door release push buttons, emergency door release buttons, PC communicator, control and power wiring and cabling and other required accessories, hardware, and software.

BSL-3 Laboratory Entry/Exit (2 set) - interlock system with emergency release switch from inside.

The access control system shall be powered through UPS supply for uninterrupted operation even during mains power failure. Access Control software shall be provided to perform the following operations.

- Assign the access rights to the individual proximity cardholder/s
- Create database for the authorized persons and assign them access
- Enable/disable access for specified time periods (for visitors etc.)
- Record the transactions and generate transaction reports.

The door Electromagnetic Lock shall be suitable for installation on doors/frames. The electromagnetic lock and armature shall be constructed and designed to provide trouble free service.

The door electromagnetic lock shall conform to the following specifications:

- Holding Force - Approx. 650 Lb per door
- Operating Voltage - 12/24 VDC
- Protect against corrosion - The electromagnetic lock and its accessories shall be of anticorrosive material/finish
- Residual Magnetism - There should be no residual magnetism after release of electromagnetic lock

The doors of BSL-3 Laboratory shall be provided with access control system to allow access or opening of only one door at a time. The access through either of the door shall be controlled through a selector switch. The system shall be configured such that after selection of one door for access/operation, the other door shall remain in permanently locked position.

#### **g) Closed Circuit TV System (CCTV)**

CCTV System shall be provided for surveillance of the Laboratory. The CCTV system shall be complete with wall/ceiling mounted high resolution color cameras, multiplexer cum DVR, LCD color monitor 32"

size, associated power and control cabling etc. and required hardware and software. The output of the CCTV system cameras shall be displayed on a 32" LCD monitor, to be installed at approved location.

The cameras shall be high resolution color cameras and shall be suitable for indoor installation and shall be equipped with varifocal lenses to enable adjustment for best view. The cameras shall also have auto Iris lens to control the aperture according to the light fluctuations. The cameras shall be suitable to exposure of chemicals during laboratory fumigation.

The multiplexer cum DVR shall be suitable for saving up-to 18 channels analog data, audio, text data and event data with play back feature. The DVR memory/Hard disk capacity shall be 1 TB or higher. For convenient backups the DVR shall be compatible with Windows based OS so that it can be backed up through a PC.

#### **h) UPS and INVERTER**

An online UPS of minimum 5KVA (or as required) capacity shall be provided for uninterrupted power backup to critical components like Door Interlock and access control system, BMS Operation and shower control panel operation. The power backup through the UPS shall be for minimum 30 minutes. The UPS shall be complete with battery bank, battery rack, interconnecting cabling and wiring, complete in all respect.

An Inverter of minimum 5 KVA (or as required) capacity shall be provided for backup power to the facility lighting. The power backup through the Inverter shall be for minimum 30 minutes. The Inverter shall be complete with battery bank, battery rack, interconnecting cabling and wiring, complete in all respect.

#### **i) SHOWER SYSTEM**

The shower system for BSL-3 Lab shall comprise of pre-fabricated cubicle and doors constructed in SS 304 (16 gauge) of approximately 1.5 mtr. dia. All the joints shall be perfectly buffed and shall be free from any blurs and sharp edges. The shower cubicle shall be provided with supply & return air diffusers and light fixture. The shower cubicle door shall be of approximately 750x 2100 mm size. The shower floor shall be perforated type with effluent collection tray at the bottom to allow connection with the effluent drain line without making any opening or puncturing the existing RCC floor slab.

A water heater/calorifier shall be provided for supply of continuous heated water to the showers at controlled temperature (30-35 Deg. C) during winters.

#### **j) GARMENT STORAGE CABINET WITH UV FITTING**

The Garment Cabinet shall be provided in Change Room of BSL-3 Lab. The garment cabinet shall be constructed in SS 304 (18 gauge). The garment cabinet shall be ventilated type fitted with UV Lamp, blower, motor, filter etc., complete. The garment cabinet shall be equipped with hangers and storage racks for storing appropriate PPE material.

#### **k) LABORATORY WORK STATION**

The BSL-3 Laboratory rooms shall be provided with workstations, as per approved layout drawing. The work stations shall be provided with the most optimum utilization of space in the laboratories. Hand wash sinks and emergency eye wash stations shall be provided integrated with the work station. Taps shall be elbow operated laboratory taps.



The workstations in BSL-3 Laboratory shall be modular type in SS 304 grade (16 Gauge) construction and with granite top. The workstation shall have under counter storage space and drawers.

Each work station and Bio-safety cabinet shall be provided with a laboratory chair. The chair in BSL-3 Laboratory shall be in SS frame and non fabric seat.

**1) EFFLUENT DECONTAMINATION SYSTEM (Price Quote must be given separately for 1 (a) and 1 (b) as an optional in price bid )**

1 (a) The Chemical Decontamination System for BSL-3 Laboratory effluent shall comprise of Two nos. Effluent Collection tanks (1 Working +1 Standby), each of 1000 Ltrs. Capacity. The decontamination tanks shall be constructed in SS 304 (14 gauge). The drain line from BSL-3 Laboratory containment area shall be terminated to the effluent decontamination tanks. The effluent decontamination tanks shall be provided with motorized OPEN/CLOSE valves connected with liquid level sensor such that when one tank get filled up to approx. 800 Ltrs volume, the supply valve shall automatically close and the supply valve of the standby tank shall automatically open to allow collection of effluent. During this time, the effluent collected in filled up tank can be decontaminated by introducing disinfectant chemical. This cycle shall be repeated automatically vice-versa with both the decontamination tanks and the process shall be automatically controlled through a control panel.

One number chemical storage tank in SS 304 (14 gauge) fitted with transfer pump and measuring device, piped and connected to both the decontamination tanks shall also be provided for introducing disinfectant chemical into the decontamination tanks.

The system shall be complete with following items:

- Two nos. Decontamination Tanks, each of 1000 Ltrs. Capacity
- Motorized valve connected with liquid level sensor through control panel
- Disinfectant Chemical storage tank
- Disinfectant Chemical dosing pump
- Non return valves
- Interconnecting piping including piping for chemical dosing
- Pumps for discharging decontaminated effluent into sewer/drain (1W+1S)
- Power and control cabling/wiring for pumps and motorized valves with control Panel

1 (b) The Chemical Decontamination System for BSL-3 Laboratory effluent shall comprise of Effluent Collection tank of appropriate Capacity. The decontamination tanks shall be constructed in SS 304 (14 gauge).

The tanks shall be located under the sinks, the effluent collected in filled up tank can be decontaminated by introducing disinfectant chemical. The chemically effluent may be allowed to stand till it's filling capacity . Once decontaminated, the treated effluent may then released by opearble pneumatic valves to the drain line which in turn is connected to the main drainage lines.

The effluent from the shower facility shall be connected with the drainage pump which shall drain the effluent to the chemically decontamination tank. Once treated, the effluent may then be released to the main drainage connected lines.

**m) Pass Boxes (Dynamic)**

Dynamic pass box shall be provided at required at 2 locations for transfer of samples, chemicals and materials into the laboratory.

The Pass Box shall be constructed in SS 304 (18 gauge). The corners inside the Pass Box chamber shall be coved for easy cleaning. The pass box chamber dimension shall be approximately 610 mm x 610 mm x 610 mm. The unit shall be complete with HEPA filters, blower, motor, door electromagnets, door interlock, UV Lamp with timer, necessary wiring, controls and all other accessories. etc. complete. The Pass Box doors shall be interlocked by providing suitable electromagnet, so that both the door cannot be opened simultaneously. The interlock shall provide visual indicator for door open/close conditions. The blower motor of Pass Box shall of suitable rating and shall be dynamically and statistically balanced. Magnehelic differential pressure gauge shall be provided to indicate the pass box chamber pressure. The pass box shall be provided with UV light with ON/OFF switch and shall be interlocked with the pass box doors The Supply Air velocity across the terminal HEPA filter in Pass Box shall be approximately 0.45 m/sec. Noise level shall be less than 70 dB. The pass box shall be installed flushed with the wall on BSL-3 Lab side and projected on the other side. The projected side shall be provided with SS coving at the pass box and wall junction.

n) Pass window box: 2 pass window boxes are to be given between the secondary containment laboratory and the associated molecular area and other area. The Pass Box shall be constructed in SS 304 (18 gauge). The corners inside the Pass Box chamber shall be coved for easy cleaning. The pass box chamber dimension shall be approximately 610 mm x 610 mm x 610 mm. (Exact site needs to be taken from the end user)

**3.5 EQUIPMENTS AND SYSTEMS** to be installed at various locations in secondary containment area (BSL-3) lab and molecular and associated area (List of equipments attached as annexure A). Vendor needs to get detailed site selection of various equipments approved by Head of department Microbiology, AIIMS Rishkesh.

