REQUEST FOR BUGETARY ESTIMATE

Ref.: HSCC/SES/MP/2023 Date: 23.10.2023

HSCC (India) Ltd. intends to invite on-line bids from eligible bidders, in two stage bid system for Execution including Supply, Installation, Testing, Commissioning of following Special Services including Turnkey Works for upcoming Hospital in Madhya Pradesh;

A. Minor Operation Theatre (Minor OT),
B. Laundry,
C. CSSD,
D. Modular Operation Theatres (MOT),
E. Kitchen,
F. Bio Medical Waste Management System (BMWMS),
G. Medical Gas Pipeline System (MGPS),
H. Mortuary,

The Technical Specifications and BOQ of above proposed Special Services works are Annexed herewith.

It is requested to submit the Budgetary Quotation of above-mentioned Special Services works in Company Letter Head, as per the BOQ format, in both Hard & Soft Copy within 10 days of issue of this Notice at following address:

The envelope to be super-scribed "BUGETARY ESTIMATE _____ *Name of Special Services* _____ Ref: No. HSCC/SES/MP/2023".

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.

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
A	**SITC of Minor Operation Theatre (Minor OT) on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	**CEILING CONSTRUCTION** Complete with all accessories as per technical specification	SQM	45.00			
2.0	**CORNER COVING** Complete with all accessories as per technical specification	Mtr	50.00			
3.0	**WALL PAINTING** Complete with all accessories as per technical specification	SQM	90.00			
4.0	**DOUBLE LEAF DOOR (2100 X 1500) mm C**omplete with all accessories as per technical specification	Nos	1.00			
5.0	**PERIPHERAL LIGHT CUM CLEAN ROOM LUMINARIES -LED** Complete with all accessories as per technical specification	Nos	8.00			
6.0	**DISTRIBUTION BOARD ELECTRICAL WIRING, CONDUITING WITH FIXTURES INSIDE THE OPERATION THEATRE** Complete with all accessories as per technical specification	Lot	1.00			
7.0	**FLOORING (ANTISTATIC CONDUCTIVE ROLL) WITH SELF LEVELLING COMPOUND** Complete with all accessories as required as per technical specification	SQM	50.00			
8.0	**INTERNAL DUCTING** Complete with all accessories as per technical specification	Lot	1.00			

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9.0	**MEDICAL GAS LINE INSTALLATION** Complete with all accessories as per technical specification	Lot	1.00			
10.0	**SCRUB STATION** Complete with all accessories as required as per technical specification.	Nos	1.00			
11.0	**X-RAY FILM VIEWER** Complete with all accessories as per technical specification	Nos	1.00			
12.0	**OT LIGHT DUAL DOME LED LIGHT** Complete with all accessories as required as per technical specification.	Nos.	1.00			
13.0	**TURNKEY works**	Lot	1.00			
	MINOR OT			**TOTAL Rs.**		**-**
B	**SITC of Laundry on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	**Slucing cum Washer Extractor 30 Kg** capacity Fully Programmable Microprocessor/Computer controlled. Steam heated. suitable for heavy duty continuous operation.Details of technical data are as per technical specification.	Nos	1			
2.0	**Slucing cum Washer Extractor 30 Kg** capacity Fully Programmable Microprocessor/Computer controlled. Steam heated. suitable for heavy duty continuous operation.Details of technical data are as per technical specification.	Nos	1			
3.0	**Washer Extractor 60 Kg** Fully Programmable Microprocessor/Computer controlled. Steam heated suitable for heavy duty continuous operation. Details of technical data are as per technical specification.	Nos	1			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
4.0	**Drying Tumbler 30 Kg** heavy duty Programmable Logic Controlled. Steam heated. Details of technical data are as per technical specification.	Nos	3			
5.0	**Flat Ironer Chest heated Roller Size-500 dia x 3000 L** Details of technical data are as per technical specification.	Nos	1			
6.0	**Flat bed press, Size- 1500mm x 750mm**. Steam heated, Details of technical data are as per technical specification.	Nos	2			
7.0	**Vacuum finishing table** with Electric steam iron, **Size- 1300mm x 800 mm**. Details of technical data are as per technical specification.	Nos	2			
8.0	**Air Compressor of 3 hp** of Ingersoll rand/Elgi/Kirloskar make. Details of technical data are as per technical specification.	Nos	2			
9.0	**Automatic m**otorized sewing machine shall be heavy duty type. Details of technical data are as per technical specification.	Nos	1			
10.0	**Wash Room Trolley** Capacity 50 Kg. Stainless steel construction with tubes and bars. Fitted with 4 nos swivelling castor wheels**.** Details of technical data are as per technical specification.	Nos	5			
11.0	**Dry Linen Trolley Capacity 50 Kg.** Stainless steel construction with tubes and bars. Fitted with 4 nos swivelling castor wheels. Details of technical data are as per technical specification.	Nos.	5			
12.0	**Mobile Table** with Stainless table top. Size-1200mm x 750mm x 800 mm ht. 1800mm x 900mm x 800mm ht. with swiveling wheels. Details of technical data are as per technical specification.	Nos.	2			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
13.0	**Shelf Trolley Capacity -50 Kg.** Stainless construction with tubes and bars. Fitted with 3 shelves and 4 nos swivelling type castor wheels. Details of technical data are as per technical specification.	Nos	4			
14.0	**Laundry Scrub Station with 2 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.	Nos.	1			
15.0	**Storage Rack (Size-1250mmx460mmx1800mm)** 4 shelves, Stainless Steel Construction. Details of technical data are as per technical specification.	Nos	10			
16.0	**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/Equivalent	Nos.	1			
17.0	**Turnkey Works Details of technical data are as per technical specification.**	lot	1			
	LAUNDARY			**TOTAL Rs.**		**-**
C	**SITC of CSSD on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	HORIZONTAL DOUBLE Sliding DOOR AUTOCLAVE WITH CARRIAGE AND TROLLEY, cap. 550-600 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			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
3.0	DOUBLE DOOR WASHER DISINFECTOR CAPACITY-275-300 L. Complete with all accessories as per detail technical specification.	Nos	1			
4.0	LOW TEMPERATURE STERILIZER/PLASMA STERILIZER (H2O2) Size- 120L Complete with all accessories as per detail technical specification.	Nos	1			
5.0	ULTRASONIC CLEANER CAPACITY-40L 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			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
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	2			
14.0	CONTROL & PACKING TABLE WITH TWO SHELVES FOR CLEAN AREA Complete with all accessories as per detail technical specification.	Nos	2			
15.0	LINEN FOLD TABLE FOR CLEAN AREA a. Size (LxWxH) : 2000x1400x900 mm approximately. Complete with all accessories as per detail technical specification.	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	3			
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	4			
19.0	Table Trolley with 2 shelves 530x1080x800 H Complete with all accssories as per detail technical specification	Nos	2			
20.0	MODULAR STERILIZING BASKETS BIG Complete with all accessories as per detail technical specification.	Nos	16			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
21.0	MODULAR STERILIZING BASKETS MEDIUM Complete with all accessories as per detail technical specification.	Nos	16			
22.0	BASKET RACK suitable to accomodate Baskets Complete with all accessories as per detail technical specification.	Nos	2			
23.0	STORAGE RACK 5 SHELVES 1830X535X1830 Complete with all accessories as per detail technical specification.	Nos	8			
34.0	TURNKEY WORKS Complete with all accessories as per detail technical specification.	Lot	1			
	CSSD EQUIPMENT			**TOTAL Rs.**		**-**
D	**SITC of Modular Operation Theatre (MOT) on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	**WALL & CEILING PANELING SYSTEM** Complete with all accessories as per tender specification	SQM	621			
2.0	**PVC FLOORING (ANTISTATIC CONDUCTIVE ROLL)** Complete with all accessories as per tender specification after using SELF LEVELLING COMPOUND	SQM	250			
3.0	**LAMINAR AIR FLOW SYSTEM, EXHAUST CABINETS AND AC DUCTING (Inside MOT) AND EXHAUST CABINET**Complete with all accessories as per tender specification	Nos	4			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
4.0	**PERIPHERAL LIGHTING AND CLEAN ROOM LUMINARIES** Complete with all accessories as per tender l specification	Nos	40			
5.0	**TOUCH SCREEN CONTROL PANEL-** Complete with all accessories as per tender specification	Nos	4			
6.0	**X-RAY FILM VIEWER** Complete with all accessories as per tender specification	Nos	4			
7.0	**STORAGE UNIT** Complete with all accessories as per tender specification	Nos	4			
8.0	**HATCH BOX** Complete with all accessories as per technical specification	Nos	4			
9.0	**PRESSURE RELIEF DAMPERS** Complete with all accessories as per technical specification	Nos	4			
10A	**HERMETICALLY SEALED DOOR (2100 X 1500mm) C**omplete with all accessories as per technical specification	Nos	4			
10B	**HERMETICALLY SEALED DOOR (2100 X 1000mm) C**omplete with all accessories as per technical specification	Nos	8			
10C	**VIEW WINDOW (With Motorized Blinds)**Complete with all accessories as per technical specification	Nos	4			
11.0	**OPERATING LIST BOARD** Complete with all accessories as per technical specification	Nos	4			
12.0	**SCRUB STATION** Complete with all accessories as per technical specification	Nos	3			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
13.0	**ELECTRICAL INSTALLATION** (Distribution Board, Internal wiring, cable tray, etc) Complete with all accessories as per technical specification	Nos	4			
14.0	**A. OT LIGHT LED WITH B. HD CAMERA and HD LED FLAT PANEL MEDICAL GRADE MONITOR -** Complete with all accessories as per technical specification	Nos	4			
15.0	**RECORDING SYSTEM** Complete with all accessories as per technical specification	Nos	4			
16A	**DOUBLE ARM MOVEABLE PENDANT FOR ANESHTHETIST** - Complete with all accessories as per technical specification	Nos	4			
16B	**DOUBLE ARM MOVEABLE PENDANT FOR SURGEON -** Complete with all accessories as per technical specification	Nos	4			
17.0	**MEDICAL GAS LINE INTERCONNECTION** Complete with all accessories as per technical specification	Lot	4			
18.0	**DIGITAL DISPLAY MONITOR** Complete with all accessories as per technical specification	Nos	4			
19.0	**TURN KEY WORKS** As per tender specification	Nos	4			
	MODULAR OT			**TOTAL Rs.**		**-**

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
E	**SITC of Kitchen on Tunrkey Basis with 1 Year Defect Liability Period**					
	CENTRAL KITCHEN					
1	**Preparation Table with 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	**Wall Shelf -** constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet	2000x600	1			
3	**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			
4	**Side Table**- Same as sl.ni.1	1500x600x600	2			
5	**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.	4800x2000x600	1			
6	**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.	150ltr.	1			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
7	**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			
8	**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.	5400x1200x600	1			
9	**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	2			
10	**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	2			
11	**Chapatti 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	2			
12	**Chapatti Making machine**-L.P.G/PNG for heating Fully automatic, compact, single unit machine to produce home-like chapattis in most hygienic way. The machine should produce balls from dough, rolls them into chapatis, cooks them by turning sides on tawas and puffs them the way it is done at home. The machine produces soft & tasty chapatis without oil. Complete with accessories as per specification.	2000 Chapatti per hr	1			

