

**TENDER DOCUMENT**

*FOR*

**SUPPLY INSTALLATION TESTING AND COMMISSIONING OF 2  
NO:S OF MODULAR OPERATION THEATRE AT TERTIARY  
CANCER CENTRE, KOZHIKKODE**

**PART-III  
PRICE BID**

**TENDER NO. HLL / ID / 16/ 18  
NOVEMBER 2016**

**HLL LIFECARE LIMITED.  
INFRASTRUCTURE DEVELOPMENT DIVISION**

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## **1. COMMERCIAL CONDITIONS**

- 1.1 The tendered rate shall inter alia be deemed to include for the provision of all materials, process, operation and special requirements detailed in the particular specification irrespective of whether these are mentioned in the description of equipment schedule and Bill of quantities or not. It is an express condition of the contract that the tendered rates for various items in the Bill of Quantities shall be deemed to include for the full, entire and final condition of the contractor respective items of the works in accordance with the provision of the contract.
- 1.2 The tendered rate shall include for all taxes, duties, etc. as applicable and shall be quoted on the works contract basis for Supply Installation Testing and Commissioning of 2 nos of Modular Operation Theatre Tertiary Cancer Centre, Kozhikode
- 1.3 The tendered rate shall remain firm and free from variation due to rise in the cost of materials/equipment labour or any other reasons whatsoever during the contract period and valid extension.
- 1.4 The quantum of excise duty included in the tendered price, the rate at which they were assumed etc. shall be indicated in the tender.

## **2. UNIT RATES**

- 2.1 Only approved work will be measured on completion and priced as per rates quoted against the respective items.

## **3. BRIEF DESCRIPTION OF PRICING**

- 3.1 The tenderer shall furnish duly certified breakup of material and labour separately for each item of work. The same shall be attached separately along with the price bid.
- 3.2 The quoted price shall be inclusive of all taxes and duties whether payable by the contractor or to be deducted at source. This shall include those applicable among VAT, Sales Tax, Income Tax, Customs Duty, Excise Duty, Turnover Tax, Work Contract Tax, Octroi, Labour Welfare Cess or any other Taxes and Duties prevailing in respect of this contract. However, in respect of service tax, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to the contractor by HLL after satisfying with documentary proof that it has been actually and genuinely paid by the contractor.

**4. PRO-RATA VALUE**

The detailed break up of prices for various items of equipments and materials of the full system should be provided by successful tenderers within fifteen days from the date of letter of intent to facilitate the Employer for assessment and verification and to certify payment.

**5. INCOME TAX**

Any payment to the contractor as per contract, will be made after deducting income tax as per the rules and regulations.

**6. SALES TAX AND EXCISE DUTY**

The tenderer shall clearly indicate sales tax, Excise and works contract tax and other duties as applicable in his offer for carrying out this work.

**7. SUBMISSION OF BILL**

7.1 The contractor shall from time to time prepare and submit interim bills of the work executed and on completion of the contract, he shall prepare and submit the final bill. The measurements sheets in support of the interim and final bills shall be prepared by the contractor on the basis of measurements taken by him jointly with the project engineer and the said measurement sheets shall be submitted by him with the relevant bill.

**8. EXTRA ITEMS**

The contractor is bound to carry out any items of work necessary for the completion of the job even though such items may not have been included in the schedule of probable quantities or rates, such items being necessary or essential for completing the job. Variation order in respect of such additional items and their quantities will be issued in writing by the Employer.

All shavings, cuttings and other rubbish as it accumulates from time to time during the progress of work and on completion including that of the sub-contractors and special tradesman and all materials condemned by the project engineer shall be cleared and removed from the site by the contractor without any extra charge.

All measuring steel taps, scaffolding, ladders instruments and tools that may be required for taking measurements shall be supplied by the contractor.

**9. OVER TIME WORK**

If the contractor is required to work night or on holidays in order to maintain the time schedule he shall take prior approval from the Employer. He should also provide and maintain at his own cost sufficient lights as may be necessary to enable the work to proceed satisfactorily during the night.

