REQUEST FOR BUGETARY ESTIMATE

Ref.: HSCC/SES/HOSPITAL/FIJI/2024 Dated: 06.06.2024

HSCC (India) Ltd. intends to invite on-line budgetary quotation from eligible bidders for Preparation of BOQ, detailed Estimate & Specification for Proposed 100 Bedded SSB Hospital at Fiji for the following Special Services works;

1. Modular Operation Theatres (MOT)
2. Integrated Operation Theatre (IOT)
3. Minor OT
4. Medical Gas Manifold System (MGMS)
5. Laundry
6. Kitchen
7. Bio Medical Waste Management (BMWM)
8. CSSD
9. Pneumatic Tube System (PTS)
10. Mortuary

BOQs of proposed works are annexed at Annexure-I to Annexure-X.

It is requested to submit the budgetary quotation of Supply, Installation, Testing and Commissioning of various SES services mentioned above on turnkey basis along with equipment including 1 year DLP, as per the BOQ and Technical Specification in both Hard & Soft Copy within 04 days of issue of this Notice at following address:

General Manager (Procurement)
Special Engineering Services Department
HSCC (India) Ltd.,
E-6(A), Sector-1,
Noida (U.P.) - 201301.

Soft copy may please be sent to: ses@hsccltd.co.in

General Manager (Proc),
HSCC (India) Ltd.

SPECIFICATION OF MECHANIZED LAUNDRY

Scope of Work : **Supply, Installation, Testing, Commissioning and Turnkey works of Mechanized Laundry equipment and handover to the hospital including services of Defect liability period as per contract.**

1. SLUICING CUM WASHER EXTRACTOR

For removal of blood stains, faecal matter, vomit and other residue
Capacity -30 kg ,
Front loading, Heavy duty, High Spin, Suspended, Variable frequency drive & Auto reverse & forward, Open pocket & Front display.

a.	Control	-	Fully programmable Microprocessor/Computer controlled
b.	Dispenser	-	3/4 compartment detergent dispensers
c.	Outer Drum	-	Made of Stainless steel AISI-304 with 2mm thickness
d.	Inner Drum	-	Made of Stainless steel AISI-304 with 2 mm thickness of basket, CNC Perforated
e.	Outer Cabinet	-	Made of Stainless Steel sheet AISI-304 and channels, Welded structure, Finished with polishing.
f.	Door	-	Made of die pressed Stainless steel AISI 304 quality, 2 mm thickness, Toughened glass window , SS door latch/handle and interlock for safety
g.	Door Opening	-	500 mm Ø (Minimum)
h.	Level Sensor	-	Highly sensitive auto water level sensor with PLC
i.	Seal	-	High quality seal to be used to prevent contact of water with the Bearings
j.	Bearing Housing	-	Roller bearings of reputed brand duly packed with grease & Lubricants
k.	Wash RPM	-	35 (Minimum)
l.	Final Extract	-	800 RPM(Minimum)
m.	G-Force	-	340 (Maximum)
n.	Motor	-	Large capacity motor with variable frequency drive for wash, distribution, low, normal and high spin.
P.	Electric Load	-	18/24 Kw

q. All wet materials and components must be of AISI-304 Stainless steel
r. All Stainless steel components should be TIG welded and highly polished.
s. In-built Control Panel and Motor

2. BARRIER WASHER EXTRACTOR 25-30 Kg

Doublr Door Heavy duty, Clean Room Technology, The machine shall be of ",High Spin " type. Features shall include Double door for Dirty & Clean Area for the linen .the machine would have 2 doors one for loading and another door for Unloading

a. There should be single compartment drum for offering the best ergonomics and mechanical action

b. Automatic Drum Positioning for fast and effortless Loading and unloading operations

c. Automatic Outer door locking and unlocking with pneumatic system for maximum safety and efficiency.

d. **Control** - The machine shall be controlled with an electronic micro-processor with the following minimum features

- The control shall display remaining wash time, error codes and program status indication
- The display shall by of LCD-type, and shall be possible to display text and symbols
- Wash Programs: The machine shall have a capacity to store program "libraries" with up to 55 different wash programs. It shall be possible to automatically start a wash program at a certain time, max 99 hours delay.
- Validation software for the minimization of the cost and maximization of the uptime of the equipment and would ensure the following (running hours, idle time, consumption figures*, machine usage, total consumption, cost calculation etc.) - process validation (print of receipt) - maintenance intervals (actions are logged) - error alerts (recommend actions).

e. Detergent supply: The machines shall be available for use with powder or liquid supplies, manual fed or automatic liquid supply via external pumps. No conversion between powder or liquid shall be needed. The manual dispenser shall have four compartments accessible from the front and the liquid connections from the rear.

f. Out of balance detection: The out of balance shall be determined electronically and based on the out of balance, the machine shall be able to determine the maximum allowable speed for extraction up to 350G.

g. **Safety features: program to ensure** that any wash program performs to its end before it allows unloading on the clean side for better control and Hygiene .

h. Drive system: The machine shall have a motor powered by a variable frequency drive. There shall be no gearboxes, clutches or gear reducers.

i. **Water and drain:** The machine shall be provided with two water inlets (Cold/Hot). The machine shall be provided with a water operated drain valve without any electrical parts for opening/closing.

j. **Electrical requirements:** The machine shall be available in the following voltage configurations: 400-415V 3 phase(ELECTRIC HEATED).

k. . **Serviceability:** Major electrical components (timer, rotary switch, water-valves and door lock, as a minimum) shall be fitted with multi-position quick-connect "card-edge" type connectors for quick and easy servicing

l. **Dispenser** - 4 compartment detergent dispensers

m. **Basket Volume**- 250 Ltrs.(Minimum)

n. **Final Extract** - More than 900 RPM or more

o. **G-Force** - 350 G or more

p. **Maximum Electric Load** – 20 kw

q. **Electric supply** - 415V, 3Ø,AC, 50hz

r. **Electric Motor** rating should not be more than 5 H.P.

3. DRYING TUMBLER

Capacity – 30 kg Electrically Heated,
Heavy duty, Front Loading, Cool down Feature, Auto-timed, Auto-reversible, Auto digital temperature control, Dual Motor drive, Open Pocket & Front display

a. Control - Microprocessor/PLC/Computer controlled
b. Temperature Controller - Auto digital control
c. Time Controller - Auto digital control for drying and cooling
d. Inner Drum - Made of Stainless steel AISI-304 with 1.5 mm thickness of basket, CNC Perforated
e. Outer Cabinet - Made of Steel sheet of 1.5 thickness, Welded structure, Finished with Powder Coating
f. Door - Made of die pressed Stainless steel AISI 304 quality, 1.5 mm thickness, Toughened glass window , SS door latch/handle and interlock for safety
g. Door Opening - 500 mm Ø (Minimum)
h. Basket Volume- 295 Ltrs.(Minimum)
i. Suction Blower- Heavy duty Centrifugal Suction Blower and dynamically balanced
j. Insulation - Glass wool duly packed on all sides & front of the drier to minimize the heat loss & saves energy
k. Lint Screen - Self cleaning lint screen of Stainless Steel AISI-304. Facility of cleaning should be through front door
l. Electric Load - 24 Kw
m. All wet materials and components must be of AISI-304 Stainless steel
n. All Stainless steel components should be TIG welded and highly polished.
o. In-built Control Panel and Motor

4. FLAT BED PRESS

Suitable for linen like uniform, room furnishing , personal garments, Bed sheets & Pillow Covers
Head & Bed Size- 1500X750mm Electrically/Steam heated,
Auto-timed, Auto-temperature controlled, Double Switch operation, Built-in Suction Blower, Pneumatically controlled,

a) Head - Polished Stainless steel/High quality steel with Teflon coated/Nickel plated
b) Main Body- Made of Mild Steel sheets of 1.5 mm thickness, Welded structure and finished with powder coating

c) Rocker Arms- Should move on ball bearings. Front head weight should be counter balanced by Springs. A pneumatic cylinder should be attached to rocker arms for raising and lowering of the head.
d) Bed- Large perforated bed with heat resistant Silicon/Molleton padding
e) Blower - o.75Kw Heavy duty Suction Blower with powerful suction
f) Safety - Emergency Stop of the machine with emergency switch. Automatic stopping of the machine for Finger guard for operator safety
g) Control - Frontally placed. Automatic digital timed release of the head at preset time. Push Button for raising and lowering of the head pneumatically
h) Temperature- Digital temperature controller
i) Electric Load- 12/18 Kw
j) Electric supply- 415V, 3Ø, AC, 50hz.

5. AUXILIARY STEAM GENERATOR

The Steam Generator of steam capacity 8Kg/hr. must be fully automatic and electrically operated. The Steam Generator shall be equipped with pressure vessel of heavy gauge AISI-316 Stainless Steel fitted with SS heating elements and built-in electric control panel, Pressure Regulator, High Pressure Water Injection Pump of 1hp, Pressure Gauge, Solenoid steam release Safety Valve, Highly sensitive Float Regulator, Blow down Valve, Built-in water storage tank, Inlet and Outlet connections, Solenoid valve with Flow Control Device and Drain lines. Pressure vessel should withstand double of working pressure hydraulically.

6. VACUUM FINISHING TABLE WITH IRON

Adjustable height.
Table Top Size -1300mm X 800mm

a. Table top - Mild Steel sheet of 2.5 thickness padding with heat resistant material like Silicon etc. Perforated flat top padded with high porosity
b. Main Body - Made of Mild steel sheets/plates and finished with powder coating
c. Blower - Heavy duty Powerful suction through Centrifugal blower of 0.5hp Motor activated by spring loaded full length foot pedal working in combination with heavy duty micro switch
d. Heater - 1 Kw In-built Thermostatically controlled stainless steel heater
e. Electric Steam - Die cast sole plate, Teflon shoe and thermostatically controlled Heating element with moisture trap, Rubberized handle

7. AIR COMPRESSOR

a. The air compressor shall be multistage stage, fully automatic suitable for delivering dry compressed air at pressure compatible to Ironer.

b. Drive - Belt driven with pulleys, belts and belt guard.

c. Motor - 3 hp.

d. Electric supply- 415 V/ 3 Ph / 50 Hz/ AC/4P

8. WASH ROOM TROLLEY

Capacity -50Kg

The wash room trolley shall be designed for movement of wet linen within the laundry. The frame of the trolley shall be fabricated out of Stainless Steel tubes and flats in all welded construction ground smooth & finished , supported on 4 castor wheels min. 75 mm size of swiveling type. The main body of the trolley shall be formed out of thick stainless steel mesh in all welded construction.

9. DRY LINENCOLLECTION ROOM TROLLEY

Capacity -50kg

The dry linen trolley shall be designed in Stainless Steel construction with all welded joints ground & smooth finished out of Stainless Steel tubes and bars and foldable front. The base frame shall be supported on 4 Nos. castor wheels min. 75 mm size of swiveling typ

10. DRY LINEN TRANSPORTATION TROLLEY

Capacity -50kg

The dry linen trolley shall be designed in Stainless Steel construction with all welded joints ground & smooth finished out of Stainless Steel tubes and bars and foldable front. The base frame shall be supported on 4 Nos. castor wheels min. 75 mm size of swiveling typ

11. MOBILE FOLDING TABLE

Dimensions:4feetX2 Feet

The folding table shall be specially designed for carrying rolling and folding of linen in the laundry. The frame OF MOC-SS-304 of the table shall be of welded construction with one bottom shelf for storage. Complete with heavy duty ball bearing for swiveling wheels. The table top shall be of polished Stainless steel.

12. STORAGE RACK

Size - 1200mmx460mmx1800mm

4 shelves; Made of Stainless Steel-AISI-304, Finished with Polishing**.**

13. SHELF TROLLEY(Finished goods)

Capacity -100kg

The shelf trolley shall be designed for stacking and carrying finished linen from the laundry to the finished goods store. The base frame of the trolley shall be in Stainless Steel construction with all welded joints ground & smooth finished out of heavy duty Stainless Steel tubes and bars. The trolley shall be fitted with at least 3 Nos. Stainless Steel

shelves(2-shelves removable). The base frame shall be supported on 4 Nos. castor wheels min. 75 mm size of swiveling type.

14. LAUNDRY SCRUB STATION WITH TWO SINKS.

Stainless Steel Construction. S.S Sinks with taps for wash and rinse using hot and cold water. SS Scrubbing Board in between Sinks. Underneath Shelf. Size- 1600x500x900 ht. Details of technical data are as per technical specification.

15. MENDING MACHINE

The Mending machine or motorized sewing machine shall be heavy duty type with all metallic shuttle, and moving parts. The machine shall be complete with mounting table with adequate space for placement and movement of garments to be stitched/mended. The machine shall have a table mounted **electrical motor** operated for convenience of operation with both hands free.

16. INDUSTRIAL WEIGHING MACHINE -100 Kg capacity

The weighing machine shall be heavy duty platform type with dial type weight indication. The platform for placement of buckets/goods for weighing shall be with steel casting with adjusting lever mechanism and knob for adjustment of error in machine.

17. IN ADDITION TO THE ABOVE, FOLLOWING <u>TURNKEY WORKS</u> FOR INSTALLATION AND COMMISSIONING OF LAUNDRY ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR :

- Bidder must take into consideration in its bid, costs to be incurred for any additional work pertaining to any kind of dismantling, reconstruction works, patch works relating to Civil, Electrical, Plumbing, Sanitary and any other protections relevant as per State/Central Govt. regulation/local authority, Servo stabilisers, U.P.S. etc. required for successful installation testing and commissioning of the system at site and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order package on a “turn key basis”.

- Providing all tools, tackles, manpower for demolishing /dismantling, alteration/ addition for lime concrete, cement concrete, R.C.C, R.B work, precast concrete or stone slabs in walls, partition walls , stone rubble masonry, dressed stone work, ashlar face stone work, marble work or precast concrete work, dismantling doors, windows and clerestory window (steel or wood) shutter including chowkhats, architrave, holdfasts etc. CI or asbestos rain water pipes of any diameter with fittings and clamps, dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, taking out doors, windows and clerestory window shutters (steel or wood), wood work in frames, trusses, purlins and rafters, dismantling steel work in single sections including dismembering and stacking, dismantling steel work in built up sections in angles, tees, flats

and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc., old plaster or skirting raking out joints and cleaning the surface for plaster, dismantling of R.C.C. spun vent shaft including

- excavating the cement concrete pit completely, taking out the shaft, refiling the excavated gap, stacking the useful materials near the site extra for cutting reinforcement bars, Dismantling aluminium/ Gypsum partitions doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material within 1000 meters lead and any other work as directed by engineer-in-charge. Disposal of building rubbish/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge.

- Laying of **UPVC water pipe line** with necessary taps, joints, elbows, Unions, Tees and valves of **UPVC** made to various supply points in the Laundry Room from single point supply(Provided by the hospital).

- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Light Points, Power points, Fans, Cool air Fans, Exhaust fan etc in the laundry room.

- Number of fans, **power point**, bulbs/tube light. Apart from this supplies to the individual equipments with ELCB & MCB in the laundry room.

- Installation of MCB, ACB, ELCB & OCB for Control Panel for laundry.

- Installation of all **electrical cabling** must be with proper earthing of all laundry equipments and other electrical instrument and accessories in the laundry room.

- Arrangement for fire extinguisher-9Kg = 3 Nos for requisite **fire fighting** for laundry Room and its maintenance for the contract period

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the Laundry then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES MAJOR EQUIPMENT FOR LAUNDRY

ELECTROLUX/MILNOR/JENSEN/FAGOR/GIRBAU

The makes for other items of LAUNDRY shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

Note :

- The contractor should attach the list of equipments for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipments to periodically check the electrical safety aspects as per IEC electrical safety standard IEC-60601 is a part of the equipments. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipments checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive Maintenance call.
- Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS).
- The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month. All software updates should be provided free of cost during warranty period and CMC Period
- The contractor should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues
- The contractor shall be responsible for the complete works including submission of working drawing and walk through view.
- The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.
- Engineer may instruct for any test this test to be got done by contractor at their own cost.
- The contractor should provide all electrical accessories like cable wire, electrical outlets, switches etc, and they should be fire proof of reputed make, certified for electrical safety.
- Wherever makes have not been specified for certain items, the contractor should provide the same as per approval of HSCC.
- The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation and commissioning.
- The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for LAUNDRY.
- The final Payment will be made on the actual measurement of the BOQ Items and ranking will be done with tendered BOQ.
- The contractor should provide Third party quality certificate of the LAUNDRY equipment from SGS/TUV/Lloyds saying as "Certifies that the LAUNDRY equipment meets the technical specification and BOQ of the Contract".

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATIONS OF BIO-MEDICAL WASTE MANAGEMENT SYSTEM

Scope of Work : Supply of items for Bio-Medical Waste Management System

1. Bio-Medical Waste Autoclave

Horizontal Cylindrical High Pressure Steam Sterilizer BIS Mark IS: 3829 (Part 1)

Horizontal Cylindrical High Pressure Steam Sterilizer, manufactured as per BIS Specification No. IS 3829 (Part 1)-1978, with the latest amendments and bearing ISI Mark IS: 3829 (Part 1).

- **Capacity: Sterilization more than 500 Ltrs**
- Mode of Heating: Electrically heated by immersion heaters wired for operation on
- Capacity suitable to the bio-medical waste of the for autoclave
- Working pressure: 20 Lbs/Sq.Inch. 1.26 kgf/cm^2.
- Operating Pressure: 1.05 + 0.15 kgf/cm^2 approx. (20 psi).
- Operating Temperature: about 110 & 121 degrees centigrade.
- Exhaust: Fast Exhaust within 7 minutes & slow exhaust from 7 to 30 minutes.
- Hydrostatic Test: The shell is subject to hydrostatic test to twice the working pressure.
- Performance: The sterilizer shall be capable of performing the following operations constituting one full cycle of sterilization.
  - Generate steam and build up working pressure in the jacket, without admitting it to the chamber:
  - Admit steam to the chamber and allow it to build up to working pressure and temperature.(maintaining pressure in the jacket) and retaining working temperature for at least 2 hours;
  - Exhausting the chamber pressure, retaining the jacket pressure; and
  - Drying of load in chamber (if required) through the circulation of dry filtered air entering through a drying system.
- Dished Door: Fitted with one dished door SS-316 and brass Hinges, with SS radial arms to manipulate smoothly by well-insulated handles, and shall have gunmetal Door Locking assembly & automatic pressure locking device to provide complete safety to the operating personnel against any explosive opening of the door under high pressure. Provision is made to tighten the dished door while in locked position. A molded steam and heat resisting silicone joint less gasket shall be fitted to the door.

Material of Construction:

- Chamber & Back Plate: SS sheet of grade (04Cr18Ni10 Mo02) 316 non-magnetic-10 SWG.
- Jacket: SS sheet of grade (04Cr18Ni10) 304 non-magnetic.

- End Ring: SS 304 non-magnetic
- Connections & Piping: Made of Stainless Steel having bright finish.
- Dished Door: Stainless Steel.
- Outer cover: SS sheet 304 Quality.
- Operating Valve: To Control the cycle of sterilization as per ISI standards.
- Safety Valve: As a pressure switch for controlling pressure is provided on jacket, spring-loaded safety valve is provided to jacket as a safe guard against excess pressure in the jacket.
- Ejector: A powerful ejector system to create partial vacuum, which shall help in quick drying.
- Drying System (Vacuum): With Bacteria Filter allows dry filtered hot air into the chamber during drying cycles.
- Vacuum Breaker: Prevents formation of accidental vacuum in jacket due to steam condensation.
- Plug Screen: Fitted in Chamber, prevents the Chamber from clogging with lint and sediment.
- Dial Thermometer: Indicates the working temperature in the Chamber accurately.
- Pressure Gauge: Indicates the pressure of steam in the jacket.
- Compound Gauge: Indicates the vacuum and pressure in the chamber.
- A Pocket (For Thermograph): The provision to fit the bulb for the temperature recorder.
- Steam Trap and Check Valve: Fitted into the discharge line for automatic removal of residual air and condensate to give optimum sterilization temperature.
- Boiler (Steam Generator): Fitted to underside of shell. Boiler shall be fitted with:
- Immersion type heating elements suitable to the requirement..
- A low water protection for heaters provided to cut off electricity supply to heaters through a float level switch and magnetic air break contactor if the water level runs below heater level. Feed water System to feed water in to the Boiler as and when water level goes down.
- Water level gauge glass indicates level in boiler (capable of self-locking in case of breakage).
- Water inlet with non-return valve and drain valve etc.
- Pressure controls switch to control and keep pressure constant in the jacket.
- Boilerplate of Stainless Steel AISI-316 & Nuts and bolts shall be of stainless steel.
- An extra pressure gauge and safety valve is provided in the boiler.
- In addition, equipped with Toggle Switch and indicating red & green Lamps.
- Tray (Stainless Steel): Provided in the Chamber of suitable size.
- The whole unit shall be mounted on a tubular pipe stand duly painted with best heat resisting paint.
- The unit shall be made as per I.S.I. Specification No. IS:3829 (Part 1) and bear I.S.I. Mark IS 3829 (Part 1).
- Secondary Sterilization system should be incorporated with the Waste Autoclave for sterilization of infected steam condensate of the Waste Autoclave.

Accessories:

- Audio Visual Alarm with Timer.
- Thermograph with 500 recording charts.
- Rack with Trays complete SS-316.
- Digital Temperature Controller with probe.
- Digital temperature indicator with 2 temperature probes.
- Water Softener Plant.
- Additional manual arrangement for filling Boiler with solution to descale boiler.

2. Waste Collection Containers

The waste collection containers shall be of steel construction with synthetic enamel paint of approved colours. Moulded non-chlorinated Plastic container -20 Ltrs capacity & 100 Ltrs capacity.

It should be set to keep vertically upright on its base.

The waste collection containers must have foot operated lids.

The approximate sizes of the collection containers shall be as per the BOQ

The waste collection containers should have Bio-medical hazard symbol printed on them

Colour, symbol and types of container shall be as per Biomedical waste Management Rules 2016, Biomedical waste Management (Amendment) Rules, 2016.

3. **Waste Collection Bags** (Red, Yellow & Blue)

The waste collection bags shall be of yellow, red and blue/white translucent colour for collection of different categories of wastes and black for collection of routine waste as per the recommendations of the Ministry of Environment and Forests in their latest gazette notification.

The yellow coloured waste collection bags of 20 Ltrs capacity for the collection of waste should be made of **non-chlorinated plastic**.

The bags of red, blue/white translucent colour should be safe for autoclaving and should be capable to withstand high temperatures and pressure during autoclaving.

All the bags must contain the Bio-hazard symbol printed on it.

The sizes of the bags should be such that the can be placed inside the waste collection containers for the collection of waste.

The bags should be supplied with non-reversible locking strips at no extra cost.

Colour, symbol and types of Bags shall be as per Biomedical waste Management Rules 2016, Biomedical waste Management (Amendment) Rules, 2016.

4. Transportation Trolley

- The container should be made of sturdy non-chlorinated plastic material resistant to acid, alkali and chemicals and should be constructed of 200 ltrs capacity.
- Should be designed and constructed so that they do not have sharp edges.
- Container must be detachable and there must be provision for washing the container
- Should be easy to clean, disinfect and drain.
- Should be covered with a sturdy plastic lid attached with hinges and latch facilities so that biomedical waste bags are not exposed to environment.
- Iron body frame of trolley MS angle.
- Should be able to contain any leakage from the damaged containers.
- The waste should be easily loaded, secured and unloaded.
- Should hold minimum number of bags as per the requirement.
- Should be color coded yellow/blue/white/black and have biohazard sign and name of the hospital.
- Should have four wheel drives, two wheel movable and two fixed. Should be rubber bounded to cast iron long life, high load capacity and road grip size 6 inch with sealed ball bearing.
- Should have wheel locks to prevent the wheel barrow from rolling on its own.
- Colour, symbol and types of Trolley shall be as per Biomedical waste Management Rules 2016, Biomedical waste Management (Amendment) Rules, 2016.

5. Industrial Weighing Machine Capacity -500 Kg.

Electronic weighing machine with digital display. Electronic weighing scales of standard make to weigh upto 500 kg. The certificate from Weights & Measures Dept. is to be attached with the machine, duly certifying the serial no. complete with accessories as per specification. The type of Weighing Machine shall be as per Biomedical waste Management Rules 2016, Biomedical waste Management (Amendment) Rules, 2016.

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION OF CSSD EQUIPMENTS

Scope of Work : Supply, Installation, Testing and Commissioning of CSSD equipment on Turnkey basis and handover to the client in satisfactory condition and providing of Operation and free spares and labour for maintenance during defect liability period.

CSSD EQUIPMENT

1. HORIZONTAL DOUBLE DOOR AUTOCLAVE 350-400 Litres (6 STU OR MORE) WITH ACCESSORIES

Fully automatic PLC controlled Horizontal Autoclave (Steam Sterilizer), with pre and post-vacuum treatment and with loading equipment. (a) Door: The sterilizer door should be pneumatically (Compressed Air) operated double door with fully automatic vertical sliding movement along with door safety features. Door Safety Systems: 1. Pressure sensor system should be available in the chamber to monitor the chamber pressure. Chamber should be completely depressurized before the door seal is retracted by vacuum. 2. Door chamber should not be opened when chamber is pressurized. 3. A mechanical safety edge should stop the door if it is obstructed while closing, thus protecting operator & loading equipment. 4. A Cycle should not start if the door is open or not properly locked. 5. The door seal should be silicon gasket & on commencement of the process the door gasket should be pressed against the rear face of the door by steam to ensure the door remains closed during the process. 6. A Pressure Switch should be there to monitor the door gasket pressure whether it pressed against the door with right pressure during the entire process. 7. Double door safety should be implemented through interlocks which shall prevent both doors from being opened simultaneously. 8. Door Gasket should be resistant to sterilization temperature and sterilization pressure. It should be sealed through a inflation of the door gasket against the door and should not require any lubrication or maintenance. (b) Construction: 1. Chamber & Doors : The chamber and doors should be made of solid, high quality AISI 316L Stainless Steel. The chamber should be resistant to corrosion. The operating thermo mechanical stress should be welded with a robotic system. The chamber should be constructed with a quadrangular section made of stainless steel with minimum 6 mm thickness. It should be able to withstand the relative pressure (-1 to 3.5 bar) and operating temperature upto 180 deg C. The chamber should be jacketed to ensure the temperature uniformity in chamber. The chamber floor should be slightly sloped towards an internal drain to facilitate drainage. A stainless steel mesh strainer should be provided to protect the drain port from blockage by debris. The chamber should be mounted on a stainless steel bearing structure at least 2mm thick tubular stainless steel so that to allow load to be distributed in four corners with height adjustable feet. 2. Surface Treatment: The internal surface should be electro-chemically treated for high quality smooth finish to facilitate cleaning. The resultant surface should be polished to less than 0.2 µm fineness to protect against corrosion (certificate from OEM should be provided along with the bid). The internal corners should be rounded off to facilitate efficient cleaning. 3. Insulation: The chamber should be covered with extra thick insulating material that limits heat dissipation. The insulation should ensure the surface temperature of the sterilizer to be less than 45 Deg C. The insulation should be minimum 50 mm thick . It should have low thermal conductivity and should not release any particles. 4. Jacket: The jacket should be made of quality stainless steel with pressure gauge and it should be minimum 5 mm thickness. 5. Steam Generator: The sterilizer should have inbuilt steam generator of adequate capacity. In built steam generator should be made of quality stainless steel. The steam generator should have insulation. Steam generator should be fitted with all safety & control devices as Certified Safety valve for: 1) Excess pressure, 2) Resettable Safety Thermostat for over heat protection, 3) Pressure switch to control & regulate the steam pressure in the steam generator, 4) Automatic electronic water level regulator, 5) Automatic Water feed system, 6) Low level and high level water cut off, 7) Automatic periodical self drain for the steam generator, 8) water level glass gauge inspection device visible from service area, 9) The heating element should be made of Inconel /incolloy material and should be of sufficient capacity to make the sterilization process faster and it also should be differential protected, 10) It should also have the automatic blow down valve and degassing system for feeding water to steam generator. (c) Pipes, Valves and Components: 1. All the process valves should be stainless steel & should be pneumatically operated piston valves. All the non-standard components should be non-proprietary & should be easily sourced. All the hot pipes should be properly insulated. The safety valves should be made of SS 316 quality. 2. Primary piping & fittings should be stainless steel threaded or stainless steel triclamp fittings. 3. Primary components: SS 316 quality triclamps or threaded fitting components like – Manual valve, non-return valve, pressure, regulator, pneumatic valves and steam trap, etc. 4. Electrical Components: the terminals & contacts should be housed in a water tight cabinet. There should be no external Electrical cabinet for control and should be housed only inside the Sterilizer. (d) Air Filter: A disposable air filter should be provided by filtering the atmospheric air before

entering inside the chamber. The filter separation efficiency should be higher than 99.998% for particle size less than 0.3µm. (e) Control System: 1. The control system should be dual PLC based system specially designed for sterilization application (one to control the main parameters (PLC) and the other to verify the functionality). Control system should have touch sensitive, minimum 8" colour display interface at operator loading side. Apart from main PLC based control system the sterilizer should also have additional independent monitoring & documentation system which constantly cross checks the safety systems & time. 2. Multiple password access levels should be provided to control access/operation of the machine preventing unauthorized access. These access levels should be user selectable. The control system should have CPU processor with battery back-up & non-volatile memories. Digital input/output controls, analog measuring inputs & COM ports for printer & PC connectivity. (f)Temperature and Pressure Sensors: 1. The sterilizer should have at least 2 temperature sensors for chamber drain & one for Jacket. It should also have two pressure sensor in chamber and one pressure sensors for Jacket as per EN 285 standards. 2. The sensors should be PT100 sensors to confirm Class A of the IEC 571 standards, with accuracy of ± 0.1°C While the pressure sensor should have the accuracy 1% over the range of 0-5 bar. 3. Each sensor circuit should be calibrated with individual constants to correct the deviation in manufacturing and aging. (g) Alarms: Automatic process checking & failure correction should be possible by the control system. The system should perform a self-diagnosis and check the autoclave for the following alarms and it should be audio/visual:

1. minimum/maximum sterilization temperature alarm,
2. no supply voltage/Power failure alarm,
3. no generator water alarm,
4. overload relay alarm,
5. no mains water alarm,
6. maximum generator water load time alarm,
7. temperature probe & Pressure Transducer fault alarm,
8. minimum/maximum chamber pressure alarm,
9. door opening residual chamber pressure alarm,
10. chamber vacuum tightness alarm,
11. maximum phase time alarm,
12. air in chamber alarm (calculated),
13. Maximum time steaming,
14. Maximum time vacuum,
15. Maximum time for heating,
16. maximum drying phase alarm.
17. Doors not properly closed alarm,
18. Door open during cycle alarm,

(h) Loading/Unloading system: Sterilizer should have the Internal trolley and External trolley for easy loading of the materials. **(i)** Cycle Documentation – Printer: The autoclave should be equipped with built in non-fadeable Ink type real time Printer and also with a provision for alpha-numeric Laser printer which prints each cycle parameter performed by the sterilizer. The measured valves of temperature and pressure should be printed at 30 sec time intervals and also for various phases of the sterilization process. (j) Vacuum Pump: It should have a High vacuum system consisting of a multi-stage vacuum pump with a liquid ring that ensures removal of the air during the pre-vacuum stage with atleast 15 kPa vacuum level and excellent drying during the post-vacuum stage. It should also have low water level alarm to protect it from dry run and should be equipped with overload protection relay. (l) Available Cycles: The sterilizer should be designed to operate various programs. Apart from standard cycles, special cycle should be programmed by an authorised supervisor code only. Programs include:

1. Wrapped Instruments, Porous load 134°C.
2. Heat Sensitive material, rubber, plastic, porous load 121°C
3. Rapid cycle for single open instrument
4. Heavy load cycle
5. Bowie & Dick test (7 kg), PCD test.
6. Leak test

(n) Directives & Standards: It should meet EN ISO / IEC directives and product should be European CE/ US FDA Standards. Copy of certificate is to be attached. (o) Should pass a hollow load (A) test (Batch monitoring system). p) Steam Sterilizer should have provision for connecting a ¾" line terminating in the shut off valve, non return value, pressure relief valve steam riser, condensate drain and other essential accessories.

q) It should have an integrated water saving recovery device. It should be able to save minimum 60% water. r) It should have integrated degassing system. s) It should have an integrated discharge cooling device which would not discharge water of more than 50 degree C. The system should ensure that no liquid discharge should be of more than 50 deg C.

2. RAPID STERILIZER (FLASH AUTOCLAVE)TABLE TOP STERILIZER WITH ACCESSORIES FOR TSSU

1. Sterilizer Type: Table Top Sterilizer 2. Capacity: **18-25 Liters** 3. Chamber: The sterilizer should have Circular or Rectangular chamber . 4. Quality System Compliance: Sterilizer should comply the quality systems as per ISO 9001:2000 and EN ISO 13485:2003. 5. Quality Standards: Sterilizer should be **US FDA/European CE certified** 6. Types of Cycles Process: Table Top Sterilizers should be equipped with B-process, N process as per latest EN 13060 . Proof of declaration of conformity is to be enclosed. 7. Chamber: Should be made of S.S.316L & should comply the Pressure Equipment Directive (PED) & EN 13445 norms. Chamber should have working pressure 2.2 bar & design pressure upto 3.8 bar. Chamber should be equipped with electrically heated jacket for preheating on standby mode. 8. Door Design: Should have radially opening door with at least two locking bolts for enhanced door safety. The doors should come with silicon elastomeric rubber gasket to withstand temperature upto 140°C & 20-30 psi. 9. Air Filter: A disposable air filter should be provided for filtering the atmospheric air before entering inside the chamber. The filter separation efficiency should be higher than 99.998% for particle size less than 0.3µm. 10. Cycle programs: ● 134°C Wrapped. ● 121°C Wrapped. ● 134°C Flash/Rapid open instrument cycle. ● 134°C Textile. ● Test programs : Bowie & Dick, Leak Test. 11. Water Storage Tank: Sterilizer should have inbuilt water reservoir with storage capacity of 3- 5 Litres and also should waste tank to collect the waste with 3 – 5 Litres capacity. Both the reservoirs should have easy access for cleaning & to avoid bio film. 12.Steam Generator: Sterilizer should have inbuilt steam generator .The steam generator design should be with integrated energy storing system for building up power for sterilization loads in short time. 13. Control Panel: The control system should be PLC based system specially designed for sterilization applications. The control system should have Digital input/output controls, analog measuring inputs & COM ports for printer & PC connectivity, also with Alpha numeric Wide Graphic Display to indicate process status & to set the protocol with soft keypad. It should have Visual indicator provided by the same Wide Graphic Display to indicate process status. 14. Alarms: Automatic process checking & failure correction should be possible by the control system. The range of alarm should include Temperature & pressure sensor failure, phase time-out, doors not properly closed, power failure (less than 10 sec should be ignored), continuous self-checking of all the safety devices, low water level etc. All the alarms should be audio-visual. 15. Accessories: The sterilizer unit should include rack with 5 levels & suitable size instrument trays should be the part of the supply for every sterilizer. The Sterilizer should have water circulation system so that no drain point & fixed water inlets required.

