



2. BOQ for Operation Theatre (Vol – V, page 1-5) work has been amended as per **Annexure – A** attached.
3. Technical Specifications of Operation Theatre (Vol – IV, page 1-12) work has been amended as per **Annexure – B** attached.
4. Any additional/extra item which is not covered in BOQ (Volume-V) required to execute for completion of work and available in concern DSR, will be paid based on DSR rate with the percentage quoted by agency on DSR items or market rate analysis if not available in concern DSR.
5. The validity of Earnest money Bank Guarantee (B.G.) will be calculated from the original date of submission by agency.

Please note that this amendment shall form part of the tender and other terms & conditions of the tender shall remain unchanged.

**On Behalf of Chhattisgarh Medical Services Corporation Limited.**  
**(Govt. of Chhattisgarh).**  
**Dy General Manager (Civil) HSCC (India) Limited.**

<b>Annexure- A</b>					
<b>BILL OF QUANTITY</b>					
<b>OPERATION THEATRE (Major)</b>					
<b>Supply Installaton Testing and Commissioning of Operation Theatre (Major) and defect liability period for Chattisgarh</b>					
A					
SL. NO.	ITEM DESCRIPTION	UNIT	QTY	MARKET RATE ( Rs.)	AMOUNT (Rs.)
1	<b>Ceiling System</b> The prefabricated modular construction for 1.60 mm thick EGP backed by 12mm thick Gypsum board to provide seamless operating room to provide seamless operating Room. Factory made cutout in the ceiling panel for light fixtures. Aluminium Ducting inside the OT with Powder coated Aluminium Return air grills at four corners fitted with ducting connection to the outside of OT from AHU. Details as per technical specification.	lot	1	375000	<b>375000</b>
2	<b>Wall with Corner Coving</b> Providing and laying Epoxy wall Coating, 300 microns thick over smoothly rendered walls. The treatment consists of surface preparation, priming with Epoxy Primer. Walls should be smoothly rendered with Wall putty. Extruded aluminium powder coated/Anodized clip on type covings for the entire wall to False ceiling. R-70. Details as per technical specification.	lot	1	1,70,000	<b>170000</b>
3	<b>Swing door</b> 44 mm thick doors made with Poly Urethene painted 0.8mm thick GPSP sheets on both sides with PUF as infill, 1.2 mm thick GPSP painted door frames totally flush with the wall, hardware like push plates, handles, door closure, double glazed view glass of std size, Stainless Steel Ball Bearing butt hinges and provision for concealed automatic door bottom Drop seal etc. Supply & Installation of double glazed view panels (1 Square ft. area) with flush design, with 6mm thick float glass fixed in double panel with necessary arrangements. Details as per technical specification..	Nos	1	1,95,000	<b>195000</b>
4	<b>Peripheral Light</b> It should be fitted outside the air ceiling system area and flush with the ceiling in the operation theatre suitable to required illumination of 500 Lux inside the OT. Peripheral lights and clean room luminaries fitted in the frame should be 8 numbers in the OT. Details as per technical specification.	Nos	8	10,500	<b>84000</b>

5	<b>X-Ray Film Viewer</b>	Nos	1	62,300	<b>62300</b>
	The two (2)-plate viewing with 3 pieces of high frequency fluorescent 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 upto 14"x17" size and complete as required with all accessories as per technical specification.				
6	<b>Distribution Board and Electrical wiring, conduiting with fixture inside the Operation theatre</b>	lot	1	150000	<b>150000</b>
	All high voltage equipment should be installed in a separate enclosure. AndLaying 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 and complete as required with all accessories as per technical specification.				
7	<b>Operation Theatre Flooring (Antistatic Conductive Flooring)</b>	lot	1	199000	<b>199000</b>
	A floor should be provided, flat to within a tolerance of +/- 3mm over any 3-metre area. Onto this sub floor, a self-leveling compound should be laid prior to lying of the floor finish.The floor finish should terminate at the room perimeter passing over a concealed cove former and continuing up the wall for 100mm. and complete as required with all accessories as per technical specification.				
8	<b>PENDANT FOR ANESTHESIA</b>	Nos	1	2,70,000	<b>270000</b>
	Should be double Arm Pendant with horizontal movement One swivel arm of 850 mm and complete as required with all accessories as per technical specification.				
9	<b>PENDANT FOR SURGEON</b>	Nos	1	2,70,000	<b>270000</b>
	Should be double Arm Pendant with horizontal movement One swivel arm of 850 mm and another of 650 mm.and complete as required with all accessories as per technical specification.				
10	<b>MEDICAL GAS PIPE LINE INSTALLATION including VALVE BOX-5 Services</b>	lot	1	1,24,600	<b>124600</b>
	Medical graded Copper pipes for Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide, Carbon di Oxide and AGSS Outlets inside the Operation Theatres from the manifold system should be provided. and complete as required with all accessories as per technical specification.				

