REQUEST FOR PROPOSAL (RFP)

For Supply/Installation/Commissioning (turnkey basis) of Modular Operation Theatres in 6 Medical College & Hospitals and 36 District Hospitals in Bihar

Sealed bids (three envelope system) are invited from the leading firms/ consortium for Supply / Installation/Commissioning (turnkey basis) of Modular Operation Theatres in 6 Medical College & Hospitals and 36 District Hospitals in Bihar. Request for proposal (RFP) and detailed terms and condition are available on (http://www.statehealthsocietybihar.org/). The last date for submission of proposal along with all requisite documents is **11.09.2014 by …5.00 pm..** All the applications received by due date will be opened on **…12.09.2014 by ….11.30 am…** in presence of bidders or their representatives. The shortlisted agency are required to make technical presentation on **22.09.2014…by 11.30 am…..** in the Conference Room of State Health Society Bihar, Sheikhpura, Patna. The State Health Society Bihar reserves the right to cancel the tender without assigning any reason**..**

Any upgradation in the technology shall be provided by the vendor without any extra cost in the next 5 years. The State Health Society Bihar reserves the right to cancel the tender without assigning any reason.

For any further clarification, please contact on office number 0612-2290351 during official working hours.

Executive Director
State Health Society Bihar

Supply/Installation/Commissioning (turnkey basis) of
Modular Operation Theatres

REQUEST FOR PROPOSAL (RFP)

A. Introduction

Health sector in Bihar has witnessed notable developments in the last few years particularly in fields of improvement in health infrastructure, patients visiting health centres, institutional delivery & reduction in maternal mortality. The results of health initiatives in the Bihar are positive and the state needs to sustain the momentum during the coming years. Continuing with the trend, Government of Bihar intends to establish modular operation theatre in medical college & hospital and district hospitals in the state.

B. Scope of Work

The Government of Bihar intends to install Modular Operation Theatre (MOT) in 6 Medical College & Hospitals and 36 District Hospitals. The agency will provide complete technical support in terms of design and execute the modular OTs on turnkey basis, supply bio medical equipments & medical furniture as required including installation, operationalisation and maintenance of modular OTs. The number of MOT are 7 (seven) in Patna Medical College & Hospital, 3 (three) in remaining 5 Medical College & Hospitals and 1 (one) in each District Hospitals (total 36 District Hospitals), thereby, totalling **58 MOT** across the state. **The agency should provide 24 x7 maintenance support through dedicated trained maintenance staff (Bio Medical engineer / technician) for each institution to maintain the facility and rectify any minor issues related to the smooth functioning of the Modular OT.**

Technical specifications and approximate Bill of Quantity (BoQ) are in Annexure A of the RFP.

C. General Terms and Conditions:

1. Interested Bidders may inspect the proposed hospital buildings before submission of their proposal to decide requirement at their own cost.

2. Before submitting the proposal, the bidder will be deemed to have satisfied themselves by actual inspection of the site and locality of the works, that all conditions liable to be encountered during the execution of the works are taken into account and that the rates quoted in the proposal are adequate and all inclusive to accord with the provisions of contract for the completion of works to the entire satisfaction of the SHSB.

3. The Bidder should have an experience for similar nature of work to manage turnkey projects for a period of 3 years in India and shall submit documentary evidence of satisfactory performance of the OTs.

4. The proposal with required document shall be submitted on or before **...11.09.2014 by 5.00pm.**. to the Office of the Executive Director, SHSB. Any submission after the due date will not be accepted. The documents should be submitted in two separately sealed envelopes, one each for **Technical and Financial bid**. All the two sealed envelopes should in turn be put in one big sealed envelope and marked as follows addressed to the Secretary Health cum Executive Director, State Health Society Bihar along with address mentioned in the advertisement:

a. **Outer Envelope:** "Proposal for Supply/Installation/Commissioning (turnkey basis) of Modular Operation Theatres".

b. **Inner Envelopes:**
   - Technical Proposal
   - Financial Proposal

5. All the applications received by due date will be opened at **11:30 am on ..12.09.2014**.. in front of bidders or their representatives.

6. The Firm will be short-listed based on technical documents furnished & presentation made for proposed services on the **22.09.2014 by 11.30 am**. The date and time for opening financial bids of the technically short listed firms will be intimated later by e-mail and/or telephone.

7. The State Health Society Bihar reserves all rights to reject any or all the RFP/tender without assigning any reason.

8. **Eligibility Criteria:** Interested agencies must have the following minimum credentials to qualify for the proposed task:

a. **The interested agency should have completed at least five nos. of successfully operational Modular OT installations in the last three years in Govt./ Semi Govt./ reputed Pvt. Institutions / Hospitals in India. The installations mentioned by the bidder in their offer must be functional and performance certificate for the same for at least last one year issued by the user concerned (Head of the Department or Institution) should also be attached with the offer**.

b. The minimum average annual turnover required for agencies taking part in this RFP shall be Rs. 15 (fifteen) crores in the last three years. Reports on the financial standing of the Bidder, such as profit and loss statements and balance sheet and auditor's reports for the past three years to be submitted.

c. Must not be blacklisted / adverse observation by Central Government or any State Government / Government institution. The bidder should submit an affidavit for the same.

d. Earnest Money Deposit (EMD) of **Rs. 25,00,000/- (Twenty Five Lakh)** (Refundable) through a Demand Draft drawn in favour of "State Health Society Bihar". Any bid which is not accompanied by the EMD will be automatically rejected. EMD will be returned to the non-qualifying bidders.

e. Contact details of the experts involved in implementation of the project.

9. The selected agency will have to provide uninterrupted power supply through online UPS system and DG Set for back up at each MOT (details in Annexure-A).

10. The agency will lay down the medical gas pipeline and supply services and connections and ensure proper upkeep of this facility (details in Annexure-A).

11. The agency will provide dedicated air handling unit (AHU) for each MOT complex (details in Annexure-A).

12. JV/ Consortium will be allowed upfront during bidding as consortium partners/members with evidences thereof in the form of Letter of Association (LOA) for specific activities in which one party will be the lead partner having all the legal and statutory responsibilities, all the other members of consortium will submit their authorization letter in favour of lead partner for the same. No sub-letting for any or whole work will be allowed thereafter.

13. The consortium will be technically evaluated based on the credentials of the lead firm.

14. The selected agency will have to carry out civil work inside of MOT area. If required, civil work of related area will also be carried out by the selected agency to ensure proper functioning and maintenance of MOT.

i) Before formulating the tender and submitting the same, the tenderer should read and examine all the terms, conditions, instructions, checklist etc. contained in the tender documents. Failure to provide and/or comply with the required information, instructions etc. incorporated in these tender documents may result in rejection of its tender.

ii) Language of Tender: The tender submitted by the tenderer and all subsequent correspondence and documents relating to the tender exchanged between the tenderer and the SHSB shall be written in English/Hindi, unless otherwise specified in the Tender Enquiry (TE).

The tender submitted by the tenderer and all subsequent correspondence and documents relating to the tender exchanged between the tenderer and the SHSB, may also be written in Hindi, provided that the same are accompanied by English translation. Again, the English translations shall prevail for purpose of interpretation of the tender etc.

iv) Eligible Goods and Services: Tenderer has to provide all the related certificates and documents duly notarized in terms of country of origin and applicable necessary certificates/ Quality Standards. The term ―origin‖ used in this clause means the place where the goods are mined, grown, produced, or manufactured or from where the related services are arranged and supplied.

v) Tendering Expenses: The tenderer shall bear all costs and expenditure incurred and/or to be incurred by it in connection with its tender including preparation, mailing and submission of its tender and for subsequent processing. The SHSB will, in no case be responsible or liable for any such cost, expenditure etc. regardless of the conduct or outcome of the tendering process.

vi) Amendments to Tender Documents: At any time prior to the deadline for submission of tenders, the SHSB may, for any reason deemed fit by it, modify the tender documents by issuing suitable amendment(s) to it.
Such amendment(s) will be notified on the website of the Society i.e., www.statehealthsocieybihar.org

Tenderers are advised to check the official website of SHSB on regular basis for latest updates. SHSB will not be held responsible if they fail to do so.

In order to provide reasonable time to the prospective tenderers to take necessary action in preparing their tenders as per the amendment(s), SHSB may, at its discretion extend the deadline for the submission of tenders and other allied time frames, which are linked with that deadline.

vii) The size of OT may vary in different Hospitals, so an approx square meter rate may also be provided as the functioning of OT has to be converted to Modular OT.

viii) Clarification of Tender Documents:- A tenderer requiring any clarification or elucidation on any issue of the tender documents may take up the same with the SHSB on any working day (Monday to Friday) between 3.00 to 5.00 pm.

15. The Bidding Documents along with terms and conditions, technical specification can be obtained from the State Health Society, Bihar website: http://www.statehealthsocietybihar.org.

16. **All the applications received by due date will be opened at …12.09.2014…. by 11.30 am in presence of bidders or their representatives.**

17. **Tender currencies**: The tenderer supplying indigenous goods or already imported goods shall quote only in Indian Rupees. Tenders, where prices are quoted in any other way shall be treated as non-responsive and rejected.

18 **Tender Prices:** The Tenderer shall indicate the Price Schedule provided under **Annexure - B** including all the specified components of prices shown therein as the unit prices and total tender prices of the goods and services it proposes to supply against the requirement. All the columns shown in the price schedule should be filled up as required. If any column does not apply to a tenderer, the same should be clarified as ―NA by the tenderer. While filling up the columns of the Price Schedule, 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 price schedule 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, CST, VAT, CENVAT, Custom Duty, Excise Duty etc. already paid or payable on the components and raw material used in the manufacture or assembly origin quoted ex-showroom etc;

b) Any sales 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 (local transportation and storage) would be borne by the Successful bidder from ware house to the consignee site for a period including 3 months beyond date of delivery, Loading/Unloading and other local costs incidental to delivery of the goods to their final destination as specified in the List of Requirements and Price Schedule.

ii) Additional information and instruction on duties and Taxes: If the Tenderer desires to ask for excise duty, sales tax/ VAT, 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.

iii) Excise Duty:

a) If reimbursement of excise duty is intended as extra over the quoted prices, the tenderer 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 firm and final and no claim on account of excise duty will be entertained after the opening of tenders.

b) If a Tenderer 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 tenderer 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 14.(iii). (a) & (b) 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 successful bidder . In case of downward revision in excise duty, the actual quantum of reduction of excise duty shall be reimbursed to the SHSB by the successful bidder. All such adjustments shall include all reliefs, exemptions, rebates, concession etc. if any obtained by the successful bidder.

iv) Sales Tax: If a tenderer asks for sales tax/ VAT, Service Tax and Works Contract Tax to be paid extra, the rate and nature of sales tax applicable should be shown separately. The sales tax / VAT, 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 / VAT, Service Tax and Works Contract Tax and is payable as per the terms of the contract. If any refund of Tax is received at a later date, the successful bidder must return the amount forth-with to the SHSB.

v) Octroi Duty and Local Duties & Prices: Normally, goods to be supplied to government organizations 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 successful bidder shall ensure that the stores to be supplied by them against the contract placed by the society are exempted from levy of any such duty or tax and, shall obtain the exemption certificate from the SHSB wherever necessary. The SHSB shall issue the certificate to the successful bidder within 21 days from the date of receipt of request from the successful bidder. However, if a local body still insists upon payment of such local duties and taxes, the same should be paid by the successful bidder to the local body to avoid delay in supplies and possible demurrage charges and obtain a receipt for the same. The successful bidder should forward the receipt obtained for such payment to the Institute to enable the SHSB to reimburse the successful bidder and take other necessary action in the matter.

19. **Firm Prices**: Prices quoted by the tenderer shall remain firm and fixed during the currency of the contract and not subject to variation on any account. However, as regards taxes and duties, if any, chargeable on the goods and payable, the conditions stipulated in clause 12 will apply.

20. **Alternative Tender**:

a) Alternative Tenders are not permitted.

b) However the Tenderers can quote alternate models meeting the tender specifications of same manufacturer with single EMD.

21. **Tender validity**: The tenders shall remain valid for acceptance for a period of 180 days (One hundred and eighty days) after the date of tender opening prescribed in the tender document. Any tender valid for a shorter period shall be treated as unresponsive and rejected.

In exceptional cases, the tenderers may be requested by the SHSB to extend the validity of their tenders up to a specified period. Such request(s) and responses thereto shall be conveyed by surface mail or by fax/telex/cable/Email followed by surface mail. The tenderers, who agree to extend the

tender validity, are to extend the same without any change or modification of their original tender and they are also to extend the validity period of the EMD accordingly. A tenderer, who may not agree to extend its tender validity after the expiry of the original validity period the EMD furnished by them shall not be forfeited.
In case the day up to which the tenders are to remain valid falls on/ subsequently declared a holiday or closed day for the SHSB, the tender validity shall automatically be extended up to the next working day.

22. **Late Tender: -** A tender, which is received after the specified date and time for receipt of tenders will be treated as ―late‖ tender and will be ignored.

23. **Alternation and Withdrawal of Tender**: - The tenderer, after submitting its tender, is permitted to alter / modify its tender so long as such alterations/modifications are received duly signed, sealed and marked like the original tender, within the deadline for submission of tenders. Alterations / modifications to tenders received after the prescribed deadline will not be considered. No tender should be withdrawn after the deadline for submission of tender and before expiry of the tender validity period. If a tenderer withdraws the tender during this period, it will result in forfeiture of the earnest money furnished by the tenderer in its tender.
Any withdrawal or deliberate uncooperative behavior by the shortlisted tenderer may also amount to unfair means and will lead to blacklisting and forfeiture of EMD.

24. **Scrutiny and Evaluation of Tenders:**

i) Tenders will be evaluated on the basis of the terms & conditions already incorporated in the tender document, based on which tenders have been received and the terms, conditions etc. mentioned by the tenderers in their tenders. No new condition will be brought in while scrutinizing and evaluating the tenders.

ii) The SHSB Technical/PAC/Expert committee will examine the tenders to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed stamped and whether the tenders are generally in order.

iii) The SHSB‘s determination of a tender‘s responsiveness is to be based on the contents of the tender itself without recourse to extrinsic evidence.

iv) The tenders will be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc. as prescribed in the tender document. The tenders, which do not meet the basic requirements, are liable to be treated as non-responsive and will be rejected.

25. Non-responsive tender: The following are some of the important aspects, for which a tender shall be declared non-responsive during the evaluation and will be ignored:
a). Tender is unsigned.
b). Tender validity is shorter than the required period.
c). Required EMD (Amount, validity etc.)/ exemption documents have not been provided.
d). Tenderer has quoted for goods manufactured by other manufacturer(s) without the required Manufacturer‘s Authorisation Form.
e). Tenderer has not agreed to give the required performance security of required amount in an acceptable form for due performance of the contract.
f). Tenderer has not agreed to other essential condition(s) specially incorporated in the tender enquiry like terms of payment, liquidated damages clause, warranty clause, dispute resolution mechanism applicable law.

g). Poor/ unsatisfactory past performance.
h). Tenderers who stand deregistered/banned/blacklisted by any Govt. Authorities.
i). Tenderer is not eligible as per eligibility criteria.
j). Tenderer has not quoted for the entire quantity as specified in the List of Requirements in the quoted schedule.
k). Tenderer has not agreed for the delivery terms and delivery schedule.

26. Discrepancies in Prices:

a). If, in the price structure quoted by a tenderer, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless the Technical /PAC committee feels that the tenderer has made a mistake in placing the decimal point in the unit price, in which case the total price as quoted shall prevail over the unit price and the unit price corrected accordingly.

b). If there is an error in a total price, which has been worked out through addition and/or subtraction of subtotals, the subtotals shall prevail and the total corrected; and

c). If there is a discrepancy between the amount expressed in words and figures, the amount in words shall prevail, subject to sub clause 23(a) and 23(b) above.

d). If, as per the judgment of the Technical Committee/PAC, there is any such arithmetical discrepancy in a tender, the same will be suitably conveyed to the tenderer by registered / speed post. If the tenderer does not agree to the observation of the SHSB, the tender is liable to be ignored.

27 Tenderer's capability to perform the contract:

a) The SHSB, through the above process of tender scrutiny and tender evaluation, will determine to its satisfaction whether the tenderer, whose tender is evaluated to be the lowest priced responsive tender, is eligible, qualified and capable in all respects to perform the contract satisfactorily. If, there is more than one schedule in the List of Requirements, then, such determination will be made separately for each schedule.

b) The above-mentioned determination will, interalia, take into account the tenderer's financial, technical and production capabilities for satisfying all the requirements of the SHSB as incorporated in the tender document. Such determination will be based upon scrutiny and examination of all relevant data and details submitted by the tenderer in its tender as well as such other allied information as deemed appropriate by the SHSB.

28 Contacting the Institute:

a) From the time of submission of tender to the time of awarding the contract, if a tenderer needs to contact the Institute for any reason relating to this tender enquiry and / or its tender, it should do so only in writing.

b) In case a tenderer attempts to influence the SHSB in the Technical /PAC committee's decision on scrutiny, comparison & evaluation of tenders and awarding the contract, the tender of the tenderer shall be liable for rejection in addition to appropriate administrative actions being taken against that tenderer, as deemed fit by the SHSB.

29 State Health Society's Right to accept any tender and to reject any or all tenders

The SHSB reserves the right to accept in part or in full any tender or reject any or more tender(s) without assigning any reason or to cancel the tendering process and reject all tenders at any time prior to award of contract, without incurring any liability, whatsoever to the affected tenderer(s).