3. DOUBLE DOOR WASHER DISINFECTOR 200-250 Litre (10 DIN Trays) WITH ACCESSORIES

1. The washer disinfector shall be suitable for cleaning and disinfection of surgical instruments/goods. The process shall include pre wash, detergent wash and hot water disinfection, rinse and drying cycles.
2. The unit shall be suitable for electrical operation and would be complete with two water circulation pump of minimum 1200 litre/minute capacity, two dryer blower pump, necessary valves & fittings.
3. Washer Disinfector Management System: The Management of Washer Disinfector for cycle process and various other menus and functions should be done through at least a 7 inch multi coloured touch screen display with the password protection ensures control of the operator and the Programmable Logic Controller (Omron PLC). The system should consists of double PLC devices, one to control the main parameters (PLC) and the other to verify the functionality and safety. The programmable electronic controller should be of a well-known company, highly reliable and fitted with a number of safety systems to ensure the Washer/Disinfector works properly. 4. Chamber Capacity: Volume should be 200-250L. Should supply 10 Nos of standard DIN trays. The chamber should be made of S.S. AISI 316L quality with electro polished washed surfaces. The chamber edges should not have the pockets & folds so as to avoid bacterial growth. The wash chamber should also be fitted with illuminated light for visibility of the washing process. Should have at least five washer disinfectors installed in India for at least two years. 5. Washer should have following features: a) Should have built-In Boiler for pre-heating the water thus reducing the cycle time by 45%. It should also have the provision to work with Hospital central Steam Network and option of combining both b) It should use Pneumatic valves since they are durable

with long life. c) Cleansable spray arms should be located at the top and bottom of the chamber. d) Wash carts should be equipped with cleansable spray arms between each shelf so as to facilitate water to reach all the surfaces which needs to be cleaned. e) Injection wash carts should be automatically connected to water and drying air in order to clean and dry the inside of the tubular instrument. f) Working Temp should be 60°C-93° C. Should have Pre Programmed cycles for instruments, micro-instruments, anaesthesia instruments, containers etc., & variable cycle of parameters for the different utilities in Washing & Disinfection. At least 20 cycles and can be programmed with the assistance of touch screen display. g) The total thermal dissipation should not be more than 1300 watt. h) It should have two temperature probes for both water & air temperatures. i) It should have built-in water recovery device. j) It should have built-in drain cooling device. k) It should have access for maintenance from front only. l) The washer should be equipped with independent temperature monitoring and validation test port. m) It should have provision for barcode tracking system, remote maintenance system, networking management system, remote connection via RS232 serial plug and data interface RS232 should be available. n) The noise level should be < 65dB. o) Washer should have a built in self-cleaning debris filter. p) Washer should be equipped with audible alarm that alerts if error code occurs. q) Double doors should be made of special tempered & Heat resistant glass contained in a frame of AISI 316L stainless steel. Closure of the doors should be carried out automatically either by Pneumatically driven, Vertical sliding movement with interlocked doors to avoid simultaneous operation. l) The washer should have 4 dosing pump (Detergent, Neutralizer, Disinfectant, & Lubrication) for process chemicals, instrument lubricants/ enzymatic cleaners ,It should be able to measure & display the dosing volume of each chemical in ml and there should be a dedicated compartment with door to keep the chemical canisters (at least 4 nos). 6. The washer should perform: a) Pre-rinses with cold water. b) Main washes with hot water (60C) and detergent. c) Final rinse with water (55C) d) Disinfection with hot water (93 C) e) Should have Thermal & Chemo-Thermal Washing. Should have validity of the cycle through A0 calculation. 7. The unit should also have an inbuilt- non fadeable Ink type real time Printer with provision of interface with External printer.

8. The washer disinfector shall be supplied with universal rack, 5 level racks for instrument tray, rack for anaesthesia instruments, full size instrument tray as well as stop valves, anti-suction device and plastic water trap manufactured by the manufacturer of the equipment only. 9. Should ensure essential washing accessories. 10. Standards & Norms: 11.The device should be a medical device according to Directive 93/42 EEC concerning medical devices. Should be US FDA/European CE certified. Manufacturer should be ISO 13485:2003, EN ISO15883 and ISO9001. Contractor should also be ISO9001 and ISO13485 certified. 12. Safety Features: The washer disinfector should be provided with the following safety devices: a) device to block the door from opening during the execution of the cycle b) device to block the door from opening when there electric resistors are operating c) device for detecting overheating while running during the washing and disinfecting phase d) device for detecting temperature abnormalities during the washing and disinfecting phase e) device to block the emission of water in the chamber if the door is open or not perfectly closed f) device that inhibits simultaneous opening of the doors g) breakers for the protection of the motors h) fuse and electrical protection on the auxiliary electrical system i) emergency stop button of all of the machine functions (reset in stand-by with rotation and start-up of the cycle functioning with new start command) j) sensor system for the anti-flood level k) differential protection for the electrical system for hot water production (resistance) l) safety thermostat for the resistance of the wash chamber m) safety thermostat for the resistance of the air heating system n) safety thermostat for the pre-heater resistors o) safety thermostat for the washer chamber resistors p) safety thermostat for the air heating system resistors q) device for detecting the internal rack and choosing the relative cycle r) All Electrical components & Panels should be IP55 protected and control panel should be IP22 protected. 13. Should have digital display of temperature, time, pressure, cycle time & elapsed time for ease of operation of the cycle and display calculation of A0 values. 14. ALARMS: It should be with audio-visual alarms in case of Error(s). All Alarms should be with full explanatory text messages on the Display and the system should perform a self-diagnosis and check the autoclave for all the alarms and these alarms are displayed & printed. 15. It also should perform a self-diagnosis and check for the following alarms: a) No supply voltage alarm b) minimum/maximum washing temperature alarm c) No water supply(hot, cold & treated water) alarm d) Overload relay alarm for motors/pumps e) temperature probe fault alarm f) maximum phase time alarm (for all the phases) g) tank temperature probes differences of readings alarm.

4. ETHYLENE OXIDE STERILIZER (ETO)

- **Chamber** made of anti-corrosive AISI- 316 Stainless steel. **Size- 600 x 600 x 900mm**
  The inner surface of the chamber should be smoothly finished to minimize gas deposit. Chamber should be heated with Strip air heater / Hot water circulated through the coil of AISI-304 around the chamber to maintain the chamber temperature at 40 – 75°C. The chamber should be insulated by 50 mm thick R.B. fibre glass/R.B glass wool covered by Stainless Steel-304. Silicon door gasket

- Working pressure of 30" Hg to 1.2 kg/cm2.

- **Door**(Single) made of AISI-316 Sliding/Swing with quick release locking arrangement process with suitable safety interlock so that the process cannot start unless the door is properly closed and cannot be opened during operation.

- Box typed **Panel** made of AISI – 304 Stainless steel sheet with arrangement of MMI-PLC.

- Diaphragm/Water ring type **Vacuum Pump** provided to achieve high level of air removal for high sterility and efficient residual gas removal during aeration process from the chamber and gas strap to separate and evacuate the gas. Inbuilt Gas catalytic converter for the exhausted ETO gas. Emergency evacuation phase for fast evacuation of gas in case of emergencies

- **Gas Purging** provided with cartridge puncturing system as well as provision for ETO +$C0_2$ cylinder.

- **Fully automatic models** for Sterilization process.

- **Stand** should be of AISI-304 Stainless steel.

- **Thermal Printer/Dot-matrix printer** which should print date, batch/ load number, program type elected and program parameters which includes one point pressure and one point temperature print out.

- Following **programs** with variable parameters should be provided to take user's requirement. Fully automatic operation.

  - Positive Pressure Cycle (with ETO (20%) + CO_2 (80%) cylinder.
  - Negative Pressure Cycle (100% ETO Cartridge)

- Microprocessor based Process control System (PCS)
  The control system should provide following features :
  - High and Low temperature and pressure alarms
  - Capability of storing and running upto 6 different programmes
  - All process parameters can be easily changed
  - Pass-word protection to prevent unauthorized access.
  - Data Acquisition Systems for process Log and report
  - A Comprehensive selection of alarm functions should be also available
  - Medial failures (Gas, Water, Air, Steam, electricity)
  - Temperature and pressure alarms,
  - Time too long for different phases.
  - Gas leakage in the work,
  - Insufficient feeding of ETO Gas etc.

- **Accessories** - 1 no. Air Compressor
- **Cartridges** - 100 Nos
- **Exhaust pipe from ETO should be taken to 3 mtr above the building**

5 . ULTRASONIC CLEANER (20-25 L)

1. The units should be a compact bench top model, with a built-in tank manufactured from high-quality (316) stainless steel and a solid-state generator that sends ultrasonic (approx 40 KHz) impulses through wash water containing detergent and electrical heating; microprocessor controlled display with memory time and temperature functions. 2. The electrical energy should be transformed into sound waves by transducers, fixed to

the bottom of the tank. 3. The tank should be made of solid stainless steel (316). 4. The ultrasonic cleaner should have a display and control which could be easily seen and placed above any liquid for safety and reliability. 5. It should have digital read out timer and temperature setting (temperature adjustable from 30 to 90 °C) monitoring. 6. Capacity should be 40LTRS. 7. Should work on 230V, 50 Hz AC Supply. 8. Ultrasonic cleaner should be European CE /US FDA certified. 9. Ultrasonic cleaner should supplied with Wire mesh basket of suitable size & Stainless steel lid. 10. It should be according to EN 61010 11. It should have Sweep & Degassing System.

6. HEAT SEALING MACHINE

1. Rotary heat sealers should provide validated sealing of sterilization bags and clear-view pouches (paper/plastic laminate). 2. It should be microprocessor-controlled. 3. The rotary heat sealer should give documentation of process parameters via an integrated printer and could be integrated with documentation system. 4. The ergonomically design should be tilted forward for increased user convenience and space saving installation. 5. The sealer housing should be powder-coated and the control panel is of the flat-membrane type, for easy cleaning. 6. It should be operationally simple. When a bag is fed into one side of the machine, the machine should start automatically or by pushing a button, moving the bag through the machine, and applying pressure and heat to form a perfect seal. 7. The warm-up time should not exceed 30 seconds. 8. The temperature should be adjustable from 50–200°C with a tolerance of 1% of the set value. 9. It should be regulated by a heating element that is highly sensitive to temperature fluctuations, assuring even temperature and perfect seals. 10. It should offer a number of additional features, including: a) Automatic start-up b) Reverse feed function in case an instrument accidentally enters the sealing area c) Energy-saving stand-by mode d) Pre-set temperatures e) Re-settable counter function 11. Rotary heat sealers come with a port and cable for connection of the sealer to a PC and printer, enabling monitoring and documentation of the entire process. 12. Should have a protection mechanism against overheating and start prevention at temperature deviations outside +/- 5° C tolerance. 13. It should be able to produce atleast 800 pouches/hour. 14. Rotary heat sealer should be European CE /US FDA certified. 15. It should complies & validated with EN ISO 11607-2. 16. It should be of the same manufacturer as sterilizer and washer disinfector.

7. DRYING CABINET

1. Should be automatic in operation 2. Inner chamber should be made up of stainless steel and outer chamber should be of epoxy painted CRCA sheets 3. Should have heaters of minimum 2 KW 4. There should be provision for setting the drying temperature and drying time. 5 **Capacity-275L 6. Should be of the same manufacturer of the sterilizers and washer disinfector.**

8. SPRAY GUN RINSER

1. Spray gun rinse unit should be designed for connection to water or compressed air, to use for assisted cleaning of pipettes, catheters, cannulas, syringes etc. 2. The spray-gun should include tubing and different tips and nozzles for the various cleaning purposes, like a) syringes and cannulas with Record cone b) Measuring and blood pipettes c) Catheters and small pipes d) Drainage tubing e) Syringes and cannulas with Lure cone f) Spray jet for rapid instrument cleaning g) Bottles and Erlenmeyer flasks h) Water jet pumps for suction cleaning i) All appliances are stored within easy reach on a special wall-mounted rack (included). 3. A special wall-mounted rack should be a part of standard supply to store all appliances within easy reach. 4. All tips should be able to get easily locked to the spray gun by a safety cone. 5. The gun grip is heat-insulated. The water/air pressure is released, regulated and fully controlled by the spray-gun trigger (adapted to a 1/2" connection). 6. Contractor should provide complete details of sets of standard and optional adapters, nozzles and accessories.

9. GAUZE CUTTING MACHINE

1. Should be useful in cutting thickest of cotton gauze material 2. Should consist of a cutting unit and a knife sharpening unit 3. Blade size should be approx. 200 mm. 4. Contractor should have ISO 9001,ISO 13485 and ISO18001. 5. Cutting Capacity should be 165 mm. 5. Should work on 230V, 50 Hz power supply.

10. AIR COMPRESSOR

a. The air compressor of shall be multistage stage, fully automatic suitable for delivering dry compressed air.
b. Motor and capacity: Suitable to the requirement.

11. INSPECTION LAMP WITH MAGNIFIER

Should have two spring balanced arms with parallel movement of at least 150 degree in horizontal plane. 2. Magnifying lens should be of fixed 7 diopter bi-convex. 3. Lens diameter should be approximately 12.5 cm

12. WASH STATIONS WITH 2 SINKS FOR DIRTY AREA

1. Size Approx. (LxWxH) : 2000x900x700 mm (whd) with sink sizes of 40X500X250mm (wdh).
2. Storage cabinet should be there.
3. Water shower/water spray gun should be attachable.
4. Air Gun should be attachable.
5. Contractor should have ISO9001, ISO13485, ISO18001.
6. Should be made of solid, bright-polished stainless steel (304) to withstand heavy-duty work with wet instrument.
7. Designed with a 60 mm high edge (splash back) at the rear.
8. The front and side edges are reinforced and widened to 49 mm. Edges are welded together and polished at the corners.
9. The worktop should slope to the sink, and reinforced by a full-length support frame.
10. Sink units should be of sizes that allow processing of the large modular instrument trays.
11. The legs should be able to provide strong support and hold to the entire unit securely.
12. The sink should include a drain valve, removable strainer, manually operated drain-valve, overflow drainpipe and water trap. The table also includes a mixing faucet with swivel spout, for cold and hot water connection.
13. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.
14. Contractor should be ISO 9001 and ISO 18001 certified.

13. WORK TABLE

1. Size Approx. (LxWxH) : 1200x650x900 mm approximately.
2. Stainless steel tables specially designed for inspection and sorting of wet goods in heavy-duty areas and for general purpose pre-storage.
3. The work tables should have a rigid stainless steel construction which is easy to clean and should not have sharp edges or corners.
4. The table should be ergonomically worked up, should have easy to clean robust matt-finished (to reduce reflection of light from the surface) with minimum sheet thickness of 1.5 mm stainless steel (304) worktop/surface to withstand and carry out heavy work comfortably, either sitting or standing.
5. They are welded together and polished at all corners for good hygiene, as well as for the comfort and safety of the staff.
6. The worktop should be supported by a complete assembly with full-length reinforcements along the front, back and ends, welded together at the corners.
7. It should be delivered ready for assembly.
12. All edges should be smooth and the rigid frame should be made up of minimum 1.5 mm sheet thickness stainless steel (304).
8. There should be unobstructed access to the working space, since the only supports needed along the front of the table are the corner legs. This also facilitates cleaning of floors.
9. Contractor should be ISO 9001 and ISO 18001 certified.
10. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

14. CONTROL & PACKING TABLE WITH TWO SHELVES FOR CLEAN AREA

1. Size (LxWxH) : 2000x1400x1400 mm approximately.
2. This table should be specially designed for sorting, inspection, functional control and packing of various sets for wards, clinics etc. and for surgical instrument sets in trays. The work could be done comfortably, either sitting or standing.
3. The worktop should be made of a robust wood-based core material, surfaced with plastic laminate in a soft beige colour that reduces reflection of light from the surface. All edges should be smooth. The extended width of the worktop should be designed to facilitate thorough inspection of instrument trays and allow the use of large wrapping material.
4. The rigid frame is made of stainless steel (304).
5. There should be unobstructed access to the working space, since the only supports needed along the front of the table are the corner legs. This also facilitates cleaning of floors.
6. Should have double workspace. One workplace table should have 700 mm wide worktop and other workplace should have1400 mm worktop.
7. The table should include a two-shelf console, mounted on the worktop, for storage of packaging materials. The rigid supporting columns of the console include 3 electrical outlets.
8. There should be a free space of 450 mm between the lower shelf and the worktop, and 150 mm between the two shelves.
9. The table should have a drawer unit (both sides as double model) mounted under the worktop.
10. Each drawer unit should be 400 mm wide and should include a drawer and a sliding plate.
11. Fluorescent tube fittings (Inspection lamp) should be available.
12. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

15. LINEN FOLD TABLE FOR CLEAN AREA

1. Size 2000x1400x900mm
2. The table should be specially designed for sorting, inspection (each piece of linen can be moved over an illuminated inspection panel) and folding of surgical dressing sets and individually packaged towels/gowns. The extended width also facilitates work with large dressing sheets. Work can be carried out comfortably, either sitting or standing.
3. The worktop should be made of a robust wood-based core material, surfaced with plastic laminate in a soft white colour that enhances the lighting for inspection of linen.
4. All edges of the worktop should be smooth.
5. The top should have a built-in opalescent (milky) plastic surface plate, 1000 x 600 mm, illuminated from underneath by two 25 W fluorescent tubes located beneath the top in a laminated recess.
6. The table should have two electrical outlets (one on each side).
7. The rigid frame should be made of stainless steel (304).
8. There should be unobstructed access to the working space, since the only supports needed along the front of the table are the corner legs. This also facilitates cleaning of floors.

16. WIRE STORAGE SHELF MODULE FOR DIRTY/CLEAN/STERILE AREA

1. Size as per design.
2. Construction should be based on single free-standing shelf modules for storage of clean linen, instruments, and packing material or sterilized goods, including disposables.
3. Moreover, two single modules can be placed back to back and combined as a double module unit.
4. If two units are to be connected, 10 S-hooks should be supplied.
5. The wire construction should allow good air circulation while permitting easy inspection of the goods.
6. The wire shelves should be made of special heavy-duty steel (304), chromium-plated and surface treated with clear epoxy varnish to facilitate cleaning.
7. The shelf unit should be easy to assemble on site and all parts should fit precisely.

8. Shelves should be mounted by means of plastic clamps onto circular rigid posts, with the adjustable height within a range of about 50 mm. Each post should include a height adjustable foot.
9. Each unit should include 5 shelves.
10. The shelf unit should have optional Ø 125 mm castors for using as a mobile storage unit by replacing the foot with castors.

17. PASS BOX

1. Area : Dirty to Clean, Clean to Sterile & Sterile Issue.
2. Size : 600x600x600mm, internal.
3. Should be made up of SS 304 sheets with double wall construction
4. Should have door interlocking to prevent simultaneous opening of both the doors.
5. Should have toughened glass paneling for easy visibility.
6. Contractor should be ISO 9001 and ISO 18001 certified.
7.. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

18. CLOSED TRANSPORT TROLLEY FROM STERILE STORE TO OT

1. Size: 1400x750x1260 mm (LxWxH) (External) approximately.
2. A Closed Transport trolley is used for sterile goods handling, for which higher protection than normal dust protection is required, e.g. short transports between hospital buildings. Suitable for handling baskets or containers with a total capacity of 9 STU (1 STU = 600 x 300 x 300 mm) on three solid, removable shelves (3 x 3 STU).
3. Trolley should be fitted with large stainless steel wheels (Ø 160 mm) for easier maneuverability.
4. Should have two fixed and two swivel wheels with brakes.
5. Should be of fully welded stainless steel construction (minimum 18 gauges, 304).
6. The doors should open 270° for easy access and cleaning.
7. Trolley should have lockable doors and should include handlebars.
8. Contractor should be ISO 9001 and ISO 18001 certified.
9. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

19. TABLE TROLLEY FOR DIRTY/CLEAN/STERILE AREA

1. Size: As per design.
2. The table trolley should be made up of SS.
3. The trolley should have handlebars.
4. The solid top and bottom shelves are made of heavy gauge stainless steel (304) with a ground and polished finish, and with a 12 mm raised edge all around.
6. The table trolley has 4 swivel wheels, mounted in ball bearings, for easy handling even in narrow passages.
7. Contractor should be ISO 9001 and ISO 18001 certified.
8. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

20. MODULAR STERILIZING BASKETS BIG

1. Size : 585x395x195 mm approximately.
2. Area : Various movement
3. It should be modular design with standard SPRI sizes and high precision and should be designed for sterilizing / processing as well as easy handling and management of the supply, storage and distribution of re-circulated sterilized goods.
4. It should be self-drying after disinfection in hot water (min.+85°C)
5. It should be sturdy, jig-welded trays maintain their size and shape even if handled carelessly.
6. It should be both nest able and stackable There should be special wire support to help making baskets both stackable (when the supports are folded into the basket) and nest able (when the supports are folded out)

7. The top frame should be designed such that it should serve as a handle grip for easy carrying even when heavily loaded.
8. There should be no sharp edges or wires.
9. The surfaces should be smooth to assure easy cleaning in a washer-disinfector.
10. The baskets should be made of electro-polishes heavy-duty stainless steel (304) and should have a rigid bottom frame that gives space for airing between goods and work surfaces and allow use on roller belt and chain conveyors.
11. It should be designed and manufactured in accordance with high quality specifications to assure long lifetime.
12. Contractor should be ISO 9001 and ISO 18001 certified.
13. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

21. MODULAR STERILIZING BASKETS MEDIUM

1. Size : 585x395x100 mm approx.
2. Area : Various movement
3. It should be modular design with standard sizes and high precision and should be designed for sterilizing / processing as well as easy handling and management of the supply, storage and distribution of re-circulated sterilized goods.
4. It should be self-drying after disinfection in hot water (min.+85°C)
5. It should be sturdy, jig-welded trays maintain their size and shape even if handled carelessly.
6. It should be both nest able and stackable There should be special wire support to help making baskets both stackable (when the supports are folded into the basket) and nest able (when the supports are folded out)
7. The top frame should be designed such that it should serve as a handle grip for easy carrying even when heavily loaded.
8. There should be no sharp edges or wires.
9. The surfaces should be smooth to assure easy cleaning in a washer-disinfector.
10. The baskets should be made of electro-polishes heavy-duty stainless steel (304) and should have a rigid bottom frame that gives space for airing between goods and work surfaces and allow use on roller belt and chain conveyors.
11. It should be designed and manufactured in accordance with high quality specifications to assure long lifetime.
12. Contractor should be ISO 9001 and ISO 18001 certified.
13. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

22. BASKET RACK:

1. Should be suitable for keeping 20 Baskets
2. Should be mounted on Bullet feet legs
3. Should be made up of Stainless Steel.
4. Should be provided with handle for easy transport.
5. Contractor should be ISO 9001 and ISO 18001 certified.
10. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

23. STORAGE RACK:

Size – 1830X535X1830
5 shelves; Made of Stainless Steel-AISI-304, Finished with Polishing with bullet feet
Contractor should be ISO 9001 and ISO 18001 certified.
Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

24. LAB STOOL WITHOUT BACKREST.(SS-304)

1. Should have stainless Steel top
2. Should be height adjustable from 450mm to 680 mm, through mild steel threaded screws

3. Should have four legged base made of 25mm steel tube mounted on rubber shoes.
4. Should have Stainless steel ring for footrest.
5. Should be pre-treated Epoxy powder coated frame work.
6. Contractor should be ISO 9001 and ISO 18001 certified.
7.. Manufacturer should have ISO9001, ISO18001, ISO13485 and ISO14001.

25. CHANGE LOCKER -4 COMPARTMENTS

1. Change locker should have 4 compartments.
2. Should have 2 lockers at bottom and 2 at top.
3. Size of each compartment should be as per design.
4. Should be of MS
5. Should be pretreated and epoxy powder coated.
6. Contractor should be ISO 9001 and ISO 18001 certified.
7. Manufacturer should be ISO9001, ISO 13485 certified.

26. **IN ADDITION TO THE ABOVE, FOLLOWING <u>TURNKEY WORKS</u> FOR INSTALLATION AND COMMISSIONING OF CSSD ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR :**

- Bidder must take into consideration in its bid, costs to be incurred for any additional work pertaining to any kind of dismantling, reconstruction works, patch works relating to Civil, Electrical, Plumbing, Sanitary and any other protections relevant as per State/Central Govt. regulation/local authority, Servo stabilisers, U.P.S. etc. required for successful installation testing and commissioning of the system at site and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order package on a "turn key basis".

- Providing all tools, tackles, manpower for demolishing /dismantling, alteration/ addition for lime concrete, cement concrete, R.C.C, R.B work, precast concrete or stone slabs in walls, partition walls , stone rubble masonry, dressed stone work, ashlar face stone work, marble work or precast concrete work, dismantling doors, windows and clerestory window (steel or wood) shutter including chowkhats, architrave, holdfasts etc. CI or asbestos rain water pipes of any diameter with fittings and clamps, dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, taking out doors, windows and clerestory window shutters (steel or wood), wood work in frames, trusses, purlins and rafters, dismantling steel work in single sections including dismembering and stacking, dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc., old plaster or skirting raking out joints and cleaning the surface for plaster, dismantling of R.C.C. spun vent shaft including
- excavating the cement concrete pit completely, taking out the shaft, refiling the excavated gap, stacking the useful materials near the site extra for cutting reinforcement bars, Dismantling aluminium/ Gypsum partitions doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material within 1000 meters lead and any other work as directed by engineer-in-charge. Disposal of building rubbish/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge.

- Laying of **UPVC water pipe line** with necessary taps, joints, elbows, Unions, Tees and valves of **UPVC** made to various supply points in the CSSD Room from single point supply(Provided by the hospital).
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Light Points, Power points, Fans, Cool air Fans, Exhaust fan etc in the CSSD room.
- Number of fans, **power point**, bulbs/tube light. Apart from this supplies to the individual equipments with ELCB & MCB in the CSSD room.
- Installation of MCB, ACB, ELCB & OCB for Control Panel for CSSD.
- Installation of all **electrical cabling** must be with proper earthing of all CSSD equipments and other electrical instrument and accessories in the CSSD room.
- Arrangement for fire extinguisher-9Kg = 3 Nos for requisite **fire fighting** for CSSD Room and its maintenance for the contract period

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the CSSD then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES MAJOR EQUIPMENT FOR CSSD

S.N0	**Works**	Make of major equipment
1	**SITC of CSSD**	Gating/Steris/Matachana/Steelco/Cisa

The makes for other items of CSSD shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

Note :

- The contractor should attach the list of equipment for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipment to periodically check the electrical safety aspects as per BIS Safety Standards IS-13540 which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipment. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipment checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive Maintenance call.
- Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS).
- The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month. All software updates should be provided free of cost during warranty period and CMC Period
- The contractor should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues
- The contractor shall be responsible for the complete works including submission of working drawing and walk through view.
- The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.
- Engineer may instruct for any test this test to be got done by contractor at their own cost.
- The contractor should provide all electrical accessories like cable wire, electrical outlets, switches

etc, and they should be fire proof of reputed make, certified for electrical safety.

- Wherever makes have not been specified for certain items, the contractor should provide the same as per BIS and as per approval of HSCC.
- The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation and commissioning.
- The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipment used for CSSD.
- The final Payment will be made on the actual measurement of the BOQ Items and ranking will be done with tendered BOQ.
- The CSSD contractor has to terminate/interconnect all the medical gas lines upto/to the OT/MOT.
- The contractor should provide Third party quality certificate of the CSSD equipment from SGS/TUV/Lloyds saying as "Certifies that the CSSD equipment meets the technical specification and BOQ of the Contract".

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

Supply, Installation, Testing & Commissioning of Integration & Data Management System for Modular Operation Theatres for Hospital Block and providing comprehensive warranty including free spares and services during DLP.

Item No.	Description as per Technical Specification
1	**Scope of works** a) Bidder has to provide all required hardware & software to complete the work all in accordance with international standard & norms. b) Bidder should be responsible for all cut-outs, patch-panels, flushing of monitors, etc. and repairing & repainting of OTs thereafter (If required) for successful completion of work. c) Bidder has to provide all required trenches/ trays, conduits for fibre optic cables, electrical cables, data cables, etc. with all necessary cabling required for integration system. MOT vendor will provide necessary cut-outs as per approved drawing provided by institute/consignee. MOT vendor will also provide dedicated MCBs/ MCCBs minimum 2Nos for integration equipment in MOT Distribution Board (DB) rest cabling will be in the scope of integration vendor for integration equipment's. Institute will provide one-point LAN incoming supply for each MOT, rest bidder is responsible to connect Integrated MOT to Hospital Network. All electrical components should be used as per industry standards and norms. d) Bidder has to provide all required convertors/transducers/ Scalars to integrate signal from different sources/equipment. The integration system should be capable of sending & receiving of all kind of audio & video signals (VGA, RGB, HD, 3D, 4K, HDMI, DVI, USB, S-Video, etc) e) Full MOT Integrations system offered should work without need of Internet within the Hospital/Institute i.e. over INTRANET or OPTICAL FIBER BACKBONE. f) Bidder is responsible to provide patch panel to connect the trolley-based VC (for bi-directional VC) with in the building on two places as required by the institute upto 100 meters of cabling. <u>Bidder should be responsible for following.</u> 1. Integration router should be placed in the Doc station well encapsulated with Modular OT walls or placed on roll in carts/trolley and all cables should be properly laid in conduits terminating at the Doc Station from Patch Panels, Room Camera, Pendants, OT Lights, 42 inch Monitor and Monitor Arms. 2. Streaming solution inside the OT, Integration Router system and Server in the Control Room should be from the same principle manufacturing company and should be classified Medical Device. 3. No off the shelf IT DVR solution should be provided. 4. MOT bidder will do cut-outs, patch-panels, flushing of monitors, etc. in the OTs 5. Bidder has to provide all required trenches/ trays, conduits for fibre optic cables, electrical cables,data cables, etc. with all necessary cabling required for integration system. MOT vendor will provide necessary cut-outs as per approved drawing provided by institute/ consignee. Integration bidder is responsible for laying cable from DB to OT sockets with switching for the integration power requirement. However, Integration bidder should submit sample/template of all kind of cut outs required in Wall panels, Ceiling panels, Anesthesia & Surgeon Pendants along with cutout drawings. MOT vendor will also provide dedicated MCBs/MCCBs minimum 2Nos for integration

	equipment in MOT Distribution Board (DB) rest cabling will be in the scope of integration vendor for integration equipment's. Institute will provide one-point LAN incoming supply for each IOT, rest bidder is responsible to connect Integrated MOT to Hospital Network. All electrical components should be used as per industry standards and norms.
2	**Medical Grade Monitors –** a) One 26-inch or more Full High Definition (1920X1080p) medical grade monitor mounted on ceiling suspended spring arm for each Integrated MOT b) One 42-inch FHD (1920X1080p) medical grade color monitor should be flush mounted on OT wall with all necessary frames with glass should be provided by bidder for each integrated MOT. c) All medical grade monitors offered should be BIS/European CE /US FDA certified d) Bidder shall be responsible for Patch panel for power & signals to be laid down for Monitors at Wall/ Pendent/ booms/ OT Light 3rd arm as required. Medical grade Monitor of should be provided. Make- Eizo/ Barco/ Sony/ LG
3	**Audio Video Communication System** a) All AV signals of MOT should be connected to Conference room/Other MOT/ Doctors lounge/ Etc. for video conferencing and live transmissions in the native(1080p) form as per the requirement. b) Audio-Video system should have 8x8 Digital/12x12 Digital with open architecture having compatibility of signals like SD, HD, FHD, 3D, 4K, etc. The routing/Switch system should be able to integrate Full HD/HD/SD/3D/4Ksignal (e.g. Room Camera/OT Light Camera / Endoscopic Camera/ Recorded Videos/Etc) c) Required Number of Decoders and Encoder/converters/ Scalars should be supplied as per the institute requirement. Dedicated Video conferencing per OT is to be provided. d) Audio – Visual system should receive the signal from different sources like Room camera, Endoscopy camera, Overhead camera, Archiving System, Auxiliary devices like C-Arm, Video Microscope, Mobile ultrasound, microphones, AUX-IN, 3.5mm (Audio) in & video conferencing. e) The routing system should allow selection of multiple views for simultaneous transmission in QUAD or PIP format f) Bi-directional MOT to MOT video conferencing should be possible with exchange of any AV sources along with bi-directional VC. g) The System should be able to receive and transmit PACS Data. h) Patient and image data (Endoscopic or open procedure) should be able to call up and distributed to required monitors in the operating room. Cross conversion and scaling for SD and HD signals should be available as standard (Every SD,HD,4K & 3Dinput can be routed to any output within MOT) i) All patch panel work required for Hardware of OT Integration system should be in the bidder's scope of work and also necessary co-ordination with consignee, MOT Vendor, construction vendor and HSCC/Institute will be the responsibility of the bidder for successful completion of all the associated works. j) Audio-Video bidirectional Conferencing system should be offered and the system should be able to transfer high quality real time images and audio signals from multipoint

	at a minimum speed of 2Mbps. The system should able to transmit full HD signals (1080p) over the ISDN lines or IP Service. k) Suitable HD(Resolution: minimum 1080p) camera with 10x or more Optical Zoom, Freely PAN/TILT for view setting & controls (2Nos- One for VC & One for Room View), Speakers & wireless mic., etc. should be provided in each MOT along with a patch panel which is capable to path any Standalone VC System, AUX in & AUX out and USB(AUX & USB for music only) l) The video conferencing system should be controlled via the touch screen of the integration system and it should capable of sending and receiving of any VC call through IP. All MOTs should be capable of dialling VC calls and receiving VC calls and simultaneously. Parties can be any two MOTs simultaneously of respective institute and any other two parties who having IP based VC anywhere in the world. m) Suitable Number / Sets of Transmitters, Receivers and Cables, connectors and accessories should be offered as per the requirement.
4	**Control System cum Digital Documentation –** a) Full High Definition 19" or more Medical grade touch screen LED/LCD control monitor should be wall mounted or mounted on extended arm on surgical Pendant for the display & routing of live transmission of images and video sequences from the Operating Room (eg. images from C arm, endoscope, OR light camera and Microscope) b) Should have provision to record the images and video sequences in OT. c) The Full High-Definition Medical Grade Digital Documentation System should be a high-end computer system based on Windows 7/8 or better embedded platform (for security purposes) designed specifically for recording, managing, and archiving surgical images and video in native (full HD, HD, SD,3D,4K) resolution. The captured full high-definition images & videos can be accessed from the hard drive for printing or saving onto USB Flash Drive & Hospital network. d) It should have at least 500 GB or more internal Hard Disk Drive (HDD) for in-system archiving. Also, able to automatically transfer the data to storage server present Hospital Network. It should be able to preview and simultaneously record views from two video sources parallel and archive as single patient file. 5 TB network storage should be provided with each integrated OT , it should be kept with in integration rack. e) Patient and image data should be able to call up and distributed to required monitors in the operating room f) All cabling including audio, video, communication, power, etc in the scope of bidder and it is responsibility of the bidder to provide all necessary connectors/convertors/switches to integrate the external OT equipment to integration system. g) The control system rack should be flush mounted into the MOT wall or mounted on rack at dirty corridor, all the suitable flushing/mounting rack & accessories should be provided by the bidder and it should be accessible for servicing purpose. h) System should able to document patient data and user configurable options for different procedure. The integration system offered should be connected with PACS & HIS. It should be DICOM and HL7 compliant.

