MID END MODULAR OPERATION THEATRE, AIIMS

I	RESPONSIBILITY OF BIDDER
a	Bidder shall be responsible for complete design, construction, testing and commissioning of modular operation theatres based on seamless integration with modular concept
b	Bidder shall execute all required civil, electrical and peripheral lighting, plumbing, air-conditioning system, fire safety, demolition and other works as may be required for complete installation and trouble-free functioning of the operation theatres as a part of the 'turnkey work'.
c	The bidder shall be responsible for the complete works including the submission of Working Drawings, and walk through view.
d	Bidder shall be responsible for installation and commissioning of medical equipment in coordination with hospital authorities
e	Bidder shall be responsible for free maintenance of modular operation theatres during warranty period.
f	Bidder shall be responsible for commissioning of Medical Gaslines , Pendants and Gas outlets for the OTs.
g	MOT Bidder should coordinate with MGPS bidder for the successful completion of OTs.
h	Bidder shall be responsible for maintaining suitable air conditioning inside the operation theatre. MOT Bidder shall provide a control panel for regulating temperature & RH in the OT. The bidder will be responsible for the integration of this control panel with the Hospital AHU
i	Bidder should provide factory test certificates for the material user for the construction of modular theatres.
j	Bidder should supply complete set of part manuals, service manuals for all the systems and subsystems to be supplied.
k	AIIMS end users have to be trained for a week by the engineers from Original Equipment Manufacturer (OEM).
l	Final electrical safety test, system test, and calibration should be done by authorized persons using calibrated test equipments.
m	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.
n	The job will be turn-key basis and bidders are required to visit the sites before submitting their bid.

SCOPE OF WORK

The turnkey work includes all modifications to the built up space provided at the hospital site including Installation of Medical Equipment, Communication Systems, civil modifications, electrical works, plumbing works, interior decoration, air conditioning ducting, 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.

Turn Key Job to be provided by the Bidder

1. Commissioning and installation of Stainless Steel wall paneling and PVC flooring.
2. Installation of laminar flow.
3. False ceiling in all areas.
4. All cable trenches and railings wherever required.
5. All electrical accessories like cable wire, electrical outlets, switches, etc should be fire proof, of reputed make, certified for electrical safety.
6. Bidder has to provide hatch box, storage shelves, scrub basin and other service areas as mentioned in the bid.
7. Installation and commissioning of all equipment.
8. Installation of Pendants.
9. Any other necessary work required for satisfactory working of the modular OT and not mentioned.

1	**WALL PANELING SYSTEM-SS**
1.1	The prefabricated Operating Room should be free standing structure from composite free standing insulated steel wall panels.
1.2	The wall will be constructed using 1.5mm thick 304 Grade Stainless Steel (duly certified) panels with suitable backing board OR it should be 0.8mm 304 Grade Stainless Steel sandwich panel with core consisting of rigid polyurethane foam, which has been injected under high pressure, with a minimum density of 40 kg/m3.
1.3	The individual wall panels shall use the tongue and groove technology for joining two panels, no welding should be allowed.
1.4	The gaps between panels shall be suitably filled with metal filler/epoxy and sanded flush.
1.5	Stainless Steel plate finished to fine grain surface, treated properly to take antifungal paint.

