16-05-2019

Amendment No. 09

Sub: Amendment to the referred tender enquiry

Ref.: Tender Enquiry HITES/PCD/PMSSY-III/37/MOT/18-19 dated 14-02-2019
Amendment No. 01 dated 19-03-2019
Amendment No. 02 dated 27-03-2019
Amendment No. 03 dated 08-04-2019
Amendment No. 04 dated 22-04-2019
Amendment No. 05 dated 25-04-2019
Amendment No. 06 dated 30-04-2019
Amendment No. 07 dated 06-05-2019
Amendment No. 08 dated 15-05-2019

The Technical Specifications of this tender enquiry is as per the Technical Compliance Format uploaded in the e-portal on 06-05-2019. The Technical Specifications published vide Amendment No. 07 dated 06-05-2019 on our websites and CPPP shall be ignored. This therefore is to be read as below and there is no changes in the Technical Compliance Format uploaded in the e-portal on 06-05-2019.

Section – VII
Technical Specification

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	RESPONSIBILITY OF BIDDER
	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 shall execute all required modification in civil, electrical and peripheral lighting, plumbing, air-conditioning system (Ducting inside the OT), demolition and other works as may be required for complete installation and trouble-free functioning of the operation theatres as a part of the 'Site Modification'.
	c. Necessary coordination with fire-safety vendor for the installation of fire-safety sensor/instrument inside the MOT to be done by the MOT bidder.
	d. The bidder shall be responsible for the complete works including the submission of Working Drawings, layout drawings and walk through view on the basis of provided Auto CAD or PDF or Hard Copies of Drawings from respective institute.
	e. Bidder shall be responsible for installation and commissioning of other medical equipment (like Integration Equipment, Monitors, Etc) in coordination with hospital authorities.
	f. The bidder should provide UPS power supply to all OTs (If UPS is in the scope of MOT bidder) **and dedicated Chemical earthing for MOTs should be done as per CPWD standard is responsibility of bidder (Separate price should be quoted for earthing per MOT, if not mentioned it will be pre assumed that inclusive in the offer)**

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	g. Bidder shall be responsible for free maintenance of modular operation theatres during warranty period **inclusive of all consumables**.
	h. Bidder shall be responsible for successful installation, testing & commissioning of all MOTs as per **technology opted (SS Sandwich/ SS DIN/ SMS)** along with all equipment coming within the MOT as per technical specification of the tender.
	i. MOT Bidder should coordinate with MGPS and other bidders for the successful completion of MOT.
	j. Bidder shall be responsible for maintaining suitable air conditioning inside the operation theatre (Ducting inside the OT). Setting and monitoring of temperature and RH should be in the scope of the MOT vendor. (Necessary coordination with HVAC vendor to be done by the MOT bidder)
	k. Bidder should provide factory test certificates for the material user for the construction of modular theatres.
	l. Bidder should supply complete set of part manuals, service manuals for all the systems and subsystems to be supplied.
	m. Consignee/ User have to be trained for a week by the engineers from Original Equipment Manufacturer (OEM).
	n. Final electrical safety test, system test, and calibration should be done **as per international standard** by authorized persons using calibrated test equipment **and declaration should be submitted by the vendor**.
	o. OEM or his authorized agent should post a trained engineer who should be available at site or should reach the site within 24 hrs of raising a service call.
	p. Regarding Outlets of the Anesthesia & surgeon Pendants, bidders have to supply same type of outlets as installed in the same building/block. Before shipment of the Pendants, bidders should take necessary action for selecting the same standard outlets and outlets should be European CE approved or UL listed
	q. Bidder must have a satisfactory installation of complete MOT as asked in tender and demo may be taken for the same.
	SCOPE OF WORK
	The "**Site Modification**" work includes all modifications to the built up space provided at the hospital site including Installation of Medical Equipment, Communication Systems, civil modifications, electrical works, plumbing works, interior decoration, air conditioning ducting and other related works of the Operation Theatre required for the smooth and efficient functioning of the centre. These works shall comply with all relevant safety and standards guidelines. The vendor is fully responsible for installation and commissioning of all equipment mentioned in the tender. Bidders are strongly advised to visit the site for assessment before the submission of tender offer.
	Turn Key Job to be provided by the Bidder for following –
	1. Wall Paneling System
	2. Ceiling Paneling System
	3. Laminar Air Flow System
	4. Internal HVAC Ducting & Exhaust System
	5. PVC Flooring
	6. Hermetically Sealed Doors
	7. Touch Screen Control Panel
	8. Pressure Relief Dampers