5	**Live Video Streaming –** The integration System should be supplied with minimum 10 User License to simultaneously remotely view of video sources of MOTs with following features – a) Full HD live streams of at least three-user selectable any Video sources of each integrated MOT should be provided with suitable encoders & decoders. The sources for the video streaming is freely selectable and the surgeon should be able to put the OT in Private Mode/off, if streaming of Audio- Video is not required to a particular user or to all the users b) The Live Streaming of VC should be possible as one of the AV sources out of three for each MOT as described above. c) All Licensed user should simultaneously login through browser based application, based on user privileges defined, to remotely view all streamed audio-video sources and logged-user should be able to select any video from all the Video Signals streaming from all the Integrated MOTs simultaneously. Any user should be able to see all streamed AV sources like - Endo Cam, In light Cam, Room Cam, C-Arm, etc. of any of the MOT at any given point of time.
6	**Trolley Based VC System (One for each Institute) –** a) The VC system should be equipped with all hardware, software & licenses to enable the bidirectional Video Conferencing like – FHD Camera with 10x Optical Zoom, Freely PAN/TILT for view setting with all controls, dedicated wireless Mic, Speaker, min. 26" LED monitor, etc. and suitable system for dialling & receiving the IP calls. a) Should be ready to connect with Patch Panels & Hospital Network, suitable accessories should be provided.

Note:

a) Comprehensive Warranty as per Conditions of Contract of the TE document for complete equipment (including Batteries for UPS, other vacuumatic parts wherever applicable) from the date of installation, commissioning and Turnkey Work from the date of satisfactory installation, commissioning, trial run & handing over of equipment to Hospital.

b) 95% up time Warranty of complete equipment with extension of Warranty period by double the downtime period on 24 (hrs) X 7 (days) X 365 (days) basis.

c) All software updates should be provided free of cost during Warranty period.

2. After Sales Service:

After sales service centre should be available at the city of Hospital on 24 (hrs) X 7 (days) X 365 (days) basis. Complaints should be attended properly, maximum within 8 hrs. The service should be provided directly by Tenderer/Indian Agent. Undertaking by the Principals that the spares for the equipment shall be available for at least 10 years from the date of supply.

3. Training:

On Site training to Doctors/ Technicians/ staff is to be provided by Principal/ Indian Agents (if they have the requisite know-how) for operation and maintenance of the equipment to the satisfaction of the consignee.

4. Site Modification Work: Site Modification Work is indicated in the technical specification of the respective items, wherever required. The Tenderer shall examine the existing site where

the equipment is to be installed, in consultation with HOD of Hospital/Institution/Medical College concerned.

The Site Modification Work should completely comply with AERB requirement, if any.

Note 1: General: Bidders are requested to make sure that they should attach the list of equipment for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipment to periodically check the electrical safety aspects as per BIS Safety Standards IS-13540 which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipment s. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipment checked for electrical safety compliance with Electronic Regional Test Labs / Electronics Test and Development Centres across the country on every preventive maintenance call.

Note 2: Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS) The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month.

All software updates should be provided free of cost during warranty period.

RESPONSIBILITY OF BIDDER

1. Bidder shall be responsible for complete design, construction, testing and commissioning of Integration and Data management System of Modular OT based on seamless integration.
2. Bidder shall execute all required civil, electrical, mechanical and demolition and other works as may be required for complete installation and trouble-free functioning of the Integration and Data management System of Modular OT as a part of the “turnkey work”.
3. Necessary coordination with MOT vendor and fire-safety vendor for the installation of fire safety sensor/instrument inside the MOT and also other necessary coordination with civil contractor to be done by the bidder.
4. The bidder shall be responsible for the complete works including the submission of Working Drawings, and walk through view.
5. Bidder shall be responsible for installation and commissioning of medical equipment for Integration and Data management System of Modular OT in coordination with respective institute/hospital authorities.
6. The bidder should provide UPS power supply with necessary cabling as per electrical Standard.
7. Bidder shall be responsible for free maintenance with spares of Integration and Data management System of Modular OT during warranty period.
8. Bidder should provide factory test certificates for the material used for the construction of modular theatres.
9. Bidder should supply complete set of Operation manuals, service manuals and As-Built drawing for all the systems and subsystems supplied.
10. Training should be provided for a week by the factory trained engineers /Original Equipment Manufacturer(OEM).
11. Final electrical safety test, system test, and calibration should be done by authorized persons using calibrated test equipment.

12. 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.
13. Third party quality certification of the IOT equipment from SGS/Lloyds/Bureau Veritas should be submitted by the contractor as “Certifies that the IOT items meet the technical specification and DBR of the tender document vide contract No (Mention Contract No.).”
14. Third party test certificate and manufacturer test report for the items/equipment should be provided at the time of pre-despatch inspection.
15. Training should be imparted to the hospital staff for 2 weeks by the contractor.

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION OF KITCHEN EQUIPMENTS

SCOPE OF WORK

The scope of work covered under this package comprises of Plan, design, supply, installation, testing and commissioning of Kitchen equipments complete with accessories and auxiliary items including Turnkey work all in accordance with the Technical Specifications, Bill of Quantities and handover to the client and providing of free spares and service during Defect Liability Period.

CENTRAL KITCHEN

1. **Preparation Table with OHS and 1u/s**

   Top of 16 swg S.S-304 sheet on M.S Angle frame work duly rust proof painted on structure made on SS square/tubular legs with adjustable bullet feet for uneven floors. Also fitted with a under shelf. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip. Size- 2000x600x850

2. **Single Burner Stock Pot**

   Top of 16 swg. S.S-304 Sheet on M.S Angle frame work duly rust proof painted on SS-304 Tubular/ Square legs with adjustable bullet feet for uneven floors. Fitted with heavy duty burner with pilot lamps with individual control valves and heavy duty cast iron pan support. Size- 750x750x600

3. **Side Table**

   Same as sl.ni.1. Size- 1500x600x600

4. **Exhaust hood**

   Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung/fixed with metal fasteners. Size- 2000x2000x600

5. **Boiler (Tilting)**

   Double walled glass wool Insulated all S.S-304 Sheet body. The outer Most is of 18swg S.S-304 Sheet body. Fitted with heavy duty high pressure burner with pilot lamp & individual control valves. Fitted with water inlet & water outlet valve & strainer at the bottom level of the boiler also fitted with a Top opening lid with insulated handle. The entire boiler is mounted on heavy duty tubular legs. Also fitted with a heavy duty tilting gear to extract the boiled food.
   Size- 80 Ltrs.

6. **Brazing Pan (Tilting)**

   Double walled mineral wool insulated all S.S-304sheet body on heavy duty tubular legs with adjustable bullet feet. Fitted with heavy duty burner with pilot lamp with individual control needle valve. Fitted with tilting gear to extract contents after cooking & water inlet valve. Also fitted with top opening lid with insulated handle. Size – 80 Ltrs.

7. **Exhaust Hood**

Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung/fixed with metal fasteners. Size- 4500x1200x600

8. Masala Trolley

The entire trolley is made on SS sheet body to keep inserts for preparation on tubular legs on 4 nos castor wheels-2 with breaks and 2 normal. Also fitted with a bottom shelf/cross brazings. Size-800 x 500 x 900

9. **Chapatti Plate cum puffer**

Structure made of mild steel angle frame duly rust proof painted . Top of 12 mm mild steel, front Panel and under shelf 18swg S.S-304sheet, vertical legs of S.S-304 round pipe of 16swg. 1.5" diameter with nylon adjustable feet. Complete with CI perforated grill for puffing of chapattis, heavy duty high pressure RV burner pilot, individual control valves Indian Oil corporation approved. Size- 1500x600x850

10. **Rolling Table**
Top made of 16swg S.S-304 sheet on MS Angle frame work with rust proof painted on S.S-304 square pipe 25x25mm/Tubular legs frame work and under shelf made of 18swg S.S-304 sheet. Vertical legs of S.S-304 round pipe of 16 swg. 1.5" dia with nylon adjustable feet. Size-1200x600x850

11. **Exhaust hood**

Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung with metal fasteners. Size- 1800x750x600

12. **Side Table**

Same as sl.ni.1. Size- 1200x600x850

13. **Dough Kneader**

Body completely constructed of heavy duty cast iron with gear box mounted on the top the mixing bowl of S.S-304 sheet 14 swg with S.S-304 arm to mix the dough and is operated electrically with heavy duty motor of 1 hp. Motor shall be S1 type of IS : 325 standard (Latest version). Capacity -25 Kg.

14. Garbage Cart

Moulded Plastic container -100 Ltrs capacity fitted with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

PREPARATION AREA

1. **Preparation Table with OHS and 1u/s-**

Top of 16 swg S.S-304 sheet on M.S Angle frame work duly rust proof painted on structure made on SS square/tubular legs with adjustable bullet feet for uneven floors. Also fitted with a under shelf. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip. Size- 1800x600x850+150

2. **SS stand for Chopping blocks with boards**

All S.S-304 sheet body to hold poly carbonate chopping boards-4Nos. Size-600x600x850

3. **Potato Peeler**

The heavy duty peeling drum is made of 18 swg. SS sheet on three nos tiny legs with adjustable bullet feet and a rotating disc of SS sheet being connected with heavy duty motor of S1 type of IS:325 standard, single/three phase. Also pasted with emery granules inside the drum and on rotating disc to peel and fitted with water inlet valve and aluminum casting/SS sheet our pour to extract peeled potatoes. Make-Robotcoupe/Sirman/Haudie. Capacity-10 Kg

4. SS Double Bowl Sink unit R.H.S

Top of 16 sg. SS sheet on S.S. Angle frame work on S.S square legs with adjustable bullet feet for uneven floors. Also fitted with a large sink on RHS. Also fitted with a back splash and under shelf. The top is fitted with stud wielded bolts with the frame for sturdy and stronger grip. The bowl size 500x500x250. Size-1500 x 650 x 850 + 150 spl.

5. Garbage Cart

Moulded Plastic container -100 Ltrs capacity with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

SPECIAL DIET

1. **Work table with sink**

Top of 16 swg S.S-304 sheet on SS frame work on Structure made of S.S-304 square/Tubular pipe. Sink made of 14 swg S.S-304 on LHS/RHS and under shelf made of 18 swg S.S-304 sheet. Vertical legs of S.S-304 round pipe of 16 swg. 1.5" dia with nylon adjustable feet. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip. Size- 1500x600x850 +150.

2. **Coffee/Tea Machine Dispenser**

Double walled glass wool insulated all S.S-304 Sheet body. Fitted with 3.0 kw heating element with auto temp. controller & indicating lamp, water level indicator, Gun metal faucet one for water and another for milk. Capacity 250 cups/hr.

3. **Micro oven**

Convectional type, Capacity-30 Ltrs.

4. Conveyor Toaster

Capacity 750 slices per hour. Power consumption should not be more then Arr 2.8 kwatt,220 volts, stainless steel table top model, should be based on belt speed inplace of heating temperature for toasting colour. stainless steel element. with variable speed. Should be able to work both sides either front or rear. stainless steel .supplied with all accessories & attachments. crumb tray /discharge tray should be provided. continous toasting with thermostatic setting.High quality components &accurate timer control.Unit size should eb arr. 455x355x415mm
Make ; LINCAT (CT -10) /HATCO (TQ-800)HPA/CROMO

5. **Egg boiler**

Capacity-120 pcs. Electrically heated, Heat insulated Container should be of SS 304 material

6. **Milk boiler**

Triple walled mineral wool insulated all SS -304 sheet body on SS-304 legs with adjustable bullet feet. The outer most wall and the second wall is mineral wool insulated and the other wall water proof and fitted with water inlet, outlet, over flow valves and water level indicator. Also fitted with 3.0 kw immersion type heating element with auto temperature controller and indicating lamps and a heavy duty gun metal faucet. A top opening lid with insulated handle is fitted . Also fitted with two nos, insulated handles on either sides to carry. Capacity- 100 Ltrs.

7. Two Burner Gas Range with Oven Below

Top of 16 swg. SS Sheet on M.S Angle frame work on SS Square legs with adjustable bullet feet for uneven floors. Fitted with heavy duty burner with pilot lamps with individual control valves and heavy duty cast iron pan support. Also fitted with an electrically operated oven beneath. Size- 950 x 950 x 850 + 150 Spl.

8. **Exhaust hood**

Complete frame work 20/22swg. Complete joints are air tight insulated weather proof mechanically painted on the Upper surface. S.S-304 filters-island type. Size- 5400x1200 x600

9. Juicer

Compact design- fits almost anywhere,under counters or worktables.

10. **Hand wash Unit**

Splash as per Layout (Rear & against side wall) Front & free side marine edge. 350mm dia.x200mm High Die Pressed Sink complete with 38mm dia. C.P. Drain Waste Out let. 16 gauge S.S-304 wall brackets. Secured to top with Acorn nuts & Bolts & Bracket secured to wall with anchor fasteners. Rear & Both sides 20 gauge S.S-304. One Deck mounted Jackson Swivel type water mixer water faucet. Unit mounted 865mm AFF Size- 600x600x450.

11. Chinese Cooking Range Size-1120X760x850+450

12. Garbage Cart

Moulded Plastic container -100 Ltrs capacity with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

POT WASH

1. Pot Rack-4-shelves

The heavy duty 4 tiers rack are made of S.S-304 square pipe (38mm & 25mm) and duly welded with 4 nos. uprights on nylon adjustable feet for uneven floor. Size- 1200X600X1650

2. **Two Sink Pot wash**

The structure made of SS: 304 square pipe 25 x 25 mm Angle frame work duly rust proof painted. Top & sink made of 14 swg and under shelf made of 18 swg SS: 304. Vertical legs of SS: 304 round pipe of 16 swg. 1.5inch dia. With nylon adjustable feet. Size- Sink Size-600x600x450

3. **Pot wash Sink**

To be constructed with Brick and Cement (Masonary Work) and finished with tiles Size-2000x1500x600

4. Hot water Geyser

Horizontal Capacity-50 Ltrs.

5. Garbage Cart

Moulded Plastic container -100 Ltrs capacity with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

DISH WASH

1. Dish Washer

Single Tank Rack conveyor type. 6 to 8 plates per rack, Cycle time 1.5 minutes. At least 155 Rack/hr. with **Drier.** The position of Dish Washer i.e RHS/LHS depends on loading and unloading table (As per layout drawing) Make-Winter Halter/ Electrlux/Hobart with Drier

2. Soiled Dish Landing Table with glass Rack with Garbage chute

The marine edged top made of 16 swg SS: 304 sheet on MS Angle frame work, duly rust proof painted & stud welded for stronger grip and cross bracing of 18 swg SS: 304 sheet. Vertical legs with nylon adjustable feet. A Garbage chute is provided on LHS & a glass is fitted on the D.L.T. 1500X800X850 +60

3. **Clean Dish Table**

Top 16 swg S.S-304 sheet on MS Angle frame work duly rust proof painted & stud welded on SS. Tubular/square legs with adjustable bullet feet. Also fitted with SS slide out beneath to hold the plate/glass racks of 500 x 500 mm Size-900x800x850+150

4. **Hot water Geyser**

Horizontal Capacity-60 Ltrs.

5. **Dish Storage Rack 5 tiers**

All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having 'C' Channel through to accommodate maximum load bearing ability. Size-900x450x1800

6. **Dish Wash Busket Trolley**

Top 16 swg S.S-304 sheet on MS Angle frame work duly rust proof painted on tiny castor wheels. Fitted with a push cart type handle.

7. **Garbage Cart**

Moulded Plastic container -100 Ltrs capacity with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

SET-UP AREA

1. **SS Rack on Castors**

All five shelves are made of 18 swg. SS sheet on 4 nos round / square legs with adjustable bullet feet. All the shelves are having "C" channel through to accommodate maximum load bearing ability. Size- 1300 x 450 x 1800

2. **Hot Bain Marie on Castors**.

Intergral with top & suitable to accommodate Six (6) Nos 300mm high GN 1/1 PANS with lid to be supplied #16 SWG S/S sheet tank integral with work top of water counter Fully coved corner insulated with 50 mm thick tightly packed glass wool on the exterior and base of internal tank & sheathed with 20 SWG s/s sheet on exterior Bottom of tank sloped to left side with 40mm dia brass waste w/angle valve # 18 SWG s/s perforated false bottom with all sides turned down 40mm in 12 mm two (2) nos 3.0 KW electric heating elements clamped 25mm off the bottom complete with thermostat, on 0 off switch, red light and controls. Size- 2250x675x850

3. **Hot Food Service Trolley**

Double walled insulated with glass wool. Inner side made of 18swg & outer side made of 20 swg as Stainless steel 304 sheet with 4 no heavy duty Castor wheels (4"/6" dia) with 2 wheels locking arrangement and push cart type handle constructed from ss pipe. Trolley has Immersion type 3Kw heating elements with auto temp. controller & indicating lamp with temp. Indicator to keep

5 Nos big round containers of 10 ltrs. capacity each and 2 more small containers all with lids to keep food hot vegetable/soup/card etc. and one rectangular for container for to keep chapattis. Also fitted with one middle and bottom shelves with lockable door. Rubber cushion to be fitted at the corners to prevent damage during transportation. Size- 1200x600x900

4. Platform Trolley

The entire trolley is made of 16 swg. S.S. Sheet on M.S. Angle frame work, duly Rust proof painted on heavy duty castor wheels. The top to be stud wielded with the frame for stronger grip. Also fitted with a push cart type handle & rubber cushion in front to avoid the damage during movement.

5. Garbage Cart

Moulded Plastic container -100 Ltrs capacity with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base.

STORE

1. Weighing Scale Electronic

Electronic weighing scales of standard make to weigh upto 300 kg. The certificate from Weights & Measures Dept. is to be attached with the machine, duly certifying the serial no. Capacity-300 Kg.

2. Storage Rack with 5 tiers

All shelves are made of 18swg S.S-304 sheet on 4 nos round/square legs with adjustable bullet feet. All the shelves are having "C" channel through to accommodate maximum load bearing ability Size- 900 x 450 x1800

3. Four Door Freezer

1410 lts ,18 deg C to -22 deg C, External and internal door and side panels in 304 AISI stainless steel. External back and top panel in galvanized steel. High-density expanded polyurethane insulating foam, 70mm in thickness 4 half doors with lock and microswitch to switch off the fan when the door is opened. Built-in refrigeration unit; Cooling capacity 1800 (watt) ventilated operating mode; digital control; automatic defrost and evaporation of defrost water; external digital temperature display. For ambient temperatures up to 43 °C. CFC and HCFC free. R134a gas in refrigeration circuit fitted with compressor, Gas in foam: Cyclopentane. Supplied with n. 8x2/1GN nylon coated grids and n. 8 sets of 2 stainless steel grid runners. Overall Dimensions Dimensions (WxDxH mm): 1450 x 825 x 1975, El. Power (kW): 720. Fitted with Dixcell controller & EBM fan motor. The sheet thickness in the top & body should be 1.00 MM & 0.8MM. Mounted on adjustable feet. Confirming to HACCP Control. should have provision for USB comaptibility,RS485 interface,& integrated data logger, prepared for GSM alarm,& contact for remote control, door opening alarm, adjustable high/ low temperature & visual & acoustic alarm.

4. Water Cooler with RO system

Structure made of mild steel angle frame duly rust proof painted. Body completely constructed of S.S-304 sheet double walled insulated with puf, Inner tank of 22 swg and outer of 20 swg S.S-304 sheet food grade. The water cooler is mounted on four S.S-304 tubular legs with S.S-304 bullet adjustable feet. Complete with compressor and condenser unit with automatic temperature controller and temp. Indicator. Capacity-250 Ltrs.

5. Onian/ Potato Bin

The entire bin is made of S.S. wire meshed body on heavy duty castor wheels. Fitted with top opening lid and the inclined bottom to have a lockable door to extract. Size- 900x600x750

6. Cereal/Atta/Maida Bin

The entire bin made of 18 swg S.S-304 sheet on tiny caster wheels & with top opening lid. Size-600x600x750

7. Cold Room

RoomSize-4500X3000X2100 Temperature -0 to 4 degree centigrade Insulation:- Panels 60mm thick PU at 40-42kg density,PCGI exposed exterior 0.5mm thick sheet,PCGI exposed exterior 0.5mm thick sheet, PCGI interior 0.5mm thick sheet, floor interior and exterior of 0.5mm thick PCGI exposed sheet, Ceiling exterior PCGI, interior PCGI Sheet 0.5mm.Vertical,Panels Joint with Cam lock coupling in Tongue & Groove arrangement. Thickness of PUF Panels (for Wall, Ceiling & Floor)- 60mm.Wall & Ceiling panels Finish- Internal: SS 304 External: PCGI Galvanized Ironic Sheet. Flooring- Kota stone. Density of Panels-40kg/cub.m No. of Doors- One for Main Room Type. of Doors- Over Lapped or Flash Type Door Size-900mm x 1950mm. Accessories Included in the scope of Supply-1. Door Alarm 2. Lock Defeat mechanism 3. Light Inside the cold room. 4. Handle, Hinges & Locks. 5. Microprocessor based digital control. Panels. 6. Panel Accessories & necessary Hardware. Technical Feature of PUF Panels, Doors, & Accessories: Individual Panel is manufactured with closed cell Rigid Polyurethane foam, injected at high pressure, which secures the bond with facing material to form a single piece construction. RPUF insulation is CFC free and has Zero ODP- Ozone Depleting potential. Core density of 40kg / Cu.M Panel finish is designed to resist many chemicals including most common cleaning agents. The panels have fire rating to BS.467 part 7, clause 1. Wall, floor & ceiling panels joined with Tongue and groove mechanism with cam lock system. The compressor and condenser unit with Automatic temperature controller and temp. Indicator. Room for Compressor, Condensor and control at the back of the Cold Room.

8. Storage Rack 5 tiers

All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having ‘C’ Channel through to accommodate maximum load bearing ability. Size-900x450x1800

9. Storage Rack 4tiers

All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having ‘C’ Channel through to accommodate maximum load bearing ability. Size- 800x450x1200.

10.	**Insect killer**	Twin tube. Branded.
11.	**Air curtain**	At entry points.

1. **LPG Bank (without cylinder)**

10 + 10 (One set working another set standby) LPG Cylinder Bank of 14.2 Kg each LPG cylinder with :

- Class'C' seamless steel pipe conforming to IS:1239 (Latest version) with Pressure Gauges (0-15 PSIG & 0-5PSIG, dial type),
- Pressure reducing stations complete with Flanges & accessories and Isolation valves having ball valves of approved makes with LPG installation certificate having carbon steel body, SS ball and PTFE seat, Laboratory tap and all other fittings such as tees, reducers, unions, elbows.
- Steel Grilled cage of area 16 ft x 4ft.with lockable door for keeping 10 + 10 Cylinder Bank.
- The piping shall be joined through welding by using welding electrodes of ISI marked only.
- The LPG piping works shall be duly supported with ceiling, on walls etc. by providing adequate supports. In no case the spacing between two supports shall exceed 1.5 meter. Adequate measures shall be taken to prevent pipe from undue stresses, sagging etc.
- The piping shall be free internally and externally of cutting burrs, loose scales, dirt, dust and other foreign matters before installation is completed.
- All care shall be taken to prevent rusting of piping during installation by providing red oxide primer coating.
- Suitable sleeve of GI/wood shall be provided wherever the pipes are crossing through the walls/slabs etc.
- The LPG shall be providing keeping a minimum distance of 100 mm from the electrical wiring system.
- On completion of installation, the LPG manifold shall be complete with all accessories and individual components/parts which are subjected to cylinder pressure shall be capable of withstanding a test pressure twice the working pressure or 26 Kg/sq.cm whichever is higher. Pressure testing of complete LPG system and obtain the pressure test certificate from appropriate regulatory authority.
- All the fittings used for installation of LPG line system shall conform to relevant BIS codes.
- The complete LPG pipeline system shall be installed in accordance with IS:6044 (Latest version), Gas cylinder rules 1981 with latest amendments, OISD July 1995 (latest amendments).
- All the accessories, components used for installation of LPG pipeline system shall have the approval from Oil Company.
- Isolation/shut off valves shall be ball valves with installation certificate for use in LPG pipelines and shall have carbon steel body, Stainless steel ball and PTFE seat.
- After completion of installation, the entire pipeline system shall be given at least two coats paint as per LPG colour norms.

- The work of supply, installation, testing and commissioning of LPG manifold and supply system shall be carried out only by specialized agency shall have certification for carrying out similar jobs from Oil Companies like IOCL/BP/HP.
- The entire work of supply, installation, testing and commissioning of LPG manifold and supply system shall be carried out in accordance with directives of Oil Industry safety directorate and of Bureau of Indian Standards and using materials having necessary approvals for use in LPG installations.
- The contractor shall submit detailed shop drawings of LPG manifold, piping layout and piping installation details for approval. The items covered under the scope of works shall include all those ancillary items which may be required to complete the work in all respect whether specifically mentioned or not.
- Fire fighting arrangements for LPG Bank should be as per the guidelines of statutory body/local authority/State Government/Central Government.

IN ADDITION TO THE ABOVE, FOLLOWING TURNKEY WORKS FOR INSTALLATION AND COMMISSIONING OF KITCHEN ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR :

- **Electric distribution panel** for the above Kitchen equipment complete with all switchgears, wiring and controls etc complete as per specifications and drawings.. **Earthing system** of control panel and other electrical instrument and accessories in the Kitchen area **as per standard guidelines of BIS(Latest edition)**. All cable trenches and railings should be made wherever required.

- **Electrical cabling** of IS : 1554 standard and wiring as per IS : 732 standard from MDB(Single point source) to Electric Distributional Panel and to the corresponding load points. All cable trenches and railings wherever required.

- Providing fixing of **Electrical Gadgets** like ELCB, MCB, , Light Points, Power points, Fans, Cool air Fans, Exhaust fan etc in the Kitchen room. • Number of fans, power point, fluorescent light. Apart from these supplies to the individual equipments with ELCB & MCB in the Kitchen room. • Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for Control Panel for Kitchen.

- Laying of **GI water pipe line, Plumbing (Concealed)** with necessary taps, joints, elbows, Unions and valves of GI made and IS-1239 standard (Latest version) from overhead tank (Overhead tank is at the roof of Kitchen room)to the installed machines'/users' ends at Kitchen Room.

- Installation and commissioning of **Water Softener** for softening of available ground/supply water continuously at the hardness necessary for washing and other application required for Kitchen is at least "< 50 ppm" or as per suitability of the Steam Generators/equipment. The Water Softening System shall be installed in the capacity compatible to the requirement of Kitchen equipments and system running for the assigned duration at fully loaded condition. The specimen of ground/supply water is available at the site of installation at for design and selection of Water Softening System.

- Construction/laying of **Draining system** from all the equipments/Sinks to the main drain (outside the Kitchen) **with SS Grating**, proper trap and flow system and tapping. 90% drain inside Kitchen shall be covered and balance part shall be covered with SS Grating. Drained water from Kitchen shall be drained to the main drain after **GREASE TRAP**.

- Necessary Ducting of GI sheet with grills inside the kitchen. **AIRWASHER (If required shall be suitable as per local weather)** of suitable capacity for supply of cool and fresh air at the working place inside the Kitchen. **Exhaustion of hot air, fumes and smokes through exhaust hoods** and finaly exhausted to the atmosphere through **AIR SCRUBBER** for creating comfortable working zone within the Kitchen. Motors shall be of continuous duty S1 type of IS: 325 standard (Latest version). The ductwork should discharge at least 1m above any open able window and should not have a mesh screen. Using ductwork louvers or discharge terminals an efflux velocity of 12-15m/sec or local authority regulations should be applied. The use of Chainman's hat type terminals should be avoided to prevent an increase in static pressure, downdraught or re-entry noise.

- Arrangement for requisite F**ire Fighting and cleaning** for Kitchen Room including installation of Centrifugal Pump-1 No. of 450 LPM, 30 Mtrs head of reputed make and Hose Reel-(30Mtrs Length)-3 Nos at the suitable locations to protect against fire at the entire effective zones in the Kitchen and their maintenance for the contract period including approval from or as per State/Central Govt. regulation/local authority/Statutory body if required. Contractor should also provide three Dry CO2 cyliners-2 kg/ and the portable fire extinguishers with essential accessories. Cylinders should be certified by respective regulatory board.

- Additional work pertaining to Civil, Electrical, Plumbing, Sanitary and any other protections relevant as per State/Central Govt. regulation/local authority, **Office Furniture** (Table & Chair), Servo stabilisers, U.P.S. etc. required for successful installation testing and commissioning of the system and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order package on a "turn key basis".

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the Kitchen then that may be provided after approval from Engineer in-charge.

- The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES FOR KITCHEN

1	**SITC of Kitchen**	Klas/Bharti Refrigeration/Kumar Equipment/ Dolche
2	Cold room	Bluestar/Carrier/Voltas/Phoenix Refrigeration
3	Dish washer	Winter Halter/ Electrlux/Hobart
4	Air curtain	Mitwaz/Sanchit/Abros

The makes for other items of KITCHEN shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

Note :

- **The contractor shall be responsible for the complete works including submission of working drawing and walk through view.**
- **The Contractor should provide complete Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.**

- **The contractor should provide Final electrical and pressure and other safety test, system test and calibration to be done by authorized person with test instruments.**
- **All electrical accessories like cable wire, electrical outlets, switches etc supplied by the contractor should be fire proof of reputed make, certified for electrical safety.**
- **Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of HSCC.**
- **Training of personnel of the Institute should be made by the contractor.**
- **The contractor should prepare and submit layout plan for Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Air Washing and Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As-Built drawing after installation.**
- **The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for Kitchen.**

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION
OF
MEDICAL GAS MANIFOLD SYSTEM

Scope of work **Complete plan, design**, S**upply, installation, testing, commissioning including turnkey work and handing over of Medical Gases Manifold and Distribution System to the client. Operation and Maintenance including providing of free spare parts and service during Defect Liability and CMC Period .**

The system shall comprise of:

A. **Source Equipments**
Oxygen Generation System
Fully Automatic Oxygen manifold & control panel
Fully Automatic N2O manifold & control panel
Vacuum (suction) supply system
Medical Compressed Air System
Anesthesia Gas scavenging system

B. **Distribution pipes.**

C. **Outlets** and bed head panel for Wards etc. with accessories.

D. **Complete Alarm system**.

E **Horizontal Bed Head Panel**

F Pendant

G. **Accessories**

Oxygen flow meter with humidifier
Ward vacuum units
Theatre Suction units.

STANDARDS

The design & selection of items should be of international standard like NFPA 99(latest version) standard and UL listed or ISO-7396-1/DIN EN (latest version) and UL listed/CE marked or HTM 02 01 (latest version) standard and CE marked. This supersedes single/multiple standards mentioned at any other places in the tender specification involving item/system/capacity etc. The products should be of one standard only. All indigenous items should be compatible to the main system.

1. Oxygen Generation System

1.1 Oxygen Concentrator Module

i. Fully Automated system Microprocessor based Oxygen Concentrator Module, **Duplex System with PSA technology**.

ii. Each Module should be to produce 500 LPM or 30 Nm^3/hr (Cubic Meter Per hour) with purity of 93% ±3%. The Oxygen should be medical grade and shall be supplied through oxygen outlet at 4 Bar pressure. Maximum operating pressure 10 bar max. The Oxygen Concentrator system shall supply to the outlet points directly and fill cylinders by using High Pressure Booster.

The Oxygen Concentrator system shall have **PSA** sieve beds with **Touch screen** size of 6" to 7" screen for alarm indication display of Real Time trending, curves of Oxygen pressure, Process Overview with Valve Operation and Analogue values and Display of Purity of Oxygen flow, **Alarm facility** (**Oxygen monitor** for oxygen generators range 0.1 – 100% includes alarm function through control) for process cycle failure, low oxygen pressure and for any other malfunction. In case of the valve malfunctioning, panel shall have diagnostic tool to pinpoint exact valves in question for fast service.
External audio/visual alarm Audio and visual alarm in one unit can be placed anywhere. Visual alarm is active whenever an alarm is present in the system. Audio will turn on when an alarm appears but can be turned off from for control panel

iii. The Oxygen concentrator should have built-in Zirconium sensor or equivalent with **Oxygen Analyzer** with digital display.

iv. Oxygen Concentrator module should be CE marked, meeting ISO-10083 standards and should be in accordance with Medical Device Directives 93/42/EC for Medical use.

1.1 **Oxygen Surge Tank**

The Oxygen concentrator should be supplied with Oxygen Surge Tank having capacity of 1000 ltres, fabricated out of thick MS sheet pressure tested 3 times the normal working pressure and should be fitted with requisite pressure gauges to display pressure for Oxygen Surge tank.

1.2 MEDICAL UPGRADE KIT

Coal Tower 90, 0.01 micron Filter, Carbon Filter, Bacteria/ Sterile Filter

1.3 Compressed air system consisting of Screw type Compressor and Refrigerated Air Dryer.

The Oxygen Concentrator should be supplied with **Air Compressor** (Screw type) system to meet the peak atmospheric air and pressure requirement. The Compressed air system with **Refrigerated Air Dryer** of flowrate 550cum./hr offered shall meet the peak load atmospheric air and pressure requirement. The compressor is non-lubricant type rated 30-35 KW skid mounted. The screw type compressor should be microprocessor based its own digital display and completely compatible with the Oxygen Concentrator Module. The desired working pressure of compressed dry air should be 5.5-8.0 bar(g).

1.3 **Filtration system for the compressed Air**

Feed air quality of the oxygen concentrator should be conforming to ISO8573 class 4 and is of filtration grade of 0.01 Micron. The ambient temperatures of compressed air shall 10 degree Centigrade to 40 degree centigrade and shall have maximum dew point of + 3 degree centigrade.