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13	**Chapatti collection Trolley-** Structure made of MS angle, duly rust proof painted Body completely constructed of S.S-304 sheet. Sunken top of 16 swg.S.S. Sheet on S.S tubular legs on heavy duty wheels- 2 with breaks & 2 normal complete with accessories as per specification.	750x600x850	2			
14	**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.	1800x1500x600	1			
15	**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.	1200x600x850 +150	2			
16	**Side Table** -Same as sl.ni.1.	1200x600x850	1			
17	**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			
18	**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 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	**Wall shelf-** Shelf constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet	1800x300	1			

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Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
3	**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			
4	**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			
5	**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.	1			
6	**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			
	PANTRY/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.	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			

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3	**Preparation Table with 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			
4	**Micro oven-** Convectional, Complete with accessories as per specification.IFB/Equivalent	20 ltrs.	1			
5	**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	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.	1			
7	**Four 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			

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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	**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			
	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	1			
2	**Pot Rack**- All the shelves are S.S-304 Square/Round pipes on 4Nos Square/Round legs with adjustable bullet feet. All the joints are firmly welded and nicely grinded, polished and puffed to a smoother finish complete with accessories as per specification..	1200x450x1650	1			
3	**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			
4	**Pot wash Sink-** To be constructed with Brick and Cement (Masonary Work) finished with tiles	2000x1500x600	1			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
5	**Hot water Geyser**- Horizontal	100 Ltrs.	1			
6	**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	**Pre-rinse Jet spray-** The spray unit to be fitted with hot & cold mixer.		2			
3	**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	1			
4	**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	1			
5	**Wiping 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 an under shelf of 18 swg. S.S. Sheet of 18 swg. With adjustable bullet feet.	1500x600x850	1			
6	**Hot water Geyser**- Horizontal	30 Ltrs.	1			
7	**Bussing Trolley-** The two tiers trolley is made of 18 swg. SS sheet on tubular/square legs on castor wheels with a push cart type handle. Fitted with cushion guard on all sides to prevent the damage during operation.	900x600x900	1			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
8	**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	2			
9	**Wall Shelf**- Shelf constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet	900 x 300	1			
10	**Clean Dish Rack**- Entirely constructed of S.S-304 round pipe with verticals and slides of 1.5 inch and inside shelves S.S-304 sheet 18 swg. The rack with 5 tiers is mounted on four nylon adjustable feet.	900x450x1800	2			
11	**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			
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.Make-Cambro/Nilkmal/Sintex/Supreme	Capacity-100 ltrs,	1			
	SET-UP AREA					
1	**Preparation Table with 1 u/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- 1500 x 650 x 850 + 150 spl.	1500 x 650 x 850 + 150 spl	1			
2	**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	1			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
3	**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			
4	**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	6			
5	**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	2			
6	**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			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD						NSR ITEMS
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
	STORE					
1	**Dunnage Rack**-Make Sintex/ Nilkamal/Supreme, Moulded type	900x600x250	4			
2	**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			
3	**Storage Rack with 5 tiers for Vegetable store-** 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			
4	**Two door Refer.-** Two/ single door unit, 650 Lts capacity, temperature range -2 deg C to +10ºC. External and internal in AISI 304 stainless steel. Complete as required with all accessories as per technical specification	650 ltrs.	1			
5	**Four Door Refrigerator**- 1410 lts ,-2deg C to +10 deg C, External and internal door and side panels in 304 AISI stainless steel. Complete as required with all accessories as per technical specification	1410 Ltrs,	1			
6	**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			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
7	**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			
8	**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			
9	**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			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD					NSR ITEMS	
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
10	**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			
11	**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	2			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
12	**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			
13	**Insect killer-** Twin tube. Make- Mitwaz/Pestokill	Branded.	3			
14	**Air curtain** -1 entry point Make-Mitwaz	Length as per drg.	2			
	LPG BANK					
1	**LPG Bank- 1**0 + 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			
1	**TURNKEY WORKS**	1 Lot	1			
	KITCHEN EQUIPMENT			**TOTAL Rs.**		**-**
F	**SITC of Bio Medical Waste Management System (BMWMS) on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	Bio-medical **Waste Autoclave** of capacity 600 Ltrs including in-built Steam Generator.complete as required with all accessories as per specification	Nos	2			
2.0	Medical **Waste Shredder** (Low speed) of capacity 50 Kg/hr complete as required with all accessories as per specification	Nos	2			
3.0	**Needle Destroyer** complete as required with all accessories as per specification	Nos	50			
4.0	**Waste Collection Containers** of metal construction with synthetic enamel painting as per specifications.					

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
	App.Size- 8"x10"x21";	Nos	60			
5.0	App.Size- 12"x14"x33";	Nos	60			
	App.Size-17"x14"x33"	Nos	20			
	Waste Collection bags as per specification					
	App. Size 17"x25"	Nos	5000			
6.0	App. Size 25"x37"	Nos	5000			
	App.Size 36"x40"	Nos	750			
	Transportation Trolley 100 Ltrs. Capacity complete as required with all accessories as per specification	Nos	10			
7.0	**INDUSTRIAL WEIGHING MACHINE-Capacity 300 Kg** Electronic machine with Digital display.Details of technical data are as per technical specification.	Nos	1			
8.0	**Turnkey Works** complete as required with all accessories as per specification	lot	1			
	BIO-MEDICAL WASTE MANAGEMENT SYSTEM			**TOTAL Rs.**		-
G	**SITC of Medical Gas Pipeline System (MGPS) on Tunrkey Basis with 1 Year Defect Liability Period**					
1.1	Fully Automatic Oxygen Control System : Supply, Installation testing and commissioning of Fully Automatic Oxygen Control System. As per specification	1	Nos			
1.2	Oxygen Manifold (2x10) : Supply, Installation, testing and commissioning of (2x10 size) class D cylinder Oxygen Supply System. As per specification	1	Nos			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
1.3	Emergency Oxygen Supply System : Supply, Installation, testing and commissioning of (2x5 size) class D cylinder Emergency Oxygen Supply System. As per specification	1	Nos			
1.4	Oxygen Flow meter with Humidifier Bottle: Supply, installation, testing and commissioning of oxygen flow meter with humidifier bottle 0-15Litres. As per specification	210	Nos			
2.1	Fully Automatic Manifold Control Panel for Nitrous Oxide: Supply, installation testing and commission of fully automatic control panel for Nitrous Oxide. As per specification	1	Nos			
2.2	Nitrous Oxide Manifold System, (2x3 size): Supply, installation, testing and commissioning of (2x3 size) Nitrous Oxide Manifold system .As per specification	1	Nos			
2.3	Emergency Nitrous Oxide Manifold System, 2x1 size: Supply, installation, testing and commissioning of (2x1 size) cylinder Emergency Nitrous Oxide supply System .As per specification	1	Nos			
3.0	Medical Air Plant (Package Unit) including electrical control panel: Supply, Installation, testing and commissioning medical air planthaving a minimum system capacity of 2800 LPM as Primary & suitable standby as per relevant standard as per specification.	1	Nos			
4.0	Medical Vacuum Plant (Package unit): Supply, Installation, testing and commissioning of Rotary Vane type medical vacuum plant having a minimum system capacity of 5500 LPM as primary and suitable standby as per relevant standard as per specification	1	Nos			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
5.0	Ward Vacuum Unit: Supply, installation, testing and commissiong of Ward Vacuum Unit as per tender technical specifications.	190	Nos			
6.0	Theater Vaccum Unit for Operation Theaters: Supply, installation, testing and commissiong of Theater Vacuum Unit as per tender technical specifications.	14	Nos			
7.0	Duplex AGSS System: Supply installation and commissioning of Duplex AGSS system. As per specification	1	Nos			
8.0	Copper Pipes					
	As per tender technical specifications					
i	76mm OD X 1.2mm thick	55	mtr			
ii	54mm OD X 1.2mm thick	83	mtr			
iii	42mm OD X 1.2mm thick	105	mtr			
iv	35mm OD X 1.2mm thick	188	mtr			
v	28mm OD X 1 mm thick	600	mtr			
vi	22mm OD X 1 mm thick	1807	mtr			
vii	15mm OD X 1 mm thick	1943	mtr			
viii	12mm OD X 1 mm thick	686	mtr			
9.0	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 .					
i	Oxygen outlet with probe (MOT outlets are in the MOT Package)	194	Nos			
ii	Nitrous Oxide outlet with probe (MOT outlets are in the MOT Package)	3	Nos			
iii	Medical Air 4 outlet with probe (MOT outlets are in the MOT Package)	53	Nos			
iv	Vacuum outlet with probe (MOT outlets are in the MOT Package)	194	Nos			
v	Medical Air 7 outlet with probe (MOT outlets are in the MOT Package)	1	Nos			
vi	AGSS outlet with probe (MOT outlets are in the MOT Package)	3	Nos			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
10.0	AREA VALVE BOX : Supply,Installation, testing and commissioning of Area Valve Boxes. as per specification					
	Valve Box - 2 Gas Service	7	Nos			
	Valve Box - 3 Gas Service	4	Nos			
	Valve Box - 6 Gas Service	6	Nos			
11.0	MEDICAL GAS ALARM PANEL : Supply, Installation, testing and commissioning of Medical Gas Alarm Panel.as per specification					
	Medical Gas Area Alarm for 2 services (Oxygen and MA4 bar)	7	Nos			
	Medical Gas Area Alarm for 3 services (Oxygen, MA4 bar and Vacuum)	4	Nos			
	Medical Gas Area Alarm 6 services (Oxygen, N2O, MA4 bar , SA7 bar N2O,and Vacuum)	6	Nos			
	Master Alarm Panel	1	Nos			
12.0	LINE ISOLATION VALVES					
	15 mm ball valve	28	Nos			
	22 mm ball valve	25	Nos			
	28 mm ball valve	4	Nos			
	35 mm ball valve	5	Nos			
	42 mm ball valve	5	Nos			
	54 mm ball valve	4	Nos			
	76 mm ball valve	2	Nos			
13.0	Supply of O2 cylinders-Class D cylinders	40	Nos			
14.0	Supply of N2O cylinders-Class D cylinders	15	Nos			