11	<b>VALVE BOX ASSEMBLY (5 Services)</b>	Nos	1	14,000	<b>14000</b>
	Valve Box are made of Powder Coated M.S. Material. Valve Box Assembly consist of the following : Lever operated quarter turn valve (i.e. 90 degree shut off ball valve- has been manufactured by ISO 9001 company and factory degreased ) with brass body and chrome plated brass ball and complete as required with all accessories as per technical specification.				
12	<b>VIEW WINDOW WITH BLINDS</b>	Nos	1	1,35,000	<b>135000</b>
	View window with 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.and complete as required with all accessories as per technical specification.				
12	<b>Ceiling OT Light (Imported)</b>	Nos	1	11,25,000	<b>1125000</b>
	Dual Dome LED Surgical Lighting System and complete as required with all accessories as per technical specification.				
<b>In words Rupees</b>					<b>3173900</b>

<b>BILL OF QUANTITY</b>					
<b>OPERATION THEATRE (Minor)</b>					
<b>B</b>	<b>Supply Installaton Testing and Commissioning of Operation Theatre and defect liability period for Chattisgarh</b>				
SL. NO.	ITEM DESCRIPTION	UNIT	QTY	MARKET RATE ( Rs. ) (In Figure)	AMOUNT (Rs.)
1	<b>Ceiling System</b>	lot	1	375000	<b>375000</b>
	The prefabricated modular construction for 1.60 mm thick EGP backed by 12mm thick Gypsum board to provide seamless operating room to provide seamless operating Room. Factory made cutout in the ceiling panel for light fixtures. Aluminium Ducting inside the OT with Powder coated Aluminium Return air grills at four corners fitted with ducting connection to the outside of OT from AHU. Details as per technical specification.Details as per technical specification.				
2	<b>Wall with Corner Coving</b>	lot	1	1,41,000	<b>141000</b>
	Providing and laying Epoxy wall Coating, 300 microns thick over smoothly rendered walls. The treatment consists of surface preparation, priming with Epoxy Primer. Walls should be smoothly rendered with Wall putty. Extruded aluminium powder coated/Anodized clip on type covings for the entire wall to False ceiling. R-70. Details as per technical specification.				
3	<b>Swing door</b>	Nos	1	1,95,000	<b>195000</b>
	44 mm thick doors made with Poly Urethene painted 0.8mm thick GPSP sheets on both sides with PUF as infill, 1.2 mm thick GPSP powder coated door frames totally flush with the wall panels, hardware like push plates, handles, door closure, double glazed view glass of std size, Stainless Steel Ball Bearing butt hinges and provision for concealed automatic door bottom Drop seal etc. Supply & Installation of double glazed view panels with flush design, with 6mm thick float glass fixed in double panel with necessary arrangements. Details as per technical specification.				
4	<b>Peripheral Light</b>	Nos	8	10,500	<b>84000</b>
	It should be fitted outside the air ceiling system area and flush with the ceiling in the operation theatre suitable to required illumination of 500 Lux inside the OT. Peripheral lights and clean room luminaries fitted in the frame should be 8 numbers in the OT.. Details as per technical specification.				