- 9.2 The contractor shall give full facilities to all other contractors working on site. He shall also arrange his programme of work so as not hinder the progress of other trades. The decision of the Employers on any point of dispute between the various parties shall be final and binding.
- 9.3 It is specifically pointed out that the contractor shall not be entitled to any compensation whatsoever on account of delay in procurement or supply of controlled materials and the rates quoted in the contract are fixed till the completion of the contract.
- 9.4 The contractor shall co-operate with other agencies appointed by the Employer for the work to proceed smoothly with the least possible delay and to the satisfaction.
- 9.5 The owners shall provide a source for power supply at one convenient point at site. The contractor shall at his own cost install a separate meter at the said source and lay additional cables from the said source also at his own cost. For the electricity consumed by the contractor he shall pay the owner the actual cost at the rate charged by the local authority for power for constructional purposes. The contractor shall also obtain the necessary permit for utilizing power for constructional purposes.

## **10. TERMS OF PAYMENT**

- 10.1 The rate of payment for the contract value under this contract shall be regulated and detailed below:
- a. 70% of the contract value on pro-rata basis against open delivery of material at site and stored as directed by the HLL and after initial inspection.
  - b. 20% of the contract value on satisfactory installation of the complete system.
  - c. 10% of the contract value will be paid after testing, commissioning trial run & handing over to HLL.

## **11.1 EXECUTION WORK**

- 11.1.1 The whole of the work as described in the contract (including bills of materials, specification and all drawings pertaining thereto) and as advised by the Owners/Employers from time to time is to be carried out and completed in all parts to the entire satisfaction of the Owners/Employers. Any minor details of construction which are obviously and fairly intended, or which may not have been definitely referred to in this contract, but which are usual construction practice and essential to the work, shall be included in this contract.

## **11.2 MAINTENANCE & TRAINING FOR PERSONNEL**

- 11.2.1 The contractor shall without any extra cost carry out for a period of 12 months after the installation is taken over by the owners, all routine and special maintenance and attend to any difficulties and defects that may arise in the operation of the system.
- 11.2.2 The contractor shall associate with the Employers' staff during erection and the maintenance period, in the maintenance/operation of the system..
- 11.2.3 If required, by the Employers, the contractor shall also train members of the Employers' staff at their works/service station without any extra charge.

## **11.3 CERTIFICATE OF COMPLETION**

- 11.3.1 The contractor shall intimate to HLL in writing as and when the works are completed and put into beneficial use in order to enable HLL to check certify to the Employer to take over the plants.
- 11.3.2 The work shall not be considered as completed and put into beneficial use until HLL have certified in writing that the same has been completed and put into beneficial use.
- 11.3.3 The defects liability period of one year shall commence from date of such completion or any specific date mentioned therein.

## **11.4 OPERATIONAL AND MAINTENANCE MANUALS**

- 11.4.1 The contractor shall also furnish the prints of all up-dated handing over along with required set of operating/maintenance manuals/instructions.

## **11.5 STATUTORY APPROVALS**

All statutory approvals pertaining to the installations including electrical inspector approvals shall be in the scope of the contractor.

## MODULAR OPERATION THEATRE

<b>I</b>	<b>RESPONSIBILITY OF BIDDER</b>
a	Bidder shall be responsible for complete design, construction, testing and commissioning of modular operation theatres based on seamless integration with modular concept
b	Bidder is responsible for the demolition, civil modifications, electrical works, plumbing works, air conditioning work and other works necessary for the proper functioning of the OT. The work is specified detailed in the tender.
c	Bidder shall be responsible for free maintenance of modular operation theatres during warranty period.
d	Bidder shall be responsible for commissioning of Medical Gas lines, Pendants and Gas outlets for the OTs.
e	The proposed OT drawing is attached. However Bidders are strongly advised to visit the site before submission of the final offer.

## SCOPE OF WORK

### **Turn Key Job to be provided by the Bidder**

1. Civil Works, Demolition, Electrical works, Plumbing works & Air Conditioning
2. Commissioning and installation of Stainless Steel wall paneling and PVC flooring.
3. Installation of laminar flow.
4. False ceiling
5. All cable trenches and railings wherever required.
6. Bidder has to provide hatch box, storage shelves, SS scrubs and other service areas as mentioned in the bid.
7. Installation of Pendants.
8. Any other necessary work required for satisfactory working of the modular OT and not mentioned.
9. Bidder should provide provision for mounting OT light in all MOTs.