30 Variation of Quantities at the Time of Award/ Currency of Contract:

a) At the time of awarding the contract, the SHSB reserves the right to increase or decrease by up to 25% (twenty-five percent) of the quantity of goods and services mentioned in the schedule(s) in the

―List of Requirements‖ (rounded off to next whole number) without any change in the unit price and other terms & conditions quoted by the tenderer.
b) If the quantity has not been increased at the time of the awarding the contract, the SHSB reserves the right to increase by up to 25% (twenty-five percent) of the quantity of goods and services mentioned in the contract (rounded off to next whole number) without any change in the unit price and other terms & conditions mentioned in the contract, during the currency of the contract.

31 Notification of Award/Letter of Intent (LOI)
a) Before expiry of the tender validity period, the SHSB will notify the successful Bidder(s) in writing, by registered / speed post or by fax or by Email (to be confirmed by registered / speed post immediately afterwards) that its tender for equipment(s), which have been selected by the SHSB, has been accepted, also briefly indicating there in the essential details like description, specification and quantity of the goods & services and corresponding prices accepted. This notification is undertaken by issuing a Letter of Intent (LOI) by the Institute.
b) The successful bidder, upon receipt of the LOI, shall furnish the required performance security and submit an agreement in the prescribed format within 10 (ten) days, failing which the EMD will be forfeited and the award will be cancelled.
c) The Notification of Award shall constitute the conclusion of the Contract.

32 Issue of Contract:
a) Promptly after notification of award, the SHSB will mail the contract form duly completed and signed, in duplicate, to the successful tenderer by registered / speed post.

b) Within 21 (twenty-one) days from the date of the contract, the successful tenderer shall return the original copy of the contract, duly signed and dated, to the SHSB by registered / speed post along with Bank Guarantee valid .

33. Submission of Performance Security: Bank Guarantee of 10% of the total order value will be submitted by the successful bidder which will remain valid for 1 year after completion of contract.

34 Non-receipt of Performance Security and Contract by the SHSB: Failure of the successful tenderer in providing performance security and / or returning contract copy not duly signed shall make the tenderer liable for forfeiture of its EMD.

35 Return of EMD: The earnest money of the successful tendererand the unsuccessful tenderers will be returned to them without any interest.

36 Corrupt or Fraudulent Practices:

It is required by all concerned namely the SHSB /Tenderers/Successful bidder s etc. to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the SHSB defines, for the purposes of this provision, the terms set forth below as follows:-
a) ― Corrupt practice‖ means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
b) ― Fraudulent practice‖ means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the SHSB, and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish Tender prices at artificial non-competitive levels and to deprive the SHSB of the benefits of free and open competition;
c) Will reject a proposal for award if it determines that the Tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

d) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract by the SHSB if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing the contract.

37 Signing of Contract: The successful bidder shall execute an agreement for ensuring satisfactory supply, installation, commissioning and the after-sale service/support during the comprehensive warranty period and during the Comprehensive Maintenance Contract (CMC).

38 The Executive Director, SHSB Patna reserves the right to accept or reject any or all tenders without assigning reasons.

39 The Executive Director, SHSB Patna reserves the right to modify, add or delete any terms & conditions of the contract as and when required.

D. SUBMISSION REQUIREMENTS:

Interested Agencies wishing to undertake the above task on behalf of State Health Society Bihar, may submit their application in a sealed envelope marked "RFP for Providing Modular OTs on Turnkey Basis in Government Medical College & Hospital and District Hospital across Bihar". Agency is required to clearly indicate the relevant page number against each of the submission requirements mentioned below in your cover letter/application accompanying the proposal. There should be two sealed envelopes, one each for (i) technical proposal, and (ii) financial proposal. The contents of each envelope are discussed below.

I. **Technical Proposal**

a. Cover letter to participate.
b. Audited Annual Financial Statement for the last 3 years.
c. **The agency should submit an affidavit (at least on INR 100/- stamp paper) claiming that MOT installed by the manufacturer is functional for at least last one year. The agency should also submit performance certificate for the same MOTs issued by the user concerned (Head of the Department or Institution**).
d. No-conviction certificate for the last three years submitting affidavit from Magistrate that they are not blacklisted by any Govt. Dept. /Govt. organization and/or the Competition Commission of India/ Central Vigilance Commission/ Comptroller and Auditor General of India for bid rigging & cartelization/ pending cases to this effect in the court of law.
e. **Agency should submit an affidavit (at least on INR 100/- stamp paper) declaring that costs quoted in the bid is their lowest price and they have not offered lower than this to any other Government/ Corporate/ Institute.**
f. EMD for Rs. Twenty Five Lakhs only
g. Contact details of the experts responsible for implementation of the project

Agency should submit technical proposal which should contain the complete technical specifications and details on the competency of the bidder with terms and conditions of supply, warranty, after-sale services etc. (Except Price Bid Form). Apart from the documents and signed copy of the purchased tender document, the necessary enclosures should be submitted in this technical bid. **All the claims regarding meeting the specifications shall be duly supported by appropriate, latest technical catalogues / brochures from the manufacturer. Simply stating that the equipment(s) meets the specifications is not sufficient and any such quotations will be summarily rejected. Computer printed documents or Photostat copy or laser printouts will not be accepted as technical**

catalogues / brochures. In short, the technical bid should contain all the necessary documents to prove the technical competency and capability of the bidders for supplying and installing a trouble-free equipment, meeting the quality standards and technical specification and the ability of the bidders in providing efficient after-sales service to the satisfaction of the Tender Inviting Authority and the user Department.

II. FINANCIAL PROPOSAL

a. The cost for speciality (in district hospitals) and super-speciality (in medical colleges) MOT should be submitted separately. **Specialty OT (Low End)** includes surgery, orthopaedics, gynaecology & obstetrics, etc. and **Super Specialty OT (Hi End)** includes transplant OTs, CTVS OT, Neurosurgery OT etc.

b. The financial will include fixed and variable cost separately. While for the decision on 1st lowest a comprehensive cost will be considered, the cost break-up of fixed and variable will allow the GoB to increase or decrease the requirements of variable components based on per unit cost within the project duly certified by the authorities.

E. Special Terms and Conditions:

1. **SHSB reserves the right to issue multiple purchase orders to the same company/ multiple companies based on the technical capability and experience after the evaluation and recommendation of Technical committee.**

2. Delivery & Installation: The ordered items shall be delivered & installed and commissioned within **6 (six) months** from the date of issue of contract.

3. **Payment Terms: The payment to selected agency will be as per following**
   - **25% - supply of equipment after proof of delivery**
   - **50% - installation**
   - **10% - operations – after technical evaluation and satisfactory report by third p[arty appointed by SHSB (payment for the evaluation will be borne by the tenderer).**
   - **3% - each every year for next five years on successful performance.**

4. **Installation Penalty Clause:** The lead firm will be liable for applicable penalty clauses in the contract. The agency will be bound to establish the MOT within the stipulated period as mentioned above, failing which the following penalty will be levied on the agency (the deductions will start with deductions from the EMD/Security Deposit). For delayed setting up of MOT: A penalty of 0.5% of the total value of order per week will be imposed subject to a maximum of 10% of the total value of the order.
   a. A delay beyond 1 year per MOT will amount to blacklisting of the firm for next 5 years for any tender in the state of Bihar.
   b. For Non-setting up of MOT:- Security Deposit of the firm shall be forfeited and firm will be blacklisted for next 5 years for any tender in the state of Bihar.

5. **Uptime guaranty and Penalty**: During the Warranty / Guaranty period, the agency shall maintain the equipment with 95% uptime.

a. **The Agency shall give a written commitment for 95% uptime of the equipment, calculated on annual basis (365 days), with penalty of Rs.10000/- per day on all days which MOT does not run due to technical fault. Maximum down time for a single event should not exceed 3 days. If it exceeds more than 3 days in a single episode then penalty will be calculated as Rs. 25000/- per day from 4th day onwards.**

6. Special Instructions:

a**. Prices should be firm & fixed**

b. Prices will be quoted on per square meter running cost wherever applicable.

c. Prices accepted are for MCH and DH as mentioned in the RFP

d. Required to furnish original manufacturers test certificate.

e. Freight & insurance, loading / unloading and incidental expenses including of all taxes, installation & commissioning will be arranged by agency at their own cost.

f. The Agency should indicate prices of MOT for Medical College & Hospitals and District Hospitals separately as the cost for MOT in DH is likely to be lower than that in MCH.

g. Short listed Tenderer will also organize the inspection of successfully functional for last one year MOT installed by them by Technical Committee at his expenses.

h. All the pages of tender should be numbered and signed with Stamp.

7. COMPREHENSIVE WARRANTY: The following Guarantee/Warrantee Clause shall be applicable and binding on agency: The qualified party will have to provide 1 year warranty and Comprehensive Maintenance Contract (CMC) for 4 years of MOT.

The seller declares/ certify that the goods/ equipment/ articles sold/ supplied to the purchaser under this contract shall be **NEW** in all respects, are of the best quality, workmanship and shall be strictly in accordance with the specification and particulars contained/ mentioned in the contract and **not** refurbished equipment/ articles are supplied. The contractor/ seller will further guarantees that the said goods/ equipments would continue to conform to the given description and quality aforesaid for a period of 36 months from the date of Installation / Commissioning of the said MOT in the premises of the purchaser/user facility. The above guarantee/ warranty are not-withstanding to the fact that the purchaser may have inspected the MOT/ article and/ or not within a period of 36 months of thereafter. In case said goods/ articles is discovered not to conform to the description and quality aforesaid or not giving satisfactory performance or have deteriorated at subsequent stage, the purchaser may take such action or issue such directions as deems fit to Agency to bring the machine in conformity with prescribed specification/ to make it operational and which shall be final and binding on the contractor/ seller. The purchaser is entitled to call upon the contractor to rectify the goods/ equipments/ articles or such portion of MOT as found to be defective by the purchaser within a reasonable period/ or such specified period as may be allowed to the contractor failing which the losses, compensation, damages etc, including the cost of repairing of such equipments/ goods, if the items/ machine is repaired from open market or such damages as assessed by purchaser, which indenter would suffer due to non-operation of the said article/ instrument, shall be recovered from the

Agency and the firms/ tenderer shall be blacklisted for breach of warranty. **No item will be excluded under CMC or warranty.**

8. Correctness and Completeness of MOT: **Third party will inspect & certify adherence to the specification. The Agency will be appointed by SHSB and cost will be borne by the tenderer.**

9. Rectification Clause: In the event of spares is given back to the manufacturer, it should be ensure that the defect is attended immediately without loss of time so that spares can be re-inspected. However, it should be noted that the manufacturer will not entitled to dispose off that spares which is given for rectification/ rejecting without prior permission of the inspection.

10. Installation: The equipment shall be installed/ demonstrated by Agency free of cost at consignee premises. The Agency should provide 2 copies of the manual including electric circuit diagram, MOT design, medical gas connections and pipeline layout, ventilation channel and connections with AHU free of cost along with the equipment.

11. **Intimation of dispatch**: The documents should be in the name of consignee only. The information regarding shipment should be sent to the institution well in advance. Delay in submission of relevant information/ incorrect document, and any such information due to which the clearance of MOT is delayed, the demurrage charges shall be to Agency accounts.

12. **Liability**: Supplier's responsibility shall be up to consignee's premises/ facilities. However, agency will be responsible for any damages/ losses due to defective packing, transportation, etc.

13. Training: The Agency shall provide onsite training to medical & technical Staff.

14. Insurance: The Agency shall take insurance cover from originating place and shall keep it valid until entire materials reach hospital leaving sufficient time for necessary installation and commissioning. The Agency shall also ensure accidental/ fire insurance, as applicable to all equipment in the MOT.

15. Safe custody of equipment: The GoB will try to provide a space wherever possible for the vendors for safe keeping of the materials under lock and key. However, the GoB is not responsible for the safety of the material stocked within the hospital premises and the vendors will have to make their own arrangements for the same.

16. The Agency will have to procure and install the equipment/ fixtures/ articles manufactured only by the reputed companies/ manufacturers. They will have to indicate the name of manufacturers in the bid document which will be duly approved by the Technical Committee of the SHSB before executing the work.

17. The decision of the State Health Society Bihar shall be final, and no enquiries, or application for review, shall be entertained. The State Health Society Bihar reserves the right to modify the terms & conditions partially or wholly or cancel the tender without assigning any reason.

18. Notwithstanding anything stated above, the State Health Society Bihar (SHSB), Patna reserves the right to assess the Bidder's capability and capacity to perform the contract satisfactorily before

deciding on award of the contract, should circumstances warrant such an assessment in the overall interest of the Society.

19. The SHSB reserves the right to ask for a free demonstration of the quoted equipment at a predetermined place acceptable to the user Department for its technical acceptability as per the tender specification, before the opening of the financial bid.

For any clarification, please contact on office number 0612-2290351 during official working hours.

Executive Director
State Health Society Bihar

Annexure - A

Technical Specification

Technical Specification for Modular Operation Theatre Hi End

1.) Walls and Ceiling for Operating Area: European CE / US. FDA approved (Certificate should be attached with the bid)

Walls & Ceiling Construction – (cladding type OT) - Imported

The FRAMEWORK should be made of upright ledgers and profiles entirely made of a **galvanized steel sheet** with a **thickness of 15mm**. They should folded structural steels with a suitable section for the loads.

The structure components should be joined together by means of coupling systems in order to create a solid reticular frame, able to support different infill panels whose weight is up to 8 Kg/sq the "Z" upright forms the vertical part of the frame and should be equipped with proper drilling of 32mm (height partial drilling) suitable for the panel coupling without suing screws between the uprights and edges of the panel there is a suitable PVC adhesive seal with a thickness firm of 3mm to ensure air and dust sealing. At the lower end of the upright an adjustment foot should allow the easy levelling of the structure and, the necessary compression of the ancharge between ceiling and floor.

The ledgers should the elements that constitute the basic module of the structure. They should be inserted on the proper hooks by pressure between two uprights, Moreover some "U" profiles , to be placed in horizontal position on the upper and lower part of this structure, constitute its extension with a depth of 64mm together with the metal panels with a thickness of 18mm and the PVC adhesive seal. The structure can be provided with stiffening ledgers or profiles for sliding door fixing and other accessories according to needs. Total thickness of the partition wall:100mm

Skin PANELS (double wall 1 side-partition wall 2 sides):

Module skin panels should have a height exceeding 3mm up to a maximum of 3.5m from the floor and a width that should vary from a minimum of 280mm to a maximum of 1200mm"they can be made of different types of finishing**; using solid surface material**

The panels should be made of solid surface material thick 3mm backed by structural panel thick 15mm consisting of a trapezoidal aluminium corrugated core glued between two flat of aluminium sheet. The Solid Mineral Surface (SMS) material should be dent free antibacterial & fire resistant. The Solid Mineral Surface (SMS) should not require any paint & should have in built antibacterial properties. The material should be manufactured for about two third with aluminium hydroxide and a third with acrylic resin and natural pigments. The aluminium hydroxide should give the product a particular strength and the quality of the acrylic resin ensure should cleanliness, water resistance and colour stability over time. The material should have antibacterial activity (% reduction>99%).

On the inner sides of the panels thee shall slotted holes for their anchorage to the support hooks fixed to the structure uprights,

This fastening system should allows obtaining all the following results:

The panel should be self centring with consequent joint alignments between panel and panel, ensuring aesthetic balance.

The connection between hook and panel should be designed so that the panel, due to its weight, is compressed against the PVC seals coating the entire structure helping to reduce noise transmission. The fixing system of the panels should ensures that there is no accidental breakway of the panel, even If it is subjected to stress for more safety and stability:

The connection system should allows disassembling and assembling each panel without moving the others near it.
Its flexibility the partition wall should satisfy all the inspection and /or the maintenance needs required by modern workplaces (for example electrical installations, hydraulic installations, medical gases etc.) all the panels can be removed over their entire length and on both sides. The lower part of the panel should be equipped with a profile prepared for the laying and the coupling of the horizontal skirtings that need to re enter with the respect to the panel.

The inner angles (which are at 900) in operating rooms or in similar environments should made up of a panel without interruption of continuity that covers the angular area of the wall. The panel should characterized by a double specular folding at 135 0 (or variable folding according to the requirements). All the panels should be drilled according to specific needs (ex ventilation grids of the room)
The panels must be perfectly sealed together by means of thermoplastic rubber gaskets inserted by pressure and free of projections.

The rate should be quoted on per square meter basis after installation the measurement shall be done and payment will made on actual basis.

Properties & Features of Solid Mineral Surface Material .

Properties & Features	
Density g/cm3	1,7
Hardness (Barcol)	60
Water Absorption %	0,023
Heat Expansion (1 x 10”in/in”/F)	2,1
Ignition Test	38
Tensil Strength, psi	6500
Elongation At Yeld %	0,2
Flexural Strength, 8ft;o,5lb	72D-79000
Water Resistance, g/1000cycl	Unbreakable
Lustre Stable Resistance	0,05
High Temperature Resistance	Uninfluential
Boiling Water Resistance	Uninfluential
Stain Resistance	Uninfluential
Chemical Resistance	Uninfluential

2.) <u>Flooring</u>

A floor screed should be provided, flat to within a tolerance of +/-
3mm over any 3 metre area. The floor finish in the operating room should be 2mm static conductive PVC tiles, laid on a semi conductive adhesive base. It conforms to CEN classification EN 685 and Resistance to Chemicals as per DIN 423/DIN 51958. It conforms to the requirement standard for healthcare facilities NFPA 99.

The floor finish should terminate at the room perimeter passing over a concealed cove former and continuing up the wall for
100mm.

All joints should be welded and the plastic wall finish should overlap the floor coving by 25 mm, to provide a continuous sealed surface.

The PVC flooring tiles should be laid on copper grid for providing antistatic electro-statically conductive flooring.