5	<b>X-Ray Film Viewer</b>	Nos	1	62,300	<b>62300</b>	
	The two (2)-plate viewing with 3 pieces of high frequency fluorescent 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 upto 14"x17" size and complete as required with all accessories as per technical specification.					
6	<b>Distribution Board and Electrical wiring, conduiting with fixture inside the Operation theatre</b>	lot	1	110000	<b>110000</b>	
	Electrical Distribution Board along with all high voltage equipment should be installed in a separate enclosure. AndLaying of PVC conduits, Modular Switch Boxes, Modular Switches-sockets, Power and Light wiring including Earthing wire for all the lighting controls and other equipment fixtures and fittings inside the theatre Wiring with low leakage current wires of FRLS wires should be as per requirements and complete as required with all accessories as per technical specification.					
7	<b>Operation Theatre Flooring (Antistatic Conductive Flooring)</b>	lot	1	199000	<b>199000</b>	
	A floor should be provided, flat to within a tolerance of +/- 3mm over any 3-metre area. Onto this sub floor, a self-leveling compound should be laid prior to lying of the floor finish and complete as required with all accessories as per technical specification.					
8	<b>Horizontal Bed Head Panel 1800 mm long</b>	Nos	1	25,000	<b>25000</b>	
	High Strength Anodised extruded Aluminium with inbuilt single railing. The chamber of Medical Gas Outlets should be made of anodized aluminium shall be powder coated as per the customer's choice. and complete as required with all accessories as per technical specification.					
9	<b>MEDICAL GAS PIPE LINE INSTALLATION including VALVE BOX-5 Services</b>	lot	1	97,500	<b>97500</b>	
	Medical graded Copper pipes for Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide, Carbon di Oxide and AGSS Outlets inside the Operation Theatres from the manifold system should be provided. and complete as required with all accessories as per technical specification.					
10	<b>VALVE BOX ASSEMBLY (5 Services)</b>	Nos	1	14,000	<b>14000</b>	
	Valve Box are made of Powder Coated M.S. Material. Valve Box Assembly consist of the following : Lever operated quarter turn valve (i.e. 90 degree shut off ball valve- has been manufactured by ISO 9001 company and factory degreased ) with brass body and chrome plated brass ball and complete as required with all accessories as per technical specification.					
11	<b>Ceiling OT Light Halogen</b>	Nos	1	5,25,000	<b>525000</b>	
	Surgical Lighting System with the dual reflector complete as required with all accessories as per technical specification.					
<b>In words Rupees</b>					<b>MINOR OT Total Rs</b>	<b>1827800</b>
<b>Grand Total -OT (Major OT + Minor OT)</b>					<b>Rs.</b>	<b>5001700</b>

**TECHNICAL SPECIFICATION OF OPERATION THEATRE (MAJOR) FOR CHATTISGARH**

**SCOPE OF WORK -**

**Supply construction, and commissioning of Operating Theatre (Major) in accordance with the specifications, bill of quantities and providing of free spare parts and service during Defect Liability Period.**

**1. CEILING SYSTEM**

The prefabricated modular construction for 1.60 mm thick EGP backed by 12mm thick Gypsum board to provide seamless operating room to provide seamless operating Room. Factory made cutout in the ceiling panel for light fixtures. Aluminium Ducting inside the OT with Powder coated Aluminium Return air grills at four corners fitted with ducting connection to the outside of OT from AHU.

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

Laminar Flow Tent should be made of 1.5 mm thk Aluminium sheet and two layer monofilament diffuser Size 8ft x 6ft x 400mm ht. with dimmable fluorescent light. Tent shall be made so as Laminar Flow System to integrate with OT equipments and Duct connections with incoming duct-line to OT

Providing and laying Epoxy Coating, 300 microns thick over smoothly rendered surface. The treatment consists of surface preparation, priming with Epoxy Primer.

**2. WALL WITH CORNER COVING**

Providing and laying Epoxy wall Coating, 300 microns thick over smoothly rendered walls. The treatment consists of surface preparation, priming with Epoxy Primer. Walls should be smoothly rendered with Wall putty.