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD				NSR ITEMS		
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
15.0	Bed Head Horizontal/ vertical Wall Panel (Without outlets) as per specification	46	Nos			
16.0	Supply installation testing and commissioning of Medical gas hose assemblies as per standard followed	250	mtr			
17.0	Electric wiring inside the gas manifold and plant room including electrical panel for plant & Manifold rooms	1	Nos			
18.0	Turnkey works as per Specification	1	Nos			
	MGPS			**TOTAL Rs.**		**-**
H	**SITC of Mortuary on Tunrkey Basis with 1 Year Defect Liability Period**					
1.0	Mortuary (4 Body) including UPS Complete with all accessories as per technical specification	Nos	1			
2.0	Loading Trolley Complete with all accessories as per technical specification	Nos	1			
3.0	TURNKEY WORKS	Lot	1			
	MORTUARY			**TOTAL Rs.**		**-**

SUPPLY, INSTALLATION, TESTING & COMMISSIONING (SITC) OF SPECIAL SERVICES ON TURNKEY BASIS WITH 1 YEAR OF DEFECT LIABILITY PERIOD					NSR ITEMS	
Item No	**Description of Item**	**Total Qty**	**Unit**	**Unit Rate of "S" in Rs.**	**Unit Rate of "ITC" in Rs.**	**Total Amount in Rs.**
I	**Comprehensive Maintenance Contract (CMC) Charges**					
	Appliances including spares, repair or replacement of defective equipments/parts, tools, tackles, accessories, consumables, labour charges etc. complete in all respect after completion of one year DLP as per the contract.					
1.0	2nd Year After DLP	1	Lot	%		
2.0	3rd Year After DLP	1	Lot	%		
3.0	4th Year After DLP	1	Lot	%		
4.0	5th Year After DLP	1	Lot	%		

Note:

1. S - Supply and ITC - Installation, Testing & Commissioning,

2. Unit Rate shall be inclusive of all charges likes packing, forwarding, taxes like GST @18% complete in all respect.

3. For CMC please mentioned the % of CMC charges only w.r.t. the SITC of Special Services and CMC charges shall be inclusive of all charges likes spares, tools, tackles, accessories, consumables, labour charges, taxes like GST @18% complete in all respect.

TECHNICAL SPECIFICATION FOR MODULAR OPERATION THEATRE

1.0.0 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 inside MOT, Medical Gas Pipe Lines & interconnection with HVAC 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, testing and commissioning of all equipment mentioned in the tender and Operation and Maintenance during warranty.

1.1.0 WALL & CEILING PANEL CONSTRUCTION:

1.1.1 WALL PANEL CONSTRUCTION:

The prefabricated construction for PUF sandwiched 50 mm thick Wall panel to be made of 0.8mm thick doubled skinned AISI-304 Stainless Steel sheet each. The double skinned panel shall be sandwiched with core consisting of rigid polyurethane foam, 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.

1.1.1 CEILING PANEL CONSTRUCTION:

The prefabricated construction for PUF sandwiched 30 mm thick ceiling panel to be made of 0.8mm thick doubled skinned AISI-304 Stainless Steel sheet each. The double skinned panel shall be sandwiched with core consisting of rigid polyurethane foam, 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 ceiling 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 panelling 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 colour 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. 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.

1.2.0 PVC FLOORING (PVC ROLL)

1. It should be with 2mm antistatic seamless PVC flooring

2. Floor should be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.

3. Electrostatic charge dissipation combat PVC seamless flooring of very high quality should be provided.

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. The sheets should be highly durable with resistance to shock and indentation. It should be scratch proof also. The conductive material should be uniformly impregnated as grains.

6. It should be inert to body fluids, chemicals and disinfectants. Should not be affected by temperature variation within the OT.

7. The floor should efficiently discharge electric charges up to 2 kV

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 2.5x104 to 5x106 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-levelling compounds should be used.

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.

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.

11. Flooring should be mechanically shock proof, scratch proof, flame retardant and anti-microbial

12. Corners should be uniformly curved

13. Final surface should be non-corrosive to biological fluids and detergents.

14. Colour should be uniform pleasant and matching with ambience

1.3.0 LAMINAR AIR FLOW SYSTEM

1. The ceiling filtration system should be designed to ensure unidirectional distribution of sterile air of the surgical theatre to ensure the cleanliness of all the area covered by the air flow.
2. The Laminar flow system should comprise of thick extruded aluminium profiles frame and sealed gasket. The filters installed in the plenum should be suitable for application for laminar flow and clean rooms.

   These filters should meet following specification -

   Separators: continuous thermo plastic chord
   Sealant: Polyurethane
   Gasket: One piece polyurethane
   MPPS average efficiency: > 99.95%
   3 Micron DOP efficiency > 99.99%
   Final Pressure drop : 600 pa (max)
   Maximum Operating Temp: 60 degree Celsius
   Maximum RH : 40-50 %

3. The ceiling system should be equipped with “H 14” class HEPA filters position in the ceiling to achieve 0.25m/sec flow at the diffuser.

4. Filtration Ceiling System holding structure, Filter frames and top plenum should be made of Aluminium/Stainless Steel.

5. The filtration ceiling system should have diffuser/flow equalizer to achieve uniform & constant air distribution over the whole surface.

6. The air management system should be designed to achieve class 100 with the following parameters:

Bacteriological class =B (5 CFU/m3) Particle decontamination kinetics CP =5 min ISO 14644/1 classification = ISO 5

7. The positive pressure should be maintained inside the OT to prevent contamination due to air from outside the OT.

8. The supplier should provide test certificate for HEPA filter and laminar air flow systems from the original manufactures.

9. Size of laminar airflow system minimum 8 feet X 8 feet or more.

10. Should be BIS/CE certified.

Note: Prospective bidders are advised to collect the information regarding CFM and AHU capacity from the respective institute site. Total flow rate of filter bank shall match the CFM of AHU.

EXHAUST AIR CABINETS

1. Return air exhaust grill should be provided in the OT.
2. The exhaust air cabinets should be open able and cleanable.
3. These cabinets should have suction from bottom and top also.
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.
5. Return air exhaust cabinet should be made from SS304/Aluminium

Air Conditioning Duct inside the MOT

1. All the ducting inside the MOT shall be scope of the MOT bidder
2. All necessary HVAC interconnection for supply and return air shall be the scope of bidder (the institute will provide the duct up to outside of the MOT)
3. All the ducting should be as per industry standard and sheet should be Aluminium of appropriate thickness and insulated as per industry standard.

1.4.0 PERIPHERAL LIGHTING AND CLEAN ROOM LUMINARIES

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.
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.

3. The reflectors should be of high quality, cleanable and non-deteriorating.

4. The white luminaries body should be made of sheet steel/ perfectly powder coated, supplied ready for connection optionally for individual or series circuit with digital electronic control gear in multi lamp technology.

5. Recess frames should be gas tight. The fitting should be flush with the ceiling and should be removable from top or bottom. The light fitting should be uniformly and aesthetically distributed on the ceiling to provide uniform illumination in the OT. Light should not interfere when green mode endoscopy is performed

6. Peripheral lighting should be done according to IP65 regulations.

7. Control equipment for the general lighting and the light dimming should be provided in the theatre control panel

1.5.0 TOUCH SCREEN CONTROL PANEL

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, light control, gas alarms, etc.

2. The touch screen should be wall mounted, stationed in the visibility line of the surgeon and OT staff. The access height should be convenient for the nurse to operate and help/assistant when in need.

3. The panel should accommodate digital clock and the elapsed time indicator.

4. The medical gas alarm should indicate high and low gas pressures for each gas service present in the OT including vacuum. This should be supported by audible alarm also. The panel should have an alarm mute (fault annunciation) facility. The sensors (pressure switches) should be at the nearest isolation valve.5. Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.

5. Control of the operating light (major and satellite and camera control (on/off and intensity control) should be provided.

6. Hand free telephone set with memory should be located at one side.

7. Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel) The controller should be capable of adjusting the temp adjustment of +/- 5 Deg with in 5Minutes wherever separate AHU is provided for each OT . "
8. Digital room pressure indicator in cm of H2O or equivalent (signal from pressure sensor shall be provided to indicate pressure differential between OT and outside)

9. HEPA filter bank differential pressure indicator.

1.6.0 X RAY FILM VIEWER

1. LED type flat panel X-ray viewing panel should be supplied.

2. This should comply with relevant electrical safely codes.

3. This should be a 3 panel viewing screen.

4. Mounting should be flush with the wall to avoid dust accumulation and growth or organisms between wall and panel.

5. Body should be of extruded Aluminium powder coated black with bacteria resistant and disinfectant resistant finish.

6. The diffuser on the front panel should be a uniformly lit screen.

7. Dimming electronic control should be enclosed at the bottom of the cabinet.

8. Proper spring loaded film clip with rollers should be provided to hold the films firmly and to remove the film without scratches.

9. Each panel should be able to illuminate films up to 14”x17” size. (Total 3 panels)

1.7.0 STORAGE UNIT

1. The storage unit should be made with minimum 1.50 mm thick stainless steel panels and should be with same finish of OT Walls. Air ventilation inside the Storage Unit should be suitably provided.

2. The storage unit should be divided 4 parts and each part should have individual glass doors with high quality locking system

3. The overall size should be approx 180 cm X 90 cm X 35 cm

4. Should be flush mounted/built-in to MOT with same finish.

1.8.0 HATCH BOX

A hatch should be provided in each operation theatre to remove waste materials from the operation theatre to dirty linen area/corridor just adjacent to Operation Theatre. Each hatch box should be equipped with two doors and the door should be operated electrically/motorized.

1. The hatch should be designed in such a way that only one door should be opened at one time.

2. 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.

3. Indicators should be provided on both sides of the OT so that door open / close status can be monitored from both sides.

4. Hatch Box material should be SS304

5. Size of the Hatch box minimum: 600mm x 600mm.

1.9.0 PRESSURE RELIEF DAMPERS

1. Pressure relief dampers or Over flow ports should be provided in each room to prevent contamination of air from clean and dirty areas.

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.

3. Counter- weight balancing system should be provided in the PRD to maintain positive pressure inside the operation room.

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.

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

1.10.0 HERMETICALLY SEALED SLIDING DOORS

1. The door should be a hermetically sealed, single sliding of following sizes **A - Door of 2.1 (H) X 1.5 m (W)**

2. The controller should be capable of being operated by elbow switches/ foot switches as well as touch less sensor.

3. The track should be of stainless steel/Aluminum and the running surface for the top rollers should be suitably angled to reduce resistance to movement

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/Aluminium track to enable smooth and noiseless movement.
5. Opening and closing of the door should be microprocessor controlled electromechanical movement.

6. The door material should be of HPL Color should match the interior and care should be taken to make the leaf strong and light weight.

7. One should be able to open and close the door effortlessly in case of failure of automatic mechanism.

8. Door opening handle should be strong and sturdy. Material should be of SS (gloss finish). Should be provided with high quality cylindrical lock.

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 100Pa.

10. The finished floor on either side of the door should be perfectly level (maximum permissible difference+1mm).

11. The overall thickness of the finished door should be 55 to 60mm. The inner part of the door should be filled with CFC free polyurethane foam thickness of 48mm or nearby. (Sealed airtight to prevent further ingress of any microbial organism).