The rate should be quoted on per square meter basis after installation the measurement shall be done and payment will made on actual basis.

3.) Operation Theatre Control Panel

All the controls within the theatre are located on membrane type
control panel mounted in the theatre wall. A remote electrical distribution board is provided to allow access to the panel for maintenance without access to the theatre. Front panel should be inside the O.T. and Rear panel shall be outside the O.T. The approach from inside the room through main door and from outside the panel through dirt corridor.

Each control panel contains:-

- Pressure Indicator
- Time elapse Clock
- Standard Clock
- Temp and Humidity Indicators
- Temp and Humidity Set Point Adjust
- Plenum Lighting Controls
- Medical Gas Alarms
- Phone
- Hepa Filter status Indicator.

The time elapsed digital clock and real time digital clocks are of high brightness characters, not less than 30mm in height.

The medical gas alarm indicate High and Low gas pressure for gas service present in the operating theatre and have audible buzzer with mute facility.

The medical gas alarms are connected to local pressure switches located downstream of the last isolation valves.

The remote cabinet should house the operating lamp transformers, main failure relays, electrical distribution equipment and circuit protection equipment for all circuits within the operating theatre.

All internal wiring should terminate in connectors with screw and clamp spring connections of the Klippon type mounted, on a DIN rail and labeled with indelible proprietary labels.

Individual fuses or miniature circuit breakers should protect all internal circuits.

All internal wiring should be of the high temperature type and enclosed in propriety ducting or mini.

All internal wires should be marked with plastic ferrule type cable markers, for ease of identification.

All wall mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

4.) X-Ray Viewing Screens

The theatre should be equipped with a twin plate X-Ray Viewing Screen, designed to provide a high level of control luminance, without flicker, from a unit that is easy to clean and maintain.

The X-Ray viewing screen illumination should be LED lamps controlled by demining ballast. The LED lamps should provide a uniform level of illumination across entire front panel.

The front panel diffuser should be of a glare free type, sealed flush with the inside face of the operating theatre wall (or may as on option be integrated within the control panel fascia).

It should be equipped with eight spring-loaded clips to secure the X-Ray negative when in use. The fluorescent lamps should provide a uniform level of illumination across the entire front panel diffuser and should be controlled by electronic step-less dimming controls to provide flicker free dimming from maximum brightness to off.

Access for maintenance and lamp changing should be front of the panel.

All internal wiring should terminate in connectors with screw and clamp spring connections.

Individual fuses or miniature circuit breakers should protect all internal circuits.

All internal wiring should be of a high temperature and secured by propriety cable clips.

All wall mounted equipment should be flush mounted and sealed into theater wall by means of a sterile jointing system.

5.) Doors and Frames (Hermetically Sealed type) 2100 mm Height & 1500 mm Width (with Automation Unit)

The door with its automation unit conforms to machine directive93/87/EC, low voltage directive 73/23/EEC and 93/68/EEC and EMC directive 89/336/EEC and 92/31/EEC and 93/97/EEC.

To maintain sterility and the correct air pressure in the department, all doors into and out of the operating theatre and ancillary rooms be of the sliding, hermetically sealing type.

All sliding doors should be electrically operated.

The doors should be constructed with high-density particle board cores, and high pressure laminate faced on both sides.

The cores should be set firmly in an aluminum frame, suitably sealed with a non-porous non-shedding gasket.

The aluminum frames should contain the door seal.

The door should seal on all four edges in the closed position. The door track should be

constructed from an aluminum extrusion, fixed firmly to the walls.

The doors should run on nylon wheels within track.

The track and wheel design should be such that during the last 50 mm at travel on the closing cycle, the door moves in 3 directions to form a seal against the floor, at the bottom and against the frame on both sides and at the top.

Nylon runner guides should be fixed to the floor in such a way that they do not obstruct trolley movement through the door.

They should provide stability during the opening and closing cycles and assist in creating the necessary pressure at the bottom of the door to maintain the seal.

Floor guides across the door opening, or doors with no floor guidance should not be considered.

To ensure efficient sealing of the doors, the door manufacturer should provide the door frames.

They should consist of reinforced plasterboard panels faced with the same laminate as the doors.

The door frames should be edged with an aluminium extrusion and with concealed fixings that are adjustable during installation to ensure a 100% hermetic seal is achieved.

Vision panels should be fitted to all doors.

Automatic units should be of the single phase electronic type mounted directly to the door track.

The units should consist of a computerized electronic controller and motor. The drive mechanism should be by heavy-duty steel reinforced toothed fabric belt.

The controller should have the facility to individually set opening speeds, partials opening, closing speeds, time delays and a variety of locking and interlocking options, within factory preset limits.

The door controller should also have the ability to sense additional loads on the door caused by any obstruction in its path and to automatically stop or reverse the direction of travel.

The controller should be capable of either being operated by elbow switches/foot switches / Knee Switches/ key switches.

All doors should be able to be operated easily manually in the event of failure of the power supply or the automation units.

6.) Laminar Air Flow System

- The plan – air ceiling ventilation should dilute the bacteria generated by the operating team and patient in the theatre and to create an Air flow System pattern that carries contaminated airway from the operating table & entering surgical wounds. It should be designed such that filtered, sterile air flows through the operating zone without an admixture of indoor air. The germs and aerosols released by occupants are displaced into adjacent zone and removed with the exhaust air.
- The main components that the Laminar flow should be having is a rectangular air outlet housing with air out let frame and air discharge element on the underside and two housing on the top side each with a built in HEPA filter. The air discharge element should be a woven polyester cloth / fine – meshed fabric for laminar displacement flow. The air discharge element should be split with a feed through for the surgical light. The element should be removable or can be folded downwards for easy accessibility to the housing interior for cleaning and disinfection. It should be also easily accessible to the HEPA filters which can be easily replaced when required to do so.
- The complete laminar flow system should be pre- manufactured and pre – assembled unit, modular in design, having connection box and filter frame. The construction should be consists of four units modular in design with filter frames and variable connection hoods for the supply of air, the air discharge element should be made of fine mesh laminar fabric / woven polyester cloth with a surrounding stainless steel frame.

The plenum box (2400mm x 2400mm) will be made of high quality Aluminium 1.6mm thick & Air diffuser will be made of Woven polyester cloth that will introduce the highest air quality into the Operation Theatre. There will be 1800 mm x 18 mm 6 HEPA filters (as per plenum size) with 99.97% efficiency to ensure high quality clean air & tight control of bacteria infection system. Air

will be diffused into the theatre uniformly over the total area through perforated aluminium sheet. The air distribution system serving to the Operation Theatre will be tested as per DIN 4799 standards. The laminar flow installation & lighting system will be design to provide the Operation Theatre as key to preventing patients being infected during operation lies on the design of sterilized air conditioning system and the flow pattern of draught as well as the quality of engineering.

The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre.

7.) Pressure Stabiliser / Pressure Relief Dampers

The cascade pressure stabilisers are a range of multi bladed units specifically designed to control room air pressures in critical areas such as Operation theatres etc.

Each Stabiliser comprises of a carbon steel case &. matching slip over ring.

The carbon steel housing contains up to four Grade 304 stainless steel Blades, which pivot upon sealed for life bearing assemblies.

Balancing should be carried out utilising a proven balance weight assembly.

Adjustment can easily be carried out on site should the need arise.
Structural steel frames
All structural steel sections will be of Grade 43 to BS 4360 or equivalent Indian Standard.

The structural frames for the operating theatre are be designed taking into account all fixed equipment to be installed in the Modular OT.

The theatre structure should support all equipment installed in the Modular OT, such as the operating lamp etc, and should be vibration free and rigid.

The theatre structure should also be capable of supporting other equipment to be installed in the same Modular OT in future, with total loading not more than twice that of all the equipment to be installed in the OT as mentioned in this specification.
Welded sections in accordance with BS 5135.

Should be flushed mounted with sterile jointly hands.

8.) Surgical Scrub Sink

Compact Surgical scrub Sink should be designed for use in Operation theatre complex providing surgeons with a convenient sink for pre-op scrub up.

Each Fixture should be fabricated from heavy gauge type 304 stainless steel & should be seamless welded construction polished to a satin finish.

The scrub sink should be provided with a front access panel, which should be easily removed for access to the water control valve, waste connections, stoppers & strainers.

Hands free Operation includes infrared sensor with built-in range of adjustment.

Thermostatic Mixing Valve control should be located behind the access panel & maintain constant water temperature.

User defined settings of 1,3,5 & 10 Min. Should be available. This timing can be changed to meet individual application requirement.

Provided with elbow action taps, infrared sensor thermostatic control with fail-safe temperature controls.

All units should have radiused anti splash fronts. Knee/ foot operated switch should be offered as an option.

9.) Operating List -Writing Board

A List/Writing Board should be provided in operating theatre.

It should comprise a flush mounted, 1.50mm thick, white laminate board, bonded to a 2mm steel sheet for additional rigidity.

It should be mounted flush into the theatre wall with a sterile jointing system.

All wall-mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

10.) Electrical Installation

Modern medical procedures utilize and increasingly rely on, electrical and electronic equipment. This equipment ranges from lighting to patient monitors and electrosurgical equipment.

Power distribution within "the departments should be "provided' from distribution boards located local to each theatre. Sub mains power to these panels should be by the general electrical contractor. From these panels all distribution services within the departments should be run.

Earthed equipotent bonding of all exposed metalwork should be provided.

Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.
Light fittings within the clinical areas should be recessed fluorescent type, with high frequency tubes and control gear.

Fittings should be sealed In accordance with the standard IP54.

All equipment should be fully and permanently labelled to identify and describe the function, operation and voltage of the apparatus concerned. Throughout and upon completion of the electrical installation, tests in accordance with relevant sections of the local wiring regulations should be carried out and the results recorded

11.) Electrical Safety System for Cladding Type OTs -Imported

Each cladding OT will have the additional electrical safety system as per IEC 60364-7-710 that do not lead to disconnection and that do not cause hazards through high touch voltages in the event of a first fault. For supply to medical electrical equipment applied on patients, the “Ungrounded system with insulation monitoring and indication” will be used. Amongst other things, the following protective goals will be achieved:

- No disconnection in case of a first fault
- Small touch currents
- Possibility of a sensitive insulation fault detection/indication
- High reliability of electrical installations which are kept in good working order

When operating an ungrounded electrical system it has to be taken into consideration that in the "event of a first fault" an initially unearthed system turns into an earthed system (TN or TT system) and that a second fault leads to the tripping of an protective device and hence to disconnection.

Design of an ungrounded power supply system for OT

The ungrounded power supply with insulation monitoring and indication will be used. In addition, a single-phase isolating transformer according to IEC 61558-2-15 will be used with a rated power of 0.5…10 kVA as specified in IEC 60364-7-710, section 512.1.6. Further specifications will be secondary voltage of AC 250 V and a max. transformer leakage current of 0.5 mA.

When a first fault occurs, only a small current flow, the value of which is determined by the system leakage capacitance. Hence, the tripping of a fuse is prevented, the power supply is not interrupted and the electrical installation can be kept in operation.

In medical locations, the medical ungrounded system will be used for circuits supplying electrical equipment and systems intended for life-support or surgical applications and other electrical equipment located in the "patient environment" excluded the following equipment:

- Circuits for the supply of operating tables.
- Circuits for X-ray units
- Circuits for large equipment with a rated power greater than 5 kVA
- Circuits for non-critical electrical equipment (non life support)

Monitoring of the insulation resistance

According to IEC 60364-7-710. Section 413.1.5, an ungrounded system will be equipped with an insulation monitoring device with the following requirements:

- The AC internal impedance will be at least 100 kΩ
- The test voltage will not be greater than DC 25V
- The test current will, even under fault conditions, not be greater than 1 mA
- The response value will be $\geq$ 50 kΩ
- The indication will take place, if the earth or wiring connection is lost.

For testing the insulation monitoring device a test button will be provided directly at the device and in the alarm indicator and test combination. Connection monitoring is another important requirement which need to be fulfilled. In this way interruptions in connecting leads to the system and to earth can be immediately recognized and indicated. Insulation monitoring devices using a pulsed measuring voltage in compliance with IEC 61557-8:2007-02 will be used.

Protection of the isolating transformer against overload and over-temperature

To protect the transformer and the connecting leads between the primary and secondary terminals and the distribution bus against overload and over-temperature, as per standard IEC 60364-7-710, section 713,413.1.3 system will have monitoring the load temperature of the transformer.

Thereby a visual and acoustic alarm will be issued when the permissible load current and/or temperature are exceeded. For monitoring, a combination of temperature monitoring and current monitoring will be utilized in order to detect both a gradual heating of the transformer as well as the occurrence of a transient load when connecting high-capacity electrical equipment.

Information for medical/technical staff

Due to insulation, load and temperature monitoring, the medical staff will be informed at an early sate, before a critical state in the power supply occurs. The following conditions will be monitored and reported to the user by an alarm indicator and test combination:

- If a faulty place of equipment is plugged in, the system will detect the insulation fault and issue an alarm alerting the user to unplug the equipment and have it repaired.
- Will excessive load be placed on the system it will display the increasing load levels will sound an alarm as the load approaches 100%.
- Will an overload or fault cause the transformer temperature to rise above normal levels a alarm and indicate the problem.

The information will be indicated by an alarm indicator and test combination at a suitable place in the medical location so that it can be permanently monitored (audible and visual signals) by the medical staff (normal operation: green LED Alarm: Yellow LEDS).

Insulation Fault location systems for OTs

Whereas ungrounded system is used for reasons of continuity of supply, an insulation monitoring device will be provided to indicate the occurrence of a first fault from live part to exposed-conductive-parts or to earth. This device will initiate an audible and/or visual signal which will continue as long as the faults persist.

12.) Equipment Storage Unit

Equipment Storage Unit is provided in operating theatre.

It is flush mounted into the theatre wall with a sterile jointing system

All wall-mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

- Control Panel
- X-ray view
- Writing board
- P.R.D.
- Grill
- All sockets

} Flush Mounted

13.) Hatch Box

A Hatch of 600mm x 600mm size will be provided in the Operation Theatre as specified in the scope of the work to remove waste materials from the Operation Theatre to Dirty linen Area just adjacent to Operation Theatre. Each Hatch will be equipped with two doors and the door will be operated electronically. The Hatch will be designed in such a way that only one door will be opened at one time. The UV light will be so installed that it is kept on while both the doors are closed, this UV light has to be automatically turned off in case of opening of either of the doors. There will be indicators on both sides of the OT so that the door open/close status can be monitored from both ends.

14.) Peripheral Lights

Eight sets of double peripheral OT lights each set having two lights will be provided with stepped

finish aluminium reflector and will be of A class for use in clean room application. The peripheral light diffusers will be constructed from opal prismatic diffuser material in aluminium frames.
Light will be generated from high frequency electronic ballast's complete with colour corrected fluorescent tubes. The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre. The laminar flow ceiling will be able to provide integrated lamp support system, ease of maintenance and long life system. Control equipment for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

The operation procedures can never be affected by shadows, shimmering lights and dazzling eyes. This has been achieved by the lighting system with sufficient illumination level at the wound site and to provide flicker less design lighting control system

Controls for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

15.) <u>Pendant</u>

a) Double arm ceiling pendant – Imported CE mark (European CE / US. FDA approved (Certificate should be attached with the bid)

Multi movement Pendent of double arm (900 mm+600 mm) with load carrying capacity of minimum 150 kg. The arm will be rotatable upto 330º- 340ºwith adjustable stopper. The pneumatic brake system will be adaptable to various safety requirements and construction facilities. The interior cross section for supply lines will be of minimum 120 mm diameter. The stoppers will be infinitely variable from 0-330º-340º

Service head will be of modular design, octagonal in shape to achieve maximum supply with minimum required space. Service head will designed to host, Base, Gas Module, Electric Module and shelves. Will have upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the surgical equipments & monitor. The total length of the manager is approx 1500mm.

Surgeon pendent will have 2 arms with shelves and will include following:

a. Horizontal arms - 2 No
b. Weight carrying capacity – approx 150kg
c. 5/15 Amp. electrical sockets without switches - 8 to10 Nos.
d. Shelfs with side rails - 4 Nos. with 1 drawer
e. Provision to fix Gas outlets(i.e.)
Oxygen- 2, Vaccum- 2, Air 4 bar-1, Air 7 bar-1 , N2O-1
f. Gas interface set for interface plate - 1 No.
g. Ceiling mounting system for interim ceiling upto 1000 - 1 No
h. Interface plate with electrical fittings - 1 No
i. Ceiling cover for interim ceiling - 1 No

b) Single Arm Pendant- Imported CE marked (<u>European CE / US. FDA approved (Certificate should be attached with the bid))</u>

Multi-movement Pendent of Single arm(900-1000mm)horizontal movement only and load carrying capacity of minimum 100 kg. The arm will be rotatable upto 330º- 340ºwith adjustable stopper. The pneumatic brake system will be adapted to various safety requirements and construction facilities. Will use a very quiet, high performance motors as well special to realize precise & steady movement. As a safety feature the motor will be equipped with an over load protection. Will have

large interior cross section for supply lines with 120 mm diameter. The stoppers will be infinitely variable from 0-330º-340º

Service head will be of modular design , octagonal in shape to achieve maximum supply with minimum required space. Service head will be designed to host Base, Gas Module, Electric Module and shelves . Upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the equipments like monitor etc. The total length of the manager is 800-1000mm.