Extruded aluminium powder coated/Anodized clip on type covings for the entire wall to False ceiling. R-70.



### **3. SWING DOOR**

44 mm thick doors made with Poly Urethane painted 0.8mm thick GPSP sheets on both sides with PUF as infill, 1.2 mm thick GPSP painted door frames totally flush with the wall, hardware like push plates, handles, door closure, double glazed view glass of std size, Stainless Steel Ball Bearing butt hinges and provision for concealed automatic door bottom Drop seal etc. Supply & Installation of double glazed view panels (1 Square ft. area) with flush design, with 6mm thick float glass fixed in double panel with necessary arrangements.

### **4. 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 500 Lux inside the OT. Peripheral lights and clean room luminaries fitted in the frame should be 8 numbers in the OT. The fluorescent lamps shall be used with highly spectacular anodized Aluminum reflectors and optical antiglare system for adjustable light distribution. Luminaries cover made of highly resistant, disinfectant proof laminated safety glass with fine grained surface, glass pane with white powder coated steel frame. Luminary's 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 from 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.

### **5. X-RAY FILM VIEWER**

The two (2)-plate viewing 3 pieces of high frequency fluorescent 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 upto 14"x17" size. Dimming is controlled using dimming ballast and PCB mounted inside the box. The mounting of the Screen should be installed flushed/hung with Operation theatre wall. 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 hold 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.

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

All high voltage equipment should be installed in a separate enclosure. Electric Distribution Panel, UPS, 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 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. Wiring for 250 volts single phase and neutral 6/16 Amps switched socket outlet with 4 sq.mm and 2.5 sq.mm PVC insulated copper conductor 1100 volts stranded flexible wires should be concealed with conduit. Installation of all electrical cabling must be of IS: 1554 (As per latest amendment) standard and wiring as per IS: 732 standard and proper earthing of OT and other accessories in the OT room as per standard guidelines of BIS. 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 TILES)**

A floor should be provided, flat to within a tolerance of +/- 3mm over any 3-metre area. Onto this sub floor, a self-leveling compound should be laid prior to laying of the floor finish. Copper grounding strips (not less than 0.05mm thick, 50mm width) should be laid flat on the floor in the conductive adhesive and connect to copper wire of grounding. The floor finish in the operating room should be 2mm Conductive PVC tiles, laid on a semi conductive adhesive base. **The floor finish should terminate at the room perimeter passing over a concealed cove former and continuing up the wall for 100mm.** All joints should be thermal welded with electrodes of the same compatible material to provide a continuous sealed seamless surface.

## **8. PENDANT FOR ANESTHESIA**

Should be double Arm Pendant with horizontal movement

One swivel arm of 850 mm

Swiveling angle should be 330°.

Anesthesia pendant should have medical outlets like Oxygen outlets X 2, Air(4 bar) X 2, Nitrous oxide X 2 and Vacuum outlet X 2, AGSS outlet X 1

Pendant should have eight 5A/15A combined electrical socket-10 Nos. Electrical socket should be of reputed make. One electrical socket should be connected with central UPS and should of different colors for easy identification.

Pendant should have two open shelves to keep Monitors/ESUs etc

Should have provision RJ 45 /cat 5 for telephone communication.  
Should have provision RJ 45 /cat 6 for data communication.

#### 9. **PENDANT FOR SURGEON**

Should be double Arm Pendant with horizontal movement

One swivel arm of 850 mm and another of 650 mm.

Swiveling angle should be 330°.

The swivel arms move only horizontally and the length in fully stretched position is  
(850+650) = 1500mm

Surgeon's pendant should have 7 bar Surgical Air outlet x 1. Oxygen Outlet x 2, Vacuum Outlet x 2. Carbon dioxide outlet-1

Pendant should have eight 5A/15A combined electrical socket 10 Nos Electrical socket should be of reputed make. One electrical socket should be connected with central UPS and should of different colors for easy identification.

Surgeons pendant should have infusion management system.

Pendant should have two open shelves to keep Monitors/ESUs etc

Should have provision RJ 45 /cat 5 for telephone communication.