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	9. Hatch Box
	10. Operating List Board
	11. X-ray Film Viewer
	12. Scrub Station
	13. Storage Unit
	14. OT Pendants (Anesthetist & Surgeon)
	15. Peripheral lighting & Clean room luminaries
	16. Electrical Installation
	17. Distribution Box
	18. Isolation Panel System (IPS)
	19. Online UPS
	20. Medical Gas Lines Installations
	21. Site Modifications
	22. OT Light with camera, Monitor & Recorder
	1. WALL PANELING SYSTEM
	1.1 The prefabricated Operating Room should be of SS Sandwich / DIN SS / SMS as per its latest standards.
	1.2 SS Sandwich : It should be 0.8mm 304 Grade Stainless Steel sandwich (both side 0.8mm sheet) panel with core consisting of rigid polyurethane foam, which has been injected under high pressure, with a minimum density of 40 kg/m3. Cladding structure insulated Stainless steel wall panels with Total Panel thickness 50-60mm. **OR** **DIN Steel : 0.8 mm stainless steel 304 (material no.1.4301 in compliance with DIN EN 10088-3) combined with glued 18 mm plasterboard sheet along with suitable substructure frame** **OR** **SMS Panel: Solid Mineral Composite Sheet (SMS) thickness of 03mm with thickness of panel including Aluminum backing structural panel (minimum 15mm thickness Al) consisting of a trapezoidal/Honeycomb aluminium corrugated core glued between two flat of aluminium sheet and total panel thickness not less than 18mm (3mm SMS +15mm Alumiium back) with suitable substructure frame. SMS panel should be bacteriostatic, dense & non-porous material and unflamable (Reaction to fire class 1 norm)**
	1.3 The individual wall panels shall use the tongue and groove technology**/Suitable 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 **or medical grade silicone/ Monolithic sealing in case of SMS**
	1.5 Stainless Steel plate finished to fine grain surface, treated properly to take antifungal paint (Not Applicable in case of SMS Option)
	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 (Not Applicable in case of SMS Option)
	1.9 Bidder should maintain anti-bacterial paint during warranty and CMC period.(Not Applicable in case of SMS Option)
	1.10 Wall elements should be resistant to all standard cleaning agents, disinfectants and

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	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 The wall panels should be CE/UL Listed/BIS/DIN 1.4301 certified (Not Applicable in case of SMS Option)
	1.14 Third party test certificate for **SS / SMS** from material testing lab (Govt. Authorized) - to be provided at the time of pre dispatch inspection/supply.
	2. CEILING PANELING SYSTEM
	2.1 The prefabricated ceiling plates /cassettes should be made up of SS 304 panels with sheet thickness of at least **0.8 mm sandwich (both side 0.8mm sheet)** panel of PUF with minimum density 40kg/m3 with matte finish and should be coated with antibacterial paint. It should be from the same manufacturer of wall panel. Total thickness should be 30-40mm. **OR** **DIN Steel : 0.8 mm stainless steel 304 (material no.1.4301 in compliance with DIN EN 10088-3) combined with glued 18 mm plasterboard sheet along with suitable supports/substructure frame** **OR** **SMS Panel: Solid Mineral Composite Sheet (SMS) thickness of 03mm with thickness of panel including Aluminum backing structural panel (minimum 15mm thickness Al) consisting of a trapezoidal/Honeycomb aluminium corrugated core glued between two flat of aluminium sheet and total panel thickness not less than 18mm (3mm SMS +15mm Alumiium back) with suitable supports/substructure frame . SMS panel should be bacteriostatic, dense & non-porous material and unflamable (Reaction to fire class 1 norm)**
	2.2 Support elements: Suspension bracket with tension spring**/ threaded rod**
	2.3 Material: High quality galvanized or powder coated steel.
	2.4 Room lighting, air supply inlet, ceiling service units, return air outlets, etc should be integrated with SS metal ceiling system.
	2.5 The individual panels except those at the edges should be removable individually.
	2.6 The ceiling material should be CE/ UL/BIS /DIN 1.4301 certified (Not Applicable in case of SMS Option)
	2.7 Anti bacterial paint should be coated on the ceiling.(Not Applicable in case of SMS Option)
	2.8 Third party test certificate for **SS/SMS** from material testing lab. (Govt. authorized) - to be provided at the time of pre dispatch inspection/supply.
	3. LAMINAR AIR FLOW SYSTEM
	3.1 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.
	3.2 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)