Anesthesia pendent will have one arm with shelves and will include following:

a. Horizontal arms	- 1 no.
b. Weight carrying capacity	- Minimum 80kg
c. 5/15 Amp. Electrical sockets without switches	- 8 to 10 Nos.
d. Shelfs with side rails	- 2 Nos.
e. Provision to fix Gas outlets(i.e.)	
Oxygen	- 2,
Vacuum	- 2,
Air 4 bar	-1,
Air 7 bar	-1,
N2O	-1
f. Gas interface set for AGSS interface plate	- 1No
g. Ceiling mounting system for interin ceiling upto 1000	- 1 No
h. Interface plate with electrical fittings	- 1 No.
i. Ceiling cover for interin ceiling	- 1No

a) <u>OT TABLE European CE / US. FDA approved (Certificate should be attached with the bid))</u>

<u>C-ARM COMPATIBLE GENERAL SURGERY OT TABLE</u>

Electro Hydraulic Operation Table with all standard accessories with Remote and auxiliary Control

1. Four section table top with divided foot section.
2. Table top should be of a high — pressure laminate to permit x-ray penetration and fluoroscopy.
3. All table positioning, i.e. height, back section, lateral tilt, trendelenburg, and anti-trendelenburg, except foot and head section should be operated electro hydraulically by remote.
4. Should have auxiliary control so that OT Table functions can be used during remote failure.
5. The casings on the frame and centre supporting column should be made of hygienic stainless steel.
6. Mattress should be radiolucent material and suitable for fluoroscopy
7. Preprogrammed Flex and reflex position should be easily achievable by remote control.
8. C arm compatible with sliding table top. Sliding should be possible both cranially

and caudally.

9. Should have zero leveling facility
10. Should be able to carry patient weight up to 225 kg or more in all articulation.
11. Self compensating floor locking system with help of remote.

12. **Measurements:**

Height: 690mm — 1100mm
Side tilt + /-20 degree
Back section adjustment : 40 degrees down to 80 degrees up (+80 degree to -40 degree)
Foot section adjustment: 90 to 0 degree, detachable (0 degree to - 105 degree)
Trendelenburg : 25 to 30 degree
Anti trendelenburg : 25 to 30 degree
Head section adjustment : -40 to +90 degree, detachable
OT Table width: approx 500 mm or more
OT Table Length: approx 1950 to 2100 mm
Longitudinal shift: 350 mm or more.

System Configuration Accessories, Spares and Consumables

Padded arm rest with straps — pair with damps
Anaesthesia screen with clamps – 01 set
Body restrain strap – 01 no
Knee crutches pair with clamps - 01 set
Lateral supports pair with clamps – 01 set

Standard, Safety and Training

Should be US-FDA and European CE approved product (copy approval must be submitted)
Manufacturer should be ISO certified for quality standards (copy approval must be submitted).

16) DOUBLE COMBINATION OT CEILING LIGHT WITH LED TECHNOLOGY – European CE / US. FDA approved (Certificate should be attached with the bid))

Should have the following Features:

Two Major Dome/light head
Single Colour Pure White LED,s
Reflector based LED Technology
Arrangement of LED in such a way that Shadow Free / Deep cavity illimination is achieved

Special design to maximize the field of illumination and optimized illumination depth

Should have good laminar flow properties
Easy and less time consumng service access of electronics on the light head dome surface
Aluminium Housing for better heat management
ESG safety glass for simple and fast disinfection process
360 deg rotation of domes/lightheads / arms for unlimited positioning of light heads

MIS Lightning Feature on domes

Technical Data of Light Heads: **Major (2)**

Central illumnination Ec (1mt)	160,000 lux
Intensity Range (Lux)	48,000-140,000
Life time of light source (h)	>/= 50,000
Number of LED's should be	>/= 70
Light Field Diameter (mm)	200-320
Depth of Field L1+L2 (mm)	>/= 1200
CRI (Ra) Color range index	>/=96
R9 (deep saturated red color index)	>/=96
Colour Temp(K)	>/=4500
Rated Power Output	less or equal approx 60W
Light Head Power Consumption	200 VA+/-10%
Radiant Energy	around 3,4mW/m2lx
Temp increase	< 1 deg
Certification	UL/CE
Power Supply-Primary Voltage(V AC)	90-240
Rotation	360 deg
Operating Range	>/= 1700 mm
Adjustment of the spring arm	>/ = 1175 mm
Approx wt of each LH	</= 15kg
Measurement of light head	695/611 mm

Specifications for Centrally Mounted Camera System:

1) **Should have the following Features:**

To be mounted on central area of LH
Should have a wall mounted control

Technical Data:

Sensor :	1/4" Super HAD CCD
Lines and Gaps:	768x576
Video standards:	PAL
Pixels:	minimum 444000
Aspect Ratio:	4-3,16-9
Minimum Illumination:	1 Lux
S/N Ratio	>50 dB
Minimum working distance:	10mm/Wide 800mm/Tele
Power Supply :	via LH/ Max 12 W
Video outputs:	Y/C

IT port:	RS 232
Zoom	18x optical zoom,4x digital zoom f:4.1-73.8 mm
Power Supply:	via OR light, max.12 W
Image stabilizer	Yes
Focus	Automatic,manual
Iris:	Automatic, manual
White balance:	Automatic, manual

Recording upto 1 T.B. System H.D. Camera System with 18"/21" medical grid monitor with Transmission on facility.

17) AHU SYSTEM WITH DUCTING< CONDENSING UNIT PACKAGE

DOUBLE SKIN AIRHANDLING UNIT	**Unit**	**Qty**
floor mounted Air handling units in double skin construction having 44 mm thick PUF Sandwitch Panels at a static pressure of 120 mm WG complete with backward curved blower, TEFC blower motor suitable for operation on 415 V +_ 10%, 3 Phase, 50 Hz, A.C. Supply complete with 8 Rows copper tube, aluminium finned DX cooling coil, prefilter, micro-vee filters, Heater Bank , Mixing Box complete with drain connections with anti-vibration mounting and with VFD compatible motor of following capacities:		
4000 CFM * 120 mm WG S.P. with 6 Row Deep Cooling Coil for Operation Theatre	Nos.	1
CONDENSING UNITS:		
Air cooled Condensing units 5.5 TR incorporating Scroll compressor , Condensing coil , Condenser Fan and fan motor with interconnecting copper pipe between compressors and Condenser coil. Display sensor with remote control shall be provided by us. Referigerant gas is included in our scope [Refrigerant will be R-22]	Nos.	2
M.S. Stands for mounting Condensing units of 5.5 TR Capacity	Nos.	2

COPPER REFRIGERANT PIPING / CONROL WIRING		
Suction Line 7/8" Dia x 18 Gauge and Liquid Line 5/8" x 18 Gauge complete with ntirile tube insulation over suction line.	RMT	5
Control Wiring between AHU and Condensing unit	RMT	8

REFRIGERANT LINE ACCESSORIES / INSTRUMENTS

Hand Shut Off Valve 7/8"	Nos.	2
Hand Shut Off Valve 5/8"	Nos.	2
Liquid Line Expansion Valves	Nos.	2
Refrigerant Driers	Nos.	2
Sight Glass	Nos.	2

DUCTING WITH THERMAL INSTALLATION

Supply of Air Handling Unit with Aluminium ducting with acoustic & Thermal installation (along with provisions for fresh air) •Canvas Connection	Mt^2	200
•Supply, Fabrication, Installation & Testing of return Aluminum metal ducts in accordance with specifications 24/22 gauge		
•Supply, installation and testing of multi blade type louver dampers of aluminum for ducts collers to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system.		

18) ELECTRICALS

Wall / Floor mounted control panel comprising of contactors / starters for Heaters , AHU Fan motor, switch fuse unit for Condensing unit ,complete with indication lights etc.	Nos.	1
Supply of Power cabling, control wiring & GI earthing assuming that Electrical panel shall be located at a maximum radial distance of 10 Meters from AHU / Condensing unit. [Main power supply terminating at each Condensing unit and our Control Panel to be provided by Client]	Lot	1

19) Anesthesia Workstation-Imported

Anesthesia workstation should be designed as per the international standards and European standards labeled with the CE mark or US FDA (Certificate must be submitted with bid).

Anesthesia workstation must be suitable for all patient age group.

All the major component of anesthesia workstation like Anesthesia Machine, Ventilator, Vaporizer and Anesthesia Monitor preferably from one manufacturer.

Anesthesia Machine

Anesthesia machine should be compact, mobile with integrated ventilator and should monitors pressure, volume and oxygen.

Anesthesia machine must be suitable for low flow anesthesia.

Machine should have working surface and the storage space for keeping the accessories.

Should have facility to connect to the central supply (O2, N2O & Air), pin index cylinder one each of O2 & N2O and pressure

gauges for central supply and cylinder.

Should have hypoxia guard and provides a nominal minimum 25%

Should have dual cascaded flow meter for O2 and N2O and single flow meter for air.

Should have integrated auxiliary oxygen flow meter.

Should have oxygen flush upto 75lpm.

Should have compact autoclavable breathing, system and soda lime chamber capacity of 1.5L.

Should have electronically controlled and electrically / pneumatically driven anesthesia ventilator.

Anesthesia Ventilator should have following settings -

Ventilation Mode : Manual / Spontaneous, IPPV
IPPV / Volume controlled
with tidal volume compensation Pressure Mode

Tidal Volume	: 40 – 1500 ml
PEEP	: off, 4 – 30 cmH2O
Frequency	: 4 – 60 bpm
I:E Ratio	: 1:4 to 4:1
Pressure Range	: 5 – 60 cmH2O

Setting of inspiratory time and Inspiratory pause time,
Should have integrated color display of at least 7".

Display should be configurable and display any one of the waveform Paw vs time or flow vs time.

Anesthesia machine should monitor and display the measured value of minute volume, tidal volume, fiO2 concentration, Peak pressure, mean pressures, plateau and PEEP.

Should have adjustable high / low limits setting for FiO2, expired tidal volume, Minute volume, frequency and airway pressure.

Anesthesia Machine should have provision to mount two vaporizers at a time and supplied with Halothane & Isoflurane vaporizer along with the machine.

Anesthesia machine should have battery backup of at least 1hrs.

Anesthesia Monitor

Anesthesia workstation should have advance patient monitor and capable of monitoring of all patient age group.

Should have integrated touch screen of 12" and display 6 channel

waveform.

All the data should be access through touch screen and rotary knob.

Monitor should have 24 hrs trends and stores 100 alarm events.

Should have Audio visual alarming system.

Monitor should have monitoring facility of 3/5 lead ECG with ST segment analysis, NIBP, SPO2, Dual Temperature and Invasive Blood , cardiac Output modular and anaesthetic gas module.

Monitor should have basic and advance arrythmia detection.

Each Anesthesia workstations should be supplied with following accessories –

a. Anesthesia machine with two vaporizers i.e. Halothane & Iso flurance one each.
b. 10 set of disposable circuits with filter.
c. ECG 3 and 5 lead one each
d. Adult & Pediatric Spo2 sensor two each
e. Adult & Pediatric NIPB cuff two each
f. Temperature probe skin & rectal one each
g. 10 set of water trap for adult / Pediatric, 25 pcs of sampling line.
h. IBP kit with 10 disposable transducer

Equipment should be demonstrated and compliance statement should be supported with brochures and technical data sheet.

20) Oxygen Manifold as per National Fire Protection Association(NFPA) USA /Hospital Technical Memorial –UK (HTM) std. UL listed / CE mark

The oxygen cylinder manifold Will comprise of two cylinder Banks which can accommodate 4 cylinders in each Bank (means 4+4) complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves. High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold Will be tested (hydraulically) at 250kg / cm sq. The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation. Each manifold Will be provided with one terminal header and a NPT connection for the Automatic control panel.

21) Fully Automatic Oxygen Gas Control System – (Imported) as per NFPA /HTM std UL listed / CE mark

Gas Manifold Will be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without interruption of gas delivery to the system. A critical connections Will be gas specific,non-interchangeable and Will be designed to eliminate gas supply error. The manifold control system Will supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit Will include right and left header bars and pigtails for the appropriate medical gas. The installed system Will automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system Will automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation Will automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders.

The LED indicator Will show a depleted bank by turning red. A buzzer Will also sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator will turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that Will also indicate that the bank was depleted and, in turn, was reset. The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders.

When a bank is depleted, Manifold Will automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves Will automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas Will leave the high pressure cylinders through the pigtails into the header bars. The pigtails Will have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank.

In the event a safety relief device on an individual cylinder Will activate or a pigtail should leak excessively, the local check vale Will also prevent loss of gas from the rest of the cylinders on that bank.

The gas Will flows through the manually operated shutoff valve into the primary regulator. This regulator Will reduce the high cylinder pressure to an intermediate pressure. The intermediate pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure reduction for use in the health care facility. Two line pressure regulators Will be installed in parallel, and each Will be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve Will be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure falls to a predetermined level, which is controlled by the preset pressure switches (high and low) , the switches Will activate the solenoids to switch to the fresh (reserve) cylinder bank . The manifold control cabinet Will have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs , two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted : third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators Will controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator from red to yellow. At the same time the yellow LED Will change to green to go form Reserve Ready to In Service. LEDs shouldshow red prior to initial pressurization or whenever both cylinder banks are below the preset value.

22) Emergency Oxygen Manifold as per NFPA/ HTM std . UL listed / CE mark

The oxygen cylinder manifold Will comprise of two cylinder Banks which can accommodate 1cylinders in each Bank (means 1+1) complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves.

High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg.

The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely.

The manifold Will be tested (hydraulically) at 250kg / cm sq.

The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation.

23) Terminal / Gas Outlet with probes– (Imported) as per NFPA /HTM std UL listed / CE mark Imported

Oxygen Vacuum Surface mount, non interchangeable, self sealing outlets, outlets Will consist of a roughing in assembly and a finishing assembly. A non removable positive- pin keying arrangement for each assembly and a finishing assembly. A non removable positive- pin keying arrangement for each a specific gas service. Installed in the mounting box a fully assembled brass secondary check valve.

Design of outlet Will be such that it Will have 100% metal construction for corrosion resistance fire safety & push button mechanism for quick release of adaptor. The secondary check valve automatically Will form a positive seal to prevent a gas flow when the finishing assembly is removed. The secondary check valve to include 7'' (17.78cm) of 1/2'' Type K copper tubing with a label affixed which identifies the specific gas by name and colour. A plastic cap inserted at the end of the inlet tube. Rotation of the inlet tube Will allow gas connection from the top or bottom the finishing assembly Will consists of a die cast chrome plated cover plate , a machined brass housing for the primary check valve, and a positive –pin keying device to prevent accidental installation into a roughing in assembly of a dismal gas. The finishing assembly incorporates a double seal arrangement which automatically engages when a hose adapter or patient treatment device is removed from the outlet. The design of the outlet Will be such that if can be easily repaired without disassembly of the outlet.

The finishing assembly Will have a colour coded (specific gas) keying disc to prevent connection of hose adapters or patient treatment device to the wrong gas service. The primary check allows absolutely no gas flow to take place until the keying devices are engaged. It will be manufactured in accordance with all applicable NFPA and CGA standards. The locking device Will be in the probe instead of gas outlet.

Matching probe for outlets – Imported as per NFPA -99 / HTM 02-01 UL Listed / CE Marked

Matching probes to the gas outlet mentioned above. That is adapter for Oxygen & vacuum.

Each adapter Will have suitable barb or threads so that it can be connected to tube or flow meter /suction regulator. Adapter Will have clear gas service embossed on it.

24) Oxygen Flow meter & Humidifier Bottle with timer facility – (Imported) as per NFPA /HTM std UL listed / CE mark Imported

Black pressure compensated flow meter shall be CE Marked / UL listed, or accurate gas flow measurement with following features:

A) The Oxygen flow meter with time facility Will be compact in design with superior performance in a single package having flow meter body & timer.

B) Control within a range of 0-15LPM

C) It shall meet strict precision and durability standard

D) The flow meter body shall be made of brass chrome plated materials.

E) The flow tube and shroud components shall be made of clear, impact resistant polycarbonate

F) Flow tube shall have large and expanded 0-15 LPM range for improved readability at low flows.

G) The humidifier bottle shall be made of unbreakable & reusable polycarbonate material and autoclavable at 121 degree centigrade.

H) The Automatic timing of oxygen flow Will be as low as .5 LPM & the time measurement Will be extremely precise with increments of 1 hour.

25.) Nitrous Oxide Manifold as per NFPA/ HTM std . UL listed / CE mark

The N2O cylinder manifold Will comprise of two cylinder Banks which can accommodate 2 cylinders in each Bank (means 2+2) for cylinder valves conforming to IS 3234 (N2O service) complete with copper tail pipes with fittings. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Nitrous Cylinders and manifold. Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves. High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold Will be tested (hydraulically) at 250kg / cm sq. The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation. Each manifold Will be provided with one terminal header and a NPT connection for the Automatic control panel.

26.) Fully Automatic Nitrous Oxide Gas Control System – (Imported) as per NFPA /HTM std UL listed / CE mark

Gas Manifold Will be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without, primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system non-interchangeable and Will be designed to eliminate gas supply error. The manifold control system interruption of gas delivery to the system. A critical connections Will be gas specific Will supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit Will include right and left header bars and pigtails for the appropriate medical gas. The installed system Will automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system Will automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation Will automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders. The LED indicator Will show a depleted bank by turning red. A buzzer Will also

sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator Will turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that Will also indicate that the bank was depleted and, in turn was reset.

The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders. When a bank is depleted, Manifold Will automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves Will automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas Will leave the high pressure cylinders through the pigtails into the header bars.

The pigtails Will have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank. In the event a safety relief device on an individual cylinder Will activate or a pigtail Will leak excessively, the local check vale Will also prevent loss of gas from the rest of the cylinders on that bank.