Should have provision RJ 45 /cat 6 for data communication.

#### 10. **MEDICAL GAS PIPE LINE INSTALLATION**

Medical graded Copper pipes for Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide, Carbon di Oxide and AGSS Outlets inside the Operation Theatres from the manifold system should be provided.

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. Medical graded Copper Piping should be laid down from Pendant of OT to the Valve Box at the outside the Operation Theatre.

#### 11. **Valve Box Assembly (5 Services)**

Valve Box should be made of Powder Coated M.S. Material.

Valve Box Assembly consisting of Lever operated quarter turn valve (i.e. 90 degree shut off ball valve- shall be manufactured by ISO 9001 company and factory degreased ) with brass body and chrome plated brass ball.Brass fittings (Nut, Nipples and extruded brass Adapter) KE Type Seat Brass Block for pressure gauge

2" Dial gauges (0 - 10 kg/cm<sup>2</sup>, 0 - 760mm Hg)  
 Nylon Bush for copper pipes holding with the valve box  
 Beeding for box lead  
 Lockable cover with breakable glass so that during normal operation access shall be by key. But during emergency operation, access by breaking the glass panel.

**12. VIEW WINDOW WITH BLINDS**

View window with roller 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 manually. The window should be sealed (Air tight)

**13. CEILING OT LIGHT - (Imported)**

**Description:** Dual Dome LED Surgical Lighting System

Operating Room Surgical Lighting System should provide an ideal combination of brightness, Maneuverability, and shadow resolution without sacrificing color accuracy through a energy efficient consistent LED technology with a unique faceted reflector design technology. Mounting Type Ceiling, Sterilizable Handle, Color temperature should be homogeneous at every illumination intensity and Control of illumination intensity.

Such Lighting System should have the following technical specifications:

(a) Technical data for main dome: - 1nos.

- Bulb Type : LED
- Number of LEDs : Should be adequate enough for following minimum illumination level
- illumination level - 160.000 lux
- Rotation - 330- 360 degrees
- Vertical Adjustment Range - + 20 inch – 25 inch
- Color temperature - 4000 - 5000K
- Field Size Diameter Depth - 8 inch – 12 inch
- Average Color rendering index Ra - 95
- Life of Light Source > 30,000 Hrs.
- Dimming Range - 20% - 100%
- Operating/Storage Humidity - 10 – 95%
- Light Head diameter - 620 minimum

- b) Technical data for satellite dome - 1nos.
- Bulb Type : LED
  - Number of LEDs : Should be adequate enough for following minimum illumination level
  - illumination level - 110.000- 120000 lux
  - Rotation - 330- 360 degrees
  - Vertical Adjustment Range - + 20 inch – 25 inch
  - Color temperature - 4000 - 5000K
  - Field Size Diameter Depth - 8 inch – 12 inch
  - Average Color rendering index Ra - 95
  - Life of Light Source > 30,000 Hrs.
  - Dimming Range - 20% - 100%
  - Operating/Storage Humidity - 10 – 95%
  - Light Head diameter - 620 minimum
- Such Surgical Light should be compliant with relevant European CE /US FDA standards

### **System Configuration Accessories, spares and consumables**

**In addition to the above mentioned equipment/appliances**, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the MGPS 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.	Ceiling System	MDD/MPS/Hi_Tek/MGI//EQUIVALENT
2.	Peripheral Light	Philips/Wipro
3.	Cable	SKYTONE/KEI/UNIVERSAL/NATIONAL/RR CABLE
4.	PVC Pipe Class III with Fitting	FINOLEX/ SUPREME/ PRINCE/ ORI-PLAST
5.	G.I. Sheet	TATA/ JINDAL /BHUSHAN/PASCO
6.	MCCB/Contactor/Relay	L&T/ABB/SIEMENS/SCHNEIDER
7.	Stainless Steel	TATA/SALEM/JINDAL/MUKUND/BHAYANDER/AMBICA
8.	Copper Pipe	MEHTA/PRECISION/RAJCO

### **Note:**

- **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.
- The contractor should provide test certificate for all material used for construction of pre-fabricated OT
- The contractor shall be responsible for the complete works including submission of working drawing.
- The Contractor should provide complete Operation manual/Service manual for all systems and subsystems.
- Final electrical safety test, system test and calibration should be done by authorized person with test instruments.
- Training for seven working days should be provided to the staff & engineers of client by the Manufacturer
- The contractor should prepare and submit layout plan to HSCC for approval before beginning of supply and As-built drawing after installation.