<b>1</b>	<b>WALL PANELING SYSTEM-SS</b>
1.1	The prefabricated Operating Room should be free standing structure from composite free standing insulated steel wall panels.
1.2	The wall will be constructed using 1.5mm thick 304 Grade Stainless Steel (duly certified) panels with suitable backing board OR it should be 0.8mm 304 Grade Stainless Steel sandwich panel with core consisting of rigid polyurethane foam, which has been injected under high pressure, with a minimum density of 40 kg/m <sup>3</sup> .
1.3	The individual wall panels shall use the tongue and groove technology for joining two panels, no welding should be allowed.
1.4	The gaps between panels shall be suitably filled with metal filler/epoxy and sanded flush.
1.5	Stainless Steel plate finished to fine grain surface, treated properly to take antifungal paint.
1.6	Paneling should be easy to maintain, durable, antistatic/conductive and fire retardant.
1.7	Clearance between inner panel and outer wall should be sufficient to allow the maintenance personnel for service. This closed space should be flushed continuously to eliminate dust and bacterial accumulation.
1.8	Anti bacterial paint should be coated on the wall.
1.9	Bidder should maintain anti-bacterial paint during warranty and CMC period.
1.10	Wall elements should be resistant to all standard cleaning agents, disinfectants and fumigation agents.
1.11	Panel should be covered with protective sheath to prevent scratch during installation.
1.12	It should have minimum number of junction. The junction should be seamless and should be sealed with suitable sealants.

1.13	Wall paneling should have proper fire protection.
1.14	Bidder should provide factory test certificate for all the material used for wall paneling.
1.15	The wall panels should be CE/BIS certified
1.16	Preferred Make : TATA/Jindal/SAIL
<b>2</b>	<b>CEILING SYSTEM</b>
2.1	The ceiling plates /cassettes should be made up of Stainless Steel sheets, 0.8 mm thick with matt finish and should be coated with antibacterial paint. The ceiling suspension should be as follows.
2.2	Support elements: Suspension bracket with tension spring. Material: High quality galvanized or powder coated steel.
2.3	Room lighting, air supply inlet, ceiling service units, return air outlets, etc should be integrated with SS metal ceiling system.
2.4	The individual panels except those at the edges should be removable individually.
2.5	The ceiling material should be CE certified according to EN standards.
<b>3</b>	<b>PVC FLOORING</b>
3.1	It should be with 2mm antistatic seamless PVC flooring
3.2	Floor should be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.
3.3	Electrostatic charge dissipation combat PVC seamless flooring of very high quality should be provided.
3.4	Thickness not less than 2 mm. Continuous roll should be used and joints should be welded by special PVC thermal welding units using PVC welding bars of same colour
3.5	The sheets should be highly durable with resistance to shock and indentation. It should be scratchproof also. The conductive material should

	be uniformly impregnated as grains.
3.6	It should be inert to body fluids, chemicals and disinfectants. Should not be affected by temperature variation within the OT.
3.7	The floor should efficiently discharge electric charges up to 2 kV
3.8	Flooring should be done by skilled workers of accredited agencies authorized by the supplier of PVC sheets. The electrical resistance (point to ground) should be within $2.5 \times 10^4$ to $5 \times 10^6$ ohms. The floor should not allow build up of electrical charge beyond 100 volts due to antistatic effect. The corners should not be terminated sharply and concealed cove-former (aluminium) should be used to overlap the wall panel to a height of approx.25mm and sealed perfectly and uniformly. Self leveling compounds should be used.
3.9	The conductive copper grid laid underneath the PVC sheet should be supported by liquid epoxy compounds allowed to set as a uniform and level surface. The copper strips to be made visible by grinding and no copper strip should project more than 0.5mm above level surface to avoid damage to the PVC sheet. One earthing lead should be brought out from every 150sq.ft area and attaching it to the main earthing strip/ground.
3.10	Copper grounding strips (0.05 mm thick, 50 mm width) should be laid flat on the floor in the conductive adhesive and connected to copper strip of grounding. The connection from copper grid should be brought out uniformly at places to form equipotential grid.
3.11	Flooring should be mechanically shock proof, scratch proof, flame retardant and anti microbial
3.12	Corners should be uniformly curved
3.13	Final surface should be non corrosive to biological fluids and detergents.
3.14	Colour should be uniform pleasant and matching with ambience
3.15	Preferred Make: Gerfloor / Tarkett
4	<b>HERMETICALLY SEALED DOORS</b>
4.1	This should be a hermetically sealed, single sliding door of 2.1 (H)X 1.8 m(W)
4.2	The controller should be capable of being operated by elbow switches/foot