The gas will flows through the manually operated shutoff valve into the primary regulator. Pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure .

This regulator Will reduce the high cylinder pressure to an intermediate pressure. The intermediate reduction for use in the health care facility. Two line pressure regulators Will be installed in parallel, and each Will be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve Will be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure falls to a predetermined level, which is controlled by the preset pressure switches (high and low) , the switches Will activate the solenoids to switch to the fresh (reserve) cylinder bank .

The manifold control cabinet Will have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs , two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted : third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators Will controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator form red to yellow. At the same time the yellow LED Will change to green to go form Reserve Ready to In Service. LEDs Will show red prior to initial pressurization or whenever both cylinder banks are below the preset value.

25) Emergency N2O System – as per NFPA/ HTM std . UL listed / CE mark

The Emergency supply manifold Will be connected to downstream of the manifold control panel. The assembly will consist of 2 (two) cylinders connection supplying a manually adjusted regulator via a common header assembly. The delivery system is isolated from the main system by an isolation valve. Pressure gauges Will indicate cylinder and delivery pressure & valves conforming to IS 3234 (N2O service)

28.) MEDICAL COMPRESSED AIR SYSTEM

SPECIFICATION OF AIR PUMPS

Air Compressor	:	Two stage reciprocating
Capacity	:	500 Lt/Min
Pump PRM cfm	:	15 cfm
Electric motor	:	5 HP
Make	:	CromptonGreve/siemen/NGEF/Kirloskar
Type of model	:	Sq. Induction TEFC
Size of reserver	:	1000 Ltr.
HEATLESS AIR DRYER		
FLUID HANDLED	:	AIR
INLET CONDITION	:	
a) Flow	:	15 CFM
b) Pressure	:	7 kg/cm2
c) Temperature	:	45 Deg.c.
d) Moisture Contents	:	100%RH
OUTLET CONDITION		
a) Flow	:	27CFM
b) Pressure	:	6.8 Kg/cm2
c) Temperature	:	AMBIENT
d) Drew point	:	-40 Deg.C. temp. at atm. Pr.
Desiccant	:	Activated Alumina
Line Size	:	15 MM
Pre Filter	:	Baffle type with drain value
After Filter	:	Polyester cloth type
Design Pressure	:	10 Kg/cm2
Material of Construction	:	IS : 2062 / IS : 1239
Code of Construction	:	IS : 2825
Approx space requirement in mm	:	600 x 600 x 1600

29.)MEDICAL VACCUM CENTRAL SYSTEM

VACCUM PUMP

Consists of three parts:

The pumps should be of following specifications :

It should be 2 nos. (One running and one standby) of Vacuum Pumps, air cooled type, model V-255 5 HP having Piston displacement – 50 cfm. Free air delivery o suction – 70 % of P.D. approximately, max working pressure – 29" of Hg or 730 mm of Hg. Single stage cylinder, 1450 Lpm fitted with MS channel frame compete with V-belt drive, belt guard etc. along with the following :

• 5 HP, 440 volts, 3 ph, 50 Hz, with TEFC electric motor of Siemens / Crompton

• 1" BSP stainless steel ball valve with PTFE seat with suitable brass adapters and non return valve with non ferrous filter element in housing (size 8.6" x 12" long).

• Silencer on discharge end projection (open to atmosphere) outside the plant room.

• Copper pipe interconnection up to receivers

• Vacuum Tank water capacity 1000 ltr

30.) Ward Vacuum Unit with Suction Jar & metal regulator - (Imported) as per NFPA /HTM std UL listed / CE mark

The ward vacuum unit shall be Analog and color coded display type regulator with 100% metal having large, easy to read gauge with gauge accuracy + 1% of full scale color coded range. The unit shall have 3-Mode High feature and equipped with push to set technology which shall automatically establish vacuum.

Limit with each vacuum level setting. The vacuum unit shall have a precision in the critical care range (0-200mm hg) and Will provide fast adjustment with turns of the knob up to full wall vacuum thus Will instantly facilitate regulated and continuous suction for tracheal and pharyngeal airway management, surgical procedure and continuous nasogastric drainage. which shall facilitate unrestricted full time vacuum for emergency. The unit shall be equipped with Positive Pressure Relief Valve to protect patient and unit both in case if accidentally connected to pressurized gas (O2, Air etc)

The unit shall be made of 100% metal and corrosion & lubrication free having service fee back plate

The Unit shall have following features:
Three Mode Continuous

A) Modes On/Off/Regulation

Gauge : High Vacuum

Regulated Vacuum 0-Full Vac
Instantaneous Full Wall Vacuum Mode

B) The regulator Will be fitted with a easy read pivoting vacuum gauge with a civil adaptor so that it can be read from any position or angle by rotating the gauge up to 360 degree.

C) The regulator Will have lock on the bonnet so that the reading suction once can not be changed.

D) It Will have a stainless steel full line key, a easy to grip on/off valve & an outlet. The Ward Vacuum Unit shall conform CE marked/UL listed.

Suction Jar Shall have the following
The ½ gallon polycarbonate Suction Jar shall be capable to autoclave up to 121 degree C. All seals and splatter tube shall be in silicone for long life. The filter trap in the jar shall be designed to ensure maximum efficiency in preventing overflow and incorporates design features to ensure the breakdown of foam.

31.)MEDICAL COPPER PIPE

Copper Piping :
Installation:

Installation of piping Will be carried out as per international standards with utmost cleanliness. Only pipes, fittings and valves which have been degreased as per International standards Will be used. Pipe fixing clamps for upto 28mm diameter. Pipes Will be non ferrous suitable for the diameter of the pipe. For the pipes of the sized above 28mm rigid metallic hanging or cemented supports to be used.

The main lines to the building to be taken overhead through metallic poles or through underground ducts with inspection removable slabs, All pipe joints Will be made using inert gas fluxless brazing method. All joints Will be of copper to copper and Will be brazed by silver brazing filler material without flux while being brazed joints shall be continuously purged with oil free dry nitrogen to prevent the formation of copper oxide on the inside surface of the joint.

All pipes Will be installed without springing or forcing. All pipes Will be protected against mechanical injury in a manner satisfactory to authorities having jurisdiction.

Test: After erection, all the new pipes cleaned or purged with the help of dry nitrogen gas. Complete system Will be tested with dry nitrogen at 2 times of working pressure for 24 hours.

Painting: All existing and proposed exposed pipes/Will be painted with two coats of Synthetic enamel paint & color codification as per international standards. All concealed pipes to have gas identification bands / labels at appropriate distance. Similarly all pipes which need embedding in the wall Will be tested/painted / labeled and properly insulated. Certification: To be certified that pipes are suitable for the particular service and complete cross connection (anti-confusion) test will be carried out.

Distribution piping system:

MATERIAL (PIPE):

Solid drawn, seamless, deoxidized, non arsenical, half hard, tempered and degreased materials conforming to Kite mark Medical Grade Kite mark Pipe All copper pipes will be inspected and certified by Kite mark Register of services for medical use before dispatch and the pipe will be delivered plugged or capped at both ends. Pipe sizes to be used as under:

28mmOD X 1.00mm thk
22mmOD X 1.00mm thk
15mmOD X 1.00mm thk
12mmOD X 1.00mm thk

Fittings will be made of copper conforming to BS 864 and suitable for a steam of working pressure of 35 bar and especially made for brazed socket type connections.

The rate should be quoted on per square meter basis after installation the measurement shall be done and payment will made on actual basis.

32.) MEDICAL AREA LINE PRESSURE ALARM:

Medical Gas Alarm – As per NFPA -99 std (Imported) as per NFPA /HTM std UL listed / CE mark

Area Alarms are designed to include all necessary displays, factory wiring, transformers and circuitry requiring only 230 VAC primary powers. Internal voltage Will be stepped down to 5 VDC and 15 VDC for control circuit Power. Voltage to external pressure or vacuum transducers Will be 15 VDC.

The Area Alarm Will have digital display facility. Each area alarm Will monitor up to 6 or 12 medical gas & / or Vacuum services. Area alarm panels Will be modular in design. Each gas monitored Will have a light Emitting Diode (LED) display to continuously indicate actual line pressure. A vertical series of LED's Will further indicate relative line pressure.

The control module Will include a silence/enter button, a Test/Shift button, an Up button and a Down button. These buttons Will be used to silence the audible alarm, set up the alarm panel and to test the alarm panel. The test button Will test all modules one at a time. An LED on the control module Will illuminate green to indicate Power on.

The LED Will show Normal pressure at 50 psi. apart from Normal it Will also show low risk of 40 PSI as low-pressure and 60 psi as high. High risk of 30 psi as low pressure & 70 psi as High pressure.

Line pressure modules Will be available in dual display configuration, dual display modules Will accept any combination of pressure or Vacuum.

The back box Will contain factory installed copper tube extensions 6" Long, 3/8" ID (1/2"OD) , to accept installer furnished lines form the medical gas system.

Each inlet tube Will accept gas – specific DISS fittings for transducers, to prevent cross-connection. The power supply Will be installed in the back box Power supply Will include an on / off rocker switch and a fuse holder.

The audible alarm tone Will pulsate, 90 dBa at 2 meters. The audible signal Will be cancelled only by the alarm silence button or fault correction. The display Will remain illuminated to indicate the presence of the alarm condition. The alarm Will automatically reset with the correction of the fault condition. Will a new alarm occur while the panel is silenced, the audible alarm Will reactivate. The area alarm Will store the last four alarm conditions in memory at the alarm panel. These conditions can be indicated by using the buttons on the alarm panel control module.

The alarm Will be capable to be connected with the HIS system.

Line pressure Alarm panel for Medical Gas Piping System Will monitor the following indication:-

4 gas service :

Oxygen	Normal / High / Low
Vacuum	Normal / Low
Air	Normal / High / Low
Nitrous	Normal / High / Low

33.) MEDICAL AREA VALVE SERVICE UNIT As per NFPA -99 std (Imported) as per NFPA /HTM std UL listed / CE mark

ZONE VALVE BOX

1/2" x 3/4" (2 Gas)

1/2" x 1/2"x 3/4" (3 Gas)

1/2" x 1/2" x 1/2" x3/4" (4 Gas)

zone valve boxes should be constructed of 18 gauge sheet steel with air dried lacquer finish. The cover frame should be made of anodized aluminium and attached to the box by concealed 1-1/2" (38 mm) screws. The finished assembly should be substantially dust-tight. The frame assembly should be capable of adjusting for variances in wall thickness up to 1". The front assembly should contain an easily removable cover window with pull ring. The window should conceal exposed piping and valves inside the box and should be labeled " Caution- Medical Gs Shut –OFF Valves- Close Only in Emergency". Clear viewing space will be provided in the window to display the gas service, the area controlled by the valve, and pressure gauges on units so equipped.

Single - valve boxes shall accept valve sizes thro' 3". Two & Three valve Boxes shall accept valves sizes throu 2" four, Five & size valve boxes shall accept valve sizes thro 1 1/4" valves will be factory installed with the smallest valve top leongest at the bottom we will apply labels to each valve within the assembly for proper gas service identification according to the manufacturer's instructions. placement of the valve within the zone valve box will be such that the removable window cannot be placed when any valve is closed. Factory installed type K copper pipe extensions will extend three inches outside the valve box. Design of the valve box will be such that valves may be removed prior to brazing, without disassembly of the box, to permit rearrangement of valves if necessary. valves will be ball type, cleaned for oxygen service, supplied with capped ends, and will operate full open to closed position with 90 degree handle rotation (refer to Medical gas Valve specification) Gauge model zone valve assemblies will include 1-1/2" pressure gauges reading 0-100 psi for oxygen, nitrous oxide, air and other 50 psi working pressure gases 0-300 psi for nitrogen and 0-30" HG for vacuum or evacuation vacuum.

The gauge port will be equipped with removable plug for pressure testing prior to final assembly of gauge. All gauge model zone valve box assemblies.

34.) Theatre Vacuum Units As per NFPA -99 std (Imported) as per NFPA /HTM std UL listed / CE mark

It will be capable to mount 2 canisters, the each canister of 1 Gallon capacity. The stand will be durable; chrome plated steel construction with five no. snag, free spinning, and rotating casters. It will have two shut off valves for controlling suction to the canisters and will have the features to select the canister.

The Regulator will have soft touch knob for easy access to (a) On/off mode (b) Regulation mode (c) full flow of vacuum pressure directly form vacuum line Mode. The regulator is designed 0-760 mm HG Gauge.

The analog gauge will have 2'' dia color coded; glow – in – the – dark face for easy readability under any condition.

Suction jar will be made of polycarbonaye a autoclable up to 121ºC. The jar capacity is 1 gallon. It has a positive shut off Metal cap & float assy that intrupts suction to help prevent fluid carryover into the regulator. The float & cap assembly includes a patient port inlet that is horizontal to help prevent kinking of suction tubing , a vacuum port that is filled with vacuum DISS swivel nut fitting & an adjustment to allow suspension from the wall using proper accessories

All collection bottle assemblies allow visual inspection of fluid level, color & consistency & can be steam autocloved or gas sterilized. Polycarbonate bottles offer the additional advantage of eliminating breakage.

35.) Anesthetic Gas Scavenging System (AGSS) (Imported) as per NFPA /HTM std UL listed / CE mark

Anesthetic Gas Scavenging System (AGSS) plants are designed to provide a safer working environment for the medical personnel by the removal of the waste gases that are produced during anesthesia and from the surrounding environment.

AGSS plants are available as simplex or duplex units comprising of die cast aluminum side channel blowers complete with electrical controls, pressure sensor, relief valve and drain flask, all pre-piped, pre-wired and factory tested.

The duplex plant control panel incorporates a duty pump selector, vacuum gauge and indicators to identify the plant status. The standby pump is activated automatically upon high demand or the failure of the duty pump.

Duplex units incorporate non-return valves to enable the maintenance of one pump whilst the other pump is in service.

Pumps are available to suit single phase or three phase electrical suppliers.

Remote switches are available to enable control of the AGSS plant from within the department served and to indicate the status of the plant.

36.) Silent Diesel Generating Set

Suitable Silent DG Set of required capacity to cover all the components to be installed by the bidder against this tender and general lighting and ventilation of the campus The technical specifications of the Silent D. G. Set should conform the norm laid down by Central Pollution Control Board.

37.) On line UPS 10 KVA

The UPS shall be a solid-state single phase UPS system designed to provide regulated and conditioned sinusoidal power to both linear and non-linear type loads. The UPS shall provide uninterruptible power during all modes of operation. There shall be no interruption of power to the critical load when the UPS transfers to and from battery operation. POWER CONNECTIONS: The UPS shall be hard wired input and output.

Technical Specification for Modular Operation Theatre Low End

1.) Walls and Ceiling for Operating Area Country of Origin : European CE / FDA (USA)

Walls & Ceiling Construction – (cladding type OT) - Imported

The FRAMEWORK should be made of upright ledgers and profiles entirely made of a galvanized steel sheet with a thickness of 15mm. They should folded structural steels with a suitable section for the loads.

The structure components should be joined together by means of coupling systems in order to create a solid reticular frame, able to support different infill panels whose weight is up to 8 Kg/sq the "Z" upright forms the vertical part of the frame and should be equipped with proper drilling of 32mm (height partial drilling) suitable fo the panel coupling without suing screws between the uprights and edges of the panel there is a suitable PVC adhesive seal with a thickness firm of 3mm to ensure air and dust sealing. At the lower end of the upright an adjustment foot should allow the easy levelling of the structure and, the necessary compression of the ancharge between ceiling and floor.

The ledgers should the elements that constitute the basic module of the structure. They should be inserted on the proper hooks by pressure between two uprights, Moreover some "U" profiles , to be placed in horizontal position on the upper and lower part of this structure, constitute its extension with a depth of 64mm together with the metal panels with a thickness of 18mm and the PVC adhesive seal. The structure can be provided with stiffening ledgers or profiles for sliding door fixing and other accessories according to needs. Total thickness of the partition wall:100mm

Skin PANELS (double wall 1 side-partition wall 2 sides):

Module skin panels should have a height exceeding 3mm up to a maximum of 3.5m from the floor and a width that should vary from a minimum of 280mm to a maximum of 1200mm"they can be made of different types of finishing**; using solid surface material**

The panels should be made of solid surface material thick 3mm backed by structural panel thick 15mm consisting of a trapezoidal aluminium corrugated core glued between two flat of aluminium sheet. The SMS material should be dent free antibacterial & fire resistant. The SMS should not require any paint & should have in built antibacterial properties. The material should be manufactured for about two third with aluminium hydroxide and a third with acrylic resin and natural pigments. The aluminium hydroxide should give the product a particular strength and the quality of the acrylic resin ensure should cleanliness, water resistance and colour stability over time. The material should have antibacterial activity (% reduction>99%).

On the inner sides of the panels thee shall slotted holes for their anchorage to the support hooks fixed to the structure uprights,

This fastening system should allows obtaining all the following results:

The panel should be self centring with consequent joint alignments between panel and panel, ensuring aesthetic balance.

The connection between hook and panel should be designed so that the panel, due to its weight, is compressed against the PVC seals coating the entire structure helping to reduce noise transmission. The fixing system of the panels should ensures that there is no accidental breakway of the panel, even If it is subjected to stress for more safety and stability:

The connection system should allows disassembling and assembling each panel without moving the others near it.

Its flexibility the partition wall should satisfy all the inspection and /or the maintenance needs required by modern workplaces (for example electrical installations, hydraulic installations, medical gases etc..) all the panels can be removed over their entire length and on both sides. The lower part of the panel should be equipped with a profile prepared for the laying and the coupling of the horizontal skirtings that need to re enter with the respect to the panel.