12. The door and controls should comply with IEE regulation. All motors used should be DC brushless motors with essential isolation from mains.

13. Door should be with vision window 300 mm x 300 mm with double glazed panels and hermetically sealed.

14. Door movement should have minimum noise.

15. The starting time after receiving the signal should be adjustable between 0.5 to 20 seconds.

16. The door controller should be BIS/CE marked.

17. Test certificate for hermetically sealed door frame (factory test certificate) should be enclosed with the pre dispatch documents.

1.11.0 HERMETICALLY SEALED SLIDING DOORS

The door should be a hermetically sealed, single sliding of following sizes
A - Door of 2.1 (H) X 1.0 m (W)
Same as Sl. No. - 1.10.0

1.12.0 VIEW WINDOW (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 Aluminium of approved shape flush mounted to wall panelling material with proper sealing. The entire assembly should be completely sealed and fitted with proper Aluminium/SMS profile. The assembled thickness of the Window

should be minimum 33 mm. The window blinds should be operated with Remote Control and manually.

1.13.0 OPERATING LIST BOARD

1. One operating list board should be provided in each operating theatre.

2. It should be made of ceramic having magnetic properties and should be flushed to the wall of the operating room.

1.14.0 SCRUB STATION

1. Compact surgical scrub sink should be designed for use in OT complex providing for pre procedural scrub up.(Double sink combination as suitable)

2. Each fixture should be fabricated from heavy gauge type 304 stainless steel (minimum thickness 1.5mm)and should be seamless welded construction, polished to a satin finish

3. The scrub sink should be provided with a front access panel which should be easily removed for access to the water controlled valve, waste connections, stoppers and strainers.

4. Hands free operation should include infra-red sensors with programmable adjustment.

5. Thermostatic mixing, valve control should be located behind the access panel and maintain constant water temperature.

6. Timing should be adjustable to meet individual application requirements.

7. Provided with infrared sensors, thermostatic control taps with fail safe temperature controls.

8. All units should have reduced anti- splash fronts.

9. Should have provision for soap/disinfection scrub solutions.

10. Knee/foot operated switch should be provided additionally.

1.15.0 ELECTRICAL INSTALLATIONS (Distribution Board, Isolation Transformer, Internal wiring, cable tray, etc.)

1. Distribution box, isolation transformer, leakage relays, cable tray, etc and all internal wiring, earthling inside the OT should be under the scope of MOT bidder.
2. Power distribution within the OT should be "provided' from distribution boards located local to each

3. theatre. Sub mains power to these panels should be by the general electrical contractor. From these

4. panels all distribution services within the departments should be run. Isolated power supply, insulation measuring and protection as per IEC standards should be provided. This unit should be BIS/EN/CE/UL/FDA/IEC certified

5. Institute will provide one point supply for three phase and/or single phase to the MOT vendor outside of MOT corridor/area.

6. DISTRIBUTION BOARD

    a) All high voltage equipment should be installed in a separate enclosure.
    b) 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.
    c) All internal wiring should terminate in connectors with screw & clamp spring.
    d) Connections of the clip- on type mounted, on a BIS/CE approved rail & labeled with indelible proprietary labels.
    e) Individual fuses or miniature circuit breakers should protect all internal circuits.
    f) Complete schematic drawing with description should be enclosed with the equipment.

7. Earthed equipment bonding of all exposed metalwork should be provided.

8. Power sockets within the Operating Theatres ancillary areas should be matched to the rest of the hospital.

9. Light fittings within the clinical areas should be recessed LED type with control gear

10. Fittings should be sealed In accordance with the standard IP54.

11. 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.

12. All necessary interconnection of LAN cables, Telephone/intercom, copper strip, etc. to MOT from hospital source is the responsibility of the bidder.

1.16.0 OT LIGHT WITH CAMERA

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.

Such Lighting System should have the following technical specifications:

1. Number of Light heads : Two per suspension
2. Colour Temperature range: 3800 k -5000 (±10 %) - Variable colour temperature.
3. Field Size Diameter: 20 to 28cm (+/- 10%)
4. Depth of Field : 750 to 1100mm (+/- 10%)
5. Illumination Level : 160000Lux (Major Dome & Minor dome)
6. Controls : Control Panel (wall and on dome)
7. Rotation : 360 -330degrees
8. Sterilizable Handle: 02 Nos.
9. Mounting Type : Ceiling
10. Supply Voltage : 230 VAC 50 Hz
11. Bulb Type : LED
12. Dimming Range : 30% - 80%
13. Life of Light Source : >40,000 Hrs Surgical Light System Should be compliant with relevant BIS/European CE /US FDA standards

B. HD Camera System – 1080 p/i

Integrated In-Light Camera System should be integrated at the centre of one of the domes of this lighting system/ third arm in order to capture images & video sequences of the open cases.

Such an autofocus – Locable camera should have the following specifications:

1. Signal to Noise Ratio (S/N Ratio) : >50 dB
2. CCD : 1/3”
3. Optical Zoom : 10X
4. Digital Zoom : 12-15X
5. Video Output : HD, S-Video & Composite Video
6. White Balance & Gain : Automatic/Manual

7. Light and Integrated Camera should have a control through Touch Panel of the control
8. equipment placed inside the operating room

C. HD LED FLAT PANEL MEDICAL GRADE MONITOR

Should be 30-32" High Definition Progressive Scan Flat-panel Medical Grade Monitors with ceiling mounted spring arm suspension to support high definition/HDTV progressive Scan images and should be able to support and display DVI/HDTV, RGBHV, S-Video, Composite video signals. Aspect ratio16:9/16:10. Resolution – 1920X1080 or more 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.

1.17.0 RECORDING SYSTEM

Recording system to be offered separately. Recording system should be full HD monitor LCD 19"touch screen or more and having the one TB storage space. Data cable for communication from both pendants and monitors should be laid down up to outside of OT in a patch port for future expansion for all OT's.

1.18.0 PENDANTS FOR ANESTHETIST AND SURGEON

A. Double arm moveable Pendant for Anaesthetist

The Pendants should comply with NFPA 99C/HTM 02-01/ISO 7396-1/DIN. The support arms should be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position

The Pendant should have the following specification:

1. Double moveable arms (any combination) with total coverage of 1800mm +/- 10% and 330 deg. Horizontal movements for each arm. Vertical movement should be motorized and the arm height should remain to a height greater than 6.5 feet above floor level

2. Weight carrying capacity of the arm should not be less than 180 Kgs. should have electromagnetic/pneumatic brakes

3. Each arm should be capable of 300-340 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.

4. The Pendant Service Heads should be modular with minimum 800mm 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.

5. The Pendant Service Heads should be supplied with medical gas terminal units and 5/15 or 6/16Amps dual Sockets.

6. Double arm pendant anesthetists : Each pendant should be supplied with pre-fitted outlets and probes as mentioned below –
   Oxygen Outlets – 2 nos.,
   Vacuum Outlets – 2 nos.,
   Nitrous oxide – 1 nos.,
   Air(4 bar) Outlets - 2 nos.,
   AGSS outlet - 1 no
   Electrical sockets - 10 nos.
   Shelf with two rails one on each side – 3 no.
   IV Fluid Pole with 4 hooks – 1No.
   Data socket RJ-45/CAT6 -2 nos.

7. The pendants should be BIS/European CE or USFDA certified.

8. Pendant supplier should provide cut outs for Patch Panels in Integrated OTs. (only for integrated OT)

B. Double arm moveable Pendant for Surgeon

The Pendants should comply with NFPA 99C/HTM 02-01/ISO7396-1/DIN. The support arms should be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position

The Pendant should have the following specification:

a. Double moveable arms (any combination) with total coverage of 1800mm +/- 10% and 330 deg. Horizontal movements for each arm. Vertical movement should be motorized and the arm height should remain to a height greater than 6.5 feet above floor level

b. Weight carrying capacity of the arm should not be less than 180 Kgs. Should have electromagnetic/pneumatic brakes

c. Each arm should be capable of 300 - 340 degrees of rotation, which can be easily adjusted to suit the desired mode of operation.

d. The Pendant Service Heads should be modular with minimum 800mm 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.

e. The Pendant Service Heads should be supplied with medical gas terminal units and 5/15 or 6/16 Amps dual Sockets. Each pendant should be supplied with pre-fitted outlets and probes as mentioned below –
   Vacuum Outlets – 2nos,
   Air (7bar) Outlet- 01nos,
   CO2 Outlet - 01 nos.,
   Electrical sockets - 10 Nos. (6/16A)
   Expandable shelf (minimum width: 70cm & Depth min. 45cm) with two rails one on each side – 5nos.Data socket RJ-45 -2 no.IV Fluid Pole with 2 hooks – 1No. (Pole should be capable of stacking 4 nos of syringe pumps)

f. The pendants should be BIS/European CE or USFDA certified.
g. Pendant supplier should provide cut outs for Patch Panels in Integrated OTs (only for integrated OTs).

1.19.0 Medical Gas Pipe Line Interconnection (MGPS Lines to Pendants etc)

a) The bidder should ensure that all works carried out as per HTM 02-01 /NFPA 99C / DIN/ISO 7396-1standard
b) Bidder should provide Oxygen, Air4, Air7, Co2, Vacuum, AGSS, and Nitrous Oxide, etc. supply to Operation Theatres from the existing lines terminated outside the MOT.
c) Bidder shall be responsible for supply, installation, testing and commissioning of complete MGPS system inside the operation theatre including Distribution piping, connection to Pendants, outlets and other essential accessories.
d) Copper pipes should be of solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe. All copper pipes should be degreased & delivered capped at both ends. The pipes should be accompanied with manufacturers test certificate for the physical properties & chemical composition. The copper pipe should comply with EN 13348
e) Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's, Bureau Veritas, SGS).
f) Fittings should be made of copper and suitable for a working Pressure of up to 17bar and especially made for brazed socket type connections.
g) The copper fitting should comply with EN 1254-1
h) The Brazing filler material should comply with EN 1044

1.20.0 DIGITAL DISPLAY PANEL (WORK STATION)

The alphanumeric electronic Touch Screen should be a 29 inch wide screen monitor of latest generation model suitable to Indian condition should have Metal panel-LCD TFT, High resolution, maximum Optical clarity, USP Ports and compatibility to other hardware system. The touch screen should be for

messages and data through displaying operating list and particular details etc., message storage and scroll display. Operating with Stylus. It should have a protective glass overcoat which protects the sensor by resisting scratches and increase durability. It should be mounted flush into the theatre wall with a sterile jointing system. NEMA sealable. The monitor should be completely water resistant with polyethylene gasket. Liquid on screen should not impede touch screen performance. The Digital viewing Unit (TFT) should be supplied and installed along with the Integrated CPU System. The TFT monitor should be with swivelling keyboard facility so that it can be integrated in to the hospital PACS, and HIS.