Equipments which will be supplied by AIIMS Rishikesh but will be placed in various area of this turnkey project laboratory includes following and sufficient uninterrupted electrical supply must be provided by the vendor for these equipments :

- MGIT liquid culture system 960 along with epicenter
- GeneXpert machine
- Hybridization system for TB laboratory

### 3.6 SERVICE & UTILITIES

a) Power:

The required Power for all the Laboratory shall be arranged and provided by AIIMS Rishikesh including laying of Power supply cable upto the main LT Panel. However all the internal power management is to be done by the vendor. The detailed plan of this need to be submitted by the vendor after assessment of area and required power to be given by AIIMS Rishikesh for this purpose need to be intimated.

b) Water:

Water supply for the Laboratory shall be arranged and provided by AIIMS Rishikesh at the nearest available source. The required piping work for water connection to storage tanks and further distribution in Laboratory and related areas shall be done by the Contractor.

c) Drain & Sewer Line

The drain and sewer from the laboratory shall be finally terminated to the nearest available drain and sewer line, by the Contractor and this needs to be approved in diagram submitted by contractor.

d) Utilities for laboratory equipment/s

Piping and cabling etc., for utilities like water, power, drain, CO<sub>2</sub> & vacuum needed for the laboratory equipment/s and instruments shall be provided by the contractor, as required. The vacuum pump, CO<sub>2</sub> cylinders and manifold and associated piping work shall also be supplied and installed by the Contractor.

### 3.7 STATUTORY APPROVALS

The required statutory approvals from authorities like Fire Authorities, Pollution Control Board, Electrical Inspectors, etc., if required and applicable, shall be obtained by the Contractor. AIIMS Rishikesh shall only provide the required assistance in getting such clearance/s, as required. Official Statutory fees, if any, shall be paid to the concerned department/authority directly by AIIMS Rishikesh. (Requirement need to be mentioned by the contractor)

### 3.8 TESTING, COMMISSIONING AND VALIDATION

a) After completion of the construction and installation works, all the equipment, systems and services shall be commissioned and tested to check the operation and performance of each of the equipment and system.

b) Once all the equipment and systems are found to be working satisfactory, the Validation of the BSL-3 Laboratory shall be carried out by the Contractor on third party basis in the presence of authorized representatives/committee of AIIMS Rishikesh. The Validation shall be carried out in accordance with the NIH Guidelines for commissioning and validation of BSL-3 Laboratories. During the validation process, operation and functioning of complete installations shall be checked to verify that the equipment and systems are delivering the desired and approved performance results. It will be checked to ensure that all the biosafety and biosecurity requirements are met, are in place and are functional.

c) Before start of the validation process, the Contractor shall submit a detailed validation document giving details of validation checks and tests to be performed, the acceptance criteria as per the approved designs and drawings and the formats for recording the check and test results.

d) After completion of the validation process, the Contractor shall compile the validation results and submit to AIIMS Rishikesh.

e) The Contractor shall provide all the test and measuring instruments, tools, tackles, manpower etc. required for the Testing, Commissioning and Validation Process.

### f) EXTERNAL VALIDATION

AIIMS Rishikesh may desire to get the BSL-3 Laboratory validation done by external experts and the contractor shall provide all the required assistance for carrying out the validation by external experts. The

Contractor shall extend full cooperation and provide the validation instruments, tool, tackles and manpower etc., as required and asked by the employer

g) Following parameters shall be taken into consideration for validation:

1. Containment Barrier integrity check
2. HEPA filter leak test – according to the US Federal Standard 209E
3. Ducting pre-welding leak test - (light leak test)
4. Ducting post welding leak test – pressure test to 2 inches water gauge
5. Room differential pressure test verification
6. Particle test for cleanliness; according to US Federation 209E DOP/AOP
7. Air pattern smoke test
8. Light intensity test
9. Noise level test
10. Air velocity test
11. Test of Air Change rate.

### 3.9 DOCUMENTS & DETAILS TO BE SUBMITTED ON COMPLETION

- a) On Completion of the works, the Contractor shall submit the following documents to AIIMS Rishikesh:
- o Complete Set of ‘AS BUILT DRAWINGS’
  - o Operation and Maintenance Instructions & Manuals for individual Equipment and Systems
    - o Recommended List of Spares and Consumables
  - o Preventive Servicing and Maintenance Schedule
- b) The Contractor shall submit the “Bio-Safety Manual” clearly highlighting all the bio-safety aspects, precautions, safeties and emergencies, applicable to this BSL-3 Laboratory Facility.
- c) The Contractor shall submit the Technical Specifications and Data sheet for all the equipment/s and systems supplied and installed.
- d) The Contractor shall submit a written undertaking that spares and after sales services for all the equipment, systems and services installed in the facility shall be made available for a period of at least ten years from the date of handing over the facility.

### 3.10 COMPREHENSIVE ANNUAL OPERATION & MAINTENANCE SERVICES

3.10.1 After Completion of Works and Handing Over the Contractor shall provide Comprehensive Operation and Maintenance services for a period of years 5 (i.e. warranty) and additional CMC after completion of successful warranty for subsequent 5 years needs to be quoted on yearly basis for subsequent 5 years for comprehensive annual operation and maintenance services with the Contractor.

3.10.2 The Comprehensive Operation and Maintenance Services to be provided by the Contractor shall include:

- a) Providing qualified, experienced and trained manpower for handling operation of the Laboratory Facility on day-to-day basis on all working days
- b) To carry out routine and preventive servicing and maintenance of the equipment, system and services like Chiller, AHU, Exhaust Blowers, Autoclave, Biosafety Cabinet, Pass Box, Access Control System, BMS, Building Electrical System, Fire Alarm system etc., installed in the facility.
- c) Attend to and carry out any breakdown maintenance works required from time to time, as and when it occurs and notified by the Employer.
- d) Providing Spares and Consumables for various equipment, systems and services like BMS, Access Control System, Gaskets (for Doors and Pass Box), Filters, Valves, Light Fittings, spare switches and sockets etc. and maintain suitable inventory at site during the period.
- e) Maintenance of electrical system, services and construction works executed by the contractor
- f) Annual Validation of the Laboratory Facility
- g) Change of batteries for UPS and Inverter (for critical instruments working)

3.10.3 The following works and consumables shall not be included and covered in the scope of Contractor in the Comprehensive Operation and Maintenance Services:

- a) Supply of power, water and fuel
- b) Internal and External Painting of the Building
- c) Chemicals/reagents for use in laboratory for Fumigation/Decontamination
- d) Water and Power
- e) General Housekeeping works including associated consumables
- f) Day-to-day operation of equipment/item installed inside the BSL-3 Lab including mopping of lab.
- g) Maintenance of any external works or roads
- h) Maintenance of equipment and items supplied directly by AIIMS
- i) Damage or loss of item/equipment caused due to fire and theft

3.10.4 During the operation and maintenance period, the RESPONSE TIME by the contractor should not exceed 24 hours from the time the breakdown intimation is given by the user.

3.10.5 During the operation and maintenance period, it is expected that the Contractor shall attend the breakdown and rectify the fault/s promptly with minimum possible downtime. The maximum permitted DOWNTIME shall be 48 Hours from the time the intimation is given by the user.