1.6	Paneling should be easy to maintain, durable, antistatic/conductive and fire retardant.
1.7	Clearance between inner panel and outer wall should be sufficient to allow the maintenance personnel for service. This closed space should be flushed continuously to eliminate dust and bacterial accumulation.
1.8	Anti bacterial paint should be coated on the wall.
1.9	Bidder should maintain anti-bacterial paint during warranty and CMC period.
1.10	Wall elements should be resistant to all standard cleaning agents, disinfectants and fumigation agents.
1.11	Panel should be covered with protective sheath to prevent scratch during installation.
1.12	It should have minimum number of junction. The junction should be seamless and should be sealed with suitable sealants.
1.13	Wall paneling should have proper fire protection.
1.14	Bidder should provide factory test certificate for all the material used for wall paneling.
2	**CEILING SYSTEM**
2.1	The ceiling plates /cassettes should be made up of Stainless Steel sheets, 0.8 mm thick with matt finish and should be coated with antibacterial paint. The ceiling suspension should be as follows.
2.2	Support elements: Suspension bracket with tension spring. Material: High quality galvanized or powder coated steel.
2.3	Room lighting, air supply inlet, ceiling service units, return air outlets, etc should be integrated with SS metal ceiling system.
2.4	The individual panels except those at the edges should be removable individually.
2.5	The ceiling material should be CE certified according to EN standards.
3	**LAMINAR AIR FLOW SYSTEM**
3.1	The ceiling filtration system should be designed to ensure unidirectional distribution of sterile air with differential flow velocities decreasing from centre to perimeter of the surgical theatre to ensure the cleanliness of all the area covered by the air flow.
3.2	The Laminar flow system should comprise of thick extruded aluminum profiles frame and sealed gasket. The filters installed in the plenum should be suitable for application for laminar flow and clean rooms. These filters should meet following specification. Protective grids : white epoxy painted micro drawn grid Separators : continuous thermo plastic chord Sealant : Polyurethane Gasket : One piece polyurethane MPPS average efficiency: > 99.95% 3 Micron DOP efficiency > 99.99% Final Pressure drop : 600 pa(max) Maximum Operating Temp : 60 degree Celsius Maximum RH : 40-50 %

3.3	The ceiling system should be equipped with "H 14" class HEPA filters with different performances according to their position in the ceiling to achieve 0.25m/sec flow velocities.
3.4	The complete filtration ceiling system should be factory assembled. Its holding structure, Filter frames and top plenum should be made of AISI 304 stainless steel.
3.5	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.
3.6	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
3.7	The positive pressure should be maintained inside the OT to prevent contamination due to air from outside the OT.
3.8	The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufactures.
3.9	Should be CE certified.
4	**EXHAUST AIR CABINETS**
4.1	Return air exhaust cabinets should be provided in the operation theater.
4.2	The exhaust air cabinets should be openable and cleanable.
4.3	These cabinets should have suction from top as well as from bottom.
4.4	Designed flow rate should not be less than 1000 m3/hr. Distribution of exhaust air volume should be divided between fluff strainers to maintain the required pressure within the theatre without causing turbulence.
4.5	The Exhaust air cabinet should be manufactured and supplied by the supplier of wall and ceiling system supplies.
4.6	Specification of materials and aesthetic should match perfectly with the ceiling system.
5	**PVC FLOORING**
5.1	It should be with 2mm antistatic seamless PVC flooring
5.2	Floor should be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.
5.3	Electrostatic charge dissipation combat PVC seamless flooring of very high quality should be provided.
5.4	Thickness not less than 2 mm. Continuous roll should be used and joints should be welded by special PVC thermal welding units using PVC welding bars of same colour
5.5	The sheets should be highly durable with resistance to shock and indentation. It should be scratchproof also. The conductive material should be uniformly impregnated as grains.
5.6	It should be inert to body fluids, chemicals and disinfectants. Should not be affected by temperature variation within the OT.
5.7	The floor should efficiently discharge electric charges up to 2 kV