	switches as well as touch less sensor.
4.3	The track should be of stainless steel and the running surface for the top rollers should be suitably angled to reduce resistance to movement.
4.4	The door leaf should be hung by means of hard plastic rollers of high quality with double bearing at the top. Rollers should be provided under the stainless steel/ track to enable smooth and noiseless movement.
4.5	Opening and closing of the door should be microprocessor controlled electromechanical movement.
4.6	The door material should be high quality Stainless steel. Color should match the interior and care should be taken to make the leaf strong and light weight.
4.7	One should be able to open and close the door effortlessly incase of failure of automatic mechanism.
4.8	Door opening handle should be strong and sturdy. Material should be of SS (gloss finish). Should be provided with high quality cylindrical lock.
4.9	Door leaf should have high quality synthetic rubber gasket with long life to ensure hermetic sealing (to maintain air pressure differential). Air tightness 99.99% at a pressure of 100KPa.
4.10	The finished floor on either side of the door should be perfectly level (maximum permissible difference $\pm 1$ mm).
4.11	The overall thickness of the finished door should not exceed 60mm. The inner part of the door should be filled with CFC free polyurethane foam/solid treated wood of thickness of 48mm or nearby. (Sealed airtight to prevent further ingress of any microbial organism).
4.12	The door and controls should comply with IEE regulation and BS 7971 standardization. All motors used should be DC brushless motors with essential isolation from mains.
4.13	Door should be with vision window 300 mm x 300 mm with double glazed panels and hermetically sealed motorized roller blind inside.
4.14	Noise level should not exceed 60 db.

4.15	The starting time after receiving the signal should be adjustable between 0.5 to 20 seconds.
4.16	Door should provide X ray protection as per AERB regulation (Lead equivalent at 100kV is 0.27mm).
4.17	The complete door assembly should be CE marked.
4.18	Test certificate for hermetically sealed door frame (factory test certificate) should be enclosed with the pre dispatch documents.
<b>5</b>	<b>TOUCH SCREEN CONTROL PANEL</b>
5.1	The control panel should be touch screen panel. This control panel should work as the central control panel for the HVAC controls, instruction board, communication interfaces- both audio and video etc.
5.2	The panel should accommodate all necessary controls for the correct operation and monitoring of the equipment and services within the operating room (OR).
5.3	The touch screen should be wall mounted, stationed in the visibility line of the surgeon and OT staff. The access height should be convenient for the nurse to operate and help/assistant when in need.
5.4	The panel should accommodate digital clock and the elapsed time indicator.
5.5	The medical gas alarm should indicate high and low gas pressures for each gas service present in the OT including vacuum. This should be supported by audible alarm also. The panel should have an alarm mute (fault annunciation) facility. The sensors (pressure switches) should be at the nearest isolation valve.
5.6	Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.
5.7	Control of the operating light (major and satellite and camera control (on/off and intensity control) should be provided.
5.8	Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel)
5.9	Digital room pressure indicator in cm of H <sub>2</sub> O or equivalent (signal from

	pressure sensor)
<b>6</b>	<b>PRESSURE RELIEF DAMPERS</b>
6.1	Pressure relief dampers should be provided in each room to prevent contamination of air from clean and dirty areas.
6.2	Suitably sized air pressure relief damper should be strategically placed, enabling differential room pressure to be maintained and ensure that when doors are opened between clean and dirty areas.
6.3	Counter- weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room.
6.4	Air pressure stabilizers should have unique capability of controlling differential pressure to close tolerance. The PRD should remain closed at pressure below the set pressure and should open fully at a pressure only fractionally above the threshold pressure.
6.5	The body should be epoxy powder coated as per standard BS colors. High grade electrolyzed steel plate should be used for body and high grade SS304 stainless steel for blades
<b>7</b>	<b>HATCH BOX</b>
7.1	A hatch should be provided in each operation theater to remove waste materials from the operation theater to dirty linen area/corridor just adjacent to Operation Theater.
7.2	Each hatch box should be equipped with two doors and the door should be operated electrically/motorised.
7.3	The hatch should be designed in such a way that only one door should be opened at one time.
7.4	The UV light should 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.
7.5	Indicators should be provided on both sides of the OT so that door open / close status can be monitored from both sides.
<b>8</b>	<b>DISTRIBUTION BOARD</b>