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	Maximum Operating Temp : 60 degree Celsius
	Maximum RH : 40-50 %
	3.3 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.
	3.4 Filtration Ceiling System holding structure, Filter frames and top plenum should be made of Aluminium/Stainless Steel.
	3.5 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
	3.6 The air management system should be designed to achieve class 100 with the following parameters:
	Bacteriological class =B (5 CFU/m3)
	Particle decontamination kinetics CP =5 min
	ISO 14644/1 classification = ISO 5
	Third party validation by Govt. approved environment lab**(After Installation)**
	3.7 The positive pressure should be maintained inside the OT to prevent contamination due to air from outside the OT.
	3.8 The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufactures.
	3.9 Size of laminar airflow system minimum 8 feet X 8 feet or more.
	3.10 Should be CE certified.
	3.11 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.
	4. Internal HVAC Ducting & Exhaust System
	4.1 All the ducting inside the MOT shall be scope of the MOT bidder.
	4.2 All the ducting should be as per industry standard and sheet should be Aluminum of appropriate thickness and insulated as per industry standard.
	4.3 All necessary HVAC interconnection for supply and return air shall be the scope of bidder (the institute will provide the duct upto outside of each MOT)
	4.4 Return air exhaust grill should be provided in the OT.
	4.5 The exhaust air cabinets should be **openable grill** and cleanable.
	4.6 These cabinets should have suction from bottom and top also.
	4.7 Designed flow rate should not be less than 1000 m3/hr. Distribution of exhaust air volume should be divided between fluff strainers to maintain the required pressure within the theatre without causing turbulence.
	4.8 The Exhaust air cabinet should be manufactured and supplied by the supplier of wall and ceiling system supplies.
	4.9 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
	5. PVC FLOORING WITH SELF LEVELING
	5.1 It should be with 2mm antistatic seamless PVC flooring
	5.2 Floor should be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.
	5.3 Electrostatic charge dissipation combat PVC seamless flooring of very high quality should

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	be provided.
	5.4 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
	5.5 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.
	5.6 It should be inert to body fluids, chemicals and disinfectants. Should not be affected by temperature variation within the OT.
	5.7 The floor should efficiently discharge electric charges up to 2 kV
	5.8 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 2.5x10^4 to 5x10^6 ohms. The floor should not allow buildup 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.
	5.9 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.
	5.10 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.
	5.11 Flooring should be mechanically shock proof, scratch proof, flame retardant and anti-microbial
	5.12 Corners should be uniformly curved
	5.13 Final surface should be non-corrosive to biological fluids and detergents.
	5.14 Colour should be uniform pleasant and matching with ambience and **as approved by respective consignee.**
	5.15 Suitable self-leveling should be done before PVC flooring to avoid undulation within the MOT.
	6. HERMETICALLY SEALED DOORS –
	6.1 Door sizes should be as per below option and quantities will be as per BOQ of respective institute
	a. HERMETICALLY SEALED DOORS Size 2.1mx1.8m
	b. HERMETICALLY SEALED DOORS Size 2.1mx1.0m
	c. HERMETICALLY SEALED DOORS Size 2.1mx1.8m with Lead Line(As per AERB Norms)
	d. HERMETICALLY SEALED DOORS Size 2.1mx1.0 m with Lead Line(As per AERB Norms)
	e. Window with Motorized Blinds for MOT - 1Nos (Optional) size approx. 1.5m x 1m
	6.2 This should be a hermetically sealed, single sliding door of 2.1 (H)X 1.8 m(W)
	6.3 The controller should be capable of being operated by elbow switches/foot switches as well as touch less sensor.
	6.4 The track should be of stainless steel/Aluminum and the running surface for the top rollers should be suitably angled to reduce resistance to movement
	6.5 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/Aluminium track to enable