## **TECHNICAL SPECIFICATION OF OPERATION THEATRE(MINOR) FOR CHATTISGARH**

### **SCOPE OF WORK -**

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

#### **1. CEILING SYSTEM**

The prefabricated modular construction for 1.60 mm thick EGP backed by 12mm thick Gypsum board to provide seamless operating room to provide seamless operating Room. Factory made cutout in the ceiling panel for light fixtures. Aluminium Ducting inside the OT with Powder coated Aluminium Return air grills at four corners fitted with ducting connection to the outside of OT.

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

Laminar Flow Tent should be made of 1.5 mm thk Aluminium sheet and two layer monofilament diffuser Size 8ft x 6ft x 400mm ht. with dimmable fluorescent light. Tent shall be made so as Laminar Flow System to integrate with OT equipments and Duct connections with incoming duct-line to OT from AHU.

Providing and laying Epoxy Coating, 300 microns thick over smoothly rendered surface. The treatment consists of surface preparation, priming with Epoxy Primer.

## **2. WALL WITH CORNER COVING**

Providing and laying Epoxy wall Coating, 300 microns thick over smoothly rendered walls. The treatment consists of surface preparation, priming with Epoxy Primer. Walls should be smoothly rendered with Wall putty.

Extruded aluminium powder coated/Anodized clip on type coverings for the entire wall to False ceiling. R-70.

## **3. SWING DOOR**

44 mm thick doors made with Poly Urethane painted 0.8mm thick GPSP sheets on both sides with PUF as infill, 1.2 mm thick GPSP painted door frames totally flush with the wall, hardware like push plates, handles, door closure, double glazed view glass of std size, Stainless Steel Ball Bearing butt hinges and provision for concealed automatic door bottom Drop seal etc. Supply & Installation of double glazed view panels (1 Square ft. area) with flush design, with 6mm thick float glass fixed in double panel with necessary arrangements.

## **4. 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 500 Lux inside the OT. Peripheral lights and clean room luminaries fitted in the frame should be 8 numbers in the OT. The fluorescent lamps shall be used with highly spectacular anodized Aluminum reflectors and optical antiglare system for adjustable light distribution. Luminaries cover made of highly resistant, disinfectant proof laminated safety glass with fine grained surface, glass pane with white powder coated steel frame. Luminary's 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 from 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.

## **5. X-RAY FILM VIEWER**

The two (2)-plate viewing 3 pieces of high frequency fluorescent 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 upto 14"x17" size. 'Dimming is controlled using dimming ballast and PCB mounted inside the box. The mounting of the Screen should be installed flushed/hung with Operation theatre wall. 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.

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

Electrical Distribution Board along with all high voltage equipment should be installed in a separate enclosure. Electric Distribution Panel, UPS, 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 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. Wiring for 250 volts single phase and neutral 6/16 Amps switched socket outlet with 4 sq.mm and 2.5 sq.mm PVC insulated copper conductor 1100 volts stranded flexible wires should be concealed with conduit. Installation of all electrical cabling must be of IS: 1554 (As per latest amendment) standard and wiring as per IS: 732 standard and proper earthing of OT and other accessories in the OT room as per standard guidelines of BIS. 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 TILES)**

A floor should be provided, flat to within a tolerance of +/- 3mm over any 3-metre area. Onto this sub floor, a self-leveling compound should be laid prior to laying of the floor finish.