The Integrated CPU should be of the following minimum configuration:

Intel Core 2 duo Processor with 4MB L2- Cache, 2.66 GHz and 1333MHz FSB, Q35 Chip set; 4GB DDR2 Memory (Extention Possible) and flexible hard disk capacity minimum 1TB; 2USB Access in the front side.

1.21.0 Turn Key Job to be provided by the Bidder

1. Commissioning and installation of SMS wall & ceiling panelling, 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.

2. All cable conduit, trenches and railings wherever required.

3. All electrical accessories like cable wire, electrical outlets, switches, Control panels, etc should be fireproof, of reputed make, certified for electrical safety.

4. Bidder has to provide hatch box, storage shelves, scrub basins and other service areas as mentioned in the tender.

5. Testing, Installation and commissioning of all equipment/services.

6. Any other necessary work required for satisfactory working/performance of the modular OT and not mentioned/specified.

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. 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.

1.22.0 RESPONSIBILITY OF BIDDER

Bidders are strongly advised to visit the site for assessment before the submission of tender offer

1. Bidder shall be responsible for complete design, construction, testing and commissioning of modular operation theatres based on seamless integration with modular concept.

2. Bidder shall execute all required civil, electrical and peripheral lighting, plumbing, air-conditioning system(Ducting inside the OT), demolition and other works as may be required for complete installation and trouble-free functioning of the operation theatres as a part of the "turnkey work". Necessary coordination with 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 MOT bidder.

3. The bidder shall be responsible for the complete works including the submission of Working Drawings, and walk through view.

4. Bidder shall be responsible for installation and commissioning of medical equipment for MOT in coordination with respective institute/hospital authorities.

5. The bidder should provide UPS power supply in OT complex with necessary cabling as per electrical standard (if UPS for OT is under the scope of bidder)

6. Bidder shall be responsible for free maintenance with spares of modular operation theatres during warranty period.

7. 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.

8. 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)

9. Bidder should provide factory test certificates for the material used for the construction of modular theatres.

10. Bidder should supply complete set of part manuals, service manuals for all the systems and subsystems supplied.

11. Training should be provided for a week by the factory trained engineers /Original Equipment Manufacturer(OEM).
12. Final electrical safety test, system test, and calibration should be done by authorized persons using calibrated test equipment.

13. 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.

14. 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.

15. **Third party quality certification of the Modular OT equipment & items from SGS/BUREAU VERITAS/Lloyds should be submitted by the contractor as "Certifies that the Modular OT equipment & items meet the technical specification and BOQ of the tender document vide contract No (Mention Contract No.)."**

16. **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATION FOR MINOR OT

2.1.0 SCOPE OF WORK

Plan, Design, S**upply 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.**

2.2.0 CEILING CONSTRUCTION

The prefabricated construction for 1.60 mm thick AISI-304 Stainless Steel backed by 12mm thick Gypsum board OR it should be Double skinned panel of 0.8mm thick 304 Grade Stainless Steel sheet each. The double skinned panel of thickness 30 mm shall be sandwiched with core consisting of rigid polyurethane foam, which has been injected under high pressure, with a minimum density of 40 kg/m3 and Silicon sealant at the joints 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

Providing and laying of Epoxy/Antibacterial painting (3 coated) after putty & primer and maintaining of 300 microns thickness over smoothly rendered surface. The treatment consists of surface preparation, priming with Primer.

2.3.0 CORNER COVING

Extruded Aluminium powder coated/Anodized clip on type covings for the entire wall to wall and wall to ceiling. R-70, 3D internal/ external corner coves. All corners coving of Return air ducting lines inside OT. Material to be used for covering should be Powder coated Aluminium/SS-304.

2.4.0 WALL PAINTING

Providing and laying Epoxy/Antibacterial painting (3 coated) after putty & primer of 300 microns thickness over smoothly rendered walls. The treatment consists of surface preparation, priming with Epoxy Primer. Walls should be smoothly rendered with Wall putty.

2.4.0 DOUBLE LEAF DOOR- BOTH WAY OPENING- Size-2100 x 1500mm

44 mm thick doors made with 0.8mm thick double skinned SS-304 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, 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. Colour of the door should be as per the requirement of the client.

2.5.0 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/As suitable to the required illumination (500 Lux) in numbers for each OT. The LED lamp of size 2ft.x 1ft 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 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 IP 65 protocol. Light should not interfere when green mode of Endoscopy is performed.

2.6.0 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. 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. 5/15 Amps **antibacterial switch** and socket outlet set -3 Nos shall be flushed equidistant in each wall at 325mm height from FFL of OT. Wiring for 250 volts single phase and neutral 5/15 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.

2.7.0 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 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 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 and should be approved by client/HSCC. **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 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 building 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) upto 100mm from FFL and should be used overlap to a height of 25mm approx.and sealed perfectly and uniformly. Self-leveling compounds should be used for this purpose. Radius for corner coving- 60-70R

2.8.0 INTERNAL DUCTING

The internal ducting in 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.

2.9.0 MEDICAL GAS LINE INSTALLATION (To be concealed in the OT wall)

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 2022/NFPA.
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/SGS/BUREAU VERITAS.

Medical graded Copper Piping should be laid down from Pendant/Bed Head Panel/Gas Outlets of OT to the nearby Valve Box outside the Operation Theatre via Surgeon Control Panel.
Gas Outlet- Oxygen-2, Vacuum-2, Nitrous-1, Ma4-1, Sa7-1, CO2-1, AGSS-1 complying to HTM 02-01/ NFPA 99 C/EN/DIN/ ISO 7396-1 shall be fitted on the wall of Minor OT.

2.10.0 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. Scrub station should be equipped with 10L Geyser for supply of hot water.

2.11.0 X-RAY FILM VIEWER

The Two (2) plate viewing LED type/ 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 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.

2.12.0 OT LIGHT

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

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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 %) - Variable colour temperature.
- Field Size Diameter : 20 to 28cm (+/- 10%)
- Depth of Field : 750 to 1100mm (+/- 10%)
- Illumination Level : minimum 160,000 Lux each
- Controls : Wall Control Touch Panel
- Rotation : 330- 360 degrees
- Vertical Adjustment Range : + 20 inch – 25 inch
- Sterilizable Handle : 2 Nos
- Light head 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.
- BIS/European CE /US FDA certified

2.13.0 IN ADDITION TO THE ABOVE, FOLLOWING <u>TURNKEY WORKS</u> FOR INSTALLATION AND COMMISSIONING OF 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.

- **Electrical cabling** of IS : 1554 standard(Latest) 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, Light Points, Power points, in the MINOR 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 MINOR OT then that may be provided and any other necessary work required for satisfactory working of the Mid-End MINOR OT and not mentioned

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.

Note: The bidder should attach Technical Compliance item wise with respect to the above technical specifications and turnkey work along with Printed catalogues

- 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.

- 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 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 for seven working days should be provided by the contractor.

- The contractor should prepare and submit to HSCC the layout plan before beginning of supply as well as As-built drawing for installed equipment and component, Electrical Wiring for approval after installation.

- **Third party quality certification of the Minor OT equipment & items from SGS/Lloyds/Bureau Veritas should be submitted as**

"Certifies that the equipment & item (Name of the equipment) meets the technical specification and BOQ of the tender document".

- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATIONS FOR MEDICAL GAS PIPELINE SYSTEM (MGPS)

3.1.0 SCOPE OF WORK:

Supply, installation, testing, commissioning including turnkey work and handing over of Medical Gases Piping System to the client. Bidder should provide free spare parts and service during Defect Liability Period.

3.2.0 STANDARDS/GUIDELINE

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

3.3.0 THE SYSTEM COMPRISES OF

1. Secondary Oxygen Manifold and Emergency oxygen manifold with automatic control panels
2. Nitrous Oxide Manifold and Emergency NO2 Manifold with automatic control panel
3. Medical Air Supply System (4 Bar & 7 Bar) complete.
4. Medical Vacuum (suction) Supply System Complete.
5. Distribution Piping Complete with Accessories.
6. Area Valve Service System.
7. AGSS system Complete
8. Alarm Systems (Master & Area)
9. Gas Outlets with Probes
10. Bed Head Panels
11. Other associated & Optional works

3.4.0 SCOPE AND TECHNICAL SPECIFICATION:

3.4.1 Oxygen Supply System

a. 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 BIS/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 350 psi and one low pressure approx.75 psi. The heavy duty control panel should be provided with a flow capacity of 1500 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.

b. 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

c. 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 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. 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.

d. 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 BIS/CE certified/ UL Listed

3.4.2 NITROUS OXIDE SYSTEM

a. 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 BIS/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.350psi 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.

b. 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.

c. 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.

3.4.3 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 BIS/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)

a. Air 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 as primary and same as standby**.

Medical quality air shall be delivered at a nominal pressure of 400 kPa (4 bar) and 700kPa(7bar) 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 particlesdown 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.

b. 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 ASME/BS/ISO

c. Air Treatment Module

The air treatment module should include dual dryers, dual filtration system and a dew point 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.

d. System Controls

The “Continuous on Demand” feature will stop the operation of the motors during periods of lower 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.

e. 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.

3.4.4 VACUUM SYSTEMS (Package unit)

It should be BIS/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

a. Vacuum Pump Module

It should be **Oil Sealed Rotary Vane Type** to produces the plant output of **{minimum Litrs Per Minutes(LPM) Plant capacity } as mentioned in BOQ of respective institute as primary and same as standby** 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.

b. Vacuum Receiver

The vacuum receiver shall be made of rust free corrosion resistant steel and fabricated as per 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.

c. 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 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 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 ennunciated for reserve pump in use.

d. 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 least99.999% 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.

e. 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.

3.4.5 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 1000ml 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.

3.4.6 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.

3.4.7 AGSS (ANESTHETIC GAS SCAVENGING SYSTEM) PLANT (PACKAGE UNIT)

Duplex Anaesthetic Gas Scavenging System (AGSS) of suitable capacity for 6 Nos OT, 1No CT Scan and I No MRI should be BIS/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 dry rotary vane vacuum pumps or Claw technology or Blower as per relevant standard, 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 anaesthetic gas scavenging systems should be designed to safely remove exhaled anaesthetic 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 anaesthesia workstation should be provided.

3.4.8 DISTRIBUTION PIPING

a. 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 BUREAU VERITAS 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 1.2mmand the thickness of copper pipes less than 28mm outer diameter, should be 1mm as mentioned in respective Institute's BOQ.

b. 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 5joints 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 orgun metal 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)

c. 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.

3.4.9 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 BIS/European CE certified or American UL listed
- All outlets should have respective label (i.e.O2/N2O/CO2/Air4/Air7/ Vacuum/AGSS/etc.)displayed accordingly.