8.1	All high voltage equipment should be installed in a separate enclosure.
8.2	The remote cabinet should house the operating lamp transformers, mains failure relays, UPS, electrical distribution equipment & circuit protection equipment for all circuits within the operating theatre.
8.3	All internal wiring should terminate in connectors with screw & clamp spring.
8.4	Connections of the clip- on type mounted, on a CE approved rail & labeled with indelible proprietary labels.
8.5	Individual fuses or miniature circuit breakers should protect all internal circuits.
8.6	Complete schematic drawing with description should be enclosed with the equipment.
<b>9</b>	<b>OPERATING LIST BOARD</b>
9.1	One operating list board should be provided in each operating theater.
9.2	It should be made of ceramic having magnetic properties and should be flushed to the wall of the operating room.
<b>10</b>	<b>X RAY FILM VIEWER</b>
10.1	LED type flat panel X-ray viewing panel should be supplied.
10.2	This should comply with relevant electrical safety codes.
10.3	This should be a 3 panel viewing screen.
10.4	Mounting should be flush with the wall to avoid dust accumulation and growth or organisms between wall and panel.
10.5	Body should be of extruded aluminum powder coated black with bacteria resistant and disinfectant resistant finish.
10.6	The diffuser on the front panel should be a uniformly lit screen.
10.7	Dimming electronic control should be enclosed at the bottom of the cabinet.
10.8	Proper spring loaded film clip with rollers should be provided to hold the films firmly and to remove the film without scratches.

10.9	Each panel should be able to illuminate films up to 14" x17" size. (Total 3 panels)
<b>11</b>	<b>STORAGE UNIT</b>
11.1	The storage unit should be made with 1.50 mm thick stainless steel panels.
11.2	It should be continuously ventilated by positive air in the room through ventilation holes provided at the bottom and top of opposite sides.
11.3	The shelves should be of welded SS mesh of size 3 mm and grid size 30 mm X 30 mm removable for cleaning.
11.4	The storage unit should be divided 2 or more parts and each part should have individual glass doors with high quality locking system
11.5	The overall size should be approx 180 cm X 60 cm X 45 cm
<b>12</b>	<b>DOUBLE ARM MOVEABLE PENDANTS .</b>
a	The Pendants should comply with NFPA 99C/HTM 02-01. The support arms should be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position
	The Pendant should have the following specification:
b	1000 mm + 800mm moveable arms each with 340 deg. horizontal and vertical movements..
c	Weight carrying capacity of the arm should not be less than 120 Kgs. should have electromagnetic brakes.
d	Each arm should be capable of 300-340 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.
e	The Pendant Service Heads should be modular with 1000 mm head. The heads should be capable of accepting a range of shelves, and infusion poles or other accessories. The Pendant Heads should support the range of Monitor Mounting Solutions.
g	The Pendant Service Heads should be supplied with medical gas terminal units and 15 Amps. Sockets.
h	Each pendant should have:

	<p>Oxygen Outlets – 2 nos,</p> <p>Vacuum Outlets – 2 nos,</p> <p>Nitrous oxide – 2 nos,</p> <p>Air(4 bar) Outlets - 2 nos</p> <p>Electrical sockets with individual switches- 8 nos</p> <p>Shelf with two rails one on each side – 1 no.</p> <p>Monitor stand – 01 no.</p> <p>Data socket RJ-45 -1 no</p>
<b>13</b>	<b>MEDICAL GAS LINE INSTALLATION</b>
13.1	The bidder should ensure that all works carried out are to the recommendation made in the Department of Health and Social Securities Health Technical Memorandum number 02-01 /NFPA 99C
13.2	Bidder should provide Oxygen, Air, Vacuum, and Nitrous Oxide supply to Operation Theatres from the existing lines terminated outside the OT .
13.3	Bidder shall be responsible for supply, installation, testing and commissioning of complete MGPS system inside the operation theatre including Distribution piping, Pendants, outlets and other essential accessories.
13.4	Terminal units should be gas specific and only accept the correct Medical gas probe. Gas specific components shall be pin indexed to ensure that a correct gas specific assembly is accepted.
13.5	Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C.