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	smooth and noiseless movement.
	6.6 Opening and closing of the door should be microprocessor controlled electromechanical movement.
	6.7 The door material should be of **HPL/SMS** Color should match the interior and care should be taken to make the leaf strong and light weight.
	6.8 One should be able to open and close the door effortlessly in case of failure of automatic mechanism.
	6.9 Door opening handle should be strong and sturdy. Material should be of SS **(gloss/matte finish**). Should be provided with high quality **cylindrical/ ESPg lock.**
	6.10 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 **minimum 75Pa**
	6.11 The finished floor on either side of the door should be perfectly level (maximum permissible difference +1mm).
	6.12 The overall thickness of the finished door should be **30-60mm**. The inner part of the door should be filled with CFC free polyurethane foam thickness of 48mm or nearby. (Sealed airtight to prevent further ingress of any microbial organism).
	6.13 The door and controls should comply with IEE regulation. All motors used should be DC brushless**/PMDC** motors with essential isolation from mains.
	6.14 Door should be with vision window 300 mm x 300 mm with double glazed panels and hermetically sealed.
	6.15 Door movement should have minimum noise.
	6.16 The starting time after receiving the signal should be adjustable between 0.5 to 20 seconds.
	6.17 The door controller should be CE marked.
	6.18 Test certificate for hermetically sealed door frame (factory test certificate) should be enclosed with the pre dispatch documents.
	7. TOUCH SCREEN CONTROL PANEL 20" or more
	7.1 The control panel should be touch screen panel. This control panel should work as the central control panel for the HVAC controls, instruction board. Touch screen, OT light control. The controller should be capable of adjusting the temp adjustment of +/- 5 Degwith in 5Minutes. It should be CE or UL Listed.
	7.2 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.
	7.3 The panel should accommodate digital clock and the elapsed time indicator.
	7.4 The medical gas alarm should indicate high and low gas pressures for each gas service (Except for vacuum, for vacuum it should be normal or low) 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
	7.5 Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.
	7.6 On/off Control of the operating light (major and satellite) should be provided.
	7.7 Hand free telephone set with memory should be located at one side.
	7.8 Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel) The controller should be capable of adjusting the temp adjustment of +/- 5 Deg with in

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	5Minutes wherever separate AHU is provided for each OT.
	7.9 Digital room pressure indicator in cm of H2O or equivalent (signal from pressure sensor shall be provided to indicate pressure differential between OT and outside)
	7.10 HEPA filter bank differential pressure indicator.
	7.11 The control Panel should be able to integrated with HIS/BMS
	7.12 The Control Panel should able to display the Isolation Panel Alarm Conditions along with MGPS Alarms
	8. PRESSURE RELIEF DAMPERS
	8.1 Pressure relief dampers or over flow ports should be provided in each room to prevent contamination of air from clean and dirty areas.
	8.2 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.
	8.3 Counter- weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room.
	8.4 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.
	8.5 The frame, body and blade should be of grade SS304 stainless steel.
	9. HATCH BOX
	9.1 It 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.
	9.2 Each hatch box should be equipped with two doors and the door should be operated electrically/motorised.
	9.3 The hatch should be designed in such a way that only one door should be opened at one time.
	9.4 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.
	9.5 Indicators should be provided on both sides of the OT so that door open / close status can be monitored from both sides.
	9.6 Hatch Box material should be SS304 grade.
	9.7 Size of the Hatch box minimum: 600mm x 600mm.
	10. **OPERATING LIST BOARD**
	10.1 One operating list board should be provided in each operating theater.
	10.2 It should be made of ceramic having magnetic properties and should be flushed to the wall of the operating room.
	11. **X RAY FILM VIEWER**
	11.1 LED type flat panel X-ray viewing panel should be supplied.
	11.2 This should comply with relevant electrical safely codes.
	11.3 Deleted.
	11.4 Mounting should be flush with the wall to avoid dust accumulation and growth or organisms between wall and panel.
	11.5 Body should be of extruded aluminum powder coated with bacteria resistant and disinfectant resistant finish.