5.8	Flooring should be done by skilled workers of accredited agencies authorized by the supplier of PVC sheets. The electrical resistance (point to ground) should be within $2.5x10^4$ to $5x10^6$ ohms. The floor should not allow build up of electrical charge beyond 100 volts due to antistatic effect. The corners should not be terminated sharply and concealed cove- former (aluminium) should be used to overlap the wall panel to a height of approx.25mm and sealed perfectly and uniformly. Self leveling compounds should be used.
5.9	The conductive copper grid laid underneath the PVC sheet should be supported by liquid epoxy compounds allowed to set as a uniform and level surface. The copper strips to be made visible by grinding and no copper strip should project more than 0.5mm above level surface to avoid damage to the PVC sheet. One earthing lead should be brought out from every 150sq.ft area and attaching it to the main earthing strip/ground.
5.10	Copper grounding strips (0.05 mm thick, 50 mm width) should be laid flat on the floor in the conductive adhesive and connected to copper strip of grounding. The connection from copper grid should be brought out uniformly at places to form equipotential grid.
5.11	Flooring should be mechanically shock proof, scratch proof, flame retardant and anti microbial
5.12	Corners should be uniformly curved
5.13	Final surface should be non corrosive to biological fluids and detergents.
5.14	Colour should be uniform pleasant and matching with ambience
6	**HERMETICALLY SEALED DOORS**
6.1	This should be a hermetically sealed, single sliding door of 2.1 (H)X 1.8 m(W)
6.2	The controller should be capable of being operated by elbow switches/foot switches as well as touch less sensor.
6.3	The track should be of stainless steel/extruded aluminum and the running surface for the top rollers should be suitably angled to reduce resistance to movement.
6.4	The door leaf should be hung by means of hard plastic rollers of high quality with double bearing at the top. Rollers should be provided under the stainless steel/extruded aluminium track to enable smooth and noiseless movement.
6.5	Opening and closing of the door should be microprocessor controlled electromechanical movement.
6.6	The door material should be high quality anodized aluminium. Color should match the interior and care should be taken to make the leaf strong and light weight.
6.7	One should be able to open and close the door effortlessly incase of failure of automatic mechanism.
6.8	Door opening handle should be strong and sturdy. Material should be of SS (gloss finish). Should be provided with high quality cylindrical lock.
6.9	Door leaf should have high quality synthetic rubber gasket with long life to ensure hermetic sealing (to maintain air pressure differential). Air tightness 99.99% at a pressure of 100KPa.
6.10	The finished floor on either side of the door should be perfectly level (maximum permissible difference $\pm$1mm).

6.11	The overall thickness of the finished door should not exceed 60mm. The inner part of the door should be filled with CFC free polyurethane foam of thickness of 48mm or nearby. (Sealed airtight to prevent further ingress of any microbial organism).
6.12	The door and controls should comply with IEE regulation and BS 7971 standardization. All motors used should be DC brushless motors with essential isolation from mains.
6.13	Door should be with vision window 400 mmx300 mm with double glazed panels and hermetically sealed motorized roller blind inside.
6.14	Noise level should not exceed 60 db.
6.15	The starting time after receiving the signal should be adjustable between 0.5 to 20 seconds.
6.16	Door should provide X ray protection as per AERB regulation (Lead equivalent at 100kV is 0.27mm).
6.17	The complete door assembly should be CE marked.
6.18	Test certificate for hermetically sealed door frame (factory test certificate) should be enclosed with the pre dispatch documents.
7	**TOUCH SCREEN CONTROL PANEL**
7.1	The control panel should be touch screen panel. This control panel should work as the central control panel for the HVAC controls, instruction board, communication interfaces- both audio and video etc.
7.2	The panel should accommodate all necessary controls for the correct operation and monitoring of the equipment and services within the operating room (OR).
7.3	The touch screen should be wall mounted, stationed in the visibility line of the surgeon and OT staff. The access height should be convenient for the nurse to operate and help/assistant when in need.
7.4	The panel should accommodate digital clock and the elapsed time indicator.
7.5	The medical gas alarm should indicate high and low gas pressures for each gas service present in the OT including vacuum. This should be supported by audible alarm also. The panel should have an alarm mute (fault annunciation) facility. The sensors (pressure switches) should be at the nearest isolation valve.
7.6	Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.
7.7	Control of the operating light (major and satellite and camera control (on/off and intensity control) should be provided.
7.8	Hand free telephone set with memory should be located at one side.
7.9	Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel)
7.10	Digital room pressure indicator in cm of H2O or equivalent (signal from pressure sensor)
7.11	HEPA filter bank differential pressure indicator.
8	**PRESSURE RELIEF DAMPERS**
8.1	Pressure relief dampers should be provided in each room to prevent contamination of air from clean and dirty areas.