If the repair/rectification is not carried out by the Contractor within the the maximum permitted DOWNTIME, the Employer shall charge penalty, for each breakdown instance, as follows:

Above 48 hours & Below 96 hours - Penalty of 1% of the annual warranty charges/CMC

Above 96 hours & Below 192 hours - Penalty of 1.5% of the annual warranty charges/CMC

Above 192 Hours - Penalty of 2% of the annual warranty charges/CMC and get the work repair/rectification done from third party at the Contractor' s Risk and Cost

3.10.6 The contractor shall maintain sufficient Inventory of required spares and consumables at site to minimize the downtime and to ensure smooth operation and functioning of the Laboratory.

3.10.7 Before entering into the Comprehensive Operation and Maintenance Contract, the Contractor shall submit details of manpower proposed to be deployed at site, detailed schedule of preventive servicing and maintenance works, the formats for maintaining daily log sheet and servicing and maintenance records and details of spares and consumables to the Employer

**3.10.8 LIST OF APPROVED MAKES / MANUFACTURERS**

<b>ITEM</b>	<b>APPROVED MAKES /MANUFACTURER</b>
Air Cooled Chiller Pack :	Voltas/Blue Star /Carrier
Hot water Generator/Calorifier :	Rapidcool / Khokar / Emerald
Double skin type AHU :	Caryaire/Suvidha/Carrier/Zeco/Euivalent
Pumps :	Kirloskar/Beacon/Greaves
Centrifugal blower for AHU :	Nicotra/ Comferi/ Flakt / Kruger /Equivalent
Motors :	Crompton/Siemens/ Bharat Bijlee/ ABB
Exhaust Blowers :	TCF / Caryaire/Carrier/Zeco /Equivalent
MS Pipes :	ITC/ Jindal/ Tata/ SAIL/ HSL
Isolation Damper :	Trox/Camfil/YIT/ Equivalent
VAV :	Trox/ Airtek/ Aldes/Celmec/Equivalent
HEPA Filters :	AAF/Camfil/YIT//Mechmark/Thermadyne
Containment HEPA Filter housing :	Camfil/YIT/Freundenberg/Equivalent
VFD :	ABB/Seimens/AllenBradley/Danfoss
Pressure sensor & transmitter :	Honeywell/Dawyer/Danfoss/Siemens
Temperature sensor & transmitter :	Honeywell/Dawyer/Danfoss/Siemens
Humidity sensor & transmitter :	Honeywell/Dawyer/Danfoss/Siemens
BMS system :	Rockwell / Siemens /ABB /Equivalent

PLC :	AllenBradley/Siemens /Equivalent
Magnehelic Gauges :	Dawyer
Grilles/Diffusers :	Carryaire/MK precision/System Air /Equivalent
Biosafety Cabinet :	Esco/Nuaire/Baker/Thermo/Equivalent
Autoclave :	Pharmalab/Machinfabrik /Genist/Equivalent
Dynamic Pass Box :	Esco/ I-Clean / Equivalent
Fire Alarm System :	Honeywell/System Sensor/Agni/Siemens
Door Interlock & Access Control :	HID/LG/ESFL / Equivalent
UPS & Inverter :	Tata Emerson/APC/Sukam
CCTV Camera :	BOSCH/Pelcin/Sony / Equivalent
LCD for CCTV display :	Samsung/LG/Sony/Panasonic /Equivalent
Butterfly Valves :	Audco/ Castle/ Arrow/Intervalve/ Equivalent
Gate Valves :	Leader/ BankimSarkar/ Sant / Equivalent
Balancing Valves :	Advance / C&R/ Arrow/ Audco / Equivalent
Y – Strainers :	Emerald/ Scientific device/Rapidcool /Equivalent
NR Valves :	Advance /C&R/ Arrow/ Univass /Equivalent
Flow Switch. :	Jhonson/Honeywell/Staefa /Equivalent
HVAC Control valves :	Honeywell/ Johnson/ Danfoss /Equivalent
3-Way Valves :	Johnson/ Honeywell/Siemens /Equivalent
Modulating Motors :	Honeywell./Jhonson/Siemens/Danfoss/Equivalent
Pressure &Temperature gauges :	Fiebig/ Japsin/Forbesmarshall / Dawyer/Equivalent
LT Panel :	Reputed Make
Electrical Switch Gears :	L&T/ABB/Siemens/Schneider
Starters. :	L & T/Siemens/ABB /Crpmpmton Greaves
Distribution Board :	Legrand/L7T/ABB/Havells/Schneider
Cables and wires :	Polycab/Finolex/Gloster/National /Havells
CAT6 cables :	AT&T/KABEL/LUCENT/LAPP/Digilink
Protection Relays :	ABB/L&T/Seimens/Schneider /Equivalent
Single phase preventor :	L&T / Minilec /Equivalent

Fire damper with controls :	Caryaire/ Dynacraft/ Ravi star / Equivalent
V belt/ Pulley :	Fenner/ Dunlop
Heaters :	Daspas/Escorts /Equivalent
Ammeter/Voltmeter :	Rishabh/L&T/Schneider
PVC Conduits and accessories :	Precision/Polycab/Supreme
Prefabricated wall and ceiling panels :	Nicomac/I-Clean/GMP/ Jindal/Equivalent
Laboratory Doors :	Nicomac/I-Clean/GMP/Jindal/Equivalent
Epoxy Coating :	Dr. Beck / Apurva / Fosrok

Any item not included above shall conform to the relevant BIS specifications, wherever applicable.



**Annexure A****TECHNICAL SPECIFICATION OF VARIOUS EQUIPMENT'S:**

S.No.	Name of Instrument	Qty
1.	General Instruction	-
2.	Bio-Safety Cabinets, Class II A2-Big	2
3.	Bio-Safety Cabinets, Class II A2-Small	2
4.	Microcentrifuge with accessories, rotors and adapters	3
5.	Deep Freezer Vertical (-20 <sup>0</sup> C)	2
6.	Insipissator	1
7.	Deep Freezer -80 °C	2
8.	BOD Incubator	2
9.	Vortex Mixture	4
10.	Autoclavable pipette set	4
11.	Analytical weighting balance	1
12.	Real time -PCR	1
13.	Gradient Thermocycler	1
14.	Refrigerated centrifuge with accessories, rotors and adapters	1
15.	Vertical Autoclave (dry and Wet Mode)	1
16.	Gel Doc System	1
17.	Heating Block	1
18.	Nanodrop	1

**GENERAL TECHNICAL SPECIFICATION APPLICABLE TO ALL INSTRUMENTS:**

These general instructions should be made available to each instruments in point wise manner and mentioned in compliance statement along with specific technical specification as mentioned in subsequent pages.

Compliance statement must in following format (General and specific):

Name of instrument:				
Number of instruments offered:				
Model & Make:				
Point or serial no. of the specification as mentioned in the technical specification of the tender document	Details of the technical specification as per the invitee document	Specification offered by the bidder	Compliance according to bidder or not	Page no of supporting document

- I. Manuals: Operation, maintenance & part list with detailed specifications must be provided in original (no photocopy will be entertained).
- II. Bidder must agree to provide onsite operational and maintenance Training to the two laboratory staff on mutually agreed date with the indenting department.
- III. Supplier must agree to provide IQ, OQ and PQ certification at the time of installation or as per the convenience of end user of the institute.
- IV. Must be compatible with Indian electrical supply of 220V, 50/60Hz supply and compatible power plugs.
- V. Should be attached to suitable power supply provided for BSL 3 laboratory or associated molecular and other work area such that it provides uninterrupted power supply for critical instruments as decided by the end user. (Necessary compatible online UPS line for such instruments must be able to provide at least 30 minutes backup time)
- VI. A half yearly essential service visits by service engineer has to be provided by vendor/company which may include training and up gradation of technicians and faculty and calibration and maintenance of instrument. (with or without complaint visits). In case of any fault in instrument, the said instrument needs to be repaired urgently as mentioned below:  
 During the operation and maintenance period, it is expected that the Contractor shall attend the breakdown and rectify the fault/s promptly with minimum possible downtime. The maximum permitted DOWNTIME shall be 48 Hours from the time the intimation is given by the user.  
 If the repair/rectification is not carried out by the Contractor within the the maximum permitted DOWNTIME, the Employer shall charge penalty, for each breakdown instance, as follows:  
 Above 48 hours & Below 96 hours - Penalty of 1% of the annual warranty charges/CMC  
 Above 96 hours & Below 192 hours - Penalty of 1.5% of the annual warranty charges/CMC  
 Above 192 Hours - Penalty of 2% of the annual warranty charges/CMC and get the work repair/rectification done from third party at the Contractor' s Risk and Cost
- VII. A five year comprehensive warranty with spares and accessories to be provided by the bidder.