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	11.6 The diffuser on the front panel should be a uniformly lit screen.
	11.7 Dimming electronic control should be enclosed at the bottom of the cabinet.
	11.8 Proper spring loaded film clip with rollers should be provided to hold the films firmly and to remove the film without scratches.
	11.9 **This should be 2 Numbers of dual panel viewing screen (14" x 17" each), it may be on one wall panel or adjacent.**
	12. **SCRUB STATION (min size 1500 mm)**
	12.1 Compact surgical scrub sink should be designed for use in OT complex providing for pre procedural scrub up.(Double sink combination as suitable)
	12.2 Each fixture should be fabricated from heavy gauge type 304 stainless steel (minimum thickness 1.5mm) and should be seamless welded construction, polished to a satin finish
	12.3 The scrub sink should be provided with a front access panel which should be easily removed for access to the water controlled valve, waste connections, stoppers and strainers.
	12.4 Hands free operation should include infra-red sensors with programmable adjustment.
	12.5 Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature.
	12.6 Timing should be adjustable to meet individual application requirements.
	12.7 Provided with infrared sensors, thermostatic control taps with fail safe temperature controls.
	12.8 All units should have reduced anti- splash fronts.
	12.9 Knee/foot operated switch should be provided additionally.
	13. **STORAGE UNIT**
	13.1 The storage unit should be made **with at least 0.8 mm** thick stainless steel panels
	13.2 The shelves should be of SS 304 & removable for cleaning.
	13.3 The storage unit should be divided 2 or more parts and each part should have individual glass doors with high quality locking system
	13.4 The overall size should be approx. 200 cm X 120 cm X **35 cm**
	14. **PENDANTS FOR ANESTHETIST AND SURGEON**
	14.1 **Double arm moveable Pendant for Anesthetist**
	a. The Pendants should comply with NFPA 99C/HTM 02-01/DIN. 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
	b. Double moveable arms (any combination) with total coverage of min 1800 mm and 330 deg. Horizontal movements for each arm. Vertical movement should be motorized and the arm height should remain to a height greater than 6.5 feet above floor level
	c. Weight carrying capacity of the arm should not be less than 180 Kg. should have electromagnetic/ pneumatic 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 should be European CE Certified with 4digit notified body number or US FDA approved.
	f. The Pendant Service Heads should be modular with minimum 800mm head. The heads should be capable of accepting a range of shelves, infusion poles, electrical switch/sockets, gas outlets other accessories as asked in tender. The Pendant Heads should support the range of Physiological Monitor Mounting Solutions.