1.4 **Air Receiver**

The system should be provided with an Air Receiver having the capacity of 3000 litres and should be designed in such a way to sustain pressure of 7-11 bar. The air receiver should be fitted with 2 Nos. auto drain-out moisture.

The system should be provided with all interconnected piping NRVs, Control switches, Flow Metres, Insulation of piping, Nuts and Bolts etc. All other items required for the generation of pure Medical grade oxygen required but not reflected above shall be deemed to have been included above and shall fall within the scope of the work with no extra cost.

1.5 **High Pressure Booster (HPB)**

The high pressure booster oxygen compressor for refilling the various type of Oxygen cylinder having the following specifications:

i. HPB should be compact mounted on a Mild Steel frame fitted with electric motor 3-phase, 1420 RPM, 4KW, 50 Hz. And should be able to run on the incoming voltage of 380 Volts.

ii. HPB System should be provided with stainless steel diaphragm type of compressor, 2-stage, coolant (1:1 ratio) cooled using close loop for re-

circulation of coolant with an output capacity of 6.4 -16 Nm^3/hr (cubic metre/hr) and should be capable of filling cylinders at a pressure gauge visible on the top front.

iii. The HPB should have Pressure Gauge and visible on the top front.

iv. The HPB system should be provided with all interconnected piping from oxygen concentrator and should have a system so as to connect easily with oxygen refilling manifold of at least 50 cylinders per day. The system should have pressure cut off valves to cut the supply from HPB as soon as the desired pressure of 140 bar is achieved.

All the above equipment should be integrated and controlled through single control.

1.6 **Digitally Controlled Fully Automatic Servo Voltage Stabilizer**

The Voltage Stabiliser of 50-60 KVA capacity should work on minimum input voltage of 340V with output voltage of 440±5%. The Voltage stabilizer should be 3 phase, oil cooled, 50hz. and should be supplied with a control panel having by-pass switch, MCCB's selector switch with input and output voltage and current indicting meters. Transformer oil required for voltage stabilizer should be provided by the contractor.

2.0 Oxygen Supply System

2.1 Fully Automatic Oxygen Control Panel:

Automatic control panel should be constructed in accordance with the requirement of international standards. The fully automatic oxygen control panel should comply with HTM 02- 01/NFPA 99C/DIN/EN/ISO-7396-1 standards. It should be European CE Certified or UL listed.
The manifold assembly should provide two stages of pressure regulation. A single stage primary regulator, one for each cylinder bank should be used to initially reduce cylinder pressure and two single stage pressure regulators should be provided in the control cabinet for final delivery pressure regulation. One delivery pressure regulator in service and one should be ready for service in a standby mode. The Manifold control panel should be digital/Analogue, fully automatic type and switches from "Bank in Use" to "Reserve bank " without fluctuation in delivery supply line pressure. Changeover should be performed by electrically/pneumatically operated valves contained in the control cabinet.
In the event of an electrical power failure the valves should automatically open to provide an uninterrupted gas flow. It should be 100% automatic and should not require manual adjustment. Instruction for changing the cylinders should be clearly identified on the front of the control panel. All functional components should be enclosed in corrosion resistant robust material. All components inside the Control Panel like Pressure Regulators, piping and control switching equipment should be cleaned for Oxygen Service and installed inside the cabinet to minimize tampering with the regulators or switch settings. The Control Panel shall include two pressure relief valves, one high pressure approx.200psi and one low pressure approx.75 psi. The heavy duty control panel should be provided with a flow capacity of 2000 or more LPM at 50 to 60 psi. The Automatic Control Panel should be installed in such a way to meet the peak flow requirement of the Hospital/Institute (If the requirement is more than flow capacity requirement automatic control panel the bidders has to supply 02 numbers of Automatic Control Panel and design the system in such a way to meet the flow requirement of respective institute) Control panel should have Alarm reset switch/Mute /acknowledgement switch to control and monitor the alarm indications by the operator.

2.2 Oxygen Manifold Supply System (without Cylinders)

The size of Manifolds should be as mentioned in BOQ of respective Institute and it shall be compatible with Class-D type bulk cylinders.
Manifold shall consist of two high pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with respective numbers of cylinder pigtail connections to suit cylinder valves as per IS.3224/ BS/ ASME incorporating a check valve at the header connection.

The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections. Each header bar assembly shall be provided with a high pressure shut off valve.Oxygen Manifold should consist of 2 rows of respective numbers of class D-type bulk oxygen cylinders. The manifold should be hydraulically tested to 3500 psig.

The manifold should be so designed that it shall suit easy cylinder changing and positioning. The system should have non – return valves for easy changing of cylinders without closing the bank. The cylinder should be placed with the help of cylinder brackets and fixing chains which should be galvanized

2.3 Emergency Oxygen Manifold (without Cylinders)

The size of Manifolds should be as mentioned in BOQ of respective Institute and it shall be compatible with Class-D type bulk cylinders.
Manifold shall consist of two high pressure header bar assemblies to facilitate connection of respective numbers of primary and secondary cylinder supplies. Each header bar shall be provided with respective numbers of cylinder pigtail connections to suit cylinder valves as per IS.3224/ BS/ ASME incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections. Each header bar assembly shall be provided with a high pressure shut off valve.
Oxygen Manifold should consist of 2 rows of respective numbers of class D-type bulk oxygen cylinders. The manifold should be hydraulically tested to 3500 psig. The manifold should be so designed that it shall suit easy cylinder changing and positioning. The system should have non –return valves for easy changing of cylinders without closing the bank. The cylinder should be placed with the help of cylinder brackets and fixing chains which should be galvanized.

2.4 Oxygen Flow meter with Humidifier Bottle

Back Pressure Compensated flow meter for accurate gas flow measurement with following features:
A) Control within a range of 0-15 LPM.
B) It should meet strict precision and durability standard.
C) The flow meter body should be made of brass chrome plated materials.
D) The flow tube and shroud components should be made of clear, impact resistant polycarbonate.
E) Flow tube should have large and expanded 0-15 LPM range for improved readability at low flows.
F) Inlet filter of stainless steel wire mesh to prevent entry of foreign particles
G) The humidifier bottle is made of unbreakable & reusable polycarbonate /polysulfone material autoclavable at 121 degree centigrade .
H) Humidifier Bottle should be covered under warranty & CMC.
I) should be European CE certified/ UL Listed

3. NITROUS OXIDE SYSTEM

3.1 Fully Automatic Nitrous Oxide Control Panel

The fully automatic N2O control panel should comply with HTM 02-01/ NFPA 99 C/ EN /DIN /ISO 7396-1 STANDARD. It should be European CE Certified or UL listed.
The manifold assembly should provide two stages of pressure regulation. A single stage primary regulator, one for each cylinder bank should be used to initially reduce cylinder pressure and two single stage pressure regulators should be provided in the control cabinet for final delivery pressure regulation. One delivery pressure regulator in service and one should be ready for service in a Standby mode. The Manifold control panel should be digital/ Analogue, fully automatic type and switches from "Bank in Use" to "Reserve bank " without fluctuation in delivery supply line pressure. Changeover should be performed by electrically/pneumatically operated valves contained in the control cabinet. In the event of an electrical power failure the valves should automatically open to provide an uninterrupted gas flow. The manifold should not require any manual resetting or adjustments after the replacements of the depleted cylinders.
All functional components should be enclosed on fire resistant, robust synthetic polymer/SS.
The Control Panel shall include two pressure relief valves, one high pressure approx.200psi and one low pressure approx.75 psi.
The control panel should also have heaters to prevent ice formation on the regulators at high flow rates.
The Control Panel should be made to provide Heavy Duty and have a flow capacity of 500 LPM or more at 50 to 60 psi.
The Automatic Control Panel should be installed in such a way to meet the peak flow requirement of the Hospital/Institute (If the requirement is more than flow capacity requirement automatic control panel the bidders has to supply 02 numbers of Automatic Control Panel and design the system in such a way to meet the flow requirement of respective institute) Control panel should have Alarm reset switch/Mute /acknowledgement switch to control and monitor the alarm indications by the operator.

3.2 Nitrous Oxide Manifold (Without Cylinders)

The size of Manifolds should be as mentioned in BOQ of respective Institute and it shall be compatible with Class-D type bulk cylinders.
Manifold shall consist of two high-pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with respective number of cylinder pigtail connections to suit cylinder valves as perIS.3224/ BS/ ASME incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections.
Each header bar assembly shall be provided with a high pressure shut off valve. The manifold should be hydraulically tested to 3500 psig. The manifold should be so designed that it shall suit easy cylinder changing and positioning. The cylinder should be locked with the help of cylinder brackets and fixing chains which should be galvanized.

3.3 Emergency N2O Manifold (Without Cylinders)

The size of Manifolds should be as mentioned in BOQ of respective Institute and it shall be compatible with Class-D type bulk cylinders.
Manifold shall consist of two high-pressure header bar assemblies to facilitate connection of primary and secondary cylinder supplies. Each header bar shall be provided with respective numbers of cylinder pigtail connections to suit cylinder valves as per IS 3224/ BS/ ASME incorporating a check valve at the header connection. The high-pressure header bar shall be designed in such a manner that it can be extended to facilitate additional cylinder connections.
Each header bar assembly shall be provided with a high pressure shut off valve. Nitrous oxide manifold should consist of 2 rows of respective numbers of cylinders.
The manifold should be hydraulically tested to 3500 psig. The manifold should be so designed that it shall suit easy cylinder changing and positioning. The system should have non – return valves for easy

changing of cylinders without closing the bank. The cylinder should be placed with the help of cylinder brackets and fixing chains which should be galvanized.

4. MEDICAL AND SURGICAL AIR SYSTEM (Package Unit)

Air-cooled Oil-Less compressors for continuous duty application with highest output of compressed air, low power consumption and very low vibration resulting in low noise level.
The medical air plant shall fully comply with the requirements of the HTM 02-01/ NFPA 99C/EN/DIN/ISO 7396-1. It should be European CE/ UL listed. (In-case of NFPA 99c the control panel of plant must be UL Listed and Undertaking from manufacturer for this tender reference must be submitted for using the same control panel in the system offered)

4.1Air Compressor Modules

It should be Oil-Less **Screw Compressors** /**Scroll Compressors** to produces the plant output of **{minimum Liters Per Minutes(LPM) Plant capacity } as mentioned in BOQ of respective institute with necessary standby as per relevant standard**.
Medical quality air shall be delivered at a nominal pressure of 400 kPa (4 bar) and 700kPa(7 bar) gauge for supply of the hospital medical air and surgical air.
Compressor plant should be designed in such a way that compressors will switch on in a sequential manner as per flow demand.
The compressors should be standalone ones with independent power supply.Each Compressor should be suitable for both continuous and frequent start/stop operation at a nominal plant pressure of 10bar or more.
The duty compressors shall be automatically rotated by the plant control system to ensure even wear. Compressors shall be supplied and installed in such a way after cooler with a quiet running fan to maximize cooling and efficiency. Each desiccant dryer shall be provided with a dew point sensing switch that shall provide an alarm on the plant control panel and central hospital alarm system when the water concentration in the delivered air rises above the limit. Duplex desiccant dryer and filtration modules shall be provided with three or more individual stages of filtration as follows:
Stage 1: Coalescing filter upstream of the desiccant dryer for removing liquid water particles down to 1micron.
Stage 2: Particulate filter after the desiccant dryer for dust protection and removing particles down to 1 micron.
Stage 3: Bacteria filter for removing particles down to 0.01 micron.
Purity should be tested as per the **American Pharmacopeia / European Pharmacopeia** standard.
The plant control and power management system shall monitor the safe operation of the plant, providing signal into the alarm system as per the requirements of the standard.
Pressure Reducing Station: for 4 bar and 7 bar should fully comply and meet with the requirements of the standard. Simplex pressure reducing station shall comprise as in-line pressure regulator, with downstream pressure gauge. Isolation valves and pressure release valves should be provided as per the standard. Duplex pressure reducing station to have two branches, connected to the MGPS in parallel in order to allow maintenance on the components of one branch, while the gas flow is maintained in the other branch. Ball Valves - Full bore which operate from fully open to fully closed position with a quarter turn of the handle. Complete pressure reducing station with base plate mounted for ease of installation.
Padlocks available to allow locking of the valves in both open and closed positions and must have easy to read pressure gauges. Base plate mounted and supplied with copper stub pipes for ease of installation using inert jointing procedures.

The compressor system should have-

1. Intake filter Check Valve Delivery pipe
2. Mounting on air tank along with all standard fittings viz. safety valve, pressure gauge, delivery valve, drain valve etc.

3. Bidder shall provide all electric control panels, starters etc required for proper functioning of motor.
4. Desiccant Air Dryer – 2 nos.(Duplex)
5. 2-Stage or more Breathing Air Filters – 2 sets(Duplex)
6. Outlet pressures for drills/equipment and ventilators should be a minimum of 7 bar and 4 bar respectively.
7. Duplex pressure reducing station

The compressor should be heavy duty, reliable with long MTBF. Each compressor cylinder is to be protected by a temperature switch, which will stop the drive motor and provide an alarm signal in the event of abnormal discharge air temperature. Each compressor module should include an inline filter with particle retention of 10 microns, inlet isolation valve, discharge isolation valve, and pressure relief valve. The capacity should be capable to take care of total load of all the outlets.

4.2 Vertical Air Receiver

Total air receiver capacity shall be at least 50% of the primary plant capacity in 1 minute in terms of free air delivered at normal working pressure. Each air receiver shall be protected by a pressure relief valve, a fusible plug and include a pressure gauge with isolating valve and a drain cock.
The corrosion resistant coated receiver is to be equipped with tested safety pressure relief valve, sight glass pressure gauge, automatic drain, three-valve by-pass and source isolation valve.
Should be fabricated as per IS:2825/ASME/BS/

4.3 Air Treatment Module

The air treatment module should include dual dryers, dual filtration system and a dewpoint transmitter with local audible and visual signals and dry contacts for remote monitoring.
The components should be mounted on a common base with interconnecting copper/brass piping and upstream and downstream isolation valves. The isolation valves must allow either set of components to be serviced without shutting down the system.
Dryers should be of heatless desiccant design and sized to provide for the peak calculated demand. The desiccant dryers should be equipped with dew point dependent switching feature to minimize the need for purge air.
The dual filtration system should remove liquid and particulate matter, consisting of 0.5micron coalescing filters with differential pressure indicators and automatic drain, airline pressure regulators with gauges, final pressure relief valve, and sampling valve.
Each bank should consist of three stage treatment. Digital dew point monitor is to be supplied with alarm contacts as per requirement of the standard.

4.4 System Controls

The “Continuous on Demand” feature will stop the operation of the motors during periods of low or no demand. The control include individual self-protected combination motor controls with short circuit protection, single phase and thermal overload protection, individual control circuit transformers with fuseless primary and secondary protection, pressure sensors, temperature switches with reset buttons, and an electronic controller to automatically change the operating sequence of the compressors.
The cabinet shall have status display to include system pressure, dew point pump operation, accumulated time, maintenance interval, fault conditions, and silence button, lighted Hand-Off-Automatic selector switches and safety disconnect operating handles.
All required local alarm functions shall be integrated in to the packaged system.
The system should be designed to function even if the programmable controller fails.

4.5 Accessories

Accessories including for job site installation such as inlet and discharge flexible connectors, vibration mounting pads, and source isolation valve should be supplied.
All the filters should be covered under warranty period and CMC Period.

5. VACUUM SYSTEMS (Package unit)

It should be European CE certified or UL listed. (In-case of NFPA 99c the control panel of Plant must be UL Listed and Undertaking from manufacturer must be submitted for using the same control panel in the system offered)and should comply with HTM 02-01/ NFPA 99C/EN/DIN/ISO 7396-1

5.1 Vacuum Pump Module

It should be **Oil Sealed Rotary Vane Type** to produces the plant output of **{minimum Liters Per Minutes(LPM) Plant capacity } as mentioned in BOQ of respective institute with necessary standby as per relevant standard.**

Designed flow capacity should be minimum of LPM capacity as mentioned in BOQ of respective institute. The vacuum plant shall comprise air-cooled, oil lubricated rotary vane vacuum pumps suitable for both continuous and frequent start/stop operation at inlet vacuum levels between 500mmHg and 660 mmHg.
The control system should normally employ automatic rotation of the lead pump to maximize pump life and ensure even wear. Vacuum pump inlets shall include a wire mesh filter and integral non-return valve to prevent oil suck back and pressure increases in the vacuum system.
Each vacuum pump shall be fitted with anti-vibration pads between the pump foot and mounting frame.
The plant shall be fitted with duplex bacteria filter system.

5.2 Vacuum Receiver

The vacuum receiver shall be made of rust free corrosion resistant steel and fabricated as per IS:2825/ASME/BS/ISO for a vacuum pressure of 760mmHg. It should include bypass valves, manual drain valves, vacuum gauge. Vacuum reservoir shall have total volume of at least 100 % of plant output in one minute in terms of free air aspired at normal working pressure.

5.3 System Controls

The control include individual self-protected combination motor controls with short circuit, single phase and thermal overload protection, individual control circuit transformers with fuse less primary and secondary protection, pressure sensors, temperature switches with reset buttons, and an electronic controller to automatically change the operating sequence of the compressors. The system should have a status display to show the system pressure, elapsed time, maintenance interval, fault conditions, and silence button, lighted Hand-Off-Automatic selector switches and safety disconnect operating handles. All required local alarm functions should be integrated into the packaged system. The circuitry should be designed so that the audible signal can be silenced and the visual indicator will remain until the fault has been cleared and the reset button resets. Local alarm functions should be annunciating for reserve pump in use.

5.4 Bacterial Filters

The filters should be designed for removal of solid, liquid and bacterial contamination from the suction side of vacuum pump systems, preventing damage to the pump and the potential biological infection of the surrounding environment. The dryer should be particulate filter dryer with ability to remove particles as small as 1micron.
Each individual filter shall have the capacity to deliver full design flow such that one set is designated duty and the other will be standby. Bacteria filters shall have efficiency at least 99.999% when tested

by the sodium flame method in accordance with BS 3928:1969/as per required standard utilising particles in the 0.02 to 2 micron size range. The pressure drop across each clean filter at 50% of the system design flow should not exceed 25 mm Hg (3 kPa) at a vacuum of 475mm of Hg (63 kPa). Bacteria filters shall be marked with the legend 'Bio-Hazard'.
Each bacteria filter shall be provided with a transparent sterilizable collection jar to collect condensate. The total water capacity of the pressure vessels shall be at least 100% of the design flow rate of the plant in 1 minute in terms of free air aspired.

5.5 Accessories

Accessories included for job site installation are inlet and discharge flexible connectors, vibration mounting pads, and source isolation valve, inlet check valve, oil temperature gauge, thermal malfunction switch and vacuum control switch. Flexible connectors on inlet and exhaust of each pump, exhaust tee with union as well as copper tubing with Shut-off-cock for gauge and vacuum switch etc.
All the filters should be covered under warranty period and CMC Period.

5.6. Ward Vacuum Units

It must consists of the following:-

1. 1no of Suction Regulator and 1no of 1000 ml polysulfone /polycarbonate collection jar.
2. Suction Regulator: Suction regulator should be supplied with a safety jar, including and antibacterial filter and an anti-overflow safety device. Should have wide membrane continuous suction controller
3. Should have vacuum levels: 0-760 mm of Hg
4. Should have vacuum gauge fitted with a protective bumper device.
5. Should have on/off knob allowing for the quick restoration of a readjusted vacuum level.
6. Must have central adjustment knob with a color coded for 0 to 760 mm of Hg. Should have Polysulfone/polycarbonate 1000cc safety jar, autoclavable at 121º C at 5mins, unbreakable, fitted with an anti-overflow safety device and equipped with a plastic antibacterial filter. It should be totally transparent, to ensure perfect sucked liquid visibility.

5.7. Theatre Vacuum unit for OT

It must consist of the following: -
1. 1no. Suction Regulator and 2nos. 1700ml or more polysulfone/ polycarbonate collection jar and both to be mounted on a trolley.
2. Suction Regulator: Suction regulator should be supplied with a safety jar, including an anti-bacterial filter and an anti-overflow safety device. Should have wide membrane continuous suction controller
3. Should have vacuum levels : 0-760 mm of Hg
4. Should have vacuum gauge fitted with a protective bumper device.
5. Should have on/off knob allowing for the quick restoration of a readjusted vacuum level.
6. Must have central adjustment knob with a color coded for 0-760 mm of Hg. Should have polysulfone/polycarbonate safety jar, autoclavable at 121º C, unbreakable, fitted with an anti-overflow safety device and equipped with a plastic antibacterial filter.
7. Collection jar should be totally transparent, to ensure perfect sucked liquid visibility.

6. AGSS (Anesthetic Gas Scavenging System) Plant (Package Unit)

Duplex Anesthetic Gas Scavenging System (AGSS) of minimum 1400LPM, should be European CE Certified or UL listed. It shall confirm to HTM 02-01/ NFPA 99 C/EN/DIN/ISO 7396-1.
One pump working and one stand by and vice versa. The package should consist of two rotary vane vacuum pumps, a control panel, and mounted on a common base frame.

AGSS pump: AGSS pump shall operate completely dry permanently lubricated and sealed. Each pump should be completely air cooled and have absolutely no water requirements.
Duplex system in-line non-return values should allow individual pump servicing. Active
anesthetic gas scavenging systems should be designed to safely remove exhaled anesthetic agents from the operating environment and dispose of them to atmosphere from the highest point of the hospital building, thus preventing contamination of the operating department and providing a safe and healthy workspace for the personal. AGSS design should be dependent upon flow rate and pressure drop characteristics of the individual components of systems. It is essential that terminal units, remote controls (If required) and pump units work in synchronized manner after connection of workstation to the AGSS System.
Installation should be on roof top/suitable location. Piping, Non-Return-Valves (NRVs), and inlet nozzle should be suitably placed. Connecting hose suitable to fit with anesthesia workstation should be provided.

7. DISTRIBUTION PIPING

7.1 Piping specifications

Copper pipe should be as per standard BS: EN 13348:2008/ ASTM B819 standards, Solid drawn, seamless, deoxidized, non-arsenical, half hard (hard can be accepted only for sizes 54mm or more), tempered and degreased copper pipe conforming to the standard. 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.
Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's or TUV or SGS). Fittings should be made of copper and suitable for a working Pressure of up to 17bar and especially made for brazed socket type connections. The isolation valve body shall be made of chromium plated brass with non lubricated ball-type. All valves shall be pneumatically tested for twice the working pressure and factory degreased for medical gas service.
Copper fittings should comply with EN 1254:1 factory degreased and brazing filler metals should comply with EN 1044. Fitting should be degreased, individually packed for medical use.
The minimum thickness of copper pipes of 35mm and above outer diameter, should be 1.2mm and the thickness of copper pipes less than 28mm outer diameter, should be 1mm as mentioned in respective Institute's BOQ.

7.2 Installation & testing

Installation of piping shall be carried out with utmost cleanliness. Only pipes, fittings and valves that have been degreased and fittings shall be used at site. Pipe fixing clamps shall be of nonferrous or non-deteriorating plastic suitable for the diameter of the pipe.
Inert gas welding technique should be used by passing oxygen Free Nitrogen Gas inside the copper pipes during silver brazing, in order to avoid carbon deposition inside the copper pipes.
Only copper-to-copper joints are permitted on site except threaded or flanged joints may be made where pipelines are connected to items such as valves and control equipment. No flux shall be used for joining Copper to Copper joints and on for joints made on site. Copper to copper joints shall be brazed using a 5% silver-copper phosphorous brazing alloy CP104. A total of 5 joints shall be cut out for examination to establish the quality of the joints being made on site.
The insides shall be clean and free from oxides and particulate matter and the minimum
penetration of the brazing alloy at any point shall be three times the wall thickness of the tube. If the joints examined do not conform to these requirements, then adjacent joints shall be cut out and examined until the extent of faulty workmanship has been made good. Copper-to-brass or gunmetal joints shall only be made under controlled conditions off site. The joints are ordinarily used to join short copper pipe tails to brass, gunmetal or bronze fittings to permit their connection into the pipeline. The sub-assemblies shall be degreased and individually sealed in bags or boxes before delivery to site.

Adequate supports should be provided while laying pipelines to ensure that the pipes do not sag. Suitable sleeves shall be provided wherever pipes cross through walls / slabs. All pipe clamps shall be non-reactive to copper.
After erection, the pipes are to be flushed with dry nitrogen gas and then pressure tested with dry nitrogen at a pressure equal to twice the working pressure or 150 psig, whichever is higher for a period of not less than 24 hours.
Length and quantity of individual items (Copper pipes, AVSUs, Alarm panels, Isolation valves, Outlets, pendants etc.) are mentioned. However quantity will be calculated and paid at actuals. Bidder should quote unit price for all the items as detailed

Maximum interval between supports (Horizontal and Vertical)
(12mm Pipe - 1.5m, 15mm pipe - 1.5m, 22mm pipe – 2m, 28mm pipe-2m, 35mm pipe-2.5m, 42mm pipe -2.5m, 54mm pipe - 2.5m, 76mm pipe – 3meter)

7.3 Painting

All the pipes from manifold/plant upto the outlets should be painted with two coats of synthetic enamel paint and colour codification should be as per standards followed and with consultation with competent authorities of the Institute.

8. GAS OUTLETS

Terminal Units (Gas Outlets) with probes/Adaptors for O2, N2O, Compressed Air 4, Air 7, AGSS, Vacuum & CO2 (CO2 can be optional depending on the requirement)
The Medical gas outlets shall confirm to HTM 02-01/ NFPA 99 C/EN/DIN/ ISO 7396-1. Front Loading Type Terminal Outlets should be designed to dispense medical gases (or an inlet for medical vacuum) to the secondary equipment (flow meters, Suction regulators, etc.) at the point of use and is gas specific so that secondary devices cannot be “attached” to the wrong gas. When not in use the gas in a non-flowing state within the Outlet (Terminal unit) sealed by “O” ring. The adapter when inserted pushes the poppet inside and the gas starts flowing and sealing is ensured by the “O” ring or a seat. The Outlets are Quick Connect Type and gas specificity is accomplished by "Pin indexing." The outlets should have following features:
• Push to insert and press-to-release mechanism for probes.
• Allows plugging of probes from front.
• Self-sealing valve on disengaging the probe (Quick disconnect)
• Smooth quite action.
• Non return valve for on line servicing/ repairing
• Indexed to eliminate inter-changeability of gas services
• Color-coded gas specific front plate
• Totally leak proof, safe & easy to operate
• Configurations possible: surface, flush & Bead-head.
•Outlet should be European CE certified or American UL listed
•All outlets should have respective labels i.e.O2/N2O/CO2/Air4/Air7/Vacuum /AGSS/etc.) displayed accordingly.

9. AREA VALVE SERVICE UNIT-

Area valve service units should fully comply and meet with HTM 02-01/NFPA
99C/EN/DIN/ISO7396-1, It should provide a zone isolation facility for use either in an
emergency or for maintenance purpose The Area Valve Service Unit should incorporate a ball valve with NIST connectors either side mounted in a lockable box with emergency access. It should be reliable and easy to operate and must have NIST connectors facilitate easy purge, sample & pressure testing and emergency supply system.
Medical gas/vacuum services should be fixed copper, piped to and from their respective area valve service units. A color coded service identity label should be fitted behind the valve handle.

The unit should provide a zone isolation facility. Gas Flow direction should be indicated.
The box shall be made from extruded aluminium to prevent corrosion. All wetted parts (except seals and gaskets) should be brass or copper. Each unit assembly should be factory tested for gas tightness. Rubber pipe grommets should be provided to ensure any leaking gas does not escape from the unit into a wall cavity. All visible aluminum surfaces should be powder coated.

10. ALARM SYSTEM
10.1 Master Alarm

Should be European CE Certified or UL listed under Medical Devices Directive.
Complies with HTM 02-01 / NFPA 99C/EN/DIN/ ISO 7396-1 Standards.
Each Master Alarm should be modular in design and be fitted with required number of master alarm modules. The master alarms should be capable to monitor minimum 40 Point.
Each point represents an alarm condition that the source equipment might have. When an alarm condition exists, a red light flashes and the audible alarm sounds. If several alarm conditions occur simultaneously, the most recent alarm light should flash, while the other alarm lights should remain lit. When an alarm condition is created, an audible alarm should be actuated. A dry contact module should be available to interface with a building management system.
The box material should be of gauge steel of requisite thickness and equipped with mounting brackets. The emissions from alarms should conform with EMC standards.
Master alarm management system should be designed to display alarm conditions from the source supply units indicating the broad status of the source equipment and manifolds as well as the master distribution status from the source supplies. Depending on the alarm priority, a visual and audible alarm should be initiated to indicate an alarm condition.
Each panel shall display and/or input up to forty point alarms. Panel should be ready to use with BMS system.
The master alarm must be able to monitor the following source alarm conditions.

- Oxygen Source Empty/Fault
- Oxygen Cylinder Bank Empty/Fault
- Oxygen Emergency Bank Empty/Fault
- Air Compressor Faulty/Operation
- Vacuum Pump Faulty/Operational
- Vacuum Deficiency Vacuum Reservoir
- Other MGPS Signals & Alarms

Bidder shall be responsible for all cabling from local alarm panels to master alarm panel .

10.2 Medical Gas Area Alarm

The medical gas central alarms should be capable of monitoring up to 5 medical gas services(As specified in BOQ of respective institute) by means of pressure sensors which detect deviations from the normal operating limits of either pressure or medical vacuum. The area alarm should have a digital/analogue display of pressures. The medical gas area alarm should fully satisfy the HTM 02-01/ NFPA 99 C/EN/DIN/ISO 7396-1 requirements and should be European CE Certified or UL listed.
An audible warning should sound simultaneously with any failure indication and a mute facility should be provided. "

11. Line Isolation Valves-

The Lockable line valves must European CE mark/UL listed and complies with HTM 02-01/ NFPA99 C/EN/DIN/ISO 7396-1 standard.

12. Supply of O2 Cylinders – Class D Type

- Gas : Medical Oxygen
- Capacity of Gas : 7.00 CUM
- Capacity of Water: 46.7 ltrs.
- Standard : BS/ASME
- Working Pressure : 150 KGF/CM^2
- Test Pressure : 250 KGF/CM^2
- Outside Diameter : 232 mm
- Wall Thickness : 5.5 mm
- Length : 1370 mm
- Tear Weight: 54 kg. (approx.)
- The valves fitted to these cylinders should confirm to specification IS:3224 & IS:3745
- The Cylinder being offered should be manufactured within the country or imported from abroad and should conform to IS Specification 7285 and BS 5045 Part I respectively
- They should also have approval of the Chief Controller of Explosives, Govt. of India, Nagpur
- Each Cylinder Shoulders should be stamped with GG : Symbol for Gas, Mfgr. : Identification Mark, MMYY : Month & Year of Hyd. Test, XYZ : Serial No. of Cylinder, IS 7285: B.I.S. Specification, TW : Tear Weight, TP : Test Pressure FP:

13. Supply of N2O Cylinders – Class D Type

- Gas : Nitrous Oxide
- Capacity of Gas : 30.0 Kg
- Capacity of Water: 46.7 ltrs.
- Standard : BS/ASME
- Working Pressure : 150 KGF/CM^2
- Test Pressure : 250 KGF/CM^2
- Outside Diameter : 232 mm
- Wall Thickness : 5.5 mm
- Length : 1380 mm
- Tear Weight: 53 kg. (approx.)

- The valves fitted to these cylinders should confirm to specification IS:3224 & IS:3745
- The Cylinder being offered should be manufactured within the country or imported from abroad and should conform to IS Specification 7285 and BS 5045 Part I respectively
- They should also have approval of the Chief Controller of Explosives, Govt. of India, Nagpur
- Each Cylinder Shoulders should be stamped with GG : Symbol for Gas, Mfgr. : Identification Mark, MMYY : Month & Year of Hyd. Test, XYZ : Serial No. of Cylinder, IS 7285: B.I.S. Specification, TW : Tear Weight, TP : Test Pressure FP:

14. Horizontal/ Vertical Bed Head Panel

It shall confirm to HTM 02-01/ NFPA 99 C/EN/DIN/ISO 7396-1. The design should be approved by the respective institute before installation and it is responsibility of the bidder after getting order they have to discuss with respective institute and finalized the Bed Head Panel (Vertical/Horizontal) as per site condition.

It should have following features:-
Efficient, Safe & Robust design in extruded aluminium section.
Smooth curved surfaces, and choice of base colour and fascia plates.
Unit should have integrated rail system to mount accessories

The headwall system should be constructed of aluminium extrusions joined together to form a carcass to suit the particular application. Unit should be factory assembled for electrical and mechanical components.
Segregation of services i.e. Low voltage supplies, High Voltage supply and Medical gases should be maintained throughout.
Front fascia plate should be removable individually to access for respective service.
Bed space management system with optional equipment rail. With all Equipment Rail mount

Accessories.

All down drops should be installed at one end preferably & Vertical drop installed at one end should be covered with Aluminium boxing with matching color.
Each bed-head unit shall be supplied with electrical and electrical outlets pre-fitted, wired and certified. (Wired up to the distribution box provided with leakage protection & proper earthling arrangements)
Note: Imported Gas Outlets quantities are already taken in consideration of quantities of respective outlets in BOQ

Facility per unit as under

Oxygen – 2
Vacuum – 2
Medical Air-1
Holder for vacuum collection jar –1
Nurse call switch – 1 (not in the scope of MGPS Vendor only space for same has to provide) Lamp with flexible LED lighting – 1
Infusion pump mount pole with adapter for mounting at least two infusion pumps
5 /15A combined Electrical outlets – 8 Nos. or more
RJ-45 socket/ Ethernet -01
Two spare spaces
Monitor Bracket

15. ICU PENDANT

The Pendant column shall be made of aluminium profiles ensuring medical gas supply and full access to accessories and pipes in 3 compartments individually closed by 2 removable covers (complying with international standards). Non removable covers are prohibited. Pendant shall be hung from concrete ceiling and flashed with false ceiling.

Electrical and medical gas connections shall be in the column and shall be accessible without damaging the ceiling. If the ceiling is not ventilated, its medical gas compartments shall have to be made airtight.
The height of the column shall be defined so to leave a 46 cm (18 in) space between the floor and the bottom of the column.

The electrical and medical gas fittings are completely modular, which allows the components to be extended, moved, removed or maintained without cutting the housing. The design of the technical column also allows an invisible yet efficient ventilation of the medical gas compartment, and a mechanical separation between electrical and medical gas networks. The covers shall be wired to the earth at the bottom of the unit. Prong systems are prohibited.

The round curves and smooth surface of the product enable its safe use and easy cleaning.

The section of the profiles so assembled must be able to resist important shocks (bed with patient) without damaging the column, or causing equipment to fall over.