- VIII. A CMC for next 5 years with spares and accessories needs to be included in quote.
- IX. Complete price should be quoted for different consumables/spare parts which will be used in future in the machine. These prices should be freezed for subsequent 10 years and in case of reduction of price the lower price to be communicated and to be charged by the supplier. Undertaking must be given by the supplier in this regards.
- X. All material, manpower etc required for the successful installation and regular maintenance of instrument is to be provided by the bidder to keep instrument working >95% time every year.
- XI. Site selection needs for installation of equipment needs to be coordinated with the indenting department.
- XII. Information regarding installation in India and satisfactory service and maintenance is be provided with complete address and telephone contact details of end users for each instruments.

**Biosafety Cabinet Class II A2(Big)**

1. **Type:** Bio safety cabinets Class II, Type A2
2. **Certification:** It must be United States NSF (National Sanitation Foundation)/ANSI Standard 49 or European norm Standards EN12469 tested and certified. The certificate of the quoted model should be attached.
3. **Design and dimensions cabinet:**
  - i. The exterior dimensions must be at least WxDx H (in inches) 62 x 31x 60 but should not exceed WxDx H (in inches) 70 x 34 x 63.
  - ii. The Interior dimensions must be at least WxDx H (in inches) 58 x 24x 25 but should not exceed WxDx H (in inches) 62 x 26 x 31.
  - iii. The working height of front window must be at 8 to 10 inches and be made of laminated safety glass to ensure containment of potentially hazardous samples in the case of accidental glass breakage.
  - iv. Easy access to interior of front sash for cleaning, without requiring any tools.
  - v. Motorized front window for finger-tip/remove controlled opening and closing.
  - vi. The maximum height of front window opening must be between 500 to 600mm.
  - vii. The front of the cabinet must be angled 10° to help minimize glare on the window to the user.
  - viii. Must be provided with comfortable Armrest which should sit just above the intake grill to enable farther reach inside the cabinet without hampering safe airflows inside the cabinet working area.
  - ix. Cabinet interior (work area) construction should be made up of one-piece, 16-gauge, Type 304 stainless steel (or better), with a smooth, easily cleanable and removable with seamless lift out knobs work surface tray.
  - x. Work area side walls and rear wall should be one-piece construction 16-gauge, Type 304 stainless steel or better. A straight back wall shall be provided to maximize work area and easily accommodate laboratory equipment.
  - xi. Must be having epoxy-coated steel exterior
  - xii. Must be supplied with adjustable stand (Electrical or manual) providing work surface at height of 30 to 38 inches adjustable in 2 inch increments or better.
  - xiii. Must be supplied with Combustible gas valve.
  - xiv. Must be supplied with Non combustible gas valve.
4. **Electrical compatibility:**
  - i. Must be compatible at 220 V, 50/60 Hz.
  - ii. Power plug should fit on Indian system of electrical supply.
  - iii. Must be connected to online UPS system of BSL-3 laboratory area which can withstand a continuous and stable voltage of at least 30 minutes in case of electrical breakdown of main supply.
5. **Filters:**
  - i. The Cabinet should have certified supply and exhaust HEPA filter of HEPA Class H14 (or better) with retention of >99.995% (or better) of airborne particles 0.3 micrometers (µm) in diameter size by DOP test as per US Department of Energy Standard or EN1822.
  - ii. Pressure guage for monitoring the condition of all HEPA filters as well as work space should be given.

- iii. One additional spare set of exhaust and supply HEPA filter should be provided by the bidder.

**6. Air Circulation:**

- i. Airflow should be drawn into the front grille of the cabinet in such a way it provide that biosafety cabinet provides operator, sample and environmental protection.
- ii. Ambient air should be pulled through the front grille of the cabinet to prevent contamination of the work surface and work product. The inflow should not mix with the clean air within the cabinet work zone.
- iii. Ambient air should be taken in through a pre-filter at the top of the cabinet, and passes through the downflow HEPA filter, entering the work zone as a laminar flow. The uniform, nonturbulent air stream should protects against cross contamination within and throughout the work area.
- iv. About 6-18 cm above the work surface, the downflow air stream should splits with a half portion moving toward the front air grille, and the remainder moving to the rear air grille.
- v. The 60-70% of recirculated air to the work area should flow as a vertical laminar flow air to create ISO Class 3 work surface and prevents cross contamination.
- vi. A combination of inflow and downflow air streams should forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone. The downflow combined with the inflow air should enters the common air plenum.
- vii. All air in the common plenum should be HEPA-filtered and exhausted (with volume as mentioned below) via a dedicated ducting system to the external environment.
- viii. Air flow pattern: 60-70% recirculation of air to the cabinet work area through supply HEPA filter, 30-40% balance should be exhausted through exhaust HEPA filter into the canopy unit.
- ix. Inflow face velocity (open front) should be of at least 100 fpm.
- x. All the positive pressure contaminated plenums within the cabinet are surrounded by a negative air pressure plenum thus ensuring that any leakage from a contaminated plenum will be drawn into the cabinet and not released to the environment. Also the plenum to be under negative pressure to the room.
- xi. Motor for air circulation should be Dual DC & must automatically adjust the airflow speed (balancing inflow and down flow) without the use of a damper to ensure continuous safe working conditions.
- xii. Cabinet must be capable of automatically handling more 150% or more increase in pressure drop across the filter without reducing total air delivery >10%.
- xiii. The cabinet must automatically reduce fan/blower motor speed to 30% when the front window sash is in closed position to ensure reduced energy consumption when the cabinet is not in use.
- xiv. Thimble connection with ducting suitable for BSL-3 laboratory as per requirement of Tuberculosis laboratory biosafety manual, WHO, 2012 and Biosafety in Microbiological and Biomedical Laboratories (BMBL– 5th Edition).
- xv. LED/LCD display:
  - a) The microprocessor must display the inflow and down flow air velocities in real-time on an LED/LCD display
  - b) Display showing hours of operation of UV system
  - c) Visual and audible alarm for showing front window working position safety.

- d) Visual and audible alarm for showing airflow safety.
- e) Real-time monitoring of HEPA filter efficiency.

7. **Ergonomics:**

- i. Lighting power at least > 100 foot candles.
- ii. Smart ports: Two 3 "plugged cable ports ,one on each side wall
- iii. Service valves up to 6 (three on each side wall)
- iv. Receptacles of 220V: two standard single receptacles located on rear wall, right and left sides.
- v. Should include a germicidal UV lamp. This UV lamp must be programmable to allow for specific exposure times from 0 to 24 hours.
- vi. The cabinet noise level must be  $\leq 65$  dBA and must be vibration free.

8. **Installation, onsite validation and certification** to be provided with testing as per “Field Certified in accordance with NSF/ANSI 49” and must meet the criteria as prescribed by NSF/ANSI 49 for Bio safety cabinets Class II, Type A2. The following parameters must be tested annually for 5 year warranty period time and during 5 year CMC period (5 year after warranty period). These parameters needs to be rechecked during repair of equipment prior to restart of work.