The inner angles (which are at 900) in operating rooms or in similar environments should made up of a panel without interruption of continuity that covers the angular area of the wall. The panel should characterized by a double specular folding at 135 0 (or variable folding according to the requirements). All the panels should be drilled according to specific needs (ex ventilation grids of the room)

The panels must be perfectly sealed together by means of thermoplastic rubber gaskets inserted by pressure and free of projections.

Properties & Features of Solid Mineral Surface Material .

Properties & Features	
Density g/cm3	1,7
Hardness (Barcol)	60
Water Absorption %	0,023
Heat Expansion (1 x 10”in/in”/F)	2,1
Ignition Test	38
Tensil Strength, psi	6500
Elongation At Yeld %	0,2
Flexural Strength, 8ft;o,5lb	72D-79000
Water Resistance, g/1000cycl	Unbreakable
Lustre Stable Resistance	0,05
High Temperature Resistance	Uninfluential
Boiling Water Resistance	Uninfluential
Stain Resistance	Uninfluential
Chemical Resistance	Uninfluential

2.) <u>Flooring</u>

A floor screed should be provided, flat to within a tolerance of +/-
3mm over any 3 metre area. The floor finish in the operating room should be 2mm static conductive PVC tiles, laid on a semi conductive adhesive base. It conforms to CEN classification EN 685 and Resistance to Chemicals as per DIN 423/DIN 51958. It conforms to the requirement standard for healthcare facilities NFPA 99.

The floor finish should terminate at the room perimeter passing over a concealed cove former and continuing up the wall for
100mm.

All joints should be welded and the plastic wall finish should overlap the floor coving by 25 mm, to provide a continuous sealed surface.

The PVC flooring tiles should be laid on copper grid for providing antistatic electro-statically conductive flooring.

3.) Operation Theatre Control Panel

All the controls within the theatre are located on membrane type
control panel mounted in the theatre wall. A remote electrical distribution board is provided to allow access to the panel for maintenance without access to the theatre.

Each control panel contains:-

- Time elapse Clock
- Standard Clock
- Temp and Humidity Indicators
- Temp and Humidity Set Point Adjust
- Plenum Lighting Controls
- Medical Gas Alarms
- Phone
- Pressure Indicator
- Hepa Filter Status Indicator

The time elapsed digital clock and real time digital clocks are of high brightness characters, not less than 30mm in height.

The medical gas alarm indicate High and Low gas pressure for gas service present in the operating theatre and have audible buzzer with mute facility.

The medical gas alarms are connected to local pressure switches located downstream of the last isolation valves.

The remote cabinet should house the operating lamp transformers, main failure relays, electrical distribution equipment and circuit protection equipment for all circuits within the operating theatre.

All internal wiring should terminate in connectors with screw and clamp spring connections of the Klippon type mounted, on a DIN rail and labeled with indelible proprietary labels.

Individual fuses or miniature circuit breakers should protect all internal circuits.

All internal wiring should be of the high temperature type and enclosed in propriety ducting or mini.

All internal wires should be marked with plastic ferrule type cable markers, for ease of identification.

All wall mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

4.) X-Ray Viewing Screens

The theatre should be equipped with a twin plate X-Ray Viewing Screen, designed to provide a high level of control luminance, without flicker, from a unit that is easy to clean and maintain.

The X-Ray viewing screen illumination should be by high frequency fluorescent lamps, controlled by demining ballast.

The front panel diffuser should be of a glare free type, sealed flush with the inside face of the operating theatre wall (or may as on option be integrated within the control panel fascia).

It should be equipped with eight spring-loaded clips to secure the X-Ray negative when in use. The fluorescent lamps should provide a uniform level of illumination across the entire front panel diffuser and should be controlled by electronic step-less dimming controls to provide
flicker free dimming from maximum brightness to off.

Access for maintenance and lamp changing should be front of the panel.

All internal wiring should terminate in connectors with screw and clamp spring connections.

Individual fuses or miniature circuit breakers should protect all internal circuits.

All internal wiring should be of a high temperature and secured by propriety cable clips.

All wall mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

5.) Doors and Frames (Hermetically Sealed type) 2100 mm Height & 1500 mm Width (with Automation Unit)

The door with its automation unit conforms to machine directive93/87/EC, low voltage directive 73/23/EEC and 93/68/EEC and EMC directive 89/336/EEC and 92/31/EEC and 93/97/EEC.

To maintain sterility and the correct air pressure in the department, all doors into and out of the operating theatre and ancillary rooms be of the sliding, hermetically sealing type.

All sliding doors should be electrically operated.

The doors should be constructed with high-density particle board cores, and high pressure laminate faced on both sides.

The cores should be set firmly in an aluminium frame, suitably sealed with a non-porous non-shedding gasket.

The aluminium frames should contain the door seal.

The door should seal on all four edges in the closed position. The door track should be

constructed from an aluminium extrusion, fixed firmly to the walls.

The doors should run on nylon wheels within track.

The track and wheel design should be such that during the last 50 mm at travel on the closing cycle, the door moves in 3 directions to form a seal against the floor, at the bottom and against the frame on both sides and at the top.

Nylon runner guides should be fixed to the floor in such a way that they do not obstruct trolley movement through the door.

They should provide stability during the opening and closing cycles and assist in creating the necessary pressure at the bottom of the door to maintain the seal.

Floor guides across the door opening, or doors with no floor guidance should not be considered.

To ensure efficient sealing of the doors, the door manufacturer should provide the door frames.

They should consist of reinforced plasterboard panels faced with the same laminate as the doors.

The door frames should be edged with an aluminium extrusion and with concealed fixings that are adjustable during installation to ensure a 100% hermetic seal is achieved.

Vision panels should be fitted to all doors.

Automatic units should be of the single phase electronic type mounted directly to the door track.

The units should consist of a computerized electronic controller and motor. The drive mechanism should be by heavy-duty steel reinforced toothed fabric belt.

The controller should have the facility to individually set opening speeds, partials opening, closing speeds, time delays and a variety of locking and interlocking options, within factory preset limits.

The door controller should also have the ability to sense additional loads on the door caused by any obstruction in its path and to automatically stop or reverse the direction of travel.

The controller should be capable of either being operated by elbow switches/foot switches, key switches.

All doors should be able to be operated easily manually in the event of failure of the power supply or the automation units.

6.) Laminar Flow System

The plenum box (1800 mm x 1800 mm) will be made of high quality Aluminium 1.6mm thick & Air diffuser will be made of Woven polyester cloth that will introduce the highest air quality into the Operation Theatre. There will be 6 HEPA filters (as per plenum size) with 99.97% efficiency to ensure high quality clean air & tight control of bacteria infection system. Air will be diffused into the theatre uniformly over the total area through perforated aluminium sheet. The air distribution system serving to the Operation Theatre will be tested as per DIN 4799 standards.
The laminar flow installation & lighting system will be design to provide the Operation Theatre as key to preventing patients being infected during operation lies on the design of sterilized air conditioning system and the flow pattern of draught as well as the quality of engineering.

The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre.

7.) Pressure Stabiliser / Pressure Relief Daipers

The cascade pressure stabilisers are a range of multi bladed units specifically designed to control room air pressures in critical areas such as Operation theatres etc.

Each Stabiliser comprises of a carbon steel case & matching slip over ring.

The carbon steel housing contains upto four Grade 304 stainless steel Blades, which pivot upon sealed for life bearing assemblies.

Balancing should be carried out utilizing a proven balance weight assembly.

Adjustment can easily be carried out on site should the need arise.

Structural steel frames

All structural steel sections will be of Grade 43 to BS 4360 or equivalent Indian Standard.

The structural frames for the operating theatre are be designed taking into account all fixed equipment to be installed in the Modular OT.

The theatre structure should support all equipment installed in the Modular OT, such as the operating lamp etc, and should be vibration free and rigid.

The theatre structure should also be capable of supporting other equipment to be installed in the same Modular OT in future, with total loading not more than twice that of all the equipment to be

installed in the OT as mentioned in this specification. Welded sections in accordance with BS 5135.

8.) Surgical Scrub Sink

Compact Surgical scrub Sink should be designed for use in Operation theatre complex providing surgeons with a convenient sink for pre-op scrub up.

Each Fixture should be fabricated from heavy gauge type 304 stainless steel & should be seamless welded construction polished to a satin finish.

The scrub sink should be provided with a front access panel, which should be easily removed for access to the water control valve, waste connections, stoppers & strainers.

Hands free Operation includes infrared sensor with built-in range of adjustment.

Thermostatic Mixing Valve control should be located behind the access panel & maintain constant water temperature.

User defined settings of 1,3,5 & 10 Min. are available. This timing can be changed to meet individual application requirement.

Provided with elbow action taps, infrared sensor thermostatic control with fail-safe temperature controls.

All units should have radiused anti splash fronts. Knee operated switch can be offered as an option.

9.) Operating List -Writing Board

A List/Writing Board should be provided in operating theatre.

It should comprise a flush mounted, 1.50mm thick, white laminate board, bonded to a 2mm steel sheet for additional rigidity.

It should be mounted flush into the theatre wall with a sterile jointing system.

All wall-mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

10.) Electrical Installation

Modem medical procedures utilize and increasingly rely on, electrical and electronic equipment. This equipment ranges from lighting to patient monitors and electrosurgical equipment.

Power distribution within "the departments should be "provided' from distribution boards located local to each theatre. Sub mains power to these panels should be by the general electrical contractor. From these panels all distribution services within the departments should be run.

Earthed equipotent bonding of all exposed metalwork should be provided.

Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.

Light fittings within the clinical areas should be recessed fluorescent type, with high frequency tubes and control gear.

Fittings should be sealed In accordance with the standard IP54.

All equipment should be fully and permanently labelled to identify and describe the function, operation and voltage of the apparatus concerned. Throughout and upon completion of the electrical

installation, tests in accordance with relevant sections of the local wiring regulations should be carried out and the results recorded

11.) Equipment Storage Unit

Equipment Storage Unit is provided in operating theatre.

It is flush mounted into the theatre wall with a sterile jointing system

All wall-mounted equipment should be flush mounted and sealed into theatre wall by means of a sterile jointing system.

12.) Peripheral Lights

Eight sets of double peripheral OT lights each set having two lights will be provided with stepped finish aluminium reflector and will be of A class for use in clean room application. The peripheral light diffusers will be constructed from opal prismatic diffuser material in aluminium frames.
Light will be generated from high frequency electronic ballast's complete with colour corrected fluorescent tubes. The ceiling will incorporate supports to secure it to the main structural frame of the modular operating theatre. The laminar flow ceiling will be able to provide integrated lamp support system, ease of maintenance and long life system. Control equipment for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

The operation procedures can never be affected by shadows, shimmering lights and dazzling eyes. This has been achieved by the lighting system with sufficient illumination level at the wound site and to provide flicker less design lighting control system
Controls for the peripheral lighting will be provided in the theatre control panel to allow independent control of the lighting levels by the surgical team.

13.) Pendant

a.) Double arm ceiling pendant – European CE / US FDA mark

Multimovement Pendent of double arm (900 mm+600 mm) with load carrying capacity of minimum 100 kg. The arm will be rotatable upto 330º- 340ºwith adjustable stopper. The pneumatic brake system will be adaptable to various safety requirements and construction facilities. The interior cross section for supply lines will be of minimum 120 mm diameter. The stoppers will be infinitely variable from 0-330º-340º.

Service head will be of modular design, octagonal in shape to achieve maximum supply with minimum required space. Service head will designed to host, Base, Gas Module, Electric Module and shelves. Will have upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the surgical equipments & monitor. The total length of the manager is 1500mm.

Surgeon pendent will have 2 arms with shelves and will include following:

a. Horizontal arms	- 2 No.
b. Weight carrying capacity – Minimum 100kg	
c. 5/15 Amp. electrical sockets without switches	- 8 to10 Nos.
d. Shelfs with side rails	- 4 Nos. with 1 drawer
e. Provision to fix Gas outlets(i.e.)	
Oxygen- 2, Vaccum- 2, Air 4 bar-1, Air 7 bar-1 , N2O-1	

f. Gas interface set for interface plate	- 1 No.
g. Ceiling mounting system for interin ceiling upto 1000	- 1 No
h. Interface plate with electrical fittings	- 1 No
i. Ceiling cover for interin ceiling	- 1 No

b.) Single Arm Pendant- CE marked

Multimovement Pendent of Single arm(900-1000mm)horizontal movement only and load carrying capacity of minimum 80 kg. The arm will be rotatable upto 330º- 340ºwith adjustable stopper. The pneumatic brake system will be adapted to various safety requirements and construction facilities. Will use a very quiet, high performance motors as well special to realize precise & steady movement. As a safety feature the motor will be equipped with an over load protection. Will have large interior cross section for supply lines with 120 mm diameter. The stoppers will be infinitely variable from 0-330º-340º

Service head will be of modular design, octagonal in shape to achieve maximum supply with minimum required space. Service head will be designed to host Base, Gas Module, Electric Module and shelves. Upto 8 Gas outlets & 10 Electrical switches. Racks & shelves are provided to mount the equipments like monitor etc. The total length of the manager is 800-1000mm.

Anesthesia pendent will have one arm with shelves and will include following:

a. Horizontal arms	- 1 no.
b. Weight carrying capacity	- Minimum 80kg
c. 5/15 Amp. Electrical sockets without switches	- 8 to 10 Nos.
d. Shelfs with side rails	- 2 Nos.
e. Provision to fix Gas outlets(i.e.)	
Oxygen	- 2,
Vacuum	- 2,
Air 4 bar	-1,
Air 7 bar	-1,
N2O	-1
f. Gas interface set for interface plate	- 1No
g. Ceiling mounting system for interin ceiling upto 1000	- 1 No
h. Interface plate with electrical fittings	- 1 No.
i. Ceiling cover for interin ceiling	- 1No

14.) <u>OT TABLE Imported European CE / US FDA Approved</u>

<u>C-ARM COMPATIBLE GENERAL SURGERY OT TABLE</u>

Electro Hydraulic Operation Table with all standard accessories with Remote Control

1. Four section table top with divided foot section.
2. Table top should be of a high — pressure laminate to permit x-ray penetration and fluoroscopy.
3. All table positioning, i.e. height, back section, lateral tilt, trendelenburg, and anti-trendelenburg, except foot and head section should be operated electro hydraulically by remote control.
4. The casings on the frame and centre supporting column should be made of hygienic stainless steel.

5. Mattress should be radiolucent material and suitable for fluoroscopy
6. Preprogrammed Flex and reflex position should be easily achievable by remote control.
7. C arm compatible with sliding table top. Sliding should be possible both cranially and caudally.
8. Should be able to carry patient weight up to 150 kg or more.
9. **Measurements:**

Height: 710mm — 1000mm
Side tilt + /-20 degree
Back section adjustment : 40 degrees down to 80 degrees up
Foot section adjustment: 90 to 0 degree, detachable
Trendelenburg : 25 degree
Anti trendelenburg : 25 degree
Head section adjustment : +45 to -90 degree, detachable
OT Table width: 500 mm or more
OT Table Length: 1900 mm or more
Longitudinal shift: 300 mm or more.

System Configuration Accessories, Spares and Consumables

Padded arm rest with straps — pair with damps
Anaesthesia screen with clamps – 01 set
Body restrain strap – 01 no
Knee crutches pair with clamps - 01 set
Lateral supports pair with clamps – 01 set

Standard, Safety and Training

Should be US-FDA / European CE approved product.
Manufacturer should be ISO certified for quality standards

15.) DOUBLE COMBINATION OT CEILING LIGHT WITH LED TECHNOLOGY –Imported European CE / US FDA marked

Should have the following Features:

Two Major Dome/light head
Single Colour Pure White LED,s
Reflector based LED Technology
Arrangement of LED in such a way that Shadow Free / Deep cavity illimination is achieved

Special design to maximize the field of illumination and optimized illumination depth
Should have good laminar flow properties
Easy and less time consumng service access of electronics on the light head dome surface
Aluminium Housing for better heat management
ESG safety glass for simple and fast disinfection process
360 deg rotation of domes/lightheads / arms for unlimited positioning of light heads
MIS Lightning Feature on domes

Technical Data of Light Heads: **Major (2)**

Central Illumnination Ec (1mt)	140,000 lux
Intensity Range (Lux)	48,000- 140,000
Life time of light source (h)	>/= 50,000
Number of LED's	>/= 70
Light Field Diameter (mm)	200-320
Depth of Field L1+L2 (mm)	>/= 1200
CRI (Ra)	>/=96
R9	>/=96
Colour Temp(K)	>/=4500
Rated Power Output	less or equal to 60W at 24V DC
Light Head Power Consumption	200 VA+/- 10%
Radiant Energy	around 3,4mW/m2lx
Temp increase	< 1 deg
Certification	UL/CE
Power Supply-Primary Voltage(V AC)	90-240
Rotation	360 deg
Operating Range	>/= 1700 mm
Adjustment of the spring arm	>/ = 1175 mm
Approx wt of each LH	</= 15kg
Measurement of light head	695/611 mm

16.) AHU SYSTEM WITH DUCTING< CONDENSING UNIT PACKAGE

DOUBLE SKIN AIRHANDLING UNIT	**Unit**	**Qty**
floor mounted Air handling units in double skin construction having 44 mm thick PUF Sandwitch Panels at a static pressure of 120 mm WG complete with backward curved blower, TEFC blower motor suitable for operation on 415 V +_ 10%, 3 Phase, 50 Hz, A.C. Supply complete with 8 Rows copper tube, aluminium finned DX cooling coil, prefilter,micro-vee filters, Heater Bank , Mixing Box complete with drain connections with anti-vibration mounting and with VFD compatible motor of following capacities:		
4000 CFM * 120 mm WG S.P. with 6 Row Deep Cooling Coil for Operation Theatre	Nos.	1

CONDENSING UNITS:		
Air cooled Condensing units 5.5 TR incorporating Scroll comressor , Condensing coil , Condenser Fan and fan motor with interconnecting copper pipe between compressors and Condenser coil.Display sensor with remote control shall be provided by us. Referigerant gas is included in our scope [Refrigerant will be R-22]	Nos.	2
M.S. Stands for mounting Condensing units of 5.5 TR Capacity	Nos.	2

COPPER REFRIGERANT PIPING / CONROL WIRING		
Suction Line 7/8" Dia x 18 Gauge and Liquid Line 5/8" x 18 Gauge complete	RMT	5

with ntirile tube insulation over suction line.		
Control Wiring between AHU and Condensing unit	RMT	8

REFRIGERANT LINE ACCESSORIES / INSTRUMENTS		
Hand Shut Off Valve 7/8"	Nos.	2
Hand Shut Off Valve 5/8"	Nos.	2
Liquid Line Expansion Valves	Nos.	2
Refrigerant Driers	Nos.	2
Sight Glass	Nos.	2

DUCTING WITH THERMAL INSTALLATION		
Supply of Air Handling Unit with Aluminium ducting with acoustic & Thermal installation (along with provisions for fresh air) •Canvas Connection • Supply, Fabrication, Installation & Testing of return Aluminum metal ducts in accordance with specifications 24/22 gauge • Supply, installation and testing of multiblade type louver dampers of aluminum for ducts collers to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system.	Mt^2	200

17.) ELECTRICALS

Wall / Floor mounted control panel comprising of contactors / starters for Heaters, AHU Fan motor, switch fuse unit for Condensing unit, complete with indication lights etc.	Nos.	1
Supply of Power cabling, control wiring & GI earthing assuming that Electrical panel shall be located at a maximum radial distance of 10 Meters from AHU / Condensing unit. [Main power supply terminating at each Condensing unit and our Control Panel to be provided by Client]	Lot	1

18.) Anesthesia Workstation- Imported

Anesthesia workstation should be designed as per the international standards and European standards labeled with the European CE / US FDA mark

Anesthesia workstation must be suitable for all patient age group.