Two attached stainless steel tubes of a diameter of 30 mm (1.2 in) and a height of 150 cm (59 in) shall be laterally installed on supports placed 20 cm (8 in) away from the body of the column so to hold accessories (syringe pumps, a monitoring unit, a shelf, a rail, and so on...) without denying access to medical gas and power supply equipment.

A leading system for tubes and wires shall be planned (shape of supports or movable elements) for hygienic reasons pertaining to the crossing of clean and dirty elements. That system shall also be easy to clean and shall enable the quick handling of these tubes and wires.

Entire pipe line shall run in continuous Pendant with no break for each unit & length as per area where it has to be installed

Pendant shall be mounted with Anchor Plate/Ceiling plate, Fix plate, drop tubes and extendable arms.

Pre-piped pendant. Gas hoses shall be antistatic

Load bearing shall be at least 150 -200 Kg

Pendant shall have CE/UL/USFDA

Each work station shall be equipped with :

- 6 earthed 6/16 A sockets (Fiji) pre-wired in both arms.
- 1 RJ45 socket for computer not pre-wired (to be connected to the ELV network)
- 1 RJ45 socket for monitor not pre-wired (to be connected to the ELV network)
- 2x Infusion arm with Bracket
- Baskets -1 No made of SS-304 wire
- Movable Shelf
- Monitor Mount/shelf
- Flow meter cum Humidifier holding bracket
- Examination lamp 50W/12V arm of suitable length
- 1xSuction Jar Holder
- 1 Nurse call
- Sharps Bin Holder
- Provision of gas outlets 2 Oxygen outlets
- 1 Compressed Medical Air (4 Bar) outlet
- 2 Vacuum outlets

16. Medical Gas Hose for O2, N2O, Compressed Air,& Vacuum

It should be colour coded for individual services i.e. white for Oxygen, Blue for N2O and Yellow for Vacuum, Black for air. Antistatic rubber tube should be as per ISO standards. It should be CE marked/UL Listed imported. (The 200m Hose- Gas wise requirement should be taken from respective institute before supply total lengths should be 200m inclusive of all type. If institute requires more than payment will be made on actual basis as per finalized BOQ rate)

17. Electrical Wiring with Electrical Panels –

All wiring inside the Manifold Room and Plant room required for MGPS equipment and General electrification. Institute will provide one point supply only. Other are under the scope of bidder. All the work should be as per CE standard and material used should be reputed make only.

Panel shall be wall mounted and fabricated from16/14 SWG CRCA Sheet duly powder coated. Panel shall incorporate isolators for the following equipments.

I. Isolator for Medical Compressed air system.
II. Isolator for Medical Vacuum System
III. Isolator for AGSS System.

Panel shall have following instrumentations for easy monitoring purpose.:-

a. Incoming power supply indications of each Phase
b. Mains indication for mains supply on for each Phase.
c. Mains shall have digital metering.
d. Each circuit shall have digital meter.
e. Mains and each circuit shall be with MCCB only.

18. Turn Key works–

Antistatic rubber flooring of 1" thick in the manifold room.
Loading/Unloading Platform of suitable sized adjacent to manifold room, so that cylinder can be loaded & unloaded easily form the lorry/vehicle.
Foundation for Medical Air Plant, Vacuum Pant & AGSS Plant in the Plant Room.
MGPS bidder shall cooperate with the MOT bidder for associated works. Trenching or other associated work related to installation and commissioning of complete MGPS system.

Providing all tools, tackles, manpower for demolishing /dismantling, alteration/ addition for lime concrete, cement concrete, R.C.C, R.B work, precast concrete or stone slabs in walls, partition walls , stone rubble masonry, dressed stone work, ashlar face stone work, marble work or precast concrete work, dismantling doors, windows and clerestory window (steel or wood) shutter including chowkhats, architrave, holdfasts etc. CI or asbestos rain water pipes of any diameter with fittings and clamps, dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, taking out doors, windows and clerestory window shutters (steel or wood), wood work in frames, trusses, purlins and rafters, dismantling steel work in single sections including dismembering and stacking, dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc., old plaster or skirting raking out joints and cleaning the surface for plaster, dismantling of R.C.C. spun vent shaft including
excavating the cement concrete pit completely, taking out the shaft, refiling the excavated gap, stacking the useful materials near the site extra for cutting reinforcement bars, Dismantling aluminium/ Gypsum partitions doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material within 1000 meters lead and any other work as directed by engineer-in-charge. Disposal of building rubbish/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge. **Electrical wiring** including **Earthing** of equipment and Electrical Control and **Ventilation** of Manifold and Plant room shall be provided.

Note :

- The bidder should attach the list of equipments for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipments to periodically check the electrical safety aspects which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipments. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipments checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive Maintenance call.

- Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS).
- The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month. All software updates should be provided free of cost during warranty period and CMC Period
- The bidder should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues
- The contractor shall be responsible for the complete works including submission of working drawing and walk through view.
- The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.
- Engineer may instruct for any test this test to be got done by contractor at their own cost.
- The contractor should provide all electrical accessories like cable wire, electrical outlets, switches etc, and they should be fire proof of reputed make, certified for electrical safety.
- Wherever makes have not been specified for certain items, the contractor should provide the same as per approval of HSCC/Client.
- The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation and commissioning.
- The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for MGMS.
- The final Payment will be made on the actual measurement of the BOQ Items and ranking will be done with tendered BOQ.
- The MGPS bidder has to terminate/interconnect all the medical gas lines upto/to the OT/MOT.
- The contractor should provide Third party quality certificate of the MGMS equipment from SGS/TUV/Lloyds saying as "Certifies that the MGMS equipment meets the technical specification and BOQ of the Contract".

APPROVED MAKES FOR MEDICAL GAS MANIFOLD SYSTEM

1	Automatic Oxygen Control Panel	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
2	Automatic Nitrous Control Panel	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
3	Air Compressor	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech/Atlas Copco
4	Vacuum Unit	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
5	AGSS	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
6	Copper Pipe	Maxflow/Rajco/Precision

7	Valve Box	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
8	Alarm	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
9	Isolation valve	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
10	Bed Head Panel	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech/Trilux/LM Medical/Medepha
11	Gas Outlets	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
12	Accessories	Amico/Allied Health care/Becon Medaes/Drager/Ohio Medical/Pneumatech Medical/Tritech
13	Electric Control Panel	L & T/ SIEMENS/ SCHNEIDER
14	ICU Pendant	Ondal/ Pneumatic Berlin / Pneumatech Medical / Trilux/Stark Storm/Amico/Becon Medaes//Trumf/Martin/Drager/Biolume/TLV/Tritech
15	Oxygen Concentrator Module	Oxymat/Novair/Oxyplus/Airsep/RiFair
16	Compressor for Concentrator	Kaeser/Atlas Copco
17	High Pressure Booster for Concentrator	Rix/RiFair/ICL

*NOTE:- BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION FOR MODULAR MINOR OPERATION THEATRE

SCOPE OF WORK -

Construction of Modular Operating Theatre (Minor) in accordance with the specifications, bill of quantities and providing of free spare parts and service during Defect Liability Period.

1 WALLS &CEILING CONSTR\UCTION:

The prefabricated construction for Double skinned panel of 0.8mm thick 304 Grade Stainless Steel sheet each. The double skinned panel shall be sandwiched with core consisting of rigid polyurethane foam (PUF), which has been injected under high pressure, with a minimum density of 40 kg/m3. with Silicon sealant to provide seamless operating room. The individual wall panels shall use the tongue and groove technology for joining two panels, no welding should be allowed.

The ceiling suspension from concrete ceiling should be as:

Suspension elements : Suspension bracket with tension spring
Suspension Height: Continuously adjustable from 250 to 1100 mm
Stability: Permanent and non-stop after adjustment.
Material High quality galvanized steel

The external wall of the room shall be constructed with solid brick and mortar by the hospital authority. Clearance between inner panel and outer wall preferably should be 40-55 cm to allow the maintenance personnel for service. This closed space should be flushed continuously to eliminate dust and bacterial accumulation. In order to create a smooth uninterrupted surface between adjacent panels, thereby preventing the risk of the accumulation of dust and bacteria in gaps, the panel should be produced in a single full height floor-to ceiling piece. The total distance between inside and outside surfaces of the operating room should be sufficient for flush mounting of the equipment. All the sharp edges and corners of the OT room should be rounded /coved to avoid bacterial contamination. The wall panel and Ceiling design and construction should be strong enough to allow for the installation and support of all equipment and should have provision of opening required for the installations without affecting rigidity and strength. Access Boxes should be fitted to the rear of all wall-mounted equipment to enable maintenance to be carried out from outside the operating room. Wall paneling should be of fire protection or Reaction to fire class-1 norm. Room lighting, air supply inlet, Ceiling Service units, return air outlets etc should be integrated with SS metal ceiling system. The individual panels except those at the edges should be removable individually. The Walls and suspended Ceiling should be hermetically sealed. All the four corners should have return air duct outlets and grill for the same made of SS with the color choice to suit the hospital's choice. The system should afford the maximum versatility at the planning stage and flexibility during erection, ensuring openness to future alternations and trouble–free maintenance. During the installation of first the structural parts and subsequently the finishing elements, the system should ensure perfect integration of technical networks and allow ample operational flexibility at the construction site. The clean, dry installation method should enable optimum programming of the various work phases, allowing optimization of the installation of

technical systems and any necessary alterations to be made – right up to checking and final testing of the installed systems – before the modules are sealed.
The cavity between the inner and outer walls should be left with minimum obstructions for the possible addition of equipment at a later date and to enable services, pipes, conduits etc, to be run within the cavity. The wall panel should be fixed to the brick wall with supports/sub-frame on which individual wall panels will be mounted. The wall panel should be fixed to the brick wall with supports. All joints and cavities should be filled with Metallic Epoxy sealer and sanded flush to provide seamless finish.
The internal surfaces of the walls and ceiling of Operation theatre should be sprayed with **anti-bacterial paint** (Factory Internal test report to be submitted) to a minimum dry film thickness of 300 microns with primer and putty. The anti bacterial paint coating should overlap the floor coving, ceiling system and door frames by 25 microns to provide a continuous sealed surface. The anti bacterial paint coating should be non-reflective type, highly resistant to abrasives, water, detergents and weak acids and alkali used in cleaning area. The coatings should have no loss of performance or adhesion to the substrate in the case of regular steam cleaning. Imported Anti bacterial paint applied should not leach out in order to maintain anti- microbial system throughout the life of the product.

A Galvanized steel cover plate shall be installed between the inner and outer wall panels, sealing and protecting the cavity from the ingress of vermin and contaminants, whilst allowing the removal at a later date for upgrading, disassembly, enlargement, or relocation.

Internal colour of the wall and ceiling panel shall be as suggested by the Institute.

2 CEILING FILTRATION SYSTEM / LAMINAR AIR FLOW SYSTEM

(Unidirectional Low Turbulence Laminar Air Flow Plenum Ceiling for each OT)

Plan air Ceiling System, standard size. PLENUM UNIT - The complete unit shall have factory prepared fine sealing system. It should be perfectly seamless integration of ceiling mounted equipment and OT Ceiling. It should be flexible modular range of solutions, adjustable to the local requirements .It should be made out of high quality and durable materials, filter housings and pressure chamber are made out of Aluminum. It should have a low pressure drop allows for the long-term usage of the HEPA miniplete H14 filters . It should have reliable filter efficiency and filters are guaranteed to remove particles and gems with the usual H14 filters retaining 99.99 % of the particles and germs. It should have minimal pressure drop a low pressure drop ensures the energy saving characteristic of the Laminar Flow Ceiling . Air & light diffuser made out of two layer of mono filament precision woven polyester for the plan air ceiling to give a “LAMINAR FLOW” of filtered air Size-8ft x 6ft. It also provides a diffused shadow less lighting system with a control on the intensity of luminance by using high frequency electronic fluorescent tubes and ballasts.

3. DOORS AND FRAMES (AUTOMATIC HERMETICALLY SEALED SLIDING DOORS) Size-2100mm x 1800mm) SMS

To maintain sterility and correct air pressure in the theatre, the door should be sliding and hermetically sealed type. Door should meet international quality and safety requirements.

- Controller should be Microprocessor based controller (CE marked) and should have digital display
- Regulated electro-mechanical sliding door drive.
- Suitable capacity of Motor should be equipped.
- Noise level of movement should not be more than 60 decibel.
- Power efficiency should be 0.95 (in AC 100 V full load).
- The track should be made up of single piece extruded aluminum
- Environment temperature should be –20 ºC to +55º C.
- Electrical safety codes for High & Low voltage system design should meet HTM 2020 /2021 standards.
- The door and control should comply current IEE regulations and BS 7971 standard.

Hermetically sealed Sliding Automatic Door shall be with Vision Panels 300 mm x 300 mm with double glazed panels and hermetically sealed should be equipped for OT.

The door panel should be hygienic SMS (Solid Mineral Sheet) that can withstand high abrasion. The thickness of the door core should be 48mm. The top layer on both sides is high Pressure laminate of size 6mm. The overall thickness of the door shutter is 60 mm. The inner part of the door should be filled with CFC free polyurethane foam.

Sealed airtight system should be provided to prevent further ingress of any microbial organism. The door should be fixed to Aluminum frame. Reinforcement of Extruded Anodized Aluminium material for SMS Panel should be with door frames. Nylon runner guides should be fixed to the door in such a way that there shall be no obstruction to the Trolley movement. The door leaf should have high quality synthetic rubber gasket with long life to ensure hermetic sealing to maintain pressure differential. Air tightness 99.99% at a pressure 50 (Test certificate for hermetic sealing with door frame should be provided with pre-despatch documents. The finished door on either side of the door should be perfectly level (maximum permissible difference +1mm). The track of the door should be made up of single piece extruded Aluminum and the running surface for the top rollers shall be suitably angled to reduce resistance to movement. The door leaf should be hung by means of hard plastic rollers of high quality with double bearing at the top. Roller should be provided under the stainless steel/extruded aluminum track to enable smooth the noiseless movement. The doorframe, track and the wheel should be designed in such a way that during last 50 mm at travel on the closing cycle the door should make a tight sealing with the frame. The door should be provided with high quality cylindrical lock. The lock should be activated or switched off by means of the key switch. The door should be governed by two sensors for half and full closure. The door controller should sense overload condition and in overload case the door shall be automatically stopped and

reversed the direction of travel. The controller should be capable of either operated by elbow switch; foot switch & radar switch (Touch fewer sensors). The door should be operated easily manually in the event of failure of the power supply or the automatic mechanism. Door opening handle should be strong and sturdy and the handle material should be AISI-304 Stainless steel and glossy finish. High and Low voltage system of the door should meet electrical safety code..

4. DOORS AND FRAMES - (Size-2100mm x 1000mm) SMS
Same as Sl.-3

5. PERIPHERAL LIGHT

It should be fitted outside the air ceiling system area and flush with the ceiling in the operation theatre suitable to required illumination of OT. Peripheral lights and clean room luminaries fitted in the frame should be 8 Nos or more depending on the size of OT and required 500 Lux level. The fluorescent lamps / Non-hygroscopic high glow low power LED based peripheral lights (2'x2') having high quality low wattage LED lighting system with highly spectacular anodized Aluminum reflectors and optical antiglare system for adjustable light distribution. Luminaire cover made of highly resistant, disinfectant proof laminated safety glass with fine grained surface, glass pane with white powder coated steel frame. Luminaire body made of sheet steel, white, powder coated supplied ready for connection. The reflectors should be of high quality, cleanable and non deteriorating. Dimmable ballasts of reputed companies to be used and diffuser should be constructed with opaque acrylic diffuser material in aluminum frames/ SS frames. It should have flicker less design with color. Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable form top or bottom. Lighting units should be properly sealed with the ceiling by means of fillers and beadings so that all lighting units are airtight with ceiling panels. The light fitting should be uniformly and aesthetically distributed on the ceiling to provide uniform illumination in the OR. Peripheral lighting should be done according to **IP54 protocol**. Light should not interfere when green mode of Endoscopy is performed.

6. DISTRIBUTION BOARD, ELECTRICAL WIRING, CONDUITING WITH FIXTURES INSIDE THE OPERATION THEATRE

Electrical Distribution Board should be installed in a separate enclosure. Transformers, Mains, Relays, Circuit protective equipment, for all circuits of Operation theatre shall be installed in the remote cabinet. All electrical wiring should be terminated to the connectors mounted on DIN/CE approved rail and labeled with indelible labels. Individual fuse and miniature circuit breakers should protect all internal circuits. Complete schematic diagram drawing description should be enclosed with the equipment.
Laying of PVC conduits, Modular Switch Boxes, Modular Switches-sockets, Power and Light wiring including Earthing wire for all the lighting controls, Pendant and other equipment fixtures and fittings inside the theatre Wiring with low leakage current wires of

FRLS wires should be as per requirements. 6/16 Amps **antibacterial switch socket** set- 2 Nos shall be equidistant flushed in each wall at 325mm height from FFL of OT. Wiring for 250 volts single phase and earth 4 sq.mm and 2.5 sq.mm PVC insulated copper conductor 1100 volts stranded flexible wires should be concealed with conduit for switch & sockets. One switch and socket along with suitable size of wire must be fitted inside the OT for operating 'C'Arm. Installation of all electrical cabling and wiring and other accessories of it must be of international standard and proper earthing of OT in the OT room as per standard guidelines. Fittings should be sealed on accordance with the standard IP54. Earthed equipotent bonding of all exposed metal work should be provided.

7. OPERATION THEATRE FLOORING (ANTISTATIC CONDUCTIVE PVC ROLL)

The Operation theatre floor finish should be laid with 2 mm antistatic seamless conductive PVC Roll on a semi-conductive adhesive base. The floor should be scratch resistant, fire resistant, chemical resistant, non-corrosive, slip resistant, smooth, anti fungi, antimicrobial impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock. The floor finish should pass over a concealed cove former and continue up the wall for 100mm. The floor should be provided flat to within a tolerance of ±3mm over any 30 Sq.mtr area. Copper grounding strip (0.05 thick, 50 mm width) should be laid flat on the floor in the conductive adhesive and connect to copper wire of grounding. The connection from copper grid should be brought out uniformly at places to form equi-potential grid. A self-leveling compound should be laid prior to lying of the floor finish. One earthing lead should be brought out of from every 150 Sq.ft. area and attaching it to main earthing strip/ground. Continuous roll should be used and all the joints should be welded by heat fusion process to get seamless floor. The joints in the flooring should be sealed by using a PVC welding bar of matching colour and hot air gun for fusion of welding bar with flooring to provide a continuous sealed surface, confirming the European/US standards. The sheets should be highly durable with resistance to shock, scratch proof and indentation. Corners should be uniformly curved. The conductive material should be uniformly impregnated as grains. The floor should be inert to body fluids, chemicals, detergents and disinfectants and it should not be affected by temperature variation within the OT. Colour should be uniform, pleasant and matching with ambience. The floor should have electrical resistance(Point to ground) within 2.5x10 to $2.5x10^6$ Ohms. The floor should efficiently discharge electric charges upto 2 KV. The floor should not allow build up of electrical charge beyond 100 volts due to antistatic effect. It should fulfill product requirement. The corner should not be terminated sharply and concealed cove-former (Aluminum) should be used overlap to a height of approx.25mm and sealed perfectly and uniformly. Self-leveling compounds should be used for this purpose. Radius for corner coving - 70R

8. VIEW WINDOW

View window with motorized horizontal Venetian blinds sandwiched in two parallel toughened glasses of thickness 5 mm. The Window frame should be powder coated Aluminum of approved shape flush mounted with wall paneling. The entire assembly should be completely sealed and fitted with proper Aluminum profile. The assembled thickness of the Window should be 33 mm. The **window blinds** should be operated electrically/manually.

9. INTERNAL DUCTING

The internal ducting Supply air and Return air ducts of the Operating theatre should be done as per ISI-655 duly fabricated out of 22 swg Aluminum sheet complete with flanges and accessories such as GI suspenders and GI supports completely sealed with Silicon sealant duly insulated with Aluminum foil and (XLPE)Polyethylene/Nitrile Rubber self adhesive type insulation. The type of insulation and its thickness should be such that there is no sweating. The to be provided

10. MEDICAL GAS LINE INSTALLATION

Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide and AGSS supply to Operation Theatres from the existing manifold system should be provided. The medical gas alarm system shall be installed which fully satisfies the principles of HTM 01-02/NFPA99c.
Medical graded Copper pipes shall be solid drawn, tempered, seamless, phosphorous deoxidized, non-arsenic and degreased for oxygen service. Copper to Copper joints shall be made on site using silver-copper-phosphorous brazing alloy to BS-1845. Copper to brass or gunmetal joints shall not be made on site. Except for mechanical joints used for components, all metallic pipeline joints shall be brazed or welded. All pipelines shall be routed in such a way that their not exposed to a temperature less than 5 deg Celsius above the dew point of the gas distribution pressure. The chemical composition shall be as per BS-6017: 1981 Table 2, Cu-DHP grade. Distribution Copper Pipe manufactured as per **BSEN:13348:2008** Each pipe shall be capped at both ends before supply. Pipeline shall be supported at interval to prevent sagging.

The supply of pipes shall accompany with manufacturers test certificates for physical properties and chemical composition. The supply of pipes shall be further substantiated with inspection certificates from third party inspectors like LLOYDS.

Medical graded Copper Piping should be laid down from Pendant/BHP/Wall mounted gas Outlets of Minor OT to the nearby Valve Box outside the Operation Theatre. **The Copper pipe should be concealed to the wall inside the Minor OT within MS tube.**

Medical gas outlets(Double locked) like Oxygen outlets X 2, Air(4 bar) X 1, Nitrous oxide X 1 and Vacuum outlet X 2, AGSS outlet X 1 should be fitted inside the Minor OT. Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding (Outlets should be as per the prevailing standard of the existing Medical Gas Manifold System of the hospital.).

Pipe OD (in mm)	Thickness (in mm)
12	0.7
15	0.9
22	0.9

PAINTING

All exposed pipes is has been painted with two coats of synthetic enamel paint and colour codification shall be of (ISO) international standard.

11. SCRUB STATION

Compact Surgical Scrub sink -2 Bay should be designed for use in Operation theatre complex providing surgeons with a convenient sink for pre-OT scrub up. The Scrub Sink should be made of 1.5mm thick AISI-304 Stainless Steel and top surface(Counter) should be made of one piece and polished to seamless satin finish. 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. Hands free operation should include infra-red sensors with built-in range of adjustment. Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature. User defined time 1, 3,5,10 min. are available. This timing should be adjustable to meet individual application requirements, provided with infrared sensors, thermostatic control taps with fail-safe temperature controls. All units should have reduced anti splash front. It should have manual foot and operation mode. Knee operated switch should be provided additionally. The station should also have inbuilt soap dispensers. The Scrubber shall have in-built 20 L Geyser for supply of hot water

12. **SURGICAL OT LIGHT-DUAL DOME (LED) -**

OT Light – LED

Operating Room Surgical Lighting System should provide an ideal combination of brightness, manoeuvrability, 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) Colour Temperature range: 3800 k -5000 (±10 %) - Variable colour temperature.
c) Field Size Diameter: 20 to 28cm (+/- 10%)
d) Depth of Field : 750 to 1100mm (+/- 10%)
e) Illumination Level : 160000Lux at both domes
f) Controls : Control Panel (wall and on dome)
g) Rotation : 360 -330degrees
h) Sterilizable Handle: 02 Nos.
i) Mounting Type : Ceiling
j) Supply Voltage : 230 VAC 50 Hz
k) Bulb Type : LED
l) Dimming Range : 50% - 100%
m) Operating/Storage Humidity: 10-95%
n) Life of Light Source : >40,000 Hrs
o) Should have provision to mount the Camera in one dome
p) Surgical Light System Should be compliant with relevant European CE with 4 digit /US FDA standards or Declaration of conformity for quoted model with ISO 13485 issued by 4 digit notified body.

13. MOTORISED OPHTHALMIC OPERATION TABLE Product Quality Standard:

- Should be CE/USFDA/BIS approved model.
- Manufacturer should be ISO 13485 certified.

- **Specifications:**

- Should be electro-hydraulically operated.
- Disinfectant resistant stainless steel finished, foot switch operated
- All stainless steel accessories
- With special design cushioned head holder
- Safety back up of all functions
- Up & down movements
- Minimum height : 700 mm (approx)
- Maximum height : 900 mm (approx)
- Stroke length : 200 mm (approx)
- Standard Accessories: 1.Foot switch (1no.), 2.Power cord (1no.)

MOTORIZED SURGEON CHAIR

- Product Quality Standard:
- Should be CE/USFDA
- Manufacturer should be ISO 13485 certified.
- Specifications
- Minimum height 480mm (approx.)
- Maximum height 630mm (approx.)
- Maximum load lifting 250Kg (approx.)
- Movement 5 twin castor
- Operated motor DC

Power supply unit 24 V DC (1), 2. Foot switch (1), 3. Power cord (1)

14. IN ADDITION TO THE ABOVE, FOLLOWING <u>TURNKEY WORKS</u> FOR INSTALLATION AND COMMISSIONING OF MODULAR MINOR OT ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR :

- The turnkey work includes all modifications to the built up space provided at the hospital site including civil modifications, electrical works, plumbing works, all cable trenches and railings wherever required, interior decoration, air conditioning duct, furniture 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. Demolishing, re-constructing, water roofing, plumbing, repainting and replacement Any demolition , reconstruction, water proofing, necessary plumbing, anti-microbial painting, replacement of any door or windows to provide structured design for MINOR OT
- **Electrical cabling** and wiring from MDB (Single point source) to Electric Distributional Panel and to the corresponding load points. **Electrical Panel** of suitable capacity for supply of power to the OT**.**
- **Earthing system** of electrical instrument and accessories in the OT area **as per standard guidelines of BS(Latest edition)/International standard**. All cable trenches and railings should be made wherever required.
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Light Points, Power points, in the Modular OT room. • Number of fans, power point, bulbs/tube light. Apart from these supplies to the individual equipments with ELCB & MCB for MINOR OT • Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for Control Panel for MINOR OT.

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the MINOT OT then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES

1	PVC Floor	Gerfloor/Tarkett/Forbo/Polyfloor/Armstrong/Altro
2	OT LED Light	Stryker/Maquet/Trilux/Berchtold/Simeon/Danmedics/Trumf/Martin/ Evonos/Surgiris
3	Copper Pipe	Maxflow/Rajco/Precision
4	Door	Metaflex/SHD/GEZE/Rebbon/ Dorma/SHD
5	Peripheral Light (LED)	Philips/Wipro/GE/Crompton

The makes for other items of Modular MINOR OT shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

Note: All electrical accessories like cable wire, electrical outlets, switches etc supplied by the contractor should be fire proof of reputed make, certified for electrical safety.

- **The contractor should provide test certificate for all material used for construction of OT**
- **The contractor shall be responsible for the complete works including submission of working drawing and walk through view.**
- **The contractor should provide complete Operation manual/Parts manual/Service manuals for all systems and subsystems.**
- **The contractor shall bear the cost of Final electrical safety test, system test and calibration to be done by authorized person with test instruments.**
- **Training should be provided by the contractor.**
- **Third party quality certification of the imported equipment from SGS/TUV/Lloyds/Bureau Veritas should be submitted by the contractor as "Certifies that the imported Modular OT items meet the technical specification and BOQ of the tender document vide contract No (Mention Contract No.)."**

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION OF MORTUARY CHAMBER

SCOPE OF WORK- Supply, Installation, Testing & Commissioning of Mortuary Chamber including turnkey works and hand over to the hospital in good working condition and providing free labour and spares during Defect Liability Period

Mortuary chambers of 6 bodies – 2 Nos. shall be used for keeping cadaver under cool condition to prevent decomposition either for the purpose of conducting postmortem or before handing it over to the relatives of the dead patient.

- Mortuary should be energy efficient and capable for storing of cadaverous for long time and ensuring best hygiene

The outer panels of all Mortuary chamber shall be of Stainless steel having a superior bacteria resistance film coating for greater hygiene and Polyurethane foam insulation of 35mm and inner chamber shall be of Stainless steel-AISI-304. Corrosion free exterior and interior. Mortuary Chamber shall have Front opening Doors.

- The hinged doors shall be made with SS-304 sheet with PUF insulation and assembled with magnetic gasket, handle and lock arrangement & keys for each dead body. The door with Double gasket seal shall be between the door and the cabinet. Insulated glass door shall remove fogging and condensation.
- Stainless Steel (AISI-304) Tray formed of one seamless sheet for dead bodies with a tubular edge and handle at both ends.
- Mortuary Chamber shall be equipped with telescopic track system along with carriage assemblies and suitable locking arrangement.
- Equipped with refrigeration unit of sealed compressor is incorporated outside the chamber. Heavy duty Air-cooled compressor. The compressor should be of low noise level and minimal vibration.
- Condenser should have automatic condensate evaporating system.
- Non-CFC environmental friendly based on compressor capacity.
- Working Temperature +2 °C to +8° C and humidity control. Digital temperature indication.
- No Defrost required cycle required with balanced flow refrigeration system.
- Circulation Forced air circulation maintains chamber uniformity of +/-1°C and provides quick recovery
- Memory and Print options.
- **UPS** with constant voltage supply and 30 minutes backup
- Microprocessor controlled. Control Panel shall be placed in the front top of chambers and equipped with Microprocessor based Temperature controller cum indicator with pilot lamp, switch.
- LCD/TFT display
- Audio visual alarm for high and low temperature

- Should be Ergonomically designed “easy grip” door Handle
- Interior fluorescent lighting.
- Swivel locking castors.
- The Mortuary Chambers – (Qty. -4 Nos). shall be suitable for keeping **6 dead bodies** and shall be complete with refrigeration system, locking arrangement, Foul Order Treatment by means of Activated Carbon filter for De-Odorizing System.

2. Loading Trolleys-

Trolley Concealment (Hydraulic Lifting Option). Reliable and durable. Smooth rapid high/low operated from either side of trolley.Lightweight aluminum folds down sides and ends. Concealment sides and ends lower below the level of the body tray for easy side or end body transfers. Small wheel base for easy maneuverability.

3. Turnkey works :

- **Electric distribution panel** if required for the above Mortuary Cabinet complete with all switchgears, wiring and controls etc complete. (Switch gears of L&T/ Siemens/ ABB/GE or Schneider make).

- **Earthing system** of control panel and other electrical instrument and accessories in the Mortuary area **as per standard guidelines of BIS(Latest edition)**. All cable trenches and railings should be made wherever required.

- **Electrical cabling** of IS : 1554 standard and wiring as per IS : 732 standard from MDB(Single point source) to Electric Distributional Panel and to the corresponding load points
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Fluorescent Light, Power points, Fans, Cool air Fans, Exhaust fan etc in the Mortuary room. • Number of fans, power point, bulbs/tube light. Apart from these supplies to the individual equipments with ELCB & MCB in the Mortuary room.

- Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for Control Panel for Mortuary.

- Construction/laying of **Draining system** from all the equipments to the main drain (outside the Mortuary) with **SS Grating**, proper trap and flow system and tapping.

- Necessary Ducting of GI sheet with grills at the suitable places for fresh air at the working place inside the Mortuary Room. Exhaustion of inside air and **Ventilation** for creating comfortable working zone within the Mortuary Room. Motors shall be of continuous duty S1 type of IS: 325 standard (Latest version).

- **SS-304 sheet should be used to cover up all gaps evolved so that the Mortuary will appear to be flushed on wall.**

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the Mortuary then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

Note-:

The contractor shall be responsible for the complete works including submission of working drawing and walk through view.

Bidder should provide complete Operation manual, Equipment manual, Service manual and As-built drawing for all systems and subsystems.

Final electrical and pressure and other safety test, system test and calibration should be done by authorized person with test instruments.

All electrical accessories like cable wire, electrical outlets, switches etc, should be fire proof of reputed make, certified for electrical safety.

Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of HSCC.

Training of personnel of the Institute should be done by the contractor.

The contractor should prepare and submit layout plan for Electrical Wiring, Plumbing, to HSCC for approval before beginning of supply and installation and As-built drawing after installation.

The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipment used for Mortuary.

The makes for other items of MORTUARY shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

- **Third party quality certification of the Mortuary equipment from SGS/TUV/Lloyds should be submitted by the contractor as "Certifies that the Mortuary equipment/items to be supplied/supplied for installation meet the technical specification and DBR of the tender document vide contract No (Mention Contract No.)."**

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION

OF

HIGH END MODULAR OPERATION THEATRE

SCOPE OF WORK : Complete plan, design, supply construction, testing and commissioning of Modular Operating Theatre in accordance with the specifications, bill of quantities including necessary Turnkey work and providing of free spare parts and service during Defect Liability and CMC Period. The design and construction of theatre shall be made using a pre-engineered solution with objectives of Infection control, Promoting high standard of asepsis, Facilitating coordinated services, Ensuring maximum standard of safety, Optimizing utilization of OT with flexibility and staff time, Optimizing working condition, Ensuring functional separation of spaces, Patient and staff comfort in terms of thermal, acoustic and lighting requirements, minimizing maintenance and regulating flow of traffic.