- i. HEPA filer leak test
- ii. Down flow face velocity
- iii. Inflow velocity
- iv. Air flow smoke pattern test
- v. cabinet integrity test (positive pressure plenum cabinets only)
- vi. site installation assessment tests which includes [alarm functions as required by NSF/ANSI 49 Standard, blower interlock and exhaust system performance (proper exhaust duct negative pressure and canopy and performance)]

**Biosafety Cabinet Class II A2 (small)**

1. **Type:** Bio safety cabinets Class II, Type A2
2. **Certification:** It must be United States NSF (National Sanitation Foundation)/ANSI Standard 49 or European norm Standards EN12469 tested and certified. The certificate of the quoted model should be attached.
3. **Design and dimensions cabinet:**
  - i. The exterior dimensions must be approximately WxDx H (in inches) 39.4 x 31.5 x 62.4 .
  - ii. The Interior dimensions must be approximately WxDx H (in inches) 35 x 24x 30 .
  - iii. The working height of front window must be at 8 to 10 inches and be made of laminated safety glass to ensure containment of potentially hazardous samples in the case of accidental glass breakage.
  - iv. Easy access to interior of front sash for cleaning, without requiring any tools.
  - v. Motorized front window for finger-tip/remove controlled opening and closing.
  - vi. The maximum height of front window opening must be between 500 to 600mm.
  - vii. The front of the cabinet must be angled 10° to help minimize glare on the window to the user.
  - viii. Must be provided with comfortable Armrest which should sit just above the intake grill to enable farther reach inside the cabinet without hampering safe airflows inside the cabinet working area.
  - ix. Cabinet interior (work area) construction should be made up of one-piece, 16-gauge, Type 304 stainless steel (or better), with a smooth, easily cleanable and removable with seamless lift out knobs work surface tray.
  - x. Work area side walls and rear wall should be one-piece construction 16-gauge, Type 304 stainless steel or better. A straight back wall shall be provided to maximize work area and easily accommodate laboratory equipment.
  - xi. Must be having epoxy-coated steel exterior
  - xii. Must be supplied with adjustable stand (Electrical or manual) providing work surface at height of 30 to 38 inches adjustable in 2 inch increments or better.
  - xiii. Must be supplied with Combustible gas valve.
  - xiv. Must be supplied with Non combustible gas valve.
4. **Electrical compatibility:**
  - i. Must be compatible at 220 V, 50/60 Hz.
  - ii. Power plug should fit on Indian system of electrical supply.
  - iii. Must be connected to online UPS system of BSL-3 laboratory area which can withstand a continuous and stable voltage of at least 30 minutes in case of electrical breakdown of main supply.
5. **Filters:**
  - i. The Cabinet should have certified supply and exhaust HEPA filter of HEPA Class H14 (or better) with retention of >99.995% (or better) of airborne particles 0.3 micrometers (µm) in diameter size by DOP test as per US Department of Energy Standard or EN1822.
  - ii. Pressure guage for monitoring the condition of all HEPA filters as well as work space should be given.
  - iii. One additional spare set of exhaust and supply HEPA filter should be provided by the bidder.
6. **Air Circulation:**

- i. Airflow should be drawn into the front grille of the cabinet in such a way it provide that biosafety cabinet provides operator, sample and environmental protection.
- ii. Ambient air should be pulled through the front grille of the cabinet to prevent contamination of the work surface and work product. The inflow should not mix with the clean air within the cabinet work zone.
- iii. Ambient air should be taken in through a pre-filter at the top of the cabinet, and passes through the downflow HEPA filter, entering the work zone as a laminar flow. The uniform, nonturbulent air stream should protects against cross contamination within and throughout the work area.
- iv. About 6-18 cm above the work surface, the downflow air stream should splits with a half portion moving toward the front air grille, and the remainder moving to the rear air grille.
- v. The 60-70% of recirculated air to the work area should flow as a vertical laminar flow air to create ISO Class 3 work surface and prevents cross contamination.
- vi. A combination of inflow and downflow air streams should forms an air barrier that prevents contaminated room air from entering the work zone, and prevents work surface emissions from escaping the work zone. The downflow combined with the inflow air should enters the common air plenum.
- vii. All air in the common plenum should be HEPA-filtered and exhausted (with volume as mentioned below) via a dedicated ducting system to the external environment.
- viii. Air flow pattern: 60-70% recirculation of air to the cabinet work area through supply HEPA filter, 30-40% balance should be exhausted through exhaust HEPA filter into the canopy unit.
- ix. Inflow face velocity (open front) should be of at least 100 fpm.
- x. All the positive pressure contaminated plenums within the cabinet are surrounded by a negative air pressure plenum thus ensuring that any leakage from a contaminated plenum will be drawn into the cabinet and not released to the environment. Also the plenum to be under negative pressure to the room.
- xi. Motor for air circulation should be Dual DC & must automatically adjust the airflow speed (balancing inflow and down flow) without the use of a damper to ensure continuous safe working conditions.
- xii. Cabinet must be capable of automatically handling more 150% or more increase in pressure drop across the filter without reducing total air delivery >10%.
- xiii. The cabinet must automatically reduce fan/blower motor speed to 30% when the front window sash is in closed position to ensure reduced energy consumption when the cabinet is not in use.
- xiv. Thimble connection with ducting suitable for BSL-3 laboratory as per requirement of Tuberculosis laboratory biosafety manual, WHO, 2012 and Biosafety in Microbiological and Biomedical Laboratories (BMBL– 5th Edition).
- xv. LED/LCD display:
  - f) The microprocessor must display the inflow and down flow air velocities in real-time on an LED/LCD display
  - g) Display showing hours of operation of UV system
  - h) Visual and audible alarm for showing front window working position safety.
  - i) Visual and audible alarm for showing airflow safety.
  - j) Real-time monitoring of HEPA filter efficiency.

## 7. Ergonomics:



- i. Lighting power at least > 100 foot candles.
  - ii. Smart ports: Two 3 "plugged cable ports ,one on each side wall
  - iii. Service valves up to 6 (three on each side wall)
  - iv. Receptacles of 220V: two standard single receptacles located on rear wall, right and left sides.
  - v. Should include a germicidal UV lamp. This UV lamp must be programmable to allow for specific exposure times from 0 to 24 hours.
  - vi. The cabinet noise level must be  $\leq 65$  dBA and must be vibration free.
8. **Installation, onsite validation and certification** to be provided with testing as per “Field Certified in accordance with NSF/ANSI 49” and must meet the criteria as prescribed by NSF/ANSI 49 for Bio safety cabinets Class II, Type A2. The following parameters must be tested annually for 5 year warranty period time and during 5 year CMC period (5 year after warranty period). These parameters needs to be rechecked during repair of equipment prior to restart of work.
- i. HEPA filter leak test
  - ii. Down flow face velocity
  - iii. Inflow velocity
  - iv. Air flow smoke pattern test
  - v. cabinet integrity test (positive pressure plenum cabinets only)
  - vi. site installation assessment tests which includes [alarm functions as required by NSF/ANSI 49 Standard, blower interlock and exhaust system performance (proper exhaust duct negative pressure and canopy and performance)]

**Microcentrifuge with accessories, rotors and adapters:**

1. Micro centrifuge with capacity to hold 18 to 24 micro centrifuge tubes (MCT) of 1.5/2mL capacity.
2. Instrument should have the ability to support the following and must be supplied with necessary accessories (rotors and adapters) in order to fulfill following:
  - a) Able to hold 18 to 24 MCT of size 0.5/0.6 ml.
  - b) Able to hold 18 to 24 MCT of size 0.25/0.4 ml
  - c) Able to hold 18 to 24 PCR tubes of 0.2 mL capacity.
  - d) Should have extended rim of rotors so that rotor could hold at least 12 to 18 spin column of 1.5 to 2.0 ml capacity without shearing tubes cap during sample processing.
3. Should have maximum RCF 20,000g or more.
4. Should have maximum speed of 14000 rpm or more.
5. Should have acceleration and deceleration time in range of 11 to 16 seconds and 12 to 18 sec respectively.
6. Should have at least time set ranging from 1 min to 99 min or better with 1 minutes or better increment.
7. Should have separate short spin/Pulse button for quick centrifugation.
8. Should have user friendly digital display and regulation for speed (rpm and RCF) and run time.
9. Should have Soft touch one finger lid closure for ergonomic operation.
10. Noise Level should be less than 56dbA.
11. Should work in ambient temperature range.
12. Rotor with lid should be autoclavable at temperature 121 deg C for 20 min or more
13. Should have certified aerosol tight rotor with click seal biocontainment lid. (Biocontainment certification by Public Health England, Porton Down, UK on all rotors with ClickSeal biocontainment lid)
14. Should be CSA certified, CE marked, IVD compliant, Certified Biosafety and meeting technical standards of IEC 61010-1, IEC 61010-2, IEC 61010-020. All certificates and documents supporting this must be attached with the bid.
15. Should be bench top model with external dimensions not exceeding 230 x 250 x 360 mm (height x width x depth in mm).