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	g. The Pendant Service Heads should be supplied with medical gas terminal units and 5/15 or 6/16 Amps hybrid sockets with switches.
	h. Double arm pendant anesthesiologist and surgeon : Each pendant should be supplied with outlets and probes as mentioned below –
	Oxygen Outlets – 2 nos.
	Vacuum Outlets – 2 nos.
	Nitrous oxide – 1 nos.
	Air (4 bar) Outlets - 2 nos.
	AGSS outlet - 1 no
	Electrical sockets - 10 nos.
	Adjustable Shelf with two rails one on each side – 3 no.
	IV Fluid Pole with 4 hooks – 1No.
	Data socket RJ-45 -2 nos.
	i. Pendant supplier should provide cutouts for Patch Panels in Integrated OTs. (only for integrated OT)
	Added para: Anaesthetist pendant should have NIST connection for all gases to connect the MGPS system.
	14.2 **Double arm moveable Pendant for Surgeon**
	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
	b) Double moveable arms (any combination) with total coverage of min 1800 mm and 330 deg. Horizontal movements for each arm. Vertical movement should be motorized and the arm height should remain to a height greater than 6.5 feet above floor level
	c) Weight carrying capacity of the arm should not be less than 180 Kgs. should have **electromagnetic/pneumatic 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 should be European CE Certified **with 4digit notified body number** or US FDA under Medical Devices Directive.
	f. The Pendant Service Heads should be modular with minimum **800mm** head. The heads should be capable of **accepting a range of shelves, infusion poles, electrical switch/sokets, gas outlets other accessories as asked in tender.** The Pendant Heads should support the range of Physiological Monitor Mounting Solutions.
	g) The Pendant Service Heads should be supplied with medical gas terminal units and 5/15 or 6/16 Amps hybrid sockets with switches.
	h) Each pendant should have – Each pendant should be supplied with outlets and probes as mentioned below –
	Vacuum Outlets – 2nos,
	Air(7bar) Outlet- 01nos,
	CO2 Outlet - 01 nos.,
	Electrical sockets - 10 nos.
	Adjustable Shelf with two rails one on each side – 3 no.
	Data socket RJ-45 -2 no.

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	IV Fluid Pole with 2 hooks – 1No. (Pole should be capable of stacking 4 nos of syringe pumps)
	Added para : **Nitrous oxide – 1 nos.**
	i) Pendant supplier should provide cutouts for Patch Panels in Integrated OTs (only for integrated OTs).
	Added para: Surgeon pendant should have NIST connection for all gases to connect the MGPS system.
	15. **PERIPHERAL LIGHTING AND CLEAN ROOM LUMINARIES (LED TYPE)**
	15.1 To provide peripheral lighting and clean room luminaries with intensity min 500 Lux, it should be minimum 8 in numbers for each OT. Should be with highly specular anodized aluminum and optical antiglare system. **Size of Peripheral Light should be 2' x 2' size**
	15.2 Luminaries cover should be made of highly resistant, disinfectant proof laminated safety glass/acrylic with stylish fine grained surface.
	15.3 Deleted
	15.4 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 multilamp technology.
	15.5 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
	15.6 Peripheral lighting should be done according to IP65 (international protection rating 65) / IP 54 regulations.
	15.7 Control equipment for the general lighting and the light dimming should be provided in the theatre control panel
	16. **ELECTRICAL INSTALLATIONS**
	16.1 Power distribution within the OT 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. Isolated power supply, insulation measuring and protection as per IEC standards should be provided. This unit should be EN/CE/UL/FDA/IEC certified.
	16.2 Earthed equipment bonding of all exposed metalwork should be provided.
	16.3 Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.
	16.4 Each wall of MOT should have minimum 02 Nos. 6/16A hybrid switch socket & 32A industrial socket at any two walls as per IEC standard.
	16.5 Light fittings within the clinical areas should be recessed LED type with control gear
	16.6 Fittings should be sealed In accordance with the standard IP54.
	16.7 All equipment should be fully and permanently labeled 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.
	17. **DISTRIBUTION BOARD**
	17.1 All high voltage equipment should be installed in a separate enclosure.
	17.2 The remote cabinet should house the operating lamp transformers, mains failure relays,