1 WALLS &CEILING SYSTEM (SMS)

The wall system should be based on a technological modular unit designed to clad and to divide interior space in controlled bacteria environments in a flexible and functional manner.
The design ensures that the unique self-loading and free standing substructure can be clad with all types of engineered finishing panels without use of screws and any other fixed mechanical joints. The outer surface of a wall surface should be created with high –tech materials such as Solid Mineral Composite Sheet (SMS) with backing of Aluminum frame. System should offer total ease of cleaning and sanitization of the partitions. It should have no corners and adjacent surfaces should be molded flush by means of connecting elements. System should afford the maximum versatility at the planning stage and flexibility during erection, ensuring openness to future alternations and trouble–free maintenance. During the installation, first the structural parts and subsequently the finishing elements to be installed. The system should ensure perfect integration of technical networks and allow ample operational flexibility on the construction site.
The clean, dry installation method should enable optimum programming of the various work phases, allowing optimization of the installation of technical systems and any necessary alterations to be made–right up to checking and final testing of the installed systems – before the modules are sealed.
System should comprise of:
i. Sub frame/Structure
ii. Wall Panels
iii. Angular Air Extraction module
iv. Sealing gaskets
v. Ceiling Panels

i) Sub Frame/Structure:

Sub Structure frame made of galvanized steel pillars with broad cross section and dual cavity, with geometry designed to achieve exceptional rigidity. The substructure, with its free-standing technology, minimize the interference with all electro mechanical systems to be installed. Possible to adjust and secure the profiles, ensuring the maximum rigidity and self-loading capacity of the sub frame system.

ii) Wall panels:

Cladding shall be with composite panels the finishing of which should be Solid Mineral Composite Sheet (SMS) thickness of 03mm.

a. External facing should be bacteriostatic, dense and non-porous material
b. The panel should be made of a durable and uniform material that should be easy to clean and extremely hygienic.
c. Internal balancing core with suitable geometry to ensure the maximum rigidity
d. The total thickness of panel including Aluminum backing should not be less than 18mm.
e. Panels should be resistant to water and detergents normally used in hospital.
f. Reaction to fire class 1 norm

In order to create a smooth uninterrupted surface between adjacent panels, thereby preventing the risk of the accumulation of dust and bacteria in gaps, the panel should be produced in a single full height floor-to ceiling piece. The wall modules should be individually dismountable independently from ceiling and floor system to allow inspectability, maintenance of technical systems, and any variations that may become necessary for future alteration, modification and repair.

iii) Sealing gaskets:

Should be non-toxic silicone rubber around all the contact perimeters between the various materials, and the hermetically sealed gaps between modules, should ensure optimum space segregation and ensure that sterile air pressure values are maintained in the protected environment, this be being a fundamental prerequisite for guaranteed sterility. Should be seamlessly connected surface.

iv) Ceiling Panels

The hermetic suspended ceiling should be a loading structure in heavy gauge material forming the grid on which the ceiling panels made of Solid Mineral Composite Sheet (SMS) thickness of 03mm. The total thickness of panel including Aluminum backing should not be less than 18mm.The integration of sealed lighting fixtures, air anemostats and /or various service units. The variable module grid should make it possible to adapt the size of the ceiling module to match the equipment to be mounted. It should also allow the use of different module sizes within the same room. The grid should be formed of loading profiles, suspended from the ceiling slab, to which the
crossbar profiles are secured by means of rigid mechanical couplings. The thus formed grid

should be rigid and remains perfectly stable during all the subsequent site operations. The suspended ceiling should be hermetically sealed by means of nontoxic silicon gasket application and it should be durable and non-degradable & resistant to microorganism attack. Color of inner surface wall & Ceiling of MOT shall be finalized after approval of consignee. SMS Panel shall be European CE certified.

2 CEILING FILTRATION SYSTEM / LAMINAR AIR FLOW SYSTEM (AIR MANAGEMENT SYSTEM) (Size-2400 x 2400mm)

The Ceiling Filtration System should be designed to ensure homogenous low turbulence unidirectional laminar flow of sterile air. 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.
H14
MPPS average efficiency: > 99.95%
0.3 Micron DOP efficiency > 99.99%
Pressure drop : 600 pa(max)
Maximum Operating Temp : 60 degree Celsius
Maximum RH : 90 %.

Others:
Protective grids : White epoxy painted micro drawn grid
Separators : Continuous thermo plastic chord
Sealant : Polyurethane
Gasket : One piece polyurethane

Efficiency test : Filters individually tested and certified (Submission of test certificate for the filters from original manufacturer is must along with its supply).
Filter frames and top plenum should be made of AISI-304 Stainless steel. The filtration should have flow equalizer for uniform & constant air distribution over the whole surface. The high quality Diffuser should secure the unidirectional airflow according to ISO 14644/1. It should have low noise recirculation systems in compliance with noise levels of 45 to 48 db. Air and Light diffuser made out of two layer of mono filament precision woven polyester for the plan air ceiling to proved Laminar flow. Frame should be rigid frame system and made out of AISI-304 Stainless steel which enables the perfect integration of the OT ceiling with surrounding installations. The OT lighting should be integrated into a frame system which ensures its air sealed integration with the OT ceiling. The frame system should allow the seamless and air-sealed coverage of all gaps among the various installations and OT ceiling. The Ceiling system should be equipped with **"H"** class HEPA filters with different performances according to their position in the ceiling to achieve flow velocities 0.25 m/sec. The filtration ceiling system should have flow equalizer to achieve uniform & constant air distribution over the whole surface .it should also have connection for surgical lamp to be fitted in place of any filter.

The air management system should be designed to achieve the following parameters: F.S. 209 classification = 100 (100 particles/ft3) Bacteriological class =B (5 CFU/m3) Particle decontamination kinetics CP =5 min ISO 14644/1 classification = ISO 5

The technology must avoid turbulences which may draw germs from the non-sterile area in the operating field. The complete filtration ceiling system should be factory assembled. Perfect tightness should be guaranteed by a liquid seal between filters and holding structure enabling no bypass of Mini Pleat filters. A written confirmation from the original product catalogue is required. Laminar air flow system and mini Pleat HEPA Filters. Laminar air flow system and mini Pleat HEPA Filters should meet relevant European/ US standards and in order to have perfect sealing both laminar air flow and filters from one source company.

Testing & maintenance of air quality with periodic replacements of HEPA filters should be done. The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufacturer. Modular OTs should be constructed considering all stipulated requirements of Air management system etc.

3 OPERATION THEATRE FLOORING (ANTISTATIC CONDUCTIVE ROLL)

The Operation theatre floor finish should be laid with 2 mm antistatic seamless conductive PVC ROLL on a semi-conductive adhesive base. The floor should be scratch resistant, fire resistant, chemical resistant, non-corrosive, slip resistant, smooth, anti fungi, antimicrobial impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock. **The floor finish should pass over a concealed cove former and continue up the wall for 100mm.** The floor should be provided flat to within a tolerance of ±3mm over any 30 Sq.mtr area. Copper grounding strip (0.05 thick, 50 mm width) should be laid flat on the floor in the conductive adhesive and connect to copper wire of grounding. The connection from copper grid should be brought out uniformly at places to form equi-potential grid. A self-leveling compound should be laid prior to lying of the floor finish. One earthing lead should be brought out of from every 150 Sq.ft. area and attaching it to main earthing strip/ground. The joints in the flooring should be sealed by using a PVC welding bar of matching colour and hot air gun for fusion of welding bar with flooring to provide a continuous sealed surface. The sheets should be highly durable with resistance to shock, scratch proof and indentation. Corners should be uniformly curved. The conductive material should be uniformly impregnated as grains. The floor should be inert to body fluids, chemicals, detergents and disinfectants and it should not be affected by temperature variation within the OT. Colour should be uniform, pleasant and matching with ambience. The floor should have electrical resistance(Point to ground) within 2.5x10 to $2.5x10^6$ Ohms as per NFPA-99/ DIN 51953/ATMF-150 B1 class of fire resistance. The floor should efficiently discharge electric charges upto 2 KV. The floor should not allow build up of electrical charge beyond 100 volts due to antistatic effect. It should fulfill product requirement s as per EN649. The corner should not be terminated sharply and concealed cove-former (Aluminum) should be used overlap to a height of approx.25mm and sealed perfectly and uniformly. Self-leveling compounds should be used for this purpose.

Radius for corner coving - 70R

4 DOORS AND FRAMES (AUTOMATIC HERMETICALLY SEALED SLIDING DOORS) Size-2100mm x 1800mm- SMS

To maintain sterility and correct air pressure in the theatre, the door should be sliding and hermetically sealed type. Door should meet international quality and safety requirements.

- Controller should be Microprocessor based controller (CE marked) and should have digital display
- Regulated electro-mechanical sliding door drive.
- Suitable capacity of Motor should be equipped.
- Noise level of movement should not be more than 60 decibel.
- Power efficiency should be 0.95 (in AC 100 V full load).
- The track should be made up of single piece extruded aluminum
- Environment temperature should be –20 ºC to +55º C.
- Electrical safety codes for High & Low voltage system design should meet HTM 2020 /2021 standards.
- The door and control should comply current IEE regulations and BS 7971 standard.

Hermetically sealed Sliding Automatic Door shall be with Vision Panels 300 mm x 300 mm with double glazed panels and hermetically sealed should be equipped for OT.

The door panel should be hygienic compact SMS(Solid Mineral Sheet) that can withstand high abrasion. The thickness of the door core should be 48mm. The top layer on both sides is high Pressure laminate of size 6mm. The overall thickness of the door shutter is 60 mm. The inner part of the door should be filled with CFC free polyurethane foam.

Sealed airtight system should be provided to prevent further ingress of any microbial organism. The door should be fixed to Aluminum frame. Reinforcement of Extruded Anodized Aluminium material for SMS Panel should be with door frames. Nylon runner guides should be fixed to the door in such a way that there shall be no obstruction to the Trolley movement. The door leaf should have high quality synthetic rubber gasket with long life to ensure hermetic sealing to maintain pressure differential. Air tightness 99.99% at a pressure 50 (Test certificate for hermetic sealing with door frame should be provided with pre-despatch documents. The finished door on either side of the door should be perfectly level (maximum permissible difference +1mm). The track of the door should be made up of single piece extruded Aluminum and the running surface for the top rollers shall be suitably angled to reduce resistance to movement. The door leaf should be hung by means of hard plastic rollers of high quality with double bearing at the top. Roller should be provided under the stainless steel/extruded aluminum track to enable smooth the noiseless movement. The doorframe, track and the wheel should be designed in such a way that during last 50 mm at travel on the closing cycle the door should make a tight sealing with the frame. The door should be provided with high quality cylindrical lock. The lock should be activated or switched off by means of the key switch. The door should be governed by two sensors for half and full closure. The door controller should sense overload condition and in overload case the door shall be automatically stopped and reversed the direction of travel. The controller should be capable of either operated by elbow switch; foot switch & radar switch (Touch fewer sensors). The door

should be operated easily manually in the event of failure of the power supply or the automatic mechanism. Door opening handle should be strong and sturdy and the handle material should be AISI-304 Stainless steel and glossy finish. High and Low voltage system of the door should meet electrical safety code..

5. DOORS AND FRAMES (AUTOMATIC HERMETICALLY SEALED SLIDING DOORS) - (Size-2100mm x 1000mm) SMS

Same as Sl.4

6 PRESSURE RELIEF DAMPERS(PRD)

The Pressure Relief Dampers are to be equipped with the theatre to prevent contamination of air from clean and dirty areas. The Dampers of suitable size should have AISI-304 Stainless Steel blades of thickness 1 mm each. The body should be epoxy powder coated as per standard BS colours. The statically and dynamically balanced Pressure Relief Damper should be properly placed. The Dampers enable to maintain differential room pressure to close tolerance inside the Operation theatre. Counter-weight balancing system should be provided in the Pressure Relief Damper to maintain positive pressure inside the operation room. The PRD should remain closed at pressure below the set pressure and should open fully at a pressure only fractionally above the threshold pressure. Powder coated Aluminium grill should be fitted in the opposite side of PRD i.e towards the corridor. Fins should inclined towards floor. Grill should be accompanied with fined SS net.

7 INTERNAL DUCTING

The internal ducting of the Operating theatre should be done as per ISI-655 duly fabricated out of 22 swg Aluminum sheet complete with flanges and accessories such as GI suspenders and GI supports completely sealed with Silicon sealant duly insulated with Aluminum foil Nitrile rubber self adhesive type insulation. The type of insulation and its thickness should be such that there is no sweating or leakage.

8 PERIPHERAL LIGHT CUM CLEAN ROOM LUMINARIES

It should be fitted outside the air ceiling system area and flush with the ceiling in the operation theatre suitable to required illumination (500 Lux) of OT. Peripheral lights and clean room luminaries fitted in the frame should be 10 in numbers for each OT. The Non-hygroscopic high glow low power LED based peripheral lights having high quality low wattage LED lighting system with highly spectacular anodized Aluminum reflectors and optical antiglare system for adjustable light distribution. Luminaire cover made of highly resistant, disinfectant proof laminated safety glass with fine grained surface, glass pane with white powder coated steel frame. Luminaire body made of sheet steel, white, powder coated supplied ready for connection. The reflectors should be of high quality, cleanable and non deteriorating. Dimmable ballasts of reputed companies to be used and diffuser should be constructed with opaque acrylic diffuser material in aluminum frames. It should have flicker less design with color. Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable form top or bottom. Lighting units should be

properly sealed with the ceiling by means of fillers and beadings so that all lighting units are airtight with ceiling panels. The light fitting should be uniformly and aesthetically distributed on the ceiling to provide uniform illumination in the OR. Peripheral lighting should be done according to **IP65 protocol**. Light should not interfere when green mode of Endoscopy is performed. **Frame of peripheral light fixture should not protrude from the Ceiling inside OT. Screw heads should not also be protruded inside OT.**
Should be from these make - Philips/ GE/ Crompton/ Wipro/ Syska

9 SURGEON CONTROL PANEL

The OT Control Panel should be designed to cope with changing technology and equipment in operating environments. Control panel should be user friendly and ease of operating and maintaining purpose.

The **touch screen** typed Control Panel should be 19" medical grade color TFT/LED panel stationed in the sterile field. The Control Panel should be configured to incorporate all the services required by the staff in the Operation theatre. It should be mounted flush in the theatre wall.

The Control Panel should comprise of following services in addition to Instruction board, Communication interfaces- both audio and video etc.:

- Day Time Clock
- Time Elapse Day Clock
- General Lighting System
- Hands free telephone set with memory card
- Temperature and Humidity Indicator with Controller
- HEPA Filter status
- Medical Gas status/alarm
- Digital Room Pressure indicator
- Music control
- Telephone

Day Time clock/Time Elapsed day Clock should be digital type and bright and the height not less than 30mm

Temperature and Humidity Indicator should indicate temperature and humidity of the theatre and the display shall be digital and bright and the height not less than 30mm. The temperature and Humidity controller should be connected to the Air Conditioning system.

General Lighting System should incorporate all the necessary controls of all the lighting system including Dimmer for peripheral/plan air lights. Medical Gas Alarm should indicate high, normal and low of gas pressure for each gas service provided in the Operation room. Alarm should be equipped with audible Buzzer. The pressure sensor of the Alarm should be connected to MGPS for monitoring the pressures.

The control panel should be user friendly and ease of operation and maintenance. All internal wires should be marked with plastic ferrule type cable markers, for ease of identification. The control panel should be able to be integrated with the commonly used OT software in future.

The control panel should meet Electrical Safety Code for High and Low voltage system, wired to the current IEE regulations

10 ADJUSTABLE MOVABLE BOOM ARM SYSTEMS

- The Ceiling boom arm systems designed to provide convenient positioning of medical equipment, medical gas terminal units, electrical and speciality services. The Ceiling Pendants should comply with international standard. 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. Pendant should be CE/US FDA marked.

a. Equipment Boom System with boom suspension(Surgeon Pendant) for Progressive Scan Flat Panel

Description : The Equipment Boom should be custom designed to meet all of the specific needs of the operating room such as concealed cables and tubes, unlimited equipment combinations. The arms should be easy to move, and each should come with pneumatic brakes as a standard option to support a locked position.

a) SURGEON PENDANT:

The Equipment Pendant with a service head column adjustable height and should be with **Double-arm** with Horizontal Motion total coverage 1800mm +/- 10% and Vertical Height Articulating motion. There should not be any sharp edges. Should have a motorized articulating vertical drop. Vertical articulation should be through a Heavy-Duty Electric motor.
Should have atleast 3 shelves of minimum 750mm size for various medical devices having a load bearing capacity (Articulating) of minimum 150 Kg.

Top-arm Rotation &Lower-arm Rotation should be atleast 330^{o}& Service-head rotation should be atleast 330^{o}

Should have a provision of mounting a spring-arm monitor in tandem with the equipment boom arm.

Service Points/Outlets *:*

Pendant should be supplied with following pre-fitted Medical Gas Service outlets (7 bar Surgical Air outlet x1, Oxygen Outlet x 2, Vacuum Outlet x 2 Outlets, CO2 outlet x 1) & atleast 10 no. 5/15 Amp standard duplex conditioned antibacterial Electrical switch & socket (same as in Anesthesia Boom System). Outlets should be CE certified/UL listed. Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA

99C. The Column should have atleast 8 no. of Data (Audio/Video/Control) Ports for connections to various other medical devices desired to be integrated in future. Pendant should have RJ 45 /cat 5 for telephone communication and RJ 45 /cat 6 for data communication. Fluid Pole with 2 hooks – 1No. (Pole should be capable of stacking 4 nos of syringe pumps)

b. **b. ANESTHESIA PENDANT**

The boom system should be available as follows:

- 900 mm moveable arms each with 330 deg. Horizontal movement.
  Arm should have anaesthesia machine lifting arrangement. The Pendant with a service head column adjustable height and should be with **Double-arm** with Horizontal Motion total Coverage 1800mm +/- 10% and Vertical Height Articulating motion. There should not be any sharp edges. Should have a motorized articulating vertical drop. Vertical articulation should be through a Heavy-Duty Electric motor.
- The weight carrying capacity of the arm should not be less than 150-200 KG.
- Each arm should be capable of 330 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.
- The arms may be fitted with pneumatic brakes to prevent inadvertent movement.
- The Pendant Service Head should be supplied with following pre-fitted medical gas terminal units and 5/15 Amps. Antibacterial Switch & Sockets:
  Oxygen Outlets– 2
  Nitrous Oxide Outlet - 1
  Medical Air(4 bar) Outlet– 2
  Vacuum Outlets– 2
  AGSS Outlet-1
  Electrical Sockets –10 nos.
  Shelf with two rails one on each side – 2 no.
  Monitor input & Output – 1no.
  Infusion pump pole – 1
  IV management – 1
  RJ 45 /cat 5 for telephone communication.
  RJ 45 /cat 6 for data communication.
  Pendant supplier should provide cutouts for Patch Panels in Integrated OTs. (only for integrated OT)
  Outlets should be CE certified/UL listed. Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C.

11 X-RAY FILM VIEWER

The three (3)-plate viewing LED lamps X-Ray Viewing Screen should be designed to provide flicker free luminance for clear film viewing. Each plate should be able to illuminate films up to 14”x17” size. ‘Dimming is controlled using dimming ballast and PCB mounted inside the box. The mounting of the Screen should be installed flushed with Operation theatre wall to avoid dust accumulation and microbial growth and ease of cleaning. The diffuser should diffuse the light evenly and to provide adequate luminance for film viewing. Body should be of extruded aluminum

powder coated black with bacteria and disinfectant resistant finish. Proper spring loaded film clip with rollers should be provided to holes of the films firmly and to remove the film without scratches. The X-Ray Film viewer should comply with relevant Electrical Safety Codes for High and Low voltage system.

12 WRITING BOARD (OPERATING LIST BOARD)

Writing Board as operating list Board of size-1000x700x60deep should be made of ceramic having magnetic properties and should be flushed to the wall of the operating Room.

13. BUILT-IN STORAGE UNIT

Storage Unit should be made out of 1.50 mm thick AISI-304 Stainless steel. The storage unit should be divided 2 or more parts and each part should have individual glass doors with high quality locking system. These doors should be installed on the storage units with the help of imported fittings allowing an opening allowance of 90-100 degree. Each part should be provided with steel racks which should be completely detachable type. The storage unit should be fitted with 5mm thick glass door and mounted flush with the theatre wall. The storage unit should be continuously ventilated by positive air in the OT through ventilation holes provided at the bottom and top of opposite sides. The dimensions of each storage unit should not be less than height 1800mm x width 900mm x depth 350mm.

The storage units should be designed in a way that they are flush with the OT wall panels and the units should be air tight, not allowing any leakage between units and the wall panels.

14 DISTRIBUTION BOARD

All high voltage equipment should be installed in a separate enclosure. 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. All internal wiring should terminate in connectors with screw & clamp spring. Connections of the clip- on type mounted, on CE approved rail & labeled with indelible proprietary labels. This unit should be EN/CE/UL/FDA/IEC certified. Wiring for 220 volts single phase and neutral 6/16 Amps **antibacterial** switched socket at the 325 mm height from FFL with 4 sq.mm and 2.5 sq.mm PVC insulated copper conductor 1100 volts stranded flexible wires should be concealed with conduit. **Antibacterial switch and socket should be flushed on the OT wall panel**. Installation of all electrical cabling, wiring, other accessories and proper earthing of OT in the OT room shall be as per international standard. Fittings should be sealed on accordance with the standard IP54. Earthed equipotent bonding of all exposed metal work should be provided. Individual fuses or miniature circuit breakers should protect all internal circuits. Complete schematic drawing with description should be enclosed with the equipment. Earthed equipment 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 LED type with control gear. Fittings should be sealed In accordance with the standard IP54. 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. All necessary interconnection of LAN cables, Telephone/intercom, copper strip, etc. to MOT from hospital source is the responsibility of the bidder.

15 SCRUB STATION

Compact Surgical Scrub sink -3 Bay should be designed for use in Operation theatre complex providing surgeons with a convenient sink for pre-OT scrub up. The Scrub Sink should be made of 1.5mm thick AISI-304 Stainless Steel and top surface(Counter) should be made of one piece and polished to seamless satin finish. 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. Hands free operation should include infra-red sensors with built-in range of adjustment. Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature. User defined time 1, 3,5,10 min. are available. This timing should be adjustable to meet individual application requirements, provided with infrared sensors, thermostatic control taps with fail-safe temperature controls. All units should have reduced anti splash front. It should have manual foot and operation mode. Knee operated switch should be provided additionally. The station should also have inbuilt soap dispensers. Scrub station should be equipped with 10L Geyser for supply of hot water.

16. MEDICAL GAS LINE INSTALLATION

Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide and AGSS supply to Operation Theatres from the existing manifold system should be provided. The medical gas alarm system shall be installed which fully satisfies the principles of HTM 02-01/NFPA 99C.
Medical graded Copper pipes shall be solid drawn, tempered, seamless, phosphorous deoxidized, non-arsenic and degreased for oxygen service. Copper to Copper joints shall be made on site using silver-copper-phosphorous brazing alloy to BS-1845. Copper to brass or gunmetal joints shall not be made on site. Except for mechanical joints used for components, all metallic pipeline joints shall be brazed or welded. All pipelines shall be routed in such a way that their not exposed to a temperature less than 5 deg Celsius above the dew point of the gas distribution pressure. The chemical composition shall be as per BS-6017: 1981 Table 2, Cu-DHP grade. Distribution Copper Pipe manufactured as per BSEN:13348:2008 Each pipe shall be capped at both ends before supply. Pipeline shall be supported at interval to prevent sagging.

The supply of pipes shall accompany with manufacturers test certificates for physical properties and chemical composition. The supply of pipes shall be further substantiated with inspection certificates from third party inspectors like LLOYDS/TUV/SGS.

Medical graded Copper Piping should be laid down from Pendant of OT to the nearby Valve Box outside the Operation Theatre via Surgeon Control Panel.

17. VIEW WINDOW (HERMETICALLY SEALED) WITH MOTORIZED BLINDS

View window with motorized horizontal Venetian blinds sandwiched in two parallel toughened glasses of thickness 5 mm should be complete with FHP Motor Control for 90° rotation. The Window frame should be powder coated Aluminum of approved shape flush mounted with wall paneling. The entire assembly should be completely sealed and fitted with proper Aluminum profile. The window blinds should be operated with Remote Control and manually.

18 EXHAUST AIR CABINETS

The openable and cleanable return-air exhaust cabinets should be provided in the operation theater. 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. The air cabinets should have suction from **top as well as from bottom.** The supplier of wall and ceiling system should manufacture and supply the exhaust air cabinet. Specification of materials and aesthetic should match perfectly with the ceiling system. Each powder coated Aluminium diffuser should be equipped with **Damper** (Opening and closing to be adjustable from OT) and 20 micron filter. Fins of diffuser shall be inclined towards the floor.

19 SURGICAL OT LIGHT WITH CAMERA AND MONITOR-

Description: Dual Dome **LED** Surgical Lighting System with one dedicated Spring-Arm Suspension for Progressive Scan HD Flat Panel with an Integrated In-Light Camera System.

i) OT Light

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 with a unique faceted reflector design technology.

Such Lighting System should have the following technical specifications:

- Number of Light heads : : Two per suspension
- Number of LEDs : Should be adequate enough for following minimum illumination level
- Color Temperature : 3800 - 5000 K (+/- 10%)
- Field Size Diameter Depth : 20 – 28 cm (+/- 10%)
- Depth of Field : 750 – 1100mm (+/- 10%)
- Illumination Level : minimum 160,000 Lux each
- Controls : Wall Control Touch Panel and on dome
- Rotation : 330- 360 degrees
- Vertical Adjustment Range : + 20 inch – 25 inch

- Sterilizable Handle : 2 Nos
- Lighthead Diameter : 30-35**/**800mm×720mm of size
- Mounting Type : Ceiling
- Supply Voltage : 230 VAC 50 Hz
- Bulb Type : LED
- Dimming Range : 30% - 80%
- Operating/Storage Humidity : 10 – 95%
- Life of Light Source : > 40,000 Hrs.

Surgical Light System Should be compliant with relevant European CE /US FDA standards

Camera System (Full HD)

Description : Camera System should be integrated at the centre of one of the domes of this lighting system in order to capture images & video sequences of the open cases.

Such a camera should have the following specifications:

- Signal to Noise Ratio (S/N Ratio) : > 50 dB.
- Minimum Illumination : <3 lx
- CCD : 1/3”
- Optical Zoom : 10X.
- Digital Zoom : 12-15X
- Power Supply : Through Light / max. 12W.
- Relative Humidity : <90%.
- Video Output : HD, S-Video & Composite Video
- White Balance & Gain : Automatic/Manual
- Light and Integrated Camera should have a control through Touch Panel of the control
- equipment placed inside the operating room

Such Surgical Light System Should be compliant with relevant European CE /US FDA standards

Such Light and Integrated Camera should have a remote control placed inside the operating room at documentation station / nurse works station.

C. Flat Panel Monitor (Full HD)

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.
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.

Such Monitor should at least meet the following technical criteria:

- Resolution : 1920x1080 or more, Progressive Scan
- Aspect ratio 16:9/16:10
- Display Colors : 16 Million Colors
- Inputs : DVI, RGBHV, S-Video, Composite Video
- Synchronization : 2.5 – 5.0 Vpp separated sync
- Response time : <25ms
- Travel : 330° - 340°
- Forward Tilt : 30° - 40°
- Backward Tilt : 45° - 50°
- Cable Kit for Integration : DVI, Fiber Optic, RGBHV, S-Video, Composite

20. MONITOR –DIGITAL DISPLAY (PACS/HMIS)

a) Medical grade monitor size should be minimum 32 inch.
b) Should be integrated with hospital PACS. Vendor has to do the necessary coordination with PACS/HMIS contractor or hospital authorities for connecting the monitor to hospital PACS/HMIS.
c) If PACS/HMIS is not available in the hospital, vendor should terminate all monitors connection to switch (should be located at MOT corridor) from where hospital will connect further.
d) Monitor should be flush mounted with suitable frame in MOT wall. Frame should be openable/serviceable for service.

21. MOTORISED OPHTHALMIC OPERATION TABLE Product Quality Standard:

- Should be CE/USFDA/BIS approved model.
- Manufacturer should be ISO 13485 certified.

- **Specifications:**

- Should be electro-hydraulically operated.
- Disinfectant resistant stainless steel finished, foot switch operated
- All stainless steel accessories
- With special design cushioned head holder
- Safety back up of all functions
- Up & down movements
- Minimum height : 700 mm (approx)
- Maximum height : 900 mm (approx)
- Stroke length : 200 mm (approx)
- Standard Accessories: 1.Foot switch (1no.), 2.Power cord (1no.)

MOTORIZED SURGEON CHAIR

- Product Quality Standard:
- Should be CE/USFDA
- Manufacturer should be ISO 13485 certified.
- Specifications
- Minimum height 480mm (approx.)
- Maximum height 630mm (approx.)
- Maximum load lifting 250Kg (approx.)
- Movement 5 twin castor
- Operated motor DC

Power supply unit 24 V DC (1), 2. Foot switch (1), 3. Power cord (1)

22. .**OPERATING MICROSCOPE**

Compact microscope body with high quality apochromatic Optics.

. Inclinable Binocular tube with 10X or better magnification eye pieces with integrated image inverter facility

Objective lens with 200mm focal length for convenient working distance.

Stereo coaxial illumination and Retro illumination. Auto illumination off facility, when microscope not required during surgery, illumination gets off when microscope is moved in upward direction without touching foot control. Auto re-centering facility of XY, Focus, Illumination & Zoom when microscope is moved back in down-ward direction in the surgical field.

Motorized foot controlled X-Y coupling, automatic re-centering should be provided.

Motorized foot controlled Zoom and Focus should be available.

High quality floor stand with magnetic / mechanical breaks and clutches for easy positioning through handles and suspension arm.

St**a**nd should have facility for setting the speed of XY, Zoom and focus with storage facility of initial setting for multiple users.

Superlux halogen / LED illumination source

Assistant microscope should be with independent 3 step magnification changer, independent fine focusing system, independent optics & inclinable binocular tube.

Full HD , 3 chip or better, camera attachment and digital video recording facility, video trolley with transformer.

42” LED display unit.

Should have Provision for attachment of wide angled non-contact viewing system (autoclavable) with aspheric lens 60D at a later a date, if required.

Should have US FDA or European CE certifications.

23. ANESTHESIA WORKSTATION

Compact three gas Anaesthesia Workstation with an integrated ventilator for infants/pediatric to adult patient. Airway monitor and Anaesthesia Monitor with the single power switch for the Work Station.

The quoted model of Anaesthesia workstation, Vaporizer, Airway Monitor & Ventilator Should be USFDA Approved/European CE Certified with 4 digit certification

Technical Details:

1. Anaesthesia Machine should be constructed from welded tubular/epoxy powder painted steel or rust proof material.

2. Stainless steel top/ABS top, a fixed work surface, two drawers with at least one lockable drawer and at least three integrated electric outlets to be provided.

3. Should have large castor wheel with foot brake

4 The Anaesthesia system should have an inbuilt at least 90 minutes battery backup for Anaesthesia machine, ventilator, gas delivery system & air way monitor.

5. The Anaesthesia System should have an integrated scavenging system with pressure relief valve.

6. In case of electricity & battery failure, manual ventilation, oxygen & agent delivery should be possible.

7. **Gas Delivery System:**

a. Should have Pin index yokes for one oxygen & one nitrous oxide cylinders besides separate pipe and adapter connection for central gas supply for oxygen, nitrous oxide & air.
b. The machine should have separate colour coded pressure gauges or digital display on screen for cylinders and central supply line pressure.
c. The gas connection should be non interchangeable.
d. Provision of alarm should be there, both audio & visual for decrease in oxygen pressure, decrease in nitrous oxide pressure, circuit disconnection, low battery, low drive gas pressure, high airway pressure and machine failure with lung protective devices.
e. The Anaesthesia workstation should have precise electronic visual flow meter with electronic/ mechanical setting as well as digital depiction of individual flow of oxygen, nitrous oxide and compressed air and total flow with an accuracy of ± 6% & range of at least 10 litre per minute. It should be capable of delivering minimal flow of 500ml or less.
f. Emergency oxygen flow of at least 35-70 litre per minute bypassing the vaporizer with non lockable push button to be provided.
g. Having mechanical/electronic hypoxic guard with automatic cut-off of nitrous oxide. There should be minimum oxygen flow of 100ml, to maintain 25% oxygen concentration.
h. Facility of delivery basal flow of oxygen or an auxiliary O2 outlet without switching on the machine & at Stand By mode.
i. Anaesthesia machine should have auxiliary common gas outlet and compatible with open circuit if needed.
j. There should be provision for a single pneumatic/ electrical on- off switch to switch from mechanical to manual mode and also to activate gas flow and vaporization.

8. Flow meter:

a. The Anaesthesia workstation should have precise electronic visual flow meter with electronic/ mechanical setting as well as digital depiction of individual flow of oxygen, nitrous oxide and compressed air and total flow with an accuracy of ± 6% & range of at least 10 litre per minute. It should be capable of delivering minimal flow of 500ml or less.
b. Electronic flow meter with electronic/mechanical setting & digital display of oxygen, nitrous oxide & air. The system should have an agent saving decision support tool for delivering safe minimal flow.
c. The vaporizer designs should be maintenance free & should not require calibration for lifetime.
d. Vaporizer should have delivery range of 0 to 5 volume percent.
e. Agent capacity should be minimum 225 ml of free volatile Anaesthetic agent.
f. Anaesthesia machine should be provided with one Isoflurane and one Sevoflurane vaporizers.
g. The point is deleted from Vaporizer and added to Additional Points in Breathing Systems.
h. Vaporizer should have delivery range of 0 to 5 volume percent.

9. Vaporizer:

a. Machine should have provision to mount two quick mount type vaporizer for easy inter changeability

b. The vaporizer should be selectate c type with tool free installation , manifold interlocks, vaporizer mounting should be compatible for Tec 5, Tec 6 plus & Tec 7 vaporizers.

c. The vaporizer designs should be maintenance free & should not require calibration for lifetime.

d. Vaporizer should have delivery range of 0 to 5 volume percent.

e. Agent capacity should be minimum 225 ml of free volatile Anaesthetic agent.

f. Anaesthesia machine should be provided with one Isoflurane and one Sevoflurane vaporizers.

g. The point is deleted from Vaporizer and added to Additional Points in Breathing Systems.

h. Vaporizer should have delivery range of 0 to 5 volume percent.

10. Breathing System:

a. Should have fresh gas de-coupled/fresh gas compensation with fully auto-clavable, semi -closed circle absorber system.
b. Should have adjustable pressure relief valve from 5 to 70 mbar.
c. Should have change over from spontaneous to bag ventilation with single step.
d. The work station should be supplied with at least two sets of closed circuit, system as following:
   i) Adult reusable circuit silicon & autoclavable-2 sets
   ii) Paediatric reusable circuit silicon & autoclavable-1 sets
   iii) Adult disposable circuit- 5 sets each
   iv) Paediatric disposable circuit- 2 sets each

e. Work station should be supplied with at least
   2 sets of Bain's circuit.
   2 sets of Ayre's T piece with Jackson Rees modification
   Resuable face masks of all sizes (size1- size 4)-1 set

f. Should be integrally fitted, at least 1 litre capacity canisters, double/single chamber type of CO2 absorber system having provision to bypass. Canisters should be allowed to be removed without introducing system leaks with indication on display.
g. Should not require tools when dismantled for cleaning & sterilization
h. The unit should have a bag arm with positional adjustment

i. All parts of the breathing system that are in contact in patient should be latex free and auto- clavable
j. Should have an external fresh gas outlet for connecting Magill/ Bain's/ Paediatric circuit.
k. Machine must be operational with circle system without the need of any specialised external spirometry tubing or proprietory breathing system.
l. The circle absorber must be compatible to the use of soda lime of any brand.
m. All sensor connections to the ventilator shall be internal to help prevent disconnection. The system should have autoclavable and reusable(not disposable) flow sensors at both inspiratory and expiratory end.