3.4.10 AREA VALVE SERVICE UNIT

Area valve service units should fully comply and meet with HTM 02-01/NFPA99C/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/else 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.

3.4.11 ALARM SYSTEM

a. Master Alarm

Should be BIS/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
- And Other MGPS Signals & Alarms

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

b. 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 BIS/European CE Certified or UL listed. An audible warning should sound simultaneously with any failure indication and a mute facility should be provided. "

3.4.12 LINE ISOLATION VALVES

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

3.4.13 SUPPLY OF O2 CYLINDERS – CLASS D TYPE

Should be as per BIS/IS/ASME Standard

3.4.14 SUPPLY OF N2O CYLINDERS – CLASS D TYPE

Should be as per BIS/IS/ASME Standard

3.4.15 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(Horizontal-1200/1500mm) 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: - Gas Outlets quantities are already taken in consideration of quantities of respective outlets in BOQ

Facility per unit

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

3.4.16 HIGH PRESSURE TUBES 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 BIS/CE marked/UL Listed -. (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)

3.4.17 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 BIS/CE standard and material used should be reputed make only.

3.4.18 Turn Key –

i. Bidder should be responsible for antistatic rubber flooring in the manifold room and thickness of flooring not less than 1inch.
ii. Bidder should provide a raised Loading/Unloading Platform of suitable sized adjacent to manifold room, so that cylinder can be loaded & unloaded easily form the lorry/vehicle.
iii. Bidder should be responsible for foundation of Plant Room (If required) for Medical Air Plant, Vacuum Pant & AGSS Plant.
iv. Bidder should co-ordinate with respective Institute/Authorities for the availability of Office Room for & Toilet for MGPS Operator into Manifold/Plant Room.

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. 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 and CMC period

3.5.0 RESPONSIBILITY OF BIDDER

Bidders are strongly advised to visit the site for assessment before the submission of tender offer

1. Bidder shall be responsible for complete design, supply, installation, testing and commissioning including turnkey works, demolition and construction as applicable. The bidders are required to survey the site before furnishing the quotations.

2. Bidder shall execute all required civil, electrical, plumbing, lighting, fire safety, exhaust systems and other works as maybe required for complete installation and trouble-free functioning as apart of the 'turnkey work'.

3. Hospital will provide one point electrical supply with isolator in the plant. The wiring, peripheral lighting, fans, exhaust etc have to be done by the bidder.

4. Control panel for Vacuum system and Air plant system has to be supplied by the bidder.

5. Bidder will be responsible for trenching or other associated work related to installation and commissioning of complete MGPS system.

6. The MGPS bidder has to terminate/interconnect all the medical gas lines upto/to the OT/MOT.

7. Installation and commissioning of area valve service unit and alarm unit for the operation theatre shall be done by the MGPS bidder.

8. Medical gas pipe line inside the minor operation theatre has to be done by the MGPS bidder. MGPS bidder shall cooperate with the MOT bidder for associated works.

9. The bidder shall be responsible for the complete works including the submission of working drawings, and isometric views, detailed work schedule and materials. Bidder shall be responsible for design, supply, installation, testing and commissioning of medical gas supply system in coordination with respective institute authorities & HSCC.

10. Bidder shall be responsible for free maintenance of all component of Gas pipeline system during warranty period including all filters & consumables.

11. Bidder should provide factory test certificates for the materials used. Bidder should supply complete set of part manuals, service manuals and user manuals for all the systems and subsystems supplied. Final electrical safety test, system test, leakage and calibration should be done by authorized persons using calibrated test equipment as per standards.

12. The Medical Gas Pipe Line System must follow Single Standard any one only from: NFPA 99c/HTM02-01/ ISO 7396-1/DIN/EN. For AGSS Ventury type is not acceptable.

13. **Third party quality certification of the - MGPS equipment & items from SGS/BUREAU VERITAS/Lloyds should be submitted as "Certifies that the MGPS equipment & items meet the technical sp specification and BOQ of the tender document".**

14. **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATION OF CSSD EQUIPMENTS

4.1.0 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.

4.2.0 CSSD EQUIPMENT

4.2.1 DOUBLE DOOR AUTOCLAVE 550-600 Litres (8 STU) 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 $\pm$ 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.

(k) 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

(l) Directives & Standards:
It should meet BIS/EN ISO / IEC directives and product should be BIS/European CE/ US FDA Standards. Copy of certificate is to be attached.

(m) Should pass a hollow load (A) test (Batch monitoring system).

(n) 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.

(o) It should have integrated water saving recovery device. It should be able to save minimum 60% water.

(p) It should have integrated degassing system.

(q) 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.

4.2.2 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 BIS/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.

4.2.3 DOUBLE DOOR WASHER DISINFECTOR 275-300 Litre (15 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 275-300L. Should supply 15 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.

r) 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.
   f) 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:
    The device should be a medical device according to Directive 93/42 EEC concerning medical devices. Should be BIS/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.

4.2.4 PLASMA (H_2O_2) /LOW TEMPERATURE STRILIZER (Double door)- 120 L

1. Sterilizer process should be suitable for sterilization of medical devices like flexible endoscopes, rigid endoscopes- both single

channel and also dual channel and non-lumen, metal, non-metal heat & moisture sensitive instruments, like defib paddles etc. The sterilizer process must have maximum material device manufacturers' recommendations from major endoscopic equipment manufacturers.

2. Should provide simple and fast sterilization of medical devices at low temperature using Hydrogen Peroxide sterilization gas/plasma technology without any need to have additional Dryer.
3. Sterilizer must be having BIS/US-FDA/European conformity.
4. Usable Rectangular chamber having volume of minimum 120 liters.
5. Should have removable shelf for keeping big load with double microprocessor controlled door.
6. Sterilization temperature should not be more than 50deg C ± 5 deg C.
7. Should have minimum two / maximum three selectable pre-programmed sterilization cycles for different types/ quantity of lumen and non-lumen loads with max. sterilization time not more than 55 min. ± 5 min.
8. Should be environment friendly and have no toxic by-products or harmful residues and should approval of EPA to guarantee its non-harmful feature.
9. Should have inbuilt Printer and touch screen color LCD display for controlling & monitoring the sterilization process. Should have facility to store/upload data on Ethernet/USB post for sterilization cycle records for recall & printing.
10. Should be easy to install without any civil/ plumbing work and should be mobile on wheel for each movements.
11. Sterilization should be validated using BIS/US-FDA/European CE approved Chemical Indicators and Self Contained Biological indicators with 24 hour read out time.
12. Should be able to run on Electricity 50 Hz three phase meeting IEC-60601-1-2 :2001General Requirements of Safety for Electromagnetic Compatibility or should comply with 89/366/EEC; EMC-directive.
13. Each Sterilizer should be supplied complete with accessories like One no. six Vial incubator(220V), 6 no.s instrument trays of three different sizes with Lids.
14. Should quote same make consumables having BIS/EPA-US/ CE as mentioned below : a H2O2 Sterilant 59% - Cassette or Cup= for 100 load cycles, b Chemical Indicator Strip (for putting inside single item packs)= 2000 strips (for approx.. 100 load cycles), c Biological Indicator Vials = 100 no.s

4.2.5 ULTRASONIC CLEANER (40 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 BIS/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.

4.2.6 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 BIS/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.

4.2.7 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.**

4.2.8 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.

4.2.9 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. Cutting Capacity should be 165 mm.

5. Should work on 230V, 50 Hz power supply.

4.2.10 AIR COMPRESSOR

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

4.2.11 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

4.2.12 WASH STATIONS WITH 2 SINKS FOR DIRTY AREA

1. Size Approx. (L x W x H): 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. Should be made of solid, bright-polished stainless steel (304) to withstand heavy-duty work with wet instrument.
6. Designed with a 60 mm high edge (splash back) at the rear.
7. The front and side edges are reinforced and widened to 49 mm. Edges are welded together and polished at the corners.
8. The worktop should slope to the sink, and reinforced by a full-length support frame.
9. Sink units should be of sizes that allow processing of the large modular instrument trays.
10. The legs should be able to provide strong support and hold to the entire unit securely.
11. 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.

4.2.13 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.

8. All edges should be smooth and the rigid frame should be made up of minimum 1.5 mm sheet thickness stainless steel (304).

9. 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.

4.2.14 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.

4.2.15 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.

4.2.16 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.

4.2.17 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.

4.2.18 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.

4.2.19 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.

4.2.20 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.

4.2.21 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.

4.2.22 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.

4.2.23 STORAGE RACKS:

Size – 1830X535X1830

5 shelves; Made of Stainless Steel-AISI-304, Finished with Polishing with bullet feet

In addition to the above, the contractor should visit the site any Civil, Plumbing, Electrical works required for satisfactorily functioning of the CSSD systems shall be carried out by the contractor and no extra payment on this account will be made.

4.2.24 TURNKEY WORKS

- The works includes all modifications/Patch work to the built up space provided at the hospital site including Installation of Equipment, civil works, electrical works, plumbing works, furniture and other related works of the CSSD and TSSUs 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. The work includes demolition of unwanted walls. Construction of Partition wall for installation of Double door Autoclaves in CSSD. Supply of requisite materials and connection for electrical supply, Plumbing line, drain line connection and exhaust of gases/steam inside CSSD and TSSUs.

  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.

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.

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 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).

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- 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 equipments 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 & items from SGS/BUREAU VERITAS/Lloyds saying as "Certifies that the CSSD equipment & items meets the technical specification and BOQ of the Contract".**

- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATION OF KITCHEN EQUIPMENTS

5.1.0 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.

5.2.0 CENTRAL KITCHEN

1. **Preparation Table with 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. **Wall shelf**
   Shelf constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet 2000 x 600

3. **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 United/Sarna make heavy duty burner with pilot lamps with individual control valves and heavy duty cast iron pan support. Size- 750x750x600

4. **Side Table**
   Same as sl.ni.1. Size- 1500x600x600

5. **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- 4800x2000x600

6. **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- 100 Ltrs.

7. **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.

8. **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-5400x1200x600

9. **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

10. **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

11. **Chapatti Rolling Table (Manual)**
    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

12. **Chapatti Making machine**
    L.P.G/PNG for heating. Fully automatic, compact, single unit machine to produce home-like chapattis in most hygienic way. The machine should produce balls from dough, rolls them into chapattis, cooks them by turning sides on Tawas and puffs them the way it is done at home. The machine produces soft & tasty chapattis without oil. Complete with accessories as per specification. Capacity-2000 Chapatti/hr. Make- KM Group/Chapatti Queen/Equivalent

13. **Chapatti collection Trolley**
    Structure made of MS angle, duly rust proof painted Body completely constructed of S.S-304 sheet. Sunken top of 16 swg.S.S.-304 Sheet on S.S tubular legs on heavy duty wheels- 2 with breaks & 2 normal. Size-750x600x850

14. 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-1800x1500x600

15. 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-1200x600x850+150

16. Side Table

Same as sl. no.1. Size- 1200x600x850

17. 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. Capacity - 25 Kg.