8.2	Suitably sized air pressure relief damper should be strategically placed, enabling differential room pressure to be maintained and ensure that when doors are opened between clean and dirty areas.
8.3	Counter- weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room.
8.4	Air pressure stabilizers should have unique capability of controlling differential pressure to close tolerance. The PRD should remain closed at pressure below the set pressure and should open fully at a pressure only fractionally above the threshold pressure.
8.5	The body should be epoxy powder coated as per standard BS colors. High grade electrolyzed steel plate should be used for body and high grade SS304 stainless steel for blades
9	**HATCH BOX**
9.1	A hatch should be provided in each operation theater to remove waste materials from the operation theater to dirty linen area/corridor just adjacent to Operation Theater.
9.2	Each hatch box should be equipped with two doors and the door should be operated electrically/motorised.
9.3	The hatch should be designed in such a way that only one door should be opened at one time.
9.4	The UV light should be so installed that it is kept on while both the doors are closed. This UV light has to be automatically turned off in case of opening of either of the doors.
9.5	Indicators should be provided on both sides of the OT so that door open / close status can be monitored from both sides.
10	**DISTRIBUTION BOARD**
10.1	All high voltage equipment should be installed in a separate enclosure.
10.2	The remote cabinet should house the operating lamp transformers, mains failure relays, UPS, electrical distribution equipment & circuit protection equipment for all circuits within the operating theatre.
10.3	All internal wiring should terminate in connectors with screw & clamp spring.
10.4	Connections of the clip- on type mounted, on a CE approved rail & labeled with indelible proprietary labels.
10.5	Individual fuses or miniature circuit breakers should protect all internal circuits.
10.6	Complete schematic drawing with description should be enclosed with the equipment.
11	**OPERATING LIST BOARD**
11.1	One operating list board should be provided in each operating theater.
11.2	It should be made of ceramic having magnetic properties and should be flushed to the wall of the operating room.
12	**X RAY FILM VIEWER**
12.1	LED type flat panel X-ray viewing panel should be supplied.
12.2	This should comply with relevant electrical safely codes.
12.3	This should be a 3 panel viewing screen.

12.4	Mounting should be flush with the wall to avoid dust accumulation and growth or organisms between wall and panel.
12.5	Body should be of extruded aluminum powder coated black with bacteria resistant and disinfectant resistant finish.
12.6	The diffuser on the front panel should be a uniformly lit screen.
12.7	Dimming electronic control should be enclosed at the bottom of the cabinet.
12.8	Proper spring loaded film clip with rollers should be provided to hold the films firmly and to remove the film without scratches.
12.9	Each panel should be able to illuminate films up to 14”x17” size. (Total 3 panels)
13	**SCRUB STATION**
13.1	Compact surgical scrub sink should be designed for use in OT complex providing for pre procedural scrub up.(Double sink combination as suitable)
13.2	Each fixture should be fabricated from heavy gauge type 304 stainless steel and should be seamless welded construction, polished to a satin finish.
13.3	The scrub sink should be provided with a front access panel which should be easily removed for access to the water controlled value, waste connections, stoppers and strainers.
13.4	Hands free operation should include infra red sensors with programmable adjustment.
13.5	Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature.
13.6	Timing should be adjustable to meet individual application requirements.
13.7	Provided with infrared sensors, thermostatic control taps with fail safe temperature controls.
13.8	All units should have reduced anti- splash fronts.
13.9	Knee operated switch should be provided additionally.
14	**STORAGE UNIT**
14.1	The storage unit should be made with 1.50 mm thick stainless steel panels.
14.2	It should be continuously ventilated by positive air in the room through ventilation holes provided at the bottom and top of opposite sides.
14.3	The shelves should be of welded SS mesh of size 3 mm and grid size 30 mm X 30 mm removable for cleaning.
14.4	The storage unit should be divided 2 or more parts and each part should have individual glass doors with high quality locking system
14.5	The overall size should be approx 180 cm X 60 cm X 45 cm
15	**PENDANTS FOR ANESTHETIST AND SURGEON**
15.1	**Double arm moveable Pendant for Anesthetist**
a	The Pendants should comply with NFPA 99C/HTM 02-01. The support arms should be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position
	The Pendant should have the following specification:
b	1000 mm + 800mm moveable arms each with 340 deg. horizontal and vertical movements. Vertical movement should be motorised and allow movement to a height greater than 6.5 feet above floor level.