11. Anaesthesia Ventilator:

a. Electronically controlled pneumatically/ electrically driven integrated Anaesthesia ventilator, should not require change of bellows for adults & infants with integrated PEEP.
b. Ventilator should automatically compensate for fresh gas by adjusting fresh gas flows for changes in fresh gas flow, small system leak changing lung compliance or compression losses.
c. Facility to change I:E ratio should be provided
d. Alarm setting should be available for low & high tidal volume, minute volume, airway pressure, apnoea, inspired oxygen. Alarm silence countdown timer should be 120 to 0 second.
e. Modes- volume control, pressure control, pressure support, SIMV- PS, manual, spontaneous, lung protective modes.
f. Tidal volume- 20 to 1400 ml
g. PEEP – 4 to 20 mbar
h. Breathing frequency – upto 60 bpm
i. I:E ratio – 2:1 to 1:4
j. Inspiratory pause – off, 5 to 50% of TI
k. Flow trigger : 0.2 to 10L/ min & Peak flow : 120 L/ min + fresh gas flow

12. Airway Monitoring:

a. Monitor should be with minimum 12 inches colour TFT display to view Pressure, Flow and CO2 waveform with both touch screen (preferable) and manual control facility.
b. The monitor should not require any lengthy start-up procedure or calibration. The system check should provide an option of bypass in case of emergency.
c. Should have 24 hours graphical & numeric trend with split screen facility of all parameters with at least 12 critical alarms summary.
d. Should be able to monitor & display all parameter in a single screen.
e. Integrated monitor for electronic monitoring & display: Expiratory tidal volume, Expiratory Minute volume, PEEP, peak, mean & Plateau airway pressure, frequency, waveform display for airway pressure, flow, Co2 & Inspired and expired

values of all gases and agents(with auto identification) as well MAC value. O2 measurement should be paramagnetic. The CO2 measurement should be side stream. The following accessories should supplied with the same.

1. Sample line- 50 nos.

2. Water trap- 20 nos.

13. Alarm Limits & Alarms Adjustable high –low limits with audio-visual alarms for tidal volume, minute volume, airway pressure (including stenosis & disconnect), inspiratory o2 concentration, audio power supply fail alarm, apnoea alarm

14. The patient monitoring system should have screen size minimum 15 inches or more with 8 channels. It should be modular for easy upgradation, high resolution colour TFT & CD display, should be capable of monitoring the following parameters. Touch screen facility should be there.

a. **ECG: leads** 3 to 5, provision to upgrade to 12 lead ECG along with printout facility, protection from interference of electrosurgical apparatus, waveform, ECG or SpO2 selectable, arrhythmia detection, heart rate detection from ECG/ pulse auto change. Two lead set with two trunk cables to be provided with each monitor.

b **NIBP** : Range paediatric/ adult, modes: auto/ manual numeric display: systolic, diastolic, mean should be supplied with proper size 5 cuffs each for pediatric, adults (arm & thigh cuffs) & extra large for obese patients.

a. **SpO2**: Range from 0 to 100% (accuracy +/- 2 digit), sensitivity should be good, waveform: ECG or SpO2 selectable/ auto change, should be supplied with proper probe (paediatric and adult patients). Five soft/clip type adult SpO2 probes and two soft/clip type paediatric SpO2 probes to be provided with each monitor.

b. **IBP**: provision of two simultaneous measurement of IBP. Display waveform & numeric, two IBP cable and 50 universal disposable transducer sets to be supplied.

c. **Temperature**: Dual temperature monitoring (core & skin) with sensor cable and probes. One skin probe & two core probes to be provided with each monitor.

d. **Anaesthesia depth monitoring**: should be provided with for BIS/ Entropy (SE, RE) with 50 electrodes.

e. **Alarm**: Asystole, full arrhythmia, leads off, spo2 probe disconnection, BP cuff occlusion, apnoea etc.

f. Neuro muscular transmission monitoring with required accessories with NMT cable and leads for atleast 100 patients.

g. Should have 24 hours graphical & numeric trend with split screen facility of all parameters with at least 15 critical alarms summary with printing facility.

A. There should be provision of up gradation of version and availability of spare parts should be there for at least next 10 years.
B. The patient monitor should have the capability to measure & display QT/QTc
C. The system should be supplied with an online UPS with at least 1 hour backup. The said UPS should be from a reputed company and serviceable in Fiji.
D. The company should have an authorized **service station in Fiji**.
E. Anaesthesia workstation should be **USFDA/ European CE with four digit number approved.**

24.ISOLATION TRANSFORMER

Should be medical grade Insolation panel
Should have fault detection feature
Should be compliant to CEI 64-8 **/ IEC 60364-7-710/BS7671 Standard**
Should be compact and mountable on wall **or flush on brick wall**
The IPS should be able to integrate with HIS/BMS and Surgeon Control Panel as standard
Capacity shall be 20 KVA
Isolation Panel System should have facility to detect fault of leakage current and same should be integrated touch screen control panel of MOT and alarm status should be displayed on the touch screen control panel.

IN ADDITION TO THE ABOVE, FOLLOWING <u>TURNKEY WORKS</u> FOR INSTALLATION AND COMMISSIONING OF MODULAR OT ARE THE SOLE RESPONSIBILITY OF THE CONT RACTOR :

- The turnkey work includes all modifications to the built up space provided at the hospital site including civil modifications, electrical works, plumbing works, all cable trenches and railings wherever required, interior decoration, air conditioning duct, furniture 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. Demolishing, re-constructing, water roofing, plumbing, repainting and replacement Any demolition , reconstruction, water proofing, necessary plumbing, anti-microbial painting, replacement of any door or windows to provide structured design for modular OT .

  Commissioning and installation of SMS wall & ceiling paneling, Frame Structures & substructure, PVC flooring, Lighting, Touch Screen Control Panel, laminar flow, pendants, OT Light, Painting (if any), electrical work, ups, windows (if any)and Doors, etc. as per technical specification. All cable conduit, trenches and railings wherever required. All electrical accessories like cable wire, electrical outlets, switches, Control panels, etc should be fire
  proof, of reputed make, certified for electrical safety. Bidder has to provide hatch box, storage shelves, scrub basins and other service areas as mentioned in the tender. Testing, Installation and

commissioning of all equipment/services. Any other necessary work required for satisfactory working/performance of the modular OT and not mentioned/specified.

- **Electrical cabling** and wiring from MDB
  (Single point source) to Electric Distributional Panel and to the corresponding load points. All cable conduit, trenches and railings wherever required.

- **Earthing system** of Control panel and other electrical instrument and accessories in the OT area **as per international standard guidelines**. All cable trenches and railings should be made wherever required.

- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Light Points, Power points, in the Modular OT room. • Number of fans, power point, bulbs/tube light. Apart from these supplies to the individual equipments with ELCB & MCB for Modular OT • Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T/Schneider etc for Control Panel for Modular OT. All electrical accessories like cable wire, electrical outlets, switches, Control panels, etc should be fire

- Providing all tools, tackles, manpower for demolishing /dismantling, alteration/ addition for lime concrete, cement concrete, R.C.C, R.B work, precast concrete or stone slabs in walls,partition walls , stone rubble masonry, dressed stone work, ashlar face stone work, marble work or precast concrete work, dismantling doors, windows and clerestory window (steel orwood) shutter including chowkhats, architrave, holdfasts etc. CI or asbestos rain water pipes of any diameter with fittings and clamps, dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, taking out doors, windows and clerestory window shutters (steel or wood), wood work in frames, trusses, purlins and rafters, dismantling steel work in single sections including dismembering and stacking, dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc., old plaster or skirting raking out joints and cleaning the surface for plaster, dismantling of R.C.C. spun vent shaft including excavating the cement concrete pit completely, taking out the shaft, refiling the excavated gap, stacking the useful materials near the site extra for cutting reinforcement bars, Dismantling aluminium/ Gypsum partitions doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material within 1000 meters lead and any other work as directed by engineer-in-charge. Disposal of building rubbish/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge.

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the Modular OT then that may be provided and any other necessary work required for satisfactory working of the Modular OT and not mentioned

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKES

1	PVC Floor	Gerfloor/Tarkett/Forbo/Polyfloor/Armstrong/Altro
2	OT LED Light	Stryker/Maquet/Trilux/Berchtold/Simeon/Danmedics/Trumf/Martin/ Evonos/Surgiris
3	Pendant (Imported)	Ondal/ Pneumatic Berlin / Pneumatech Medical / Trilux/Stark Storm/Amico/Becon Medaes//Trumf/Martin/Drager/LM Medical /Maquet
4	Copper Pipe	Maxflow/Rajco/Precision
5	Door	Metaflex/ Dorma/Rebbon/Chem Pharm/SHD/GEZE
6	Sealed Window	Windowtech/Mac Decor/Vista
7	Surgeon Control panel	Bender/Trilux/ Pneumatic Berlin /Starkstorm/SHD/LM Medical/Rein Medical
8	Wall Panel	SHD/Pneumatic Berlin/Medepha/Operisti/Gremit/Nexor
10	Peripheral light	Philips/Wipro/GE/Crompton
11	Digital Display Monitor	DELL/Stryker/SCAPE/Rein Medical
12	Operating Microscope	Zeiss/hag streit
13.	Anaesthesia Workstation	GE Medical System/Maquet/Drager
14	Isolation Transformer	LM Medical/Schneider/Bender

The makes for other items of MODULAR OT shall be as mentioned in the Civil, Electrical, PHE and HVAC of the tender document.

Note:

- **All electrical accessories like cable wire, electrical outlets, switches etc supplied by the contractor should be fire proof of reputed make, certified for electrical safety.**
- **Wherever makes have not been specified for certain items, the same shall be as per approval of HSCC.**
- **The contractor should provide test certificate for all material used for construction of pre-fabricated Modular OT**
- **The contractor should prepare and submit layout plan for Modular OTs, Laminar flow System including ducting, Electrical Wiring, to HSCC for approval before beginning of supply and installation and <u>As-built drawing</u> after installation.**
- **The contractor shall be responsible for the complete works including submission of working drawing and walk through view.**
- **The contractor should provide complete Operation Manual/Equipment & parts manual/Service manuals for all systems and subsystems.**
- **The contractor shall bear the cost of Final electrical safety test, system test and calibration to be done by authorized person with test instruments.**
- **Training should be provided by the contractor.**

- **All software updates should be provided free of cost during warranty period and CMC period**
- **Bidders are requested to make sure that they should attach the list of equipments for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipments to periodically check the electrical safety aspects as per international Safety Standards which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipments. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipments checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive maintenance call.**
- **.Bidder shall be responsible for commissioning of Medical Gas pipe lines, Pendants, LED OT Light and Gas outlets for the OTs and other associated works to make MOT fully functional. MOT Bidder should coordinate with MGPS, Integration and other vendors for the successful completion of MOTs.**
- **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. (Necessary coordination with HVAC vendor to be done by the MOT bidder)**
- **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 outlets.**
- **Third party quality certification of the imported Modular OT items from SGS/TUV/Lloyds should be submitted by the contractor as "Certifies that the Modular OT items for installation meet the technical specification and BOQ of the tender document vide contract No (Mention Contract No.)."**

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

TECHNICAL SPECIFICATION OF PNEUMATIC TUBE SYSTEM

Scope of work : **Complete plan, design**, S**upply, installation, testing, commissioning including turnkey work and handing over of Pneumatic Tube System to the client. Maintenance including providing of free spare parts and service during Defect Liability**

1. Main Controller & Software System :

Control & Software System including hardware, software package with license key for programming, real time monitoring & RFID pack including all in one - CPU software package power control all in one extended including dongle, software 1 line, editor software for 1 client, software history & evaluation and software for code-tag system, for 64 devices, extendable up to 3 lines complete with power supply unit, power supply - kit external, additional power supply unit with kit external & power supply connecting cable for power control 5 meter.

The entire system has to be electronically controlled by microprocessors with software unit and the main control unit, which controls the sending process and the compressor unit, supervises all system components.
The Main Controller of the System must remain fully available without any restrictions.

The sending process has to be indicated on display devices. The device also has to provide information to find the cause of a system malfunction. Customer-specific data such as the system's layout, target numbers, target names, arrival signals, priority and special functions must be selectable on site without change or external reprogramming of memory devices. An integrated uninterrupted power supply must provide the requested system back up time to paste all date before shutting down the system, so after power source is providing energy again an automatic system start will occur and the system status will get back in the operation mode as before. Chosen targets at stored containers must be kept in the memory to proceed them automatically after power failure restart.

All components of the pneumatic tube conveyor should be constantly monitored; the operating software has to be based on action reaction control for any device. The status of each device should be checked by the master control unit. A test program must be included to automatically check, move and supervise all of the system's devices, or specific selected devices, by access via service code from the Station control panel.

During both normal operation and testing, all devices should inform the master control unit that the selected functional position has been reached. The system should be designed in such a way that it does not allow the unobserved pivoting of devices.

The system has to come with an efficient fault-clearance program that automatically recognizes operating errors, power failures, time-out errors and other system errors. It should also allow the system to continue functioning.

It should be possible to redirect empty containers which have exceeded the pre-allocated distance limit to a Station for maintenance to be carried out – new drivers to be fitted for example.

Main Controller should include the following:

- Main Control Unit Hardware for main controller.
- UPS Uninterruptable Power Supply for Monitoring
- Software package for main controller includes the following:-
- Software for the system including extension lines, as required.
- Software for Code-Tag System/Transponder System.
- Software for Visualization & Editor.
- Software for History & Evaluation.
- Power Supply Unit

2. Blower with VFD:

It should have a separate Blowers maximum 3.0 kW, 3 phase 400v/50Hz, with a standby minimum 2800 rpm with minimum 200 mbar pressure, with low noise, unidirectional rotation with electronic air switch to switch between compressed air and vacuum. Blower with variable frequency drive and attachments, air diverter, to switch between vacuum and compression, carrier by-pass & pressure switch operative on 400 volts, 3 phase AC supply with diverter.

Each blower should be provided with Frequency Converter or VFD for Control of slow speed for sensitive laboratory samples by frequency control of Compressor. The blower should be set go up to 75Hz with the help of Frequency Converter.

It should be provided with all the mounting accessories and soundproof enclosure.

3. Front Load Pass through Stations:

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as pass- through station. The Pneumatic Station should be able to send and receive containers. Station should be provided with 7'' touch screen display with multifunctional operation. The conveying direction of the containers should be both sided (single tube reversing principle). Inserting a container into the Pneumatic Station and selecting a target number should be possible independent from system status.
The container should be loaded on the front side of the Pneumatic Station. The Pneumatic Station should be Steel made, maintenance free mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less censoring of the unit positions. There should not be any air exiting at the pneumatic station. With RFID readers for container ID and inventory, this should ensure automatic container redistribution to its home address & also non-acceptance of any items than authorized container. The Pneumatic Station should have Air cushioned soft landing facility for arriving container to protect samples. Provided with container rack and receiving basket with cushion.

4. Auto Unload Stations:

160mm auto-unload station having special features like no carrier exit, only samples slide out, avoids cross contamination, avoids wastage of time for lab Technician, better carrier inventory management.

The Lab should be provided with an Automatic Unload Pneumatic Station.

When the carrier comes into the pneumatic station it should automatically open inside the stations (without exiting the station), sample bags should slide out, the carrier should automatically return to its origin pneumatic station based on RFID transponder technology.

The carrier should never exist at the station.

The Pneumatic Station should be maintenance free mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less censoring of the unit positions.

With RFID readers for carrier ID and inventory, which should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier.

Should have Air cushioned soft landing facility for arriving containers to protect samples above the station, with the help of slide gate.

Should be provided with carrier rack & SS Slide for sample soft slide-landing.

5. **Compact End Station**

The Pneumatic Station should be designed as a fully automatic dispatch and receiving unit and used as end station with carrier loading from bottom and back sending function. The Pneumatic Station should be able to send and receive containers. Inserting a container into the Pneumatic Station and selecting a target number should be possible independent from system status. Station should be provided with 7'' touch screen display with multifunctional operation. Station should have RFID Reader Circuit Board with in the dispatch magazine of the station, where the carrier is loaded. Optical Sensor Built- in each station The Pneumatic Station should be Steel made, maintenance free gear mechanism, with self-adjusting optical switches, with self-adjusting maintenance free gaskets for noise less operations, contact less sensoring of the unit positions. There should not be any air exiting at the pneumatic station. With RFID readers for carrier ID and inventory, this should ensure automatic carrier redistribution to its home address & also non-acceptance of any items than authorized carrier. It should have Air cushioned soft landing facility for arriving carrier to protect samples. Provided with carrier rack and receiving basket with cushion. Dimensions: (60 x 50 x 50 cm) Approx. to occupy least possible space.

6. **Forwarding Tube:**

Forwarding tube should include the cost of cable and other tube mounting accessories as are required for networking between Pneumatic Stations. Every Station and Routing device must provide transparent tube.

The forwarding tube should be made of PVC of 160 mm OD x 153.6 mm ID. Good Physical tensile strength, general medium density, absorption of water, combustibility self-extinguishing.

7. **Transparent tube** of UPVC 160 mm OD x 153.6 mm ID of Good Physical tensile strength, general medium density, absorption of water, combustibility self-extinguishing.

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8. **Bends:**

It should be of 90 deg. with radius not more than 800 mm (centre) with length approx 1.5 mtrs, for optimal space utilization, grey color. The material should be od Polyvinylchloride PVC

9. **Sleeves:**

It should be made up of Polyvinylchloride PVC with length approx. 150 mm. The outer dia should be 168 & Inner Dia should be 160 mm. Colour RAL 7000.

10. **Composite System Cable:**

It should not be localized and it should be from the principle equipment manufacturer with company brand name marked.

11. **Inserts:**

The Material should be made up of Foam PU and it can be used to transport various types of test tubes. It should be with suitable holders of vacutainers and a pair shuttle bung for each carrier.

12. **Routing Device (Diverter):**

The routing device must provide one incoming and three outgoing delivery tubes. The Routing device must provide a smooth connection between incoming and outgoing tube, to prevent impact on transported items. A maintenance free rotary oscillating pipe has to be pneumatically sealed to the device housing, to prevent air loss, self-adjusting

Teflon gaskets have to provide airtight operation in vacuum and pressure operation.

13. Carriers with RFID:

Carriers for hospital use should be with easy to operate swivel top mechanic, sealed load chamber, to prevent contamination of tubing in the unlikely event of spill of transported goods. This must be realized only by closing the sealed swivel top mechanism.

The "closed" position should be fastened in a lock-in position. The lid should be kept in this position by a spring force and has to be equipped with seals. Furthermore the design of the container must be done in a way that an open container can't be sent. Any container has to be equipped with two free programmable data transponder, system according to send receive device used by the manufacturer in the Pneumatic Stations send magazines. Transponders are used to electronically identify any container by a unique address and to offer the user automatic redistribution to home Pneumatic Station and optionally a second address for dedicated locations or special container use. The containers must provide an easily visible wear and tear resistant colour coding system, which must be changeable also on site by the user without damage and not requiring special tools.

Inside-loading-dimension for Container 160mm swivel top 115 x 400mm approx. Outer-dimension for Container 160mm swivel top 150 x 420mm approx.

With suitable holders of vacutainers and a pair shuttle bung for each container.

14. Auto Unload Carriers with RFID:

Auto Unload containers should be such that no manual handling be required during unloading.

The container should automatically unload at the Pneumatic Station then automatically close & go back to the origin Pneumatic Station.

The system should not accept an open container.

The container should also be able to open manually at the unloading station.

It should have at least two free programmable data transponder system.

Inside-loading-dimension for System 160mm swivel top110 x 260mm approx.

15. RFID:

The system should be provided with RFID as a standard solution, this helps in proper management of Carriers with the help of return of empty carrier. It also does not allow anything else to go in the system, but the carrier. All stations should have RFID reader Cards for the carrier, duly installed in the dispatch magazine. All the carriers should have RFID programmable chips on both sides of the carrier (2 per carrier).

16. Turn Key –

Providing all tools, tackles, manpower for demolishing /dismantling, alteration/ addition for lime concrete, cement concrete, R.C.C, R.B work, precast concrete or stone slabs in walls, partition walls , stone rubble masonry, dressed stone work, ashlar face stone work, marble work or precast concrete work, dismantling doors, windows and clerestory window (steel or wood) shutter including chowkhats, architrave, holdfasts etc. CI or asbestos rain water pipes of any diameter with fittings and clamps, dismantling G.I. pipes (external work) including excavation and refilling trenches after taking out the pipes, taking out doors, windows and clerestory window shutters (steel or wood), wood work in frames, trusses, purlins and rafters, dismantling steel work in single sections including dismembering and stacking,

dismantling steel work in built up sections in angles, tees, flats and channels including all gusset plates, bolts, nuts, cutting rivets, welding etc., old plaster or skirting raking out joints and cleaning the surface for plaster, dismantling of R.C.C. spun vent shaft including excavating the cement concrete pit completely, taking out the shaft, refiling the excavated gap, stacking the useful materials near the site extra for cutting reinforcement bars, Dismantling aluminium/ Gypsum partitions doors, windows, fixed glazing and false ceiling including disposal of unserviceable surplus material and stacking of serviceable material within 1000 meters lead and any other work as directed by engineer-in-charge. Disposal of building rubbish/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge. Earthing of equipment and Control and Ventilation of Blower Room should be done by the contractor.

Approved Makes : Swisslog/Aerocom/Sumetzburger / Greenvac / Sitratech

Note :

- The bidder should attach the list of equipments for carrying out routine and preventive maintenance wherever asked for and should make sure that Electrical Safety Analyzer / Tester for Medical equipments to periodically check the electrical safety aspects as per BIS Safety Standards IS-13540 which is also equivalent to IEC electrical safety standard IEC-60601 is a part of the equipments. If the Electrical Safety Analyzer/Tester is not available they should provide a commitment to get the equipments checked for electrical safety compliance with Electronic Regional Test Labs /Electronics Test and Development Centres across the country on every preventive Maintenance call.
- Adequate training of personnel and non-locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS).
- The successful tenderer will be required to undertake to provide at his cost technical training for personnel involved in the use and handling of the equipment on site at the institute immediately after its installation. The company shall be required to train the institute personnel onsite for a minimum period of 1 month. All software updates should be provided free of cost during warranty period and CMC Period
- The bidder should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues
- The contractor shall be responsible for the complete works including submission of working drawing and walk through view.
- The contractor should provide complete List of Commonly used Spares, Operation manual, Equipment manual, Service manual and manuals for all systems and subsystems.
- Engineer may instruct for any test this test to be got done by contractor at their own cost.
- The contractor should provide all electrical accessories like cable wire, electrical outlets, switches etc, and they should be fire proof of reputed make, certified for electrical safety.
- Wherever makes have not been specified for certain items, the contractor should provide the same as per BIS and as per approval of HSCC.
- The contractor should prepare and submit layout plan for Steam Pipeline, Electrical Wiring, Electrical Distributional Panel, Plumbing, Fire Fighting System, Ventilation and Drain line to HSCC for approval before beginning of supply and installation and As built drawing after installation and commissioning.
- The contractor should provide test certificate for all materials along with manufacturer's test certificate and equipments used for PTS.
- The final Payment will be made on the actual measurement of the BOQ Items and ranking will be done with tendered BOQ.
- The PTS bidder has to terminate/interconnect all the medical gas lines upto/to the OT/MOT.
- The contractor should provide Third party quality certificate of the PTS equipment from SGS/TUV/Lloyds saying as "Certifies that the MGMS equipment meets the technical specification and BOQ of the Contract".

*NOTE: - BIDDER HAS TO FOLLOW THE STANDARD AS APPLICABLE IN THE FIJI.

BOQ FOR MOT

Package- Supply, installation, testing and commissioning of MODULAR OT on turnkey basis along with equipment including 1 year DLP

Item No.	Description 2	Unit 3	Qty 4	Rate in Fig in Fiji $ 5	Rate in Words in Fiji $ 6	Amount in Fiji $ 7
1.0	**WALL & CEILING SYSTEM (SMS)** Complete with all accessories as per technical specification Area	SQM	315			
2.0	**CEILING FILTRATION SYSTEM / LAMINAR AIR FLOW SYSTEM (AIR MANAGEMENT SYSTEM)** Complete with all accessories as per technical specification	Nos	2			
3.0	**OPERATION THEATRE FLOORING (ANTISTATIC CONDUCTIVE TILES)** Complete with all accessories as per technical specification	SQM	130			
4.0	**DOORS AND FRAMES (AUTOMATICALLY HERMETICALLY SEALED SLIDING DOOR) Size-2100 x 1800 mm C**omplete with all accessories as per technical specification	Nos	2			
5.0	**DOORS AND FRAMES (AUTOMATICALLY HERMETICALLY SEALED SLIDING DOOR) Size-2100 x 1000 mm C**omplete with all accessories as per technical specification	Nos	2			
6.0	**PRESSURE RELIEF DAMPERS** Complete with all accessories as per technical specification	Nos	2			
7.0	**INTERNAL DUCTING** Complete with all accessories as per technical specification	Sqm	250			
8.0	**PERIPHERAL LIGHT CUM CLEAN ROOM LUMINARIES** Complete with all accessories as per technical specification	Nos	20			
9.0	**SURGEON CONTROL PANEL** Complete with all accessories as per technical specification	Nos	2			

10.0	**ADJUSTABLE MOVABLE BOOM ARM SYSTEMS**					
a	**SURGEON PENDANT** Complete with all accessories as per technical specification	Nos	2			
b	**ANESTHETIST PENDANT** Complete with all accessories as per technical specification	Nos	2			
11.0	**X-RAY FILM VIEWER** Complete with all accessories as per technical specification	Nos	5			
12.0	**WRITING BOARD (LIST BOARD**) Complete with all accessories as per technical specification	Nos	2			
13.0	**STORAGE UNIT** Complete with all accessories as per technical specification	Nos	2			
14.0	**DISTRIBUTION BOARD ELECTRICAL WIRING, CONDUITING WITH FIXTURES INSIDE THE OPERATION THEATRE** Complete with all accessories as per technical specification	Lot	2			
15.0	**SCRUB STATION** Complete with all accessories as per technical specification	Nos	2			
16.0	**MEDICAL GAS LINE INSTALLATION** Complete with all accessories as per technical specification **(15mm dia- , 22 mm dia-)**					
	15 mm dia	mtr	120			
	22 mm dia	mtr	120			
17.0	**VIEW WINDOW** Complete with all accessories as per technical specification	Nos	2			
18.0	**EXHAUST CABINET Complete with all accessories as per technical specification**	Nos	2			
19.0	**SURGICAL OT LIGHT (LED) WITH CAMERA AND MONITOR** Complete with all accessories as per technical specification	Nos.	2			
20.0	**MONITOR –DIGITAL DISPLAY (PACS/HMIS)**	Nos.	2			
21.0	**MOTORIZED OPTHALMIC OPERATION TABLE** Complete with all accessories as per technical specification	Nos	2			
22.0	**OPERATING MICROSCOPE** Complete with all accessories as per technical specification	Nos	2			
23.0	**ANESTHESIA WORKSTATION** Complete with all accessories as per technical specification	Nos	2			
24.0	**ISOLATION TRANSFORMER** Complete with all accessories as per technical specification	Nos	2			
25.0	**TURNKEY WORKS** Complete with all accessories as per technical specification	Lot	2			
					TOTAL Fiji $	

BOQ FOR IOT						
Package- Supply, installation, testing and commissioning of INTEGRATION OF MODULAR OT on turnkey basis along with equipment including 1 year DLP						
Item No.	**Description**	**Unit**	**Qty**	**Rate in Fiji $**	**Rate in Words Fiji $**	**Amount in Fiji $**
1.0	**Digital Medical Grade Monitor (26" or more with ceiling suspended Arm) Complete inclusive of all accessories as per technical specification.**	No.	1			
2.0	**42 inch Medical Grade Monitor (flushed in MOT wall with frame)**	No.	1			
3.0	**Audio Video Communication System (Including Router, Rack, VC, HD Cameras, Speakers, Mic, and other accessories as per tender document**	No.	1			
4.0	**Control System cum Digital Documentation System-19" or more Medical grade monitor, windows based recorder, 5 TB Network Storage, PACS**	No.	1			
5.0	**Trolley Based vc System (Camera, Speaker, Mic, Dialying System, 26" or more Monitor, Suitable Trolley, Licenses, Patch Panels and other accessories as per tender requirement**	No.	1			
6.0	**Live Video Streaming Complete inclusive of all accessories as per technical specification.**	Nos	1			
7.0	**Turnkey works**	Ls	1			
					Total Amount in Fiji $	

BOQ FOR MINOR OT

Package- Supply, installation, testing and commissioning of MINOR OT on turnkey basis along with equipment including 1 year DLP

Item No. 1	Description 2	Unit 3	Qty 4	Unit Rate (In Figure) Fiji $ 5	Unit Rate in Words in Fiji $ 6	Amount FijI$ 7
1.0	**WALL & CEILING CONSTRUCTION** Complete with all accessories as per technical specification	SQM	122			
2.0	**CEILING FILTRATION SYSTEM / LAMINAR AIR FLOW SYSTEM** Complete with all accessories as per technical specification	Nos	1			
3.0	**DOORS AND FRAMES (AUTOMATICALLY HERMETICALLY SEALED SLIDING DOOR) Size-2100 x 1800 mm C**omplete with all accessories as per technical specification	Nos	1			
4.0	**DOORS AND FRAMES (AUTOMATICALLY HERMETICALLY SEALED SLIDING DOOR) Size-2100 x 1000 mm C**omplete with all accessories as per technical specification	Nos	1			
5.0	**PERIPHERAL LIGHT CUM CLEAN ROOM LUMINARIES** Complete with all accessories as per technical specification	Nos	10			
6.0	**DISTRIBUTION BOARD ELECTRICAL WIRING, CONDUITING WITH FIXTURES INSIDE THE OPERATION THEATRE** Complete with all accessories as per technical specification	Lot	1			
7.0	**OPERATION THEATRE FLOORING (ANTISTATIC CONDUCTIVE ROLL)** Complete with all accessories as per technical specification	SQM	50			

8.0	**VIEW WINDOW** Complete with all accessories as per technical specification	Nos.	2			
9.0	**INTERNAL DUCTING** Complete with all accessories as per technical specification	Lot	1			
10.0	**MEDICAL GAS PIPELINE INSTALLATION** Complete with all accessories as per technical specification	Lot	1			
11.0	**SCRUB STATION (2-BAY)** Complete with all accessories as per technical specification	Nos	1			
12.0	**SURGICAL OT LIGHT (Dual dome LED) Complete with all accessories as per technical specification**	Nos	1			
13.0	**MOTORIZED OPTHALMIC OPERATION TABLE Complete with all accessories as per technical specification**	Nos	1			
14.0	**TURNKEY WORKS**	Lot	1			
					TOTAL Fiji $	

BOQ FOR MGMS

	Package- Supply, installation, testing and commissioning of MEDICAL GAS MANIFOLD SYSTEM on turnkey basis along with equipment including					
Sl.No.	**Desciption of items**	**QTY**	**Unit**	**Rate in Fiji $**	**Rate in Fiji $ in Words**	**Amount in Fiji $**
1	Oxygen generation System- Supply installation, testing commissioning of Oxygen Concentrator Module, Touch screen, alarm facility, Oxygen Analyzer, Oxygen Surge Tank, Compressed air system, Refrigerated dryer, Filtration system, Air Receiver, High Pressure Booster as per specifications	1	Nos			
i	Oxygen Concentrator Module - Fully Automated system Microprocessor based Oxygen Concentrator Module, **Duplex** System with PSA technology complete with all accessories as per technical specification	1				
ii	Touch Screen 6" to 7" screen complete with all accessories as per technical specification	1				
ii	Oxygen Monitor for Oxygen generators includes Alarm Function complete with all accessories as per technical specification	1				
iv	Oxygen Analyzer with digital display complete with all accessories as per technical specification	1				
v	External Audio-Visual Alarm- Visual alarm is active whenever an alarm is present in the system. Audio will turn on when an alarm appears but can be turned off from control panel.	1				
vi	1" hose (Generator and other outlet connections	4				
1.1	Oxygen Surge Tank The Oxygen concentrator should be supplied with Oxygen Surge Tank having capacity of 750 ltres complete with all accessories as per technical specification	1				
1.2	Medical Upgrade Kit Coal Tower 90, 0.01 micron Filter, Carbon Filter, Bacteria/ Sterile Filter complete with all accessories as per technical specification	1				
1.3	Compressed air system consisting of Screw type Compressor complete with all accessories as per technical specification (1Working + 1Standby)	1				
a	Refrigerated Air Dryer of flowrate 550cum./hr complete with all accessories as per technical specification	1				
b	Filtration system for the compressed Air Feed air quality of the oxygen concentrator should be conforming to ISO8573 class 4 and is of filtration grade of 0.01 Micron complete with all accessories as per technical specification	1				
1.4	Air Receiver The system should be provided with an Air Receiver having the capacity of 3000 litres and should be designed in such a way to sustain pressure of 7-11 bar. The air receiver should be fitted with 2 Nos. auto drain-out moisture complete with all accessories as per technical specification	1				
1.5	High Pressure Booster (HPB) The high pressure booster oxygen compressor for refilling the various type of Oxygen cylinder complete with all accessories as per technical specification	1				
1.6	Digitally Controlled Fully Automatic Servo Voltage Stabilizer The Voltage Stabiliser of 40 KVA capacity should work on minimum input voltage of 340V with output voltage of 440±5%. The Voltage stabilizer should be 3 phase, oil cooled, 50 hz complete with all accessories as required as per specifications	1	Nos			