18. 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. Make-Cambro/Nilkmal/Sintex/Supreme

5.3.0 PREPARATION AREA

1. **Preparation Table with 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. **Wall shelf**

   Shelf constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet Size -1800x300

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

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

4. **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

5. 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.

6. 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. Make-Cambro/Nilkmal/Sintex/Supreme

5.3.0 PANTRY/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. **Preparation Table with 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

4. **Micro oven**

Convectional type, Capacity-20 Ltrs. Make-IFB/Equivalent.

5. 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

6. **Sandwich Griller**

Self balancing top double plate. plate descent adjustablew by means of brass brakes, thermostatic controls with o deg c to 300 deg c temperature range with warning lights(=live/yellow= plate temperature).spring with anti breaking system.complete body with fixed joints.supplied with steel cleaning brush. Double griller. Orion 2 (Itally) ARISTARCO/ PANINI/ SIRMAN

7. **Egg boiler**

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

8. **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.

9. 4 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 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.

10. **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

11. Idly Steamer

Doubled walled mineral wool insulated all SS sheet body on tiny tubular legs with adjustable bullet feet. Fitted with two nos immersion type heating element of 3.0 KW each with individual auto temperature controller and indicating lamps and SS hinges inside to keep detachable idly trays. Also fitted with water inlet, outlet valves and water level indicator. A front opening insulated door is fitted at the service side.120 Idlys.

12. Juicer

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

13. **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.

14. 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. Make-Cambro/Nilkmal/Sintex/Supreme

5.4.0 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. **Pot Rack**

   All the shelves are S.S-304 Square/Round pipes on 4Nos Square/Round legs with adjustable bullet feet. All the joints are firmly welded and nicely grinded, polished and puffed to a smoother finish. Size-1200x450x1650

3. **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

4. **Pot wash Sink**

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

5. **Hot water Geyser**

   Horizontal Capacity - 100 Ltrs

6. **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. Make-Cambro/Nilkmal/Sintex/Supreme

5.5.0 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. **Pre-rinse Jet spray**

   The spray unit to be fitted with hot & cold mixer.

3. **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

4. **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

5. **Wiping 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 an under shelf of 18 swg. S.S. Sheet of 18 swg. With adjustable bullet feet.

6. **Hot water Geyser**

Horizontal Capacity-30 Ltrs.

7. **Bussing Trolley**

The two tiers trolley is made of 18 swg. SS sheet on tubular/square legs on castor wheels with a push cart type handle. Fitted with cushion guard on all sides to prevent the damage during operation. Size-900x600x900

8. **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

9. **Wall Shelf**

Shelf constructed of 18 swg S.S-304 sheet & supports constructed from the 16 swg sheet Size-900 x 300

10. **Clean Dish Rack**

Entirely constructed of S.S-304 round pipe with verticals and slides of 1.5 inch and inside shelves S.S-304 sheet 18 swg. The rack with 5 tiers is mounted on four nylon adjustable feet. Size-900x450x1800

11. 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.

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. Make-Cambro/Nilkmal/Sintex/Supreme

5.6.0 SET-UP AREA

1. Preparation Table with 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- 1500 x 650 x 850 + 150 spl.

2. 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

3. 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

4. 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

5. 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.

6. **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. Make- Cambro/Nilkmal/Sintex/Supreme

5.7.0 STORE

1. Dunnage Rack

Make Sintex/ Nilkamal/Supreme. Moulded typed Size- 900x600x250

2. 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. Make- Atco / Sanchit

3. Storage Rack with 5 tiers for Vegetable store

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

4. **Two door Refrigerator**

Two/ single door unit, 650 Lts capacity, temperature range -2 deg C to +10ºC. External and internal in AISI 304 stainless steel. High-density, expanded polyurethane insulating foam, 70 mm in thickness. Full door with lock and micro-switch to switch off the fan when the door is opened. Built-

in Danfoss make refrigeration unit; Cooling capacity 1300 (watt).ventilated operating mode; digital control; automatic or manual defrost with automatic evaporation of defrost water; external digital temperature display; electronic thermostat. Humidity level adjustment. Internal lighting. Cavity drain. For ambient temperatures up to 43 °C. CFC and HCFC free. R134a gas in refrigeration circuit. Gas in foam: Cyclopentane. Supplied with n. 4x2/1GN Rilsan coated grids and n. 4 sets of 2 stainless steel grid runners. Dimensions (WxDxH mm): 725 x 825 x 1975,Power (kW): 0.52,Power supply: 230 V-1N -50.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. External locking arrangement should be provided, 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.

5. Four Door Refrigerator

1410 lts ,-2deg C to +10 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 Danfoss make 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 (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.

6. 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 Danfoss make 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.

7. 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. Make-Bluestar/Celfrost/Cibwal

8. 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

9. 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

10. Cold Room

- Room Size - 4500X3000X2100
- Temperature - 0 to 4 degree centigrade
- Insulation - Panels 60mm thick PU at 40-42kg density,
- 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/Kirloskar make with Automatic temperature controller and temp. Indicator. Room for Compressor, Condensor and control at the back of the Cold Room. Make-Bluestar/Celfrost /Mothersonzonetti /Carrier/Voltas/Phoenix Refrigeration

11. 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.

12. **Insect killer**
    Twin tube Branded

13. **Air curtain**
    At entry points Make - Mitwaz/Sanchit/Abros

5.8.0 LPG Bank

1. 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 32 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.
- Firefighting 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 <u>TURNKEY WORKS</u> 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. (Switch gears of L&T/ Siemens/ ABB/GE or Schneider make). **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 (INOX/THERMAX make) 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.

- Necessary Ducting of GI sheet with grills inside the kitchen. AIRWASHER 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 for creating comfortable working zone within the Kitchen. Motors shall be of continuous duty S1 type of IS: 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/ Crompton Greaves make. 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 Fire Fighting and cleaning for Kitchen Room including installation of Centrifugal Pump-1 No. of 450 LPM, 30 Mtrs head. Make-KIRLOSKAR/ NGEF/ SIEMENS/CROMPTON/ABB 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 "turnkey 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.

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.

- **Third party quality certification of the Kitchen equipment & item from SGS/BUREAU VERITAS/Lloyds should be submitted as "Certifies that the Kitchen equipment & items meet the technical specification and BOQ of the tender document".**

- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATION OF MECHANISED LAUNDRY

6.1.0 SCOPE OF WORK

The scope of work covered under this package comprises of supply, installation, testing and commissioning and handover of complete laundry on turnkey basis for the 100 bedded Hospital including all equipments, accessories and auxiliary items in accordance with the specifications, bill of quantities and drawings and handover Laundry equipment to the client in satisfactory

6.2.0 WASH PROCESS AND OPERATION SEQUENCE

The dirty linen received from various departments of the hospital shall be marked and subsequently sorted out in the soiled linen storage and sorting area. The clothes with stains shall be separated for the sluicing operation and the balance load shall be fed to the Washer Extractor. The linen after washing and extraction of water is divided into two - one for the Flat Ironers and the other for the Drying Tumblers. From the Drying Tumbler some of the goods which require high order finish are forwarded to the finished goods store for issue to various departments of the hospital. All the goods received from Flat Ironers, Vacuum Finishing Table and the Flat Bed Presses are also forwarded to the finished goods store, which has a mending unit attached to it for minor repairs before issue. Mending unit is also attached to the incoming linen sorting area to carry out any minor mending work before the linen is sent for washing.

6.2.1 SLUICING CUM WASHER EXTRACTOR

For removal of blood stains, faecal matter, vomit and other residue
Capacity -15 kg , Electrically Heated,
Front loading, Heavy duty, High Spin, Soft Mount, 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.

o. ABB/SIEMENS /CROMPTON/NGEF/KIRLOSKAR MAKE

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

6.2.2 WASHER EXTRACTOR

For washing cleaning and extraction
Capacity -30 kg , Electrically Heated,
Front loading, Heavy duty, High Spin, Soft Mount, 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.

o. ABB/SIEMENS/CROMPTON/NGEF/KIRLOSKAR MAKE

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

6.2.3 WASHER EXTRACTOR

For washing cleaning and extraction
Capacity -60 kg , Electrically Heated,

Front loading, Heavy duty, High Spin, Soft Mount, Suspended, Variable frequency drive & Auto reverse & forward, Open pocket & Front display.

a) Control - Fully programmable Microprocessor/Computer controlled

b) Dispenser - 5 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 - More than 700 RPM

m) G-Force - 320 G or more

n) Motor - Large capacity motor with variable frequency drive for wash, distribution, low, normal and high spin.

o) All wet materials and components must be of AISI-304 Stainless steel

p) All Stainless steel components should be TIG welded and highly polished.

q) In-built Control Panel and Motor

6.2.4 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
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

6.2.5 FLATWORK IRONER CHEST HEATED/ROLLER HEATED (Calendaring m/c) Electrically heated

Suitable for rapid ironing of linen like Bed sheets, Pillow cover or flat sheet etc

Roller Size- 500 Ø mm x 3000 mm length,

Front feed and Rear Return Type, Variable Speed Control, Powder coated outer body. Auto timed and Auto temperature control

a.	Roller	-	Machined with perforations through out the length and periphery for moisture suction. Roller should run on self-aligning ball bearings
b.	No. of Rollers	-	1 (One) padded with heavy duty heat resistant Numex/Polyester
c.	Ironing Chest	-	Sliding type. Grinded smoothly Polished Chest should move back and forth through pneumatic cylinders at both sides. Adjustable and uniform ironing pressure should be across the entire roll.
d.	Drive	-	Heavy duty chain drive with spring loaded adjustable sprockets and equipped with Geared Box Motor
e.	Drive Motor	-	1.5 Kw (Approx.)
f.	Suction Motor	-	0.37 Kw (Approx.)
g.	Control	-	Digital control with variable speed of Roller through VFD
h.	Roller Speed	-	2-6 m/min
i.	Main body	-	Made of steel sheet of 1.5 mm thickness with powder coating

j.	Safety	-	Start and stop of the machine with emergency switch. Automatic stopping of the machine for Finger guard
k.	Padding	-	Galvanized coil type/leaf type springs should be covered with heat resistant double layer Polyester Padding of minimum 900 GSM

l. All wet materials and components must be of AISI-304 Stainless steel

m. All Stainless steel components should be TIG welded and highly polished.

n. In-built Control Panel and Motor

6.2.6 FLAT BED PRESS

Suitable for linen like uniform, room furnishing, personal garments, Bed sheets & Pillow Covers
Head & Bed Size- 1500X750mm
Electrically 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	-	0.75Kw 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

6.2.7 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

6.2.8 AIR COMPRESSOR

a. The air compressor of Ingersolrand/ Elgi/Kirloskar make 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 - 3.0 hp.