All the major component of anesthesia workstation like Anesthesia Machine, Ventilator, Vaporizer and Anesthesia Monitor preferably from one manufacturer.

Anesthesia Machine

Anesthesia machine should be compact, mobile with integrated ventilator and should monitors pressure, volume and oxygen.

Anesthesia machine must be suitable for low flow anesthesia.

Machine should have working surface and the storage space for keeping the accessories.

Should have facility to connect to the central supply (O2, N2O & Air), pin index cylinder one each of O2 & N2O and pressure gauges for central supply and cylinder.

Should have hypoxia guard and provides a nominal minimum 25%

Should have dual cascaded flow meter for O2 and N2O and single flow meter for air.

Should have integrated auxiliary oxygen flow meter.

Should have oxygen flush upto 75lpm.

Should have compact autoclavable breathing, system and soda lime chamber capacity of 1.5L.

Should have electronically controlled and electrically / pneumatically driven anesthesia ventilator.

Anesthesia Ventilator should have following settings -

Ventilation Mode : Manual / Spontaneous, IPPV
IPPV / Volume controlled
with tidal volume compensation Pressure Mode
Tidal Volume : 40 – 1500 ml
PEEP : off, 4 – 30 cmH2O
Frequency : 4 – 60 bpm
I:E Ratio : 1:4 to 4:1
Pressure Range : 5 – 60 cmH2O
Setting of inspiratory time and Inspiratory pause time,
Should have integrated color display of at least 7".

Display should be configurable and display any one of the waveform Paw vs time or flow vs time.

Anesthesia machine should monitor and display the measured value of minute volume, tidal volume, fiO2 concentration, Peak pressure, mean pressures, plateau and PEEP.

Should have adjustable high / low limits setting for FiO2, expired tidal volume, Minute volume, frequency and airway pressure.

Anesthesia Machine should have provision to mount two vaporizers at a time and supplied with Halothane & Isoflurane vaporizer along with the machine.

Anesthesia machine should have battery backup of at least 1hrs.

Anesthesia Monitor

Anesthesia workstation should have advance patient monitor and

capable of monitoring of all patient age group.

Should have integrated touch screen of 12" and display 6 channel waveform.

All the data should be access through touch screen and rotary knob.

Monitor should have 24 hrs trends and stores 100 alarm events.

Should have Audio visual alarming system.

Monitor should have monitoring facility of 3/5 lead ECG with ST segment analysis, NIBP, SPO2, Dual Temperature and Invasive Blood.

Monitor should have basic and advance arrtheymiya detection.

Each Anesthesia workstations should be supplied with following accessories –

i. Anesthesia machine with two vaporizers i.e. Halothane & Isoflurance one each.
j. 10 set of disposable circuits with filter.
k. ECG 3 and 5 lead one each
l. Adult & Pediatric Spo2 sensor two each
m. Adult & Pediatric NIPB cuff two each
n. Temperature probe skin & rectal one each
o. 10 set of water trap for adult / Pediatric, 25 pcs of sampling line.
p. IBP kit with 10 disposable transducer

Equipment should be demonstrated and compliance statement should be supported with brochures and technical data sheet.

19.) Oxygen Manifold as per NFPA/ HTM std . UL listed / CE mark

The oxygen cylinder manifold Will comprise of two cylinder Banks which can accommodate 4 cylinders in each Bank (means 4+4) complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves. High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold Will be tested (hydraulically) at 250kg / cm sq. The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation. Each manifold Will be provided with one terminal header and a NPT connection for the Automatic control panel.

20.) Fully Automatic Oxygen Gas Control System – as per NFPA /HTM std UL listed / CE mark

Gas Manifold Will be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without interruption of gas delivery to the system. A critical connections Will be gas specific,non-interchangeable and Will be designed to eliminate gas supply error. The manifold control system Will supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit Will include right and left header bars and pigtails for the appropriate medical gas. The installed system Will automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system Will automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation will automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders.

The LED indicator Will show a depleted bank by turning red. A buzzer Will also sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator will turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that Will also indicate that the bank was depleted and, in turn, was reset. The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders.

When a bank is depleted, Manifold Will automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves Will automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas Will leave the high pressure cylinders through the pigtails into the header bars. The pigtails Will have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank.

In the event a safety relief device on an individual cylinder Will activate or a pigtail should leak excessively, the local check vale Will also prevent loss of gas from the rest of the cylinders on that bank.

The gas Will flows through the manually operated shutoff valve into the primary regulator. This regulator Will reduce the high cylinder pressure to an intermediate pressure. The intermediate pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure reduction for use in the health care facility. Two line pressure regulators Will be installed in parallel, and each Will be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve Will be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure falls to a predetermined level, which is controlled by the preset pressure switches (high and low) , the switches Will activate the solenoids to switch to the fresh (reserve) cylinder bank . The manifold control cabinet Will have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs, two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted: third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators will controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator form red to yellow. At the same time the yellow LED Will change to green to go form Reserve Ready to In Service. LEDs should show red prior to initial pressurization or whenever both cylinder banks are below the preset value.

21.) Emergency Oxygen Manifold as per NFPA/ HTM std. UL listed / CE mark

The oxygen cylinder manifold Will comprise of two cylinder Banks which can accommodate 1cylinders in each Bank (means 1+1) complete with copper tail pipes with bull nose fittings of RH External threading suitable for cylinder valves conforming to IS 3234 (Oxygen service) and Cylinder support system. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Oxygen Cylinders and manifold.

Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves.

High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg.

The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely.

The manifold Will be tested (hydraulically) at 250kg / cm sq.
The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation.

22.) Terminal / Gas Outlet with probes– as per NFPA /HTM std UL listed / CE mark

Oxygen, Vacuum Surface mount, non interchangeable, self sealing outlets, outlets Will consist of a roughing in assembly and a finishing assembly. A non removable positive- pin keying arrangement for each assembly and a finishing assembly. A non removable positive- pin keying arrangement for each a specific gas service. Installed in the mounting box a fully assembled brass secondary check valve.

Design of outlet Will be such that it Will have 100% metal construction for corrosion resistance fire safety & push button mechanism for quick release of adaptor. The secondary check valve automatically Will form a positive seal to prevent a gas flow when the finishing assembly is removed. The secondary check valve to include 7'' (17.78cm) of 1/2'' Type K copper tubing with a label affixed which identifies the specific gas by name and colour. A plastic cap inserted at the end of the inlet tube. Rotation of the inlet tube Will allow gas connection from the top or bottom. The finishing assembly Will consists of a die cast chrome plated cover plate, a machined brass housing for the primary check valve, and a positive –pin keying device to prevent accidental installation into a roughing in assembly of a dismal gas. The finishing assembly incorporates a double seal arrangement which automatically engages when a hose adapter or patient treatment device is removed from the outlet. The design of the outlet Will be such that if can be easily repaired without disassembly of the outlet.

The finishing assembly Will have a colour coded (specific gas) keying disc to prevent connection of hose adapters or patient treatment device to the wrong gas service. The primary check allows absolutely no gas flow to take place until the keying devices are engaged. It Will be manufactured in accordance with all applicable NFPA and CGA standards. The locking device Will be in the probe instead of gas outlet.

Matching probe for outlets – Imported as per NFPA -99 / HTM 02-01 UL Listed / CE Marked

Matching probes to the gas outlet mentioned above. That is adapter for Oxygen & vacuum.

Each adapter Will have suitable barb or threads so that it can be connected to tube or flow meter /suction regulator. Adapter Will have clear gas service embossed on it.

23.) Oxygen Flow meter & Humidifier Bottle – as per NFPA /HTM std UL listed / CE mark

Brass body chrome plated Flowmeter with colour coding to match with the gas being used. The housing will be made of poly carbonate to ensure high durability. The flow range will be 0-15 LPM. The Flow meter will be fitted with matching adaptor (probe) for Oxygen Gas Outlet Point. The Flow meter will be CE marked.

Humidifier bottle will be compatible with Oxygen Flowmeter & it will be reusable type. The bottle will be shatterproof & made of polypropylene. Metal components of humidifier bottle will be made of brass with anti-corrosion nickel plating.

24.) Nitrous Oxide Manifold as per NFPA/ HTM std. UL listed / CE mark

The N2O cylinder manifold Will comprise of two cylinder Banks which can accommodate 2 cylinders in each Bank (means 2+2) for cylinder valves conforming to IS 3234 (N2O service) complete with copper tail pipes with fittings. Manifold Will be suitable to withstand a pressure of 140 Kg/cm2, along with high pressure copper annealed tail pipes with Brass adapter suitable for Nitrous Cylinders and manifold. Top frame comprising of high pressure copper pipes of size 1/2" I.D. x 15swg with high pressure brass fittings made of high tensile brass and connections through non- return valves. High pressure copper tail pipes, made of high pressure copper pipe of size 1/4" I.D. x 15 swg. The middle and bottom frame to be provided to fit both round and flat bottom cylinders safely. The manifold Will be tested (hydraulically) at 250kg / cm sq. The copper tail pipes are fitted to the individual non return valves of the cylinder manifold for easy removal of cylinders without disturbance to system operation. Each manifold Will be provided with one terminal header and a NPT connection for the Automatic control panel.

26.)Fully Automatic Nitrous Oxide Gas Control System – as per NFPA /HTM std UL listed / CE mark

Gas Manifold Will be fully automatic, self – shifting to reserve bank on exhaustion of the service bank without, primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system non-interchangeable and Will be designed to eliminate gas supply error. The manifold control system interruption of gas delivery to the system. A critical connections Will be gas specific Will supply a flow of 1000 L/ Min at 50 psi. The dual line regulator/single vent Medical Gas Manifold control unit Will include right and left header bars and pigtails for the appropriate medical gas. The installed system Will automatically switch over to the reserve bank when the primary bank is depleted. When the depleted cylinders are replaced with full cylinders the system Will automatically reset itself in preparation for the next bank change. The primary side bank in use and the remaining side bank on reserve. This designation Will automatically change from left to right and right to left as each bank is depleted and, in turn, refitted with full gas cylinders. The LED indicator Will show a depleted bank by turning red. A buzzer Will also sound to indicate an empty bank. When the system is reset by replacing the depleted cylinders, the indicator Will turn green and also silence the buzzer. If the manifold is connected to the health care facility's central alarm system that Will also indicate that the bank was depleted and, in turn, was reset.

The only manual activity Medical gas Manifold requires is the changing of the depleted cylinders. When a bank is depleted, Manifold Will automatically switch to the fresh bank, delivering an uninterrupted gas supply to the health care facility. Changeover is performed by solenoid valves contained in the control cabinet. In the event of an electrical power failure, both solenoid valves Will automatically open to provide an uninterrupted gas flow. Under normal operating conditions, the gas Will leave the high pressure cylinders through the pigtails into the header bars.

The pigtails will have on-way Valves (check valves) to allow the replacement of depleted cylinders without gas pressure back-flow into the remaining depleted cylinders on that bank. In the event a safety relief device on an individual cylinder Will activate or a pigtail Will leak excessively, the local check vale Will also prevent loss of gas from the rest of the cylinders on that bank.

The gas Will flows through the manually operated shutoff valve into the primary regulator. Pressure gas flows through the solenoid valve to the line regulator for its final (Line) pressure.

This regulator Will reduce the high cylinder pressure to an intermediate pressure. The intermediate reduction for use in the health care facility. Two line pressure regulators Will be installed in parallel, and each Will be capable of maintaining a constant dynamic delivery pressure at the maximum designed flow rate of the system.

The solenoid valve Will be the key to the automatic mechanism the manifold. This component ensures that the flow of gas is not interrupted and the pressure does not fluctuate during normal operation. When the operating bank pressure falls to a predetermined level, which is controlled by the preset pressure switches (high and low) , the switches Will activate the solenoids to switch to the fresh (reserve) cylinder bank .

The manifold control cabinet Will have three means of giving continuous information on the system status: first pressure gauges to indicate the bank pressure and the delivery pressure: second six indicator LEDs, two green that indicate which cylinders is in use, two yellow for Reserve Ready and two red that indicate a bank is now depleted: third, a loud audible buzzer gives an alarm when either or both banks are depleted.

The six indicators Will controlled by sensing the bank pressure. Replacing the depleted cylinders on the empty bank resets the system, changing the indicator from red to yellow. At the same time the yellow LED Will change to green to go form Reserve Ready to In Service. LEDs Will show red prior to initial pressurization or whenever both cylinder banks are below the preset value.

27.) Emergency N2O System – as per NFPA/ HTM std. UL listed / CE mark

The Emergency supply manifold will be connected to downstream of the manifold control panel. The assembly will consist of 2 (two) cylinders connection supplying a manually adjusted regulator via a common header assembly. The delivery system is isolated from the main system by an isolation valve. Pressure gauges Will indicate cylinder and delivery pressure & valves conforming to IS 3234 (N2O service)

28.)MEDICAL COMPRESSED AIR SYSTEM

SPECIFICATION OF AIR PUMPS

Air Compressor	:	Two stage reciprocating
Capacity	:	500 Lt/Min
Pump PRM cfm	:	15 cfm
Electric motor	:	5 HP
Make	:	CromptonGreve/siemen/NGEF/Kirloskar
Type of model	:	Sq. Induction TEFC
Size of reserver	:	1000 Ltr.
HEATLESS AIR DRYER		
FLUID HANDLED	:	AIR

INLET CONDITION	:
a) Flow	: 15 CFM
b) Pressure	: 7 kg/cm2
c) Temperature	: 45 Deg.c.
d) Moisture Contents	: 100%RH
OUTLET CONDITION	
a) Flow	: 27CFM
b) Pressure	: 6.8 Kg/cm2
c) Temperature	: AMBIENT
d) Drew point	: -40 Deg.C. temp. at atm. Pr.
Desiccant	: Activated Alumina
Line Size	: 15 MM
Pre Filter	: Baffle type with drain value
After Filter	: Polyster cloth type
Design Pressure	: 10 Kg/cm2
Material of Construction	: IS : 2062 / IS : 1239
Code of Construction	: IS : 2825
Approx space requirement in mm	: 600 x 600 x 1600

29.)MEDICAL VACCUM CENTRAL SYSTEM

VACCUM PUMP

Consists of three parts:

The pumps should be of following specifications :

2 nos. (One running and one stand by) of Vacuum Pumps, air cooled type, model V-255 5 HP having Piston displacement – 50 cfm. Free air delivery o suction – 70 % of P.D. approximately, max working pressure – 29" of Hg or 730 mm of Hg. Single stage cylinder, 1450 Lpm fitted with MS channel frame compete with V-belt drive, belt guard etc. along with the following :

• 5 HP, 440 volts, 3 ph, 50 Hz, with TEFC electric motor of Siemens / Crompton

• 1" BSP stainless steel ball valve with PTFE seat with suitable brass adapters and non return valve with non ferrous filter element in housing (size 8.6" x 12" long).

• Silencer on discharge end projection (open to atmosphere) outside the plant room.

• Copper pipe interconnection up to receivers

• Vacuum Tank water capacity 1000 ltr

30.) Ward Vacuum Unit with Suction Jar & metal regulator - as per NFPA /HTM std UL listed / CE mark

The Ward Suction unit capacity 600 ml is designed for minimum servicing and high efficiency. Regulator body which houses an ON/OFF knob, regulation knob, vacuum gauge graduated in mbar. The ON/OFF knob allows the operator to start or stop suction by turning the switch. With regulation knob operator can set the amount of vacuum required. The jar is made of polycarbonate transparent and unbreakable autoclave at 121deg.C. A Well proved fluid control trap (Safety) fitted on the unit automatically and efficiently shut off vacuum fully, preventing the transfer of liquid to the vacuum regulator , pipeline and pump.