c	Weight carrying capacity of the arm should not be less than 200 Kgs. should have electromagnetic brakes.
d	Each arm should be capable of 300-340 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.
e	The pendant should be European CE Certified or US FDA under Medical Devices Directive.
f	The Pendant Service Heads should be modular with 400mm head. The heads should be capable of accepting a range of shelves, and infusion poles or other accessories. The Pendant Heads should support the range of Physiological Monitor Mounting Solutions.
g	The Pendant Service Heads should be supplied with medical gas terminal units and 15 Amps. Sockets.
h	Each pendant should have:
	Oxygen Outlets – 2 nos, Vacuum Outlets – 2 nos, Nitrous oxide – 2 nos, Air(4 bar) Outlets - 2 nos AGSS outlet - 1 no Electrical sockets - 6 nos Shelf with two rails one on each side – 1 no. Monitor stand – 01 no. Data socket RJ-45 -1 no
15.2	**Double arm moveable Pendant for Surgeon**
a	The Pendants should comply with NFPA 99C/HTM 02-01. The support arms should be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position
	The Pendant should have the following specification:
b	1000 mm + 800mm moveable arms each with 340 deg. horizontal and vertical movements. Vertical movement should be motorised and allow movement to a height greater than 6.5 feet above floor level.
c	Weight carrying capacity of the arm should not be less than 300 Kgs. should have electromagnetic brakes.
d	Each arm should be capable of 300-340 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.
e	The pendant should be European CE or US FDA under Medical Devices Directive.
f	The Pendant Service Heads should be modular with 400mm head. The heads should be capable of accepting a range of shelves, and infusion poles or other accessories. The Pendant Heads should support the range of Physiological Monitor Mounting Solutions.
g	The Pendant Service Heads should be supplied with medical gas terminal units and 15 Amps. Sockets.
h	Each pendant should have: Vacuum Outlets – 2nos, Air(7bar)/Nitrogen Outlet- 02nos (for Ortho OT/Neuro OT **(Optional)** CO2 Outlet - 02 nos **(Optional)** Electrical sockets - 6 nos

	Shelf with two rails one on each side – 1 no. Monitor stand – 1no. Data socket RJ-45 -1 no
16	**PERIPHERAL LIGHTING AND CLEAN ROOM LUMINARIES**
16.1	To provide peripheral lighting and clean room luminaries with intensity min 500 Lux, it should be 8 in numbers for each OT. Should be with highly specular anodized aluminum reflectors and optical antiglare system.
16.2	Luminaries cover should be made of highly resistant, disinfectant proof laminated safety glass with stylish fine grained surface, glass pane with white coated steel frame.
16.3	The reflectors should be of high quality, cleanable and non deteriorating.
16.4	The white luminaries body should be made of sheet steel/ perfectly powder coated, supplied ready for connection optionally for individual or series circuit with digital electronic control gear in multilamp technology.
16.5	Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable from top or bottom. The light fitting should be uniformly and esthetically distributed on the ceiling to provide uniform illumination in the OT. Light should not interfere when green mode endoscopy is performed
16.6	Peripheral lighting should be done according to IP65(international protection rating 65)
	Control equipment for the general lighting and the light dimming should be provided in the theatre control panel
17	**ELECTRICAL INSTALLATIONS**
17.1	Power distribution within "the departments should be "provided' from distribution boards located local to each theatre. Sub mains power to these panels should be by the general electrical contractor. From these panels all distribution services within the departments should be run. Isolated power supply, insulation measuring and protection as per IEC standards should be provided. Complete details and BOQ to be furnished. Complete schematics should be supplied along with the offer.
17.2	Earthed equipotent bonding of all exposed metalwork should be provided.
17.3	Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.
17.4	Light fittings within the clinical areas should be recessed LED type with control gear
17.5	Fittings should be sealed In accordance with the standard IP54.
17.6	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.
18	**MEDICAL GAS LINE INSTALLATION**
18.1	The bidder should ensure that all works carried out are to the recommendation made in the Department of Health and Social Securities Health Technical Memorandum number 02-01 /NFPA 99C
18.2	Bidder should provide Oxygen, Air, Vacuum, AGSS, and Nitrous Oxide supply to Operation Theatres from the existing lines terminated outside the OT .