Copper grounding strips (not less than 0.05mm thick, 50mm width) should be laid flat on the floor in the conductive adhesive and connect to copper wire of grounding. The floor finish in the operating room should be 2mm Conductive PVC tiles, laid on a semi conductive adhesive base. The floor finish should terminate at the room perimeter



passing over a concealed cove former and continuing up the wall for 100mm. All joints should be thermal welded with electrodes of the same compatible material to provide a continuous sealed surface.

## **8. HORIZONTAL BED HEAD PANEL 1800 mm long**

High Strength Anodised extruded Aluminium with inbuilt single railing. The chamber of Medical Gas Outlets should be made of anodized aluminium shall be powder coated as per the customer's choice. The panel should be designed to have as following:

- a). Medical outlets like Oxygen outlets X 2, Air(4 bar) X 2, Nitrous oxide X 2 and Vacuum outlet X 2, AGSS outlet X 1
- b) Electrical Sockets / Switches- 6 Nos

## **9. MEDICAL GAS PIPE LINE INSTALLATION**

Medical graded Copper pipes for Oxygen, Air(Medical & Surgical), Vacuum, Nitrous Oxide, Carbon di Oxide and AGSS Outlets inside the Operation Theatres from the manifold system should be provided.

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. Medical graded Copper Piping should be laid down from Pendant of OT to the Valve Box at the outside the Operation Theatre.

## **10. Valve Box Assembly- 5 Services**

Valve Box should be made of Powder Coated M.S. Material.

Valve Box Assembly consisting of Lever operated quarter turn valve (i.e. 90 degree shut off ball valve- shall be manufactured by ISO 9001 company and factory degreased ) with brass body and chrome plated brass ball.Brass fittings (Nut, Nipples and extruded brass Adapter) KE Type Seat Brass Block for pressure gauge

2" Dial gauges (0 - 10 kg/cm<sup>2</sup>, 0 - 760mm Hg)

Nylon Bush for copper pipes holding with the valve box

Beeding for box lead

Lockable cover with breakable glass so that during normal operation access shall be by key. But during emergency operation, access by breaking the glass panel.

## 11. CEILING OT LIGHT –HALOGEN

The unit should have reflector for optimum utilization of the dual reflector by means of targeted light direction technique with following specifications:

- Power supply : 230V, 50/60Hz
- Colour Temp. : 4200K
- Light intensity at 0.8m distance : 40000-45000lux
- Light field diameter : 180-200mm
- Colour rendering index Ra(1-8)-93
- Luminous efficacy in the light field : 290lm/w or more
- Power consumption : 12V/50W
- Working space : 27-173cm
- Lifetime of bulb : Atleast 2000hrs.
- Swivel radius : 960mm
- Vertical adjustment : 1250mm
- Weight : 20 kg.
- Should have CE certification for electricity safety

**In addition to the above mentioned equipment/appliances**, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the MGPS 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.	Ceiling System	MDD/MPS/Hi_Tek/MGI/EQUIVALENT
2.	Peripheral Light	Philips/Wipro
3.	Ceiling OT Light	PHILIPS/UNITED SURGICAL/MAGNATEK/SURGITECH/EQUIVALENT
4.	Cable	SKYSTONE/KEI/UNIVERSAL/NATIONAL/RR CABLE
5.	PVC Pipe Class III with Fitting	FINOLEX/ SUPREME/ PRINCE/ ORI-PLAST
6.	G.I. Sheet	TATA/ JINDAL /BHUSHAN/PASCO
7.	MCCB/Contactor/Relay	L&T/ABB/SIEMENS/SCHNEIDER
8.	Stainless Steel	TATA/SALEM/JINDAL/MUKUND/BHAYANDER/AMBICA

### Note:

- **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.**
- **The contractor should provide test certificate for all material used for construction of pre-fabricated OT**
- **The contractor shall be responsible for the complete works including submission of working drawing.**
- **The Contractor should provide complete Operation manual/Service manual for all systems and subsystems.**
- **Final electrical safety test, system test and calibration should be done by authorized person with test instruments.**
- **Training for seven working days should be provided to the staff & engineers of client by the Manufacturer**
- **The contractor should prepare and submit layout plan to HSCC for approval before beginning of supply and As-built drawing after installation.**