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	UPS, electrical distribution equipment & circuit protection equipment for all circuits within the operating theatre.
	17.3 All internal wiring should terminate in connectors with screw & clamp spring.
	17.4 Connections of the clip- on type mounted, on a CE approved rail & labeled with indelible proprietary labels.
	17.5 Individual fuses or miniature circuit breakers should protect all internal circuits.
	17.6 Complete schematic drawing with description should be enclosed with the equipment.
	17.7 DB Should have minimum two 32A/16A(As per requirement) extra circuits with MCCB/MCB for future uses like integration equipment, etc.
	18. **Isolation Panel System–**
	18.1 Isolation Panel System of minimum 10KVA capacity should be provided for every operation theatre which ensures the safety of staff and patient. System should have isolators provided through leakage relays etc. (If required) according to IEC recommendation. This unit should be EN/CE/UL/BIS/FDA/IEC certified. These systems are to be commissioned by specialists.
	18.2 Should be medical grade Insolation panel
	18.3 Should have fault detection feature
	18.4 Should be compliant to CEI 64-8/ IEC 60364-7-710/ BS7671 Standard
	18.5 Should be mountable on wall & compact
	18.6 The IPS should be able to integrate with HIS/BMS and Surgeon Control Panel as standard
	Added para: **Isolation panel system should have facility to detect fault of leakage current for each circuit(minimum 12 circuits) and same should be integrated with touch screen control panel of MOT and alarm status should be displayed on the touch screen control panel**
	19. **Online UPS –**
	19.1 Backup should be minimum 30min.
	19.2 The room for the central UPS will be provided by the respective institute/hospital preferably at same OT floor and one point electric supply will be provided to the UPS Room by the respective institute/hospital.
	19.3 Bidder should provide required electrical wiring from UPS to all modular MOT as per IEC/International standard.
	19.4 Electrical control panel complete with MCCB, Switchgears etc should be provided.
	19.5 Bidder shall offer UPS from make – APC/ TATA Liebert/ Delta /Hitachi/ Consul Neowatt / UNILINE/3EM
	19.6 Per MOT UPS load should be provided minimum 10 KVA with one 10 KVA backup for all OTs and redundancy (n+1) should switch automatically. The battery bank may be common for UPS.
	19.7 Bidder should provide suitable AC for UPS rooms of MOT
	20. **MEDICAL GAS LINE INSTALLATION**
	20.1 The bidder should ensure that all works carried out are to the recommendation made in the Department of Health and Social Securities HTM 02-01 /NFPA 99C / DIN
	20.2 Bidder should provide Oxygen, Air, Vacuum, AGSS, and Nitrous Oxide supply to Operation Theatres from the existing lines terminated outside the OT .
	20.3 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.
	20.4 Terminal units should be gas specific and only accept the correct Medical gas probe. Gas

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	specific components shall be pin indexed to ensure that a correct gas specific assembly is accepted.
	20.5 Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C. Outlets should be CE certified/UL listed.
	20.6 Copper pipes should be of solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe. All copper pipes should be degreased & delivered capped at both ends. The pipes should be accompanied with manufacturers test certificate for the physical properties & chemical composition. The copper pipe should comply with EN 13348
	20.7 Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's, TUV, SGS).
	20.8 Fittings should be made of copper and suitable for a working Pressure of up to 17bar and especially made for brazed socket type connections
	20.9 The copper fitting should comply with EN 1254-1
	20.10 The Brazing filler material should cOmply with EN 1044
	21. **Site Modification -**
	21.1 Any **minor** demolition , reconstruction, water proofing, necessary plumbing, anti-microbial painting, replacement of any door or windows to provide structured design **within the OT area** for modular OT should be carried out by the bidder **for successful installation and commissioning of MOT.**
	22. **OT LIGHT WITH CAMERA**
	22.1 **OT Light – LED**
	Operating Room Surgical Lighting System should provide an ideal combination of brightness, maneuverability, and shadow resolution without sacrificing color accuracy through a consistent LED technology.
	Such Lighting System should have the following technical specifications:
	a. Number of Light heads : Two per suspension
	b. Color Temperature range: 3800k-5000 (±10 %)- Variable color temperature.
	c. Field Size Diameter : 20 to 28cm (+/- 10%)
	d. **Working Range** : 750 to 1100mm (+/- 10%)
	e. Illumination Level : 160000Lux (Major Dome & Minor dome)
	f. Controls : Control Panel (wall and on dome)
	g. Rotation : 360-330degrees
	h. Sterilizable Handle : 02Nos.
	i. Mounting Type : Ceiling
	j. Supply Voltage : 230 VAC 50 Hz
	k. Bulb Type : LED
	l.Dimming Range : **50% - 100% or 30% to 80%**
	m. Operating/Storage Humidity : 10 – 95%
	n. Life of Light Source : >40,000 Hrs
	o. Should be provision to mount the camera in one dome.
	p. Surgical Light System Should be European CE with 4digit notified body/US FDA certified **or Declaration of Conformity for quoted model with ISO 13485 issued by European CE notified body.**
	22.2 **HD Camera System – 1080p/i.**
	Description: Integrated In-Light Camera System should be integrated at the centre of one of the domes of this lighting system/ third arm in order to capture images & video sequences of the open cases.