18.3	Bidder shall be responsible for supply, installation, testing and commissioning of complete MGPS system inside the operation theatre including Distribution piping, Pendants, outlets and other essential accessories.
18.4	Terminal units should be gas specific and only accept the correct Medical gas probe. Gas specific components shall be pin indexed to ensure that a correct gas specific assembly is accepted.
18.5	Each terminal unit should be identified by the appropriate recognized name or symbol, colour, coding and shape as per HTM 02-01 /NFPA 99C. Outlets should be CE certified/UL listed.
18.6	Copper pipes should be of solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe conforming to BS: 6017, 1981 and manufactured as per BS: 2871, 1971 Part 1. All copper pipes should be degreased & 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, TUV, 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.
19	**CAMERA INSIDE OT'S**
19.1	The bidder should install the room camera inside OTs
19.2	It should be high speed cameras, with 25X zoom lens, with pan tilt with power supply and reliable strong mounting assembly.
20	**DEMOLISHING,RECONCONSTRUCTING,WATER PROOFING,PLUMBING,REPAINTING AND REPLACEMENT**
20.1	Any demolition , reconstruction, water proofing, necessary plumbing, anti-microbial painting, replacement of any door or windows to provide structured design for modular OT should be carried out by the bidder.
21	**CENTRAL UPS**
21.1	Bidder should provide central sine wave based UPS to support all modular theatre equipments.
21.2	Bidder should supply two 200 KVA UPS one for equipment and one for lighting.
21.3	Bidder should provide required electrical wiring from UPS to all modular OTs.

SPECIFICATION OF EQUIPMENT

A. OT Light – LED

Operating Room Surgical Lighting System should provide an ideal combination of brightness, maneuverability, and shadow resolution without sacrificing color accuracy through a consistent LED technology 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	:	minimum 90 LEDs
Color Temperature	:	4300 k (±10 %)
Field Size Diameter	:	18 cm – 25cm
Depth of Field	:	80 cm – 120 cm
Illumination Level	:	Two domes 160,000 and 120,000
Controls	:	Control Panel (wall and on dome)
Rotation	:	360 degrees
Sterilizable Handle	:	Yes
Light head Diameter	:	65 – 75 cm
Mounting Type	:	Ceiling
Supply Voltage	:	230 VAC 50 Hz
Bulb Type	:	LED
Dimming Range	:	30% - 100%
Operating/Storage Humidity	:	10 – 95%
Life of Light Source	:	>40,000 Hrs

There should be a provision to mount the camera in the satellite dome.

Surgical Light System Should be European CE /US FDA certified.

B. Camera System

Description: Integrated In-Light 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
CCD	:	1/4”
Optical Zoom	:	25 to 30 X.
Digital Zoom	:	12-15X
Video Output	:	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.

C. Flat Panel Monitor

Should be 23” High Definition Progressive Scan Flat-panel Monitors with ceiling mounted spring arm suspension to support high-definition/HDTV progressive Scan images and should be able to support and display DVI/HDTV, RGBHV, S-Video, Composite video signals.

The flat Panel suspension should be ready with the cables for integration of High Definition Digital (DVI/HDTV), RGBHV (High Resolution), SVHS (S-

Video), Composite video signals to travel from the various sources of video like endoscopic camera, room camera, in light camera, high definition flat panel monitors, while assuring native resolution / signal.