**Deep Freezer Vertical (-20°C)**

1. Microprocessor controlled Deep Freezer with digital LED displays.
2. Temperature range -10°C to -25°C, adjustable with increment of 1°C with temperature deviation of  $\pm 1^{\circ}\text{C}$
3. Working efficiently at wide ambient temperature range of 10°C to 45°C.
4. High density foam insulation for rigidity and stable storage temperature.
5. Broad Voltage range 180-240V. All electrical system should be compatible with Indian electrical supply.
6. Built-in Over/Under voltage compensating technology to reduce wear & tear.
7. Storage capacity: 300 liters or more.
8. High efficiency compressor with CFC free refrigerant.
9. Should have Stainless steel lockable castor & should be movable.
10. 7 or more standard shelves with drawer with separate closing lid for individual shelves so that minimal temperature fluctuations are there.
11. Door handle for easy operation with locking facility.
12. Both types of alarm indications: audible buzzing and visible flashing light.
13. Malfunction Audio-visual alarms for over/under temperature, voltage,
14. Sensor defect, condenser radiating effect, over ambient temperature and power.
15. Instrument should be European CE Certified & ISO certified, these certificate should be attached with the technical bid.

**Inspissator**

1. A shallow polish stainless tray rested inside a tank containing water. The whole undersurface of the tray is in contact with water at a constant temperature which ensures that the temperature of the McCartney bottles with media is also constant.
2. The surface of the tray is a series (3 or 4) of sloping steps (at 9 degree angle above the horizontal) and will hold 160 to 170 McCartney bottles (Each McCartney bottles is of 28ml capacity, Length 82 mm with maximum external diameter of the bottom of bottle 28.2 mm)
3. A blanket and quilt should be provided to be placed over the containers to exclude draughts and a quilted cover provides thermal insulation: both blanket and quilt are made from insect-resistant materials.
4. The temperature of the water under the tray is controlled by a digital immersion thermostat. Accuracy and reproducibility of set temperature are ensured with the digital display of actual and, at the touch of a button, set temperature.
5. Built in Electronic timer (0–6 hours) which gets activated once set temperature is achieved.
6. The control unit is mounted on a bridge plate over one end of the bath, from which heater, stirrer and temperature sensors project down into the bath.
7. All moving parts are incorporated in the control unit which removable for servicing.
8. The tray and tank are made of polished stainless steel.
9. A constant level device is fitted to maintain the water level despite evaporation losses.
10. Instrument must also meet following standards
  - i. Standard working temperature: 85°C
  - ii. Operating temp. range: ambient +5 to 90 °C.;
  - iii. Temperature display: LED;
  - iv. Display resolution: 0.1°C;
  - v. Uniformity: tray surface + or - 0.7°C;
  - vi. Heater power: (approx.)1.4Kw, 230V+;
  - vii. Tank capacity: (approx.) 45 lit;
  - viii. Heat up rate from 20 to 85 °C in maximum of 3.5 hours at ambient temperature;
  - ix. Working area: length/width: (approx.) 820/594mm; overall dimensions (approx.): length /width /height : 1040/600/380mm;
  - x. Over temperature protection and Fixed cut-out;
  - xi. Approx. weight: 25-35 kgs

**SPECIFICATIONS FOR UPRIGHT DEEP FREEZER -80°C**

1. It should be microprocessor controlled system with ergonomic design
2. It should have adjustable temperature range -40°C- to -82°C with the increment of 1°C
3. Should have a capacity of 500 ltrs-600lit
4. It should be well insulated with HCFC free, foamed –in- place polyurethane.
5. It should be Hermetically sealed cooling system with durable compressors
6. It should have easy to clean condenser filter
7. It should have pressure equalization port to allow easy to access to cabinet after door closer.
8. It should have a minimum of noise level not exceeding □ 50 dBa
9. Should have 4 or more standard shelves with drawer with separate closing lid for individual shelves so that minimal temperature fluctuations are there
10. Should work efficiently at even a temperature of +35°C with 85-90% RH
11. It should have minimum of 15 (2 “) cryo boxes per rack
12. It should have minimum of 10 (3 “) cryo boxes per rack
13. It should be able to run at 220 Volts and 50 Hz
14. Door handle for easy operation with locking facility.
15. Automatic voltage stabilizer has to be provided as essential accessories
16. Display: ambient room temperature, voltage level
17. Multi position key switch on and off
18. Both types of alarm indications: audible buzzing and visible flashing light.
19. Malfunction Audio-visual alarms for over/under temperature, voltage,
20. Battery alarm, power failure alarm, Sensor defect, condenser radiating effect, over ambient temperature and power.
21. Base should have four wheels for easy movement
22. Instrument should be European CE Certified & ISO certified, these certificate should be attached with the technical bid.

### **BOD Incubator**

1. Should provide working temperature of at least in range of 10 to 60 °C.
2. Should provide temperature Controller Accuracy : +/-0.5 degree C of set value for Temp.
3. Should provide temperature uniformity: +/-1degree C throughout chamber of incubator.
4. Should have Controller/Digital indicator for Temperature (microprocessor control with vacuum fluorescent display)
5. Adjustable over-temperature protection controller so as to ensure that the Incubator does not go beyond the set temperature automatically gets cutoff after attaining the set temperature.
6. Programs stored on power failure so that when power is restored, equipment continues to function on the previous programme.
7. Air Circulation : Motorized Blower from back and forced air circulation for temperature homogeneity.
8. Should have volume of working chamber of at least 350 to 450 liters.
9. Size in mm approximately (of inner chamber):- 700±20(W) x 900 ±20 (H) x 650 ±20 (D), Capacity: approx. 400±50 liters) and door swing 65±5 cms
10. Should be supplied with at least 6 adjustable racks/Shelves.
11. Inner chamber made up of Stainless steel make of SS-304 grade, full length inner acrylic security glass door.
12. Should have self supported transparent doors inside and magnetic gasket outer doors.
13. The Internal door allows sample viewing without impacting temperature variation.
14. Housing made of zinc galvanized sheet metal coated with epoxy, hardened by heat treatment, corrosion resistant
15. Triple wall with special grade glass wool insulation.
16. The equipment should conform to Indian Standard Institution Guidelines with latest amendments in Indian Standard Specification for Incubators or equivalent National or International Standards covering Markings, tests and Safety requirements. Supporting certificate must be attached.

**VORTEX MIXER**

1. Speed range 0 to 2850 rpm
2. Operating Mode touch or continuous
3. Ambient operating range +4 to 65 degree centigrade.
4. Dimensions(WxDXH) 14X16X13 cms
5. Weight -2.2kg
6. Power motor for efficient mixing.
7. Safe for cold room or incubator use.