13.6	<p>Copper pipes should be of solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe conforming to BS: 6017, 1981 and manufactured as per BS: 2871, 1971 Part 1. All copper pipes should be degreased &amp; delivered capped at both ends. The pipes should be accompanied with manufacturers test certificate for the physical properties &amp; chemical composition.</p> <p>Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's, TUV, SGS).</p> <p>Fittings should be made of copper and suitable for a working Pressure of up to 17bar and especially made for brazed socket type connections.</p>
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	<b>SPECIFICATION OF DOUBLE DOME LED OT LIGHT WITH CAMERA &amp; MONITOR</b>
1.1	Should be double dome surgical light unit incorporating the latest LED technology only for homogenous and shadow less operating light field with following specifications.
1.2	Should have single colour LEDs with lifetime of $\geq 48000$ hrs.
1.3	The main light and satellite should have the following specifications.
	Lux intensity of 120000 for both domes
	Light field diameter 22 cm on each light head
	Fixed color temperature 4500 K
	Colour rendering index min of 95
	Depth of illumination should be minimum of 185 cm on each light head
	Illumination adjustment 30% to 100 %.
1.4	Should have technology to produce light beams for perfect visualization on surface as well as in deep cavities.
1.5	Should have constant voltage delivery system to the LED bulb to achieve unique and control illumination throughout the procedure.
1.6	Should have adjustable focus system.
1.7	Should have infra red remote control to illumination (increase/decrease), selection of light, Camera Zoom (increase/decrease) & rotation of video image when camera is in place.
1.8	The LED must be of single colour only for long term maintenance and ease of replacement.
1.9	Should conform to ISO, IEC and other international quality/safety standards with specific conformance on IEC 60601-2-41 in terms of depth of illumination and shadow dilution such that depth of illumination (L1 +L2) to be at least 185cm or better.
1.10	Should have average radiant energy of the lights should be less than $3.9\text{mW}/\text{m}^2$

1.11	The main light should have camera pre wiring as standard.
1.12	OT light should be US FDA/ European CE certified. The copy of certificate should be enclosed with the technical bid
	<b>OPTIONAL CAMERA</b>
	The light must be upgradeable to a latest centrally mounted camera system on the main of the light head having following specification.
	CCD Sensor : 1/4 CCD
	Signal : PAL
	Lens Zoom : 10x Motorized Zoom
	Location of the camera: -Main light head
	<b>OPTIONAL FLAT PANEL MONITOR</b>
	Should be 23" High Definition Progressive Scan Flat-panel Monitors with ceiling mounted spring arm suspension to support high-definition/HDTV progressive Scan images and should be able to support and display DVI/HDTV, RGBHV, S-Video, Composite video signals.
	The flat Panel suspension should be ready with the cables for integration of High Definition Digital (DVI/HDTV), RGBHV (High Resolution), SVHS (S-Video), Composite video signals to travel from the various sources of video like endoscopic camera, room camera, in light camera, high definition flat panel monitors, while assuring native resolution / signal.

<b>14</b>	<b>LAMINAR AIR FLOW SYSTEM</b>
14.1	The ceiling filtration system should be designed to ensure unidirectional distribution of sterile air of the surgical theatre to ensure the cleanliness of all the area covered by the air flow.

14.2	The Laminar flow system should comprise of thick extruded aluminum profiles frame and sealed gasket. The filters installed in the plenum should be suitable for application for laminar flow and clean rooms. These filters should meet following specification.
	Separators : continuous thermo plastic chord
	Sealant : Polyurethane
	Gasket : One piece polyurethane
	MPPS average efficiency: > 99.95%
	3 Micron DOP efficiency > 99.99%
	Final Pressure drop : 600 pa(max)
	Maximum Operating Temp : 60 degree Celsius
Maximum RH : 40-50 %	
14.3	The ceiling system should be equipped with "H 14" class HEPA filters position in the ceiling to achieve 0.25m/sec flow at the diffuser.
14.4	Filtration Ceiling System holding structure, Filter frames and top plenum should be made of Aluminium/Stainless Steel.
14.5	The filtration ceiling system should have diffuser/flow equalizer to achieve uniform & constant air distribution over the whole surface. It should be CE/UL certified
14.6	The air management system should be designed to achieve class 100 with the following parameters:
	Bacteriological class =B (5 CFU/m <sup>3</sup> )
	Particle decontamination kinetics CP =5 min
	ISO 14644/1 classification = ISO 5