6.2.9 AUTOMATIC SEWING MACHINE

Automatic motorized 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 drive motor foot pedal operated for convenience of operation with both hands free.

6.2.10 WASH ROOM TROLLEY

Capacity -50Kg

The wash room trolley shall be fabricated out of Stainless Steel AISI-304 tubes and flats in all welded construction ground smooth & finished, supported on swiveling wheels.

6.2.11 DRY LINEN TROLLEY Capacity-50 Kg

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 type.

6.2.12 MOBILE TABLE

Table top size-1200mm x 750mm x 800mm -2 Nos & 1800mm x 900 mm x 800mm-2 Nos

The folding table shall be specially designed for carrying rolling and folding of linen in the laundry. The frame of the table shall be fabricated out of MS 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.

6.2.13 SHELF TROLLEY (Finished linen) Capacity -50Kg

The linen trolley shall be designed in Stainless Steel AISI-304 construction with all welded joints ground & smooth finished out of Stainless Steel tubes and bars and foldable front. The trolley shall be fitted with at least 4 Nos. AISI-304 Stainless Steel shelves(2-shelves removable). The base frame shall be supported on swiveling wheels.

6.2.14 LAUNDRY SCRUB STATION WITH 2 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. Size of sink- 500x500x 450 mm

6.2.15 STORAGE RACK

Size - 120mmx460mmx1800mm shelves; Made of Stainless Steel-AISI-304, Finished with Polishing

6.2.16 INDUSTRIAL WEIGHING MACHINE Capacity -300 Kg.

Electronic weighing machine with digital display. 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.

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

- **Electric distribution panel** for the above Laundry equipment complete with all switchgears, wiring and controls etc complete as per specifications and drawings. (Switch gears of L&T/ Siemens/ ABB/GE or Schneider make)
- **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, 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 these supplies to the individual equipments with ELCB & MCB in the Laundry room.

- Installation of MCB, ACB, ELCB & OCB of Havell/Siemens/L&T /Schneider etc for Control Panel for Laundry.
- Laying of GI water pipe line 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 Laundry room)to the installed machines'/users' ends at Laundry 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 Laundry 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 Laundry 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 for design and selection of Water Softening System.

- Construction/laying of **Draining/Sewer system** from all the equipments/Sinks to the main drain (outside the Laundry) 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 laundry. Exhaustion of hot air and Ventilation for creating comfortable working zone within the Laundry. Motors shall be of continuous duty S1 type of IS: 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/ Crompton Greaves make.
- Arrangement for requisite **Fire Fighting** for the entire effective zones in the Laundry Room
- Additional work pertaining 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 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 "turnkey 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 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.

Note:

- 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.
- Bidder should provide complete Operation manual, Equipment manual, Service manual and manuals 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 by the contractor.

- The contractor should prepare and submit layout plan for Steam Pipeline, 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 Laundry.

- **Third party quality certification of the Laundry equipment & item from SGS/BUREAU VERITAS/Lloyds should be submitted as "Certifies that the Laundry equipment & item meets the technical specification and BOQ of the tender document".**

- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATION OF MORTUARY CHAMBER

7.1.0 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 **4 bodies** 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 SS-304 sheets 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 to be provided.

- 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 Chamber shall be suitable for keeping 4 dead bodies and shall be complete with refrigeration system, locking arrangement, Foul Order Treatment by means of Activated Carbon filter for De-Odorizing System.

7.2.0 Loading Trolley (SS tray/top)-

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.

7.3.0 Turnkey works :

- **Electric distribution panel** 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 Laundry room. • Number of fans, power point, bulbs/tube light. Apart from these supplies to the individual equipments with ELCB & MCB in the Laundry room.

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

- 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 with **Exhaust fan** within the Mortuary Room. Motors shall be of continuous duty S1 type of IS: 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/ Crompton Greaves make.

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 manuals 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.

- **Third party quality certification of the Mortuary equipment & items from SGS/BUREAU VERITAS/Lloyds should be submitted by the contractor as "Certifies that the Mortuary equipment & items meet the technical specification and BOQ of the tender document vide contract No (Mention Contract No.)."**

- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**

TECHNICAL SPECIFICATIONS OF
BIO-MEDICAL WASTE MANAGEMENT SYSTEM

8.1.0 SCOPE OF WORK:

Supply, Installation, Testing, Commissioning of Bio-Medical Waste Management System and Turnkey work operation and maintenance <u>including environmental clearance from the Regulatory Body/Local authority</u> and handing over to the client.

8.2.0 BIO-MEDICAL WASTE AUTOCLAVE

<u>Horizontal Cylindrical High Pressure Steam Sterilizer BIS Mark IS: 3829 (Part 1)</u>
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 400 Ltrs**
- Mode of Heating: Electrically heated by immersion heaters wired for operation on
- Capacity suitable to the bio-medical waste of the AIIMS 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.

8.2.1 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**.

8.2.2 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.

8.3.0 MEDICAL WASTE SHREDDER (LOW SPEED)

- Should be of robust design with minimum maintenance requirement.
- Should be properly designed and covered to avoid spillage and dust generation. It should be designed such that it has minimum manual handling.
- The hopper and cutting chamber of the shredder should be so designed to accommodate the waste bag full of biomedical waste.
- The shredder blade should be highly resistant and should be able to shred waste sharps, syringes, scalpels, glass vials, blades, plastics, catheters, broken ampoules, intravenous sets/ bottles, blood bags, gloves, bandages etc. It should be able to handle/ shred wet waste, especially after microwave/ autoclave/ hydroclave.
- The shredder blade should be of non- corrosive and hardened steel.
- The shredder should be so designed and mounted so as not to generate high noise & vibration.
- If hopper lid or door of collection box is opened, the shredder should stop automatically for safety of operator.
- In case of shock- loading (non- shred able material in the hopper), there should be a mechanism to automatically stop the shredder to avoid any emergency/ accident.
- In case of overload or jamming, the shredder should have mechanism of reverse motion of shaft to avoid any emergency/ accident.

- The motor should be connected to the shredder shaft through a gear mechanism, to ensure low rpm and safety.
- The unit should be suitably designed for operator safety, mechanical as well as electrical.
- The shredder should have low rotational speed. This will ensure better gripping and cutting of the biomedical waste.
- The discharge height (from discharge point to ground level) should be sufficient (minimum 3 feet) to accommodate the containers for collection of shredded material. This would avoid spillage of shredded material.
- The minimum capacity of the motor attached with the shredder should be adequate enough for carrying out for 25 Kg/hr and should be three phase induction motor. This would ensure efficient cutting of the bio-medical waste as prescribed in the bio- medical waste (Management & handling) Rules.
- Anti-vibration mounting should be provided
- Control panel should be provided with auto stop/reversing
- Emergency stop should be provided for safety
- Limit switch should be provided to switch off the Shredder if hopper lid of the door of the Collection Box is opened

8.4.0 NEEDLE DESTROYER

- Should incinerate the needle using low voltage electrical current.
- It should reach a temperature of 1600-1700°C to turn the needle into ash.
- The process should be rapid taking 1-2 seconds
- There should be no visible sparking or arcing
- After incineration the needle debris should be contained in a built in receptacle/container which may be disposable or reusable
- Should have a cutter to cut the nozzle of the syringe with minimal agitation
- Should destroy or deform the needle and syringe by mechanical means
- The cutting blades should be of the best quality

8.5.0 WASTE COLLECTION CONTAINERS

The waste collection containers shall be of steel construction with synthetic enamel paint of approved colours.

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

The colours of the waste collection containers should be as per the July 1998, Gazette Notification of Ministry of Environment & Forest for identification of category of wastes that shall be collected in to it.

8.6.0 WASTE COLLECTION BAGS

The waste collection bags shall be of yellow, red and blue/white translucent colours 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 for the collection of incinerable waste should be made of non chlorinated plastic so as to facilitate incineration of waste without having to open the bags

The bags of red, blue/white translucent colours 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.

8.7.0 TRANSPORTATION TROLLEY

- The container should be made of sturdy plastic material resistant to acid, alkali and chemicals and should be constructed of suitable 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.

8.8.0 INDUSTRIAL WEIGHING MACHINE Capacity -300 Kg.

Electronic weighing machine with digital display. 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

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

- **Environmental clearance** from the Regulatory Body/Local authority

- Contractor must take into consideration in its bid, costs to be incurred for any additional work pertaining to Civil, Electrical, Plumbing, Sanitary and any other protections relevant as per State/Central Govt. regulation/local authority of 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".

- **Plumbing, Laying of GI water pipe line** with necessary taps, joints, elbows, Unions, Tees and valves of GI made and IS-1239 standard (Latest version) to various supply points in the BMW Room from single point supply(Provided by the hospital).

- Installation and commissioning of **Electric distribution panel** with all switchgears, wiring and controls etc of L&T/ Siemens/ ABB/GE or Schneider make) for distribution of power supply to various load points in the BMW Room from single point power supply(Provided by the hospital). **Earthing system** of control panel and other electrical instrument and accessories in the BMWMS area **as per standard guidelines of BIS (Latest edition)**. All cable trenches and railings should be made wherever required.

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

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

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

- 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 all BMW equipments and other electrical instrument and accessories in the BMW room as per standard guidelines of BIS.

- Necessary Ducting of GI sheet with grills at the suitable places for **<u>AIRWASHER (Reputed make)</u> of suitable capacity** for supply of fresh and cool air at the working place inside the BMWS. Exhaustion of hot air and **Ventilation** for creating comfortable working zone within the BMWS. Motors shall be of continuous duty

S1 type of IS: 325 standard (Latest version) and of Kirloskar/NGEF/Siemens/ABB/GEC/ Crompton Greaves make.

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

- Arrangement for requisite **Fire Fighting** system (Fire Extinguishers of suitable capacity at the appropriate places for BMWS including approval from or as per State/Central Govt. regulation/local authority/Statutory body if required.

- **Water Softener** (ION Exchange/Thermax make) of suitable capacity for BMWMS

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the BMWS 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.

- The contractor should provide complete Operation Manual/Equipment manual/Service manuals for all systems and subsystems.

- The contractor should provide Final electrical 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.

- The contractor should provide test certificate for all materials and equipments used for BMWMS

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

- The contractor should prepare and submit layout plan to HSCC for approval before beginning of supply and installation.

- The contractor should prepare and submit layout plan as well as As-Built drawing 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.

- Environmental Clearance from the Local Authority/Regulatory Body is the sole responsibility of the Contractor.
- **Third party quality certification of the BMWMS Equipment & items from SGS/BUREAU VERITAS/Lloyds should be submitted by the contractor as "Certifies that the BMWMS Equipment & items meet the technical specification and BOQ of the tender document vide contract No (Mention Contract No.)."**
- **It should have import/manufacturing license from Central licensing Authority or State licensing authority of CDSCO for the product and copy of valid license should be submitted, if applicable.**