**Autoclavable pipette set (0.1 $\mu$ l to 10 ml)**

1. Each set consist of 4 pipette with overlapping volume with whole range from volume **(0.1 $\mu$ l to 10 ml)**
2. Autoclavable
3. Single channel
4. Volume adjustable
5. Display volume 4 digit
6. Very low operating force
7. Spring loaded tip cone
8. Calibration certificate from the company's local supplier included
9. Precision and calibration 1 $\mu$ l+/-2.5%; 10 $\mu$ l+/-0.8%



**ANALYTICAL WEIGHING BALANCE:**

1. **Weighing Range:** 0.01 – 60 g
2. **Readability:** 0.1 mg
3. **Calibration:** External
4. **Display:** LCD Display
5. **Verification interval:** 0.001 g
6. **Pan Size:** 80 - 100 mm
7. **Power Supply:** 210-240V/50-60 Hz
8. **Should have readouts to have at least four decimal places.**
9. **Should be equipped with a draft shield chamber to eliminate interfering ambient effects.**

**Real time -PCR**

1. The system should be table top including basic system with all essential accessories supplied with state of art computer workstation, acquisition & analysis software, startup kit inclusive of calibration standards with **CE-IVD compliance**. The certificate regarding this must be submitted by the bidder.
2. System should support applications including absolute quantitation, multiplex-PCR, allelic discrimination (SNP), dissociation curve analysis as well as pathogen detection and plus/minus assay using internal positive control.
3. The hardware must provide peltier 96 well fast thermal cycling, completing standard 40 cycle protocol in less than 30 minutes.
4. **System should be CE certified and IVD approved and certification in this regard must be submitted.**
5. **Thermal Cycling System:** Peltier-based system
6. **Block Format:** 96-well block (Fast)
7. **Compatible Consumables:** 96-well plates (Fast) and 0.1/0.2 mL tube strips along the optical covers.
8. **Open system:** Should accommodate Taqman, SYBR green and all other florescent dye based chemistries. It should be compatible with other third party consumable certificate must be produced.
9. **Sensitivity:** Detection of 1 copy of template
10. **Supported Volumes:** 10–30  $\mu$ L
11. **Peak Block Ramp Rate:** 5.5°C/sec
12. **Temperature Range:** 4°C-94°C
13. **Excitaiion Source:** Tungsten-halogen lamp / Laser or better
14. **Detection System:** charged coupled device
15. **Multiplex Ability:** Upto Five dyes in a single run with 5 excitation and 5 Emission filters.
16. **Calibrated Dyes at Installation:** SYBR Green I, FAM™, VIC™, JOE™, NED™, TAMRA™, ROX™, Texas Red ®, Cy3™, Cy5™. Should offer flexibility in dye selection
17. **Capability of adding new dyes:** Systems should be easily calibrated with new dyes without any filter or hardware change by user.
18. **Passive Reference Dyes:** The normalization of reaction due to non-PCR related fluctuations such as pipetting variations or florescent fluctuations should be possible by using ROX™ or any calibrated dye. Selection or de-selection of passive reference during the run should be optional.
19. **Quantitative PCR Run Time should be such that it must provide at least following ramp rate or more:**
  - i. 1.6°C/sec up and 1.6°C/sec down and

- ii. Average is about 3.0°C/sec up and 3.0°C/sec down.
20. **Software:** Instrument software should utilize a algorithm to provide solution for multiple dye signals, to enable the simultaneous detection of multiple fluorophores with reduced cross-talk.
21. Software's for applications like comparative Ct, Standard Curve, Relative standard curve, Allelic discrimination/SNP genotyping, Plus/Minus, Dissociation/melt curve should be provided.
22. Vendor should also supply below software along with system
  - i. Primer designing software
  - ii. Relative quantitative Software for simultaneously Visualize and analyze unlimited number of 96-well plates of gene expression data
  - iii. High resolution Melt curve analysis software
23. **The software must have tools for compliance to FDA510K or CE-IVD such as security access, auditing and e-signatures.**
24. **Consumable Support:** The necessary consumables to perform real-time quantitative PCR and assays (TaqMan MGB probes) including sample preparation reagent, Real Time PCR reagents and Plastic wares should be available with same vendor. Further the supplier should also be able to design and provide the TaqMan assays for the DNA/small RNA (Custom Assays) templates of our interest.
25. **Flexible system:** The system should be able to run more than one chemistry in the same run without any Calibration or optimization.
26. **Service and support:** The Vendor should have a good service and application support back up along with Instruments to provide an effective application related troubleshooting and support .The Vendor should provide Comprehensive Training on the operation of the instrument, Chemistry options and software on site on mutually agreed date.

## Gradient Thermocycler

1. Six or more separate Peltier blocks should be provided in the instrument which provide maximal versatility and flexibility for:
  - i. PCR optimization: Specific temperature can be set for each block for precise control over PCR optimization.
  - ii. At least six or more different annealing temperature must be set simultaneously in the instrument so that six or more run can be set simultaneously in the same run.
  - iii. For providing gradient function instrument must be able to provide six or more temperature zones for PCR optimization.
2. Block for  $96 \times 0.2$  ml tubes; possibility to use block with  $48 \times 0.5$  ml tubes and 96-well PCR plates.
3. Blocks must be resistant to oxidation.
4. Heating rate:  $4\text{ }^{\circ}\text{C/s.}$ , Cooling rate:  $2\text{ }^{\circ}\text{C/s.}$
5. Temperature range (block):  $4\text{--}100\text{ }^{\circ}\text{C.}$
6. Regulating accuracy for block temperature:  $\pm 0.1\text{ }^{\circ}\text{C.}$
7. Temperature uniformity at  $70\text{ }^{\circ}\text{C}$  (block):  $\pm 0.4\text{ }^{\circ}\text{C.}$
8. Dimension should be within Width (22 to 28cm) x Height (20 to 29cm) x Depth (40 to 50 cm)
9. Internal memory for at least 50 programs with up to 99 steps/program, freely editable.
10. Should have large color touch screen which enable easy operation with finger tip and setting up of cycle, easy view of temperature profile of during running of cycle etc.
11. Instrument should have USB port for easy portability of data .
12. Heatable lid with automatic height adaptation.
13. Electromechanical lid blocking to prevent accidental opening during a run.
14. Temperature range for lid:  $80\text{ }^{\circ}\text{C}$  to at least  $103\text{ }^{\circ}\text{C.}$
15. Optional: Interface for remote control via PC; activated RS 232 serial port.
16. Electricity requirements
  - i. Supply voltage:  $230 \pm 10\text{ V, AC, }50/60\text{ Hz.}$
  - ii. Voltage and plugs to be adapted to meet the Indian supply requirements. The line cord / Power cord supplied with the equipment shall be of acceptable durability, length, and current carrying capacity complying with Indian Standards.
  - iii. Power consumption: Approximately 500 W.
  - iv. Conform to electrical safety standards IEC 60601–1, UL 61010–1, EN 61010–1.
  - v. Protection class (in accordance with EN 60529).
  - vi. Designed not to interfere with circuit radio (in accordance with EN 55014).
17. Documentation
  - i. Manufacturer's certificate
  - ii. The manufacturer must have a management system certified to ISO 9001.

- iii. One certificate to state that the thermocycler has been calibrated at the factory and certified according to ISO 13485 quality regulations.
- iv. Quality and safety standards met by the product must be listed.