14.7	The positive pressure should be maintained inside the OT to prevent contamination due to air from outside the OT.
14.8	The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufactures.
14.9	Size of laminar airflow system should preferably not be less than 10 feet X 10 feet. Minimum 8 feet X 8 feet.
14.10	Should be CE certified.
14.11	Provision for mounting OT light should be provided in all modular OTs.
	Note: Prospective bidders are advised to collect the information regarding CFM and AHU capacity from the respective institute site. Total flow rate of filter bank shall match the CFM of AHU.
<b>15</b>	<b>EXHAUST AIR CABINETS</b>
15.1	Return air exhaust grill should be provided in the OT.
15.2	The exhaust air cabinets should be openable and cleanable.
15.3	These cabinets should have suction from bottom and top also.
15.4	Designed flow rate should not be less than 1000 m <sup>3</sup> /hr. Distribution of exhaust air volume should be divided between fluff strainers to maintain the required pressure within the theatre without causing turbulence.
15.5	The Exhaust air cabinet should be manufactured and supplied by the supplier of wall and ceiling system supplies.
15.6	Return air exhaust cabinet should be made from SS304 and should be from the same manufacturer of wall panel. Also it should match perfectly with the ceiling system aesthetically

<b>16</b>	<b>PERIPHERAL LIGHTING AND CLEAN ROOM LUMINARIES</b>
16.1	To provide peripheral lighting and clean room luminaries with intensity min 500 Lux, it should be 8 in numbers for each OT. Should be with highly specular anodized aluminum reflectors and optical antiglare system.
16.2	Luminaries cover should be made of highly resistant, disinfectant proof laminated safety glass with stylish fine grained surface, glass pane with white coated steel frame.
16.3	The reflectors should be of high quality, cleanable and non-deteriorating.
16.4	The white luminaries body should be made of sheet steel/ perfectly powder coated, supplied ready for connection optionally for individual or series circuit with digital electronic control gear in multi lamp technology.
16.5	Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable from top or bottom. The light fitting should be uniformly and aesthetically distributed on the ceiling to provide uniform illumination in the OT. Light should not interfere when green mode endoscopy is performed
16.6	Peripheral lighting should be done according to IP65(international protection rating 65)
16.7	Control equipment for the general lighting and the light dimming should be provided in the theatre control panel

**ABSTRACT**

<b>SL. NO</b>	<b>ITEM</b>	<b>AMOUNT (Rs.)</b>
<b>1</b>	<b>SUPPLY INSTALLATION TESTING AND COMMISSIONING 2 NO:S MODULAR OPERATION THEATRE AT TERITIARY CANCER CENTRE, KOZHIKKODE</b>	
	<b>GRAND TOTAL</b>	

**Signature of the Bidder with date**

S.N	NAME OF THE ITEMS	UNIT	QTY	Rate (In words and figures)	Amount (In words and figures)
1	Prefabricated SS 304 room walls	Sq M	150		
2	PVC Flooring for Modular OT	Sq M	85		
3	Self Levelling Compound	Ls	2		
4	Anti microbial Painting	Sq M	150		
5	False ceiling as per tender specification	Sq M	85		
6	Touch screen control panel as per tender Specification	Nos	2		
7	LED X ray Viewing Screen as per tender Specification	Nos	2		

8	Storage Shelves as per tender Specification	Nos	4		
9	Hatch Boxes as per tender Specification	Nos	2		
10	Pressure Relief Dampers	Nos	2		
11	Hermetically sealed automated door as per tender Specification	Nos	2		
12	Operating List Board as per tender Specification	Nos	2		
13	Medical Gas copper pipeline inside the OT and the Provision to connect to Pendant Systems	Ls	1		
	15mm OD X 0.7mm thick	Mtrs	60		
	22mm OD X 0.9mm thick	Mtrs	30		

14	Outlets with probe				
a	Oxygen	Nos	4		
b	Vacuum	Nos	4		
c	Medical Air 4 Bar	Nos	4		
d	Nitrous Oxide	Nos	4		
15	Supply installation testing and commissioning of Medical gas hose assemblies. Hoses shall be color coded throughout their length as specified in British standards .	Mtrs	40		
16	Double arm movable pendant	Nos	2		
17	OT Light LED with camera &	Nos	2		

	Monitor				
	<b>TOTAL</b>				

**The quoted rate should be inclusive of all applicable taxes including the work contract tax but excluding service tax which shall be reimbursed at actuals. .**