31.) MEDICAL COPPER PIPE (ILLOYD's Certified)

Copper Piping :

Installation:

Installation of piping Will be carried out as per international standards with utmost cleanliness. Only pipes, fittings and valves which have been degreased as per International standards Will be used. Pipe fixing clamps for upto 28mm diameter. Pipes Will be non ferrous suitable for the diameter of the pipe. For the pipes of the sized above 28mm rigid metallic hanging or cemented supports to be used.

The main lines to the building to be taken overhead through metallic poles or through underground ducts with inspection removable slabs, All pipe joints Will be made using inert gas fluxless brazing method. All joints Will be of copper to copper and Will be brazed by silver brazing filler material without flux while being brazed joints shall be continuously purged with oil free dry nitrogen to prevent the formation of copper oxide on the inside surface of the joint.

All pipes Will be installed without springing or forcing. All pipes Will be protected against mechanical injury in a manner satisfactory to authorities having jurisdiction.

Test: After erection, all the new pipes cleaned or purged with the help of dry nitrogen gas. Complete system Will be tested with dry nitrogen at 2 times of working pressure for 24 hours.

Painting: All existing and proposed exposed pipes/Will be painted with two coats of Synthetic enamel paint & color codification as per international standards. All concealed pipes to have gas identification bands / labels at appropriate distance. Similarly all pipes which need embedding in the wall Will be tested/painted/labeled and properly insulated. Certification: To be certified that pipes are suitable for the particular service and complete cross connection (anti-confusion) test will be carried out.

Distribution piping system:

MATERIAL (PIPE):

Solid drawn, seamless, deoxidized, non arsenical, half hard, tempered and degreased materials conforming to Kite mark Medical Grade Kite mark Pipe All copper pipes will be inspected and certified by Kite mark Register of services for medical use before dispatch and the pipe will be delivered plugged or capped at both ends. Pipe sizes to be used as under:

28mmOD X 1.00mm thk
22mmOD X 1.00mm thk
15mmOD X 1.00mm thk
12mmOD X 1.00mm thk

Fittings will be made of copper conforming to BS 864 and suitable for a steam of working pressure of 35 bar and especially made for brazed socket type connections.

32.)MEDICAL AREA LINE PRESSURE ALARM:

Medical Gas Alarm – As per NFPA -99 std as per NFPA /HTM std UL listed / CE mark

Alarm body is made out of powder coated MS sheet of 18 gauge size.Box size: - LxWxH 12”x7”x4”.Test function is provided in the Line Pressure Alarm system to test the audio-visual indicators. On pressing the Test Button, all the emergency indicators i.e. the High and the Low indicators start glowing along with a beep alarm. This test is performed for 5 seconds and after that it comes back to its previous position. Alarm has provision to install upto 6 no. of gases. Mute Function is provided for switching off the beep alarm whenever it blows. The system is provided with a timer, which allows the

beep alarm to restart after 10 minutes of pressing the mute button. LED window size 10mmx20mm. Complies with HTM 2022 Std.

33.) MEDICAL AREA VALVE SERVICE UNIT As per NFPA -99 std as per NFPA /HTM std UL listed / CE mark

ZONE VALVE BOX

1/2" x 3/4" (2 Gas)

1/2" x 1/2"x 3/4" (3 Gas)
1/2" x 1/2" x 1/2" x3/4" (4 Gas)

zone valve boxes should be constructed of 18 gauge sheet steel with air dried lacquer finish. The cover frame should be made of anodized aluminium and attached to the box by concealed 1-1/2" (38 mm) screws. The finished assembly should be substantially dust-tight. The frame assembly should be capable of adjusting for variances in wall thickness up to 1". The front assembly should contain an easily removable cover window with pull ring. The window should conceal exposed piping and valves inside the box and should be l;abled " Caution- Medical Gs Shut –OFF Valves- Close Only in Emergency". Clear viewing space will be provided in the window to display the gas service, the area controlled by the valve, and pressure gauges on units so equipped.

Single - valve boxes shall accept valve sizes thro' 3". Two & Three valve Boxes shall accept valves sizes throu 2" four, Five & size valve boxes shall accept valve sizes thro 1 1/4" valves will be factory installed with the smallest valve top longest at the bottom we will apply labels to each valve within the assembly for proper gas service identification according to the manufacturer's instructions. placement of the valve within the zone valve box will be such that the removable window cannot be placed when any valve is closed. Factory installed type K copper pipe extensions will extend three inches outside the valve box. Design of the valve box will be such that valves may be removed prior to brazing, without disassembly of the box, to permit rearrangement of valves if necessary. valves will be ball type, cleaned for oxygen service, supplied with capped ends, and will operate full open to closed position with 90 degree handle rotation (refer to Medical gas Valve specification) Gauge model zone valve assemblies will include 1-1/2" pressure gauges reading 0-100 psi for oxygen, nitrous oxide, air and other 50 psi working pressure gases 0-300 psi for nitrogen and 0-30" HG for vacuum or evacuation vacuums.

the gauge port will be equipped with removable plug for pressure testing prior to final assembly of gauge. All gauge model zone valve box assemblies.

38.) Theatre Vacuum Units As per NFPA -99 std as per NFPA /HTM std UL listed / CE mark

The Basic theatre trolley consists of a stand base mounted on five castor wheels made of plastic moulded and pole incorporating two no's 2000 ml , jar (made of transparent & unbreakable polycarbonate) is of aluminum duly anodized an rust proof. 2 nos jar fitted in trolley are autoclavable at 121º C. Vacuum regulator fitted with TST, is made of aluminium duly anodized and cap is made of ABS. Regulator body which houses an ON/OFF knob, regulation knob, vacuum gauge graduated in mbar.

39.) Anesthetic Gas Scavenging System (AGSS) (Imported) as per NFPA /HTM std UL listed / CE mark

Anesthetic Gas Scavenging System (AGSS) plants are designed to provide a safer working environment for the medical personnel by the removal of the waste gases that are produced during anesthesia and from the surrounding environment.

AGSS plants are available as simplex or duplex units comprising of die cast aluminum side channel blowers complete with electrical controls, pressure sensor, relief valve and drain flask, all pre-piped, pre-wired and factory tested.

The duplex plant control panel incorporates a duty pump selector, vacuum gauge and indicators to identify the plant status. The standby pump is activated automatically upon high demand or the failure of the duty pump.

Duplex units incorporate non-return valves to enable the maintenance of one pump whilst the other pump is in service.

Pumps are available to suit single phase or three phase electrical suppliers.

Remote switches are available to enable control of the AGSS plant from within the department served and to indicate the status of the plant.

40.) Silent Diesel Generating Set

Suitable Silent DG Set of required capacity to cover all the components to be installed by the bidder against this tender and general lighting and ventilation of the campus The technical specifications of the Silent D. G. Set should conform the norm laid down by Central Pollution Control Board.

41.) On line UPS 10 KVA

The UPS shall be a solid-state single phase UPS system designed to provide regulated and conditioned sinusoidal power to both linear and non-linear type loads. The UPS shall provide uninterruptible power during all modes of operation. There shall be no interruption of power to the critical load when the UPS transfers to and from battery operation. POWER CONNECTIONS: The UPS shall be hard wired input and output.

Bill Of Quantity for one no Modular Operation Theatre Super Specialty

S.no	Description	Qty	Unit
1.	Walls and Ceiling for Operating Area Country of Origin : Europe as per technical specification enclosed	1	Sq feet
2.	Flooring as per technical specification enclosed	1	Sq feet
3.	Operation Theatre Control Panel as per technical specification enclosed	1	no
4.	X-Ray Viewing Screens as per technical specification enclosed	1	No
5.	Doors and Frames (Hermetically Sealed type) 2100 mm Height & 1500 mm Width (with Automation Unit) as per technical specification enclosed	1	No
6.	Laminar Flow System as per technical specification enclose	1	set
7.	Pressure Stabiliser as per technical specification enclosed	1	no
8.	Surgical Scrub Sink as per technical specification enclosed	1	no
9.	Operating List -Writing Board as per technical specification enclosed	1	no
10.	Electrical Installation as per technical specification enclosed	1	no
11.	Electrical Safety System for Cladding Type OTs - Imported as per technical specification enclosed	1	no
12.	Equipment Storage Unit as per technical specification enclosed	1	no
13.	Hatch Box as per technical specification enclosed	1	no
14.	Peripheral Lights as per technical specification enclosed	8	nos
15.	Pendant		
a)	Double arm ceiling pendant – Imported CE mark with four digit no as per technical specification enclosed	1	No
b)	Single Arm Pendant- Imported CE marked with four digit no as per technical specification enclosed	1	No
16.	OT Table Imported CE & FDA Approved as per technical specification enclosed	1	No
17.	Double Combination of Ceiling Light with LED Technology –Imported CE marked as per technical specification enclosed	1	No
18.	AHU System with Ducting < condensing Unit Package as per technical specification enclosed	1	Set
19.	ELECTRICALS as per technical specification enclosed	1	Lot
20.	Anaesthesia Workstation-Imported as per technical specification enclosed	1	No
21.	Oxygen Manifold as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	No
22.	Fully Automatic Oxygen Gas Control System – (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	No
23.	Emergency Oxygen Manifold as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	No
24.	Terminal / Gas Outlet with probes– (Imported) as per NFPA /HTM std UL listed / CE mark Imported as per technical specification enclosed 4- Oxygen	13	nos

	4 – vaccum 2-Air 2-N2O 1-AGSS		
25.	Oxygen Flow meter & Humidifier Bottle with timer facility – (Imported) as per NFPA /HTM std UL listed / CE mark Imported as per technical specification enclosed	1	No
26.	Nitrous Oxide Manifold as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	no
27.	Fully Automatic Nitrous Oxide Gas Control System – (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	no
28.	Emergency N2O System – as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	no
29.	Medical Compressed Air System as per technical specification enclosed	1	No
30.	Medical Vacuum Central System as per technical specification enclosed	1	no
31.	Ward Vacuum Unit with Suction Jar & metal regulator - (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed.	1	no
32.	Medical Copper pipe MEDICAL COPPER PIPE as per technical specification enclosed		
a	15mm	50	mtr
b	22mm	30	mtr
c	28mm	25	mtr
33.	Medical Area Line Pressure Alarm : as per technical specification enclosed	1	no
34.	Medical Area valve Service Unit As per NFPA -99 std (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	no
35.	Theatre Vacuum Units As per NFPA -99 std (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	no
36.	Anesthetic Gas Scavenging System (AGSS) (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	no
37.	Diesel Generating Set as per technical specification enclosed	1	No
38.	On line UPS 10 KV as per technical specification enclosed	1	No
39.	Civil Work	1	Sq feet
40.	Labour Cost as per installation	1	Sq feet

Bill of Quantity for one no Modular Operation Theatre Specialty

S.no	Item Name	Qty	Unit
1.	Walls and Ceiling for Operating Area Country of Origin: Europe as per technical specification enclosed	1	Sq feet
2.	Flooring as per technical specification enclosed	1	Sq feet
3.	Operation Theatre Control Panel as per technical specification enclosed	1	no
4.	X-Ray Viewing Screens as per technical specification enclosed	1	no
5.	Doors and Frames (Hermetically Sealed type) 2100 mm Height & 1500 mm Width (with Automation Unit) as per technical specification enclosed	1	no
6.	Laminar Flow System as per technical specification enclosed	1	no
7.	Pressure Stabiliser as per technical specification enclosed	1	no
8.	Surgical Scrub Sink as per technical specification enclosed	1	no
9.	Operating List -Writing Board as per technical specification enclosed	1	no
10.	Electrical Installation as per technical specification enclosed	1	set
11.	Equipment Storage Unit as per technical specification enclosed	1	no
12.	Peripheral Lights as per technical specification enclosed	8	nos
13.	Pendant		
a)	Double arm ceiling pendant – CE mark with four digit no as per technical specification enclosed	1	no
b)	Single Arm Pendant- CE marked with four digit no as per technical specification enclosed	1	no
14.	OT Table Imported CE & FDA Approved as per technical specification enclosed	1	no
15.	Double Combination OT Combination OT Ceiling Light with LED Technology –Imported CE marked as per technical specification enclosed	1	no
16.	AHU System with Ducting < Condensing Unit Package as per technical specification enclosed	1	set
17.	ELECTRICALS as per technical specification enclosed	1	lot
18.	Oxygen Manifold as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	no
19.	Fully Automatic Oxygen Gas Control System – as per NFPA /HTM std UL listed / CE mark with four digit no as per technical specification enclosed	1	no
20.	Emergency Oxygen Manifold as per NFPA/ HTM std. UL listed / CE mark with four digit no as per technical specification enclosed	1	no

21.	Terminal / Gas Outlet with probes– as per NFPA /HTM std UL listed / CE mark with four digit no as per technical specification enclosed 4- Oxygen 4 – vaccum 2-Air 2-N2O 1-AGSS	13	nos
22.	Oxygen Flow meter & Humidifier Bottle – as per NFPA/ HTM std UL listed / CE mark as per technical specification enclosed	2	no
23.	Nitrous Oxide Manifold as per NFPA/ HTM std . UL listed / CE mark with four digit no as per technical specification enclosed	1	no
24.	Fully Automatic Nitrous Oxide Gas Control System – as per NFPA /HTM std UL listed / CE mark with four no digit as per technical specification enclosed	1	no
25.	Emergency N2O System – as per NFPA/ HTM std. UL listed / CE mark with four digit no as per technical specification enclosed	1	no
26.	Medical Compressed Air System as per technical specification enclosed	1	set
27.	Medical Vacuum Central System as per technical specification enclosed	1	set
28.	Ward Vacuum Unit with Suction Jar & metal regulator - as per NFPA /HTM std UL listed / CE mark with four no digit as per technical specification enclosed	1	no
29.	Medical Copper pipe MEDICAL COPPER PIPE as per technical specification enclosed		
a	15mm	50	mtr
b	22mm	30	mtr
c	28mm	25	Mtr
30.	Medical Area Line Pressure Alarm as per technical specification enclosed	1	No
31.	Medical Area Valve Service Unit As per NFPA -99 std as per NFPA /HTM std UL listed / CE mark with four digit no as per technical specification enclosed	1	no
32.	Theatre Vacuum Units As per NFPA -99 std as per NFPA /HTM std UL listed / CE mark four digit no as per technical specification enclosed	1	no
33.	Anaesthetic Gas Scavenging System (AGSS) (Imported) as per NFPA /HTM std UL listed / CE mark as per technical specification enclosed	1	set
34.	Diesel Generating Set as per technical specification enclosed	1	No
35.	On line UPS 10 KV as per technical specification enclosed	1	No
36.	Civil Work	1	Sq feet
37.	Labour Cost as per installation	1	Sq feet

ANNEXURE- B
FINANCIAL PROPOSAL BREAK-UP

Component wise cost break up of Modular OT in MCH
(Super specialty modular OT)
(Approx. size: 24 X 24 feet)

Sl. No.	Major Components	Bid Price in INR
Fixed costs		
1	Automatic Hermetic Doors	
2	Twin plate X-ray Viewing Screen	
3	Laminar Air Flow	
4	Air Handling unit	
5	Double arm surgical+ Anaesthesia pendant with lights	
6	Single Arm Pendant with lights	
7	Anaesthesia Work Station including ventilator	
8	Electro hydraulic OT Table	
9	OT Safety Control Panel (separately for each control system)	
10	Power back up (online UPS and 35 KVA DG Set (silent)	
11	Equipment Storage Unit	
12	Two bay scrub sink	
13	Operating list writing board	
14	Hatch box	
15	Medical gas, vacuum and compressed air station	
Variable costs		
16	Wall and Ceiling Panel (per sq. ft.)	
17	Flooring (per sq. ft.)	
18	Peripheral Lights (per light)-ceiling	
19	Surgical OT Lights (per light)-ceiling	
20	Electrical Installations	
21	Civil Work (per sq. ft.)	
22	Labour Costs per installation	
23	Medical Gas Pipe Line including vacuum and compressed air system	
24	Manifold	
25	Miscellaneous	
	Total	

- Any additional items may be mentioned clearly by the tenderer.

Component wise cost break up of Modular OT in DH
(Specialty modular OT)
(Approx. size: 20 X 20 feet)

Sl. No.	Major Components	Bid Price in INR
Fixed costs		
1	Automatic Hermetic Doors	
2	Twin plate X-ray Viewing Screen	
3	Laminar Air Flow	
4	Air Handling unit	
5	Double arm surgical+ Anaesthesia pendant with lights	
6	Single Arm Pendant with lights	
7	Anaesthesia Work Station including ventilator	
8	Electro hydraulic OT Table	
9	OT Safety Control Panel (separately for each control system)	
10	Power back up (online UPS and 35 KVA DG Set (silent)	
11	Equipment Storage Unit	
12	Two bay scrub sink	
13	Operating list writing board	
14	Hatch box	
15	Medical gas, vacuum and compressed air station	
Variable costs		
16	Wall and Ceiling Panel (per sq. ft.)	
17	Flooring (per sq. ft.)	
18	Peripheral Lights (per light)-ceiling	
19	Surgical OT Lights (per light)-ceiling	
20	Electrical Installations	
21	Civil Work (per sqft)	
22	Labour Costs per Installation	
23	Medical Gas Pipe Line including vacuum and compressed air system	
24	Manifold	
25	Miscellaneous	
	Total	

- Any additional items may be mentioned clearly by the tenderer.