**Refrigerated centrifuge with accessories, rotors and adapters:**

1. Must provide at least a temperature range from -9°C to 40°C or better.
2. Refrigeration system must be CFC free.
3. Fast function for pre-cooling of the centrifuge.
4. Instrument should have the possibility to switch off the compressor after non-usage.
5. Brushless maintenance free drive.
6. Instrument should have at least following
  - a. Maximum RCF with fixed angle rotor: 20913 x g (or more)
  - b. Maximum RCF with swing out rotor: 4500 x g (or more)
  - c. Maximum speed of 14000rpm or more for fixed angle rotor.
7. Instrument should be supplied with aerosol tight swing out rotors (with Certified Bio-containment Lid-certificate) and adapter combination which can hold (a)16 (or more) x 50ml and (b) 36 (or more) x 15 ml polypropylene (PP) centrifuge tubes. All the rotors, buckets and lids should be autoclavable. Maximum capacity for swinging bucket rotor should be 4x250 ml (or more). The rotor must be able to support both conical bottom and self standing conical bottom with flat top threaded screw capped centrifuge tubes or rotor compatible to both types must be provided.
8. Aerosol tight fixed angle rotor for 24 (or more) x 1.5/2.0ml tube with adapter for 0.6ml and 0.2ml should be provided.
9. Attachment of rotors to the instrument must be user friendly. No tool to be required to change the rotor or push button rotor exchange facility.
10. The centrifugation chamber must be made up of corrosion-resistant, high-thermal conductivity, 304 grade stainless steel.
11. Free access to chamber must be there for easy cleaning and disinfection of area.
12. Rotors and lid should be made up of metallic material able to resist corrosion with outstanding durability and integrity.
13. Noise level should be below 70dB A.
14. Rotors and lid should be autoclavable at 121°C for 20 mins.
15. Instrument should possess an automatic rotor recognition with speed limitation for safety; Automatic imbalance detection and cut off
16. It should be possible to adjust the acceleration and deceleration ramps at least from 0-9.
17. Should have an “at set rpm” function which enables timer countdown to be started only after the set speed is reached
18. Should be possible to set the speeds in rpm/rcf, radius correction values must be user changeable.
19. There should be a separate short spin key for brief spin.
20. Instrument should have a built –in condensation drain to eliminate water accumulation and prevent corrosion.
21. Should have user friendly digital display (LCD) for programme, acceleration rate, deceleration rate, time, speed and temperature.
22. Instrument should be bench top model type with size enough to be accommodated within a bench width of 75cm.
23. Instrument quoted model should be UL listed, European CE certified and marked, IVD compliant, Biocontainment certification by Public Health England, Porton Down, UK. These should be attached with the technical bid.

**VERTICAL AUTOCLAVE (wet and dry mode)**

1. Should have a triple walled construction.
2. The working chamber, steam jacket, outer chamber and the lid should be made of stainless steel 16.
3. Should have water inlet and outlet valves.
4. Should have a water level gauge
5. Should have gauges for measuring inner and outer steam pressure.
6. Should have an inner temperature indicator.
7. Should have automatic pressure control switch, safety valve and eject valve.
8. Should have joint-less silicone gasket.
9. Should have automatic low water protection.
10. Should be supplied along with bins.
11. Should have an ISI mark.
12. Should have 121°C working temperature at 15 to 20 psi pressure.
13. Chamber volume should be approximately 300mm diameter and 500mm depth with minimum 2 bin type.
14. Should be operated in mains 220 – 240 V ac 50 Hz input power supply.
15. Water inlet and outlet pipe should be provided and connections should be done on a turnkey basis
16. Should operate both on wet and dry mode.

**GEL DOCUMENTATION SYSTEM (12-BIT)**

1. **TRUE 12-bit** Optical output **CCD CAMERA** with **Anti-reflective coating**
2. Should have atleast 1.44 Million pixels resolution
3. Full screen refresh rate of atleast 30 frames per second for real time viewing
4. **Motorized Zoom Lens**
5. Darkroom should be chemiluminescence imaging ready
6. Should have atleast **5-POSITION FILTER WHEEL**
7. **UV Transilluminator** with EVENSCSAN & imaging area of atleast 21 x 26 cm.
8. Independent Source for Transilluminated White Light with imaging area of atleast 21 x 31 cm
9. Dual Epi-White Lights
10. Software for acquisition, enhancement, editing, annotation, archiving & analysis including features like 1-D multilane densitometry, 2-D spot densitometry, MW, Rf analysis, Microtiter plate, Eli-spot, Array & Dot Blot Analysis, Colony, Cell & GFP Yeast Counting, Q-PCR, Zymogram gel analysis, Gel Scoring, Band matching, RFLP, RAPD, Fingerprinting, Dendrogram creation, options for Dice, Jacard, Pearson, Frequency, Similarity Coefficients, & Cluster analysis with multiple methods including Neighbor joining, UPGMA, WPGMA, Simple linkage, complete linkage, ward, median, centroid etc., Multi-color fluorescence microscopy imaging & Movie Mode facility.
11. Computer (with Intel Pentium duo Core Processor 160 GB HDD, 512 MB RAM, DVD-CD-Read/Write Combo Drive, 17" TFT Monitor, Keyboard, Mouse)



**HEATING BLOCK**

Temperature Range (Metric)	Ambient +5° to 130°C (Ambient at 25°C)
Temperature Uniformity	$\leq \pm 1^\circ\text{C}$
Temperature Accuracy	$\leq \pm 0.5^\circ\text{C}$
Heating Rate	$\leq 20$ min. 30° to 130°C
Voltage	200-240V
Height	3.9"
Height	100mm
Length	11.3"
Length	288mm
Width	7.9"
Width	200mm
Hertz	50/60
Certifications/Compliance	CE, cULus, RoHS
Dimensions (L x W x H)	288 x 200 x 100mm (11.3 x 7.9 x 3.9")
Includes	Dry bath, CN, EU and UK plugs, block lifter
No. of Blocks	1
Weight	6.39 lb.
Weight	2.9kg
Plug Type	CN, EU and UK plugs
<b>Controller Type</b>	PID digital
<b>Max. Relative Humidity</b>	$\leq 80\%$
<b>Timer Range</b>	0 to 99:59 min or continuous
<b>Fuse</b>	250V 2.5A

**Nano Spectrometer (Pedestal/ Cuvette based) for quantification of Biomolecules**

Description
Compact UV-VIS spectrometer to quantify undiluted nucleic acids at nanolitre volume (2 $\mu\text{L}$ ) and other biomolecule analysis using standard volumes.

Optical system	Double beam /single –beam photometer with reference beam
Light Source	Xenon flash lamp
Receiver	CMOS photodiode array /CCD array
Wavelength range	200 nm to 830 nm or more
Wavelength Selection	Method – dependent, freely selectable
Spectral bandwidth	$\leq 4$ nm or less
Wavelength increment	1 nm
Systematic wavelength error	$\pm 1$ nm
Random wavelength error	$\leq 0.5$ nm
Photometric measuring range	0.0 to 3.0A at 260 nm
Photometric reading accuracy	$\Delta A = 0.001$
Random photometric error	$\leq 0.002$ at $A = 0$ , $\leq 0.005$ (0.5%) at $A=1$
Systematic photometric error	$\pm 1$ % at $A= 1$
Cuvette type	Accommodate plastic disposable/ standard Quartz Cuvettes and microliter cells
Methods	<ul style="list-style-type: none"> <li>• Absorbance with one or more wavelengths, scans</li> <li>• Nucleic acids, Proteins, OD 600, dye labeling</li> <li>• Evaluation via factor, standard and calibration curve</li> <li>• Dual wavelength with subtraction and division evaluation</li> </ul>
Method dependent evaluation	<ul style="list-style-type: none"> <li>• Absorbance, concentration via factor and standard</li> <li>• Concentration via standard series using</li> <li>• Linear regression, Nonlinear regression with 2<sup>nd</sup> and 3<sup>rd</sup> degree polynoms</li> <li>• Spline analysis</li> <li>• Linear interpolation (point to point evaluation)</li> <li>• Absorbance allocation via subtraction and division</li> <li>• Ratio 260/280, 260/230 molar concentration and total yield for nucleic acids</li> <li>• Frequency of incorporation of Cy3, Cy5 dyes and labeling density</li> <li>• Spectral zoom and peak evaluation for scans</li> </ul>
Display	5.7” VGA TFT display/Desk top
Interfaces	USB master for USB stick; USB slave for connection to PC; Serial RS-232 for thermal printer
Memory	<p>&gt;100 method programs on the instrument</p> <p>&gt;1000 results with data, evaluation results and used parameters</p>

Power supply	100 to 240 V $\pm$ 10% / 50 to 60 Hz $\pm$ 5%
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Note:

UPS for running the instrument and accessories for 2 hours should be quoted

Disposable cuvettes for 200 samples with Cuvette stand should be quoted with the instrument