2.1	Fully Automatic Oxygen Control System : Supply, Installation testing and commissioning of Fully Automatic Oxygen Control System. complete with all accessories as required as per specifications	1	Nos			
2.2	Oxygen Manifold (2x20) : Supply, Installation, testing and commissioning of (2x20 size) class D cylinder Oxygen Supply System. complete with all accessories as required as per specifications	1	Nos			
2.3	Emergency Oxygen Supply System : Supply, Installation, testing and commissioning of (2x10 size) class D cylinder Emergency Oxygen Supply System. complete with all accessories as required as per specifications	1	Nos			
2.4	Oxygen Flow meter with Humidifier Bottle: Supply, installation, testing and commissioning of oxygen flow meter with humidifier bottle 0-15Litres. complete with all accessories as required as per specifications	272	Nos			
3.1	Fully Automatic Manifold Control Panel for Nitrous Oxide: Supply, installation testing and commission of fully automatic control panel for Nitrous Oxide. complete with all accessories as required as per specifications	1	Nos			
3.2	Nitrous Oxide Manifold System, (2x3 size): Supply, installation, testing and commissioning of (2x3 size) Nitrous Oxide Manifold system . complete with all accessories as required as per specifications	1	Nos			
3.3	Emergency Nitrous Oxide Manifold System, 2x1 size: Supply, installation, testing and commissioning of (2x1 size) cylinder Emergency Nitrous Oxide supply System . complete with all accessories as required as per specifications	1	Nos			
4.0	Medical Air Plant (Package Unit) including electrical control panel: Supply, Installation, testing and commissioning medical air plant having a minimum capacity of 4500 LPM as Primary & 1500 LPM as standby or Total minimum Plant capcacity of 6000 LPM and complete with all accessories as required as per specifications	1	Nos			
5.0	Medical Vacuum Plant (Package unit): Supply, Installation, testing and commissioning of Rotary Vane type medical vacuum plant having a minimum system capacity of 5000 LPM as Primary and 5000 LPM as standby and complete with all accessories as required as per specifications	1	Nos			
5.6	Ward Vacuum Unit: Supply, installation, testing and commissiong of Ward Vacuum Unit complete with all accessories as required as per specifications .	244	Nos			
5.7	Theater Vaccum Unit for Operation Theaters: Supply, installation, testing and commissiong of Theater Vacuum Unit complete with all accessories as required as per specifications	21	Nos			
6.0	Duplex AGSS System: Supply installation and commissioning of Duplex AGSS system. complete with all accessories as required as per	1	Nos			
7.0	Copper Pipes complete with all accessories as required as per specifications					
i	76.1 mm OD X 1.2mm thick	100	mtr			
ii	54mm OD X 1.2mm thick	250	mtr			
iii	42mm OD X 1.2mm thick	450	mtr			
iv	35mm OD X 1.2mm thick	400	mtr			

v	28mm OD X 1 mm thick	700	mtr			
vi	22mm OD X 1 mm thick	2000	mtr			
vii	15mm OD X 1 mm thick	2500	mtr			
viii	12mm OD X 1 mm thick	1600	mtr			
8.0	Gas Outlet Points/ Terminal Units with probe: Supply,Installation, testing and commissioning of Gas outlet points for Oxygen, Nitrous Oxide, Medical Air 4 Bar , Vacuum, CO2 and AGSS complete with all accessories as required as per specifications .					
i	Oxygen outlet with probe (MOT outlets are in the MOT Package)	252	Nos			
ii	Nitrous Oxide outlet with probe (MOT outlets are in the MOT Package)	6	Nos			
iii	Medical Air 4 outlet with probe (MOT outlets are in the MOT Package)	104	Nos			
iv	Vacuum outlet with probe (MOT outlets are in the MOT Package)	252	Nos			
v	Medical Air 7 outlet with probe (MOT outlets are in the MOT Package)	5	Nos			
vi	AGSS outlet with probe (MOT outlets are in the MOT Package)	6	Nos			
9.0	AREA VALVE BOX : Supply,Installation, testing and commissioning of Area Valve Boxes. complete with all accessories as required as per specifications					
	Valve Box - 2 Gas Service	15	Nos			
	Valve Box - 3 Gas Service	18	Nos			
	Valve Box - 6 Gas Service	9	Nos			

10.0	MEDICAL GAS ALARM PANEL : Supply, Installation, testing and commissioning of Medical Gas Alarm Panel complete with all accessories as required as per specifications					
	Medical Gas Area Alarm for 2 services (Oxygen and MA4 bar)	15	Nos			
	Medical Gas Area Alarm for 3 services (Oxygen, MA4 bar and Vacuum)	18	Nos			
	Medical Gas Area Alarm 6 services (Oxygen, N2O, MA4 bar , SA7 bar N2O,and Vacuum)	9	Nos			
	Master Alarm Panel complete with all accessories as required as per specifications	1	Nos			
11.0	LINE ISOLATION VALVES complete with all accessories as required as per specifications					
	15 mm ball valve	93	Nos			
	22 mm ball valve	62	Nos			
	28 mm ball valve	5	Nos			
	35 mm ball valve	8	Nos			
	42 mm ball valve	6	Nos			
	54 mm ball valve	4	Nos			
	76 mm ball valve	2	Nos			
12.0	Supply of O2 cylinders-Class D cylinders	60	Nos			
13.0	Supply of N2O cylinders-Class D cylinders	20	Nos			
14.0	Bed Head Horizontal/ vertical Wall Panel (Without outlets) as per specification	91	Nos			
15.0	"ICU Pendant (Without outlets) complete with all accessories as required as per specifications	26	Nos			
17.0	Supply installation testing and commissioning of Medical gas hose assemblies as per standard followed	600	mtr			
18.0	Electric wiring inside the gas manifold and plant room including electrical panel for plant & Manifold rooms	1	Nos			
20.0	Turnkey works as per Specification	1	Nos			
					TOTAL Fiji $	

BOQ FOR LAUNDARY

Package- Supply, installation, testing and commissioning of MECHANIZED LAUNDARY on turnkey basis along with equipment including 1 year DLP

Item No.	Description 2	Unit 3	Qty 4	Unit Rate In Fiji $ (in Figure) 5	Unit Rate in Fiji $ (in Words) 6	Amount (Fiji $) (In Figure) 7
1.0	Supply, Installation, Testing and Commissioning of **SLUICING CUM WASHER EXTRACTOR** 30 **Kg** Details of technical data are as per technical specification.	Nos	1			
2.0	Supply, Installation, Testing and Commissioning of **BARRIER WASHER EXTRACTOR 25 -30 Kg** Details of technical data are as per technical specification.	Nos	2			
3.0	Supply, Installation, Testing and Commissioning of **DRYING TUMBLER 30 Kg** Details of technical data are as per technical specification.	Nos	2			
4.0	Supply, Installation, Testing and Commissioning of **FLAT BED PRESS, Size- 1500mm x 750mm**. Details of technical data are as per technical specification.	Nos	2			
5.0	Supply, Installation, Testing and Commissioning of **AUXILIARY STEAM GENERATOR 8 Kg/hr** Details of technical data are as per technical specification.	Nos	1			
6.0	Supply, Installation, Testing and Commissioning of **VACUUM FINISHING TABLE** with Electric steam iron, Size-1300mm x 800 mm. Details of technical data are as per technical specification.	Nos	1			
7.0	**AIR COMPRESSOR 3hp.** Details of technical data are as per technical specification.	Nos	2			
8.0	Supply, Installation, Testing and Commissioning of **WASH ROOM TROLLEY 50 Kg** capacity. Details of technical data are as per technical specification.	Nos	2			
9.0	Supply, Installation, Testing and Commissioning of **DIRTY LINEN COLLECTION ROOM TROLLEY Capacity 50 Kg.** Details of technical data are as per technical specification.	Nos	2			

10.0	Supply, Installation, Testing and Commissioning of **DIRTY LINEN TRANSPORTATION TROLLEY -50 Kg** Details of technical data are as per technical specification.	Nos	6			
11.0	Supply, Installation, Testing and Commissioning of **MOBILE FOLDING TABLE** with **Stainless table top.** Details of technical data are as per technical specification.	Nos	2			
12.0	Supply, Installation, Testing and Commissioning of **STORAGE RACKS.** Details of technical data are as per technical specification.	Nos	6			
13.0	Supply, Installation, Testing and Commissioning of **SHELF TROLLEY (Finished goods)-100 Kg.** Details of technical data are as per technical specification.	Nos	6			
14.0	Supply, Installation, Testing and Commissioning of **LAUNDRY SCRUB STATION WITH TWO SINKS.** Details of technical data are as per technical specification.	Nos	1			
15.0	Supply, Installation, Testing and Commissioning of **MENDING MACHINE** Details of technical data are as per technical specification.	Nos	1			
16.0	**Industrial Weighing Machine** Details of technical data are as per technical specification.	Nos	1			
17.0	**TURNKEY WORKS as per specification**	Lot	1			
					TOTAL in Fiji $	

	BOQ FOR KITCHEN					
	Package- Supply, installation, testing and commissioning of KITCHEN on turnkey basis along with equipment including 1 year DLP					
Sl.No1	**Specifications 2**	**Size/Unit 3**	**Qty. 4**	**Rate in Fiji $ 5**	**Rate in words in Fiji $ 6**	**Amount in Fiji $ 7**
	CENTRAL KITCHEN					
1	**Preparation Table with OHS and 1u/s-** Top of 16 swg S.S-304 sheet on M.S Angle frame work duly rust proof painted on structure made on SS square/tubular legs with adjustable bullet feet for uneven floors. Also fitted with a under shelf. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip.	2000x600x850	1			
2	**Single Burner Stock Pot-** Top of 16 swg. S.S-304 Sheet on M.S Angle frame work duly rust proof painted on SS Tubular/ Square legs with adjustable bullet feet for uneven floors. Fitted with United/Sarna make heavy duty burner with pilot lamps with individual control valves and heavy duty cast iron pan support complete with accessories as per specification.	750x750x600	4			
3	**Side Table**- Same as sl.ni.1	1500x600x600	2			
4	**Exhaust hood**- Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung/fixed with metal fasteners complete with accessories as per specification.	2000x2000x600	1			
5	**Boiler (Tilting) -** Double walled glass wool Insulated all S.S-304 Sheet body. The outer Most is of 18swg S.S-304 Sheet body. Fitted with heavy duty high pressure burner with pilot lamp & individual control valves. Fitted with water inlet & water outlet valve & strainer at the bottom level of the boiler also fitted with a Top opening lid with insulated handle. The entire boiler is mounted on heavy duty tubular legs. Also fitted with a heavy duty tilting gear to extract the boiled food complete with accessories as per specification.	80ltr.	2			
6	**Brazing Pan (Tilting) -** Double walled mineral wool insulated all S.S-304sheet body on heavy duty tubular legs with adjustable bullet feet. Fitted with heavy duty burner with pilot lamp with individual control needle valve. Fitted with tilting gear to extract contents after cooking & water inlet valve. Also fitted with top opening lid with insulated handle complete with accessories as per specification.	80 ltr.	1			
7	**Exhaust Hood -** Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung/fixed with metal fasteners complete with accessories as per specification.	4500x1200x600	1			
8	**Masala Trolley** -The entire trolley is made on SS sheet body to keep inserts for preparation on tubular legs on 4 nos castor wheels-2 with breaks and 2 normal. Also fitted with a bottom shelf/cross brazings. Size-800 x 500 x 900	800x500x900	1			

9	**Chapatti Plate cum puffer**- Structure made of mild steel angle frame duly rust proof painted . Top of 12 mm mild steel, front Panel and under shelf 18swg S.S-304sheet, vertical legs of S.S-304 round pipe of 16swg. 1.5" diameter with nylon adjustable feet. Complete with CI perforated grill for puffing of chapattis, heavy duty high pressure RV burner pilot, individual control valves Indian Oil corporation approved complete with accessories as per specification.	1500x600x850	1			
10	**Rolling Table** - Top made of 16swg S.S-304 sheet on MS Angle frame work with rust proof painted on S.S-304 square pipe 25x25mm/Tubular legs frame work and under shelf made of 18swg S.S-304 sheet. Vertical legs of S.S-304 round pipe of 16 swg. 1.5" dia with nylon adjustable feet complete with accessories as per specification.	1200x600x850	1			
11	**Exhaust hood**- Entire exhaust is made of 20 swg.S.S-304 Sheet with S.S-304 baffle filters. Fitted with grease collection tray and hung with metal fasteners complete with accessories as per specification.	1800x750x600	1			
12	**Side Table** -Same as sl.ni.1.	1200x600x850	2			
13	**Dough Kneader**- Body completely constructed of heavy duty cast iron with gear box mounted on the top the mixing bowl of S.S-304 sheet 14 swg with S.S-304 arm to mix the dough and is operated electrically with heavy duty motor of 1 hp. Motor shall be S1 type of IS : 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/ Crompton Greaves make complete with accessories as per specification..	25 kg.	2			
14	**Garbage Cart**- Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its basecomplete with accessories as per specification. Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			

	PREPARATION AREA					
1	**Preparation Table with OHS and 1u/s-** Top of 16 swg S.S-304 sheet on M.S Angle frame work duly rust proof painted on structure made on SS square/tubular legs with adjustable bullet feet for uneven floors. Also fitted with a under shelf. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip.	1800x600x850+150	1			
2	**SS stand for Chopping blocks with boards-** All S.S-304 sheet body to hold poly carbonate chopping boards-4Nos.complete with accessories as per specification.	600x600x850	4			
3	**Potato Peeler-** The heavy duty peeling drum is made of 18 swg. SS sheet on three nos tiny legs with adjustable bullet feet and a rotating disc of SS sheet being connected with heavy duty motor of S1 type of IS:325 standard, single/three phase . Also pasted with emery granules inside the drum and on rotating disc to peel and fitted with water inlet valve and aluminum casting/SS sheet our pour to extract peeled potatoes complete with accessories as per specification. Make-Robotcoupe/Sirman/Haudie	10 kg.	1			
4	**SS Single Bowl Sink unit (Vegetable washing)-** Top of 16 sg. SS sheet on S.S. Angle frame work on S.S square legs with adjustable bullet feet for uneven floors. Also fitted with a large sink on RHS. Also fitted with a back splash and under shelf. The top is fitted with stud wielded bolts with the frame for sturdy and stronger grip. The bowl size 500x500x250	1500 x 650 x 850 + 150 spl.	2			
5	**Garbage Cart-** Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base complete with accessories as per specification.Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			
	DIETARY AREA					
1	**Work table with sink-** Top of 16 swg S.S-304 sheet on SS frame work on Structure made of S.S-304 square/Tubular pipe. Sink made of 14 swg S.S-304 on LHS/RHS and under shelf made of 18 swg S.S-304 sheet. Vertical legs of S.S-304 round pipe of 16 swg. 1.5" dia with nylon adjustable feet. The top is fitted with stud welded bolts with the frame for sturdy and stronger grip.	1500x600x850 +150	1			
2	**Coffee/Tea Machine Dispensor-** Double walled glass wool insulated all S.S-304 Sheet body. Fitted with 3.0 kw heating element with auto temp. controller & indicating lamp, water level indicator, Gun metal faucet one for water and another for milk complete with accessories as per specification..	250 cups/hr	1			
3	**Micro oven-** Convectional, Complete with accessories as per specification.IFB/Equivalent	30 ltrs.	1			

4	**Conveyor Toaster**- Capacity 750 nos per hour. Power consumption should not be more then Arr 2.8 kwatt,220 volts, stainless steel table top model, should be based on belt speed inplace of heating temperature for toasting colour. stainless steel element. with variable speed. Should be able to work both sides either front or rear. stainless steel .supplied with all accessories & attachments. crumb tray /discharge tray should be provided. continous toasting with thermostatic setting.High quality components &accurate timer control.Unit size should eb arr. 455x355x415mm Complete with accessories as per specification. Make ; LINCAT (CT -10) /HATCO (TQ-800)HPA/CROMO	750 Slices/hr	2			
5	**Egg boiler**- Double walled mineral wool insulated all SS Sheet body on SS legs with adjustable bullet feet. Fitted with 3.0 kw immersion type heating element with auto temperature controller and indicating lamps. Also fitted with a top opening lid with insulated handle and two insulated handles on either side to carry. Also fitted with water inlet, outlet valves & water level indicator complete with accessories as per specification.	120 pcs egg/cycle	1			
6	**Milk boiler**- Triple walled mineral wool insulated all SS sheet body on SS legs with adjustable bullet feet. The outer most wall and the secnd wall is mineral wool insulated and the other wall water proof and fitted with water inlet, outlet, over flow valves and water level indicator. Also fitted with 3.0 kw immersion type heating element with auto temperature controller and indicating lamps and a heavy duty gun metal faucet. A top opening lid with insulated handle is fitted . Also fitted with two nos, insulated handles on either sides to carry complete with accessories as per specification.	100 Ltrs.	2			
7	**Two Burner with Oven**- Top of 16 swg. SS Sheet on M.S Angle frame work on SS Square legs with adjustable bullet feet for uneven floors. Fitted with United/Sarna make heavy duty burner with pilot lamps with individual control valves and heavy duty cast iron pan support. Also fitted with an electrically operated oven beneath. Size-950 x 950 x 850 + 150 Spl.	950 x 950 x 850 + 150 Spl.	1			
8	**Exhaust hood**- Complete frame work 20/22swg. Complete joints are air tight insulated weather proof mechanically painted on the Upper surface. S.S-304 filters complete with accessories as per specification.	5400x1200x600	1			
9	**Juicer**- Compact design- fits almost anywhere,under counters or worktables.		2			
10	**Hand wash Unit**- Splash as per Layout (Rear & against side wall) Front & free side marine edge. 350mm dia.x200mm High Die Pressed Sink complete with 38mm dia. C.P. Drain Waste Out let. 16 gauge S.S-304 wall brackets. Secured to top with Acorn nuts & Bolts & Bracket secured to wall with anchor fasteners. Rear & Both sides 20 gauge S.S-304. One Deck mounted Jackson Swivel type water mixer water faucet. Unit mounted 865mm AFF Size- 600x600x450.	600x600x450	1			
11	**Chinese Cooking Range** Size-1120X760x850+450	1120X760x850+450	1			
12	**Garbage Cart**- Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base complete with accessories as per specification.	Capacity-100 ltrs,	1			
	POT WASH					
1	**Pot Rack-4shelves**- The heavy duty 4 tiers rack are made of S.S-304 square pipe (38mm & 25mm) and duly welded with 4 nos. uprights on nylone adjustable feet for uneven floor complete with accessories as per specification.	1200X600X1650	2			
2	**Two Sink Pot Wash**- The structure made of SS: 304 square pipe 25 x 25 mm Angle frame work duly rust proof painted. Top & sink made of 14 swg and under shelf made of 18 swg SS: 304. Vertical legs of SS: 304 round pipe of 16 swg, 1.5inch dia. With nylon adjustable feet. Sink Size- 600x600x450	1500x600x850+150	1			
3	**Pot wash Sink**- To be constructed with Brick and Cement (Masonary Work) finished with tiles	2000x1500x600	1			

4	**Hot water Geyser**- Horizontal	50 Ltrs.	1			
5	**Garbage Cart-** Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base complete with accessories as per specification.Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			
	DISH WASH					
1	**Dish Washer**- Single Tank Rack conveyor type. 6 to 8 plates per rack, Cycle time 1.5 minutes.The position of Dish Washer i.e RHS/LHS depends on loading and unloading table (As per layout drawing) Make-Winter Halter/ Electrlux/Hobart with Drier	At least 155 Rack/hr	1			
2	**Soiled Dish Landing Table with glass Rack with Garbage chute**- The marine edged top made of 16 swg SS: 304 sheet on MS Angle frame work, duly rust proof painted & stud welded for stronger grip and cross bracing of 18 swg SS: 304 sheet. Vertical legs with nylon adjustable feet. A Garbage chute is provided on LHS & a glass is fitted on the D.L.T.	1500X800X850 +600	2			
3	**Clean Dish Table**- Top 16 swg S.S-304 sheet on MS Angle frame work duly rust proof painted & stud welded on SS. Tubular/square legs with adjustable bullet feet. Also fitted with SS slide out beneath to hold the plate/glass racks of 500 x 500 mm	900x800x850+150	2			
4	**Hot water Geyser**- Horizontal	60 Ltrs.	1			
5	**Dish Storage Rack 5 tiers-** All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having 'C' Channel through to accommodate maximum load bearing ability	900x450x1800	6			
6	**Dish Wash Busket Trolley**- Top 16 swg S.S-304 sheet on MS Angle frame work duly rust proof painted on tiny castor wheels. Fitted with a push cart type handle.	600x600x200	2			

7	**Garbage Cart**- Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base complete with accessories as per specification.Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			
	SET-UP AREA					
1	**SS Rack on Castors**- All five shelves are made of 18 swg. SS sheet on 4 nos round / square legs with adjustable bullet feet. All the shelves are having "C" channel through to accommodate maximum load bearing ability. Size- 1300 x 450 x 1800	1300 x 450 x 1800	2			
2	**Hot Bain Marie on Castors**- Double walled mineral wool insulated all S.S. Sheet body is fitted with an immersion type heating element of 3.0 KW with auto temp. controller & indicating lamps on heavy duty castor wheels. Intergral with top & suitable to accommodate Six (6) 300mm high GN 1/1 PANS GN 1/1 food pans with lid to be supplied #16 SWG S/S sheet tank integral with work top of water counter Fully coved corner insulated with 50 mm thick tightly packed glass wool on the exterior and base of internal tank & sheathed with 20 SWG s/s sheet on exterior Bottom of tank sloped to left side with 40mm dia brass waste w/angle valve # 18 SWG s/s perforated false bottom with all sides turned down 40mm in 12 mm two (2) nos 3.0 KW electric heating elements clamped 25mm off the bottem complete with thermostat, on 0 off switch, red light and controls.	2250x675x850	2			
3	**Hot Food Service Trolley**- Double walled insulated with glass wool. Inner side made of 18swg & outer side made of 20 swg as Stainless steel 304 sheet with 4 no heavy duty Castor wheels (4"/6" dia) with 2 wheels locking arrangement and push cart type handle constructed from ss pipe. Trolley has Immersion type 3Kw heating elements with auto temp. controller & indicating lamp with temp. Indicator to keep 5 Nos big round containers of 10 ltrs. capacity each and 2 more small containers of suitable capacities all with lids to keep food hot vegetable/soup/card etc. and one rectangular for container for to keep chapattis. Also fitted with one middle and bottom shelves with lockable door. Rubber cushion to be fitted at the corners to prevent damage during transportation complete with accessories as per specification..	1200x600x900	8			
4	**Plartform Trolley**- The entire trolley is made of 16 swg. S.S. Sheet on M.S. Angle frame work, duly Rust proof painted on heavy duty castor wheels. The top to be stud wielded with the frame for stronger grip. Also fitted with a push cart type handle & rubber cushion in front to avoid the damage during movement.	900x600x250	4			
5	**Garbage Cart**- Moulded Plastic container with 2 Nos-Big castor wheel. Garbage cart should be set to keep vertically upright on its base complete with accessories as per specification.Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			
	STORE					
1	**Weighing Scale Electronic (Digital)** - Electronic weighing scales of standard make to weigh upto 300 kg. The certificate from Weights & Measures Dept. is to be attached with the machine, duly certifying the serial no. complete with accessories as per specification. Make- Atco/Sanchit	300kg	1			
2	**Storage Rack with 5 tiers** - All shelves are made of 18swg S.S-304 sheet on 4 nos round/square legs with adjustable bullet feet. All the shelves are having "C" channel through to accommodate maximum load bearing ability complete with accessories as per specification.	900 x 450 x1800	4			

3	**Four Door Freezer** 1410 lts ,18 deg C to -22 deg C, External and internal door and side panels in 304 AISI stainless steel. External back and top panel in galvanized steel. High-density expanded polyurethane insulating foam, 70mm in thickness 4 half doors with lock and microswitch to switch off the fan when the door is opened. Built-in refrigeration unit; Cooling capacity 1800 (watt) ventilated operating mode; digital control; automatic defrost and evaporation of defrost water; external digital temperature display. Complete as required with all accessories as per technical specification	1410 Ltrs,	1			
4	**Water Cooler with RO system -** Structure made of mild steel angle frame duly rust proof painted. Body completely constructed of S.S-304 sheet double walled insulated with puf, Inner tank of 22 swg and outer of 20 swg S.S-304 sheet food grade. The water cooler is mounted on four S.S-304 tubular legs with S.S-304 bullet adjustable feet. Complete with compressor and condenser unit of Emerson/ Techumshah/Copeland/Danfoss make with automatic temperature controller and temp. Indicator complete with accessories as per specification. Make-Bluestar/Celfrost/Cibwal	250 ltr.	1			
5	**Onian/ Potato Bin-** The entire bin is made of S.S. wire meshed body on heavy duty castor wheels. Fitted with top opening lid and the inclined bottom to have a lockable door to extract.	900x600x750	2			
6	**Cereal/Atta/Maida Bin-** The entire bin made of 18 swg S.S-304 sheet on tiny caster wheels & with top opening lid.	900x600x750	2			
7	**Cold Room-** Room size- Temperature 0 to 4 degree centigrade Insulation: Panels 60mm thick PU at 40-42kg density,PCGI exposed exterior 0.5mm thick sheet,PCGI exposed exterior 0.5mm thick sheet, PCGI interior 0.5mm thick sheet, floor interior and exterior of 0.5mm thick PCGI exposed sheet, Ceiling exterior PCGI, interior PCGI Sheet 0.5mm.Vertical,Panels Joint with Cam lock coupling in Tongue & Groove arrangement. Thickness of PUF Panels (for Wall, Ceiling & Floor)- 60mm.Wall & Ceiling panels Finish- Internal: SS 304 External: PCGI Galvanized Ironic Sheet. Flooring- Kota stone by client. Density of Panels-40kg/cub.m No. of Doors- One for Main Room Type. of Doors- Over Lapped or Flash Type Door Size-900mm x 1950mm. Accessories Included in the scope of Supply-1. Door Alarm 2. Lock Defeat mechanism 3. Light Inside the cold room. 4. Handle, Hinges & Locks. 5. Microprocessor based digital control. Panels. 6. Panel Accessories & necessary Hardware. Technical Feature of PUF Panels, Doors, & Accessories: Individual Panel is manufactured with closed cell Rigid Polyurethane foam, injected at high pressure, which secures the bond with facing material to form a single piece construction. RPUF insulation is CFC free and has Zero ODP- Ozone Depleting potential. Core density of 40kg / Cu.M Panel finish is designed to resist many chemicals including most common cleaning agents. The panels have fire rating to BS.467 part 7, clause 1. Wall, floor & ceiling panels joined with Tongue and groove mechanism with cam lock system. The compressor and condenser unit of Emerson/ Techumshah/Copeland/Danfoss make with Automatic temperature controller and temp. Indicator complete with accessories as per specification. Make- Bluestar/Celfrost/Mothersonzonetti	4500X3000X2100	1			
8	**Storage Rack 5 tiers-** All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having 'C' Channel through to accommodate maximum load bearing ability complete with accessories as per specification.	900x450x1800	6			
9	**Storage Rack 4tiers-** All shelves are made of 18 swg SS: 304 on 4 nos round/square legs with adjustable bullet feet. All the shelves are having 'C' Channel through to accommodate maximum load bearing ability complete with accessories as per specification.	800x450x1200	2			
10	**Insect killer-** Twin tube.	Branded.	6			
11	**Air curtain** -1 entry point	Length as per drg.	2			
	LPG BANK (WITHOUT CYLINDER)					
1	**LPG Bank- 10** +10 (One set working another set standby) LPG Cylinder Bank of 14.2 Kg each LPG cylinder with :Class'C' seamless steel pipe conforming to IS:1239 (Latest version) with Pressure Gauges (0-15 PSIG & 0-5PSIG, dial type) Complete with accessories as required as per specicification.	1 Lot	1			
2	**TURNKEY WORKS**	1 Lot	1			
					Total in Fiji $	

BOQ FOR BMWMS						
Package- Supply, installation, testing and commissioning of BMWMS (Bio Medical Waste Management System) on turnkey basis along with equipment including 1 year DLP						
Item No. 1	**Description 2**	**Unit 3**	**Qty 4**	**Rate In Fiji $ (in Figure) 5**	**Rate In Fiji $ (in Words) 6**	**Amount in Fiji $ 7**
	Part-I					
1.0	**Autoclave 500 ltrs**		2			
2.0	**Waste Collection Containers** as per specifications.					
	Yellow colour container-20 Ltrs approx	Nos	60			
	Red colour container-20 Ltrs approx	Nos	60			
	Blue colour container-20 Ltrs approx	Nos	60			
	Yellow colour container-100 Ltrs	Nos	12			
	Red colour container-100 Ltrs	Nos	12			
3.0	**Waste Collection bags** as per specifications					
	Red Colour non-chlorinated Plastic bag-Size of container-20 Ltrs approx	Nos	2000			
	Yellow Colour non-chlorinated Plastic bag-Size of container-20 Ltrs approx	Nos	2000			
	Blue Colour non-chlorinated Plastic bag-Size of container-20 Ltrs approx	Nos	2000			
4.0	Transportation Trolley of 200 Ltrs Capacity complete as required with all accessories as per specification	Nos	5			
5.0	**Industrial Weighing Machine-Capacity 300 Kg** Electronic machine with Digital display.Details of technical data are as per technical specification.	Nos	1			
					Total in Fiji $	

BOQ FOR CSSD						
	Package- Supply, installation, testing and commissioning of CSSD on turnkey basis along with equipment including 1 year DLP					
Item No.	Description 2	Unit 3	Qty 4	Unit Rate In Fiji $ (in Figure) 5	Unit Rate in Fiji $ (in Words) 6	Amount (Fiji $) (In Figure) 7
1.0	HORIZONTAL DOUBLE Sliding DOOR AUTOCLAVE WITH CARRIAGE AND TROLLEY, cap. 350-400 L Complete with all accessories as per detail technical specification.	Nos	2			
2.0	RAPID STERILIZER (FLASH AUTOCLAVE) 18-25 L Complete with all accessories as per detail technical specification.	Nos	2			
3.0	DOUBLE DOOR WASHER DISINFECTOR CAPACITY-200-250 L. Complete with all accessories as per detail technical specification.	Nos	1			
4.0	ETO Complete with all accessories as per detail technical specification. Size 600 x 600 x 900 mm	Nos	1			
5.0	ULTRASONIC CLEANER CAPACITY-20-25L Complete with all accessories as per detail technical specification.	Nos	1			
6.0	HEAT SEALING MACHINE Complete with all accessories as per detail technical specification.	Nos	1			
7.0	DRYING CABINET 275 L Complete with all accessories as per detail technical specification.	Nos	1			
8.0	SPRAY GUN RINSER Complete with all accessories as per detail technical specification.	Nos	1			
9.0	GAUZE CUTTING MACHINE Complete with all accessories as per detail technical specification.	Nos	1			
10.0	AIR COMPRESSOR Complete with all accessories as per detail technical specification.	Nos	1			
11.0	INSPECTION LAMP WITH MAGNIFIER Complete with all accessories as per detail technical specification.	Nos	1			
12.0	WASH STATIONS WITH 2 SINKS FOR DIRTY AREA Size Approx. (L x W x H) : 2000x750x850 mm Complete with all accessories as per detail technical specification.	Nos	1			
13.0	SS WORK TABLE SIZE-1200X650X900 Complete with all accessories as per detail technical specification.	Nos	1			
14.0	CONTROL & PACKING TABLE WITH TWO SHELVES FOR CLEAN AREA Complete with all accessories as per detail technical specification.	Nos	1			

15.0	**LINEN FOLD TABLE FOR CLEAN AREA a. Size (LxWxH) : 2000x1400x900 mm approximately. Complete with all accessories as per detail technical**	Nos	1			
16.0	**WIRE STORAGE SHELF MODULE FOR DIRTY/DISINFECTION AREA/CLEAN/STERILE AREA Complete with all accssories as per detail technical specification**	Nos	2			
17.0	**PASS BOX Complete with all accessories as per detail technical specification.**	Nos	2			
18.0	**CLOSED TRANSPORT TROLLEY FROM STERILE STORE TO OT Size : 1400x750x1260 mm(LxWxH) (External) approximately Complete with all accessories as per detail technical specification.**	Nos	2			
19.0	**Table Trolley with 2 shelves 530x1080x800 H Complete with all accssories as per detail technical specification**	Nos	1			
20.0	**MODULAR STERILIZING BASKETS BIG Complete with all accessories as per detail technical specification.**	Nos	8			
21.0	**MODULAR STERILIZING BASKETS MEDIUM Complete with all accessories as per detail technical specification.**	Nos	8			
22.0	**BASKET RACK suitable to accomodate Baskets Complete with all accessories as per detail technical specification.**	Nos	1			
23.0	**STORAGE RACK 5 SHELVES 1830X535X1830 Complete with all accessories as per detail technical**	Nos	3			
24.0	**LAB STOOL WITHOUT BACKREST.(SS) Complete with all accessories as per detail technical specification.**	Nos	4			

25.0	**CHANGE LOCKER -4 COMPARTMENTS Complete with all accessories as per detail technical specification.**	Nos	2			
26.0	**TURNKEY WORKS Complete with all accessories as per detail technical specification.**	Lot	1			
					TOTAL Fiji $	

BOQ FOR PNEUMATIC TUBE SYSTEM (PTS)						
Package- Supply, installation, testing and commissioning of Pneumatic Tube System on turnkey basis along with equipment including 1 year DLP						
S.No.	**Item Description**	**Qty**	**Unit**	**Rate in Fiji $**	**Rate in words in Fiji $**	**Amount in Fiji $**
1	Supply, Installation, Testing and Commissioning of Control & Software System. As per technical speicfication	1	No.			
2	Supply, Installation, Testing and Commissioning of Blower with VFD. As per technical speicfication	2	Nos.			
3	Supply, Installation, Testing and Commissioning of NW 160 mm front load station with RFID Reader Card. As per technical speicfication	11	No.			
4	Supply, Installation, Testing and Commissioning of 160mm Compact end station complete as per technical specification	3	Nos			
5	Supply, Installation, Testing and Commissioning of 160mm auto-unload station complete as per technical specification	1	No.			
6	Supply, Installation, Testing and Commissioning of Diverter 160 mm, 3-Way, Air Tight, Microprocessor Controlled, With Touch Free Position and Tube Switches, Steel Housing. Provided with Optical Sensors.	4	Nos.			
7	Supply, Installation, Testing and Commissioning of Tubing material suitable for 160 mm system for the above items including the following (running metre):- 1.160mm dia UPVC tube grey complete with slide bend 2.Air tube 3.Transparent tube 4.Bends 5.Endpiece 6.Sleeve 7.Composite system cable 8.Mounting tools As per technical specification	400	Mtrs			
8	Supply, Installation, Testing and Commissioning of Tubing material suitable for 160 mm system for the above items including the following (running metre):- 1.160mm dia UPVC **Transparent** tube grey complete with slide bend 2.Air tube 3.Transparent tube 4.Bends 5.Endpiece 6.Sleeve 7.Composite system cable 8.Mounting tools As per technical specification	100	Mtrs			
9	Supplying, installation, testing & commissioning of Carrier 160 mm with 2 programmable RFID tag for easy return of empty carrier. Inload size: 400x115. As per technical specification	35	Nos.			
10	Supplying, installation, testing & commissioning of Carrier 160 mm automatic opening on both ends, including 2 x code-tags for autounloading. As per technical specification	10	Nos.			
11	Misc. Installation Accessories sourced from India, including: Pipe Clamps, Srew Bolts, Cable Clips, Hose Clamps & Baskets, Cushions and Racks for Stations	1	Job			
12	Touch Screen for all stations	15	Nos			
13	Installation of PTS and other charges	1	Job			
14	Turnkey works	1	Job			
					TOTAL Fiji $	

BOQ FOR MORTUARY					
Package- Supply, installation, testing and commissioning of MORTUARY on turnkey basis along with equipment including 1 year DLP					
Item No.	**Description**	**Unit**	**Qty**	**Rate in Fiji $**	**Amount in Fiji $**
1.0	**Mortuary (6-Body) including UPS Complete with all accessories as per technical specification**	**Nos**	**2**		
2.0	**Loading Trolley Complete with all accessories as per technical specification**	**Nos**	**2**		
3.0	**TURNKEY WORKS**	**Lot**	**2**		
	Total Amount in Fiji $				