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	Such a autofocus – Locable camera should have the following specifications –
	a. Signal to Noise Ratio (S/N Ratio) : >50 dB
	b. CCD**/CMOS** : 1/3" **or 1/2.8"**
	c. Optical Zoom : 10X
	d. Digital Zoom : 12-15X
	e. Video Output : HD, DVI, S-Video & Composite Video
	f. White Balance & Gain : Automatic/Manual
	g. Light and Integrated Camera should have a control through Touch Panel of the control equipment placed inside the operating room.
	22.3 **HD LED FLAT PANEL MONITOR (Only for non-integrated OT's)**
	a. Should be 30-32" 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. Aspect ratio 16:9/16:10. Resolution – 1920X**1080 or better**.
	b. 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.
	c. Monitor should capable of displaying from other sources like endoscope, microscope, etc. necessary provision should be provided as standard.
	22.4 **Recording system to be offered separately (Only for non-integrated OT's)**
	a. Recording system to be offered separately. Recording system should be full HD medical grade monitor LCD **minimum** 19" touch screen and having the one TB storage space.
	b. Data cable for communication from both pendants and monitors should be laid down up-to outside of OT in a patch port for future expansion for all OT's where there is no integration
	c. Patch Panel for power & signal to be laid down for 32" LCD Monitor at wall of MOT
	d. Recorder should be capable of recording video from other sources like - microscopes, endoscopes. Etc., suitable provision should be provided as standard.
	e. Should be flushed mounted on the OT wall with suitable frame.
	23. **Extra Works (Price Should be Quoted Separately)**
	a. Construction of 9" brick wall (500 Sq.ft) with Plaster on both sides with paint matching the surrounding premises. Payment shall be made at actuals.
	b. Demolition of brick wall 200 Cu.ft. Payment shall be made at actuals.
	c. IPS flooring for MOT unit rate (Per Sq.mtr.) with min.75mm thickness (Optional-Price to be quoted seperately).
	d. Should quote unit rate (Per mtr.) for suitable wiring (including tray / pipes / casing as per requirment) from UPS to Control Panel
	e. Should quote unit rate (per mtr.) from control panel to MOT. For ranking purpose 50 mtr. wiring will be considered for UPS to Control and 100 mtr. for wiring from control panel to MOT.
	Responsibility of the Consignee
	1. The institute will provide MOT shell structure (complete with brick works, plastering, and levelled floor)
	2. Insitute will provide UPS room preferably on same OT floor or If it is elsewhere the necessary power cables from UPS room to each OT (load capacity of approx 10-15kVA) to be provided by the institute.

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	3. Institute will provide hot and cold water supply with drain and 5/15 A switch sockets at each scrub location.
	4. Institute will provide temporary storage for storing of raw materials of MOT system during installation period and the security of the store is the responsibility of MOT vendor
	5. Institute will provide working electrical power supply for installation to MOT vendor
	6. Institute will provide LAN cable, telephone line, copper strip earthing for each OTs
	7. Institute will provide dedicated AHU & air conditioning with HVAC supply and return Aluminium air duct and suitable pre-filter up to outside of each Ots.
	8. Institute will be responsible for complete finishing of areas outside the MOT like corridors, scrub area, preparation room, store room etc. except inside MOT area and floor level of corridor connecting to the OT should be 4-5mm higher than MOT floor level

All other contents of the tender enquiry including terms & conditions remain unaltered.

Note:

i. **Prospective Bidders are also advised to check the website regularly prior to the closing date and time of online submission of bids**